Contagion and Spillovers: New Insights from the Crisis

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Edited by
Peter Backé, Ernest Gnan and Philipp Hartmann

Chapters by:
Ewald Nowotny
Jürgen Kröger, Stefan Kuhnert and Mary McCarthy
Sebastián Nieto-Parra and Javier Santiso
Stéphane Dees and Filippo di Mauro
Catherine Keppel and Julia Wörz
Már Gudmundsson and Thorsteinn Thorgeirsson
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Editors: Peter Backé, Ernest Gnan and Philipp Hartmann

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List of Authors

Peter Backé
Deputy Head, Foreign Research Division, Oesterreichische Nationalbank, Vienna

Eugenio Cerutti
Economist, International Monetary Fund, Washington DC

Stéphane Dees
Principal Economist, External Developments Division, DG Economics, European Central Bank, Frankfurt am Main

Filippo di Mauro
Head, External Developments Division, DG Economics, European Central Bank, Frankfurt am Main

Martin Feldkircher
Economist, Foreign Research Division, Oesterreichische Nationalbank, Vienna

Sonsoles Gallego
Economist in the ADG of International Affairs, Banco de España, Madrid

Sándor Gardó
Economist, Foreign Research Division, Oesterreichische Nationalbank, Vienna

Ernest Gnan
SUERF Secretary General and Head, Economic Analysis Division, Oesterreichische Nationalbank, Vienna

Már Gudmundsson
Governor, Central Bank of Iceland, Reykjavik

Philipp Hartmann
SUERF Vice President and Head, Financial Research Division, DG Research, European Central Bank, Frankfurt am Main

Anna Ilyina
Deputy Chief, Financial Sector Analysis Division, Monetary & Capital Markets Department, International Monetary Fund

Ove Sten Jensen
Head of Government Debt Management in the Danish DMO, Danmarks Nationalbank and OECD Working Party on Public Debt Management, Copenhagen

Claus JOHANSEN
Economist, Government Debt Management, Danmarks Nationalbank, Copenhagen

Catherine KEPPEL
Teaching and Research Associate, Institute for Fiscal and Monetary Policy, Vienna University of Economics and Business, Vienna

Violeta KLYVIENE
Senior Baltic Analyst, Danske Bank, Vilnius

Jürgen KRÖGER
Director – Economies of the Member States I, Directorate for Economic and Financial Affairs, European Commission, Brussels

Stefan KUHNERT
Economist, Directorate for Economic and Financial Affairs, European Commission, Brussels

Mathias LAHNSTEINER
Economist, Foreign Research Division, Oesterreichische Nationalbank, Vienna

Yulia MAKAROVA
Economist, International Monetary Fund, Washington DC

Reiner MARTIN
Head of the Convergence and Structural Analysis Section in the Directorate General Economics, European Central Bank, Frankfurt am Main

Mary MCCARTHY
Adviser, Economies of the Member States I, Directorate for Economic and Financial Affairs, European Commission, Brussels

Luis MOLINA
Staff economist, International Economics Division, Banco de España, Madrid

Sebastián NIETO-PARRA
Economist at the OECD Development Centre, Paris

Ewald NOWOTNY
Governor, Oesterreichische Nationalbank, Vienna

Javier SANTISO
Professor of Economics, ESADE Business School, Formerly Chief Development Economist of the OECD and Director of the OECD Development Centre, Paris

Christian Schmieder
Economist, International Monetary Fund, Washington DC

José Maria Serena
Economist in the ADG of International Affairs, Banco de España, Madrid

Dimitry Sologoub
Head of Research, Raiffeisen Bank Aval, Kiev

Thorsteinn Thorgeirsson
Senior Adviser, Governors' Office, Central Bank of Iceland, Reykjavík

Lars Tranberg Rasmussen
Senior Analyst, Euroland, Danske Markets, Danske Bank, Copenhagen

Julia Wörz
Economist, Foreign Research Division, Oesterreichische Nationalbank

1. Contagion and Spillovers – New Insights from the Crisis

Peter Backé, Ernest Gnan, Martin Feldkircher & Mathias Lahnsteiner

On February 12, 2010, SUERF, the Oesterreichische Nationalbank and the Bankwissenschaftliche Gesellschaft continued their established tradition of jointly organised conferences. As evidenced also by the 115 conference participants, this year's subject of "Contagion and Spillovers – New Insights from the Crisis" turned out to be particularly topical, as first lessons from the financial crisis and global recession were being drawn, while concerns about Greece's government debt problems were threatening to spread to other countries within the euro area, with potential negative repercussions for the euro area as a whole being feared by observers.

In his introductory statement, OeNB Governor **Ewald Nowotny** emphasized the importance of SUERF's dedicated and systematic efforts of bringing together academics, practitioners from the financial industry and policy makers. He noted that the transmission of crises across borders has significant welfare and policy implications and therefore an understanding of the underlying mechanisms is vital. Governor Nowotny then sketched some striking features of the global crisis. He thereby referred to the fall of Lehman Brothers, which set off an avalanche of world-wide deleveraging and caused major disruptions in a financial system that had become more and more globalized in recent decades. With regard to CESEE he mentioned the remarkable achievement that uncontrolled currency collapses have been avoided even if Ukraine came close to it. Finally, he pointed to the forceful global policy response that was successful in preventing the crisis from escalating. In this respect Governor Nowotny underlined the important role of the Vienna Initiative, which served as an instrument to avoid the well-known prisoner's dilemma, in which individual action leads to suboptimal results for the system as a whole, while coordination achieves better outcomes.

The first keynote speech by **Jürgen Kröger**, Director of the Economies of the Member States I Department, DG ECFIN, European Commission, entitled "Contagion and Spillovers – Recent European Experience and the Way Forward" drew on his paper written with Stefan Kuhnert and Mary McCarthy. Kröger started by highlighting vulnerabilities and the potential for spillovers in the euro area. In particular he drew attention to the divergent developments of real effective exchange rates, current account imbalances and net financial assets. Kröger also

illustrated, that both trade and financial openness increased markedly in recent years and alongside the potential for contagion and spillovers rose. He then presented the results of an empirical study that investigates differences across euro area countries in terms of vulnerability and the relative importance of the various transmission channels. According to the model, the impact of external shocks differs considerably across euro are countries and the financial transmission channel dominates across all countries. Kröger concluded with three policy lessons: 1) Timely correction of imbalances and divergences within the euro area is important for the cohesion of the euro area in withstanding external (and internal) shocks. 2) Financial innovation/integration is good for risk-sharing, but complex instruments pose problems for risk managers, investors and policy makers. 3) Given increasingly complex financial linkages across Member States, there is an urgent need for coordination across the euro area in financial regulation and supervision.

Javier Santiso, then Director and Chief Economist at the OECD Development Centre, talked about politics and elections shaping financial and capital markets sentiment, drawing extensively on his paper "Revisiting Political Budget Cycles in Latin America", written with Sebastián Nieto-Parra. He pointed to the clear link between political processes (elections) and instability in debt and currency markets. The focus of his presentation was a comparison of Latin America – as a representative of an emerging market region – and OECD countries. Elections constitute the opportunity to launch new reforms. Especially in Latin America there is still a lot of room for structural reforms. As one concrete example, Santiso emphasized that the spending per pupil in Latin America is still five times lower than in OECD countries. However, in a politically unstable environment, the sustainability of new reforms is questioned by market participants. This is mirrored in systematic downgrades of investment banks' recommendations prior to elections, which are then followed by revisions (upgrades) after a certain transitional phase. The fears of the market have empirical foundations: historically, uncertainty about the economy's fiscal stance increased during times of elections. Also the real exchange rate showed greater variation shortly after the event of an election. Comparing Latin America with the OECD member states, the impact of elections on the fiscal stance is larger in the former. However, the link between elections and capital markets has become weaker over time. In particular case studies of Brazil, Chile and Mexico show that the 'election effect' vanished after 2006. From this Santiso concluded that capital markets tend to perceive Latin America's democracies as being more mature than before.

Session 1, dealt with real economy channels of crisis transmission. **Filippo di Mauro**, Head of the External Developments Division, European Central Bank, presented a study on "The Real Impacts of the 2008-09 Financial Crisis: What

We Knew and What We Have Learned about International Linkages", written with Stéphane Dees. It is a long-standing stylized fact that the US business cycle leads the world economy, with the US leading the euro area cycle by about five quarters and the influence becoming stronger over time. While in the most recent period the impact of a change in US GDP on the euro area has somewhat diminished, the persistence of US shocks has increased. Furthermore, US downturns are transmitted faster (2 quarters) than recoveries (6 quarters). Trade empirically figures as the most important transmission mechanism, while FDI and portfolio investment linkages are much less relevant. Among various financial variables, financial volatility in addition to the slope of the yield curve work best as predictors for the probability of a recession. Financial variables could have helped detect the US recession, but its depth was missed. The authors conclude that the most recent crisis has confirmed the established wisdom in the economics literature that trade – not least through third-country effects – is the most important cross-border business cycle and crisis transmission channel. However, financial market channels may, particularly during turbulent periods, magnify global interactions. They attribute the recent collapse in trade only marginally to financial reasons, such as restrictions on trade financing; the primary reasons were real, related to a sudden re-assessment of global demand prospects following a period of strong – and unsustainable – growth.

Julia Wörz, economist at the OeNB's Foreign Research Division, presented a paper on "The Impact of the Global Recession in Europe – The Role of International Trade" written with Catherine Keppel. The study gives several reasons for the particularly strong response of trade to the recent recession, including increased vertical specialization and global supply chains. Due to sudden and severe financing constraints, demand dropped steeply in particular for durable consumption and investment goods, thus causing a sharp recession in the manufacturing sector worldwide. In its empirical estimates, which cover 38 countries, including the EU, advanced OECD members and a number of CESEE countries, the study assesses the effect of export orientation for the severity of the growth downturn in 2009, controlling for a number of country characteristics such as economic structure, macroeconomic imbalances, and countries' previous growth record. The authors find that greater export orientation is weakly related to a stronger growth downturn, but only when coupled with a dominance of the industrial sector in countries' economic structure. Countries specialized in consumption goods exports suffered relatively less than those specialized in intermediate goods exports. Furthermore, export orientation towards the EU-27 bolstered the impact of the crisis in 2009. Pre-crisis overheating as well as high debt ratios are also found to be systematically linked to sharper recessions in crises. The presentation concluded with two interesting and relevant policy issues: First, should the particularly strong decline in manufacturing and industry be taken as

a sign for lasting structural change, implying that short-term interventions should not aim at preserving existing structures? Second, will trade be able to spur growth in the recovery? On the latter issue, Wörz recalled that trade, being merely a facilitator of transactions, ultimately is only a mirror of demand; so it will be demand which will lead trade, and not vice versa.

The presentation[1] by **Simon Evenett**, Professor of International Trade and Economic Development, University St. Gallen, which dealt with the issue "Has Stabilisation Limited Protectionism? Evidence from the Global Trade Alert", linked very well to issues raised by the previous speakers. Building on a data base on global protectionist measures, Evenett identified four key developments in global protectionism during the recent economic crisis: First, the currently observed intensification of protectionist measures is global, i.e. it is not confined to any specific regions. However, there is considerable variation across countries and regions: Russia, Ukraine, Indonesia, China, Ecuador, lead in the numbers of protectionist measures being taken, followed by the EU27 (taken as a whole), India, Japan, the UK and the US. Only Canada and Brazil have not shown above-trend levels of protectionist measures recently. Second, a new mix of protectionism has arisen. Discriminatory bailouts and subsidies – the overwhelming majority of which benefited the manufacturing, not the financial sector – are the most widely used protectionist measures, followed by trade defense, tariff, public procurement and migration-related measures. The number of jurisdictions hurt by those measures is highest in the case of bailouts and subsidies, public procurement and tariff measures, but is also large in case of trade defence and migration measures. Third, other than the financial sector, the sectoral incidence of protectionism has not changed. Finally, protectionism is so far showing no signs of slowing down, despite the peak of the crisis and the trough of the recession being over and a brightening economic outlook. The current wave of protectionism is much less severe than the one in the 1930s. Reasons for the difference include, for one thing, a more flexible and active response by monetary and fiscal macroeconomic policies, limiting domestic corporate pressures for protectionism. For another, the spread of international supply chains has created an important corporate constituency opposing raising tariffs. Nevertheless, Evenett warned against complacency – rising protectionism has to be taken seriously: Vigilance, close monitoring and peer pressure are needed. As many contemporary protectionist measures are not self-terminating, the G20 should develop principles for an unwinding of subsidies, bailouts, export incentives and "buy national" policies.

Session 2 dealt with aspects related to financial sector contagion as well as the role of government debt management offices during the crisis. **Már Gudmundsson**,

[1] No paper on this presentation is included in this volume.

Governor of the Central Bank of Iceland, held a keynote speech on the lessons from the crisis on cross-border banking, drawing on his paper co-authored by Thorsteinn Thorgeirsson "The fault lines in cross-border banking: lessons from the Icelandic case". By way of introduction, Gudmundsson pointed to the high growth of international bank claims prior to the financial crisis and argued that there was a link between claim growth and crises in general. He then explained that the international bank run following the collapse of Lehman Brothers was associated with an intense deleveraging and a transfer of funds to the US, a freezing of inter-bank funding markets, a run of cross-border banking operations as well as dysfunctional foreign exchange swap markets. Gudmundsson then elaborated on the case of the Icelandic banking sector. In October 2008, three Icelandic banks failed and were put into special resolution regimes after years of rapidly expanding their activities abroad. Gudmundsson linked these events on the one hand to Iceland's boom-bust cycle and problems in the macroeconomic management in small open and financially integrated economies and on the other hand to weaknesses in the European supervisory legislation. Inter alia he pointed to the fact that Icelandic banks' total assets equalled 11 times Iceland's GDP before the collapse. Moreover, he criticized that within the European Economic Area there was a common legal and regulatory framework but the safety net (i.e. deposit insurance and lender of last resort) remained largely national. In addition he described the cross-border crisis management following the collapse of Icelandic banks as non-cooperative. Gudmundsson concluded that the global and European frameworks for the operation of cross-border bank needs reforming as the alternative would be de-globalisation of finance.

A paper prepared for the conference by **Eugenio Cerutti, Anna Ilyina, Yulia Makarova and Christian Schmieder** entitled "Bankers Without Borders? Assessing Capital Needs of European Cross-border Banks Under Ring-Fencing"[2] analyses potential recapitalization requirements of 25 major European cross-border banking groups that might arise from a credit shock in their CEESE subsidiaries under different scenarios of ring fencing. Ring fencing refers to restrictions on intra-group transfers of profits and/or capital; currently, a number of European countries have legal and regulatory limits or conditions on intra-group asset transfers. Ring fencing aims at preventing undue influence by a foreign parent on its subsidiaries or at protecting the interests of minority shareholders and creditors of subsidiaries. Ring fencing has obvious costs in terms of loss of efficiency and diversification. On the other hand, it may be seen by host-country supervisors as a means to protect the domestic banking system from negative international spill-overs, and to promote greater self-sufficiency of bank affiliates, particularly in crisis times. Simulations conducted by the authors show that banks'

[2] Due to weather induced flight cancellations, the paper could not be presented at the conference.

aggregate recapitalization needs are substantially higher if ring fencing is applied. Thus, if ring fencing were applied, cross-border banking groups may need higher capital buffers at the parent and/or subsidiary levels than their current capital holdings under existing capital requirements. Furthermore, cross-border banking groups, capacity for intermediating capital across borders might diminish, and the cost for such services might rise, with adverse real economic consequences. Obviously, ring-fencing is promoted by the tension between the international nature of banking business and crises, and the continued national nature of banking regulation and supervision. Thus, the authors propose two possible ways forward: either credible international resolution and burden-sharing schemes are established; or, in the absence of such schemes, regulators should assume the de facto presence of ring fencing in crises and raise minimum capital requirements for cross-border banking groups accordingly. While the crisis has again emphasised the desirability of progress on the former front, reaching international or EU wide agreement on this are evident.

Ove Sten Jensen, Head of the Government Debt Management Department, Danmarks Nationalbank, presented the nature of the crisis, its impacts and consequences for financial markets from the perspective of a public debt manager, based on his paper "Spillover Effects from the Crisis to the Role of Government Debt Management Offices" written with Claus Johansen. Mr. Jensen noted that the primary goal of a debt manager lies in covering the central government's financing needs at lowest possible borrowing costs. In the aftermath of the crisis, an additional role for a debt manager emerged: supporting financial stability. The period before the crisis was characterized by the general perception that everything can be priced via swaps. Furthermore, competition among countries with respect to government bond markets was relatively low. When the turmoil started, swap spreads widened considerably and the refinancing cost of governments increased heterogeneously across countries. Mr. Jensen noticed a 'flight to liquidity and quality' as evidenced by the soaring demand of investors for German government bonds. The crisis also revealed a break down of stable correlations among bond markets. Historically we have faced high correlations of bond yields among EMU countries during normal times and low correlation between Europe and the US. On the one hand, in turbulent times correlations within the EMU broke down: member states have been treated more as individual countries, with more emphasis being put at country specific fundamentals. On the other hand, the correlation between Europe and the US increased, probably as a result of co-movement in monetary policy rates. Concluding, Mr. Jensen emphasized the high uncertainty linked to the timing of unwinding fiscal stimulus packages and extraordinary monetary policy measures for future borrowing conditions.

Session 3 focused on the spillovers of the crisis to specific emerging market regions and on two country cases. **José María Serena Garraldo**, economist at the Banco de España, and **Reiner Martin**, Head of the Convergence Section of the ECB, seconded to the OeNB at the time of the conference, presented their paper on "The Impact of the Global Economic and Financial Crisis on the CESEE region and on Latin America" co-authored by Sonsoles Gallego, Sándor Gardó and Luis Molina. This comparative analysis examines the macrofinancial vulnerability profiles of these two emerging market regions at the onset of the recent financial crisis and relates them to the actual knock-on effects the crisis had on both regions. The two presenters highlighted the following main findings: CESEE and Latin America differ in some important structural features which are of relevance for the transmission of external shocks. Booming economic conditions in both regions before the global crisis were largely driven by capital inflows, but also supported by region-specific features (commodity prices in Latin America, EU accession in CESEE). Between the two regions, there were notable differences in pre-crisis macrofinancial vulnerabilities. Still, both regions were hit hard after the fall of Lehman; CESEE was affected more strongly given higher trade openness and more pronounced drop in capital inflows. Three CESEE EU member states needed IFI/EU assistance packages during the crisis, while Latin America could manage without recourse to the Fund. However, a fully-fledged financial meltdown did not materialize either in Latin America or CESEE. Importantly, integration into European banking networks was an asset for CESEE during the crisis. As of now, the economic downturn has bottomed out in both regions. While the short-term outlook for Latin America is better than for CESEE, the medium-term growth perspectives are similar for both regions.

The two country cases featuring in this session were on Latvia and Ukraine, two Emerging Europe countries hit most hardly by the crisis. **Lars Tranberg Rasmussen**, senior analyst at Danske Bank, presented on "The Contribution of Poor Economic Policy Mix to Economic Vulnerability – the Case of Latvia", a paper written jointly with Violeta Klyviene. He argued that the poor policy mix during the boom years (procyclical fiscal policy, benign neglect of rapid credit expansion) contributed to economic and financial vulnerability and has dented the competitiveness of the Latvian economy. The current situation is seen as very challenging, and there is no quick fix. A change in the exchange rate regime would bring forward the negative balance-sheet effects that Latvian households and firms will be facing anyway. Internal devaluation, i.e. a real depreciation through goods and factor downward price adjustments, will take several years and the prospects for euro adoption over the medium term are slim, given the large fiscal adjustment needs Latvia is facing.

Finally, **Dimitry Sologoub**, Head of Research at Raiffeisen Bank Aval, spoke on "Ukraine: The Story of Boom and Bust". He stressed the procyclical policy stance during the boom years between 2001 and 2007 and the stalling of structural reforms during the last five years, which substantially added to the weaknesses and vulnerabilities of the Ukrainian economy (low TFP, lack of trade diversification, widening external imbalances, banking sector risks, fiscal vulnerabilities). Low steel prices, contagion in the banking sector and a lack of a coherent policy response contributed to the depth of the crisis. Looking forward, the recovery after the crisis will be gradual, with weak policies constituting a drag on future performance. The ensuing questions and answers session focused on the role of commodity price developments in the boom years before the crisis, the issue of foreign-currency loans, and on the political and economic outlook for Ukraine and Latvia, with a specific focus on measures that ought to be taken to overcome the crisis and resume growth and convergence.

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As on previous occasions, this joint SUERF-OeNB event managed well to provide a concise overview of currently relevant economic developments and policy issues in the area of real and financial contagion and to bring together the views of academics, financial practitioners and the policy makers.

2. Opening Remarks by Governor Nowotny, Oesterreichische Nationalbank

Vienna, February 12, 2010

Ladies and Gentlemen,

It is becoming a well-established tradition that once a year SUERF and the Oesterreichische Nationalbank organize a joint conference. I am very pleased to welcome you again this year. As you know, SUERF and the OeNB have been cultivating close ties for many years, with the OeNB having hosted the SUERF General Secretariat for a decade. I am very pleased to see that this close cooperation again bears fruit in today's conference.

SUERF's dedicated and systematic efforts of bringing together academics, practitioners from the financial industry and policy makers, notably representatives of central banks and supervisory authorities, are particularly relevant in the current post-crisis economic environment. It will certainly take years and decades to understand the sources of the crisis, and reaching a full understanding will only be possible in close cooperation with academics, policy makers and practitioners. Equally, all of these three constituencies will need to be involved in the design of the post-crisis regulatory and supervisory frameworks. And finally, all three constituencies will be involved in shaping the macroeconomic environment and the structural redesign of our economic and financial systems over the years to come.

The next few years will bring a number of big challenges, for which unconventional, out-of-the-box thinking and a mutual understanding of both the interests and needs of policy makers and the financial industry will be particularly important. What probably ties us all together in the first place is that we, everyone in his own way, contributed to the crisis: banks and financial markets by relentlessly accepting or even seeking risks, without due regard to risk-taking capacity; policy makers by permitting overly relaxed macroeconomic conditions, insufficient supervisory frameworks and implementation of regulations; and academics by relying too heavily on over-simplified stylized, mathematically elegant representations of the economy, which obviously were far from reality and failed to express appropriate warnings about the risks of the bubbles that were building up.

But what also ties us all together is our ability and readiness over the past two and a half years to learn from our mistakes, and to adapt our thinking and actions to a dramatically changed reality. It is now important that we maintain the momentum in our post-crisis reform efforts, be it in the financial industry, in

financial supervisory frameworks, in macroeconomic policies or in academic research. Central banks have a particularly rich agenda, given their often triple nature as macro policy makers, lenders of last resort and financial supervisors, in addition to economic researchers and think tanks.

These general considerations seem to be particularly relevant to today's conference topic, 'Contagion and spillovers'. The conference is well timed: At this juncture, it is too early to say that the crisis has come to an end, as its impact continues to be noticeable in important areas, such as rising unemployment and increasing public debt. But most observers agree that the worst of the crisis is over, even if risks remain elevated – stress on financial markets has been easing for quite a while and the global economy has started to bottom out. Against this background, I would like to argue that the time has come to analyze in depth the forces which had led to the worst economic crisis since the Great Depression, to assess and to draw lessons and to take the necessary actions. I am sure that the developments of the recent past will provide generations of economists with ample material for analyses and research. As to the focus of our meeting today: What can economists and policy makers learn from the recent developments in addition to what we already know from the existing literature on contagion?

The transmission of crises across borders has significant welfare and policy implications and therefore an understanding of the underlying mechanisms is vital. How could the subprime loan crisis in the United States – a relatively limited and localized event – have effects of such magnitude on the world economy[1]? Let me very quickly recall some striking features of the crisis and how it spread from advanced to emerging countries before today's conference will deliver more detailed answers.

The crisis started with subprime mortgages in early 2007, extended to financial institutions and money markets in the summer of 2007, and to emerging market countries in the fall of 2008. It is remarkable that in its early stage, the crisis had been confined to advanced economies, and emerging economies, with a few exceptions, were affected only to a limited extent. However, as it is well known today, the situation changed dramatically after the bankruptcy of the US investment bank Lehman Brothers. Following this event, the crisis hit emerging economies through several channels.

A striking aspect of the recent crisis is the collapse in international trade. The slump in real world exports was three times larger than the contraction in world GDP[2]. As most Central, Eastern and Southeastern European (CESEE) countries are very open economies, this collapse of world trade strongly affected Emerging

1 O. BLANCHARD (2009), *The Crisis: Basic Mechanisms, and Appropriate Policies*, IMF Working Paper WP/09/90.

2 M. AMITI and D. WEINSTEIN (2009), *Exports and Financial Shocks*, NBER Working Paper No. 15556.

Europe. In fact, I would argue that a substantial part of contagion in the current crisis has occurred via the trade channel. It is thus essential to pin down the involved forces.

The downturn in global activity, the main factor behind the trade collapse, was amplified by a range of additional factors:
– the contraction in output was mostly focused in trade-intensive expenditure components;
– the breakdown of cross-border supply chains was a main factor behind the extraordinary decline of trade in intermediate goods;
– tight credit conditions – and thus limited access to trade finance, in particular in emerging economies – also dampened global trade activity.

As much as trade contributed to spreading the real economy downturn globally, it can also serve to boost a future economic recovery. However, some qualifications need to be made in this context:
– temporary policy measures are expiring or will so in the near future (macro stimulus, car scrappage schemes and supportive inventory cycle), which may also dampen trade;
– the need to reduce global imbalances (in particular the need for US households to repair their balance sheets) can also have a trade-dampening effect;
– tighter liquidity conditions in the banking sectors will have an impact on the availability of trade finance;
– furthermore, entering export markets, establishing business ties and building up reputation for companies is costly and depends on the productivity and knowledge of firms[3].

On the other hand, the role of cross-border supply chains can also spur the recovery once it gets started and spreads from one country to another.

What are the policy implications of what we have learned so far from the trade channels? From a macro perspective, there is little emerging economies can do to mitigate stress in the short term. While diversification of exports reduces the risk of being hit by an external idiosyncratic shock, this will not provide shelter in times of a global downturn[4].

When designing trade-enhancing policy measures, it is important to bear in mind that trade is rather the victim than the cause of the global crisis. Economic policies should therefore primarily be targeted to spur domestic demand so that trade expansion will follow.

[3] M.J. MELITZ (2003), "The impact of trade on intra-industry reallocations. And aggregate industry productivity", *Econometrica*, Vol. 71, No. 6.
[4] L.F. HERNÁNDEZ and R.O. VALDÉS (2001), *What Drives Contagion: Trade, Neighborhood, or Financial Links?*, IMF Working Paper WP/01/29.

Today's morning session will provide some insight into the real economy channels of crisis transmission.

The fall of Lehman Brothers set off an avalanche of world-wide deleveraging, which caused major disruptions in a financial system that had become more and more globalized in recent decades. Increased financial integration in emerging economies had created potential channels of spillovers. This integration had two main dimensions, namely increased cross-border flows and, in particular as regards the CESEE region, the integration of banking systems in international banking networks. In my reading, the presence of foreign banks in CESEE attenuated capital outflows and thus was a crisis mitigating factor[5], and this is also highlighted in the findings of several recent studies.

In my view, the process of global deleveraging and its role in the transmission of the crisis to emerging economies deserves a good deal of scrutiny. The basic mechanism – banks reduce exposure to emerging markets in response to pressures on their balance sheets – is quite obvious.

– But how exactly did it work?
– Did financial institutions withdraw money across the board or did they discriminate between countries and if yes how? Or to put it slightly differently: To which extent did global factors as opposed to country-specific factors in the lender/borrower country contribute to the transmission of financial stress from advanced to emerging countries?
– If global factors were predominant: Is there anything emerging economies can do to dampen spillovers and contagion?

The 2nd session of today's event is geared to giving answers to these questions.

A remarkable characteristic of the crisis has been the fact that uncontrolled currency collapses and systemic banking crises in emerging markets have largely been avoided despite world-wide deleveraging and related capital outflows. Only in Ukraine did the depreciation resemble currency collapses typical of past emerging market crises, such as the Asian crisis[6]. In the light of the vulnerabilities accumulated during the boom years and the magnitude of the external shocks and output declines, this is all the more relevant. With respect to emerging markets, recent research also illustrates that the global crisis severely hit the financial systems of emerging markets, but to a lesser extent than would have been indicated by past patterns of financial stress transmission[7]. The last session of today's conference is dedicated to the experiences of emerging market regions and to case studies of specific emerging economies during the global crisis.

[5] E. BERGLÖF, Y. KORNIYENKO, A. PLEKHANOV and J. ZETTELMEYER (2009), *Understanding the crisis in emerging Europe*, EBRD Working Paper No. 109.
[6] EBRD, *Transition Report* 2009, November.
[7] IMF, *World Economic Outlook*, October 2009.

It seems convincing that both financial interlinkages and trade played a significant role in transmitting the crisis across regions and from advanced to emerging countries, respectively. On top of these, there have certainly been further spillover mechanisms at work, of which I would like to mention the following:

– the commodity price channel: Some commodity exporting countries faced veritable terms-of-trade shocks, when the crisis intensified in fall 2008. In the first phase of the financial crisis – until late summer 2008 – however, still high or even rising commodity prices provided a buffer for some of these countries. In commodity importing countries, the plunge of commodity prices helped smooth the negative impact of the global downturn;
– the confidence channel: Declining confidence in future economic developments had a negative impact on consumption and investments.

Against the backdrop of the different transmission channels, the question arises: What has been the relative importance of the different transmission channels in transmitting the crisis?

When talking about spillovers, we should also take into consideration what I would like to call 'positive spillovers'. Under positive spillovers I subsume the positive direct and indirect spillovers from the strong global policy response to emerging economies. Various measures were taken to mitigate spillovers and contagion. Let me add a few thoughts on international cooperation with respect to CESEE during the current crisis.

Apart from general political considerations, like in particular solidarity and security principles, strong economic linkages (in the fields of trade and investment) between Western Europe and the CESEE region justified rendering direct and indirect financial support to CESEE countries. The increased economic and political integration also provided incentives for policy makers to act decisively, and in a timely and coordinated way. Presumably, a decade ago, lack of coordination would have resulted in national interests prevailing, which would have made it nearly impossible to quickly and efficiently counter the crisis.

First of all, the CESEE region indirectly benefited from euro area-related measures. In particular, the ECB extended liquidity support to euro area-based banks in an early and comprehensive manner. This funding helped them maintain the refinancing of their CESEE subsidiaries. Also, coordinated measures of euro area countries to support their respective banking systems were beneficial for the CESEE region, as home country authorities permitted parent bank support of subsidiaries (including the use of state capital injections for subsidiaries), i.e. there was no ring-fencing.

When the breakdown of international financial markets in October 2008 made it difficult for CESEE banks to hedge and refinance their positions, the ECB went

beyond this euro area-related approach and also entered into bilateral central bank repurchase arrangements with some CESEE EU Member States.

For several CESEE countries, the collapse of foreign demand, disrupted international financial markets and heightened risk awareness of financial market participants made it difficult to stabilize their currency and/or to meet their external financing requirements. Therefore, these countries (Hungary, Ukraine, Latvia, Romania, and Serbia) had to turn to the IMF (and the EU) for financial assistance.

I do think that the coordinated efforts of major international players like the IMF, the World Bank and the EBRD together with the European Union were instrumental in re-establishing financial market stability in the region and in preventing a systemic crisis in the region's financial system. To some extent, a(n even) quicker reaction might have been desirable – for instance, it took some time to convince our partners in Europe that the whole of Western Europe would be affected if the crisis in CESEE got out of hand. Eventually, however, the response of the IFIs and of the EU came in time to stop the crisis from escalating, and both the increase in IMF resources and loan facilities (agreed at the G-20 meeting in early April 2009) and the quadrupling of EU balance-of-payment support funds (to EUR 50 billion) were important stabilizing steps.

Complementary to the stand-by arrangements with these hardest hit CESEE countries, the 'Vienna Initiative' helped coordinate the responses of major public and private stakeholders to the financial crisis in these countries (home and host supervisors, large banks and international financial institutions). While the integration of CESEE banking systems into European banking networks has created incentives for parent banks to stay committed in the region even in bad times, the Vienna Initiative has served as an instrument to avoid the well-known prisoner's dilemma, in which individual action leads to suboptimal results for the system as a whole, while coordination achieves better outcomes. Within this framework, the internationally operating banks active in CESEE committed to maintaining their (direct and indirect) exposure to these economies and to recapitalizing their respective subsidiaries if necessary. These commitments locked in the better equilibrium for all banks and for the respective economies at large, and are now widely acknowledged for their crucial role in stabilizing the financial systems in these CESEE countries.

Along with the recovery in global financial markets, the measures I outlined above were instrumental in stabilizing sentiment toward CESEE and CESEE financial markets. Moreover, more recently some pick-up in Western European export markets – partly driven by fiscal stimulus measures and accommodative monetary policy – has been helping CESEE economies recover faster than

expected. However, the recovery in the region remains fragile, with substantial variations across countries.

Let me conclude and stress that the forceful – and successful – global policy response is an important feature of the global crisis, as it illustrates that policy makers have learned from the experiences garnered in past crises. This conference should serve as a forum to exchange views and experiences about the transmission of financial stress in light of the current crisis. Understanding how and why the local financial crisis culminated in a global economic slowdown is essential to preventing or dampening similar developments in the future. Shedding light on the workings of these transmission channels can provide new insights for future policy actions. I am looking very much forward to hearing, discussing and learning from the opinions of key experts, policy makers, bankers and academics over the next couple of hours.

3. Contagion and spillovers – recent European experience

Jürgen Kröger, Stefan Kuhnert & Mary McCarthy[1]

3.1. Introduction

The global financial crisis has taken a heavy toll on the European Union (EU) and the Euro Area (EA). The recession triggered by the crisis has been the deepest and the longest in history of the EU. In 2009, real GDP shrank by 4.2% in the EU and by 4% in the EA, with a range stretching from -18% in Latvia to +1.7% in Poland. At the same time, the unemployment rate rose above 9% in the EA, with Spain at more than double this figure, while inflation averaged 0.3% for the year as a whole. Fuelled by rising expenditures – both discretionary and non-discretionary – and falling revenues, government deficits rose well above 3% of GDP in many countries, reaching 6.4% of GDP in the EA and 6.9% in the EU in 2009 and the debt ratio was approaching 80% of GDP in both regions. Furthermore, European Commission simulations of the effect of the crisis suggest that the potential growth rate in the euro area could be halved from a range of 1.3–1.6% in 2008 to 0.7–0.8% in 2009-2010[2]. But the crisis has not only led to recession, unemployment and banking sector problems as in other parts of the world, it has also put the spotlight on the underlying macroeconomic imbalances and competitive divergences that had been accumulating in the euro area during its first decade of existence[3].

This paper begins (section 2) with an overview of the imbalances that developed in euro-area countries between 1999 and 2007, which meant that many countries were in a fragile position when the financial shock hit the world in 2008. Section 3 considers the various channels of transmission of shocks, economic spillovers and contagion and examines various stylised facts that are likely to render euro-area countries vulnerable in this respect. Section 4 presents the model together with some preliminary results on the channels of transmission of shocks or spillovers to euro-area countries. The final section considers ways of dealing with current problems and moving forward from here.

[1] All authors are staff members of the Directorate for Economic and Financial Affairs, European Commission. The opinions expressed in this paper are the personal opinions of the authors and do not necessarily represent the views of the European Commission.

[2] See European Commission (2009).

[3] See European Commission (2006).

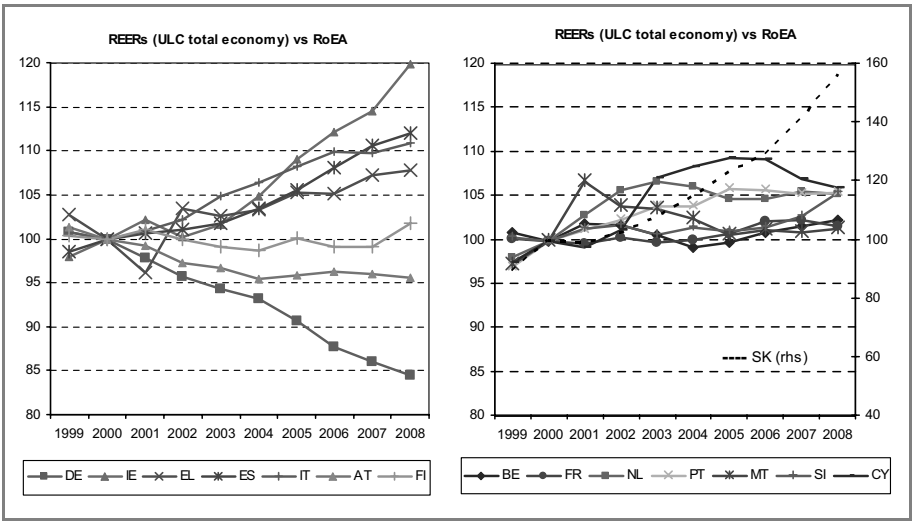
3.2. IMBALANCES IN EURO-AREA COUNTRIES

3.2.1. The period 1999-2007

The competitive position of euro-area Member States, as illustrated by the real effective exchange rate (REER)[4] vis-à-vis the rest of the EA (see Graph 1) and a larger group of countries encompassing major global trading partners (35 industrial countries), had diverged significantly during the nine years preceding the crisis. Three groups of countries may be distinguished. The first group, characterised by steady improvements in competitiveness since the launch of the euro, comprises Germany, Finland and Austria. The second group consists of countries that experienced by a broadly stable REER against the rest of the EA since 1999 (Belgium and France). The nominal appreciation of the euro over this period, however, implied deteriorating competitiveness against global competitors. The remaining countries experienced various degrees of real effective appreciation (both versus the rest of the euro area and globally), with a first sub-group showing relatively contained appreciation against the rest of the euro area (Luxembourg, the Netherlands, Portugal) and a second sub-group experiencing sharp losses in cost competitiveness, namely Ireland, Greece, Spain and Italy both inside and outside the euro area. The four countries that joined the euro area more recently show quite diverse developments. Malta and Slovenia maintained a relatively stable REER vis-à-vis the euro area, with the latter country showing a marked upward movement since 2007. Cyprus, on the other hand, experienced a steady real appreciation until 2006, but saw its REER decline somewhat in 2007 and 2008. Finally, Slovakia's REER appreciated sharply, by 75% between 1999 and 2008. Despite the contained and recently stalled deterioration in the REER in Malta and Cyprus, respectively, both countries experienced significant losses in market shares over the past decade.

[4] In the assessment presented here, we refer to the REER based on unit labour costs (ULC), although in the underlying analysis we also considered the REER based on the GDP deflator, the private consumption deflator and the export price deflator, depending on the particular suitability of each indicator for analysing competitiveness issues in the country in question.

Graph 1: Real effective exchange rates vis-à-vis the rest of the Euro Area (2000=100)



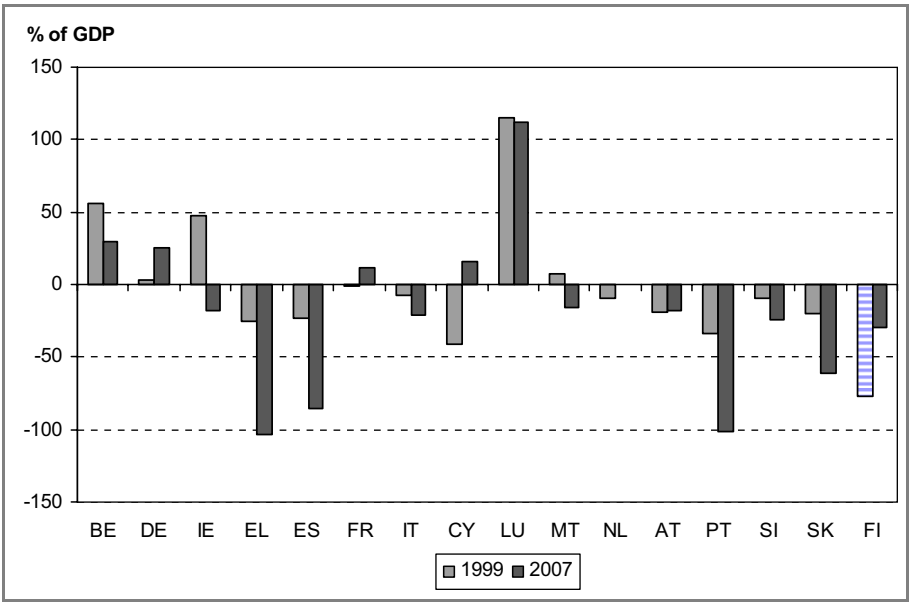
Source: Commission services

These developments in cost competitiveness were to some extent mirrored by corresponding divergences in current account balances: Germany, Finland and, to a lesser degree, Austria experienced large current account surpluses. Luxembourg and the Netherlands recorded even larger trade surpluses despite some deterioration in cost competitiveness measures. On the other hand, Greece and Spain and, to a lesser extent, Ireland, as well as other appreciating countries (Portugal), posted large external deficits, which were attenuated only recently with the onset of the crisis in 2008. Reflecting their catching-up process, Cyprus, Malta, Slovakia and Slovenia registered sizeable current account deficits, which were driven mostly by deficits in the merchandise trade balance and, additionally, in the case of Slovakia by a deficit in the primary income balance.

Looking at the factors underlying the external imbalances accumulated in the above-mentioned, mostly southern, Member States (and Ireland), a mismatch between wage and productivity developments emerges as a general feature. Italy also shares this mismatch, although its external imbalance was relatively contained. This suggests that non-price/cost factors (e.g. trade product mix) are also relevant in explaining the external imbalance. The effect of falling wage competitiveness on the external position was indeed compounded by unfavourable sectoral and/or geographical export patterns in some countries (Greece, Portugal), and over-investment in non-productive housing in others (Ireland, Spain, Cyprus). In terms of the savings-investment perspective, the latter developments were mirrored in rising net borrowing positions of households (Ireland, Greece, Spain) and the corporate sector (Spain and Portugal). Imbalances were fuelled

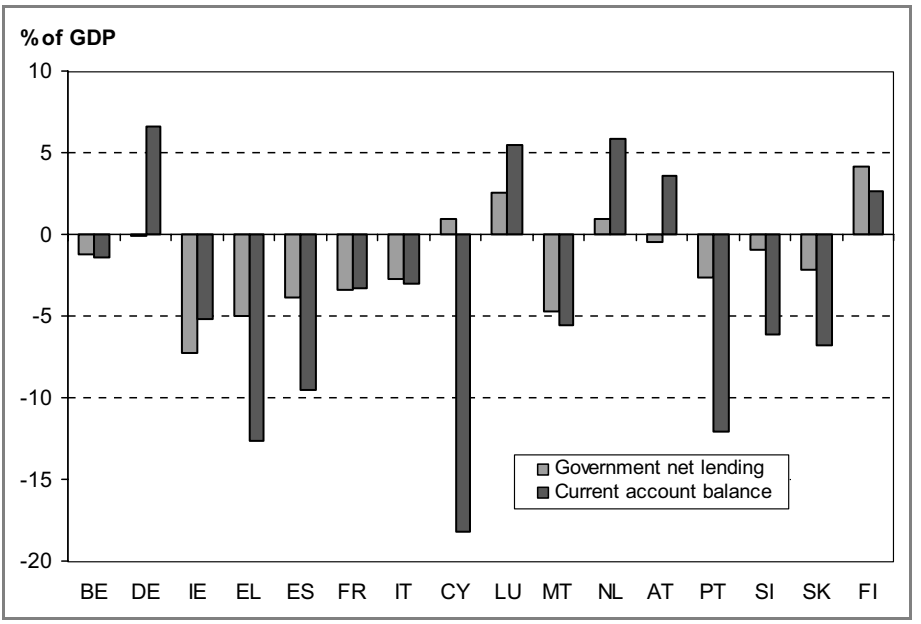
further by inadequate fiscal policy developments in Greece and Portugal, where economic good times, particularly in Greece, were not used sufficiently to cut back on the net borrowing position of the government sector. Moreover, a snowball effect of ever-deteriorating current account balances – through increasing primary income deficits linked to very large foreign liabilities – seems to have been present in several countries (Greece, Spain, Portugal; see Graph 2). In the cases of Malta, Slovenia and Slovakia, where current account deficits might be expected due to their catching-up status, there is still a competitiveness issue linked to an apparent misalignment of wage and productivity developments. In Slovakia, this seems to be compounded by a rather narrow sectoral specialisation pattern.

Graph 2: Net foreign financial assets in euro-area countries



Source: Lane Milesi-Ferretti database mark II. First column for Finland refers to 1998 rather than 1999.

Graph 3: Current account balance and government net lending (2008,% of GDP)



Source: Commission services

The current account deficits and surpluses in the euro area mostly reflected private borrowing and lending activities before the onset of the crisis (Graph 3). In most deficit countries, the current account balance was significantly higher than the government deficit, implying that private capital flows were driving the net lending of the deficit countries. Ireland, France, Italy and Malta were exceptions to this trend; in Ireland, a sharp rise in the government deficit had already taken place under the impact of the collapse of the housing market on the economy.

Apart from the six countries mentioned above as facing obvious cost competitiveness challenges (namely Ireland, Greece, Spain, Italy, Portugal and Cyprus) and clear losses in market shares (except for Ireland), Belgium, France and Malta also suffered from marked losses in export market shares between 1999 and 2008.

As shown by the examples of France and Italy, it is important to differentiate between nominal and real export performance. France saw its export market shares decline more in nominal terms than in real terms, indicative of a downgrading along the value-added chain or reduced profit margins. Italy, on the other hand, experienced marked losses in export markets in volume terms, but its market shares at current prices stabilised in 2007/08, possibly due to an upgrading of its export structure and/or a considerable loss of market shares in low price segments.

Although market share losses were not mirrored by significant losses in cost competitiveness (except for Italy) or striking deteriorations in external balances, competitiveness developments in these countries deserve further attention. Low productivity growth (France), unfavourable geographical (Belgium, France) and sectoral export composition (France) and inefficient wage formation, which has limited wage flexibility in some Member States (notably Belgium, Malta), seem to be the major factors behind the unsatisfactory export performance of these countries.

Among the countries with current account surpluses (Germany, Luxembourg, the Netherlands, Austria, Finland), most countries saw their export market shares increase between 1999 and 2008 (except the Netherlands). However, in the case of Germany, large external surpluses also reflected relatively contained domestic demand due to wage moderation and restricted infrastructure investment (as well as general consolidation of public finances). None of the surplus countries experienced a boom in housing construction, with house prices even decreasing in real terms in Germany and Austria.

3.2.2. More recent developments (2008 onwards)

The crisis has so far not led to a necessary rebalancing of price competitiveness and is not projected to do so in 2010-11 according to European Commission forecasts. Most indicators of price and cost competitiveness point to further divergence in competitiveness within the euro area, both during the crisis and in the early stage of the recovery. Germany improved its already strong competitive position further. Meanwhile Greece continues to experience a steady deterioration in its competitive position. The only signs of rebalancing come from Ireland, which registered significant gains in competitiveness in 2008 and 2009.

The crisis triggered some rebalancing of current accounts, in terms of both deficits and surpluses. With the exception of Portugal, Member States with very large current-account deficits have experienced sharp improvements. Meanwhile, most Member States with large current-account surpluses have seen substantial falls in their balances. The convergence in current accounts induced by the crisis reflects the interplay of three factors. Firstly, falling domestic demand since the onset of the crisis has helped to improve the trade balance via reduced imports especially in current account deficit countries e.g. Greece, Ireland and Spain. Secondly, this effect has been intensified by a strong substitution of imports by local – usually lower value – products in some deficit countries. Thirdly, surplus countries have tended to be more exposed to the slump in world trade partly due to their greater degree of trade openness, but also because of their specialisation in product groups that have been more severely affected by the crisis (e.g. high quality goods, investment equipment).

Although this attenuation in current account positions might be seen as indicative of an adjustment of underlying imbalances, there are several reasons to be cautious about such an interpretation. First, the rebalancing of current accounts appears to be at least partly cyclical and might be reversed once the recovery picks up pace. Past experience suggests that structural current account adjustment takes time to emerge. Second, changes in current-account positions in some deficit countries have taken place in parallel with an increase in unemployment rather than through significant price/wage adjustments. Except for Ireland, price adjustments in housing markets in deficit countries have so far remained small. In addition, while balance sheet adjustment has started in the private sector, household and corporate debt remains high in many countries.

Turning to public finances, the deterioration in government balances is sharp and clear, with deficits rising in all countries and increasing gaps vis-à-vis Germany. The sources of these divergences are many: reduced revenue due to lower growth rates and collapse in housing market bubbles, and higher expenditures due to rising social transfer costs and stimulus packages. It is instructive to look at the fiscal position in conjunction with the current account balance. Countries with high current account deficits tend to be characterised also by high fiscal deficits (twin deficits). The deteriorating net borrowing positions of Greece, Ireland and Portugal were driven by the growing net borrowing positions of households up to 2008. Since then, the general government sector has replaced the private sector as the main source of net borrowing. The longer-term outlook for public finances is not particularly bright either. Most governments are faced with both lower revenues due to lower growth – in the Euro Area, a 1% fall in GDP is estimated to imply an average loss of 0.42% of GDP in budgetary revenues[5] – and a higher interest rate burden due to rising public debt, in addition to expected higher expenditures due to ageing populations[6]. Mainly as a result of the fiscal costs directly related to the recent financial and economic crisis, the euro-area public debt ratio is set to rise by at least 20% of GDP in the medium-tem compared to the pre-crisis level and the debt-servicing burden is also growing as sovereign bond yields rise. This implies a much greater fiscal adjustment need compared to the recent past. Financial markets have started to factor in this perspective, as illustrated by the recent rise of the interest rate spreads between the southern countries and Germany.

[5] See for example LARCH and TURRINI, 2010.

[6] Recent estimates suggest a rise in the share of age-related spending of 4.4% of GDP between 2010 and 2050, bringing this share to about 28% of GDP but the costs could be even higher (European Commission, 2009).

3.3. POTENTIAL FOR SPILLOVERS/CONTAGION[7] ACROSS EURO-AREA COUNTRIES

3.3.1. Channels of transmission

Real shocks may be transmitted from one country to another through both real linkages and financial linkages. Trade is the main channel envisaged under real linkages, which refer to shocks affecting the real sector of the economy. A country can be exposed to a shock in a country to which it exports or to a shock in a country with which it competes for export market shares, e.g., a shock in another country that affects demand for the home country exports, leading in turn to a deterioration in the trade account that undermines economic growth in the home country. This may lead investors to reassess the risks of investing in the home country to the detriment of the latter. The origin of the shock may also be a depreciation of the currency of a major trading partner.

Although trade links can be important in explaining spillovers and contagion, they cannot explain all forms of shock propagation. The crisis that began in East Asia in 1997 eventually spread to Russia and Brazil in spite of the fact that the latter two countries did not have substantial trade links with the countries where the crisis originated. For this reason, many believe that financial linkages can be more important channels of transmission. The degree of financial market integration is an important element in explaining the spillover of a financial shock in one country to the real sector of another economy. The literature distinguishes between direct and indirect financial linkages[8]. In the case of direct linkages, a financial crisis in one country can spread to others through a reduction in capital flows, such as FDI or a reduction in trade credits. The former type of direct financial linkage is well known among developing countries, where growth has often been supported by strong FDI inflows and the accumulation of large current account deficits have often preceded abrupt capital flow reversals. Indirect effects from FDI include those that operate through labour market, given that multinational companies are important employers of labour across the world, and supply channels, which can be important in creating local linkages. Some research shows[9] that foreign disturbances transmitted through FDI may have more dura-

[7] The definition of contagion (from the World Bank website) varies from the broad definition of "cross-country transmission of shocks or the general cross-country spillover effects" to the narrow definition of "the transmission of shocks to other countries or the cross-country correlation, beyond any fundamental link among the countries and beyond common shocks". In the financial contagion literature, the term 'shift-contagion' is used for purposes of precision. This is defined as "a significant increase in cross-market linkages after a shock" (CLAESSENS and FORBES, 2001). A distinction is also made in the literature between 'spillovers' and 'interdependence'. In this analysis, we use the broad definition of contagion which encompasses spillovers, as it is a better indicator of the vulnerability of a country to all shocks originating outside the country, not just financial shocks.

[8] See for example IMF, 2009.

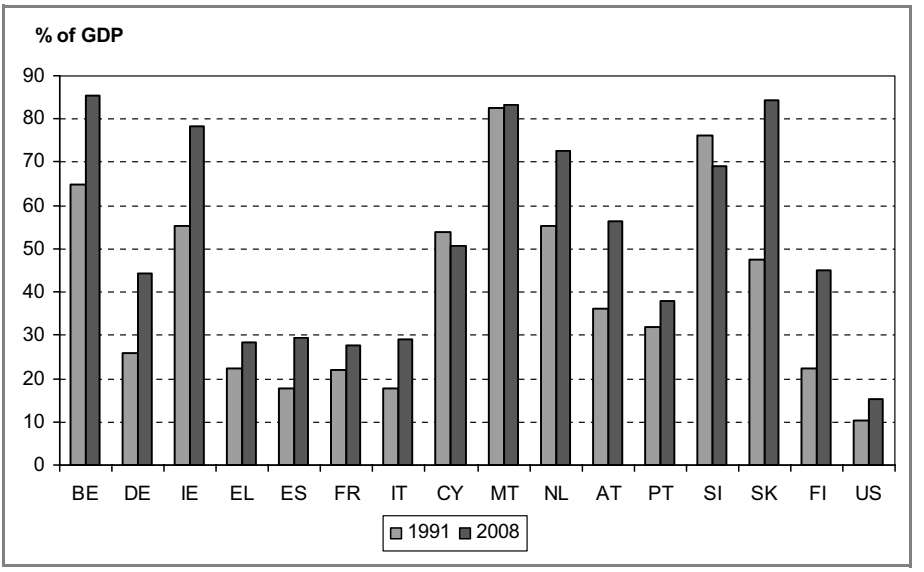
[9] See for example JANSEN and STOKMAN, 2004.

ble effects on the economy than those transmitted through the trade channel. The banking channel can operate through direct cross-border banking or indirectly through the 'common lender' channel. The indirect effect in the latter case is exemplified by an international bank that is a key lender in two countries. If the bank's capital position is weakened due to a real shock in one country, it may adjust by reducing its overall risk exposure, e.g., by restricting credit in the other country. This creates a spillover from the financial sector to the real sector. Innovations in financial instruments over the past decade have increased the complexity of financial linkages across countries, as testified by the current global financial crisis.

3.3.2. Stylised facts – the potential for spillovers or contagion across euro-area countries

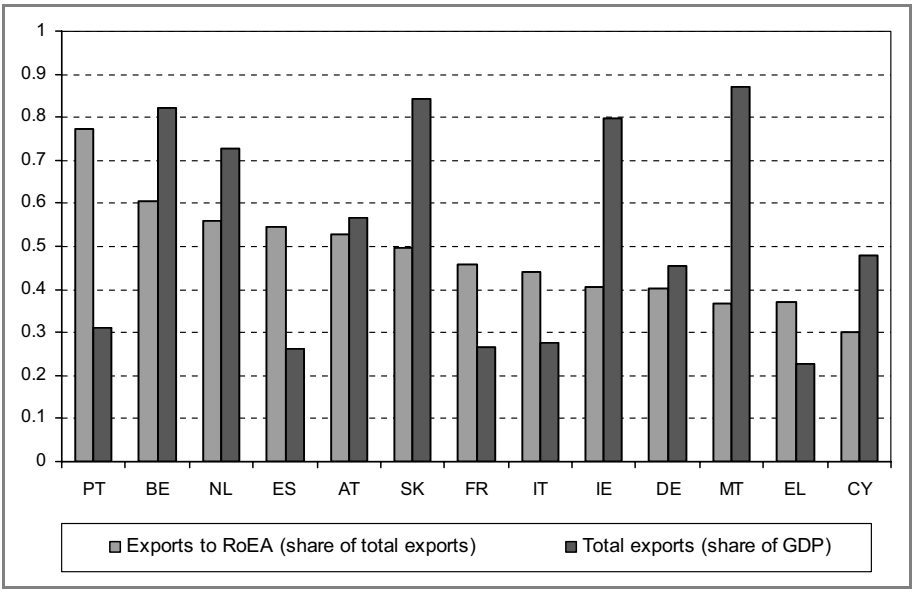
This subsection considers various indicators of the potential for spillovers or contagion across euro-area countries. The degree of openness of an economy (average of imports and exports as a percentage of GDP) provides an indicator of the potential for spillovers through trade linkages. An analysis of trade openness (Graph 4) reveals that all euro-area countries experienced a rise in openness between 1991 and 2008. There are several factors behind this, including falling transportation costs, declining trade barriers, growing information about production opportunities in other countries and an increase in international migration, all of which were relevant at the global level. The closer economic integration engendered by creation of the single market and the euro area, and the enlargement of the EU should have strengthened these factors. In general, the increase was relatively smaller for the small countries, apart from Slovakia and Finland, probably because smaller economies have long been more dependent on trade as a source of development. Interestingly, Germany was already more open in the early nineties than the other large economies and the increase in openness over time has been relatively greater. The fact that the EA is the most important destination of exports for Austria, Belgium, Netherlands, Spain and Portugal (Graph 5) suggests that these countries should be more susceptible to spillovers from other euro-area countries via the trade channel. It also implies that for current account deficit countries such as Spain and Portugal, a rebalancing of domestic demand within the Euro Area will be particularly important in facilitating their adjustment.

Graph 4: Trade openness



Source: Commission services

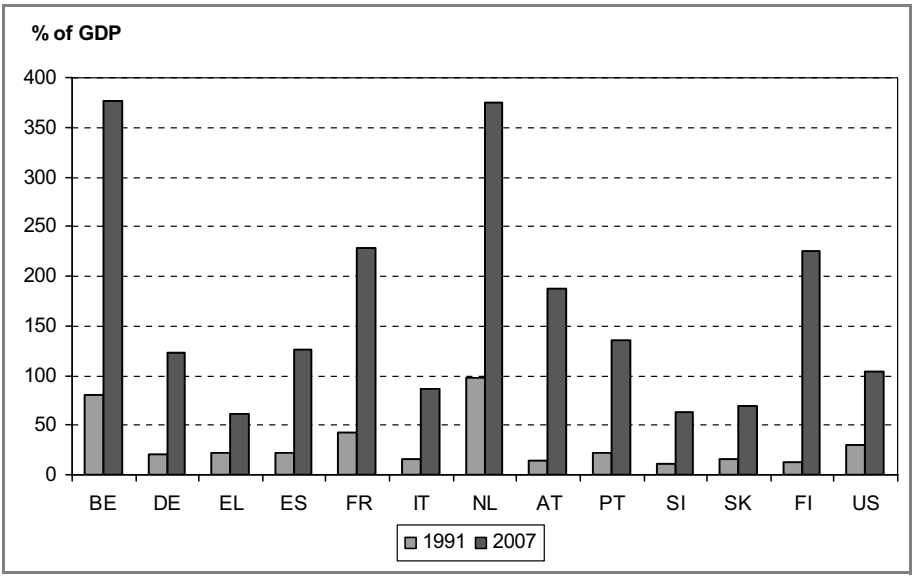
Graph 5: Share of intra and extra euro-area exports (data for 2006)



Source: Commission services

Financial linkages occur through financial markets, financial institution linkages, interaction of financial institutions and markets, and contagion via a common lender. Given the various facets of financial linkages – money, bond, equity, banking markets and financial infrastructures – there are many possible indicators of financial openness. Here we consider the sum of foreign (portfolio and FDI) assets and liabilities as a percentage of GDP. Graph 6 shows a sharp increase in financial openness in several euro-area countries between 1991 and 2007. This development is not unexpected given the rapid increase in financial integration across the world during the past 15-20 years. In fact, both stocks and flows of FDI have grown rapidly across the OECD area since the mid-1980s, with a significant acceleration since 1995 (Jansen and Stokman, 2004). During the same period, FDI inflows grew faster than both GDP and international trade (Jansen and Stokman, 2004). An analysis of euro-area international equity holdings by Lane and Milesi-Ferretti (2005) shows that the EA is second only to the US in terms of portfolio equity investment. They also find that euro-area equity investment is strongly biased towards other euro-area countries and is strongly linked to bilateral trade in goods and services.

Graph 6: Financial openness (portfolio and FDI assets and liabilities as a % of GDP)



Source: Lane Milesi-Ferretti database mark II. First column for Finland refers to 1998 rather than 1999.

BIS data showing bank exposure (in terms of lending) to emerging economies of Central and Eastern Europe may also provide an indication of the potential exposure to spillovers arising from developments in the latter countries. The 'great moderation' saw Western European banks expanding rapidly into emerging econ-

omies and particularly into Central and Eastern Europe, leading to a high degree of exposure to economic developments in these countries. The degree of exposure differs markedly across euro-area countries. Among the countries most exposed[10] to Eastern European emerging economies were Austria (66% of GDP), Belgium (27%) and the Netherlands (14%).

3.4. RESEARCH ISSUES, MODEL, METHODOLOGY AND PRELIMINARY RESULTS

3.4.1. Research issues

This paper deals with two questions: 1) Is there a difference across euro area Member States in the degree of vulnerability to external shocks/economic spillovers? and 2) What are the most important channels of transmission of external shocks/economic spillovers[11]? Where the first question is concerned, one would expect to see some differences a priori. While the Euro Area as a whole is relatively closed, it is composed of some very open economies, which have the potential to transmit external shocks via strong intra-euro-area linkages. Also shifts in trade have been taking place within Europe through, *inter alia*, the decentralisation of production to low cost countries, especially in Central and Eastern Europe. Finally, the process of globalisation is likely to have increased the number of linkages beyond the traditional channels of trade and FDI.

3.4.2. Model and methodology

Our model is based on Bayoumi and Swiston (2007), who use a VAR model to investigate the size of economic spillovers between the US, the EA, Japan and the rest of the world in a first step and, in a second step, examine the relative importance of three main potential connections between countries – trade, commodity prices and financial conditions. They find that: the US is the source of the largest spillovers for all other areas and that financial conditions are the main source of such spillovers. Using a similar methodology, we set up a bivariate VAR model to investigate how large the spillovers are from the US to each EA country in turn and then examine the relative importance of three main potential connections between countries – trade, oil prices and financial conditions. The advantage of this approach is that it distinguishes among the various channels for transmission of external shocks.

[10] Exposure is measured as claims to emerging countries of Central and Eastern Europe as a % of the lender's GDP.

[11] These questions are part of a larger research project, which is also devoted to answering other questions such as the nature and extent of spillovers among euro-area countries as well as spillovers between euro-area and non-euro-area EU countries.

The basic VARs (first step) contain growth of real GDP for each individual EA country and the US. In a second step, the VARs are augmented by (exogenous) variables representing the three potential connections, specifically:

– the trade channel, as represented by the contribution of net exports to growth;
– financial channels, represented by the change in real equity prices, the level of nominal government bond yields and the level of nominal short-term interest rates; and
– the commodity channel, as represented by change in real oil prices.

We use seasonally- and, where relevant, working-day-adjusted quarterly data for all variables[12]. The time span varies across countries, the longest period starting in 1978 (France) and the shortest in 2000 (Malta). Tests for stationarity imply the use of growth rates for real GDP and inclusion of a constant in the VARs. The basic VARs contain growth of real GDP for each individual EA country and the US with a maximum lag length of four depending on the results of lag inclusion tests. The VARs are stable in the sense that all roots of the characteristic AR polynomials lie within the unit circle. Impulse response functions are used to trace the effect of a one standard deviation shock to US GDP growth after a Cholesky decomposition of the residual matrix. In terms of the ordering of variables, since US real GDP is considered to be exogenous, it is ordered first in all VARs (except those including the trade channel, where net export contributions come first).

3.4.3. Preliminary results

Our results are robust for most euro-area Member States, although less reliable for a few countries where the datasets are limited in size. Graphical representations of the decomposition of responses to US GDP shocks are presented in Appendix 1. We find that:

– shocks to US GDP generate significant spillovers to EA economies but the impact differs considerably across countries;
– the impact on Ireland, Luxembourg and Slovenia is above the average for the Euro Area;
– the impact is significantly smaller than average for France, Italy, Netherlands and Greece;
– the financial transmission channels dominate across all Member States;
– the trade channel is important only for Germany and Spain;
– the commodity price channel is significant for Germany, Spain and Slovenia;

[12] The quarterly national account data are taken from Eurostat; the source of other data series is Ecowin.

– long-term interest rates are more relevant than short-term interest rates;
– equity prices matter even more than interest rates, in particular for Italy, Spain, Belgium, Slovenia, Luxembourg and Malta.

Although these results are preliminary, we can already present some implications for further research:

(1) the financial channels appear to predominate in the transmission of external shocks. This result calls for a better understanding of the individual channels and their interaction. Much blame for the strength and speed of contagion of the current crisis has been laid at the door of the increased complexity of financial instruments and the multiplicity of financial linkages. Some similar issues were raised at the time of the Asian crisis in the late nineties. Yet there are still many questions to be answered. A better understanding of how individual financial channels work is a prerequisite for devising appropriate policies to avert similar crises in the future;

(2) within the financial channels, the bond market channel appears to be particularly important. The market capitalization of international bond markets is much larger than that of international equity markets. Yet, while there is a large body of literature on linkages through international equity markets, the literature on international bond market co-movements especially for developed economies is less extensive. But such linkages may have important implications for the cost of financing fiscal deficits as well as for monetary policy. One recent study of European bond markets[13] finds that government bond returns of euro-area countries are more influenced by euro-area risk factors, while for non-euro-area countries, it is world risk factors that prevail. On the other hand, another recent study[14] finds that the effect of domestic factors on bond yield spreads increased significantly during the crisis, when international investors started to discriminate more between countries. In particular, the combination of high risk aversion and a large current account deficit tends to magnify the incidence of a deterioration in public finances on government bond yield spreads.

3.5. WHERE DO WE GO FROM HERE?

The global financial crisis has brought a number of issues to the forefront. This is true not only at the global level but also in the context of the Euro Area. These include weaknesses in the economic and financial surveillance and policy frameworks as well as gaps in our understanding of the channels of transmission of shocks across countries.

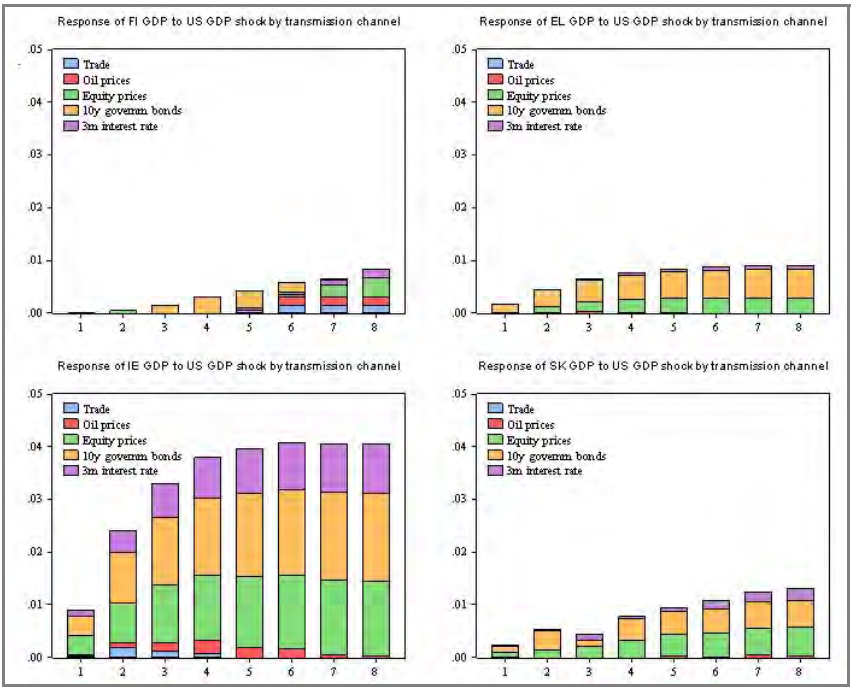
[13] See ABAD-ROMERO *et al.*, 2009.
[14] See BARRIOS *et al.* 2009.

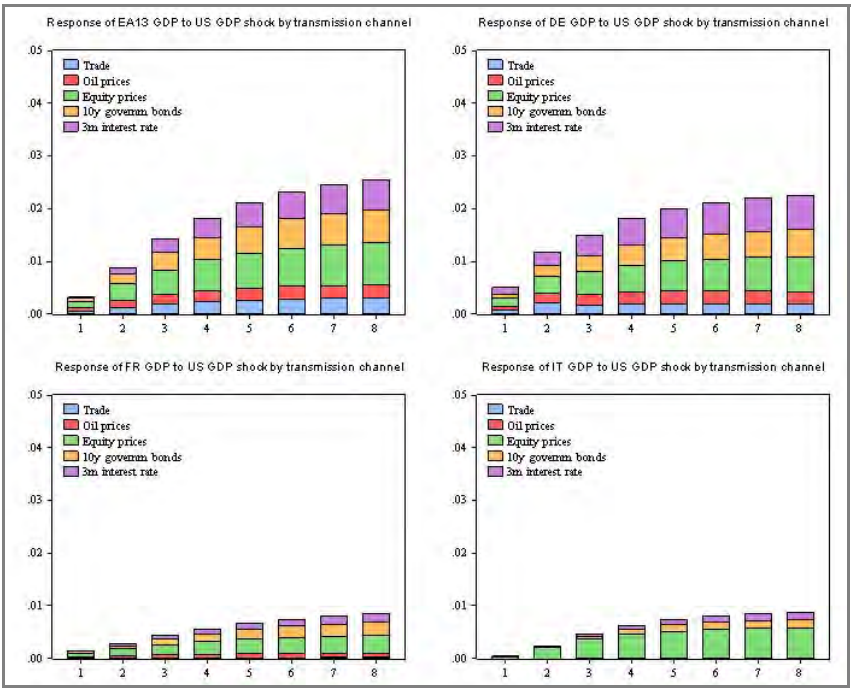
We had already known for several years that increasing competitiveness divergences and macroeconomic imbalances within the Euro Area were building up future adjustment challenges for the countries concerned, which would not have been easy even in benign economic circumstances. It is generally the case that the seeds of a crisis are sown in periods of expansion and, unfortunately, it seems that remedial action in Europe can only take place when the situation is already critical, i.e. when the adjustment has the potential to impose even higher social costs. The crisis could hamper adjustment capacities in three ways: In a period of very low inflation, nominal rigidities (which are present in many countries) are holding back needed changes in relative prices. In addition, the crisis will weigh significantly on medium-term potential growth. Losses in potential growth are generally projected to be stronger in countries with large competitiveness problems. In such countries, wage bargaining systems face the challenge of having to adjust to both past losses in competitiveness and weaker growth. Finally, the crisis has clearly affected financial intermediation and this could delay the necessary reallocation of capital and labour across sectors.

The positive effects of financial integration in Europe have been recognised for quite a while. Kalemli-Ozcan, Sørensen, and Yosha (2004) showed that since 1999, with increasing financial integration, risk sharing had begun to emerge across euro-area economies. They also found that the extent to which financial integration could insure incomes against country-specific shocks was still limited and uneven across regions – with estimates below 10 percent in all regions. However, there has been a lack of integration of macroeconomic and financial stability perspectives. Until the current crisis, macroeconomic policies tended to largely ignore the build-up of systemic risk in financial systems and the emergence of asset price bubbles.

Despite increasing financial integration, the global financial architecture remained incomplete leading to fragmented surveillance, attributable perhaps to a general belief that only emerging economies were prone to financial crises. Accordingly, there is a need for reform of financial regulation and supervision to fill information gaps and guard against a similar crisis in the future. But the lessons we have learned from the crisis are not limited to financial reform. The financial crisis exposed vulnerabilities in euro-area countries and recent experience with economic spillovers suggests a particular need to deepen and strengthen both macroeconomic and financial surveillance in order to ensure the smooth functioning of the Euro Area.

APPENDIX 1 – DECOMPOSITION OF RESPONSES TO US GDP SHOCKS





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4. Revisiting Political Budget Cycles in Latin America[1]

Sebastián Nieto-Parra & Javier Santiso

Preface

One of the unexpected by-products of the current global financial crisis is that it has placed fiscal policy back at the centre of the public policy debate. In Latin America, political and fiscal cycles have been intrinsically linked, with fiscal deteriorations prior to elections. This paper contributes to ongoing debates on the interplay of politics and economic policies, and provides some policy options aimed at minimising potential disruptions of fiscal policy ahead of elections.

Revisiting the political budget cycles in Latin America seems also very timely at a moment when no less than 17 presidential elections are due to take place between October 2009 and December 2012, starting with Uruguay and Chile by the end of 2009 and ending with Mexico and Venezuela by the end of 2012. This research also provides some insights regarding the reelection systems and fiscal policy, a crucial aspect for the region nowadays. Out of 2006's ten presidential elections, seven took place in countries allowing re-election. In six of those seven elections of that year, the candidate for re-election was successful. More importantly, the current trend in election reform in Latin America is moving towards a less restrictive system of reelection.

This analysis highlights, from a governmental and political perspective, the need to avoid fiscal deteriorations around elections in Latin America. Several policy recommendations may be derived from this: First, fiscal rules that stabilise the fiscal balance may help 'immunise' the fiscal situation to electoral disturbances. Moreover, around elections, better transparency and disclosure of the major components of fiscal balance could be valuable for the region. Second, in the current debate on electoral systems in some countries, moving away from immediate reelection systems would reduce the risks of fiscal deterioration ahead of and during election years. Alternatively, establishing special bodies within Ministries of Finances to instil a long-term perspective on fiscal policy could strengthen the independence of fiscal policy from short-term incentives of politicians. A final policy implication may be related to a strategy of risk mitigation during political

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electoral cycles. A consensus among major political parties, by reducing the menu of options to a range of credible commitments in the fiscal area, could reduce the uncertainty traditionally generated by upcoming presidential elections.

Abstract

In this paper we test the impact of elections on fiscal policy in Latin American economies in comparison to OECD countries over the period 1990-2006. We find that in Latin American countries, the average primary balance declines by an amount close to 0.7 per cent of GDP during an election year, confirming the hypothesis of fiscal deteriorations during the election cycle. Most of this movement is due to the expenditure component and within this it is current (close to 0.8 per cent of GDP) rather than capital expenditure that is most affected. By contrast, in OECD countries, the observed changes in the primary balance and current expenditures during election years are minimal. Our analysis also suggests that re-elections of incumbent candidates in Latin America have a considerable impact on the expenditure side of the fiscal balance. Finally, by comparing the 2005-2006 electoral cycle with respect to prior electoral cycles, we note a slight improvement of fiscal management around elections in the region. We derive policy implications and recommendations from our findings.

Keywords: Political budget cycle, Elections, Incumbent candidates, Latin American countries.

JEL classification: D72; E62; H62; P16.

4.1. INTRODUCTION

Elections matter and can affect economic policies. Specifically, some components of fiscal policy may be expanded around elections in order to attract voters. As underlined by Alesina *et al.* (1997), "certain more visible and politically sensible programs may be more easily and productively manipulated than others" with a view to ensuring election.

Political systems permitting re-election of officials can also influence politicians' behaviour once they become incumbent candidates. The core idea is that incumbents artificially expand economic activity during election years to improve their chances of re-election. However, empirical evidence shows that expansionary fiscal policy of incumbent candidates around elections does not always 'pay off' in terms of a victory in the re-election (Brender and Drazen, 2008).

These observations have important implications regarding the efficiency of economic policies around elections. This is particularly evident when there is a risk that expansionary fiscal policy could undermine the effectiveness of monetary policy (i.e. fiscal dominance). Moreover, under some circumstances, monetary policy alone cannot control its main target and fiscal discipline is then a priority. Such was the case of Brazil following the 2002 elections: the most important tool

to reduce the inflation rate was a credible fiscal policy and not an increase in interest rates (Blanchard, 2004)[2].

In this paper we revisit the impact of elections on fiscal policy in Latin American countries and we pose the following questions: To what extent do Latin American governments expand fiscal expenditures around elections to attract voters? And, especially significantly in the current political context, do different types of electoral systems have different impacts on fiscal policies around elections? Behind these questions, of course, lies a basic issue: fiscal irresponsibility during elections.

The purpose of this paper is therefore to answer these questions for Latin American countries. To do this, we first compare the impact of elections on fiscal policy in Latin American economies with respect to OECD countries. More precisely, we analyse the most important components of the expenditure side of the fiscal balance of these economies over the period 1990-2006. Second, in the current debate regarding the electoral system in some Latin American countries, we study the impact that the re-election system could have on the management of fiscal policy in Latin America, and in particular the role that *immediate* re-elections (i.e. there is the possibility of one or more successive terms for the president elected) could have on the behaviour of fiscal components during elections. Third, we provide some stylised facts comparing the electoral cycle of 2005-2006 with previous electoral cycles in Latin American countries.

The remainder of this article is organised as follows. In section 4.2., we provide a review of the literature on the impact of elections on fiscal policy. Section 4.3., the core of this paper, presents the most important stylised facts and analyses the results of the econometric model that analyses the impact of elections on fiscal policy. Finally, section 4.4. provides concluding remarks and outlines the major policy implications that follow on from this research.

4.2. REVIEW OF THE LITERATURE

The expansionary monetary and/or fiscal policies adopted during elections could potentially affect economic regimes and then capital markets (Ames, 1987; Schuknecht, 1996; Alesina *et al*., 1999; Block and Vaaler, 2004).

[2] Following on from this, the political cycle is also crucial to capital markets, which have in the past been acutely sensitive to political developments in Latin American democracies, be they cabinet reshuffles or elections. Bankers and financial markets react to elections (JENSEN and SCHMITH, 2005; WHITEHEAD, 2006; CHANG, 2007; NIETO-PARRA and SANTISO, 2008), re-allocate money after democratic transitions (RODRÍGUEZ and SANTISO, 2008) or react to political announcements and events (SANTISO, 2003; HAYS, FREEMAN and NESSETH, 2003; FRIEDEN, LEBLANG and VALEV, 2008). While this phenomenon is not specific to emerging economies, it remains especially strong there (CAMPELLO, 2007).

Increases in public expenditure around elections do not necessarily imply a deteriorating fiscal situation[3]. As pointed out by Drazen and Eslava (2005), in an examination of municipal elections in Colombia, incumbents tend to increase expenditure in ways which maximise the impact on voters without affecting the fiscal deficit. In turn, Eslava (2005) finds that voters indeed reward pre-election increases in targeted spending, but punish incumbents who run high deficits prior to an election. For the case of Mexico over the period 1957-1997, González (2002) finds that governments make ample use of public spending on infrastructure and current transfers in order to attract voters. More generally, for the case of Latin American countries, Rodríguez (2006) finds that during the period 1990-2004, governments tend to increase public investment one year prior to elections and current transfers during the election year. Other authors also show that newly elected governments tend to be rather frugal, reducing spending in the inaugural year of their mandate (see Barberia and Avelino, 2009). The findings related to increasing deficits and spending in the year prior to elections has also been corroborated in more recent specific country studies, in particular for Brazil (Sakurai and Menezes-Filho, 2008) or for Argentina (Jones, Meloni, and Tommasi, 2009). In this last paper, the authors show that Argentine voters reward those governors who provide higher spending, rewarding their capacity to extract more resources from the federal government. The same pattern has also been found under non-democratic regimes like Mubarak's Egypt (Blaydes, 2008).

The results presented above for the case of Latin American countries contrast with developed economies. Peltzman (1992) finds that US voters penalise federal and state spending growth, qualifying voters as 'fiscal conservatives'. Shi and Svensson (2006) analyse elections in 58 developing and 27 developed countries during the period 1975-91, finding that fiscal deficits did not increase during elections in OECD developed countries. Similar results were found by Brender and Drazen (2005) over the period 1960-2001 when differentiating among old and new democracies and using as fiscal variables government balance, total expenditure and total revenue. Indeed, expansionary fiscal policies around elections are particularly likely in developing countries. In a recent analysis including quarterly data from 1975 to 2000 in 116 countries, Krieckhaus (2009) finds that political business cycles are particularly widespread and influent in Latin America, this phenomenon being more pronounced in this region than in other developing regions like Asia or Africa[4].

More precisely, the expansion of fiscal policy during elections depends on the capacity of voters to monitor government policies. The main factors that influence the ability of voters to understand the government's budget balance are often

[3] For a review of the literature regarding voters and fiscal policy around elections, see ESLAVA (2006).

[4] A recent example of expansionary fiscal policy around elections in developing countries refers to Ghana, in which macroeconomic conditions deteriorated substantially during 2008, in the run-up to the elections.

associated to government accounting practices, media transparency and the education of voters. In particular, the role of informed voters on fiscal outcomes around elections is crucial. Shi and Svensson (2006) find that the negative effect of election periods on the deficit is weaker when voters are better informed.

Empirical evidence for legislative elections in developed countries supports the idea that the probability of being re-elected, measured by opinion polls, has no significant effect on the fiscal budget[5] However, concerning municipal elections in developed countries, there is no systematic result showing that elections do not have an impact on the fiscal items by which voters could be influenced. For the cases in which elections have an impact on government expenditures see Kneebone and McKenzie (2003) for the case of Canada and Veiga and Veiga (2004) for the case of Portugal.

Finally, depending on the re-election system, the effect of elections on economic policies will tend to be different. Empirical research suggests that incumbent parties facing re-election, particularly incumbents from left-wing parties, face strong incentives to engage in unsustainable expansionary economic policies (Leblang, 2002). Voters and incumbent parties are, of course, playing a dynamic game and rational voters should not be expected to make such systematic mistakes. However, there exists information asymmetries between the two groups regarding the competence of politicians and the conduct of fiscal policy, and rational voters may well prefer incumbent candidates that run fiscal deficits (Rogoff, 1990). This view has been recently challenged by Brender and Drazen (2008), who, by using a sample of 74 countries over the period 1960-2003, find no evidence that deficits promote re-election in either developed or developing countries. In this paper, we analyse the impact of re-elections on fiscal policy in Latin American countries by differentiating between two key regimes (non immediate re-elections and immediate re-elections).

The results presented above give important insights concerning the management of fiscal policy around elections as well as the differences that exist across countries and depending on the type of elections. In line with these analyses, our comparative analysis of Latin American and developed country governments' management of fiscal policy may be a useful contribution to the field. More importantly, we provide useful insights on the impact that different electoral systems could have on the management of fiscal policy.

[5] Additionally, there is no evidence that more conservative governments spend more on defence and more liberal governments spend more on social security and welfare (LAMBERTINI, 2003).

4.3. EMPIRICAL EVIDENCE

4.3.1. Elections and Fiscal Policy: A comparative analysis between OECD and Latin American countries

In this section, we present some empirical evidence on the relation between elections and fiscal policy outcomes over the period 1990-2006. The source of the database used for this study is ECLAC ILPES, the Public Finance database for Latin American countries and an OECD database, the General Government Accounts for OECD countries[6].

By studying the period 1990-2006 for 28 OECD countries and 19 Latin American countries[7], our results suggest that general elections are indeed associated with much greater changes to fiscal policy in Latin America than in high-income countries[8]. Figure 1 summarises the development of four fiscal variables during election periods: the fiscal deficit before interest payments (primary balance), public expenditure excluding interest payments (primary expenditure), current expenditure, and capital expenditure.

In Latin American countries, the average primary balance declines by an amount close to 0.7 per cent of GDP during an election year. Most of this movement is due to the expenditure component and within this it is current (close to 0.8 per cent of GDP) rather than capital expenditure that is most affected. There is little change in capital expenditures during election years themselves, but an increase of more than 0.3 per cent of GDP is observed in the year prior to the election. By contrast, in OECD countries, observed changes in the primary balance and current expenditures during election years are minimal, less than 0.1 per cent of GDP for either measure.

This difference between Latin American and OECD countries is all the more remarkable considering the relatively small size of governments in Latin American democracies. According to OECD (2008), over the period 1990-2006, primary expenditure accounts for 22 per cent of GDP in Latin America, against 40 per cent in OECD countries[9]. These differences are still evident when upper mid-

[6] The exception is Brazil for which we use as source of information the Secretaria do Tesouro Nacional.

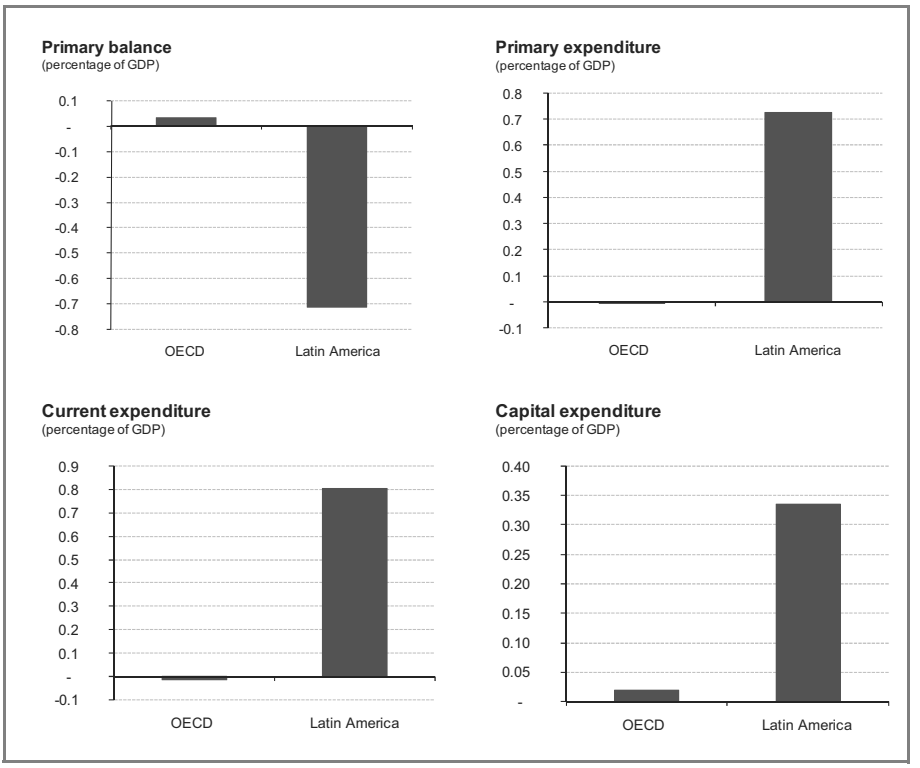
[7] The OECD countries are Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway. Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, United Kingdom and United States. The Latin American countries are Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela. Mexico is the only country belonging to these two groups of countries.

[8] Legislative elections are used for countries with parliamentary political systems and executive elections for countries with presidential systems. OECD countries, other than Mexico, Poland and the United States, have been treated as parliamentary systems (see KEEFER, 2007).

[9] OECD data refer to the consolidated general government sector. In Latin America coverage corresponds to the non-financial public sector (OECD, 2008).

dle income countries are distinguished from lower middle income countries in Latin America (24 per cent of GDP and 21 per cent of GDP respectively). Similar results are found when the total expenditures to GDP ratio is compared for OECD and Latin American countries (44 per cent and 25 per cent respectively). Similarly, over the period 1970-1995, Gavin and Perotti (1997) report that total expenditures to GDP represent 45 per cent for OECD countries against 23 per cent for Latin American countries.

Figure 1. Impact of elections on fiscal policy in Latin American and OECD countries (Changes in selected fiscal indicators, percentage of GDP)



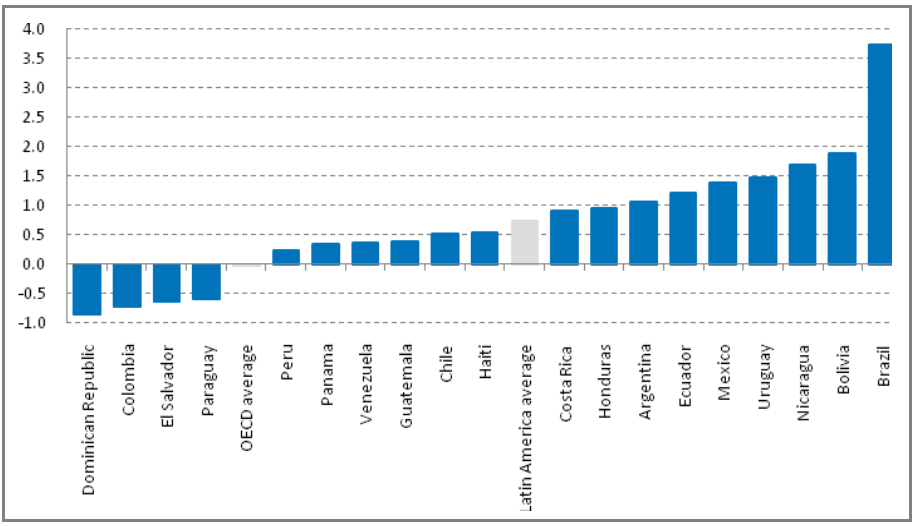
Notes: The impact of elections on fiscal policy is calculated as the difference between the fiscal variable (as percentage of GDP) during the election year and non-election years. The exception is capital expenditure which is assumed to lead the election by one year.
Legislative elections are used for countries with parliamentary political systems and executive elections for countries with presidential systems.
Given the availability of the data, data on fiscal policy refers to Central Government for Latin American countries and Consolidated General Government for OECD countries. Simple Averages are used for the calculation.

Source: The authors, based on Secretaria do Tesouro Nacional (for the case of Brazil); ECLAC ILPES, Public Finance database (for other Latin American countries) and OECD, General Government Accounts (for OECD countries), 2009.

Figure 1 identifies the importance of primary expenditure among the fiscal variables affected by electoral politics. Figure 2 analyses this across individual Latin American countries, showing the impact of elections on primary expenditure as a share of GDP, and exposing considerable variation between countries. In Brazil, Bolivia and Nicaragua, for example, primary expenditure increases by more than 1.5 per cent of GDP relative to non-election periods. By contrast, in Paraguay, Peru, Panama, Venezuela, Guatemala and Chile primary expenditure is apparently unaffected by the electoral process. Moreover, Annex 1 exhibits the four fiscal variables over GDP presented above for Latin American countries over the period 1990-2006[10]. By analysing these variables at and around election periods, we note considerable differences among countries but also regards time. For instance, for the case of Brazil, the impact of elections on primary expenditure as well as on capital expenditure prior to elections seems to be more important in the election of 1998 (1.7 per cent of GDP and 5 per cent of GDP respectively) than in the election of 2002 (0.1 per cent of GDP and 0.9 per cent of GDP respectively). For the case of Venezuela, in the last two presidential elections, primary expenditure over GDP increased (i.e. 4.6 per cent of GDP in 2000 and 2.3 per cent of GDP in 2006) more than in earlier elections (i.e. 0.5 per cent of GDP in 1993 and 1.8 per cent of GDP in 1998). By contrast, in Chile, these stylised facts suggest that the impact of elections on fiscal policy appears limited.

[10] The four fiscal variables are: fiscal deficit before interest payments (primary balance), the public expenditure excluding interest payments (primary expenditure), the current expenditure, and the capital expenditure.

Figure 2. Impact of elections on Latin American countries, 1990-2006 (Changes in primary expenditure, percentage of GDP)



Notes: The impact of elections on fiscal policy is calculated as the difference between the fiscal variable (as percentage of GDP) during the election year and non-election years.
Legislative elections are used for countries with parliamentary political systems and executive elections for countries with presidential systems. Data on fiscal policy refers to Central Government.

Source: The authors, based on Secretaria do Tesouro Nacional (in the case of Brazil); ECLAC ILPES, Public Finance database (for other Latin American countries) and OECD, General Government Accounts (for OECD countries), 2009.

However, in order to confirm the stylised facts presented above, it is necessary to use an empirical model to control for other macroeconomic variables that may explain the behaviour of fiscal variables around elections. By estimating components of government balance and political cycles using a method similar to that employed by Shi and Svensson (2006), we confirm the results showed in Figure 1. The empirical specification takes the following form:

$$Fiscal\ variable_{i,t} = \sum_{j=1}^{2} \alpha_j\ Fiscal\ variable_{i,t-2} + \alpha_k GDPcapita_{i,t} + aLogrealGDPcapita_{i,t} + \beta_0 electiondummy_{i,t} + \varepsilon_{i,t}$$

Where *Fiscal variable* is the fiscal item we study in this paper (i.e. primary balance, primary expenditure, current expenditure and capital expenditure). The election dummy variable takes the value of 1 when there is an election and 0 otherwise[11].

[11] The impact of elections on fiscal variables is calculated from the contemporaneous election year. The exception is capital expenditure which is assumed to lead the election by one year.

The control variables are the logarithm of real GDP per capita, GDP growth rate and the lagged dependent fiscal variable in periods one and two.

Since OLS regressions are known to deal inadequately with time series and cross-section heterogeneity, we start the estimation technique with a Fixed Effect regression (FE estimators). We then include the lagged dependent variables in FE estimation. We adopt the GMM (Generalized Method of Moments) estimator developed for dynamic panel data by Arellano and Bond (1991) in order to avoid the bias caused by the inclusion of lagged dependent variables. Results obtained in the GMM estimation do not change significantly with respect to the FE (Fixed-Effects) model. These results are presented in Table 1 for the case of FE regressions without lagged dependent variables. Table 2 reports FE regressions with lagged dependent variables. Table 3 presents FE regressions with lagged dependent variables and with time-effect, and finally Table 4 presents GMM estimates with time effect specification (see tables at the end of the paper).

Differentiating among developed and emerging democracies and using as fiscal variables government primary balance, primary expenditure, current expenditure and capital expenditure, our estimations find the same results. Fiscal variables are not affected during elections for OECD countries. By contrast, for Latin American economies, primary balances decrease during election years due to an increase of the primary expenditure, caused above all by an expansion in current expenditure.

Figure 3 summarises the most important results exposed in Table 4 (GMM estimation with time-effect). The election dummy variable is not significantly different from 0 for OECD countries. This is true for the primary balance as well as for the most important components of the expenditure side. Indeed, for OECD countries, fiscal balances do not deteriorate, neither do important components of expenditure increase.

In contrast, for Latin American countries, the impact of elections on fiscal policy is high and statistically significant. In particular, practically all the decrease of the primary balance around elections is explained by an increase in primary spending (which rises by close to 0.45 percentage points during election years). In turn, most of the increase in primary spending is due to rises in current expenditure, which, as a share of GDP, increases by over 0.5 per cent for the region[12].

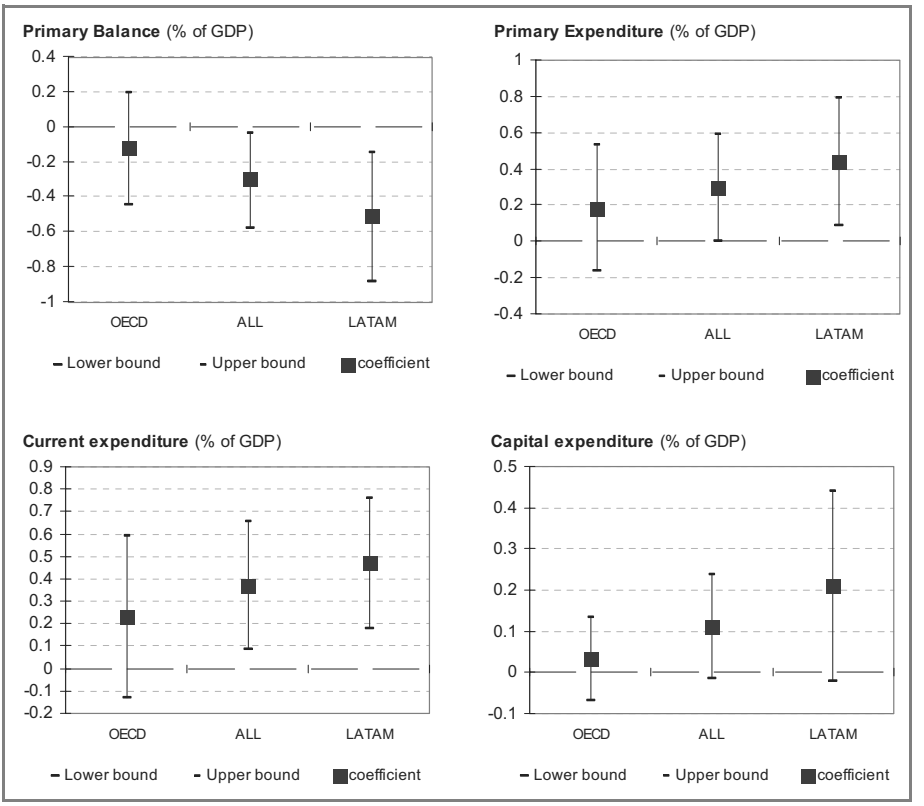
In the case of Latin American countries, the increase in current expenditure is partially compensated by a reduction in public investment. Results suggest that

[12] When all (Latin American and OECD) countries are analysed, fiscal policy tends to be expansionary. Our estimation suggests that, for the full sample, primary expenditure over GDP is close to 0.3 percentage points higher during an electoral year, and current expenditure as a share of GDP increases 0.4 per cent.

Latin American governments expand in the election year components in which there is a direct impact on voters, as is the case for current expenditures. Indeed, current expenditures have two key characteristics that may serve this purpose: first, they are flexible (i.e. they can be manipulated relatively easily by politicians) and second, voters can rapidly quantify and observe them (e.g. social transfers). Finally, the impact of elections on capital expenditure is observed one year prior to elections. More precisely, particular items that are observed by voters, such as public investment (infrastructure), increase considerably one year before elections. For all countries of the sample (Latin American and OECD countries), capital expenditures increase 0.11 per cent, with yet again a stronger rise for Latin American countries (0.21 per cent).

These results confirm earlier studies in the research literature, which found that developed countries are not sensitive to political cycles. This result contrasts with the case of Latin American countries in which current expenditure and public investment as a share of GDP, increase during and prior to an election year respectively. Clearly, behind this finding lies the poor governance performance and legitimacy of Latin American economies, in comparison with OECD countries (see Marshall and Cole, 2008 for a ranking of state fragility in the world).

Figure 3. Significance of elections in OECD countries, Latin American countries and the total sample. 1990-2006



Notes: This figure reports results presented in Table 4. More precisely, the significance of elections on fiscal variables is estimated from GMM estimation. Time-specific fixed effects are included as regressors. The significance is at the 5 per cent level.
The impact of elections on fiscal variables is calculated from the contemporaneous election year. The exception is capital expenditure which is assumed to lead the election by one year.
Legislative elections are used for countries with parliamentary political systems and executive elections for countries with presidential systems. Data on fiscal policy refers to Central Government.

Source: the authors, based on Secretaria do Tesouro Nacional (for the case of Brazil); ECLAC ILPES, Public Finance database (for other Latin American countries) and OECD, General Government Accounts (for OECD countries), 2009.

Expansionary fiscal policy before elections does not necessarily increase the probability that an incumbent candidate remains in power (see Eslava, 2006 for a review of the literature). However, the efficiency of economic policies is affected. Given these factors, an agreement among political parties could avoid fiscal disruptions around elections. Concretely, a consensus among major political parties limiting the menu of options to a range of credible commitments in the fiscal area could reduce the uncertainty traditionally generated by upcoming presidential

elections. The 2002 presidential elections in Brazil provide an example of such a multi-party agreement (Chang, 2007).

4.3.2. Re-elections and fiscal policy in Latin American countries

The previous section showed that elections have an impact on fiscal policy in Latin American countries. Incumbent politicians can expand fiscal policy before elections in order to increase the probability that they or their political party will be re-elected. However, a question remains: does the re-election system in place affect candidates' propensity to use fiscal policy to attract votes? In other words, are incumbent candidates more likely to increase public expenditure before elections when they can be re-elected?

In order to answer these questions, this section tests the impact that immediate reelections have on fiscal policy in Latin American countries. More precisely, we examine whether or not countries with re-elections of incumbent candidates raise fiscal expenditures.

Latin American countries may be classified according to their re-election procedure (Payne *et al.*, 2006). Table 5 shows the re-election system and the year terms for the largest Latin American countries. As of 2009, seven countries (Argentina, Brazil, Colombia, Dominican Republic, Ecuador, Haiti and Venezuela) allow immediate re-election. In eight countries (Bolivia, Chile, Costa Rica, El Salvador, Nicaragua, Panama, Peru and Uruguay) non-immediate reelection is allowed, and in four countries (Guatemala, Honduras, Mexico and Paraguay) reelection is forbidden. Out 2006's 10 presidential elections, seven took place in countries allowing re-election (immediate or non-immediate). In six of those seven elections of that year, the candidate for re-election was successful (immediate re-election in the case of Brazil, Colombia and Venezuela and non-immediate re-election for Costa Rica, Nicaragua and Peru). Most recently in 2009, President Correa was re-elected in Ecuador. In Chile, where re-election is allowed but not immediately after a first mandate, former president Frei is one of the candidates for the elections of end 2009. More important, the 2009 Honduran *coup d'état* to the president Manuel Zelaya occurred in the context of an ongoing dispute concerning a new constitution that would allow the president Zelaya to be re-elected, which is prohibited under the present constitution.

The current trend in election reform in Latin America is moving towards a less restrictive system of re-election. Venezuela (1998), Dominican Republic (2002), Colombia (2005) and Ecuador (2008) have adopted immediate re-election in recent years, as it exists in some OECD presidential regimes such as the United States, for example. Moreover, the debate in some Latin American countries has

been focused on promoting immediate re-election (e.g. Bolivia, Honduras and Nicaragua) and in some countries on allowing re-election for more than two mandates (e.g. Colombia, Venezuela). It is clear that the recent trend in a large majority of Latin American countries towards immediate re-election will be a crucial element of upcoming electoral cycles.

Immediate re-election can be associated with high incentives for incumbent candidates to increase the components of government expenditure that are observed by voters, who can then be influenced by these fiscal measures.

In order to study the impact of immediate re-election on fiscal variables, the basic regression is of the form:

$$\begin{aligned} Fiscal\ variable_{i,t} = & \sum_{j=1}^{2} \alpha_j Fiscal\ variable_{i,t-2} + a_k GDPgrowth_{i,t} \\ & + \alpha_k LogrealGDPcapita_{i,t} + \beta_0 immediate\_re\text{-}election_{i,t} \\ & + \beta_0 non\text{-}immediate\_forbidden_{i,t} + \varepsilon_{i,t} \end{aligned}$$

In particular, instead of using the election dummy variable (as we did in the previous section), we compare immediate re-elections (*immediate _re-election)* with the opposite case (*non-immediate _forbidden)*: non immediate re-elections are allowed and re-elections are forbidden.

Table 6 analyses the impact of immediate re-elections on fiscal policy. The estimation techniques reported are FE and GMM with time effect. Results suggest that immediate reelections have a considerable impact on the expenditure side of the fiscal balance. In particular, immediate re-elections increase primary expenditure by more than 1.2 per cent of GDP (significant at 1 per cent). This result contrasts with the case in which immediate re-election is not allowed (less than 0.2 per cent of GDP and not significant). Moreover, the impact of immediate re-elections on primary expenditure is more than twice the impact in the case of elections as a whole (more than 1.2 per cent of GDP for immediate re-elections according to Table 6 vs. less than 0.5 per cent of GDP for total elections and reported in Table 4).

Similarly, the expansion of current expenditure during the electoral year (more than 1.0 per cent of GDP and significant at 1 per cent) and the increase of capital expenditure one year prior to elections (more than 0.5 per cent of GDP and significant at 5 per cent) are considerable in the case of immediate re-elections. Again, these results contrast with the case in which there is no immediate re-election, as well as with the case in which we analyse elections without differentiating according to electoral system (according to Table 4 the impact of elections on capital expenditure is close to 0.2 per cent of GDP and significant at 10 per

cent). Finally, the impact on the primary balance is high. The primary balance is reduced by close to 0.6 per cent of GDP during the electoral year, but this is not significant. This last result shows that the impact on the primary balance varies considerably across countries. A possible explanation for this phenomenon is that some Latin American countries that allow immediate re-election expand the expenditure component of the fiscal balance during elections and during a context of high economic growth, which can attenuate (through high revenues) the impact on the primary balance.

The findings presented above suggest that incumbent candidates in Latin American democracies increase considerably the components of government expenditure which may be observed by voters. Where there is non-immediate re-election and when re-election is forbidden, the opposite is true.

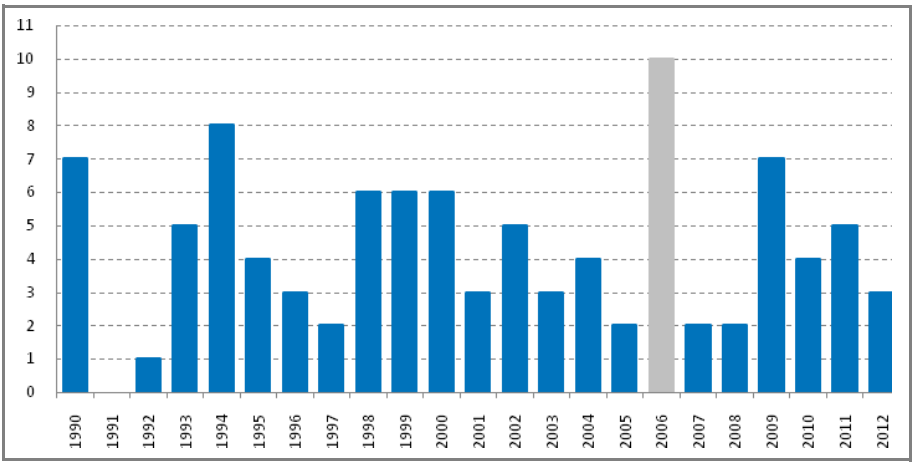
4.3.3. Is Latin American fiscal policy maturing?

The empirical study presented above analyses Latin America during the period 1990-2006. Results suggest that during this period the region expanded fiscal policy around elections (in contrast to OECD countries). As also stressed in a previous paper (Nieto-Parra and Santiso, 2008), such critical electoral junctures tend to have significant impacts on banks' recommendations and financial variables, which are negatively affected by the uncertainty surrounding elections. All major financial crises during the period studied have coincided with elections. 1994, a year in which no less than eight presidential elections took place, saw a major financial crisis known as the 'tequilazo', which originated in Mexico some months after the presidential election of mid 1993. Since 1994, all of the major financial crises affected the region were coincident with presidential election years that saw the fiscal deteriorations already underlined.

However, a question remains: Is Latin American democracy maturing in the context of fiscal policy around elections? It is particularly notable that in 2006, a record year of presidential elections in Latin America (more than in 1994, with 10 presidential run offs and over 80 per cent of the region's population heading to the polls) no major financial disruption took place (Figure 4).

In spite of such political effervescence, financial markets in the region did not experience major disruptions. This was a marked contrast to previous cycles and we are led to wonder whether this was a one-off or perhaps evidence of a permanent change in the historic jitteriness of financial markets towards the democratic cycle in Latin America.

Figure 4. Number of presidential elections by year, Latin America

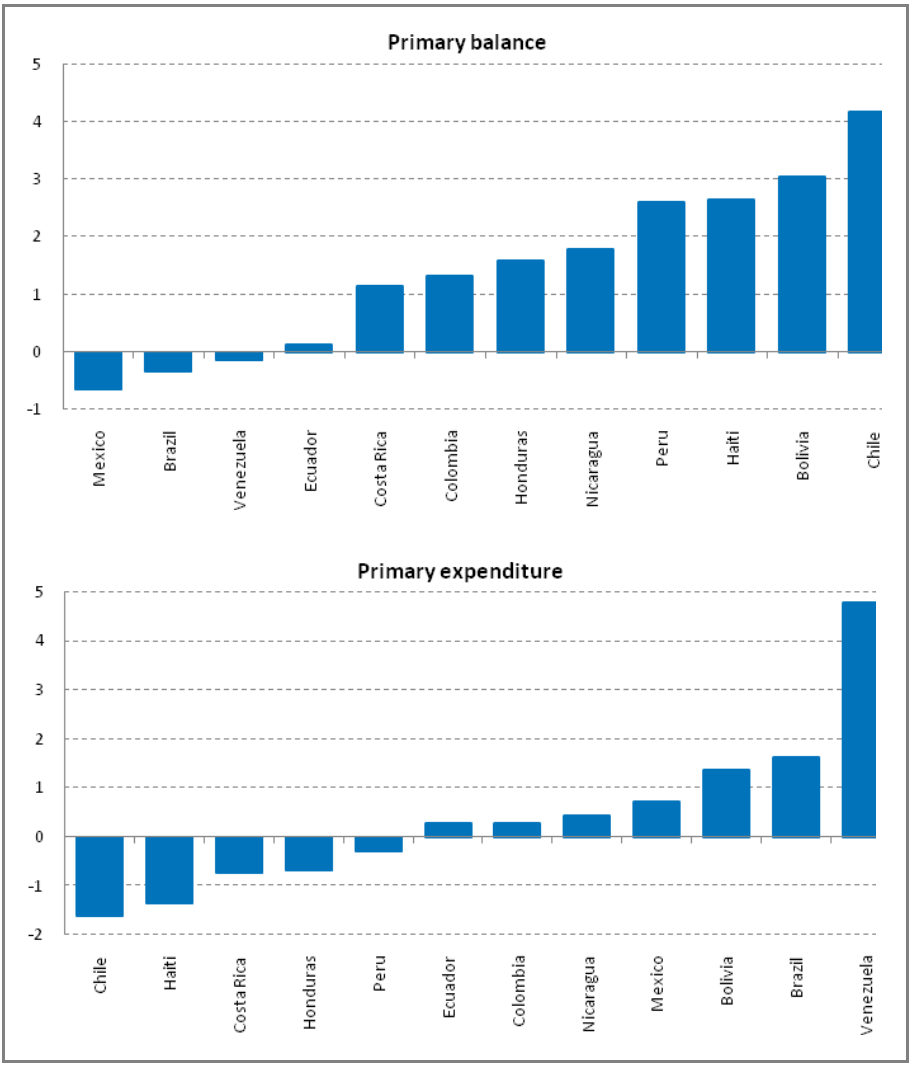


Notes: The Latin American countries covered are Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela.
For elections with a second (run-off) round, the date of the final round is used.

Source: the authors based on www.electionguide.org, 2009.

A changed attitude on the part of the markets would certainly have some justification if we look only at the primary balance in Latin American countries. Figure 5 compares the effect of elections in 2006 on the primary surplus and on primary expenditure. Strikingly, primary surpluses tended to grow rather than shrink in countries for which 2006 was an election year.

Figure 5. Impact of presidential elections on fiscal variables (Percentage of GDP, 2005 and 2006 presidential elections against prior non election years).



Note: The impact of 2005 and 2006 elections on fiscal policy is calculated as the difference between the fiscal variable (as a proportion of GDP) during the election year and prior non-election years.

Source: The authors, based on Secretaria do Tesouro Nacional in the case of Brazil and ECLAC ILPES, Public Finance database for other Latin American countries, 2009.

There is no doubt that part of this fiscal discipline can be ascribed to the more forgiving conditions of high real GDP growth. Certainly, as the second panel of Figure 6 shows, spending restraint was not driving low deficits. Many of those

same countries witnessed some increases in primary expenditure as a share of GDP. This is the case for Venezuela, Brazil and Mexico, in which primary spending booms stimulated fiscal deficits, and is in sharp contrast to Chile, Costa Rica or Peru. That said, with the exception of Venezuela that experienced a considerable jump in primary expenditure during its election year, in cases such as Mexico or Colombia the increase was moderate. As already underlined, fiscal policies have been improving in Latin America over the 2000s and particularly since the mid 2000s (OECD, 2008). Structural revenues have improved as a share of GDP, and structural primary balances are currently in surplus in many Latin American countries (see Vladkova and Zettelmeyer, 2008), the case of Chile being particularly impressive, with fiscal surpluses that increased significantly in the years 2006 and after again in 2007-2008.

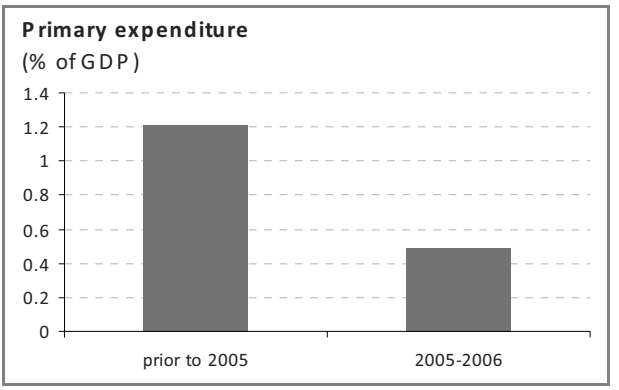
It is clear that Latin America's governments have taken enormous strides to put their fiscal houses in order. The OECD's *Latin American Economic Outlook 2009* shows that, since the end of the debt crisis of the 1980s, governments have assiduously tightened their belts. Fiscal deficits have fallen from 11 per cent of public revenues in the 1970s and 1980s, to 8 per cent since 2000. The year-to-year volatility of taxes, spending and deficits – long a feature of fiscal policymaking in the region, with harmful effects for economic performance – has likewise fallen: an index of deficit volatility calculated for the 2009 Latin American Economic Outlook shows a fall of a third from 1990-94 to 2000-06, with Latin America standing just 6 per cent above the volatility levels in OECD countries in the latter period.

A closer look at the statistically significant fiscal variables studied in the previous sections shows a relative change in the pattern between fiscal policy and elections. Prior to 2005, primary expenditures were increasing significantly while for 2005-2006 the rise is on average much more moderate for the region (Figure 6). Similarly primary fiscal balances tend to be negative prior to 2005 and positive in the year 2005-2006 (Figure 7)[13]. Lastly, current expenditure increases has been cut by nearly half in the year 2005-2006 when compared to prior 2005 (Figure 8). However, even today we note that Latin American countries still increase public expenditure during elections, a result which still contrasts with OECD countries (Figure 1), showing that fiscal discipline around elections remains an issue for the region[14].

[13] Moreover, by analysing FE and GMM regressions with time effects (presented in Tables 3 and 4), we note that for Latin American countries the 2006 time dummy variable is positive and statistically significant for the model that uses as dependent variable the primary balance.

[14] Moreover, by analysing FE and GMM regressions with time effect (presented in Tables 3 and 4), we note that for Latin American countries the 2006 time dummy variable is positive and statistically significant for the model that uses current expenditure as the dependent variable. When we analyse the model with primary expenditure as the dependent variable, results are also positive and significant in the FE specification.

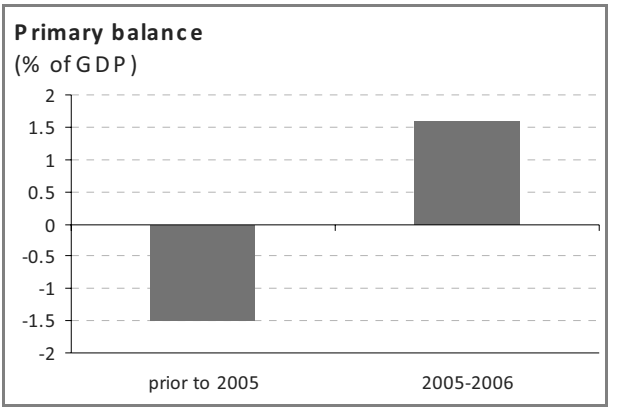
Figure 6. Changes in primary expenditure prior 2005 and for the year 2005-2006 (Percentage of GDP)



Note: The impact of 2005 and 2006 elections on fiscal policy is calculated as the difference between the primary expenditure (as a proportion of GDP) during the election year and prior non-election years. The impact of elections prior to 2005 on fiscal policy is calculated as the difference between the average of the primary expenditure during elections and the average of the primary expenditure for non-elections years.

Source: The authors based on Secretaria do Tesouro Nacional in the case of Brazil and ECLAC ILPES, Public Finance database for other Latin American countries, 2009.

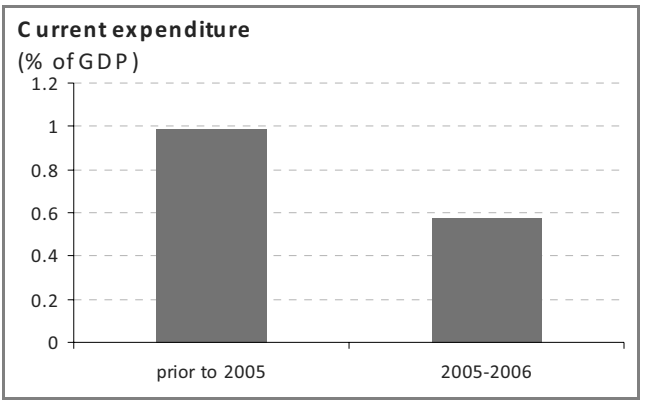
Figure 7. Primary balance prior 2005 and for the year 2005-2006 (Percentage of GDP)



Note: The impact of 2005 and 2006 elections on fiscal policy is calculated as the difference between the primary balance (as a proportion of GDP) during the election year and prior non-election years. The impact of elections prior to 2005 on fiscal policy is calculated as the difference between the average of the primary balance during elections and the average of the primary balance for non-elections years.

Source: The authors based on Secretaria do Tesouro Nacional in the case of Brazil and ECLAC ILPES, Public Finance database for other Latin American countries, 2009.

Figure 8. Current expenditure prior 2005 and for the year 2005-2006 (Percentage of GDP)



Note: The impact of 2005 and 2006 elections on fiscal policy is calculated as the difference between the current expenditure (as a proportion of GDP) during the election year and prior non-election years. The impact of elections prior to 2005 on fiscal policy is calculated as the difference between the average of the current expenditure during elections and the average of the current expenditure for non-elections years.

Source: The authors, based on Secretaria do Tesouro Nacional in the case of Brazil and ECLAC ILPES, Public Finance database for other Latin American countries, 2009.

Of course there are some caveats and selection bias problems with the stylised facts presented above for the comparison between the electoral cycle of 2005-2006 and prior electoral cycles. First, the size of the sample is much smaller in 2005-2006, with a limited number of countries voting. Second, the number of elections between these two periods differs considerably (12 for 2005-2006 vs. 59 prior to 2005). These last stylised facts are not tested, however. Indeed, one may also justify the result presented above with the boom of commodity prices and argue that the positive shock to the terms of trade has also been a key driver influencing these results.

4.4. CONCLUSIONS

This paper compares the impact that elections could have on the deterioration of the fiscal positions and in particular on the public expenditure components in Latin American countries with respect to OECD countries.

Our study of 28 OECD countries and 19 Latin American countries during the period 1990-2006, suggests that general elections are indeed associated with much greater changes to the major components of fiscal policy in Latin America than in high-income countries. In particular, we find that in Latin American countries, the average primary balance declines by an amount close to 0.7 per cent of GDP during an election year, confirming the hypothesis of fiscal deteriorations

during the election cycle. Most of this movement is due to the expenditure component and within this it is current (close to 0.8 per cent of GDP) rather than capital expenditure that is most affected. Our analysis also suggests that immediate re-elections in Latin America have a considerable impact on the expenditure side of the fiscal balance. Finally, by comparing the 2005-2006 electoral cycle with respect to prior electoral cycles, we note a slight improvement of fiscal management around elections.

Several policy recommendations can be derived from our findings. First, in order to avoid fiscal deterioration, fiscal rules focusing on the stability of the major components of fiscal balance may be an appropriate policy measure for Latin American countries. Moreover, around elections, higher transparency and disclosure of the major components of fiscal balance could be valuable for the region. Second, in the current debate on electoral systems in some Latin American countries, immediate re-election systems may be avoided in order to minimise the risks of fiscal deterioration ahead of and during election years. Alternatively, special bodies at the Ministries of Finances aiming to look at a long-term perspective on fiscal policy can be established. This recommendation is associated with the independence of fiscal policy from short-term incentives of politicians, a crucial aspect for Latin American countries studied in previous research (Eichengreen, Hausmann and Hagen, 1999). A final policy implication has to do with the strategy of risk mitigation during political electoral cycles. Following the example of Lula in 2002, presidential candidates, could, for example, signal responsible and credible commitments ahead of elections. A consensus among major political parties aiming to reduce the menu of options to a range of credible commitments in the fiscal area could be a way to reduce the uncertainty traditionally generated by upcoming presidential elections, as already exemplified by Brazil in 2002 (Chang, 2007).

This research contributes to ongoing debates on the influence of politics on economic policy in Latin America. The policy options put forward may serve to mitigate the potential fiscal disruptions ahead of elections, which are, after all, regular and normal events in democracies.

TABLES

Table 1. Impact of elections on Fiscal variables, 1990-2006

	Primary Balance			Primary Expenditure		
	Latam	OECD	All	Latam	OECD	All
GDP growth	1.48956e-01***	3.46741e-01***	2.05938e-01***	-0.0485	-2.91941e-01***	-8.25982e-02**
	[5.60]	[6.42]	[7.17]	[1.58]	[4.19]	[2.18]
log GDPpercapita	-2.96178***	5.40090***	3.27884***	8.65440***	-15.01481***	-7.70128***
	[3.06]	[6.21]	[4.83]	[7.57]	[13.22]	[8.13]
Election dummy	-6.30263e-01***	-6.67E-02	-2.95E-01	4.52574e-01*	8.84E-02	3.28E-01
	[2.86]	[0.27]	[1.65]	[1.74]	[0.29]	[1.35]
Constant	23.02620***	-53.53851***	-29.55381***	-51.40074***	188.19048***	98.61837***
	[3.09]	[6.28]	[4.87]	[5.83]	[16.92]	[11.70]
Observations	307	445	735	317	414	714
R-squared	0.14	0.18	0.11	0.18	0.35	0.1
Number of country	19	27	45	19	28	46

Absolute value of t statistics in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

	Current Expenditure			Capital Expenditure		
	Latam	OECD	All	Latam	OECD	All
GDP growth	-9.46377e-02***	-2.62932e-01***	-1.01712e-01**	0.00961	-0.0135	0.00505
	[3.07]	[3.10]	[2.28]	[0.57]	[0.94]	[0.44]
log GDPpercapita	7.01026***	-22.48073***	-13.16378***	0.54838	-0.08879	0.12499
	[6.10]	[16.29]	[11.80]	[0.87]	[0.36]	[0.42]
Election dummy	5.22594e-01**	1.29E-01	4.31E-01	3.06659e-01**	1.46E-02	1.44032e-01*
	[2.00]	[0.34]	[1.51]	[2.11]	[0.23]	[1.94]
Constant	-39.36847***	261.94742***	147.33459***	-1.34547	3.84113	1.82749
	[4.44]	[19.39]	[14.84]	[0.28]	[1.59]	[0.69]
Observations	317	414	714	317	390	690
R-squared	0.14	0.43	0.19	0.02	0	0.01
Number of country	19	28	46	19	28	46

Absolute value of t statistics in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: This table reports results of FE estimation (country-specific effect). The impact of elections on fiscal variables is calculated from the contemporaneous election year. The exception is capital expenditure which is assumed to lead the election by one year.
Legislative elections are used for countries with parliamentary political systems and executive elections for countries with presidential systems. Data on fiscal policy refers to Central Government.

Source: the authors based on Secretaria do Tesouro Nacional (for the case of Brazil); ECLAC ILPES, Public Finance database (for other Latin American countries) and OECD, General Government Accounts (for OECD countries), 2009.

Table 2. Impact of elections on Fiscal variables, 1990-2006
FE estimation with lagged dependent variables

	Primary Balance			Primary Expenditure		
	Latam	OECD	All	Latam	OECD	All
GDP growth	7.79747e-02***	3.07529e-01***	1.31166e-01***	9.99E-03	-3.67655e-01***	-7.15291e-02***
	[3.03]	[7.82]	[5.87]	[0.43]	[8.78]	[3.27]
log GDPpercapita	-0.03372	1.69043**	1.90120***	1.43842	-2.43077***	-2.22595***
	[0.03]	[2.48]	[3.22]	[1.29]	[2.82]	[3.38]
Election dummy	-0.47460**	-0.14697	-0.25483*	0.35534*	0.21847	0.23935*
	[2.35]	[0.90]	[1.90]	[1.85]	[1.31]	[1.75]
Fiscal variable (-1)	5.03949e-01***	8.50491e-01***	7.59023e-01***	5.88921e-01***	7.70417e-01***	7.57572e-01***
	[7.77]	[19.28]	[20.06]	[9.61]	[16.83]	[19.63]
Fiscal variable (-2)	-0.06756	-0.20528***	-0.16312***	0.05109	0.01328	-0.00467
	[1.13]	[4.77]	[4.53]	[0.89]	[0.31]	[0.13]
Constant	0.33128	-17.25029**	-17.24180***	-5.42534	33.29401***	27.29445***
	[0.04]	[2.58]	[3.25]	[0.65]	[3.59]	[4.41]
Observations	267	391	643	279	358	622
R-squared	0.3	0.67	0.54	0.49	0.8	0.69
Number of country	19	27	45	19	28	46

Absolute value of t statistics in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

	Current Expenditure			Capital Expenditure		
	Latam	OECD	All	Latam	OECD	All
GDP growth	-4.38277e-02**	-3.99953e-01***	-1.23071e-01***	1.94E-02	-1.57E-02	1.03E-02
	[2.38]	[8.97]	[5.85]	[1.32]	[1.23]	[1.02]
log GDPpercapita	0.91727	-3.14174***	-2.35051***	-0.60077	0.20997	-0.16938
	[1.06]	[3.23]	[3.55]	[0.90]	[0.93]	[0.57]
Election dummy	0.56541***	0.26828	0.37908***	0.23032*	0.02874	0.13353**
	[3.66]	[1.53]	[2.90]	[1.88]	[0.54]	[2.08]
Fiscal variable (-1)	6.72954e-01***	8.35205e-01***	8.44688e-01***	5.80896e-01***	4.27444e-01***	5.50533e-01***
	[11.81]	[18.51]	[23.01]	[9.51]	[7.62]	[13.06]
Fiscal variable (-2)	0.09382*	-0.00393	-0.01606	-0.10784*	0.17515***	-0.0517
	[1.73]	[0.09]	[0.46]	[1.83]	[3.24]	[1.28]
Constant	-3.41673	38.42785***	26.20471***	6.16578	-0.90563	2.93618
	[0.52]	[3.72]	[4.22]	[1.20]	[0.40]	[1.11]
Observations	279	358	622	279	334	598
R-squared	0.66	0.87	0.82	0.3	0.33	0.29
Number of country	19	28	46	19	28	46

Absolute value of t statistics in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: This table reports results of FE estimation (country-specific effect) with lagged dependent variables. The impact of elections on fiscal variables is calculated from the contemporaneous election year. The exception is capital expenditure which is assumed to lead the election by one year. Legislative elections are used for countries with parliamentary political systems and executive elections for countries with presidential systems. Data on fiscal policy refers to Central Government.

Source: the authors based on Secretaria do Tesouro Nacional (for the case of Brazil); ECLAC ILPES, Public Finance database (for other Latin American countries) and OECD, General Government Accounts (for OECD countries), 2009.

Table 3. Impact of elections on Fiscal variables, 1990-2006
FE estimation with lagged dependent variables and time effect

	Primary Balance			Primary Expenditure		
	Latam	OECD	All	Latam	OECD	All
GDP growth	3.09E-02	2.14500e-01***	1.03380e-01***	4.53537e-02*	-3.00458e-01***	-5.07424e-02**
	[1.17]	[4.95]	[4.42]	[1.84]	[6.60]	[2.20]
log GDPpercapita	-3.69249***	0.76836	-0.71306	-0.99374	0.99231	-1.75552*
	[2.71]	[0.53]	[0.74]	[0.74]	[0.65]	[1.66]
Election dummy	-0.48822**	-0.12756	-0.26872**	0.34213*	0.20617	0.24946*
	[2.54]	[0.79]	[2.04]	[1.80]	[1.26]	[1.82]
Fiscal variable (-1)	4.31882e-01***	8.09204e-01***	7.45398e-01***	5.04143e-01***	7.35907e-01***	7.63378e-01***
	[6.73]	[16.98]	[19.32]	[7.91]	[15.42]	[19.56]
Fiscal variable (-2)	-0.05289	-0.15808***	-0.11861***	-0.00065	0.06252	0.00994
	[0.89]	[3.40]	[3.20]	[0.01]	[1.38]	[0.27]
Constant	28.66246***	-8.32585	5.94233	14.67901	-0.72457	22.14948**
	[2.74]	[0.58]	[0.69]	[1.43]	[0.05]	[2.29]
Observations	267	391	643	279	358	622
R-squared	0.44	0.7	0.58	0.55	0.82	0.7
Number of country	19	27	45	19	28	46

Absolute value of t statistics in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

	Current Expenditure			Capital Expenditure		
	Latam	OECD	All	Latam	OECD	All
GDP growth	-2.44E-02	-3.48925e-01***	-1.13813e-01***	3.73034e-02**	-5.25E-03	1.84392e-02*
	[1.21]	[7.19]	[5.14]	[2.27]	[0.35]	[1.70]
log GDPpercapita	-1.55808	0.90538	-1.73683*	-1.42364	1.45190***	-0.20657
	[1.41]	[0.55]	[1.68]	[1.58]	[2.69]	[0.44]
Election dummy	0.53938***	0.27243	0.39104***	0.19722	0.03234	0.12176*
	[3.46]	[1.58]	[2.98]	[1.57]	[0.62]	[1.88]
Fiscal variable (-1)	5.95543e-01***	8.18607e-01***	8.51479e-01***	5.65159e-01***	3.87403e-01***	5.59156e-01***
	[9.69]	[17.54]	[22.93]	[9.03]	[6.61]	[13.12]
Fiscal variable (-2)	0.07735	0.0154	-0.00982	-0.13896**	0.16849***	-0.05399
	[1.36]	[0.35]	[0.28]	[2.27]	[2.96]	[1.31]
Constant	16.51774*	-0.12823	20.04490**	12.43684*	-12.58157**	3.08677
	[1.93]	[0.01]	[2.13]	[1.79]	[2.38]	[0.73]
Observations	279	358	622	279	334	598
R-squared	0.7	0.88	0.82	0.35	0.4	0.31
Number of country	19	28	46	19	28	46

Absolute value of t statistics in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: This table reports results of FE estimation (country-specific effect) with lagged dependent variables and time-specific fixed effects are included as regressors. The impact of elections on fiscal variables is calculated from the contemporaneous election year.
The exception is capital expenditure which is assumed to lead the election by one year. Legislative elections are used for countries with parliamentary political systems and executive elections for countries with presidential systems. Data on fiscal policy refers to Central Government.

Source: the authors based on Secretaria do Tesouro Nacional (for the case of Brazil); ECLAC ILPES, Public Finance database (for other Latin American countries) and OECD, General Government Accounts (for OECD countries), 2009.

Table 4. Impact of elections on Fiscal variables, 1990-2006
GMM estimation with time effect

	Primary Balance			Primary Expenditure		
	Latam	OECD	All	Latam	OECD	All
GDP growth	5.12E-03	2.06001e-01***	9.42426e-02***	9.15E-03	-3.26826e-01***	-4.85E-02
	[0.18]	[4.08]	[3.21]	[0.36]	[5.73]	[1.64]
log GDPpercapita	-1.89634	1.39508	-6.12286***	1.4848	3.47551	-0.24641
	[1.06]	[0.54]	[3.06]	[0.81]	[1.27]	[0.11]
Election dummy	-0.51189***	-0.12043	-0.30359**	0.44077**	0.18493	0.29636**
	[2.72]	[0.73]	[2.18]	[2.46]	[1.04]	[1.97]
Fiscal variable (-1)	4.28951e-01***	8.06338e-01***	8.10756e-01***	3.83635e-01***	7.41707e-01***	8.25724e-01***
	[6.54]	[16.16]	[18.85]	[5.17]	[13.49]	[16.97]
Fiscal variable (-2)	-0.06464	-0.13777***	-0.07263*	-0.03015	0.04836	0.00541
	[1.11]	[3.03]	[1.90]	[0.51]	[0.98]	[0.13]
Constant	15.22207	-14.71758	53.28168***	-0.73396	-23.18899	7.08513
	[1.10]	[0.59]	[3.01]	[0.05]	[0.87]	[0.36]
Observations	247	364	597	260	330	576
Number of country	19	27	45	19	28	46

Absolute value of t statistics in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

	Current Expenditure			Capital Expenditure		
	Latam	OECD	All	Latam	OECD	All
GDP growth	-2.67E-02	-3.84402e-01***	-1.17039e-01***	2.61E-02	-1.67E-02	1.77E-03
	[1.26]	[6.43]	[4.04]	[1.47]	[1.01]	[0.14]
log GDPpercapita	-1.94253	4.20896	-0.05032	1.24878	1.24345	2.32860***
	[1.14]	[1.47]	[0.02]	[1.04]	[1.54]	[2.86]
Election dummy	0.46948***	0.23074	0.36999**	0.20925*	0.03176	0.11070*
	[3.16]	[1.25]	[2.56]	[1.77]	[0.62]	[1.72]
Fiscal variable (-1)	4.11416e-01***	8.17835e-01***	9.01717e-01***	4.98095e-01***	2.81691e-01***	4.94675e-01***
	[5.31]	[15.63]	[19.79]	[7.73]	[4.29]	[9.90]
Fiscal variable (-2)	0.06392	0.00338	-0.02006	-0.18220***	0.0943	-0.10253**
	[1.17]	[0.07]	[0.51]	[3.13]	[1.61]	[2.44]
Constant	21.94886*	-32.44865	4.00135	-7.64304	-9.9869	-18.44196***
	[1.66]	[1.16]	[0.20]	[0.84]	[1.28]	[2.59]
Observations	260	330	576	260	306	552
Number of country	19	28	46	19	28	46

Absolute value of t statistics in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: This table reports result of GMM estimation with two lags of the dependent variables and time-specific fixed effects are included as regressors. The impact of elections on fiscal variables is calculated from the contemporaneous election year. The exception is capital expenditure which is assumed to lead the election by one year. Legislative elections are used for countries with parliamentary political systems and executive elections for countries with presidential systems. Data on fiscal policy refers to Central Government.

Source: the authors based on Secretaria do Tesouro Nacional (for the case of Brazil); ECLAC ILPES, Public Finance database (for other Latin American countries) and OECD, General Government Accounts (for OECD countries), 2009.

Table 5. Re-election system and year-terms in Latin America (2009)

	Re-election			Year term
	Immediate	No-immediate	Forbidden	Nb. Years
Argentina	X			4
Bolivia		X		5
Brazil	X			4
Chile		X		4
Colombia	X			4
Costa Rica		X		4
Dominican Republic	X			4
Ecuador	X			4
El Salvador		X		5
Guatemala			X	4
Haiti	X			5
Honduras			X	4
Mexico			X	6
Nicaragua		X		5
Panama		X		5
Paraguay			X	5
Peru		X		5
Uruguay		X		5
Venezuela	X			6

Source: The authors, based on Payne et al. (2006) and IFES Election guide (www.electionguide.org), 2009.

Table 6. Impact of re-elections on Fiscal variables, 1990-2006
FE and GMM estimation with time effect

	Primary Balance		Primary Expenditure	
	FE	GMM	FE	GMM
GDP growth	2.47E-02	3.20E-03	3.05E-02	7.32E-03
	[0.89]	[0.11]	[1.14]	[0.27]
log GDPpercapita	-3.67295**	-2.17356	-0.72679	1.82436
	[2.41]	[1.11]	[0.49]	[0.86]
immediate re-election	-0.66202	-0.65945	1.34151***	1.23740***
	[1.49]	[1.48]	[3.21]	[3.11]
non-immediate forbidden	-0.45249**	-0.49033**	0.07944	0.17532
	[2.07]	[2.28]	[0.37]	[0.86]
Fiscal variable (-1)	4.29848e-01***	4.39313e-01***	5.14023e-01***	4.05921e-01***
	[6.54]	[6.61]	[7.88]	[5.39]
Fiscal variable (-2)	-0.05723	-0.05422	0.00155	-0.02527
	[0.94]	[0.91]	[0.03]	[0.42]
Constant	28.92510**	17.50399	12.81875	-5.02496
	[2.45]	[1.16]	[1.10]	[0.31]
Observations	256	238	264	246
Number of country	18	18	18	18
R-squared	0.43		0.57	
Absolute value of t statistics in brackets				
* significant at 10%; ** significant at 5%; *** significant at 1%				

	Current Expenditure		Capital Expenditure	
	FE	GMM	FE	GMM
GDP growth	-5.04687e-02**	-5.37335e-02**	3.36256e-02*	2.92E-02
	[2.38]	[2.46]	[1.79]	[1.48]
log GDPpercapita	-1.09131	-2.75076	-1.38515	1.74098
	[0.90]	[1.51]	[1.30]	[1.17]
immediate re-election	1.34955***	1.04569***	0.55727*	0.55294**
	[4.05]	[3.27]	[1.94]	[1.99]
non-immediate forbidden	0.32599*	0.33903**	0.11563	0.15402
	[1.92]	[2.13]	[0.78]	[1.09]
Fiscal variable (-1)	6.21954e-01***	4.05022e-01***	5.30566e-01***	4.74616e-01***
	[10.03]	[5.12]	[8.10]	[7.00]
Fiscal variable (-2)	0.06215	0.04504	-0.14040**	-0.18754***
	[1.08]	[0.82]	[2.20]	[3.06]
Constant	13.21684	30.50117**	12.47231	-11.39582
	[1.38]	[2.07]	[1.51]	[0.99]
Observations	264	246	246	228
Number of country	18	18	18	18
R-squared	0.73		0.32	
Absolute value of t statistics in brackets				
* significant at 10%; ** significant at 5%; *** significant at 1%				

Notes: This table reports result of FE and GMM estimation with two lags of the dependent variables and time-specific fixed effects are included as regressors. "Non immediate and forbidden" refers to all elections in which there is no immediate re-election (e.g. reelection is forbidden, re-election is not immediate). The impact of re-elections on fiscal variables is calculated from the contemporaneous election year. The exception is capital expenditure which is assumed to lead the election by one year.

Source: the authors based on Secretaria do Tesouro Nacional (for the case of Brazil); ECLAC ILPES, Public Finance database (for other Latin American countries), 2009.

ANNEX

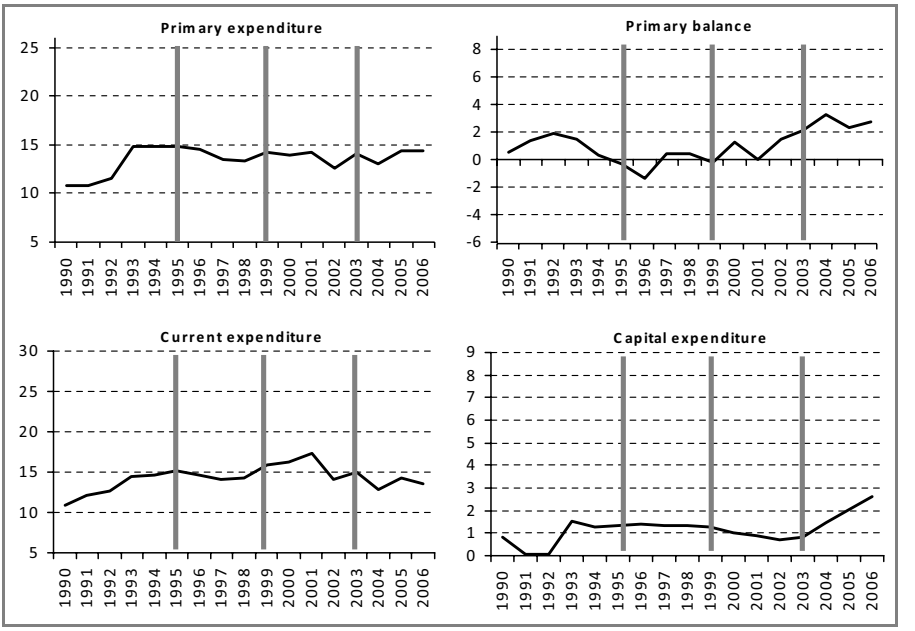
Fiscal Variables (Percentage of GDP) in Latin America. Period 1990-2006

Source: The authors, based on Secretaria do Tesouro Nacional in the case of Brazil and ECLAC ILPES, *Public Finance database* for other Latin American countries, 2009.

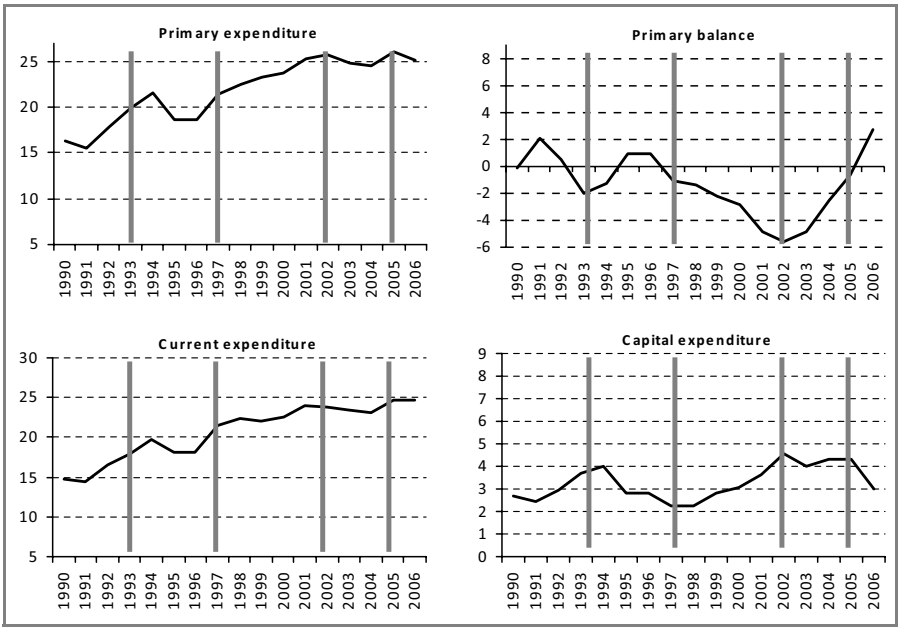
Notes:

1. Fiscal Variables (percentage of GDP) are: The fiscal deficit before interest payments (primary balance), the public expenditure excluding interest payments (primary expenditure), the current expenditure, and the capital expenditure.
2. Red vertical line represents the election date

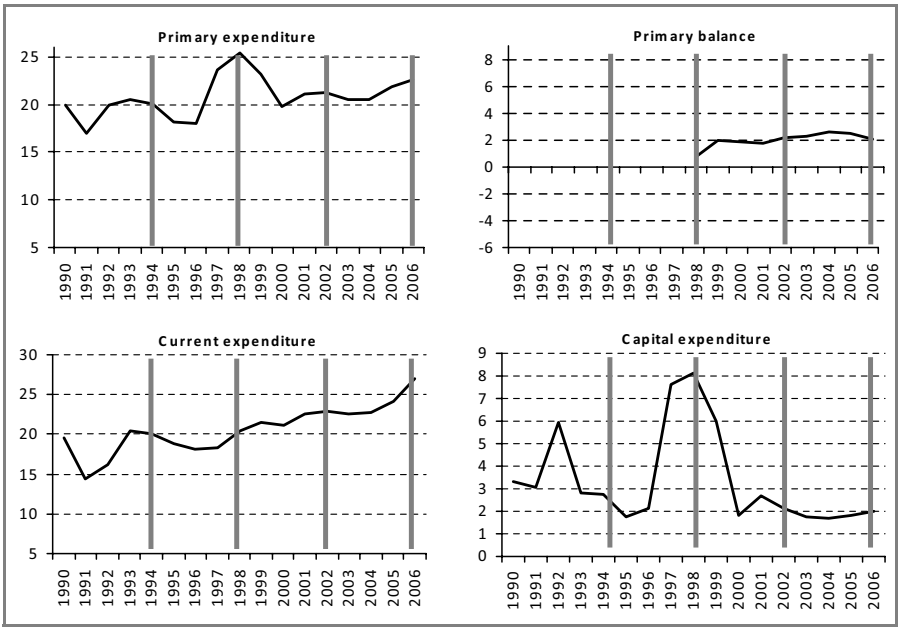
Argentina



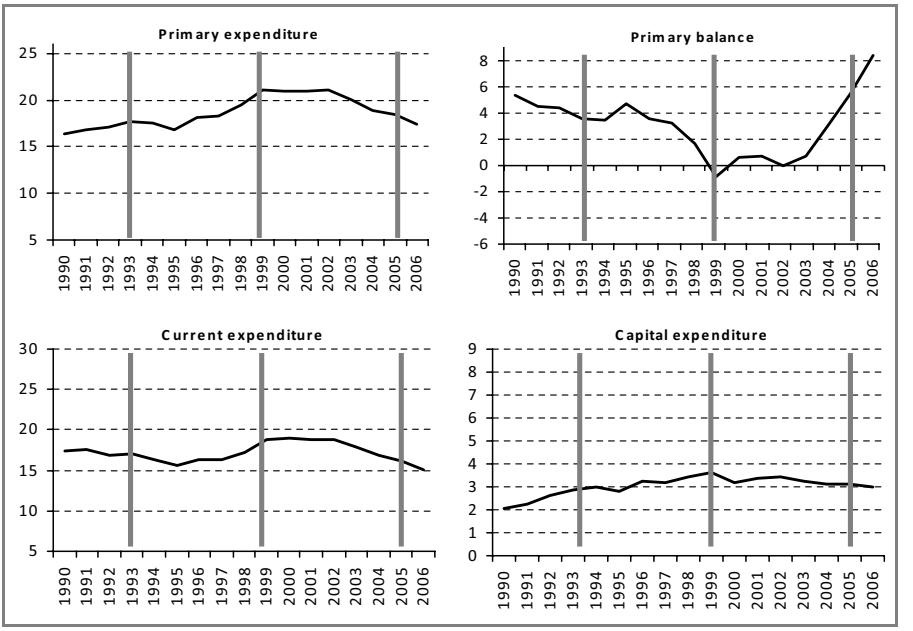
Bolivia



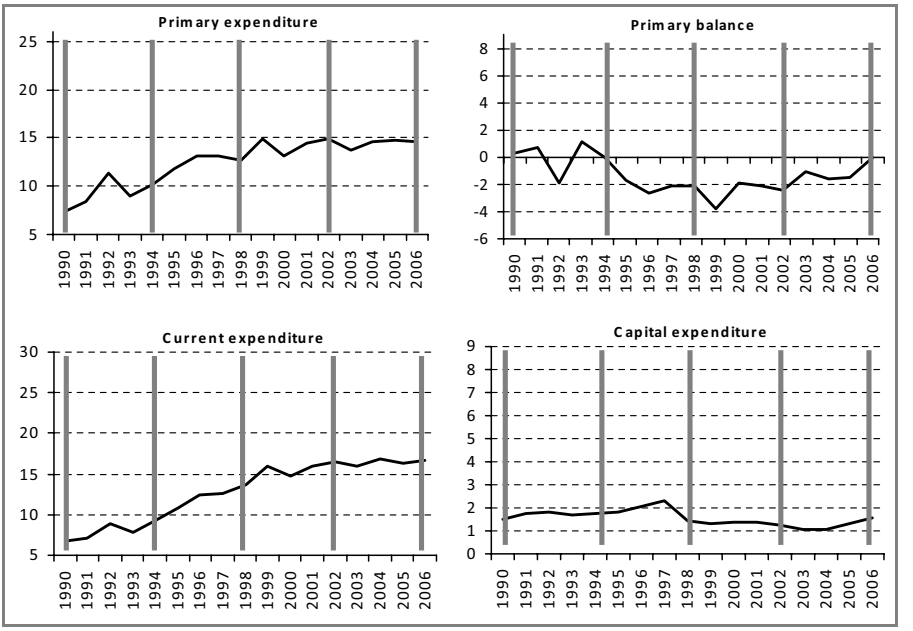
Brazil



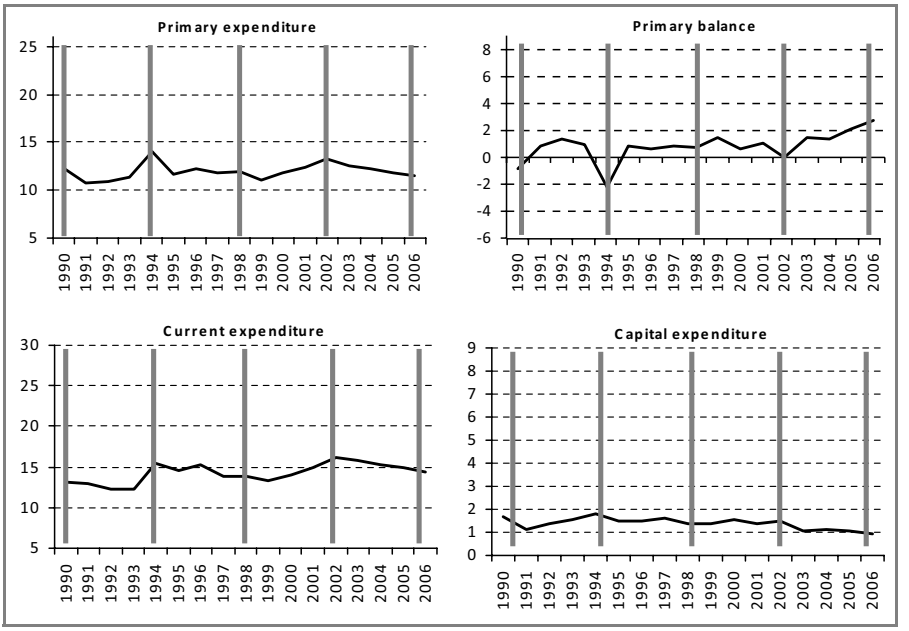
Chile



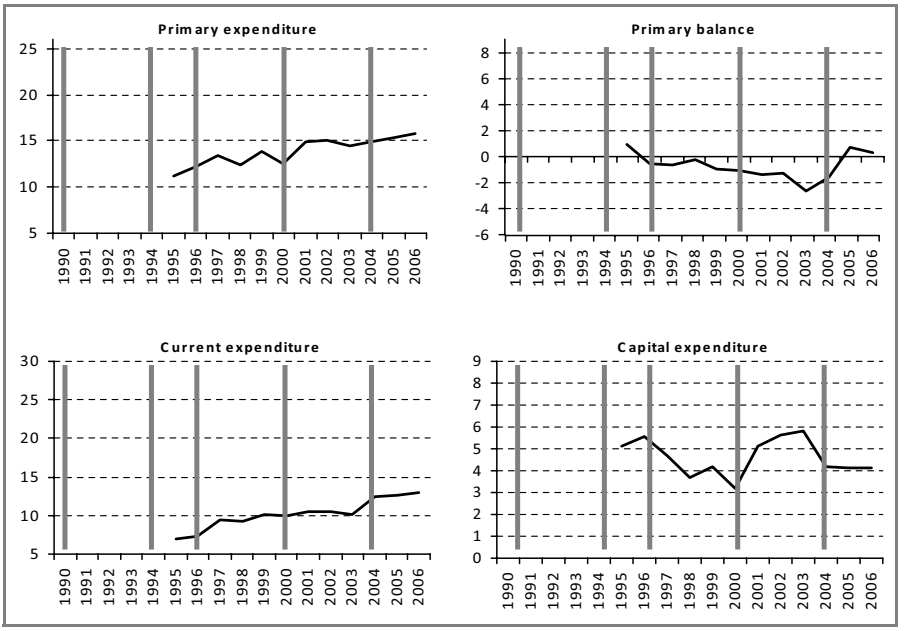
Colombia



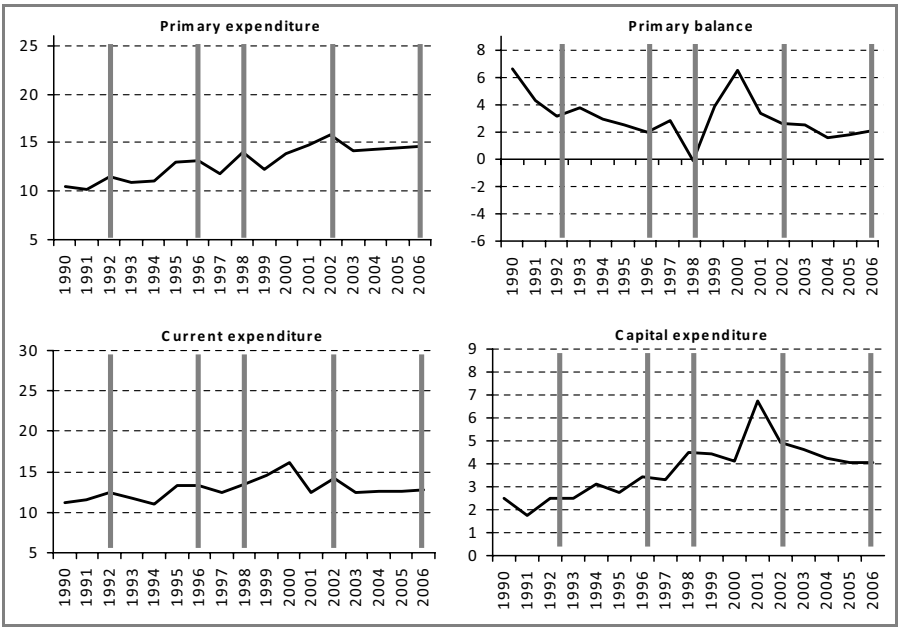
Costa Rica



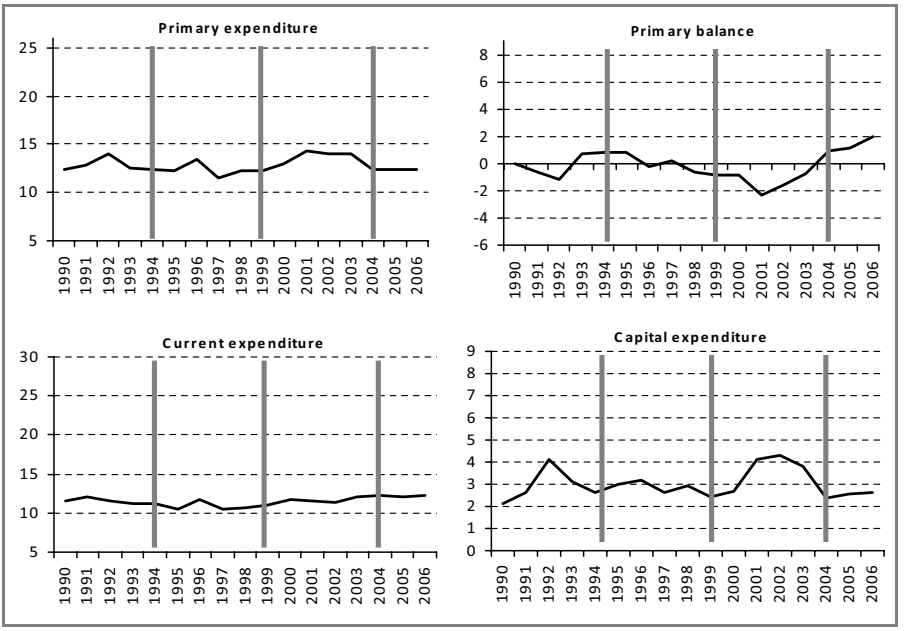
Dominican Republic



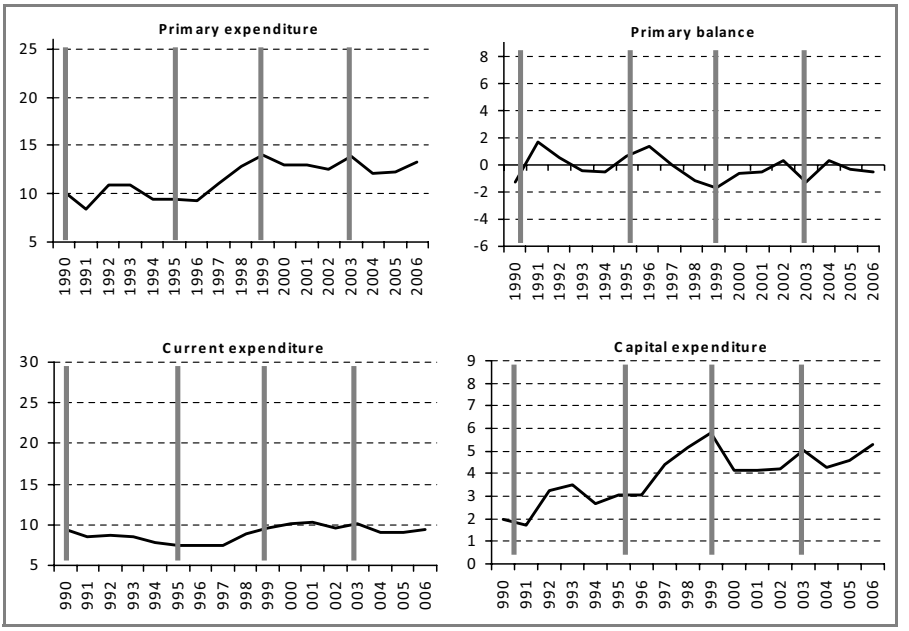
Ecuador



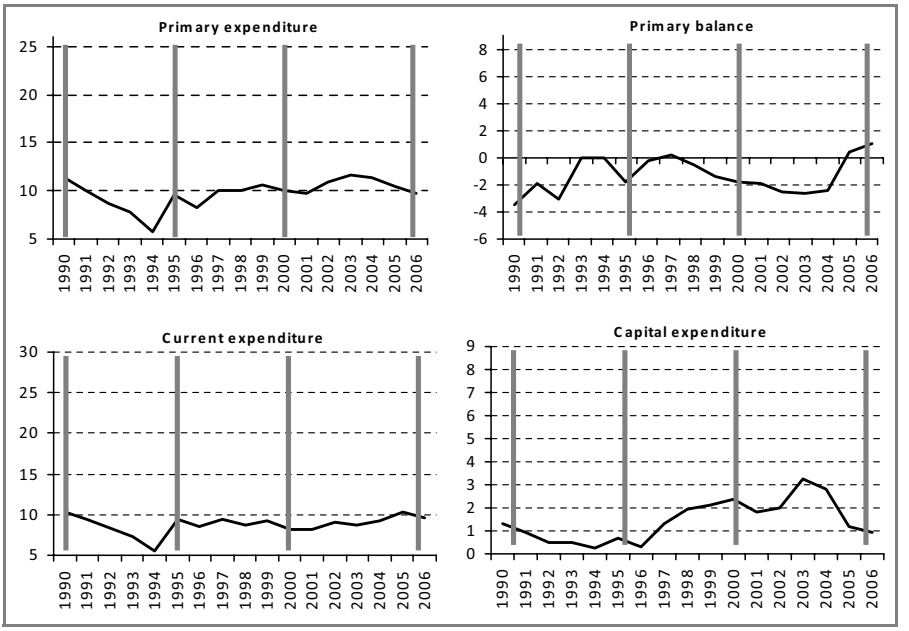
El Salvador



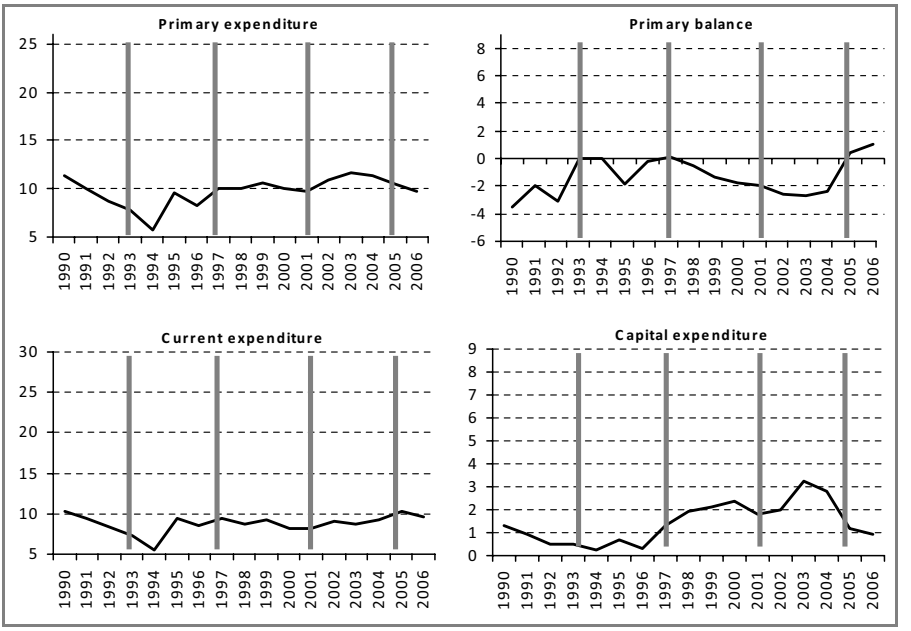
Guatemala



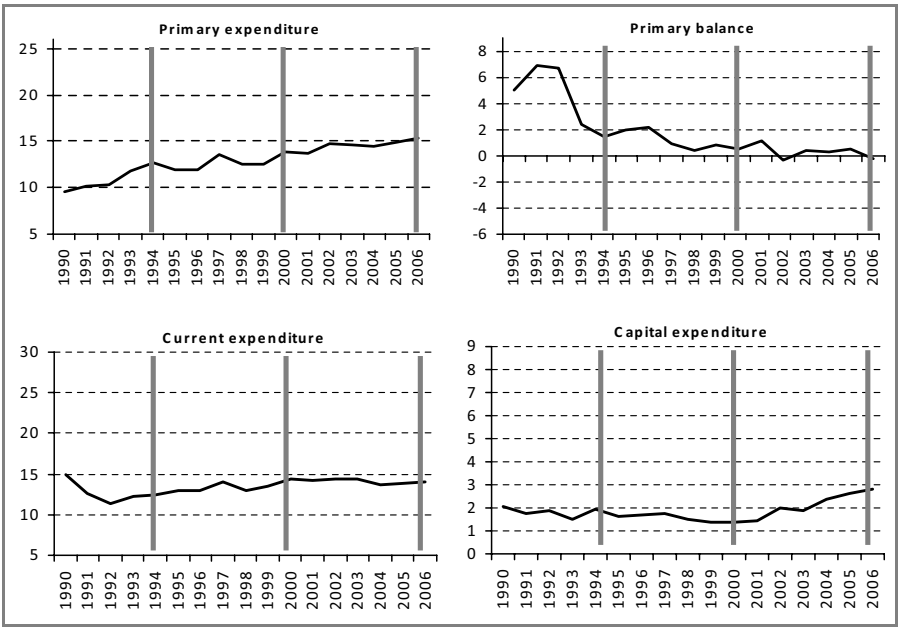
Haiti



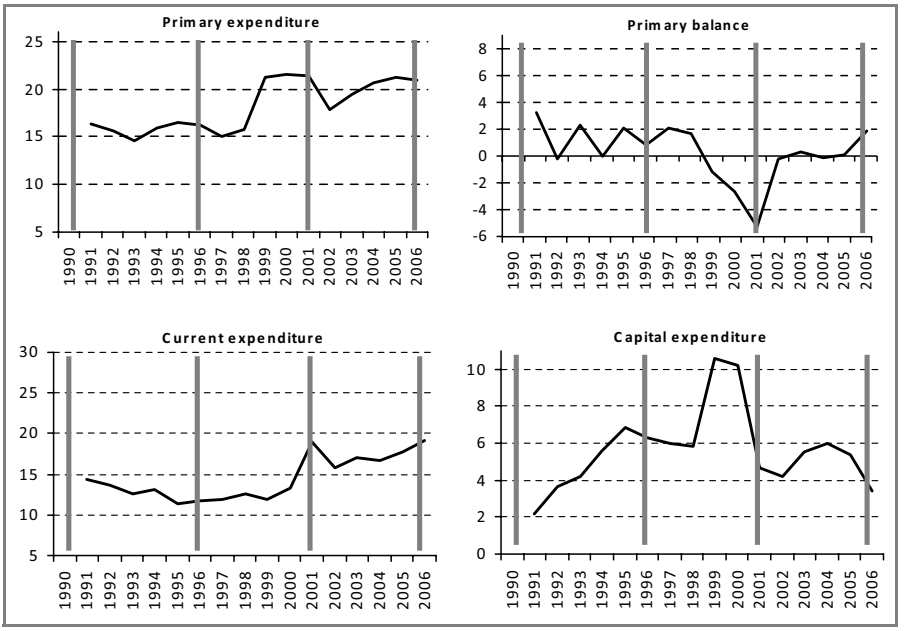
Honduras



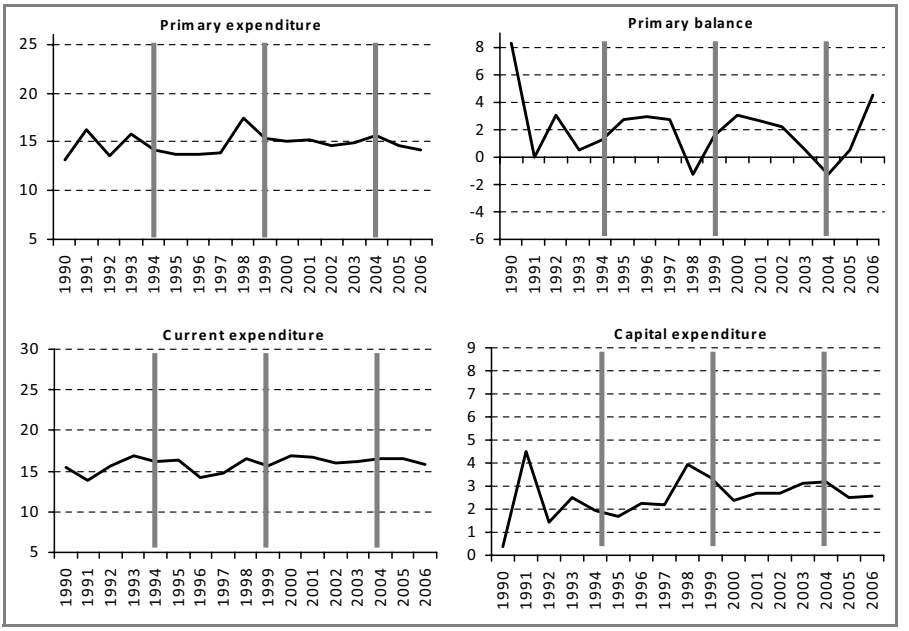
Mexico



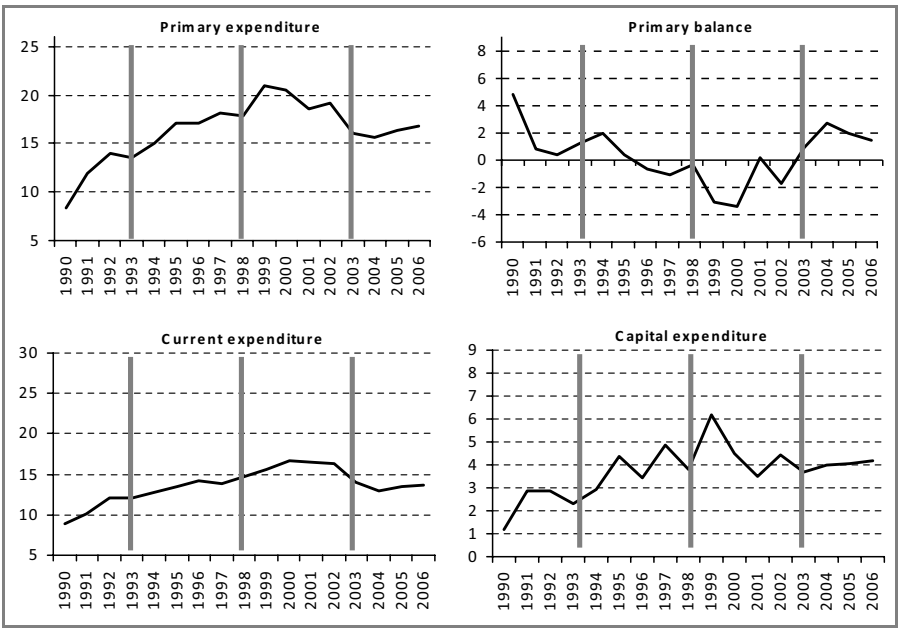
Nicaragua



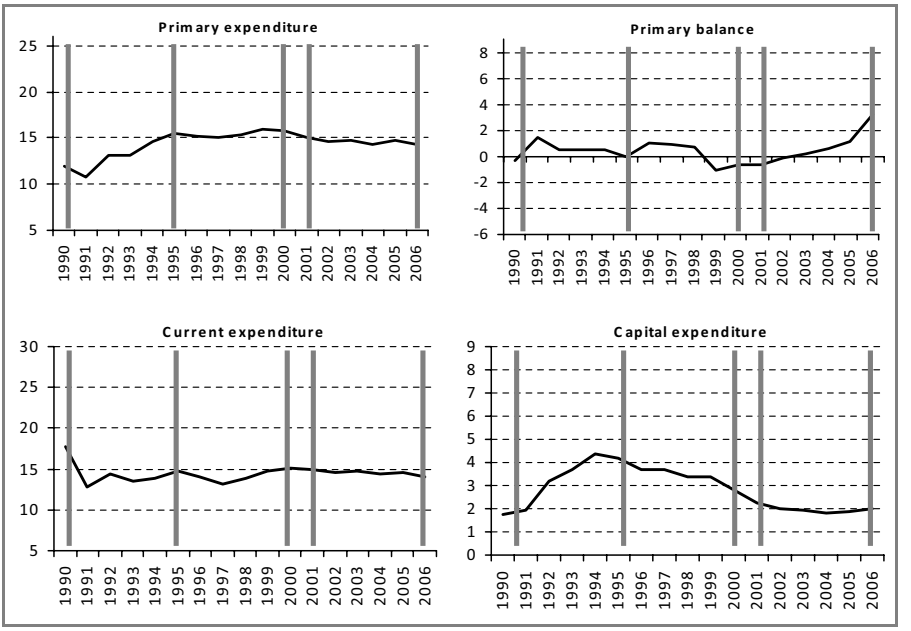
Panama



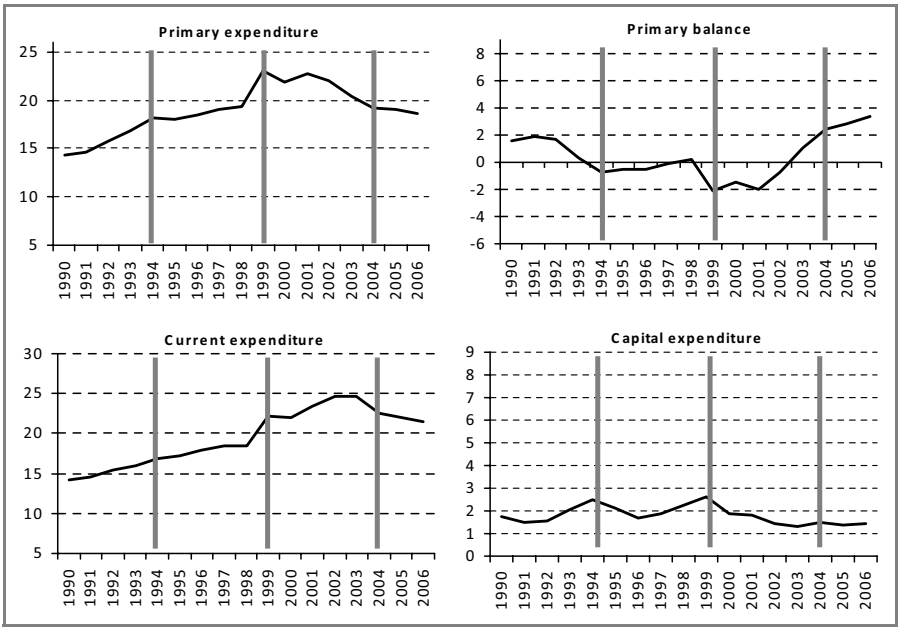
Paraguay



Peru



Uruguay



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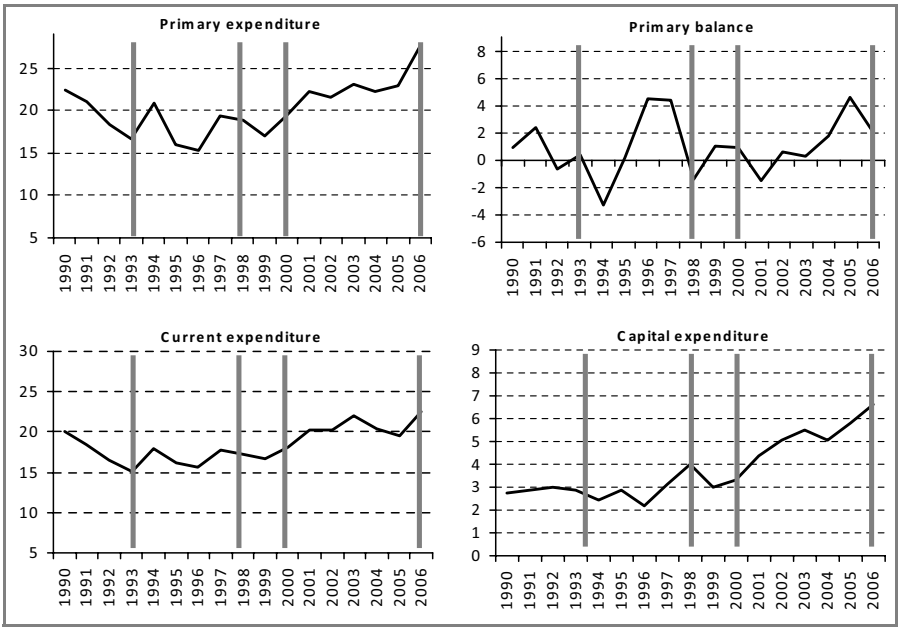

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5. The Real Impacts of the 2008-09 Financial Crisis: What We Knew and What We Have Learned about International Linkages[1]

Stéphane Dees & Filippo di Mauro[2]

Abstract

The 2008-09 financial crisis had severe impacts bringing the global economy to its deepest and most widespread recession since World War II. One important characteristic of this recession has been its broad-based nature – not only across countries, but also across demand components. Thus, while countries have been exposed to a different degree to the impact of the financial crisis – as soon as world trade dropped and substantial balance-sheet correction took place across sectors – none of them could remain unaffected. Overall, this paper examines some selected aspects related to international linkages – most notably the ones originated in the US and for their impact on the rest of the world – from several different perspectives. The overall lesson we have learned in the light of the 2008-2009 financial crisis, is that trade remains the most important cross-border transmission channel. This notwithstanding, the financial crisis has highlighted the role financial channels may have in magnifying global economic interactions. The inability so far of business-cycle related literature to fully spell out the role of financial variables calls for additional research.

Keywords: International transmission of shocks, financial integration, financial crises, international business cycle.

JEL codes: E44, F15, F41, G01

5.1. Introduction

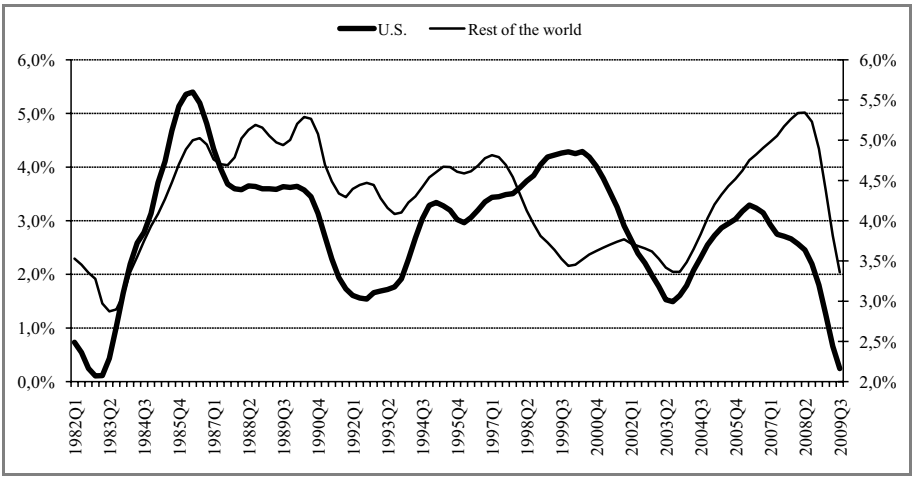
That the United States has to be considered, de facto, as the 'engine' of the world economy has been a puzzle for at least a full generation of economists. How can it be that an economy that represents only less than a fourth of world GDP could still have such a role, particularly when large and fast growing economic players, like China, are potently emerging in the global economy? The empirical regularity, however, is unequivocally strong, as all past US recessions have typically coincided with significant reductions in global growth (IMF, 2007).

[1] This paper is partly based on a book entitled "Catching the flu from the United States: Synchronisation and transmission mechanisms to the euro area" by Filippo di Mauro, Stephane Dees and Marco Lombardi (2010), Palgrave Macmillan. The authors are grateful to Fabio Fornari, Marco Lombardi and Nico Zorell for their valuable input and Tadios Tewolde for excellent research assistance. The views expressed in this paper do not necessarily reflect the views of the European Central Bank or the Eurosystem.

[2] European Central Bank.

A quick glance at the data seems to provide support to the fact that the US economy is the engine of the world. Figure 1 shows the relatively strong correlation of US real GDP growth and a common component derived from non-US economies' growth rates. In addition to a large correlation (45%), it seems that in most periods, the US cycle tends to lead the one of the rest of the world. Indeed, the correlation between the US growth rates and the common component lagged one period increases to 50%. There are only few episodes when correlation was very low, implying that – in a sense – the US cycle is a good proxy for a global cycle.

Figure 1: US real GDP growth rates (detrended) and common component of rest of the world growth rates (detrended)
(Quarterly growth rates – 3 year moving average)



Source: Authors' computation

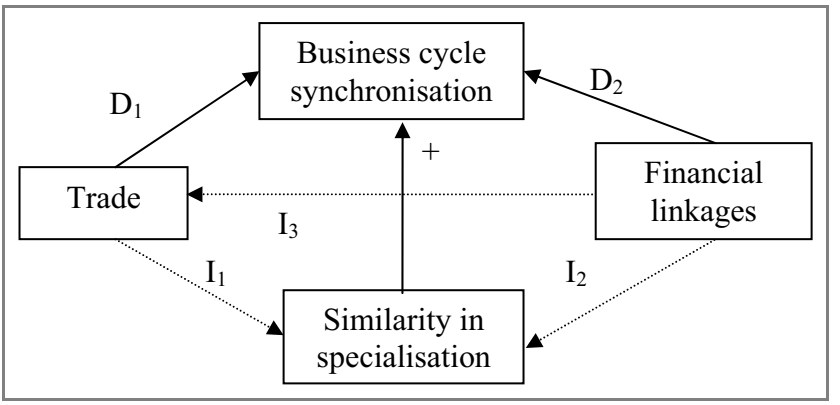
Note: Common component is the first principal component derived from a pool of 25 non-US economies. Last observation refers to 2006Q4.

That engine role has to do with the whole set of interactions, which – departing from the United States – tend to reverberate, amplified, to the rest of the world. Such interactions include all sort of transmission channels related to trade links, financial interconnections in globally interlinked markets, as well as other more 'mood' related variables such as confidence indicators of consumers and business operators.

First, the *trade channel* (Channel D_1 on Figure 2) refers to the increasing relevance of external trade that makes economies more vulnerable to external shocks, either positive or negative. While theoretically, the impact of trade integration on synchronisation of cycles depends on the nature of trade (intra- *vs* inter-industry trade) and the type of shocks (Kose and Yi, 2001), the empirical evidence tends

to suggest a strong, positive link between trade linkages and output correlation. Second, the *financial channel* (Channel D_2) refers in its narrowest definition to the financial integration between economies through cross-border capital and financial flows. While some studies have pointed out a positive relationship between financial integration and business cycle co-movements in the case of advanced economies (Imbs, 2004 and 2006), this result runs against the predictions of a standard international business cycle model (Backus *et al.*, 1992) and becomes challenged when it is extended to developing economies (Kose *et al.*, 2003 or Garcia-Herrero and Ruiz, 2008).

Figure 2: Business cycle synchronisation: direct and indirect channels

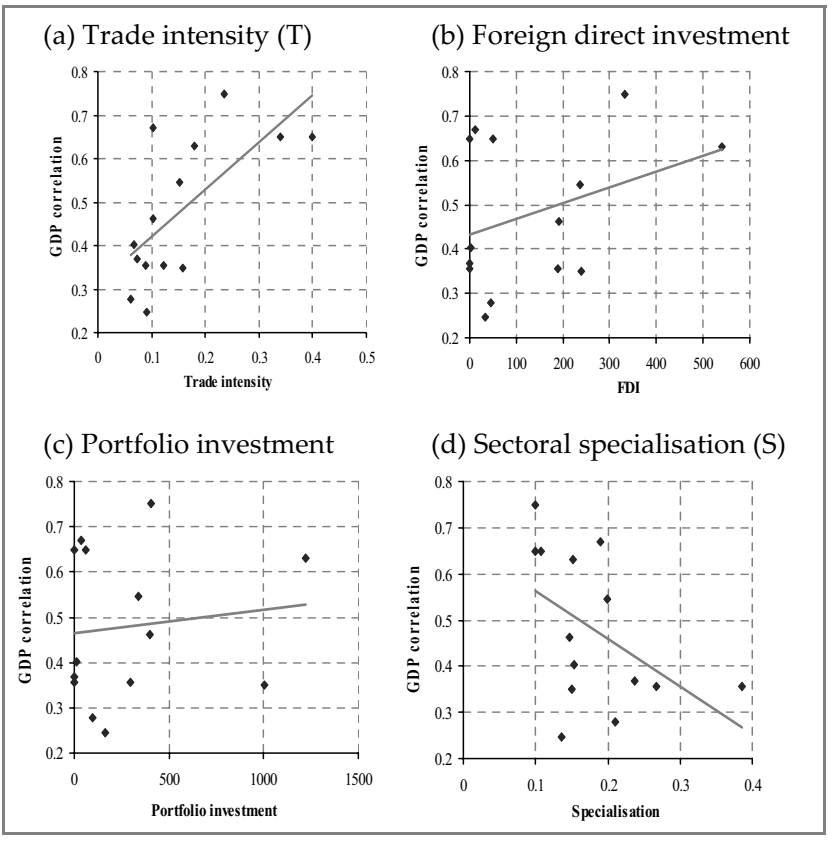


Following Imbs (2004 and 2006), di Mauro *et al.* (2010) study three main determinants of business cycle co-movement in a large sample (more than 900 bilateral relationships including both advanced and emerging economies): Trade integration, financial integration and cross-country differences in sectoral specialisation. The motivation for including the third explanatory variable alongside the two measures of economic integration is straightforward. Countries with similar patterns of sectoral specialisation are more likely to be hit by similar industry-specific shocks. This should make their business cycles more synchronised, all other things being the same.

The presence of this third explanatory variable allows to capture indirect channels. Indeed, trade and financial channels may also operate in a less direct fashion. Stronger trade links might induce more or less similarity of economic structure – depending on whether it is mostly inter-industries or intra-industries – which, in turn, influences the co-movement of output (Channel I_1). Also, there might also be some indirect effects of financial links on output synchronisation, through the similarity in specialisation (Channel I_2) or trade relationships (Channel I_3). Here also, the signs of the relationships remain largely ambiguous.

Given the complex set of interactions between the determinants of business cycle synchronisation, the objective is to disentangle the various channels through which economic integration affects cross-country output correlations. Figure 3 provides a graphical evidence of the relationship between business cycle synchronisation and economic integration. For the sake of simplicity, we focus on the bilateral GDP correlations of selected economies – including most euro area countries – with the United States. First, it appears that countries trading intensively with the US co-move more with US GDP than others. Second, there is a – rather weak – positive link between the bilateral stocks of FDI as well as portfolio capital (panel b and c, respectively) and business cycle co-movement. Third, if the sectoral specialisation of a country differs significantly from that in the US, the bilateral GDP correlation is lower.

Figure 3: Bilateral GDP correlation with the US and its determinants for selected countries



Note: This small sub-sample of 14 countries includes all euro area countries (except Greece, Finland, Ireland and Slovenia) as well as Japan and the UK.

The empirical evidence in di Mauro *et al.* (2010) confirms strong *direct effects*: economies with more intensive trade move more closely together. Also, similar patterns of sectoral specialisation lead to closer business cycle co-movement. However, it remains difficult to show any positive, significant relationships between bilateral financial relationships and business cycle correlation. This is at odds with results found for instance by Imbs (2006), but is in line with those reported by Garcia-Herrero and Ruiz (2008). Actually, it appears in particular that financial integration does not affect directly synchronisation in output but acts more indirectly through a positive, significant relationship between financial linkages and similarity in specialisation. This is possibly because financial linkages make countries more similar.

It is worth noting that financial linkages are here understood in their narrowest definition, i.e. in terms of holdings of a country's assets or liabilities by the residents of another country. Of course, financial linkages also need to be tackled in a broader sense. Financial markets have become increasingly integrated, so that a tightening of financing conditions in one country has therefore repercussions globally, i.e. even on countries which have relatively low financial exposures with this country. Actually, as asset prices reflect expectations of future returns, any negative shock on a given market will tend to be transmitted to other markets just because of the consequences it might have globally, especially when the shock originates in a large country like the United States. This transmission will not necessarily go through foreign asset withdrawals but more through asset price valuation in anticipation of the likely effects this shock will have on real activity, whatever ultimate channel it might take. In this sense, financial markets just reflect market participants' views of future cyclical developments and therefore include 'mood' related variables such as consumer and business confidence.

Overall, it appears that increased trade and financial integration has led to international business cycle synchronisation in the post-war period. Several studies show an increase in synchronisation over time, indicating that globalisation promotes international economic linkages and heightened business cycle correlations (see for instance Kose *et al.*, 2003 or Artis *et al.*, 2008). Moreover, given its role in the global economy, the United States has a large influence on this common component and therefore on the business cycle of the other countries. In particular, recessions that originate from the US tend to be severe and often accompanied by a synchronous and protracted global downturn. Finally, it appears that global trade flows fall significantly, particularly when the US is also in recession (IMF, 2008).

Beyond transmission channels, an important and challenging element is to clearly identify the shocks driving output fluctuations, in particular by singling out their source and their nature. As shown in Figure 1, there are strong co-movements

between the US economic growth and a measure of rest of the world activity. However, these co-movements do not necessarily reflect a pure transmission of US idiosyncratic shocks and might also represent impacts of shocks that are more global in nature. Kose *et al.* (2003, 2008) and IMF (2007) find that global factors generally plays an important role in explaining business cycles, especially in industrial countries, while idiosyncratic factors have a larger role in emerging market and developing countries. Kose *et al.* (2008) also show that, for the G7 countries, a common factor explains, on average, a larger fraction of output, consumption and investment volatility in the globalization period (1986:3–2003:4) than it does in the Bretton Woods period (1960:1–1972:2).

However, such results are based on approaches relying on low frequency data (quarterly or annual data) and the transmission of idiosyncratic shocks abroad (spillovers) are defined as a shock originating in one country and affecting the other countries with at least a one-period delay. It might be difficult to clearly distinguish common shocks to spillovers in such a context, as some idiosyncratic shocks might take less than a quarter to propagate to other countries. Therefore, some common shocks might also been identified as fast-transmitting idiosyncratic shocks.

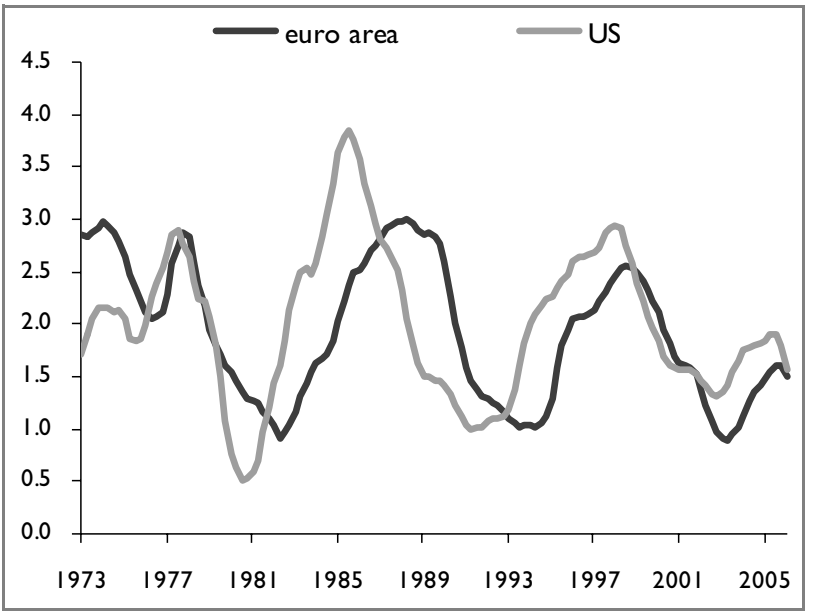
5.2. WHAT WE KNEW ABOUT INTERNATIONAL LINKAGES BEFORE THE FINANCIAL CRISIS

5.2.1. Modelling international linkages during normal times

5.2.1.1. Modelling the US-euro area relationship

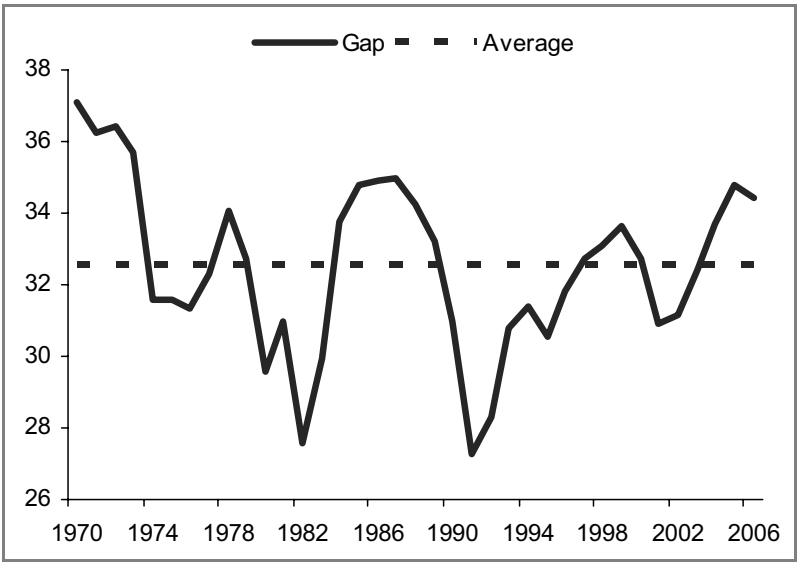
Economic activity in the United States and in the euro area (measured in terms of GDP per capita) has been co-moving over the last 40 years (see Figure 4a). Descriptive evidence suggests that the US leads the euro area business cycle and that fluctuations in the two economies evolve around a common trend. These two stylised facts have been confirmed by economic research.

Figure 4a: Smoothed GDP per capita growth rates
year on year % change, 5-years centered moving average



Source: Eurostat and the US Bureau of Economic Analysis Note: Last observation is 2006Q2.

Figure 4b: Gap between US and Euro Area in per capita GDP (in percentage points)



The figure reports the difference between the log-levels of GDP per head in the US and the euro area in the sample 1970-2006. Data source: OECD, National Accounts. Source: Giannone, Lenza and Reichlin, 2009, Figure 7.

First, using a parsimonious bivariate VAR model for US and euro area GDP, Giannone and Reichlin (2006) show that there have been systematic linkages since 1970 between economic activity in both economic areas, with GDP in the euro area always lagging behind its US counterpart. Giannone *et al.* (2009) estimate the US cycle to lead the euro area one by around 4 quarters. Dees and Vansteenkiste (2007) also show that the US leads the cycle of the euro area but find that US downturns are transmitted faster to the euro area than upturns. On average, it takes 2 quarters for a downturn in the US to transmit to the euro area, whereas it takes 6 quarters for an upturn to spillover. These estimates tend to hold on average over the past, whereas each recession episode was of course somewhat different in terms of lags, size and length.

Second, Giannone and Reichlin (2005) show that real GDP per capita in the US and in the euro area share a common trend. The level of euro area real GDP per capita has been on average about 30% less than its US counterpart and the gap between the two areas has been mean-reverting around such a value (see Figure 4b). 'Granger causality' tests also evidence that the gap in the growth rates does not drive future US growth but helps explain growth in the euro area. This confirms the apparent 'unilateral' nature of the relationship.

Finally, the degree of cross-country transmission of shocks has changed over time. For instance, Dees and Saint-Guilhem (2010) find evidence that US cyclical developments have become more global over time. While a change in US real GDP appears to have weaker contemporaneous impacts on activity in many countries during most recent periods than for earlier periods, shocks originating in the US have become increasingly persistent over time. This might be partly explained by the increasing role of second-round and third partners' effects that make US cyclical developments more global.

5.2.1.2. Measuring the transmission of US shocks to the rest of the world

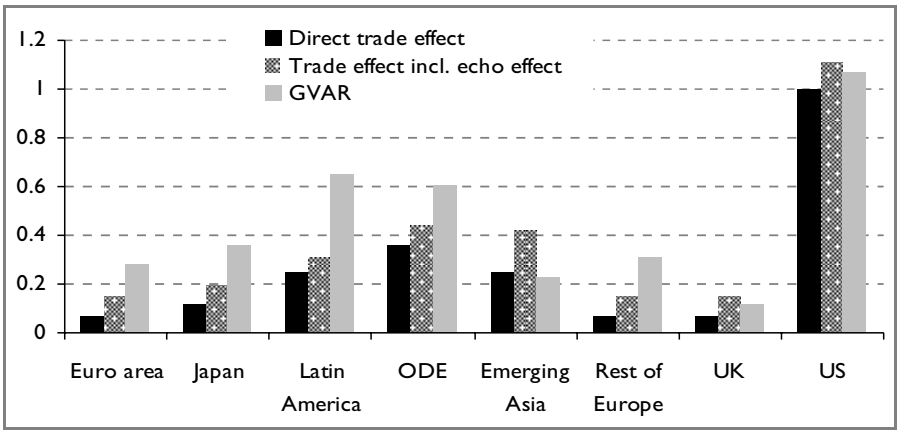
The external exposure of a country to its international environment is traditionally measured by the openness ratio and the geographical structure of its trade. However, such measures of exposure may be misleading as they reflect only the direct effects of the trade transmission. Beyond this, additional factors affect the economies in an indirect manner. For example, positive demand shocks in the United States will of course stimulate the partners' economic activity through the bilateral trade channel. But higher import demand from the US also benefits the exports of other countries which thereafter are likely to increase their imports and in particular their imports from the euro area, a so called 'echo effect'.

Dees and Vansteenkiste (2007) show that trade spillovers between a country and its international environment are likely to be amplified once accounting for the

'echo effect' (see Figure 5). However, the strong comovements observed across countries' real output are difficult to explain in terms of trade linkages alone. New channels such as financial or confidence channels play an important role. In order to account for channels additional to trade, such as financial linkages, price adjustments and economic policy reactions, Dees and Vansteenkiste (2007), using a global VAR model (GVAR), show that, for most countries, output is more sensitive to a shock originating in the US when all channels are considered in addition to the purely trade-related ones. The point estimates are in most cases higher than the benchmark values for trade-related effects (Figure 5). For the euro area and Latin America, the effect of a US domestic demand shock is around 2.5 times the one based on direct trade effects. It is slightly less (around 1.5) in the case of Japan and Other Developed Economies and it is above 5 for the rest of Europe.

Overall, Dees and Vansteenkiste (2007) find that a 1 percentage point positive shock in the United States would result in an increase in the GDP of the other regions in the world via the trade channel comprised between 0.1 to 0.5 percentage points (pp), depending on the region considered. Including also other channels this range would be much higher, namely between 0.2 and 0.7 pp.

Figure 5: The effects of a US domestic demand shock (by 1 p.p. of GDP) on GDP of other countries/regions (in percent)



Source: Dees and Vansteenkiste (2007)

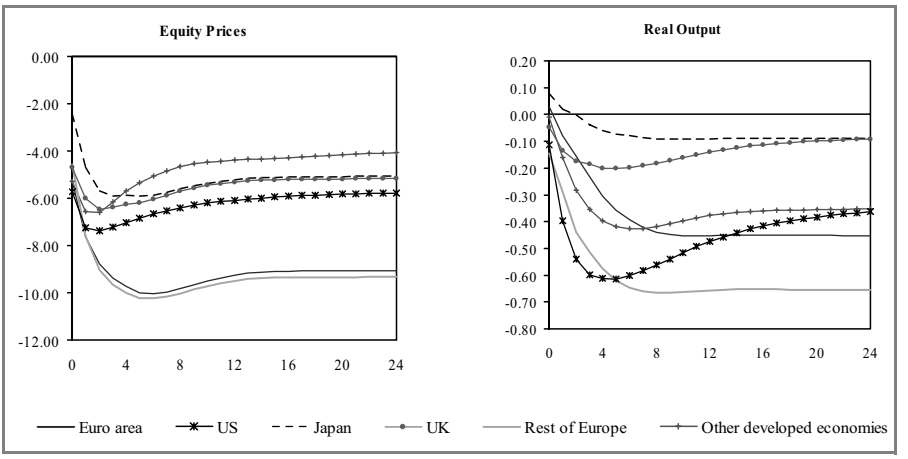
5.2.2. The role of financial variables

There is a huge literature on the topic and here we want to briefly concentrate on two specific topics: i) methodological issues regarding the role of financial variables and ii) empirical evidence using VAR models.

5.2.2.1. Transmission of financial shocks

Starting with some methodological aspects, it is important to realise that the role of financial variables in international business cycles has at least two dimensions. On the one hand one needs to assess the role of the financial channel. On the other hand, one needs to define which part of the exogenous shock can be identified as financial. As shown by the GVAR literature (see for instance Dees *et al.*, 2007), financial variables play an important role not only as a channel for shock transmission, but also as sources of shocks. Although this literature faces some difficulties in identifying shocks as being purely financial[3], generalized impulse responses of a negative shock to US real equity prices already give some hints about the role of the US financial markets in the global economy. As shown by Figure 6, the transmission of the shock to the other equity markets takes place rather quickly. On impact, a one standard error shock to US equity prices leads to a fall by around 4% in both the United States and in the rest of the world. In Europe, the effects of the US shock on the equity markets become more pronounced over the first two years, suggesting a mild overreaction of equity prices in the European markets to the US shock. This partly reflects the higher volatility of the European equity markets as compared to the volatility of the S&P 500 used as the market index for the USA. Like in the US, real output in the other countries is negatively affected by the adverse equity shock, although to a lesser extent due to reduced relevance of wealth effects.

Figure 6: Generalized impulse responses of a negative unit (1 s.e.) shock to US real equity prices



Source: Calza and Dees (2007)

[3] The existence of several 'puzzles' in the standard theory of finance has hampered the role of financial variables in macro models, like DSGE models. So much so that DSGE models are currently mostly based on real variables, though research is ongoing to include financial variables.

5.2.2.2. Financial variables as predictors of future economic activity

The turbulences and the associated losses experienced by financial markets worldwide since approximately summer 2007 have spurred research as well as policy debate about the possibility of using the forward-looking nature of financial prices to forecast economic activity. The information content of financial prices can be evaluated through their ability to forecast GDP when used together with past values of the GDP themselves. The forecasting ability of such types of models has been thoroughly investigated in recent research based on quarterly data ranging between 1970 and 2007 (see Stock and Watson, 2003a or Espinoza *et al.*, 2009). It is shown in particular that the forecasting performance of a model including only past GDP is hard to outperform, when one takes an out-of-sample perspective. In other words, financial variables are not very helpful to forecast business cycle developments when one looks at a very long sample. However, tests specifically aimed at detecting real-time forecasting ability indicate that in periods of time consistent with the realization of financial shocks (for example between 1999 and 2002), VAR models including financial indicators would have been preferable to models including past GDP only.

Similarly, Fornari and Mele (2009), by analysing post-war economic activity in the United States, find that movements in financial volatility are extremely informative about future economic activity. For example, they find that financial volatility explains between 30% and 40% of the industrial production growth at horizons of one and two years. Moreover, it appears from this research that the predicting power of stock market volatility has increased in the last twenty-five years, a period that includes a sustained decline in the volatility of real aggregates (the 'Great Moderation').

In their paper, Fornari and Mele (2009) predict probabilities of recessions through Probit models estimated as in Estrella and Hardouvelis (1991). According to the predictors used (see Table 1), they define eight predicting blocks[4].

Table 1: Predicting blocks of economic activity

B0 = lagged industrial production
B1 = term spread, corporate spread, 12 month stock market returns
B2 = term spread, short-term rate
B3 = stock market volatility, term spread volatility
B4 = stock market volatility, term spread
B5 = volatility of stock market volatility, short-term rate
B6 = volatility of stock market volatility, term spread
B7 = volatility of stock market volatility, stock market volatility, term spread
B8 = volatility of stock market volatility, stock market volatility, interaction term, term spread

[4] More details in Fornari and Mele (2009), http://fmg.lse.ac.uk/~antonio/files/vol_predict.pdf.

Figure 7a depicts the probabilities of NBER-recessions predicted by blocks B1 through B8. Blocks B7 and B8, which include the term spread, stock market volatility and volatility of volatility variables, perform relatively well. This might be attributable to the large number of regressors in these blocks. Blocks B2 (term spread and short-term rate) and B4 (stock market volatility and term spread) are, instead, more parsimonious, and yet they explain NBER-dated recessions reasonably well. Block B1 (term spread, corporate spread and stock returns) has also explanatory power, comparable to that of B2 and B4. However, it is less parsimonious and seems to generate wrong recession signals more frequently than B2 and B4, for example around the two years 1983 and 1998 (see Figure 7a). Except perhaps block B1, no block really helps predict the last recession in the sample, which started in December 2007. The explanation for this failure is that such in-sample analysis averages out complex and temporally heterogeneous relations: arguably, the links between capital markets volatility and the business cycle over the 2007 recession might be distinct, at least quantitatively, from those occurred half a century earlier.

Figure 7a: U.S. Recession probability using financial indicators (in sample probits – 1957-2008)

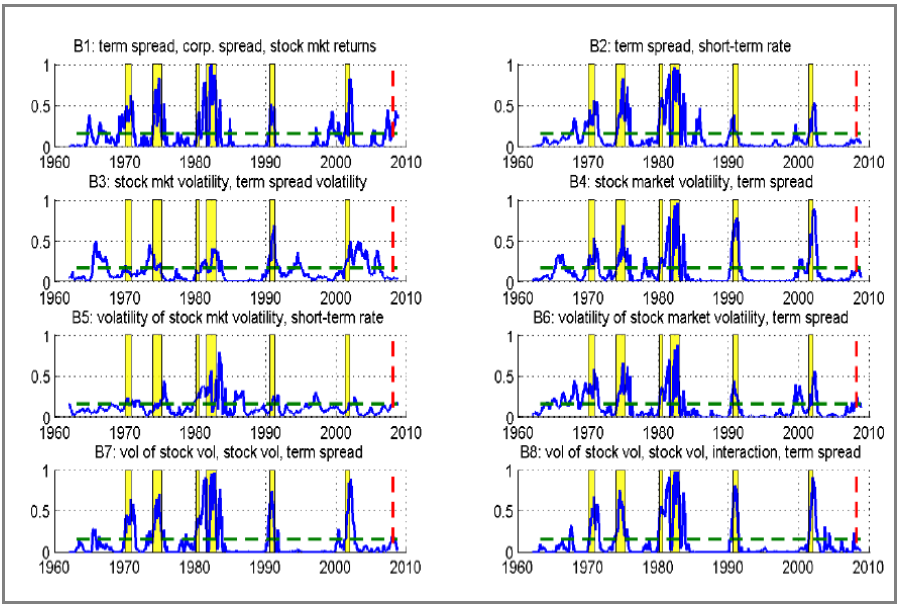
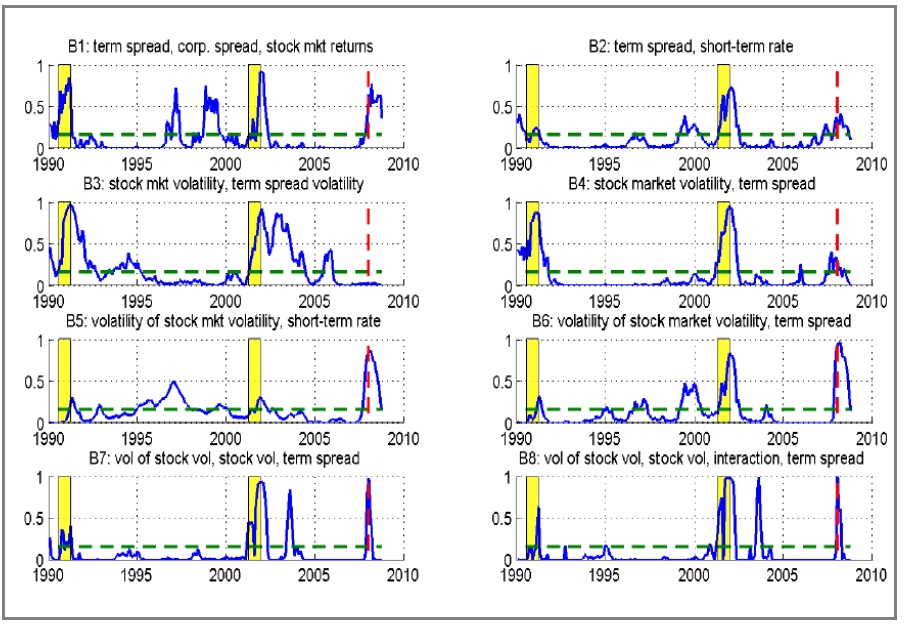


Figure 7b depicts coincident probabilities (out of sample) predicted by all blocks from B1 through B8, along with the horizontal line drawn at 16.22%, which is the fraction of time the US spent in recession over the entire sample period. The volatility-term spread block B4 and the volatility block B8 would have performed

quite well at signaling the last three recessions. At the same time, B8 does produce a sizeable and wrong warning flag of a recession in 2003, which the volatility-term spread block B4 does not.

Figure 7b: U.S. Recession probability using financial indicators (coincident – 1 month – out-of-sample projection)



Source: Fornari and Mele (2009)

The 2001 recession deserves additional discussion. As documented by Stock and Watson (2003b), this recession took forecasters by surprise. The predicting block B4 would have helped signal this downturn: the coincident probability of an imminent recession predicted by Block B4 was larger than 16.22%, even before the 2001 recession. Note that the two volatility blocks, B7 and B8, also point to a recession, in 2001, but they both deliver one false recession signal in 2003. Finally, on top of B4, the additional volatility blocks, B5 through B8, would have signalled the 2007 recession.

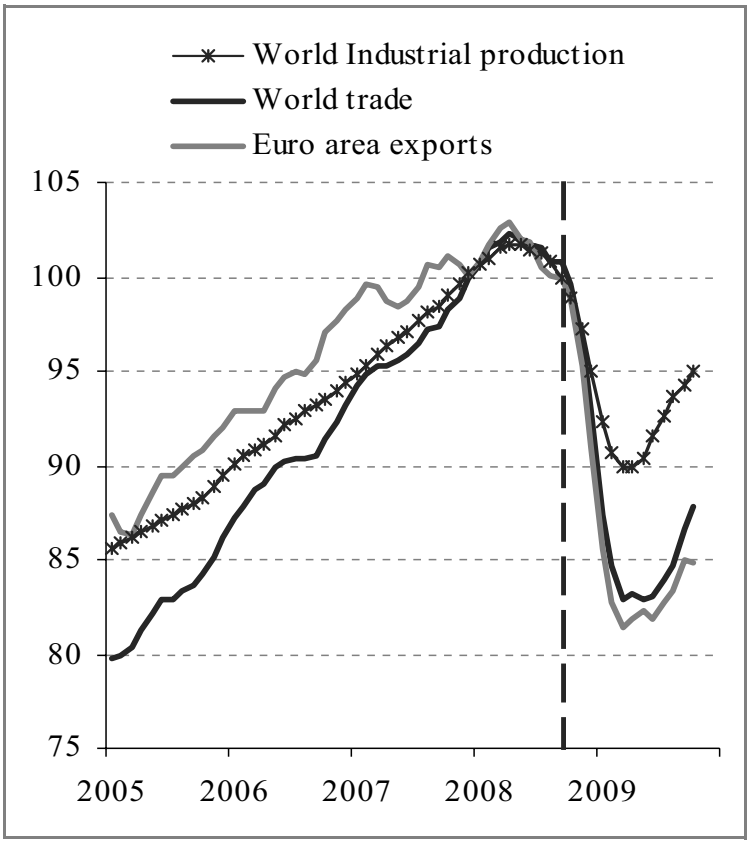
Overall, based on an array of measurement methods, this research shows that stock volatility does indeed help predict the business cycle. In particular, combining stock volatility with the term spread leads to a predicting block of economic activity, which tracks and anticipates the business cycle reasonably well. This predicting block would have considerably helped predict at least the last three recessions, with no 'false' signals.

5.3. WHAT WE HAVE (RE) LEARNED DURING THE FINANCIAL CRISIS: TRADE MATTERS ENORMOUSLY

Prior to the onset of the current global downturn, a widely held view was that the global economy could 'decouple' from the US in its downturn, given the US-specific nature of the shock. However, the onset of the global economic recession has been very severe and the cyclical dynamics very synchronised with the US, at least since the start of the financial crisis in mid-2007. While the shock initially appeared as originating from the US, it has acted as a trigger for vulnerabilities that were common across countries and regions, including high levels of leverage and an under-pricing of risks. The shock was, therefore, global in nature and its transmission triggered a synchronised downturn. There had been several factors fostering this development. The trigger of the recession was undoubtedly financial in nature. Financial innovation allowed US mortgages to be converted through securitisation into asset-backed securities, which were partly sold to international investors, without the ratings of these products fully reflecting their inherent risks. This allowed US-specific risks to be spread globally, leading to a particularly strong transmission of US mortgage-related credit problems to the rest of the world. However, the role of financial linkages in the recent episode has not been as major as we could have thought. Indeed, a striking feature of the recent global economic downturn was the synchronised fall in manufacturing output associated with a major collapse in world trade. The combination of housing market corrections, households' balance sheet adjustments and difficulties in short-term financing all contributed to the collapse of demand for durable goods (particularly in the car industry), which account for a large share of manufacturing output. The worldwide inventory adjustment process further aggravated the dynamics of the downturn, leading to a severe and synchronised contraction in industrial production. Such developments have been amplified through the trade channel, with the fall in world trade occurring at a pace without precedent since the Second World War. World trade fell by 17% between October 2008 and May 2009, returning to 2005 levels within the span of a few months (Figure 8a).

The trade decline was also exceptional in terms of the globally-synchronised nature of the downturn: over 90% of countries reported export declines of more than 5% in quarterly terms at the beginning of 2009, while almost 30% of the countries reported export falls of 20% or more (Figure 8b).

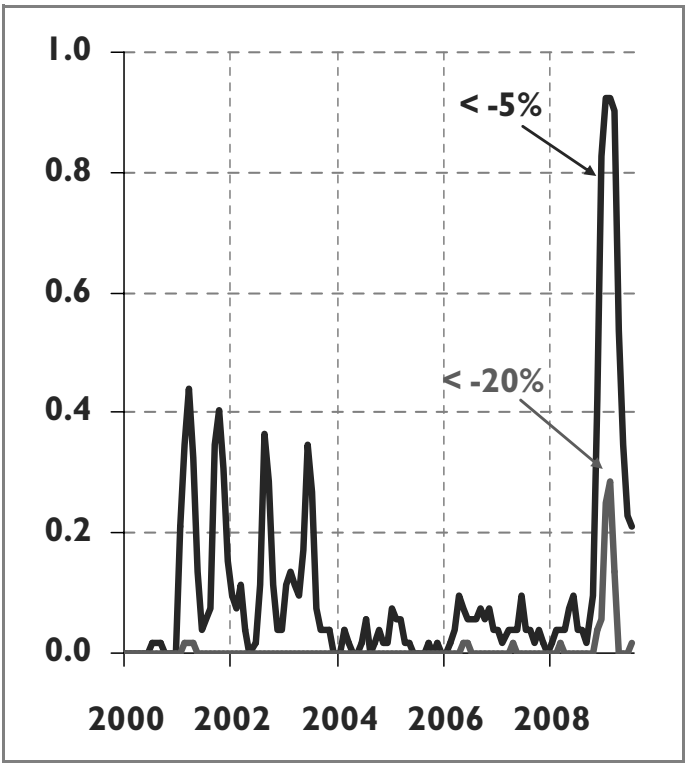
Figure 8a: World trade, global activity and euro area exports
(volume indices: 2008Q3=100; 3-month moving average; monthly data)



Source: CPB Netherlands Bureau for Economic Policy Analysis (CPB).

Notes: Euro area exports correspond to both intra- and extra-euro area exports. The vertical dotted line represents September 2008 (ie, Lehman). The latest observation refers to October 2009.

Figure 8b: Fraction of economies reporting negative merchandise export growth
(based 3-month moving average value series)



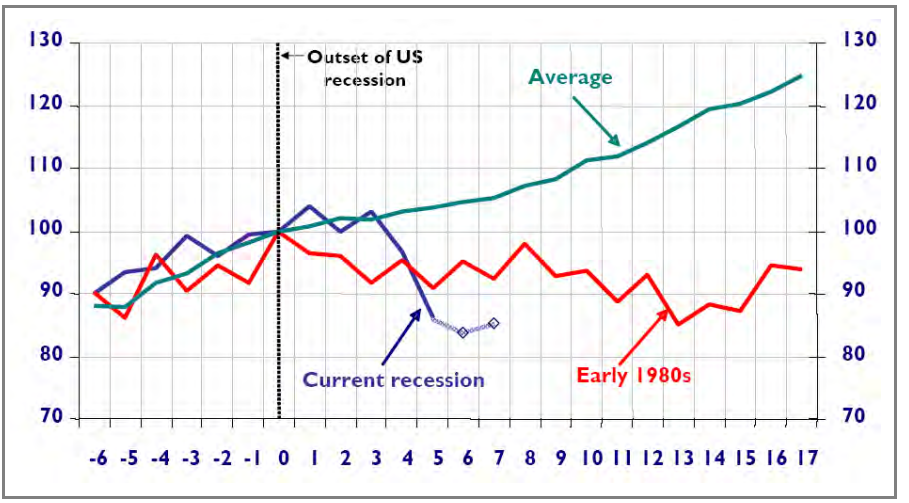
Source: CPB Netherlands Bureau for Economic Policy Analysis (CPB), ECB staff calculations.

Notes: The latest observation refers to July 2009.

From an historical perspective, the link between US business cycle and global economic developments remains strong, and US recessions have often been associated with downturns in world trade. The recession in the early 1980s in particular shows significant similarities with the current cycle, although the depth of the current trade downturn significantly exceeds that of the early 1980s. The impacts of the 1980s recession on world trade were particularly strong, with trade remaining below its pre-recession levels for the next four years, hence some further weakness in world trade for a period of time may be possible (Figure 9).

At the same time, the current episode has also been exceptional compared to previous global downturns [1975, 1982, 1991, 2001, 2009]. This is evidenced by the unprecedented rates of decline in both world GDP and world trade. Moreover, the global trade openness ratio (i.e. trade/GDP) has fallen by far more than in previous downturns, indicating that trade has been hit more heavily than total activity (Figure 10).

Figure 9: Developments in world trade volumes during U.S. recessions
(Index, Q0=100; quarterly data)



Source: IMF, CPB and ECB staff calculations.

Note: Quarter "0" refers to the start of the US recession (2007Q4). Average is based on US recessions since 1957.

Figure 10: Trade during global downturns (% change)

	1975	1982	1991	2001	2009F
World GDP	1.9	0.7	1.0	1.5	-2.5
World trade*	-7.6	-2.3	0.0	-3.2	-18.5
Openness ratio*	-2.8	-4.3	-3.2	-4.5	-13.7

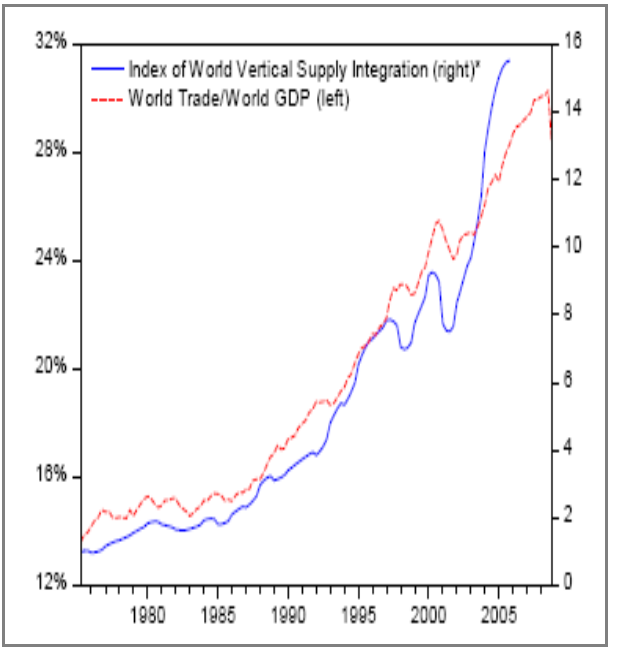
Source: European Commission.

Note: (*) Percentage change from peak quarter to trough quarter.

Structural changes related to globalisation have made trade more responsive to demand fluctuations. The pace of world trade expansion since the beginning of the 2000s corresponds to an acceleration in globalisation trends, with fewer barriers to international transactions, rapidly spreading information technology and the emergence of large players in the world economy (e.g. China). World trade was also partly fuelled by 'overconsumption' by US households, as a result of increasing private indebtedness. In parallel, economic integration at the regional level has also strengthened, particularly in Europe, with the increasing integration

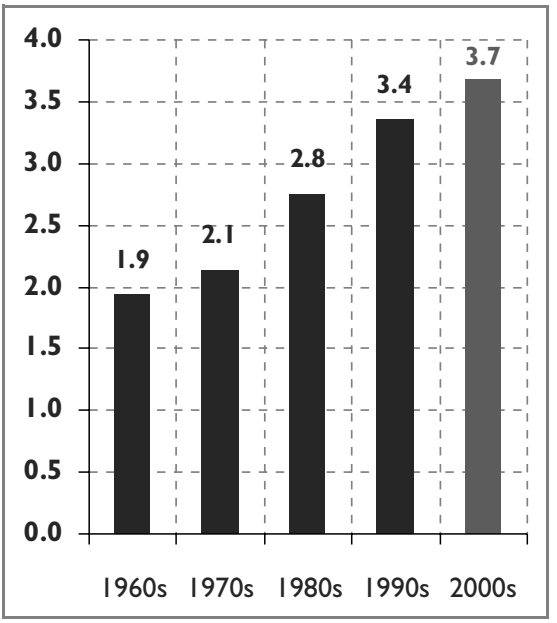
of Central and Eastern European economies after their accession in the EU in 2004. Finally, the most recent period also features important changes in production processes, which have been internationalised to a great extent. The globalisation of production processes, facilitated by an overall reduction in trade barriers and transportation costs, has led to considerable growth in vertical supply integration – ie, the use of imported inputs in the production of exports – over recent decades, which is estimated to account for about one-third of total trade growth over the last 20 to 30 years (Hummels *et al.*, 2001). This implies that goods are now manufactured via complex international networks, with the export of a single product requiring numerous intermediate stages of production involving the product in many crossings of international borders, with each stage counted as both an import and export. Interestingly, the recent fall in trade was stronger for countries that have rapidly growing, or higher proportions, of vertical specialisation (Miroudot and Ragoussis, 2009), indicating that the increase in vertical supply integration may have indeed acted as an additional amplification and propagation mechanism for the trade collapse. Figure 11 illustrates that the share of world trade in world income has evolved roughly in line with an index of vertical integration, as measured in Amador and Cabral (2009).

Figure 11: Trade openness and index of vertical integration (lhs: percentage; rhs: index, 1975=1)



Source: OECD (2009), Amador and Cabral (2009).

Figure 12: Elasticity of world trade to world income



Source: Freund (2009).

Freund (2009) using annual data also shows the gradual increase in the elasticity of trade to income over a longer sample period (Figure 12). While, overall in the 1961-2006 period, the elasticity is around 1.8, it has increased in the latter part of the period (2000-2006) to 3.7. However, as shown by Freund (2009), trade tends to respond differently to income during a global downturn. While real GDP growth declines on average by 1.5 percentage points from the previous year, real trade declines by 7.2 percentage points on average, i.e. 5 times as much[5].

5.4. MODEL-BASED REASSESSMENT OF THE RECENT EPISODE

Against the background of a large role for the trade channel in the ongoing crisis, the question still remains regarding the role of financial variables as source of shock as well as channel of international transmission. Using the previously detailed methodologies we examine whether looking at financial variables could have helped detect the i) first signs of the recession, ii) its depth and iii) its possibly close end. Following up on the work of Espinoza *et al.*, (2009), the three developments are evaluated by looking at forecasts produced at different quarters, i.e. between 2008Q2 and 2009Q4, by 2 VAR models whose variables are, respec-

[5] Freund (2009) bases this computation on 4 global downturns: 1975, 1982, 1991, and 2001.

tively: i) the US, the euro area and the Rest of the World GDP, ii) these three GDP plus the stock market indices and the stock market volatilities[6].

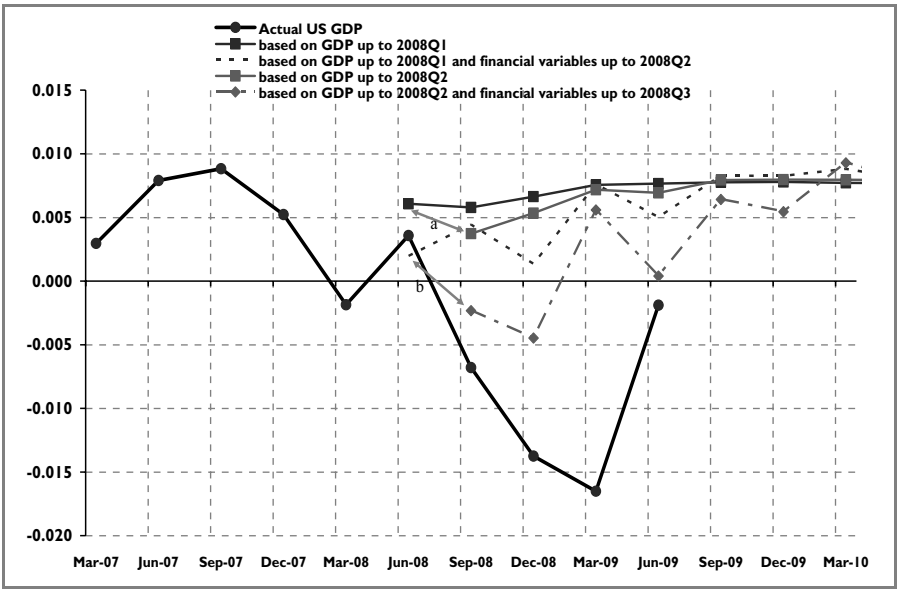
The estimation of the 2 VAR models is carried out for all the quarters between 2008Q2 and 2009Q4 (the last date for which GDP is available being 2009Q3), with data going back to 1970Q1. In each quarter various forecasts are generated: i) traditional GDP forecasts for the subsequent 12 quarters based on GDP information up to t-1 (the previous quarter), ii) conditional forecasts of the GDP based on GDP information up to quarter t-1 (the previous quarter) as well as on the current quarter values of the financial variables.

5.4.1. Detecting the US recession and its depth

The first exercise aims at assessing whether financial variables would have helped detect the recession in the United States standing in the second and third quarters of 2008 (i.e. before it was officially announced by the NBER, in December 2008). Figure 13 reports the actual growth rates of the US GDP together with its forecasts made in such two quarters based both on past GDPs alone (whose information was limited to, respectively, the first and the second quarter of 2008) as well as on GDP considered together with financial variables, which were instead known also for the actual quarters (i.e. 2008Q2 and 2008Q3). Comparing the two dark lines (forecasts made in 2008Q2, GDP known up to 2008Q1, financial variables known up to 2008Q2) and the two light lines (forecasts made in 2008Q3, GDP known up to 2008Q2, financial variables known up to 2008Q3) shows that some indications about the forthcoming slowdown in activity would have been achieved, although the extent of the output contraction in the last quarter of 2008 as well in the first quarter of 2009 would have been by and large missed.

[6] All VAR models are estimated on quarterly data starting in 1970Q1. The last available observation refers to 2009Q3 for GDP and to 2009Q4 for financial variables. The Rest of the World is an aggregation of seven small countries, different one another (Australia, Canada, Denmark, New Zealand, Norway, Sweden, Switzerland). The stock market indices are broad indices taken from Global Financial Indicators. The stock market volatility is a 4-quarter moving average of absolute stock market returns. Other types of financial variables have been employed in Espinoza *et al.* (2009), among which the Ted spread, the distance to default of a number of financial firms, C&I loans, all of them providing overall similar forecasting results.

Figure 13: US GDP forecasts made in 2008Q2 and 2008Q3 (q/o/q values)



Source: ECB staff calculations and Global Financial Data.

Note: the GDP forecasts based on 3 GDP come from a VAR model which includes the GDP of the United States, the euro area and the Rest of the World up to the previous quarter. The forecasts based on financial variables, i.e. the stock market level and its volatility, assume that such variables are known up to the current quarter (i.e. their values in 2008Q2 are known when the forecasts are made for 2008Q2). The arrow marked with 'a' highlights the revision in the US GDP forecast between 2008Q2 and 2008Q3 that came only from GDP developments between 2008Q1 and 2008Q2. The arrow marked with 'b' denotes instead the same GDP revision stemming from developments in GDP between 2008Q1 and 2008Q2 as well as in financial variables between 2008Q2 and 2008Q3.

5.4.2. Model-based forecasts and scenarios for the US and the euro area

The model detailed above is used as a simple forecasting tool. This exercise should not be seen as a proper forecasting exercise – as it relies only on GDP and financial variables – but more as a model-based assessment to quantify the sensitivity of a given forecast to different financial market conditions. First, a forecast for the US and euro area real GDP growth is derived from the VAR model using only GDP data up to the third quarter of 2009 (see light lines with circles in Figures 14a and 14b): it shows some rebound in growth in the United States relative to the previous quarter while activity in the euro area remains more subdued. It is worthwhile to note that both types of models predict that the rebound in US activity will be followed by some moderation into 2010. When information from financial market is included (lines with sqares based on financial variables

up to 2009Q3 and lines with triangles based on financial variables up to 2009Q4), the forecasts give a somewhat more positive picture, reflecting the financial market optimism in the second half of 2009. The lagging behaviour of the euro area growth relative to the United States occurs notwithstanding the positive effect which in principle should have been played by the recovery in financial markets in 2009. The latter effect may have been possibly dominated, within the model, by the historical strength of the lag existing between real developments in the two areas (Figure 14a and 14b).

Figure 14a: Model-based forecasts and scenarios: US GDP as of 2009Q4 (q/o/q values)

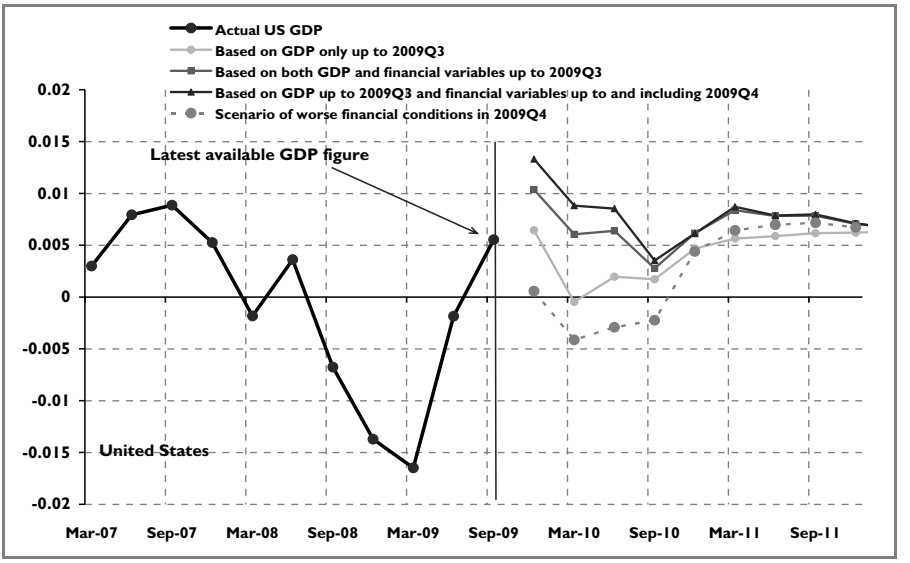
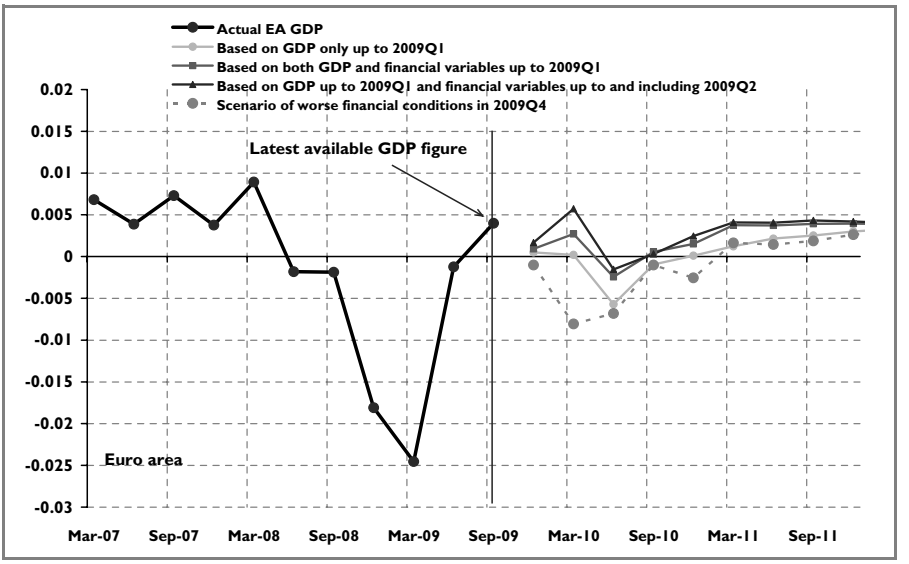


Figure 14b: Model-based forecasts and scenarios: euro area GDP as of 2009Q4 (q/o/q values)



Source: ECB staff calculations and Global Financial Data.

This framework allows also to gauge the importance of financial market conditions. Assuming for instance that in 2009Q4 the S&P500 index would have dropped by 20% while its volatility would have risen by 50%, real GDP growth in both the US and the euro area would have fallen into negative territory in 2010 (dotted lines). This is significant if one considers that the amount of deterioration included in the scenario would not have been particularly severe with respect to the extremes reached in the aftermath of Lehman's collapse.

5.5. CONCLUSIONS

The traditional analysis of the transmission of shocks views the trade channel as the main source of spillovers. This holds true historically particularly by taking care of third-country effects. Overall, the purely financial channel appears to be rather weak if one excludes the role of financial variables as early information on real developments. In particular, only in turbulent periods, financial variables would seem to contain additional power to anticipate business cycles.

The recent crisis has actually confirmed this. While the origin of the shock was financial in nature, related in particular to the mispricing of risk, 'mood' related variables – such as consumer and business confidence – played an immediate role in its transmission to the real economy through a collapse of demand across the globe. The reaction of financial variables reflected the uncertainty around the

further transmission of this demand contraction and has certainly played a role in magnifying global economic interactions. What remains more evident however was the drop in world trade which has acted as a potent spillover of recession across the globe. What remains still not fully explained is the reason why trade has collapsed. But this has marginally to do with financial channels – if one excludes some short-lived restrictions in trade financing. Most of the reasons of the trade collapse were real and related to a one-off sudden re-assessment of global demand prospects following a period of strong (and unsustainable) growth, which the financial system has helped accommodate, but has not necessarily caused.

Overall, the analysis of the financial crisis provided so far shows the difficulty to disentangle the various channels at play during this episode. As most results are based on partial analysis exercises, additional research is clearly needed to fully apprehend the role of financial variables in cyclical developments in general and during this episode in particular. At the policy level, it is also necessary to better understand why the financial system was so fragile during such a period of stress in order to make the global economy much more resilient.

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6. The Impact of the Global Recession in Europe – The Role of International Trade[1]

Catherine Keppel[2] *& Julia Wörz*[3]

Abstract

We assess empirically the marginal impact of export orientation for the severity of the growth downturn in 2009 while controlling for a host of country characteristics such as structural features, macroeconomic imbalances, previous growth record, and the like. We employ an iterative robust regression technique using a sample of 38 mostly European countries to quantify the direct contribution of trade to the crisis response with a special focus on Eastern European economies. We find that greater export orientation is related to a stronger growth downturn in our sample. This effect is only revealed when we allow for an interaction term between export orientation and domestic GDP structure. Moreover, we find strong evidence that the domestic structure of value added (in particular a high share of industry in GDP) has mitigated a country's vulnerability during the recent crisis. We further find support for the effects of overheating: previous high growth rates are systematically linked to a stronger growth downturn in all specifications. Finally, a negative influence from previously high debt ratios on the output response during the crisis is confirmed.

JEL-codes: F14, F15, O52

Keywords: trade collapse; industrial structure; Central, Eastern and Southeastern Europe

6.1. Introduction

Since the unfolding of the recent financial crisis, world exports and imports dropped dramatically. While global GDP has shrunk by -0.6% (according to the IMF World Economic Outlook 04/2010), world trade volume has fallen by -10.7% in 2009. The figures are similar for all major industrialized regions in the world and some emerging markets. Hence, trade has certainly been one of the most severely hit economic activities. The question arises to what extent this strong and immediate trade response has propagated the crisis throughout the globe in 2009 and to what extent trade openness has reinforced the impact of the crisis for individual countries.

[1] The authors thank Jarko Fidrmuc for helpful comments and suggestions.
[2] Vienna University of Economics and Business, Institute for Fiscal and Monetary Policy.
[3] Oesterreichische Nationalbank, Foreign Research Division.

In other words, the remarkably large drop in trade is central in the discussion on how a local financial crisis could turn into a global economic crisis. The academic discussion seems to agree that only the combination of a number of distinct shocks could have led to the sudden spread of the crisis and cause a global recession of this magnitude (see for example Escaith, 2009; McKibbin and Stoeckel, 2009; Rose and Spiegel, 2009, to name just a few). Starting from the bursting of the housing bubble in the US in mid 2007, households in the US experienced a sharp reduction in wealth which, coupled with changing perceptions of risk by households and businesses, implied a demand shock in the US. All else equal, this would have triggered two offsetting effects on the global economy: a shortfall in external demand for countries which are heavily dependent on the US market on the negative side and rising investment opportunities in those countries in response to low returns on investment in the US on the positive side (McKibbin and Stoeckel, 2009).

In the recent crisis the latter effect did not materialize, because the reappraisal of risks was just as global in scope as was the shortfall in demand. In particular, emerging markets which in theory could have profited from worsening investment conditions in the US (and other highly developed countries) were negatively affected by changing investor risk perceptions. Hence in the current crisis, the two effects reinforced instead of offsetting each other. In that way, international trade acted as a compounding factor not only transmitting but also magnifying the effects of the US crisis. All this has led to a worsening in investment climate, deteriorating credit conditions and falling domestic demand in particular for durable and investment goods.

But how important in quantitative terms was trade in the global transmission of the crisis? In this paper, we try to quantify this effect and argue that the direct contribution of trade to deepening the economic downturn should not be overstated. A significant negative growth impact from openness to trade can only be established when allowing for interactions between trade openness and the share of industry in total value added. Thus, the domestic output structure played a much more significant role for the impact of the crisis. Openness to trade was actually found to mitigate this negative impact for the countries specialized in the sectors which were hit most strongly in 2009 (investment goods, machinery and in particular transport equipment).

We start by summarizing the dramatic developments in world trade in 2009 in Section 6.2. Section 6.3. reviews the existing related literature and discusses the mechanisms of crisis transmission through trade. We identify basically three factors of theoretical importance in shaping the outcome of the crisis. Two demand-side explanations are related to the rising importance of global supply chains and structural differences between the domestic and external sector of the economy.

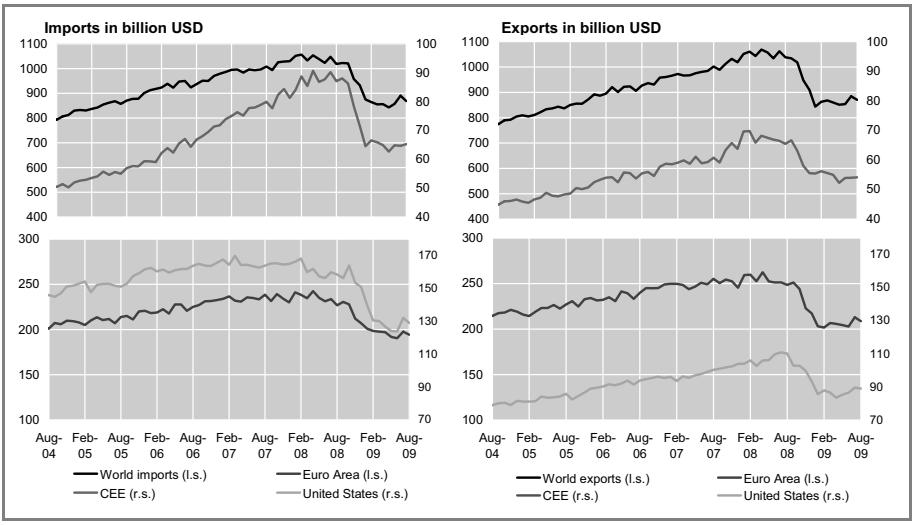
A supply-side explanation relates to problems in trade financing. Section 6.4. uses an econometric model to estimate the importance of trade, structural characteristics and financial uncertainties for the incidence of the crisis in a cross-section of 38 predominantly European countries. Section 6.5. concludes.

6.2. DEVELOPMENTS IN WORLD TRADE

The drop in international trade flows observed in early 2009 was unprecedented and largely unexpected. Figure 1 shows real growth of exports and imports for the world, the Euro Area, the United States, and for Central and Eastern Europe from August 2004 to August 2009. The decline in trade volumes started in May 2008 and lasted for roughly one year. By May 2009, global trade volume has dropped by almost 20% annually in real terms.

A similar picture emerges when looking at different world regions. US imports were down by 21%, Euro Area imports by 18%. Exports of both regions contracted by 20% and 19% respectively. For Central and Eastern Europe, the contraction in trade has been particularly strong. Exports from Central and Eastern European countries fell by 23%, while the region's imports contracted by as much as 28%.

Figure 1. Real Merchandise World Trade, Aug. 2004 – Aug. 2009



Source: CPB Trade Monitor.

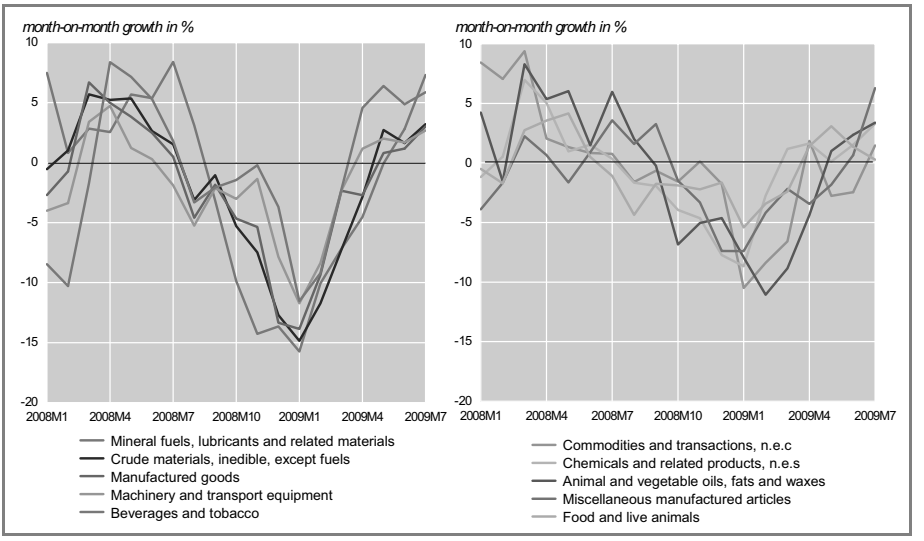
At the sectoral level, mineral fuels, crude materials, manufactured goods and machinery and transport equipment experienced the most severe drops in trade. Figure 2 displays three-month moving averages of import growth for different

sectors in OECD countries. OECD imports in these categories recorded dramatic declines between 11% and 15% month-on-month at the height of the trade collapse (from December 2008 to January 2009). In May 2009, when global trade volumes reached the trough, these categories were between 49% (mineral fuels) and 34% (machinery and transport equipment) below their previous levels in annual terms. However, these were also the categories which showed the strongest signs of recovery in mid-2009.

As mentioned above, trade growth started to decline in May 2008 and turned negative first in October 2008 when the collapse of Lehman and the consequent re-assessment of risks has added a second, decisive shock to the global economy in addition to the US-demand shock. The trough in trade growth was reached already in January 2009, positive import growth, however, was only reached again in July 2009.

Much of the nominal trade collapse depicted in Figure 2 is of course due to price effects, which becomes visible in the steep decline in OECD fuel imports shown in the second panel of figure 2. The weakness in US demand for mineral fuel may also have a supply-chain component since petroleum and natural gas are major inputs into chemicals and plastics, which are in turn intermediate inputs for many other industrial sectors (Ferrentino and Larsen 2009).

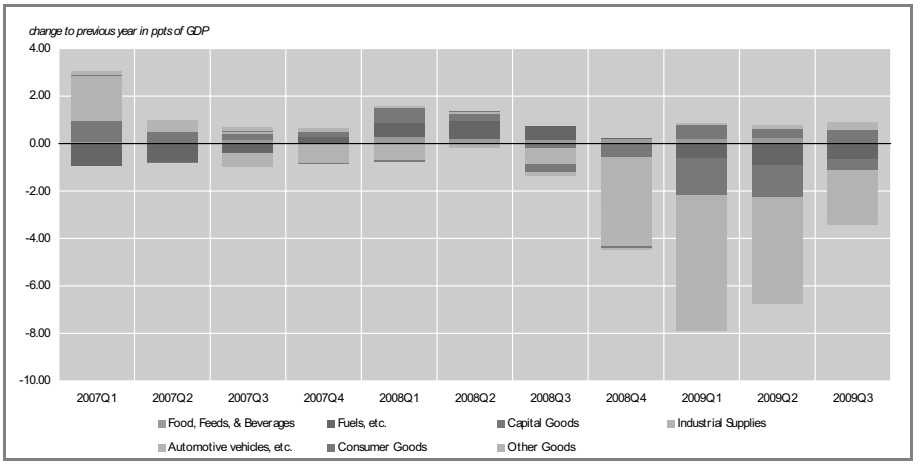
Figure 2. OECD Import growth by product categories, based on 3-month moving averages



Source: OECD.

The casual inspection of the data suggests that trade may have the potential to act as an important transmission channel in particular for countries heavily exposed to those manufactured exports experiencing the sharpest declines. For example, the Central, Eastern and Southeast European countries (CESEE) are strongly specialized in exports of machinery and transport equipment. Recent trade data for the CESEE EU member states reveal that indeed their exports of automobiles and related parts declined strongly already in the fourth quarter of 2008 and thus before most of these countries showed a GDP-reaction to the financial crisis. The initial drop was particularly strong in exports of automobiles and related parts, followed by a substantial reduction in capital goods exports in early 2009 (see Figure 3).

Figure 3. Absolute Change In Exports By End-Use Categories for CESEE EU Member States



Source: Eurostat.

By all standards, the trade developments in 2009 represented a dramatic shock for all export oriented countries throughout the world. In the next section, we will separate conceptually different mechanisms through which this external demand shock could be transmitted to domestic output shocks in individual countries.

6.3. THE ROLE OF TRADE IN CRISIS TRANSMISSION

The discussion in the literature on openness and vulnerability to shocks is not new, the findings may often seem, however, to be contradictory at first sight. For example, Cavallo and Frankel (2008) find robust evidence that – when controlling for endogeneity between trade and growth – openness to trade reduces the

vulnerability to crises. Edwards (2004) shows that trade integration can lead to fewer sudden stops in capital inflows. Martin and Rey (2006) find that emerging markets showing increased financial integration without increased trade openness are at higher risk to financial crises – since profits and dividends relate to output volatility.

The contrasting view, namely that trade propagates shocks, is presented inter alia very recently by Fidrmuc and Korhonen (2009) who point towards greater synchronisation of shocks in the presence of stronger trade ties. Their analysis is based on East Asian business cycles over the period 1990-2008. Haile and Pozo (2008) confirm this view with respect to currency crises. Both studies conclude that openness is one factor which renders a country prone to sudden stops of capital inflows. To summarize, countries that are more integrated are also more at risk to be affected by external shocks.

The apparent puzzle between the conflicting findings presented above is easily resolved when disentangling differences in the definition of a 'crisis' as being of either domestic or external origin. On the one hand, greater openness will have a positive impact when the crisis is of domestic origin. There is even evidence that openness can help to avoid domestic crises, for it spurs financial (Aizenman, 2008) and general regulatory, economic and legal reform (Cavallo and Frankel, 2008). On the other hand, greater openness by definition helps to propagate external shocks across countries which are highly integrated. This is also often considered to be an explanation why most crises remain regional in scope (Caramazza, Ricci and Salgado, 2000).

Assigning the centre of the current crisis to the housing bubble in the US, all other countries have been confronted with an external shock during 2007/2008. It is still unclear, to which extent this US-based crisis has then been transmitted by the financial channel as opposed to a real (i.e. trade) channel. Looking at currency crises, Caramazza *et al.* (2000) identify weak output growth and to a lesser extent external imbalances as important factors for the vulnerability of emerging and developing countries. Trade and financial linkages play a role only when coupled with weak current account balances. Also for industrial countries they find that fundamentals play an important role, however, their importance differs with unemployment playing a greater role here. Haile and Pozo (2008) also confirm these findings and stress the importance of fundamentals and highlight the possibility of contagion through the trade channel, when fundamentals are weak.

Basically, three rather distinct channels emerge, which could explain the fast propagation of the crisis across the globe. Two of these offer a demand-side explanation, while the third one works through supply shortages. All three channels imply also an indirect role for international trade in crisis transmission:

– rising importance of global value-chains;

– structural differences between domestic and external sector;
– problems in (trade) financing.

The first two channels imply that the demand contraction in the US is transmitted across trading partners with different intensity depending on structural characteristics of these countries. The third channel is qualitatively different and describes a supply shock, i.e. production outside the US is impeded due to deteriorating credit conditions.

6.3.1. Rising importance of global value-chains

The interconnectedness of modern production chains provides for the first channel. The US demand shock is transmitted via international trade, often within a firm but nevertheless across countries, through strongly integrated global supply chains, also referred to as 'fragmentation of production', outsourcing or offshoring. The elasticity of trade to changes in GDP has been explored by many empirical studies. While the literature provides different estimates depending on the model being used, there is a clear consensus that the elasticity of trade to GDP seems to have increased over recent years in response to the higher degree of vertical specialisation we see today. Irwin (2002) estimates the elasticity of real world trade to real world income to have increased from around 2 in the 1960s and 1970s to 3.4 in 1990. In a rather simple empirical framework, Freund (2009) finds this elasticity to be around 3.5 today. Yi (2008) and Tanaka (2009) also attribute the significant increase in the elasticity of trade to income to greater fragmentation of production. The high degree of vertical integration we see today would however imply that the countries which are similarly integrated in global value chains are hit to the same extent. However, this is not what we observed in practise.

Escaith (2009) attributes also a prominent role in the spreading of the 2008/09 crisis to trade effects. He argues that global production networks aggravated the downturn in the real sector because global supply chains involve a high degree of stock-building and hence financing. The drop in final demand and the drying up of credit markets consequently resulted in the aggravation of the initial effect in each link in the chain and thereby exacerbated the economic downturn. By the same logic, economic recovery should also work its way back the supply chain in a similar way.

However, increased vertical specialization and supply chains might be only part of the explanation for the strong trade reaction. As several authors point out (Francois and Woerz, 2009; Freund, 2009), a part of the unproportionally strong drop in trade is due to simple accounting reasons. Since GDP is a value added measure but trade data are measured on a gross value basis, any decline in GDP

necessarily triggers a relatively higher decline in trade. Double counting over countries adds to this.

Hence, the contribution to crisis-transmission by trade potentially remains considerably smaller than the observed volatility in trade flows. A large decline in trade could reflect a much smaller decline in global value added if production is done across countries at the margin and – as demand falls – international production chains break down. For example, Porsche in April announced that it is reducing production in Finland, but upholding German production (New York Times, 4 April 2009). Firms may tend to source relatively more from home country suppliers during times of crisis[4].

6.3.2. Structural differences between domestic and external sector

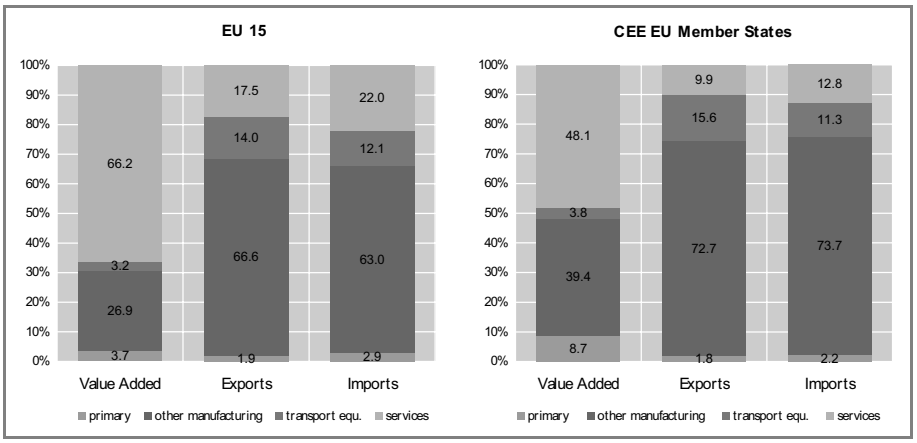
A second demand-side transmission channel via trade is to be found in structural differences between the domestic sector and the external sector of an economy. For developed countries, about 80% of trade is manufactures, while they constitute only 20% of domestic GDP. This structural argument offers an explanation for a different crisis-impact on countries depending on their specific trade and GDP structure. Thus, not only openness as such matters for a country's vulnerability to an external demand shock, but it is important whether the country is particularly exposed to those sectors which suffer the strongest decline in demand.

A casual inspection of available data underlines this argument. Figure 3 contrasts the differences in GDP versus trade structure for the EU25 (as of 2004). The left panel of figure 3 shows a weighted average for all EU members which acceded prior to 2004 (EU15), while the right hand side panel gives the same data for the Central and Eastern European countries which acceded in 2004 (CEE EU member states). The differences are striking. First of all, we see a clear distinction between the industrial structure of the external sector (exports and imports) and domestic value added in each region. The EU15 exhibit a typical structure for highly industrialized countries with 66% of domestic income generated by the service sector in 2005. The manufacturing sector accounted for 30% in domestic value added but as much as 80% of trade. The respective figures for the CEE EU member states' manufacturing sector were 43% and 89% respectively in 2005, the share of services in domestic value added was at 48%. Thus, the importance

[4] As a word of caution, there is the danger that protectionist policies kick in when global GDP drops sharply and this sharp drop is exacerbated through a decline in trade. However the same protectionist policies, while arriving too late to shield a country from the downturn may also impede the country to profit from the global upswing again. The Great Depression of the 1930s illustrated very impressively this policy mistake which has led to a prolonged period of recession. (see ALMUNIA *et al.*, 2009).

of manufacturing in trade is much greater than in domestic GDP for both regions, hence explaining the steep drop in trade during the peak of the crisis.

Figure 4. Structure of Value Added and Trade in 2005



Source: EUKLEMS database (Timmer et al. 2007).

This figure further illustrates a second important difference between the two regions: The catching-up economies of Central and Eastern Europe show a higher share of manufacturing not only in trade but also in domestic value added. A tenth of this is transport equipment, almost 4% of GDP and more than 15% of exports for the region as a whole. This share is however higher for the three largest economies in the region. According to recent Eurostat figures, exports of automobiles and related parts accounted for 22% in the Czech Republic, 21% in Hungary and almost 23% in Poland in 2008. Countries with high trade shares in industries and sectors that were hit especially hard in the crisis were strongly affected by the crisis as well. During the 2008/09 downturn, the manufacturing industries have been among the ones that have been hit the hardest. For Central and Eastern Europe, the automobile sector along with increased risk perceptions by international investors was particularly relevant for the deep impact of the crisis in 2009.

6.3.3. Problems in (trade) financing

Finally, financial crises may affect different sectors not only on the demand side but also through different financing needs. Iacovona and Zavacka (2009) show that sectors which are highly dependent on external financing suffer more from a banking crisis than other sectors. Auboin (2009) assigns an important role to problems with financing in general and hence also with trade finance concerning the trade collapse in the recent crisis. He stresses that credit for trade – while

holding up well compared to other forms of credit until autumn 2008 – was subject to a tremendous reassessment of risk and scarce liquidity in late 2008 as shown by the increase in spreads for credit for emerging and developing countries. This is in line with Chauffour and Farole (2009) who underline the role of trade finance in the recent trade collapse and give a number of reasons why trade finance declines particularly strongly during times of financial crises: First, markets may encounter difficulties in (re)assessing the associated risks, second, market participants face asymmetric information and increased risks of default, third, financial intermediaries have to respond to scarce liquidity and needs of recapitalization and finally, political factors might play a role as well. Furthermore, it might be more difficult to assert one's claims across borders during times of crisis. Alun (2009) emphasizes that trade is usually financed via short-term credit lines which are more easily cut back in times of crises. He shows that the simultaneous halt of capital inflows and banking crises significantly lowers imports in emerging economies.

6.4. QUANTIFYING THE IMPORTANCE OF TRADE FOR THE ECONOMIC DOWNTURN

In this section we try to quantify the direct contribution of trade to the crisis response with a special focus on Eastern European economies. We use regression analysis to assess empirically the marginal impact of export orientation on the severity of the growth downturn in 2009 while controlling for a host of country characteristics such as structural features, macroeconomic imbalances, previous growth record, etc. In particular, this allows us to shed some light on the relative importance of the two demand-side explanations given earlier and to assess empirically to which extent openness as such has implied an increased economic weakness during the crisis.

Our econometric model identifies how the vulnerability of individual countries to common shocks is determined by national characteristics of each country. Our approach is similar to Rose and Spiegel (2009) in two ways: First, as in Rose and Spiegel (2009) we undertake a cross-section analysis (determined by the uniqueness of the event) using iterative robust regression. Secondly, we also do not attempt to determine the timing or causes of the crisis, but the different impact of the crisis across countries. However, we depart in two important ways from the analysis by Rose and Spiegel (2009): First of all, while they incorporate changes in real GDP, the stock market, country credit ratings and exchange rates into a single measure of crisis incidence, we do not construct a latent variable. In contrast, we consider some of the components which they incorporate into their 'crisis measure' as determinants for the crisis response. We focus here on the output response to the crisis, thus our measure of the severity of the crisis is the downturn

in real GDP growth between the realized growth rate in 2007 and the projected growth rate in 2009. Second, we also apply a different timing for the causes and crisis-response than in Rose and Spiegel (2009). Although many countries already exhibited negative growth in the final quarter of 2008, most countries continued to grow throughout 2008. However, the majority of countries showed a real GDP decline in 2009. Further, in particular emerging countries and the countries in Central and Eastern Europe, which are of particular interest to us, entered into recession with a roughly 1 quarter delay compared to major industrial countries. Forecasts for 2010 are again somewhat brighter, even if the recovery may turn out to be unassertive. Hence, 2009 appears to be a good choice for the trough of the crisis. By the same reasoning, we calculate the full impact of the crisis as the absolute change in real growth between 2007, the last year before the crisis struck, and the real growth forecast for 2009 rather than the growth difference 2007-2008 as in Rose and Spiegel (2009).

6.4.1. Data description

In our model we relate the decline in output growth between 2007 and 2009 to a set of country specific characteristics relating to potential transmission channels and a range of other control variables. The dependent variable – the absolute decline in real GDP growth – is calculated as the absolute change in real GDP growth in 2007 and recent forecasts for 2009 (and 2010 for robustness checks). The latter are taken from IMF and Consensus Forecasts and date from November 2009. Thus, the growth downturn is measured in percentage points with high values indicating a strongly negative crisis response.

We identify a range of macroeconomic preconditions arising from the literature review in Section 3 and which may have played a role in determining the severity of the crisis across countries. The direct impact of openness or trade is captured by various trade ratios (exports to GDP ratio, intermediate or consumption goods as a share of total exports, exports to the EU as a share of total exports) whereby we concentrate on total exports to GDP in most specifications. Structural aspects are captured by the share of industry in total value added. We further control for a certain lack of investor confidence already prior to the crisis rather crudely through the change in nominal exchange rates or alternatively the change in CDS spreads between 2006 and 2008. This can also be interpreted as an indication of economic weakness (or perceptions thereof) before the full impact of the crisis stroke. Apart from these prime variables of interest, we also control for a range of alternative factors. Previous growth is included to control for effects from overheating. We further control for weak fundamentals by including external debt stocks in relation to GDP. Finally, we also include regional integration

dummies. A detailed description of the variables used is given in appendix table A1.

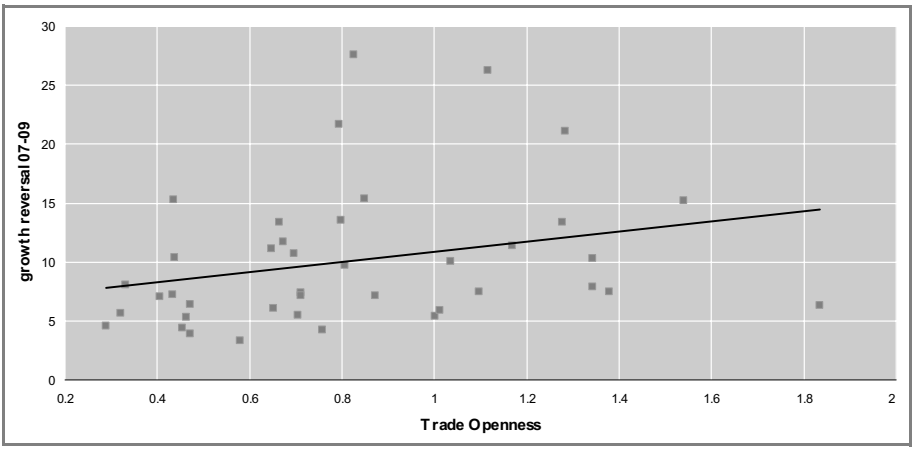
In order to minimize the number of missing observations and to even out short-term fluctuations on some variables, we calculate a three-year average for all explanatory variables over the period 2006-2008. This approach also avoids endogeneity problems, since all explanatory variables are lagged compared to the short-term reaction of GDP on changes in the external environment[5]. For the exchange rate and CDS spreads, we use the percentage change over the period 2006-2008 instead of average levels, since we want to capture strong revaluations and thus already existing vulnerabilities in these variables prior to the crisis, rather than relative standing of countries as reflecting a potential initial weaknesses[6].

We base our analysis on a sample consisting of 38 OECD and European countries (see appendix table A2). Our data comes from various sources. We combine data from the IMF International Financial Statistics and the World Bank's World Development Indicators with data from Eurostat, national sources and Datastream in order to obtain detailed information on trade structure and changes in risk perception. A first inspection of the data shows an apparent but rather weak positive relationship between the share of exports in GDP and the output response to the crisis. As mentioned before, our dependent variable is defined such that a large positive value implies a strong decline in GDP growth, hence in the figure below a positive correlation is interpreted as a reinforcing effect of trade openness on the crisis response.

[5] We also run two robustness checks replacing our dependent variable by the decline between 2008 and 2009 as well as 2007-2010. The results are presented in the appendix.

[6] It lies outside the framework of our empirical model to capture transmission channels, and in particular the financial channel, during the unfolding of the crisis, due to the simultaneity of events. The time period between the large and sudden re-assessments of risks in late 2008, leading to sharp increases in credit costs, and the outbreak of the crisis in individual countries is too short to be captured by the macro-economic data which we are using in our model.

Figure 5. Crisis Response in 2009 and Trade Openness 2006-2008



Sources: Authors' Calculations based on Eurostat, UN, IMF, Consensus Economics.

6.4.2. The econometric model

Our econometric model is rather simple and the basic specification is summarized in equation 1.

$$y_i = \alpha + \beta_1 xratio_i + \beta_2 vad\_ind_i + \beta_3 er_i + \beta_4 avgrowth_i + \beta_5 debt_i + \varepsilon_i$$

In earlier versions of the model, we included a range of additional control variables. Since they all turned out to be insignificant and were without impact on the remaining variables in the model, we dropped them in view of severe degree of freedom constraints in the small sample. The following variables were additionally used in earlier specifications: Macroeconomic imbalances were captured by the current account (and trade) balance as a ratio of GDP. The magnitude of domestic demand, which may influence the effect of external demand as transmitted through trade, was proxied for by country size in terms of GDP and population. We also constructed a measure of domestic demand as domestic consumption plus imports minus exports. From the growth accounting framework we used gross fixed capital formation as a share of GDP. According to the convergence hypothesis, poorer countries experience faster growth. Hence, we also included per capita GDP at purchasing power parities in an initial specification. Finally, given the importance of global production chains and the lack of suitable data to capture outsourcing, we included the inward FDI stock as a ratio of GDP as well[7]. As

[7] We would like to emphasize that, although our original model might at first sight resemble the classical growth model, we are not trying to explain long-run determinants of economic growth here. Rather we want to identify stylized facts of the short-run output reaction to the crisis. Put differently, we identify the characteristics shared by countries prior to the outbreak of the crisis and which implied a particularly strong decline in output.

mentioned, all these factors were without influence on the growth downturn and on the remaining variables and were dropped in the final specification.

We use iteratively re-weighted least squares to eliminate the influence of outliers and to deal with the violation of fundamental assumptions in the empirical model related to our small sample size[8]. This uses a Maximum-Likelihood estimator, whereby in a preliminary step, possible influential outliers are detected and assessed based on Cook's (1977) distance statistic. Two types of iterations are performed subsequently whereby observations are weighted such that influential outliers obtain lower weights. First, Huber (1981) iterations are performed, attaching non-zero weights to all observations. In the next step, up to 1000 bi-weight iterations are applied, whereby all cases with residuals are down weighted and cases with large residuals obtain zero weight. In most cases, convergence occurred relatively fast after about 20 iterations in total. This sequencing ensures fast convergence (from the Huber iterations) while also minimizing problems with extreme outliers (due to the bi-weight iterations) (Yaffee 2002).

6.4.3. A Weak Case for Strong Trade Effects

Table 1 shows the results of our regression and compares the importance of the three main variables of interest: trade openness (to proxy for the importance of increased integration of production) as measured by the export to GDP ratio (*xratio*), differences in domestic structure of value added measured by the share of industry in total value added (*vad_ind*), and potential macroeconomic weaknesses prior to the crisis as captured by strong devaluations of the currency (*er*). We find no evidence for a significant direct effect of increased export orientation on the GDP downturn in the short run. However, we find rather strong evidence for the structural-difference hypothesis in terms of both, statistical and economic significance. Those countries with a higher share of industry in domestic value added are hit considerably stronger by the crisis. The growth downturn for countries with a 1% greater share of industry in domestic GDP is predicted to be increased by roughly 0.4 pps. This would imply for example that the Slovak Republic, with 40% of total value added generated in the industrial sector, would have seen a drop in real GDP by 6.8 pps beyond the drop recorded in the UK, where industry accounts for only 23% of GDP. These 6.8 pps difference, which is explained solely by structural differences between the two economies, is in fact rather close to the observed difference of 8 pps (-15 pps in the Slovak Republic versus -7 pps growth downturn in the UK). Finally, we also find no significant direct effect from strong exchange rate fluctuations of the currency – reflecting less stable macroeconomic conditions – prior to the crisis on the severity of the

[8] This form of estimation is implemented in Stata through the command 'rreg'.

growth downturn. Along the same line, we also do not see a significant effect in either direction from participating in a fixed currency arrangement (a point which we turn to in section 4.4).

Table 1: Determinants of the Growth Downturn in 2009

Variable	(1)	(2)	(3)	(4)	(5)
xratio	-0.003	0.019			0.216 **
	0.89	*0.47*			*0.03*
vad_ind	0.427 ***		0.354 ***		0.705 ***
	0.00		*0.00*		*0.00*
er	0.074			-0.034	0.107
	0.20			*0.62*	*0.34*
avgrowth	0.511 ***	0.830 ***	0.487 ***	0.872 ***	0.652 ***
	0.01	*0.00*	*0.01*	*0.00*	*0.00*
debt	0.002 ***	0.001	0.002 ***	0.001	0.002 ***
	0.00	*0.56*	*0.01*	*0.48*	*0.01*
xratio*vad_ind					-0.009 **
					0.02
xratio*er					-0.004 *
					0.09
constant	-5.721 ***	4.953 ***	-3.644 *	5.510 ***	-13.000 ***
	0.01	0.00	0.08	0.00	0.01
N	38	38	38	38	38
R^2	0.69	0.32	0.60	0.37	0.71
F	14.0 ***	5.4 ***	17.3 ***	6.7 ***	10.7 ***
Prob > F	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*

*Note: The dependent variable is the percentage point change in real GDP growth between 2007 and the projected growth rate for 2009; p-values are reported below each coefficient; *(**)[***] indicate significance at the 10% (5%) [1%] level or below.*

Columns 2-4 in table 1 show that our main variables of interest are robust to in- or exclusion of the remaining two variables. Nevertheless, we further tested for possible multiplicative relationships between export orientation and the remaining two main variables of interest. Controlling for interactions between the export ratio and the weight of industry in GDP in column (5) brings out more clearly the importance of either factor in aggravating the growth downturn, while at the same time the two factors jointly seemed to have ameliorated the situation. Put differently, greater export orientation has helped to soften the adverse effects arising from the dominance of the industrial sector which was hit particularly strongly in the crisis. However, this dampening effect is very limited in scope, given the statistically significant (at the 2% level), but economically rather small coefficient on the first interaction term. The second interaction between the export ratio and exchange rate developments also shows a similar, economically small and statistically only weakly significant, dampening impact on the growth downturn[9].

[9] We also included in a different specification the interaction term between the exchange rate and the industry share in GDP, which turned out to be insignificant and without impact on the results.

Let us now turn to the remaining control variables in our model. There is clear evidence for the overheating-hypothesis: countries with a previous fast growth performance (*avgrowth*) showed a significantly greater contraction in GDP during the crisis. This effect is highly significant and robust across different specifications. The coefficient of 0.65 implies that countries which on average grew by 1 pp more over the period 2006-2008 experienced a decline in GDP growth of 0.65 pps beyond the average in the period 2007-2009. Finally, also the debt to GDP ratio (*debt*) emerges as a robust and significant determinant of the growth reaction to the crisis in the sense that starting from a higher debt ratio has clearly added to a country's vulnerability in 2009.

The results are more or less robust to using an alternative timing for the calculation of the growth downturn (see appendix table A3). In particular our results are not sensitive to measuring the growth downturn by the change in GDP growth rates between 2008-2009 rather than 2007-2009. The same factors emerge as being relevant, apart from the debt to GDP ratio, which looses its significance in the very short term. On the other hand, strong currency depreciation just prior to the outbreak of the crisis seemed to have intensified the growth downturn in the short run. The coefficient of roughly 0.2 in the appendix table implies that a 1% greater depreciation over the 2006-2008 period translates into a 0.2 pp further decrease in real GDP on average in the very short-run (2008-2009). This may reflect less investor confidence in countries with rather volatile exchange rate developments already before the crisis as well as the fact that strong devaluations before the crisis may have limited the scope for further devaluation during the crisis, which have improved nominal competitiveness in the short run.

In this context, it is interesting to see some qualitative differences arising when looking at the medium-term growth response. The last column of appendix table A3 uses the change in real GDP growth between 2007 and the forecast for 2010 as the dependent variable. Neither the export ratio, nor the share of industry in GDP or any of the interaction terms between the two show a significant effect here. In contrast, now strong currency devaluation seems to have smoothed the GDP contraction. This implies that in the medium term, depreciation and hence improvements in nominal competitiveness have helped to bolster the impact of the crisis on GDP. However, one should bear in mind that the dependent variable in this last specification in the appendix is subject to considerable uncertainty, since the 2010 forecasts rely on information up until September 2009 plus on certain external assumptions. Therefore, we decided to focus on the more short term output response using forecasts for 2009 only which are already based on data for the first three quarters of 2009.

Table 2: Controlling for Different Regions

Variable	EU-27	EU-10	BAL	CEE
xratio	0.198 **	0.204 **	0.218 **	0.206 **
	0.05	*0.04*	*0.02*	*0.04*
vad_ind	0.680 ***	0.690 ***	0.727 ***	0.691 ***
	0.00	*0.00*	*0.00*	*0.00*
er	0.123	0.083	0.099	0.104
	0.28	*0.45*	*0.32*	*0.34*
avgrowth	0.674 ***	0.723 ***	0.744 ***	0.600 ***
	0.00	*0.00*	*0.00*	*0.01*
debt	0.002 ***	0.006 **	0.006 **	0.006 **
	0.01	*0.05*	*0.03*	*0.04*
xratio*vad_ind	-0.008 **	-0.009 **	-0.009 ***	-0.009 **
	0.03	*0.02*	*0.01*	*0.02*
xratio*er	-0.004	-0.004	-0.005 **	-0.004 *
	0.11	*0.15*	*0.05*	*0.09*
EU	0.591			
	0.51			
EU10		0.845		
		0.39		
BAL			14.441 ***	
			0.00	
CEE				1.188
				0.27
constant	-13.000 ***	-13.000 ***	-14.000 ***	-13.000 ***
	0.01	*0.00*	*0.00*	*0.00*
N	38	37	37	37
R^2	0.72	0.74	0.90	0.74
F	9.1 ***	9.9 ***	30.6 ***	9.9 ***
Prob > F	*0.00*	*0.00*	*0.00*	*0.00*

*Note: The dependent variable is the percentage point change in real GDP growth between 2007 and the projected growth rate for 2009; p-values are reported below each coefficient; *(**)[***] indicate significance at the 10% (5%) [1%] level or below; see appendix table A1 for explanation of regional dummies.*

Controlling for regional integration clubs (table 2) does not alter the results of our baseline model (last column in table 1). Controlling for membership in the EU or the effect of being located in Eastern Europe, brings out the effect of most factors more clearly: the coefficients on domestic economic structure, previous growth and debt ratios all increase marginally. This is particularly true when we include a dummy for the three Baltic states, which showed by far the worst growth performance, or in the framework of our model: the largest crisis response.

6.4.4. Robustness of the Results

Finally, we performed a series of robustness checks, using alternative measures to capture the effect of financial weakness and trade. We continue to include the dummy for the Baltic states given their extremely bad growth performance in 2009, which seems to be largely unrelated to the explanatory variables in our

model[10]. In the first column in table 3 we use the growth in CDS spreads (in percent) to control for early indication of financial trouble instead of changes in the exchange rate. The results suggest that the reappraisal of risks has had a decisive influence for the impact of the crisis, amounting to half a pp of additional loss in GDP growth following a one percent stronger rise in CDS spreads. In columns 2 and 3 we alternatively use a dummy variable for Euro area members and fixed exchange rate regimes instead of exchange rate movements. The results are again robust, however the exchange rate dummies themselves are not statistically significant. Thus, we cannot identify any effect (neither negative nor positive) from being a member of the euro zone or having a fixed exchange rate regime.

In the last three columns of table 3, we add different measures of trade structure to our model. In column 4 we include the share of consumer goods in total exports, while columns 5 and 6 use the share of intermediate goods and goods shipped to the EU instead. The results are again highly robust when controlling for sectoral and regional trade structure in addition to openness to trade as in our baseline specification. One new result emerges with respect to the commodity structure of trade: A large share of consumption goods in total exports seemed to have had a cushioning effect during the crisis. Contrary to our expectations, there is no evidence for a significantly negative influence arising from global production chains given that the coefficient on the intermediate goods share fails to be significant. Finally, export orientation to the EU also had no systematic effect for the growth downturn.

To summarize, the sensitivity checks show that our results are rather robust to alternative specifications concerning the financial channel and to refining the trade channel. Domestic output structure appears as one of the strongest and quantitatively speaking most important determinant of a country's vulnerability in the recent crisis. Further, we find strong evidence for an aggravating impact (in terms of subsequent output loss) from previous high growth rates (i.e. overheating). Finally, the negative influence from previously high debt ratios on the output response during the crisis is confirmed.

[10] The three Baltic countries show average values of export orientation, export structure and the share of industry in GDP. They all have a fixed exchange rate regime. Their previous growth performance was mixed, only Latvia showed very strong growth, coinciding with rather low debt ratio. The other two countries had elevated debt ratios. All three countries clearly stand out with respect to the increase in CDS spreads between 2006 and 2008.

Table 3: Alternative Financial and Trade Measures

	CDS	EURO	FIX-ER	Exp_int	Exp_cons	Exp_EU27
xratio	0.229 ***	0.059	0.032	0.163 *	0.188 **	0.216 **
	0.01	*0.47*	*0.64*	*0.08*	*0.02*	*0.02*
vad_ind	0.462 ***	0.476 ***	0.403 ***	0.646 ***	0.626 ***	0.697 ***
	0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
er				0.113	0.033	0.062
				0.27	*0.72*	*0.58*
avgrowth	0.712 ***	0.797 ***	0.871 ***	0.676 ***	0.816 ***	0.774 ***
	0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
debt	-0.008	0.005 *	0.006 **	0.005 ***	0.007 ***	0.006 ***
	0.13	*0.06*	*0.02*	*0.04*	*0.00*	*0.02*
exports*vad_ind	-0.009 ***	-0.003	-0.002	-0.007 **	-0.008 ***	-0.009 ***
	0.00	*0.36*	*0.50*	*0.04*	*0.01*	*0.01*
exports*financial [1)]	-0.015 ***	-0.044	-0.077	-0.004 *	-0.004 *	-0.004 *
	0.01	*0.55*	*0.18*	*0.08*	*0.04*	*0.07*
BAL	16.55 ***	13.48 ***	14.25 ***	14.367 ***	15.136 ***	14.410 ***
	0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
cds	0.505 ***					
	0.00					
EURO		1.017				
		0.67				
FIX-ER			1.683			
			0.36			
exp-int				0.054		
				0.17		
exp-cons					-0.066 *	
					0.07	
exp-eu27						-0.019
						0.50
constant	-5.378	-7.333 **	-5.372 *	-14.000 ***	-9.448 ***	-12.000 ***
	0.12	*0.05*	*0.10*	*0.00*	*0.02*	*0.01*
N	36	37	37	37	37	37
R^2	0.93	0.90	0.92	0.90	0.92	0.90
F	42.6 ***	30.5 ***	40.1 ***	26.6 ***	36.1 ***	27.3 ***
Prob > F	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*

*Note: The dependent variable is the percentage point change in real GDP growth between 2007 and the projected growth rate for 2009; p-values are reported below each coefficient; *(**)[***] indicate significance at the 10% (5%) [1%] level or below.*

[1)] The interactions terms are built with the respective variables for financial factors used in each specification and thus vary across columns.

6.5. CONCLUSIONS

World trade has reacted strongly to the global recession. Several reasons explain the particularly strong response of trade to the decline in GDP. Besides accounting and price effects, increased vertical specialisation and global supply chains boosted the drop of trade figures in the aftermath of the financial crisis. While on the one side the decline in GDP had an impact on imports and exports worldwide, the collapse of trade on the other side may also have aggravated the decline in growth and helped to spread the crisis quickly and profoundly across regions. Due to sudden and severe financing constraints demand dropped steeply in particular for durable consumption and investment goods, thus causing a recession

which fell hard on manufacturing and within the manufacturing sector on intermediate goods. This in turn affected the functioning of global supply chains, making a role for international trade as a transmission channel of the crisis. As a consequence, regions which specialized in these industries were hit particularly hard during the crisis.

In this paper we present some empirical evidence to verify the above line of argument and to quantitatively assess the importance of different factors for the impact of the crisis within a predominantly European context. We focus on a sample of 38 countries, consisting of EU members, advanced OECD members and a number of Eastern and South-Eastern European countries. We employ robust regression techniques in the cross-section (owing to the uniqueness of the event) to quantify the effect of trade openness on the reversal of GDP growth, thereby controlling for a range of additional determinants such as structural features of the economies, exchange rate developments, previous growth performance and external debt ratios to account for macroeconomic imbalances at large. Thus, we do not attempt to determine the timing or causes of the crisis. Our econometric model rather identifies how the vulnerability of individual countries to the common shock occurring in late 2008 is determined by national characteristics of each country.

Our analysis suggests that greater export orientation is related to a stronger growth downturn in our sample but the effect is only revealed when allowing for interaction terms between the export ratio and the structure of GDP. In quantitative terms, the marginal effect of export openness is non-negligible but still considerably lower than the impact of domestic economic structure on the growth reversal. In contrast to the conditional findings for openness, we find quite convincing evidence that the domestic structure of value added matters strongly for a country's vulnerability during the recent crisis. Those countries with a higher share of domestic value added in the industrial sector as opposed to more service-based economies were suffering more severe GDP shortfalls. While the predominance of the industrial sector for a country's output response in the crisis is independent of other characteristics of the economy, the trade effect only materializes when interacted with structural characteristics of the economy. It should be noted that our results, while pointing towards a generally greater crisis response in more open economies, also point towards a non-linearity in the relationship between trade openness and crisis impact. For countries with an equal exposure to the industrial sector, and hence an equal vulnerability arising from their domestic output structure, greater openness actually implied a mitigation of the adverse demand effects in 2009. Hence, only the combination of different characteristics allow us to explain regional differences in the impact of the crisis.

Another highly robust result gives support to the overheating hypothesis: previous high growth rates are systematically linked to a stronger growth downturn in all specifications. Further, a negative influence from previously high debt ratios on the output response during the crisis is confirmed reflecting increased vulnerability from the fiscal side. Our results can be reconciled with the view that a higher level of indebtedness prior to the crisis – besides impairing financing conditions for the respective country – implied severe limitations to the room for necessary counter-cyclical measures during the crisis.

Sensitivity checks show that our results are rather robust and in particular do not depend on the geographical composition of trading partners and only to a limited extent on the sectoral composition of trade. Countries which are specialized in consumption goods suffered relatively weaker declines in output growth, while a specialization on intermediate goods failed to yield a statistically significant result. The results further do not depend on alternative measures of exchange rate or country risk. All these robustness checks suggest that openness to trade has amplified the negative impact of the crisis, however the case for a strong role for trade as such in aggravating the crisis remains limited.

The robust correlation between the importance of industry and manufacturing and the severity of the crisis response raises of course another, highly policy relevant question: Did the crisis reveal a fundamental structural change, or in other words: Are the industries which suffered the strongest declines in the recent crisis going to recover or will they loose importance in the near future? This would of course call for a completely different set of long-term, structural policy responses, rather than short-term interventions in the reaction to the crisis.

Finally, since we find only weak evidence that openness to trade has reinforced the impact of the crisis on the growth performance in the short-run, it remains an open question by how much trade is able to spur growth in the upswing. In the presence of global supply chains, open borders are of course an important prerequisite to guarantee the functioning of economic activity and to assure a prosperous development in all countries. However, hopes that trade will pull the world out of recession may be unwarranted as long as credit markets are not fully functioning and global demand for goods continues to remain below average.

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APPENDIX

Appendix Table A1: List of Variables and Data Sources

Variable name	Description	Source
dependent variable		
gdp0709	Absolute difference in real GDP growth 2007 to real GDP growth forecasts for 2009, in pp	Eurostat/ Consensus Economics
gdp0809	Absolute difference in real GDP growth 2008 compared to real GDP growth forecasts for 2009, in pp	
gdp0710	Absolute difference in real GDP growth 2007 compared to real GDP growth forecasts for 2010, in pp	Eurostat/ Consensus Economics
trade factors		
xratio	Exports of goods and services (% of GDP)	World Development Indicators
exp_cons	Export share of consumption goods plus motor spirit and passenger motor cars (in % of total exports)	Eurostat/ IMF
exp_eu27	Export share to EU-27 (in % of total exports)	Eurostat/ IMF
exp_int	Export share of intermediate goods (in % of total exports)	Eurostat/ IMF
structural factors		
vad_ind	Industry, value added (% of GDP)	World Development Indicators
financial factors		
cds[1]	5 year Credit Default Swaps	Datastream
er[2]	Nominal exchange rate versus Euro	Eurostat/ IMF
additional control variables		
avgrowth	Average real GDP growth 2006-2008	Eurostat/ IMF
debt	External debt, incl. intercompany loans (% of GDP)	Eurostat/ IMF
regional dummies		
BAL	Dummy variable for Estonia, Latvia, Lithuania	
CEE	Dummy variable for Albania, Bosnia and Herzegovina, Bulgaria, Belarus, Czech Republic, Estonia, Croatia, Hungary, Lithuania, Latvia, Montenegro, Macedonia, Poland, Romania, Serbia, Russia, Slovenia, Slovakia, Ukraine	
EU	Dummy variable for the EU-27 countries	
EU10	Dummy variable for Poland, Slovakia, Slovenia, Czech Republic, Hungary, Estonia, Latvia, Lithuania, Bulgaria, Romania	
FIX-ER	Dummy variable for countries with fixed exchange rates (Austria, Belgium, Bulgaria, Bosnia and Herzegovina, Cyprus, Germany, Estonia, Spain, Finland, France, Greece, Ireland, Italy, Luxembourg, Lithuania, Latvia, Macedonia, Malta, Montenegro, The Netherlands, Portugal, Slovakia, Slovenia)	
EURO	Dummy variable for Euro Area 16	

Note: All control variables represent averages over the period 2006-2008, except of the exchange rate and CDS, where the growth rate between 2006 and 2008 was used.

[1] Growth of CDS spreads between 2006 and 2008; data on 5y CDS spreads were not available for Albania, Bosnia and Herzegovina, Belarus, Switzerland, Macedonia, Norway, and the United Stated, for these countries, CDS spreads were assumed to equal zero.

[2] Growth of the nominal exchange rate of national currency vis-à-vis the euro between 2006 and 2008, a positive number indicates a depreciation of the national currency vis-à-vis the euro.

Appendix Table A2: List of Countries

Albania	Greece	Romania
Austria	Hungary	Russia
Belarus	Ireland	Serbia
Belgium	Italy	Slovak Republic
Bosnia and Herzegovina	Japan	Slovenia
Bulgaria	Latvia	Spain
Croatia	Lithuania	Sweden
Czech Republic	Luxembourg	Switzerland
Denmark	Macedonia	Turkey
Estonia	Netherlands	Ukraine
Finland	Norway	United Kingdom
France	Poland	United States
Germany	Portugal	

Appendix Table A3: Sensitivity of results to differences in the timing of measured growth downturn

Variable	2007-2009		2008-2009		2007-2010	
xratio	0.216	**	0.237	**	-0.054	
	0.03		*0.02*		*0.34*	
vad_ind	0.705	***	0.524	***	0.073	
	0.00		*0.00*		*0.43*	
er	0.107		0.196	*	-0.114	*
	0.34		*0.09*		*0.08*	
xratio*vad_ind	*0.65*	***	*0.88*	***	*0.81*	***
	0.00		*0.00*		*0.00*	
xratio*er	0.00	***	0.00		0.01	***
	0.01		*0.21*		*0.00*	
avgrowth	-0.009	**	-0.008	**	0.002	
	0.02		*0.03*		*0.42*	
debt	-0.004	*	-0.002		0.002	
	0.09		*0.39*		*0.19*	
constant	-13.000	***	-11.000	***	-1.942	
	0.01		*0.01*		*0.44*	
N	38		37		37	
R^2	0.71		0.75		0.83	
F	10.7	***	12.4	***	20.4	***
Prob > F	*0.00*		*0.00*		*0.00*	

*Note: The dependent variable is the percentage point change in real GDP growth; p-values are reported below each coefficient; *(**)[***] indicate significance at the 10% (5%) [1%] level or below.*

7. The fault lines in cross-border banking: lessons from the Icelandic case

Már Gudmundsson & Thorsteinn Thorgeirsson[1]

Early in October 2008, nearly nine-tenths of Iceland's banking system collapsed when its three large cross-border banks failed. This article examines a particular aspect of this episode and places it in the context of the run on cross-border banking operations in the wake of the collapse of Lehman Brothers in September 2008. The main focus of this article is therefore on the risks associated with the foreign currency exposures in cross-border banking, both currency mismatches and maturity mismatches in terms of foreign currency. The purpose is to draw lessons from the Icelandic experience in this regard and to determine whether major proposals to reform the framework for cross-border banking, both globally and at the European level, measure up to that experience.

One point should be stressed at the outset in order to avoid a false impression. Foreign currency maturity mismatches, not backed by a lender of last resort (LOLR) were a key vulnerability that contributed to the demise of the Icelandic cross-border banks in the conditions that arose in the autumn of 2008. However, this is only one of many causes of their collapse. The story is complex and ongoing research is revealing that there was an underlying solvency issue, as was likely the case in many other countries affected most severely by the international banking crisis. There were also regulatory and supervisory failures, as well as serious deficiencies in the internal risk management of the banks themselves. The existence of large common exposures and interconnections in the system and flawed accounts increased the vulnerability of the banks. Furthermore, many of the metrics used to assess banks' strength failed. As a result, stress tests, by ignoring liquidity risk and interconnectedness, gave a misleading picture. Finally, the jury is still out on the role of fraud and market manipulation in the whole process. In this brief article, we focus only on a particular aspect of the story, the build up of currency liquidity risk and the run on cross-border banking. For the rest, we refer to an increasing number of studies of the financial crisis in Iceland[2].

[1] We would like to thank Tryggvi Palsson, Sigridur Logadottir, Ragnheidur Jonsdottir, Helga Gudmundsdottir, Gudrun Ogmundsdottir, Jonas Thordarson, Stefan Thor Sigtryggsson and Anna Benassi for their help and constructive comments. All remaining errors and omissions are ours.

[2] The Parliamentary Special Investigation Commission (2010) presented an extensive report to the Icelandic Parliament, in which the processes leading to the collapse of the three main banks are investigated and analysed. Several books have also been published on the financial crisis in Iceland to date, both in Icelandic and English. Publications in English include Boyes (2009), Jónsson (2009) and Thorvaldsson (2009). Mar Guðmundsson, Governor of the Central Bank of Iceland, gave a speech on the faults in cross-border banking at the FIBE meeting in Bergen on 7 January 2010. Ingimundur Fridriksson, former member of the Board of Governors of the Central Bank of Iceland, has also analysed important aspects of the crisis in two speeches. See also Central Bank of Iceland (2009).

This article is composed of three sections. The first sets the stage by giving the international background on foreign currency liquidity risk and the run on cross-border banking during the crisis. The second section presents the case of the Icelandic banks. The third section provides reflections on current proposals to reform the framework for cross-border banking in light of the Icelandic experience.

7.1. FOREIGN CURRENCY LIQUIDITY RISK AND THE RUN ON CROSS-BORDER BANKING

Cross-border banking grew significantly in the years prior to the financial crisis[3]. Attending this growth was a steady build-up of cross-currency liquidity risk. Such risk can take two forms: currency mismatches and maturity mismatches between foreign currency assets and liabilities. The former implies borrowing in one currency in order to finance assets in another. The second implies financing longer-term assets in a foreign currency with shorter-term liabilities in the same foreign currency. Such maturity mismatches are of course the bread and butter of banking; however, as is well known, there is an inherent risk involved if short-term liabilities are withdrawn or cannot be rolled over. It is the role of central banks to act as lenders of last resort when solvent banks face such a run on their domestic liabilities. It should be born in mind that these two risks can interact in important ways. For example, a currency mismatch could also involve a maturity mismatch. Furthermore, a maturity mismatch in foreign currency can turn into a currency mismatch when foreign financing dries up and banks are forced to turn to domestic financing of foreign assets. This proved important during the crisis when banks used FX swap markets in order to turn domestic liquidity into foreign liquidity with the results that these markets became dysfunctional.

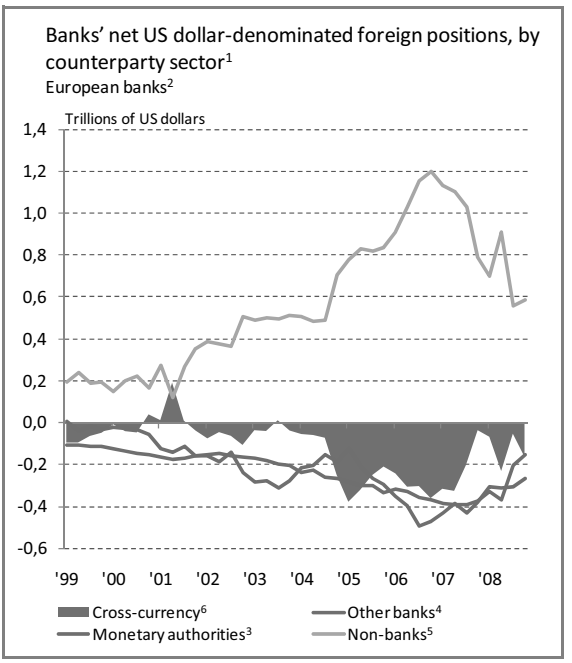
Partly due to ample liquidity in the financial system during the upswing, liquidity risk tended to be grossly underestimated. In the event, cross-currency liquidity risk turned out to be an important component of the crisis, with such risk materialising quickly and severely as funding sources and market liquidity dried up, with knock-on effects for asset valuations and capital adequacy. In that situation, access to a credible LOLR in terms of foreign currency could turn out to be the final arbiter of survival or collapse.

The links between European and US banks in terms of cross-border claims provide an important example of the kind of cross-currency liquidity risks that accumulated prior to the international financial crisis. The BIS Committee on the Global Financial System (2010) reports that European banks accumulated huge for-

[3] See for example MCGUIRE and VON PETER (2009).

eign claims and liabilities, which made them dependent on short-term funding in foreign currency. While the currency composition of foreign claims and liabilities varied, most European banks built up large net foreign positions (foreign claims minus foreign liabilities) denominated in US dollars. Moreover, while European banks were net borrowers of dollars from other banks, most likely US banks, in turn the US banks tended to be net borrowers from non-banks. As a result, the demand for European currencies by US banks was more limited. Since these banks tended not to have a sufficiently large onshore dollar funding base while their US counterparts tended to have no structural needs for European currencies, cross-currency funding (borrowing in one currency to fund assets in another) was needed to fill an ever-expanding gap[4]. Graph 1, which is adapted from the BIS report, shows the net US dollar-denominated positions of European versus US banks.

Graph 1: Cross currency risks accumulated before the crisis (a)



[1] US dollar-denominated foreign claims minus US dollar-denominated foreign liabilities vis-à-vis the indicated sectors.

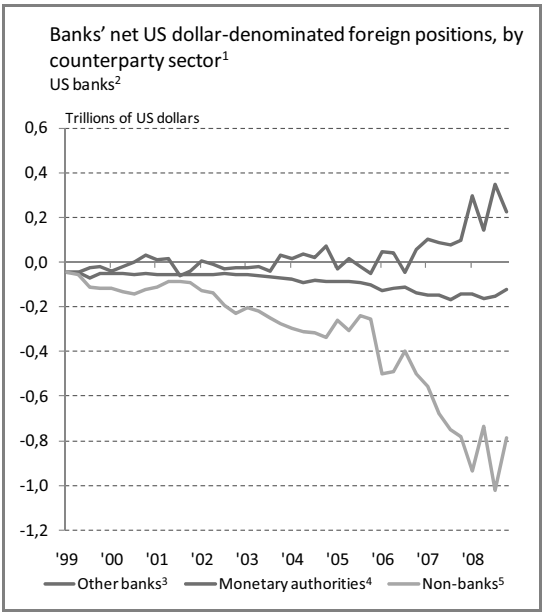
[2] Estimates are constructed by aggregating the on-balance sheet cross-border and local positions reported by Belgian, Dutch, French, German, Italian, Spanish, Swiss and UK banks' offices.

[4] BIS Committee on the Global Financial System (2010) reports that in the run-up to the crisis, the cross-currency funding needs of European banks were estimated to reach around $350 billion, which appeared relatively modest when compared to the $8 trillion gross US dollar liabilities on their balance sheets at the time. The fact that the US dollar is a predominant vehicle currency for swap and spot transactions likely compounded the situation.

[3] Cross-border positions in all currencies and local positions in foreign currencies vis-à-vis official monetary authorities. Excluding liabilities to Japanese monetary authorities placed in banks located in Japan.
[4] Net interbank lending to other (unaffiliated) banks.
[5] The estimated net position vis-à-vis non-banks is the sum of net international claims on non-banks and net local claims on US residents (vis-à-vis all sectors) booked by the US offices of the reporting bank.
[6] Implied cross-currency funding (ie FX swaps) which equates gross US dollar assets and liabilities.

Source: BIS calculations.

Graph 1: Cross currency risks accumulated before the crisis (b)



[1] US dollar-denominated foreign claims minus US dollar-denominated foreign liabilities vis-à-vis the indicated sectors.
[2] Estimates are constructed by aggregating the on-balance sheet cross-border and local positions reported by Belgian, Dutch, French, German, Italian, Spanish, Swiss and UK banks' offices.
[3] Cross-border positions in all currencies and local positions in foreign currencies vis-à-vis official monetary authorities. Excluding liabilities to Japanese monetary authorities placed in banks located in Japan.
[4] Net interbank lending to other (unaffiliated) banks.
[5] The estimated net position vis-à-vis non-banks is the sum of net international claims on non-banks and net local claims on US residents (vis-à-vis all sectors) booked by the US offices of the reporting bank.
[6] Implied cross-currency funding (ie FX swaps) which equates gross US dollar assets and liabilities.

Source: BIS calculations.

Furthermore, as the European banks had a significant maturity mismatch between US dollar assets and liabilities it made them highly vulnerable to the drying up of USD wholesale markets, which occurred during the turmoil. As it turned out, this maturity mismatch was a larger vulnerability than the need to fund across currencies. However, when dollar liquidity dried up banks were

forced to finance themselves in domestic markets or use the FX swap markets to convert into US dollars, leading to severe stress in these markets.

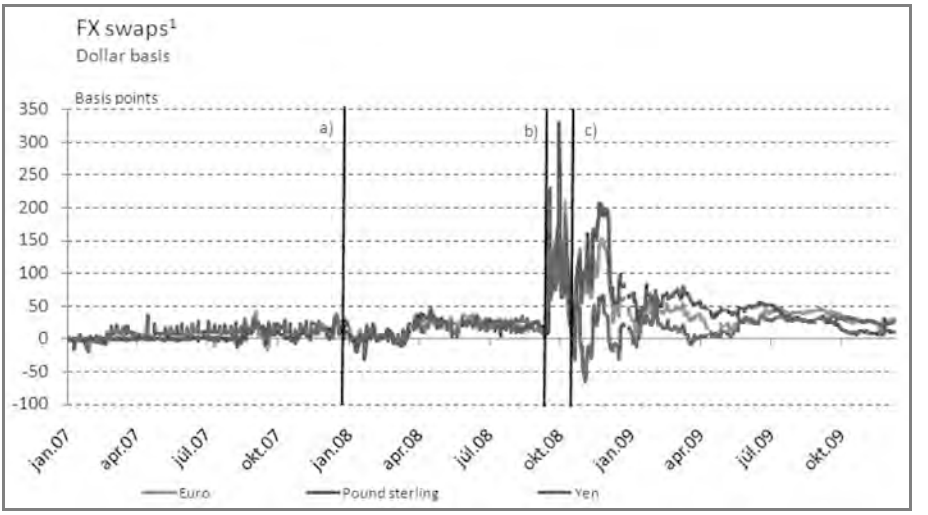
In normal times, managing liquidity across currencies from countries with free movement of capital and relatively developed capital markets is not much of an issue. In these conditions, foreign exchange swap markets can speedily be used to convert liquidity from one currency to another at spreads that closely reflect the differences in domestic money market rates in the two countries concerned. In other words, the covered interest parity (CIP) condition broadly holds. As the crisis unfolded, however, this relationship became strained and then broke down. For most currencies, this relationship vis-à-vis the US dollar began to show periodic strain after the financial turmoil erupted in late summer 2007.

After the collapse of Lehman Brothers in mid-September 2008, the CIP relationship broke down almost completely. A number of probable reasons for this have been identified by Baba, Packer and Nagano (2008) and Baba and Packer (2008)[5]. A run on cross-border banking developed, resulting in intense deleveraging and transfer of funds to the US. McCauley and McGuire (2009) describe how cross-currency liquidity management of banks and other entities became very difficult as foreign exchange swap markets became severely impaired and a general scramble for dollar liquidity ensued around the globe.

The Lehman bankruptcy resulted in a major loss of confidence. Concerns over protecting one's own solvency and liquidity led financial institutions worldwide to take action that, although rational from the standpoint of individual institutions, was disastrous for the system as a whole. Credit lines were closed, margin calls were made, and all but the safest assets sold off at fire sale prices. Emerging market assets experienced a sell-off as a part of this process, and funds were repatriated back to the US in order to meet margin calls and repay debt. A 'perfect storm' developed with a freezing of inter-bank funding markets, a run on cross-border banking operations and the foreign exchange swap market becoming dysfunctional as witnessed by unprecedented spreads (see Graph 2). The introduction of US dollar swap lines by the US Federal Reserve in December 2007 helped during the earlier phase of the crisis. The further spread of swap lines around the globe in mid-September 2008 did not alleviate the problem immediately, but after they were uncapped in the case of four major central banks in mid October 2008 – the Bank of England, European Central Bank, Bank of Japan, and Swiss National Bank – the FX swap spreads began to subside.

[5] See also Box III-1 "The recent turmoil in the Icelandic foreign exchange swap market" in the *Monetary Bulletin of the Central Bank of Iceland* (2008).

Graph 2: The global US dollar liquidity shortage



[1] *Spread between the three-month FX swap-implied dollar rate and the three-month USD Libor; the FX swap-implied dollar rate is the implied cost of raising US dollars via FX swaps using the funding currency. The vertical lines indicate (a) 9 August 2007, the onset of money market turmoil, and (b) 15 September 2008, the Lehman Brothers bankruptcy; c) 13 October 2008, swaps uncapped for 4 major central banks.*

Sources: Bloomberg, BIS calculations.

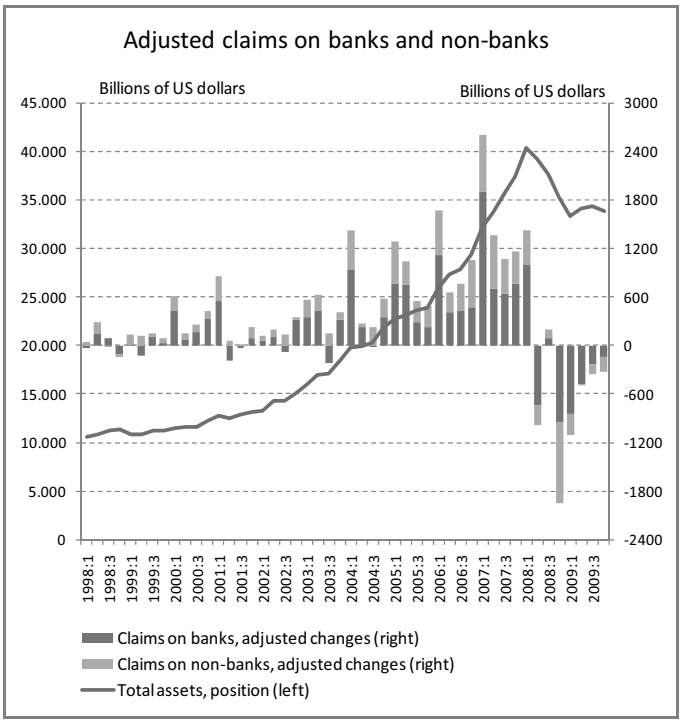
In the case of solvent institutions, it is well known how to resolve bank runs domestically, by letting central banks lend to markets and/or institutions through their virtually unlimited short-run capacity to expand their domestic balance sheet. However, when it comes to foreign currency, a central bank's capacity to help banks to refinance the foreign liquidity denied them on the market is limited by the size of its reserves or the willingness of its big neighbours to help. This was one of the factors that transformed banking crises, in some cases, into country crises. As a result, during the autumn and early winter of 2008 several countries, including Iceland, Hungary, Ukraine and Pakistan, came under pressure as banking and currency crises interacted.

The foreign exchange swap lines granted by the US Federal Reserve to the ECB and selected other European central banks mitigated the US dollar liquidity shortage; however, the problem was not confined to currency pairs involving the US dollar. A similar dynamic played out for smaller currencies in Europe vis-à-vis the euro, especially where banking systems had significant short-term foreign refinancing needs. In some cases, foreign exchange swap lines were granted vis-à-vis the dollar, euro and yen, and in some cases they were not. Where swap lines were granted, it helped. And for some of the smaller players, it might not have mattered terribly much which of the major international currencies they hooked on to in this sense, especially after the uncapped swap lines had been established. There

was also a drawdown of dollars in foreign exchange reserves. Finally, IMF rescue packages were launched for countries were other measures had failed and assistance had been requested.

The future evolution of cross-border banking is currently more uncertain than it seemed before the crisis. First, cross-border banking began to contract well before the peak of the crisis as can be seen in Graph 3, which shows both the stock and flow of cross-border banking claims based on BIS banking statistics. Second, significant rethinking is taking place, both within the banks and among regulators, which will affect the nature, size and composition of cross-border banking. This issue is explored in more detail in the third section. The following section examines the instructive case of the Icelandic banks.

Graph 3: Cross-border banking began to decline during the crisis



Source: BIS Locational banking statistics by residence.

7.2. THE CASE OF THE ICELANDIC BANKS

The economic and financial developments in Iceland during the last decade or so are a combination of two separate but interrelated stories. On the one hand, there is Iceland's boom-bust cycle and problems with macroeconomic management in

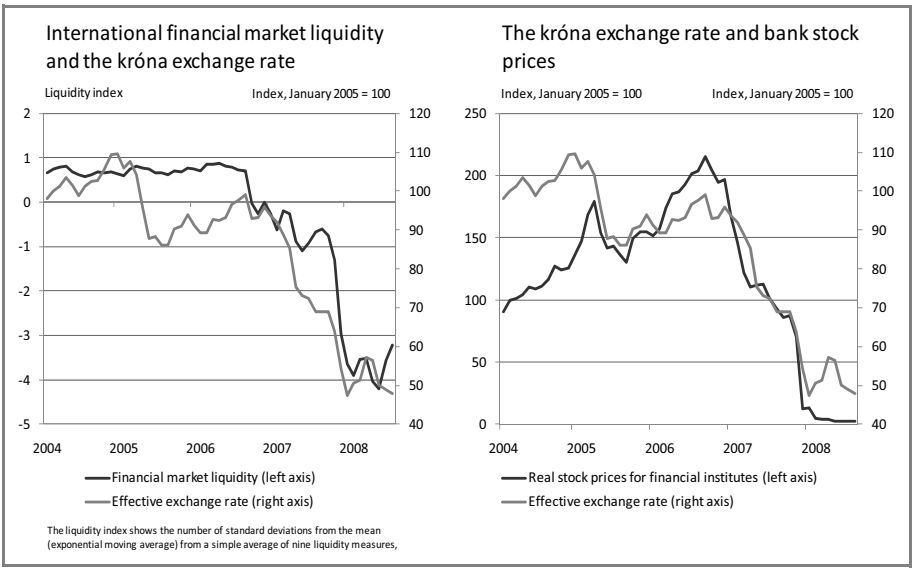
small, open, and financially integrated economies. This is a well-known story that has played out in other countries several times. On the other hand, we have the story of the rise and fall of three cross-border banks operated on the basis of European Union legislation (the European 'Passport'). That story, at least for smaller countries, is much more unique than the first, and is therefore the focus of this article.

While these two stories are different, they interact in important ways. Thus the unsustainable boom that Iceland experienced during the years 2005-2007 was fuelled by a combination of favourable external conditions, macroeconomic mismanagement, and aggressive domestic bank lending. It may well be that the banks' international activities and the easy access to foreign credit that came with those activities fuelled stronger growth in domestic bank lending than would have occurred in a more traditional small-country banking system. But we cannot be sure to what degree, as we know that unsustainable domestic credit booms fuelled by capital inflows can very well take place in countries that are not home countries to international banks.

As so often occurs in great tragedies, the two stories converged in a grand finale in early October 2008, when nearly nine-tenths of Iceland's banking system collapsed when its three large cross-border banks – Glitnir, Landsbanki, and Kaupthing – were taken into special resolution regimes on the basis of the emergency legislation that had just been passed by Iceland's Parliament.

An important channel of interaction was through the exchange rate (Graph 4). On the one hand, low risk aversion and ample liquidity tended to boost both the exchange rate of the króna and the banks' share prices at the same time. On the other hand, a speculative position against the share price of the banks tended to weaken the króna, as the banks were listed in Iceland and their equity denominated in Icelandic krónur. Furthermore, as the banks' official accounts and equity were denominated in Icelandic krónur, while a two thirds of their balance sheet were in fact denominated in foreign currency, they tended to hedge their equity, which, during the weakening phase of the króna, tended to weaken it further. These relationships emerge clearly in the graphs below, which show the strong correlation between international liquidity conditions, as measured by an index constructed by the Bank of England, the exchange rate of the Icelandic króna, and share prices of listed financial institutions.

Graph 4: Exchange rate interactions



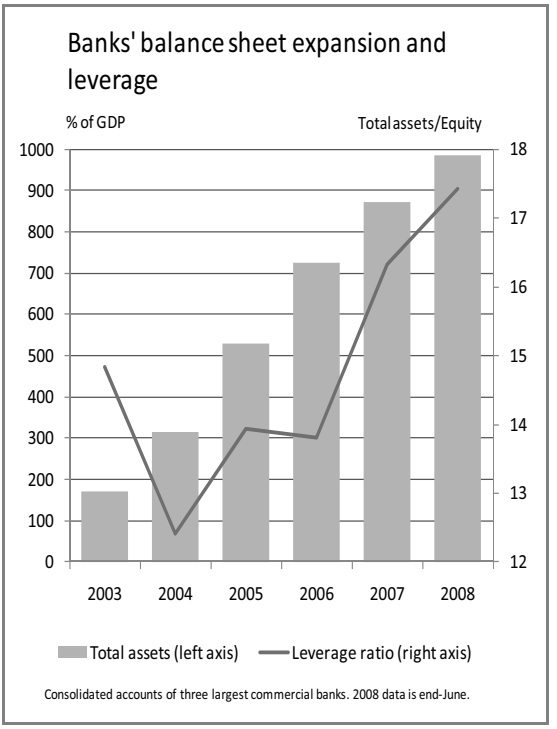
Source: Bank of England, Central Bank of Iceland. *Source: EcoWin Reuters, Central Bank of Iceland.*

7.2.1. The build-up

A turning point in the economic history of Iceland is the decision to join the European Economic Area (EEA) in 1994. The EEA Agreement provided a legal and regulatory framework based on European Union Directives. The agreement provided for the free movement of capital and made it possible for Icelandic banks to operate across European borders. This meant that the operating licences held by Icelandic financial institutions were not limited to Iceland but included all the countries in the EEA. The European 'Passport' gave the banks the scope to operate throughout the EEA, including permission to operate branches in other EEA countries. The stage was set for the transformation of the relatively small domestic banks in Iceland into large cross-border banking operations.

The Icelandic banks became very large, even on an international scale, following a process of consolidation and privatisation, which began in 1990 and was largely completed in 2003. With headquarters in Reykjavik, they expanded their activities abroad, for the most part by acquiring financial institutions in other countries, opening up bank branches, and stepping up their foreign operations. This phenomenal growth was made far easier by Iceland's EEA membership. Statistics illustrate the rapid-fire growth over a very short period (Graph 5). From 2001 to 2008, the banks' total assets grew from 100% Iceland's GDP to over 900%.

Graph 5: Cross-border expansion of the Icelandic banks



Source:Central Bank of Iceland.

In the first half of 2006 the Icelandic banks narrowly escaped the so-called mini crisis. In late 2005 and into 2006, the banks began to attract negative international attention. A notable shift in market attitudes was reflected in rising credit default swaps. Analytical coverage of the banks became critical, expressing significant concerns about their ability to manage risk or to exploit economies of scale given such rapid growth. The enormous dependence on wholesale financing given the low share of deposits as a proportion of total funding, lack of transparency, cross-ownership ties and connected lending, and other points were also mentioned. Up to that time, the banks had actively sought to raise funds with large international bond issues and were strained to bring in funds for all their activities, which now become more difficult.

Both the banks and the authorities reacted to the criticism by cleaning up their act, but also by taking the offensive with a propaganda campaign[6]. The public relations effort worked. In retrospect, one could even say that this was unfortunate, as it would have been much easier to reduce the size and the riskiness of the

[6] The report by MISHKIN and HERBERTSSON (2006) was an important contribution to that debate. See also PORTES and BALDURSSON (2007).

system in the conditions prevailing in 2006 than in 2008. Furthermore, one of the solutions was to start collecting deposits abroad, which was to prove costly for the Icelandic nation once the banks failed.

The banks also entered new markets, including the US, where issuers with good credit ratings found it easy to sell bonds. As a result, risk appetite returned and Moody's took the banks to AAA for a while in 2007. Interestingly, the high credit default swaps compared to their ratings made the banks' bonds good input for structured products. This, however, was to prove a big drawback for the banks once the financial crisis struck in earnest in 2007 and 2008 as the sell-off of structured products pulled Icelandic bank shares with it and sent CDS spreads through the ceiling.

7.2.2. Size and reach

Right before their collapse, the total assets of the Icelandic banks amounted to around USD 200 billion, or eleven times GDP. Over 40% of total assets were in foreign subsidiaries, 60% of total lending was to non-residents, and 60% of income was from foreign sources. Over two-thirds of lending and over three-quarters of deposits were denominated in foreign currency, notably in pounds sterling. Around 85% of the banks' foreign lending was in Europe, with half in the Nordic countries, a third in the United Kingdom, and a tenth in the Benelux countries. At the peak, Kaupthing Bank was operating in 13 jurisdictions: Austria, Belgium, Denmark, Dubai, Finland, Germany, the Isle of Man, Luxembourg, Norway, Qatar, Sweden, Switzerland, and the UK.

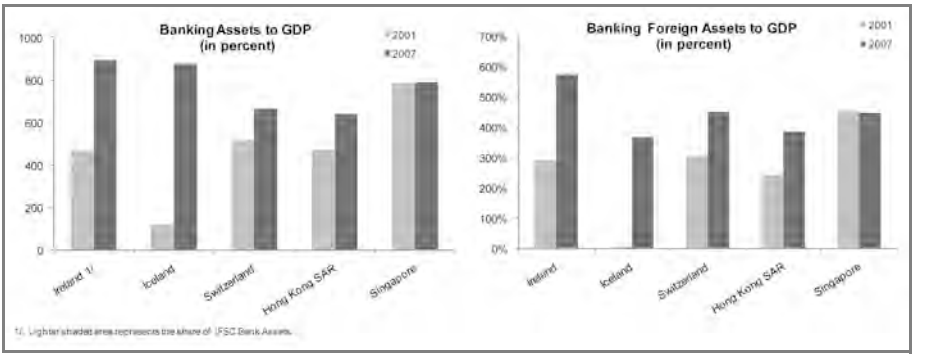
The size of these banks in an international context can partly be gauged from the relative size of their collapse. According to Moody's (2009) list of defaults during the period 1920-2008, Kaupthing, at USD 20 billion, ranks 4th after Lehman, Worldcom and GMAC, with Glitnir close on its heels. The combined balance sheet of these failed banks was much larger than that of Worldcom, and only Lehman's was larger. The effect was also felt far and wide, as these banks were truly international.

7.2.3. Comparison with other small countries with big banks

The IMF has produced a study – IMF (2010) – comparing the experience of several economies with large banking systems, which is used here to compare the Icelandic banking system with some other countries with large banking systems relative to the size of their countries. As soon as 2007, Iceland's banking system was larger in relation to the domestic economy than the banking systems of estab-

lished banking centres like Hong Kong, Switzerland and Singapore, and not far behind that of Ireland (Graph 6). As the Icelandic banking system expanded abroad, its foreign assets grew significantly as a share of GDP and began to approach the levels seen in the other countries in 2007, with the same development advancing even further in Ireland. A crucial difference is that the Irish banks had a large share of their foreign assets denominated in the domestic currency – the euro.

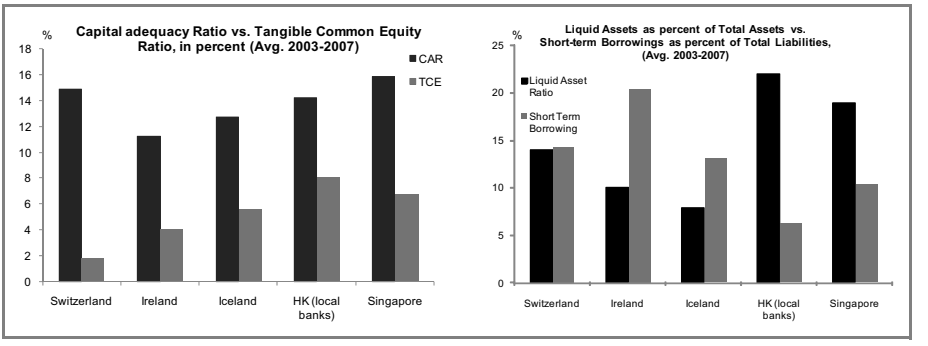
Graph 6: Small countries, big banks



Source: IMF (2010).

Compared to these more established banking centres, the Icelandic banks were not outliers in terms of capital adequacy and tangible common equity ratios (Graph 7). In fact, the Icelandic banks were somewhere in the middle. Nevertheless, of the EEA countries, the cross-border risks of the Icelandic banks were greater than those of the Irish banks, due to currency risks compounding the maturity mismatch risks.

Graph 7: Capital and liquidity



Source: IMF (2010).

Compared to their peers, the Icelandic banks had a relatively weaker liquidity situation, with liquid assets as share of total assets among the lowest of these countries, while short-term borrowings were somewhere in the middle.

In particular, the IMF (2010) study finds that rapid bank growth was accompanied by domestic bubbles and these resulted in growing international activities, rising leverage and macro risks. The Icelandic banks exhibited rapid growth of both their domestic and foreign assets. They also exhibited significant reliance on trading income, external funding and wholesale and/or short-term funding. While the Swiss banks did not expand their domestic bank assets significantly and Irish banks did not rely heavily on trading income, their overall development, while more tempered, shared other features of the Icelandic experience. This stands in sharp contrast to the banks in Hong Kong and Singapore, which displayed none of the above features. It made a difference for the Irish banks that they relied more on domestic lending and retail deposit taking. While the Icelandic banks increased their retail deposit activities abroad they, and the Swiss banks, remained relatively dependent on foreign wholesale funding. As the crisis unfolded the access of Icelandic, Irish and Swiss banks to wholesale funding liabilities became a problem as concerns were triggered by deteriorating assets in the face of overextended loan books. The IMF study also finds that the liquidity buffers of Icelandic and Irish banks were not as strong as those of the Hong Kong and Singapore banks. At the critical juncture, the domestic headquarters of Irish banks, unlike those in Iceland, were able to obtain large amounts of liquidity support directly from the ECB.

7.2.4. Crisis management and resolution

As the financial crisis intensified, the risks mounted, and by early 2008, both the banks themselves and the Icelandic authorities were acutely aware of it. The Icelandic authorities tried to build credible defences by negotiating swap lines with central banks in neighbouring countries but were declined by the ECB, the Bank of England and the US Federal Reserve, the last of which told Iceland to go to the IMF[7]. The other Nordic countries, however, decided in May 2008 to grant a euro swap line amounting to €1.5 billion. That same month, Iceland's Parliament approved a major extension in the government's borrowing limit to boost the foreign exchange reserves, in the amount of €5 billion, but it was only used to a very limited extent as foreign loans were either not available to the Icelandic government or the terms were considered to be unacceptable.

On 25 September 2008, Glitnir requested a loan of last resort amounting to €600 million in order to cover a loan repayment in mid-October. The decision not to

[7] IMF (2008).

grant the loan was probably influenced by the relatively small foreign exchange reserves of the Icelandic Central Bank. Instead, the government, on the advice of the Central Bank, announced on 29 September that it was taking a 75% equity stake in Glitnir valued at €600 million, which implied a valuation of 50% of the value of that stake in the market the week before. In the following week the equity price collapsed further, ending the week 75% below what it had been at the end of the week before.

This action did not boost market confidence in the Icelandic banking system. On the contrary, it intensified the run. On the following day, both the sovereign and the banks were downgraded by two notches, followed by widespread margin calls and closing of credit lines. The foreign deposits that had helped to alleviate the foreign liquidity squeeze experienced outflows. The equity loss involved in the Glitnir takeover also created a domino effect within the Icelandic financial system.

It was becoming clear that the entire system was on the brink of collapse, and on 6 October, 2008, the Icelandic Parliament passed emergency bank legislation with the objective of ensuring continued domestic banking operations. The following day, the Icelandic financial supervisory authority (FME) intervened in the operations of Glitnir and Landsbanki. On 8 October, following perfunctory exchanges between the UK Chancellor of the Exchequer and the Icelandic Minister of Finance, the UK government froze the assets of Icelandic banks in the UK and took over Singer & Friedlander, a British-licensed subsidiary of Kaupthing. The deposit part of Singer & Friedlander was transferred to a subsidiary of the Dutch ING Group. Later that day, a system-wide response of central banks and governments emerged, emphasising international coordination. Such efforts were too little and too late for the Icelandic banks, and on October 9, the FME intervened in Kaupthing bank.

During the height of the turmoil the crisis management left a great deal to be desired, especially the cross-border part. There was lack of information sharing and co-operation between affected jurisdictions. There was early sale of 'good' assets at fire sale prices which will lead to lower recovery ratio for bond holders. The UK authorities froze and ring-fenced assets. Further research will throw light on the UK decision to close the subsidiary Singer & Friedlander, which brought Kaupthing down[8]. By comparison, an LOLR loan was granted to Kaupthing's subsidiary in Sweden. A consequence of all of this is the dispute with UK and Dutch authorities over the settlement of deposit insurance claims related to the branches of Landsbanki in foreign jurisdictions. In the first half of 2010, the

[8] In the case of Kaupthing's failure the Basel Committee on Banking Supervision (2010) suggests that the main lesson concerns the limited national resources which constrained the home country supervisory capacity.

absence of a resolution to this problem was still negatively affecting the economic recovery in Iceland.

Domestic bank resolution has been somewhat more orderly. It was shaped by the initial goal of securing continued banking operations in the country. It began with the Emergency Act of 6 October, 2008, which granted the FME broad-based intervention rights. Bank deposits were assigned higher priority than other unsecured claims. The Parliament then approved the required government capital injections. Finally, the government issued a statement guaranteeing all deposits in Iceland.

The tool used to secure domestic banking operations was to split the banks into new and old banks along domestic and foreign lines in such a way that the foreign creditors did not suffer over and above what was implied by giving deposits priority over other claims. When these drastic actions are assessed, it must be borne in mind the dire straits that Iceland was in at the time and the sense in the country that it was under financial siege. Furthermore, the old banks' assets were over 10 times GDP in 2008, and in the absence of international cooperation, forced downsizing was the only option. In 2009, the new banks were 1.7 times GDP.

The domestic banking system functioned more or less seamlessly throughout, but demand for cash tripled and almost outstripped physical supply for a few days at the height of the crisis, until the government declared that domestic deposits were safe. International payment flows were seriously affected, however. Payments stopped at first, as the correspondent banking system seized up due to uncertainty, attempts at netting and punitive actions, and the UK freezing order. International payment flows were gradually restored with Central Bank involvement.

The collapse of the banking system has been extremely costly, but progress is being made to stabilise the economy and return it to growth[9]. Since November 2008, the continuation of the resolution process has been part of an IMF programme, of which the main elements are: stabilisation of the exchange rate, a plan for fiscal sustainability, and resurrection of the financial system[10]. Three reviews have been completed under the IMF programme with a fourth expected in the winter of 2010/11. The exchange rate has remained broadly stable since early 2009 at almost half its pre-crisis value, albeit in the presence of temporary capital controls. The government has begun to implement its medium-term fiscal consolidation in line with the goals of the programme, with the bulk of the difficult measures already implemented. Resurrection of the financial system has progressed, with all the three banks now up and running and two of them majority-owned by the foreign creditors of the old banks.

[9] SIGHVATSSON and GUNNARSSON (2010) estimate the net fiscal impact of the banking collapse to have exceeded 40 per cent of GDP in the first year alone.

[10] IMF (2009).

7.2.5. Why did the banks fail?

It is important to note that the phenomenal growth of the Icelandic banks was enabled but not caused by the common European legal and regulatory framework. As is well known, from the early 2000s to the middle of 2007, highly unusual conditions developed in the international financial markets. The supply of credit was plentiful, and interest rates were lower than they had been at any time in the 20th century. The financial markets eagerly sought bonds, including those of the Icelandic banks, which were suited for use in various structured products, partly because their ratings were high compared to their CDS. The banks were under regular scrutiny by international credit rating agencies, which at one point took them to triple-A. In turn, the good ratings facilitated their push into the bond market. Finally, the banks became an important part of the Icelandic economy, their expansion and that of Icelandic firms enjoyed broad support, they paid high salaries, and the Treasury received sizable tax receipts based on their activities, direct and indirect.

The fact that the Icelandic banking system was based on EU legislation proved conducive to the cross-border expansion of the banking system. However, in spite of all its merits there were fatal flaws in this system. The basic problem was that, although banking and regulation was European, supervision and the safety net of deposit insurance and LOLR was national. The same applied to a significant degree to crisis management. There was an inherent vulnerability and risk associated with this setup, especially for small countries outside the euro area, given the limited ability of the domestic central bank to serve as LOLR in foreign currency. This proved fatal for Iceland, in part because it made the mistake of taking European regulatory directives as mostly binding, but not as a minimum. The deposit insurance system was another significant failure of the EU/EEA framework. Not only did it violate the principle of matching international private action with international public measures, but it also failed to observe the insurance principle of pooling. European banks need European deposit insurance!

The interplay between trust, liquidity and solvency is complicated when it comes to banks. Banks fail because they lose trust. This might not be warranted, in which case the bank will face a liquidity problem. However, it might still fail if it is not supported by a credible LOLR or if the liquidity problem lasts long enough. Furthermore, the line between liquidity and solvency can be a thin one. An underlying solvency problem will often manifest itself as a liquidity problem, and a liquidity problem will often over time create a solvency problem. Did the Icelandic banks face a solvency problem? Not if we look at what used to be the traditional metrics before the crisis (Table 1).

Table 1: Some key metrics[11]

As of June 30, 2008	Kaupthing	Landsbanki	Glitnir
CAD ratio	11.2%	10.3%	11.2%
Tier 1 ratio	9.3%	8.2%	8.0%
Leverage ratio	14	19	18
Equity/tangible assets	6.7%	5.1%	5.3%
Bond maturity[a]	5 years	5 years	3.2 years
Deposits/funding	41%	55%	29%
Liquidity ratio	1.95	1.74	1.52

Source: Central Bank of Iceland and Bloomberg (a).

Compared to their peers, the banks' capital and leverage ratios were not out of line. Neither do their underlying liquidity problems stare at us through these metrics. But this might say more about the metrics than the reality. Add to this the fact that around a month before the collapse the FME issued statements about how well the banks came out of a variety of stress tests. However, these stress tests were flawed in the sense that they did not include liquidity. Furthermore, they tested one institution at a time and did therefore not take into account interconnectedness and the contagion elements that proved so important during the collapse.

Also underlying the official figures were hidden vulnerabilities that were not well known at the time[12]. 'Weak' capital means here that part of a bank's equity that is financed by lending from the bank itself or uses the banks own shares as collateral. Such capital is not a proper buffer against losses as true 'outside' capital is required[13]. When the official measures are adjusted to exclude weak capital, the capital adequacy ratio drops from 11% to 7% and Tier 1 capital falls from 9% to 5%. These are below the regulatory minimum. Also using the adjusted figures, the ratio of equity to tangible assets goes from 6% to 3% while the leverage ratio doubles, from 16 to 31 (Table 2).

11 CAD ratio and Tier 1 ratio according to Basel II definitions. According to CBI Rules on Liquidity Ratio, No. 317/2006, the claims and liabilities of credit institutions are classified according to their nature, maturity and risk and assigned a weighting. Among items included in the ratio are cash, sight deposits and short-term claims on the Central Bank, claims on credit institutions and others, market securities, off balance sheet items etc. Liability items include liabilities towards the Central Bank and credit institutions, market securities issues, borrowing, deposits and off-balance sheet items. The liquidity ratio is calculated for four periods; ON-1 month, 1-3 months, 3-6 months and 6-12 months. According to the liquidity rules of the Central Bank, the ratios of claims to liabilities which fall due or can be liquidated within one month and three months shall not be lower than 1.

12 The banking expert report by Jannari (2009) noted numerous significant problems which served to undermine the asset quality and ultimately the solvency of the Icelandic banks. Such problems included insufficient definition of related parties; an excessive concentration of loans to holding companies (that invested in shares or other venture capital) and indirect risks through cross-financing of bank shares.

13 For more detail see chapter 9 in the report by the Special Investigation Commission (2010).

Table 2: Hidden vulnerabilities

As of June 30, 2008	Official	Less 'weak' capital
CAD ratio	10.9%	7.2%
Tier 1 ratio	8.5%	5%
Leverage ratio	16.2	30.9
Equity/tangible assets	5.9%	3.1%
Bond maturity[a]	4.6 years	4.6 years
Deposits/funding	41.3%	41.3%
Liquidity ratio	1.7	1.7

Source: Central Bank of Iceland and Bloomberg (a).

A great deal of value is lost at the very moment when banks cease to be going concerns. However, relatively low estimated recovery rates after the bank's collapse seem to support the picture above, which indicates that there was an underlying solvency issue involved. All of this raises questions about the quality of accounting and the bank's capital.

As the crisis unfolded, the overriding problem facing the banks concerned their big foreign currency balance sheets. Not only was there a significant maturity mismatch between the asset and liability sides but their size relative to the home base was a major risk as well. Prior to their collapse, the banks' balance sheets had expanded to almost 11 times GDP, with the foreign currency part amounting to two-thirds, or almost 7½ times GDP. By comparison, the reserves of the Central Bank of Iceland, which were 21% of GDP at the time; a swap agreement with the Nordic countries amounting to €1.5 billion, or around 12% of GDP; and committed credit lines of around 2% of GDP, or a total of around 35%. This is dwarfed by the foreign currency liabilities of the banks, even if some of them were, of course, longer-term, which meant that the banks were effectively without a lender of last resort in terms of foreign exchange[14]. As a result, these defences could buy only limited breathing space in the face of a full-scale run on cross-border operations of banks of this size.

Further research is needed before we can assess to what degree such breathing space would have facilitated a more orderly and less costly episode than the complete collapse that took place. Importantly, while the BIS Committee on the Global Financial System (2010) considers it important for countries to have adequate foreign exchange reserves and to use them during a crisis, it recognises that both the financial and opportunity costs of developing such reserves can become quite

[14] The Ministry of Finance (2008) estimates that the foreign currency reserves, which had increased significantly by mid 2008, were adequate according to traditional measures, such as covering at least 4 months of import demand. However, as a ratio of foreign short term debt (one-year or less maturity), they amounted to only 5.7 percent in June 2008.

significant. In the case of Iceland, in view of the relatively large foreign currency liabilities of the banks, the cost of increasing the foreign exchange reserves by a factor of almost twenty, if it had been possible, was likely prohibitive.

In summary, one of the main causes of the collapse of the Icelandic banks was that they had large foreign-currency balance sheets with significant maturity mismatches but did not have a LOLR in foreign currency. By early 2008, it had become clear that the banks faced massive rollover risks in terms of foreign currency liabilities. The banking system had far outgrown their home base (country and currency). Furthermore, there were fatal flaws in the EU financial architecture and crisis management across interested jurisdictions proved extremely poor and non-cooperative. But there were also triggers and contributing factors. The evolution of the international financial crisis shut out any hope of recovery. A variety of linked problems contributed, including incentive systems, regulation and supervision. There were serious flaws in business models and risk management. Iceland also suffered from large macroeconomic imbalances. There were domino vulnerabilities in Iceland's financial sector (e.g. cross-ownership, connected lending, large exposures across institutions). The governance and accounting practices of the banks were also likely inadequate.

It had become clear well before the collapse that the Icelandic banks were in dire straits. Buiter and Sibert (2008) provided a sound analysis of the problem. The main concern was the closure of foreign funding markets, the associated rollover risk, and the absence of a credible LOLR in terms of foreign currency[15]. The hidden vulnerabilities also contributed to a rapid souring of the loan book as the crisis unfolded.

The financial crisis was an event of systemic proportions in parts of Europe. It is clear that there was a failure of private and public risk management policies in Iceland. But it is equally true that the EU framework for cross-border banking failed. There was an inbuilt vulnerability or risk to this setup, especially for small countries outside the euro. This is linked to the fact that the legal and regulatory framework was common in the EEA, while the safety net (e.g. deposit insurance and LOLR) and crisis management and resolution remained largely national. The experience of Iceland figures as an example in major reports and will affect the shape of the future framework for regulation and supervision of cross-border banks. The Icelandic experience also serves as a key example of the problems with

[15] It might be of some interest that the possibility that the Icelandic banks might fail in precisely the way they did was much more widely foreseen than is currently acknowledged. GUDMUNDSSON (2007) gave a speech on May 18, 2007 stating "...emergency liquidity assistance will be complicated or even impossible for central banks to deliver when internationally active banks face liquidity problems in currencies other than that of their home country. Iceland is a case in point." This was before the breakout of the financial turmoil in August of the same year and most saw this as a tail event rather than an immediate possibility, although concern was beginning to creep in.

cross-currency liquidity management during the crisis, including the lack of central bank liquidity provision and emergency liquidity assistance (ELA) in terms of foreign currency.

7.3. THE LESSONS AND THE REFORM AGENDA

The story of Iceland's cross-border banks holds important lessons for cross-border banking more generally, both from the standpoint of the small economy and at the European and global levels.

7.3.1. Key lessons

Baba and Packer (2009) find that the risks in cross-border banking were significantly underestimated, especially the cross-currency part. The crisis had significant elements of a run on cross-border banking, with the drying up of foreign currency funding through the foreign exchange swap markets, resulting in a dollar shortage. In Iceland's case, a partial run on deposits in foreign branches and subsidiaries contributed. Relatively large cross-border banking operations in small European countries outside the euro area can be very risky. The foreign exchange reserve dilemma suggests that limits are needed for cross-border banking activities, either to link the size of banks' cross-border activities to the size of the home country economy, or to establish common reserves through, for example, foreign exchange swap lines or a liquidity pool.

7.3.2. EU reform agenda

Work is underway at the international and national levels to draw lessons from the crisis and institute reforms. The Turner review (2009) in the UK noted problems with the EU architecture and suggested a new European institution to regulate and oversee the supervision of cross-border banks. It also recommended that national powers be increased to require subsidiarisation or to limit retail deposit-taking and that European deposit insurance be reformed, including pre-funded resources. The De Larosière report (2009) suggested that the deposit guarantee systems in EU be harmonised and preferably pre-funded. It proposed a review of existing powers of host countries with respect to branches and the creation of a European Systemic Risk Board (ESRB) and European System of Financial Supervisors (ESFS). There was also a recommendation to create colleges of supervisors for all major cross-border institutions. Importantly, the issue of burden-sharing was not resolved. The Basel Committee on Banking Supervision (2010) recommends the Cross-Border Bank Resolution Group take the home country principle

as a given but that cooperation and coordination between home and host countries be improved.

These official proposals do not go far enough when measured up to the Icelandic experience. The banking collapse in Iceland is wrongly seen as primarily a supervisory failure, which it was only in part. There is a need to move towards EU supervision, deposit insurance, crisis management and resolution regimes for cross-border banks. The specific risks facing EU and EEA countries outside the euro area must be addressed, notably the LOLR issue in a cross-border and cross-currency setting.

The EU and EEA framework for deposit insurance was put to the test and found to be seriously lacking in the face of a run on cross-border banking. In Iceland's case, a run on deposits developed in both foreign branches and subsidiaries. Neither the Icelandic Depositors' and Investors Guarantee Fund (DIGF) nor the EU regulatory framework could deal with a systemic crisis. The crisis has shown that the principle of home country responsibility for foreign bank branches is flawed, especially when the deposits are not in the home currency. This principle, which was established in 1988, stems from the EU's ambition to establish a common market for banking services, giving banks the freedom to compete in any EU member state. People in host countries were made to rely on the authorities in the home country to ensure them deposit protection equal to that given to their own citizens. There are EU minimum harmonisation and mutual recognition principles for protection, so as to ensure that the home country protection is sufficient. This system is rational from a market perspective, but from the perspective of consumer protection, to transfer what is essentially the host country's responsibility to the taxpayers in the home country makes it questionable. When the principle was introduced, foreign branches were a minor part of banking business. However, when such banking practices expanded, as they did in the case of the Icelandic banks, the home country principle became a threat to financial stability.

According to the EEA Joint Parliamentary Committee (2009), the regulation has also been found to lack clarity, which has proved unhelpful in the dispute between Iceland and the UK and Netherlands concerning the payment of Icesave deposits in the branches of Landsbanki abroad. For instance, it is unclear whether dispute resolution is to take place on a bilateral, European or international level. A major reform effort is needed in this area. If EEA-wide deposit insurance is not on the cards, should banks from small countries outside of the euro area have the same 'Passport' rights and/or capital charges as banks in the euro area? Alternatively, will there be an exclusive focus on separately capitalised subsidiaries? That might go against the principles of the EU and EEA Single Market.

7.3.3. Global issues

There are also major unresolved issues globally, and how they are addressed will determine the future development of cross-border banking. Do we need a system of foreign exchange swap lines or a foreign exchange liquidity pool to provide insurance against a run on cross-border banking, as we have domestically through central bank liquidity provisions and LOLR? Will there be a repeat of the retrenchment and de-globalisation seen at the beginning of the 20th century? Will the world have truly international banks based only in a handful of countries? The importance of addressing this situation successfully is great, given the substantial benefits of financial globalisation.

7.4. CONCLUSIONS

Many studies of the collapse of the Icelandic banking system in the autumn of 2008 cover a wide range of the complex issues involved. This paper analyses the dynamics and framework that led to a run on the cross-border liabilities of Iceland's three main banks which contributed to their collapse. A steady-build up of cross-currency liquidity risk, especially maturity mismatches in foreign currency, tended to be grossly underestimated and became an important component of the crisis. When such risk materialised quickly and severely as funding sources and market liquidity dried up, it had knock-on effects for asset valuation and capital adequacy. In that situation, access to a credible LOLR in terms of foreign currency turned out to be the final arbiter of survival or collapse of many international banks. The crisis also exposed serious flaws in the EU and EEA framework for cross-border banking, including the deposit insurance system. The key lessons of the Icelandic experience show that sizeable cross-border banking operations in small countries with their own currency come with significant risks. The foreign exchange reserve dilemma suggests that either limits are needed for cross-border banking activities, e.g. to link the size of banks cross-border activities to the size of the home country economy, or to establish common reserves through, for example, foreign exchange swap lines or a liquidity pool.

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8. Bankers Without Borders? Implications of Ring-Fencing for European Cross-Border Banks[1]

Prepared by Eugenio Cerutti, Anna Ilyina, Yulia Makarova, and Christian Schmieder

Abstract

This paper presents a stylized analysis of the effects of ring-fencing (i.e., different restrictions on cross-border transfers of excess profits and/or capital between a parent bank and its subsidiaries located in different jurisdictions) on cross-border banks. Using a sample of 25 large European banking groups with subsidiaries in Central, Eastern and Southern Europe (CESE), we analyze the impact of a CESE credit shock on the capital buffers needed by the sample banking groups under different forms of ring-fencing. Our simulations show that under stricter forms of ring-fencing, sample banking groups have substantially larger needs for capital buffers at the parent and/or subsidiary level than under less strict (or in the absence of any) ring-fencing.

8.1. Introduction

The concept of centralized capital and liquidity management by internationally active banks was challenged by the recent crisis, sparking a debate about the desirable organizational and regulatory arrangements for cross-border banking groups. This paper focuses on the costs for these banking groups that are associated with different restrictions on intra-group cross-border transfers imposed by the host/home country regulators (henceforth referred to as 'ring-fencing'). More specifically, it provides a stylized analysis of how much additional capital might be needed if the banking groups are restricted, to different degrees, in their ability to re-allocate funds across jurisdictions following a credit shock affecting their lending activities in a given region. The paper does not estimate the group level potential recapitalization needs under an extreme scenario (which is typically done in a stress test), but rather considers the implications of adverse economic conditions for cross-border banking groups under different forms of ring-fencing.

[1] This paper benefited from comments by Bas Bakker, Jan Brockmeijer, Miroslav Kollar, Inci Otker-Robe, Daniel Hardy, Jérôme Vandenbussche, and Rachel van Elkan, as well as the participants of the MCM-EUR seminar. All errors are the authors' own. The views expressed in this paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. An earlier version of this paper was published as IMF Working Paper 10/247.

The analysis is based on bank-level data for European banking groups and their subsidiaries in Central, Eastern, and Southern Europe (CESE)[2].

At present, a number of European countries have legal restrictions on intra-group cross-border asset transfers. These limits are aimed at preventing undue influence by a foreign parent on its subsidiaries (e.g., in the form of disproportionate transfers of assets that could potentially trigger solvency or liquidity problems), or aimed at protecting the interests of minority shareholders and creditors of subsidiaries (European Commission, 2010). In order to ring-fence the subsidiary from the rest of the group, the host country can target the subsidiary's ability to transfer funds abroad directly or indirectly, through measures affecting the entire domestic banking system (e.g., stopping the distribution of dividends by all banks during a crisis)[3].

During 2008-09, many subsidiaries of European banking groups had to rely on their foreign parents for capital and liquidity support. There is some evidence that, *ex ante,* CESE subsidiaries expected that they could rely on parent banks in case of need (e.g., the average capitalization levels of foreign-owned subsidiaries in most CESE countries were 1 to 2 percentage points lower than banking system averages at the outset of the crisis (Appendix 1)). *Ex post*, these expectations were validated by the assistance provided by parent banks[4]. Yet, in order to maintain financial and economic stability, the regulators in many host countries tightened restrictions on intra-group cross-border transfers, limiting the ability of cross-border banking groups to re-allocate funds from subsidiaries with excess capital (liquidity) to those that were in need of capital (liquidity)[5].

[2] The interbank linkages in this region and their role in transmitting or mitigating shocks have been recently analyzed in ARVAI, DRIESSEN, and OTKER-ROBE (2009), HERMANN and MIHALJEK (2010), and MAECHLER and ONG (2009), but the analysis relied mainly on the *country-level* (not *bank-level*) data on cross-border bank exposures.

[3] The current initiatives at the EU level aim to achieve the dual objective of (i) preventing the risk of insolvency that could potentially be generated by a disproportionate transfer of assets for the credit institution making the transfer; and (ii) lifting restrictions on transfers of assets if such transfers can potentially limit the extent of a crisis (European Commission, 2010).

[4] See, for example, the recent "Statement at the end of the European Bank Co-ordination Initiative's Second Full Forum Meeting", Press Release No. 10/106, March 22, 2010. In the context of this initiative, the large bank groups with systemic presence in several CESE countries have committed to maintain their exposure and keep their subsidiaries well capitalized. (http://www.imf.org/external/np/sec/pr/2010/pr10106.htm).

[5] To name a few examples, bank regulators in Croatia, Poland, and Turkey recommended the non-distribution of profits by the subsidiaries of foreign banks despite relatively strong bank fundamentals. In the case of Croatia, the CNB Governor, Dr. Željko Rohatinski, at a press conference held on 18 February 2009 said that "the CNB would not look favorably upon attempts to withdraw capital, deposits or pay out total accumulated profits, because that would destabilize the domestic banking system. In such a case, the CNB would be forced to undertake protective measures, regardless of thus connected risks." In the case of Turkey, the head of the banking regulation agency stated in December 2009 that "it is our natural right to expect those profits generated in this country to be invested and used in credit extension again in this country." Banks in Turkey were expected to consult the regulator before distributing any dividends during the last two years. The IMF Article IV report on Poland (2010) classified the regulator's recommendation for subsidiaries of foreign banks to refrain from paying out dividends, despite robust capital buffers, as a form of capital control.

There are arguments both for and against ring-fencing. The arguments in favor of centralized cross-border bank structures and against ring-fencing rely on efficiency and financial stability considerations (e.g., benefits of diversification across country-specific shocks). From a *cross-border bank's perspective*, the ability to freely re-allocate funds across its affiliates is essential for achieving the most efficient outcome – a point emphasized in the recent report prepared by the Institute of International Finance (IIF, 2010). Centralized cross-border bank structures may yield benefits for the *host country economies* as well. De Haas and van Lelyveld (2010), for example, show that the ability of international banks to attract liquidity and raise capital allows them to operate an internal capital market, which provides their subsidiaries with better access to capital and liquidity than what they would have been able to achieve on a stand-alone basis, and hence may help to reduce the pressure to scale back lending during economic downturns. For both home and host authorities, the absence of ring fencing facilitates diversification and can thus make the group as a whole more stable, for example, against shocks in the home country.

However, there are also arguments in favor of ring-fencing. For a *host country regulator*, the decision to impose ring-fencing would typically be driven by macro-financial stability considerations, such as the need to protect the domestic banking system from negative spillovers from the rest of the group, or more generally, to increase reserves for the whole domestic banking system during a crisis when the magnitude of the impending output collapse and bank losses are uncertain. The possibility of contagion from a parent bank to subsidiaries in the European context was recently analyzed by Popov and Udell (2010), who showed that the contraction of banks' balance sheets caused by losses and/or a deterioration in bank solvency was transmitted across borders to Eastern Europe by Western European banking groups in the early stages of the 2007-08 crisis.

Moreover, the difficulties in resolving cross-border banking groups during the recent crisis and the absence of agreements on burden-sharing mechanisms triggered a discussion about the desirability of promoting greater self-sufficiency of banking groups' affiliates in normal and in crisis times. Hoelscher, Hsu, Otker-Robe, and Santos (2010) consider the pros and cons of the so-called stand-alone subsidiarization (SAS) approach, according to which a cross-border banking group should be set up as a network of fully self-sufficient national subsidiaries. The authors note that from a *banking group's perspective*, the SAS approach may be beneficial if it can provide additional incentives for subsidiaries to better manage liquidity and credit risk. From the *host/home country perspective*, the key benefits of SAS include limiting intra-group contagion and allowing selective resolution of problem parts of the group with minimal disruption for the rest of the group.

Leaving aside the question of the potential benefits of imposing greater autonomy on the banking group's affiliates operating in different jurisdictions, this paper focuses on the *costs of ring-fencing* for cross-border banking groups under different forms of ring-fencing. The cost is measured in terms of the amount of external capital that is required to cover capital shortfalls faced by the affiliates of these groups as a result of a credit shock. More specifically, this paper estimates the amount of additional capital that might be needed if the sample banking groups are restricted in their ability to re-allocate *excess profits and/or capital* across jurisdictions following a credit shock that affects some of the affiliates within these groups[6].

It should be noted that the transfers of excess profits/capital are not the only mechanisms through which banking groups could manage the level of capitalization of their affiliates. For example, the latter could also be achieved through capital injections via subordinated debt or by 'shifting' assets (instead of capital) between different parts of the group[7]. However, the empirical analysis of these alternative mechanisms is constrained by the lack of publicly available bank-level data on intra-group lending and asset transfers. That said, the conclusions that such exercises might yield are likely to be quite similar to the results regarding the transfers of excess capital/profit presented here.

Three different types of ring-fencing are considered in this paper, ranging from partial ring-fencing to full ring-fencing. *Partial ring-fencing* assumes that only excess profits of subsidiaries, but not their excess capital buffers, can be re-allocated within a group. *Near-complete ring-fencing* assumes that only transfers from the parent to a subsidiary are allowed. *Full ring-fencing* corresponds to the strict *standalone subsidiarization* (SAS) model, where no intra-group transfers are allowed. The analysis presented below takes into account the parent banks' ownership stakes in their subsidiaries.

The *sample of banks* included in the analysis consists of 25 European banking groups and their 113 subsidiaries located in 18 countries in CESE. There are several reasons for using this sample: (i) most of these banks have a large network of subsidiaries operating in several countries in CESE region; and (ii) the fact that many countries in the region were severely hit by the crisis allows us to illustrate a range of outcomes under different ring-fencing assumptions, given a severe, but realistic credit shock affecting parts of these banking groups. The individual bank-level data on branches are not used in the estimation because branches are not stand-alone entities, which makes it difficult for the host country authorities

[6] The issue of intra-group liquidity transfers is not considered in this paper. It is left for future research.

[7] At the onset of the crisis, many European parent banks had direct cross-border loans on their books, which sometimes had been purchased from the subsidiaries in the boom years. There is anecdotal evidence that suggests that the reverse happened during the crisis; that is, in some cases, subsidiaries with large capital buffers bought back loans from the parent banks, thereby, reducing their capital adequacy ratios (CARs).

to ring fence them. The CESE exposures via branches are analyzed as part of the total direct cross-border exposures of parent banks[8].

Qualitatively, the *results* of the analysis are fairly intuitive: any type of restrictions on intra-group transfers would entail the need for additional, and possibly significant, capital buffers at the subsidiary and/or the parent bank level of cross-border banking groups. Quantitatively, the sample banks' capital needs resulting from a simulated credit shock affecting their CESE subsidiaries over the 2009-2010 period are 1.5-3 times higher in the ring-fencing/SAS scenarios than those under no ring-fencing. These results are robust to variations in the methodology for computing capital needs, including the post-shock adjustment in risk-weighted assets (standardized versus the Basel II Internal Ratings Based (IRB) approach).

What are the policy implications of this analysis? *First*, the establishment of a credible framework for the resolution of cross-border banking groups would help to avoid unilateral and likely more costly solutions (in terms of capital requirements). This is because the existence of such a framework could reduce the incentives for and the incidence of ring-fencing by the home/host country authorities. *Second*, in the absence of such resolution and burden-sharing mechanisms, setting the minimum capital requirements for cross-border banking groups would have to take into account the potential presence of ring-fencing, especially in crisis times. Such a possibility may force cross-border banks to gravitate towards organizational structures that are more immune to ring-fencing (either SAS-type structures or branch structures). *Third*, should regulators decide to promote a SAS-like approach, its potential benefits would have to be carefully weighed against its costs.

The rest of the paper is organized as follows. Section II provides a description of the exercise and the data. Section III explains the calibration of the credit shock affecting CESE subsidiaries. Section IV presents the methodology for calculating capital needs, as well as the main results under different ring-fencing scenarios. Section V draws conclusions and discusses policy implications.

[8] The choice between branches and subsidiaries has been analyzed in the literature. CERUTTI *et al.* (2007), for example, found that cross-border banking groups are more likely to set up a branch than a subsidiary in host countries with relatively higher corporate taxes, since this makes it easier to transfer profits across borders. Other considerations in the choice between branches and subsidiaries were: (i) branches are more common when foreign operations are smaller in size and do not have a retail orientation; (ii) branches are less common in countries with highly risky macroeconomic environments, where parent banks seem to prefer the 'hard' shield of limited liability provided by subsidiaries; (iii) foreign banks tend to specialize in one organizational form or the other, beyond what is explained by their home-country regulation; and (iv) foreign banks are less likely to operate as branches in countries that limit their activities and where regulation makes it difficult to establish new banks.

8.2. CROSS-BORDER BANKING GROUPS

8.2.1. Description of the Exercise

Consider a stylized cross-border banking group that has subsidiaries operating in countries A, B, and C (Figure 1). Suppose that countries A, B, and C are affected by a regional shock that leads to a significant deterioration in the credit quality of the loan books of subsidiaries operating in these countries. Suppose that losses resulting from this shock are offset by profits and capital buffers held by each of these subsidiaries (as a first line of defense) and by funds transferred from the rest of the group (as a second line of defense).

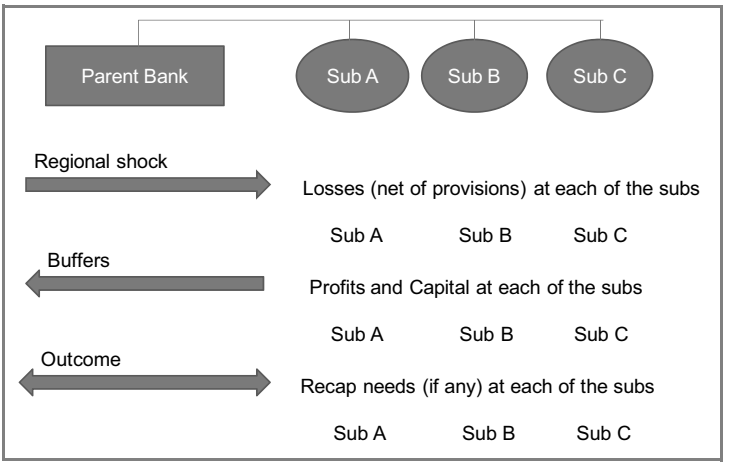
The capital needs resulting from the CESE credit shock are estimated in two steps:

- *for each subsidiary*, the capital need is defined as the amount of capital required to bring its post-shock CAR back to either the country-specific (basel ii) regulatory minimum or to the subsidiary-specific pre-shock level[9], the latter is conservative in that it requires subsidiaries not to run down pre-shock buffers;
- *at the group level*, total capital needs are computed by adding up all the capital needs of individual subsidiaries (and also losses on direct cross-border exposures of parent banks, in some simulations) and offsetting them against any other funds (i.e., excess profits and/or capital) that can be re-allocated from other parts of the banking group.

Hence, the resulting total capital needs at the group level depend on the availability of excess profits and/or capital in the subsidiaries and parent bank, as well as on the degree to which these funds (excess profits and/or capital) can be re-allocated within a group.

[9] The post shock CAR is estimated by taking into account actual or projected losses, provisions, capital buffers, and possible increases in risk-weighted assets.

Figure 1. A Stylized Example of a Cross-Border Banking Group – Impact of a Regional Credit Shock on Subsidiaries A, B, and C

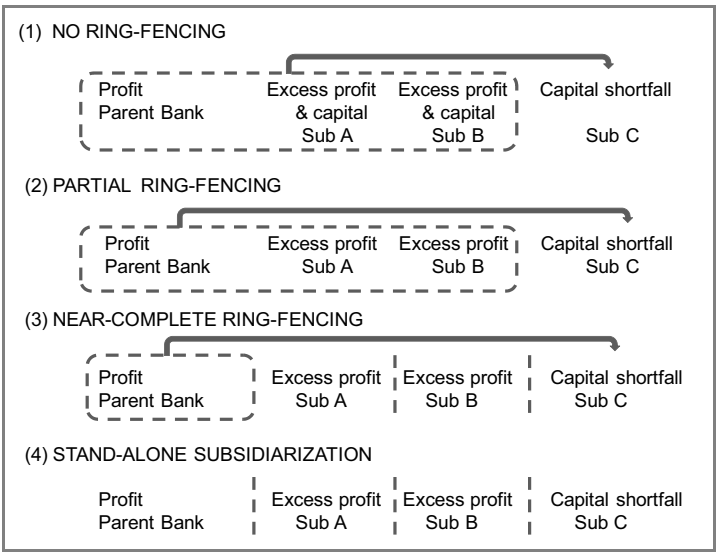


Suppose that as a result of the shock, one of the three subsidiaries (Sub C in Figure 2) experiences a capital shortfall (i.e., its regulatory capital falls below the national minimum capital requirement). Then, the extent to which this subsidiary can be recapitalized using the funds transferred from other parts of the group (i.e., without having to raise fresh capital) would depend on the existence of restrictions on such transfers (i.e., on the degree of ring-fencing).

Four ring-fencing scenarios are analyzed in this paper and illustrated in Figure 2:

1) *the no ring-fencing* scenario assumes that parent bank's profits, as well as subsidiaries' excess profits *and* excess capital buffers can be used to cover capital shortfall in any of the subsidiaries;
2) *the partial ring-fencing* scenario assumes that parent bank's profits and *only* subsidiaries' excess profits, but not excess capital, can be re-allocated within a group;
3) the *near-complete ring-fencing* scenario assumes that only transfers from the parent to any of the subsidiaries are allowed;
4) *the full ring fencing*, i.e., stand-alone subsidiarization SAS, assumes that no transfers between any of the group's affiliates (including from the parent bank to subsidiaries) can take place.

Figure 2. A Stylized Example of a Cross-Border Banking Group – Reallocation of Funds Within a Group to Cover Capital Shortfall at Subsidiary C



8.2.2. Sample Description

The analysis focuses on 25 European cross-border banking groups with parent banks domiciled in Austria, Belgium, Norway, France, Germany, Greece, Italy, Netherlands, and Sweden that have significant presence in the CESE region (Table 1). The CESE subsidiaries of the European banking groups listed in Table 1 include the ones operating in Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Turkey, and Ukraine.

For each banking group, only the CESE subsidiaries with total assets of at least $1 billion, in which the parent bank has an ownership stake of at least 20 percent, are included in the sample[10]. The final sample contains 25 banking groups and 113 CESE subsidiaries, covering the majority of European banking groups with a significant presence in the CESE, as well as a substantial share of the banking sector assets in most CESE host countries. The total assets of the sample subsidiaries represent, on average, about 50 percent of the host country's total banking system assets, with significant coverage within EU countries (about 60 percent) (Figure 3).

[10] Data availability is another limiting factor. It should also be noted that for the majority of subsidiaries in the sample the ownership stake of the parent bank exceeds 50 percent.

Table 1. Sample Banking Groups and Their CESE Subsidiaries (A circle may indicate the presence of more than one subsidiary)[11]

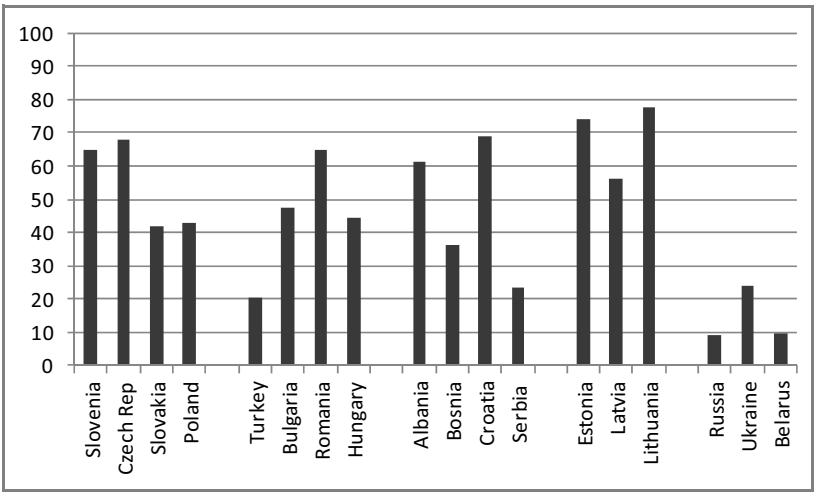
		Subsidiaries																	
		Central Europe				Southern and South-Eastern Europe				Southern Europe (Balkans)				Baltic Countries			CIS		
Parent Bank	*Parent bank's home country*	Slovenia	Czech Rep.	Slovakia	Poland	Turkey	Bulgaria	Romania	Hungary	Albania	Bosnia	Croatia	Serbia	Estonia	Latvia	Lithuania	Russia	Ukraine	Belarus
Erste Group Bank	Austria		●	●				●	●			●	●					●	
RZB	Austria	●	●	●	●		●	●	●	●		●	●				●	●	●
Volksbank	Austria		●	●				●	●		●	●	●						
Bank Austria 1/	Austria	●	●	●		●	●	●	●		●	●	●		●		●	●	
Hypo Alpe Adria Group 2/	Austria	●									●	●	●						
Dexia	Belgium					●													
KBC Bank	Belgium	●	●	●	●		●		●								●		
DNB NOR	Norway				●										●	●			
BNP Paribas	France		●		●	●											●	●	
Société Générale	France	●	●				●	●		●		●					●		●
Crédit Agricole	France				●	●	●	●										●	
Bayern LB	Germany								●										
Commerzbank	Germany				●		●	●		●							●		
Deutsche Bank	Germany				●	●			●										
Alpha Bank	Greece							●											
EFG Eurobank	Greece					●	●	●											
NBG	Greece					●	●	●											
Piraeus Bank	Greece						●			●									
Allied Irish Banks	Ireland				●		●												
Intesa Sanpaolo	Italy	●						●	●	●							●	●	
UniCredit SpA	Italy				●														
ING Bank	Netherlands				●	●											●	●	
Nordea Bank	Sweden				●												●		
SEB	Sweden													●	●	●	●		
Swedbank	Sweden													●	●	●	●	●	

Sources: Bankscope and Bank reports.

Notes: 1/ Subsidiary of Unicredit and 2/ Subsidiary of BayernLB.

[11] See Appendix 2 for a detailed description of the sample.

Figure 3. Total Assets of Sample CESE Subsidiaries (In percent of total banking assets of the host country, December 2008)



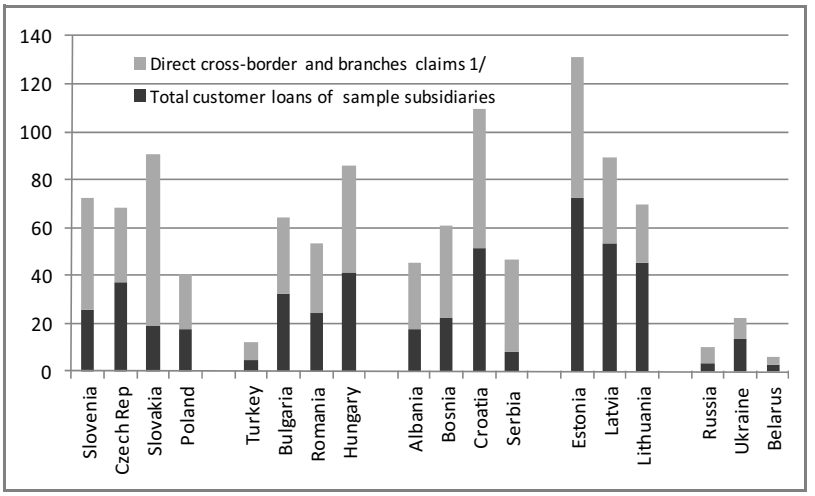
Source: Bankscope, national authorities, and staff estimates.

That said, the total assets of subsidiaries included in the sample do not necessarily capture the full CESE exposures of these banking groups. This is because the latter could also include the parent banks' direct cross-border lending to CESE countries, as well as lending by the branches operating in the host countries alongside the subsidiaries[12]. In order to capture these exposures, the aggregate BIS data on foreign claims by reporting banks on the CESE countries are used to impute the residual exposures of the banking groups to the CESE countries, including both direct cross-border exposures and exposures through branches (Figure 4). The data used for this purpose comes from the BIS consolidated international banking statistics (see Appendix 7 for details).

For each banking group, end-2008 data on total assets, total customer loans, profits, nonperforming loans (NPLs), loan loss provisions, regulatory capital, Tier 1 capital and risk-weighted assets were collected at the group level, at the parent bank level and at the level of individual CESE subsidiaries (when available). The main data sources include Bankscope, Bloomberg, as well as individual bank reports.

[12] There are some cross-border banking groups that conduct mainly direct cross-border lending instead of lending through subsidiaries/branches (see MCCAULEY, MCGUIRE and VON PETER, 2010).

Figure 4. Total Foreign Claims of Sample Banking Groups on the CESE Countries (In percent of host country GDP, December 2008)



8.3. CALIBRATION OF THE CESE REGIONAL SHOCK

8.3.1. Country-Level Data

The CESE credit shock is modeled as deterioration in macroeconomic conditions during 2009-10 leading to an increase in NPLs and a decrease in the return on assets (ROAs) of the CESE subsidiaries. The simulation of the shock relies largely on the actual data for 2009 and on projections for the CESE country-level NPLs and ROAs for 2010, which assume a slower economic recovery than the one envisaged in the April 2010 IMF's World Economic Outlook (WEO) forecasts.

Changes in NPLs and ROAs are linked to the changes in macroeconomic conditions via panel regression models. The rationale behind this approach is to use consistent data across countries to come up with a specification that captures historical NPL and ROA patterns in the CESE region rather than fitting country-specific dynamics separately or extrapolating from past crises that occurred in other regions.

The panel regression analysis uses annual data for all CESE countries for the period of 1999-2009. The data for the dependent variable, aggregate NPLs at the country level, comes from the IMF's Global Financial Stability Reports (IMF, 2009, Table 24). The data are examined for possible structural breaks and inconsistencies in the NPL definitions across countries[13].

[13] See Appendix 3 for details.

The GDP data comes from the IMF's World Economic Outlook (WEO) database. Interest rate data come from different sources: when T-bill rates are not available, the Money Market Rates (Serbia, Ukraine, and Estonia) or other comparable interest rates (Bosnia-Herzegovina, Bulgaria, Romania, Slovakia, and Belarus) are used instead (Appendix 4).

Table 2 shows descriptive statistics for the variables used in the regression analysis:

Table 2. Descriptive Statistics

Variables (all in percent)	N	Mean	StDev	Min.	Max.
NPLs	185	7.6	7.3	0.2	35.8
GDP growth	198	3.0	4.9	-18.5	12.2
Interest Rate	187	10.5	12.9	1.4	93.2
ROA	179	1.2	1.3	-6.1	3.3

Sources: GFSR (IMF 2010a), and International Financial Statistics.

Notes: N denotes the number of observations and StDev is the standard deviation.

8.3.2. Regression Analysis

For the NPL model, from a large set of macroeconomic variables that could potentially influence the NPL dynamics, only two variables turned out to have reliable predictive power, namely real annual GDP growth rates and short-term interest rates. Other potential explanatory variables (e.g., inflation rates, output gaps, growth of private sector credit (as a share of GDP), long-term nominal interest rates, the REER overvaluation, foreign currency debt (as a share of GDP), government debt, and real government revenue) were either not significant or not available for the entire sample period. For the ROA model, the same variables (GDP growth, short-term interest rates) as well as the NPL ratios were statistically significant.

The estimated dynamic panel model for NPLs is as follows:

$$npl_{i,t} = \alpha + \beta_1 npl_{i,t-1} + \beta_2 \Delta GDP_{i,t} + \beta_3 \text{interest}_{i,t} + \varepsilon_{i,t} \quad (1)$$

where *npl* stands for nonperforming loans (as a share of total loans), ΔGDP for the real GDP growth on an annual basis and *interest* for the short-term nominal interest rate. ε is the error term, $i = 1, 2, \ldots N$, denotes the country and $t = 1, 2, \ldots T$ denotes the time period.

Three specifications of model (1)-fixed effects, Arellano-Bond, and Arellano-Bover – are considered, yielding similar results (Table 3). For the simulation of shocks, the Arrellano-Bover dynamic panel specification is chosen, given its better

asymptotic properties for small T and large N dynamic panels than fixed effects, and the fact that it minimizes the data loss compared to the Arrellano-Bond dynamic panel specification.

Table 3. The Dynamic Panel Regression Output for Nonperforming Loans

Variable	Fixed Effects	Arellano-Bond	Arellano-Bover
NPL (t – 1)	0.6116***	0.6342***	0.7198***
GDP (t)	–0.2633***	–0.2930***	–0.3576***
Interest (t)	0.1241***	0.1437***	0.0714**
Constant	2.1183***	1.8891***	2.1161***
Number of Observations	170	143	161
Number of Groups	18	18	18
R^2	0.69	N/A	N/A
Wald Chi^2	N/A	361	424

Source: Staff estimates.

*Note: ***, **, * denote significance at the 1 percent, 5 percent, and 10 percent level respectively.*

Unsurprisingly, NPLs display high persistence. The signs of the explanatory variables are also as expected, with a negative sign for GDP growth rates and a positive sign for interest rates. Real GDP growth rates have the most significant impact on NPLs among the macroeconomic variables included in the regression equation. Overall, the model-based NPLs match the historical NPL patterns quite well. The model works worst for Estonia, where the model-based NPLs are substantially higher than the observed ones, which is likely to be partly driven by the definition of NPLs (Appendix 3).

For the ROA model, all explanatory variables are highly significant in all specifications, except for the lagged ROAs in the fixed-effects and the Arellano-Bover specifications (Table 4). All signs are as expected and in line with other studies (e.g., Babihuga 2007). The Arellano-Bover model is the preferred specification.

Table 4. The Dynamic Panel Regression Output for ROAs

Variable	Fixed Effects	Arellano-Bond	Arellano-Bover
ROA (t – 1)	0.0856	0.1326**	0.0834
GDP (t)	0.0723***	0.0840***	0.0768***
Interest (t)	–0.0523***	–0.0318***	–0.0230***
NPLs (t)	–0.0479***	–0.0514***	–0.0799***
Constant	1.7519***	1.5055***	1.7181***
Number of Observations	157	139	157
Number of Groups	18	18	18
R^2	0.52	N/A	N/A
Wald Chi^2	N/A	146	232

Source: Staff estimates.

*Note: ***, **, * denote significance at the 1 percent, 5 percent and, 10 percent level, respectively.*

8.3.3. Calibration of NPLs and ROAs

The *baseline scenario* uses the actual 2009 NPL ratios for the banking sectors of the CESE country and the 2010 NPL ratios projected using the Arellano-Bover regression estimation, the WEO forecast of GDP, CPI and Libor six-month (in €) for 2010.

The *adverse scenario* uses the actual NPL data for 2009 (as in the baseline) and the 2010 NPL projections based on the assumption that for each of the CESE countries, the 2010 GDP growth rate is 2 percentage points lower than the 2010 April WEO GDP growth rate forecasts and the 2010 interest rate is 200 basis points higher than in 2009. Given the dominant role of GDP in the regression specification that is used to calibrate the shock, the adverse scenario features a slow recovery and high NPLs in both years, with most of the NPL increase taking place in 2009. The NPLs estimated under the 2010 baseline scenario are broadly in line with the estimates in the GFSR (April 2010, IMF 2010a)[14]. Overall, the adverse scenario can be characterized as relatively 'mild' among the plausible adverse scenarios, not necessarily too far away from the baseline (Table 5).

[14] The averse scenario used in this paper is somewhat less severe than the adverse growth scenario in the GFSR (April 2010, IMF 2010a), with NPLs that are 3-5 percentage points lower for the CEEs, SEEs and the Baltic states. For the CIS, the figures are comparable, as the figures in this paper include Belarus (with low NPLs), whereas the GFSR did not.

Table 5. Country-Specific NPL Assumptions

	2008 Median	2009 Median 1/	2010 Baseline Median 2/	2010 Adverse Median 3/
Baltic countries	3.6	16.4	15.9	16.8
CEE-3	3.3	5.6	5.9	7.0
CIS	3.8	9.6	8.1	9.1
SEE	4.3	6.4	7.4	8.3

Source: Staff estimates.

1/ The 2009 provisional data come from IMF, 2010, Table 24;
2/ Baseline scenario uses NPLs estimated via dynamic panel regression using CESE 1999-2008 data. WEO assumptions are used for out-of-sample forecasts;
3/ Adverse scenario assumes a slow recovery, i.e., 2010 GDP growth is 2 percentage points below the 2010 WEO GDP growth forecasts, and interest rates are 200 bps higher than in 2009.

For subsidiaries, 2009-10 profits are calculated by taking the actual 2008 pre-provision profits of individual subsidiaries as a base and applying the same rate of change as that of the country level ROAs calculated based on the regression model (Table 6). The regression based estimates of ROAs are adjusted downward for Slovenia, Slovakia, Belarus and Bosnia-Herzegovina and upward for Romania and Bulgaria[15].

Table 6. Country-Specific ROA Assumptions

	2008 Median	2009 Median /1	2010 Baseline Median 2/	2010 Adverse Median 3/
Baltic countries	1.2	–0.1	0.0	–0.2
CEE-3	1.2	1.1	1.2	1.0
CIS	1.4	0.5	1.0	0.8
SEE	1.7	0.9	1.0	0.8

Source: Staff estimates.

1/ The 2009 provisional data come from IMF, 2010, Table 24;
2/ Baseline scenario uses ROAs estimated via dynamic panel regression using CESE 1999-2008 data;
3/ Adverse scenario assumes a slow recovery, i.e., 2010 GDP growth is 2 percentage points below the 2010 WEO GDP growth forecasts, and interest rates are 200 bps higher than in 2009.

For parent banks, the 2009 net profits are either the actual numbers or estimates based on market consensus forecasts[16]. The 2010 profits are assumed to be equal to the 2009 profits, provided that the latter were positive, and zero otherwise.

[15] The adjustment accounts for the fact that the returns have been lower (first group of countries) or higher (Romania and Bulgaria) than on average in the sample in the past, which could be triggered by the level of competition, for example. The adjustment was 0.4 (Bulgaria) and 0.7 (Romania) in positive terms as well as 0.5 (Belarus and Slovakia) and 0.7 (Bosnia-Herzegovina and Slovenia) in negative terms.

[16] Parent banks' net profits are used because parent bank' non-CESE-related losses are not explicitly included in the simulations. As explained at the end of the next section, some adjustments are needed to parent banks' net profits when including parent banks' direct cross-border CESE losses to avoid double counting.

While this assumption is ad hoc, it is fairly neutral and is unlikely to introduce an upward bias in the estimates of capital needs.

8.4. ASSESSING BANK CAPITAL NEEDS UNDER ALTERNATIVE RING – FENCING SCENARIOS

8.4.1. Methodology

This section presents the method applied to calculate capital adequacy under stress, and capital requirements, respectively.

The *loan loss reserve (LLR)* for subsidiary *k* located in a CESE country *i* following a credit shock is as follows:

$$\text{Post-shock LLR}_{k,i} = \text{NPL}_{k,i} * \text{E}_{k,i} * \text{LGD}_i \quad (2)$$

where $\text{NPL}_{k,i}$ is the post-shock NPL ratio[17] (nonperforming loans in percent of total exposure), $\text{E}_{k,i}$ is the total exposure (customer loans), and LGD_i is the loss given default (assumed to be the same for all subsidiaries operating in country *i*). Because bank-level end-2008 NPL data are not available for the majority of subsidiaries in the sample, the country-level end-2008 NPL ratios are used to proxy for the pre-shock bank-level NPL ratios. Country-specific LGDs come from the World Bank's Doing Business webpage. In order to account for the empirical finding that LGDs tend to increase during economic downturns, a formula proposed by the Federal Reserve Board (2006) to derive downturn LGDs is applied to country-specific LGDs[18].

For each subsidiary, the *capital need* is defined as the amount of capital required to bring its post-shock CAR back to the country-specific (Basel II) regulatory minimum level[19].

The CAR of subsidiary *k* located in a CESE country *i* before the shock is:

$$\text{Pre-shock CAR}_{k,i} = \text{Regulatory Capital}_{k,i}/\text{RWA}_{k,i} \quad (3)$$

The post-shock CARs of subsidiaries reflect the impact of losses and possible under-provisioning (net of pre-shock LLR and pre provision profits at the subsidiary level) and an adjustment in Risk-Weighted Assets (RWAs) after the shock (denoted $\Delta\text{RWA}_{k,i}$). More specifically, the post-shock CAR of subsidiary *k* located in a CESE country *i* is as follows:

[17] The stock (rather than the flow) of NPLs is considered in order to account for both possible under-provisioning as well as provisions on additional NPLs.
[18] See Appendix 6 for details.
[19] The regulatory minimum CARs for the CESE countries are presented in Appendix 5.

$$\text{Post-shock CAR}_{k,i} = \frac{(\text{Regulatory Capital}_{k,i} - \text{Additional Provisions}_{k,i})}{(\text{RWA}_{k,i} + \Delta\text{RWA}_{k,i})} \quad (4)$$

where

$$\text{Additional Provisions}_{k,i} = \begin{cases} \text{Post-shock LLR}_{k,i} - \text{Pre-shock LLR}_{k,i} - \text{Profit}_{k,i}, \text{ if positive} \\ 0, \text{ otherwise} \end{cases}$$

Under the standardized approach, $\Delta\text{RWA}_{k,i}$ is negative and corresponds to written-off losses[20,21].

Then, the *capital need* (CN) at the group level is defined as the total amount of capital required to restore the CARs of all of the group's affiliates to their regulatory minimums. Clearly, the extent to which this can be done by re-allocating excess profits or excess capital within a group would reduce the need for fresh capital at the group level. This, in turn, would depend on the degree of ring-fencing within a group.

The precise definitions of the banking groups' capital needs related to their CESE subsidiaries under different ring-fencing assumptions are presented in Table 7. *Excess profit* refers to the residual profit of a given subsidiary after it covers its own capital needs and *excess capital* refers to the capital cushion above the regulatory minimum. The excess profits/capital and losses of the subsidiaries are computed taking into account the parent bank's *ownership stake* in each of these subsidiaries.

Table 7. Definitions of Capital Needs Under Four Ring-fencing Scenarios

Scenarios	Capital Needs after a CESE Credit Shock (if positive)
No ring-fencing	CN(1) = sum of capital needs of all CESE subsidiaries – sum of excess profits and capital of all CESE subsidiaries – profits of the parent bank
Partial ring-fencing	CN(2) = sum of capital needs of all CESE subsidiaries – sum of excess profits of all CESE subsidiaries – profits of the parent bank
Near-complete ring-fencing	CN(3) = sum of capital needs of all CESE subsidiaries – profits of the parent bank
Stand-alone subsidiarization	CN(4) = sum of capital needs of all CESE subsidiaries

[20] An alternative approach – the Basel II Internal Ratings Based (IRB) approach, was considered as well. According to the IRB approach, $\Delta\text{RWA}_{k,i}$ takes into account the overall increase in the riskiness of performing loans that is likely to be associated with the increase in NPLs and hence, can be positive despite the write-offs. The results based on the IRB approach are broadly similar to the standardized approach, with the estimated recapitalization needs being slightly higher under the IRB approach. The small difference between the two approaches results from the high level of credit risk. In 'normal' times, the difference could be substantial.

[21] Dividends are not explicitly modeled. It is implicitly assumed that most of the profits are retained.

Note that under the SAS scenario, the capital needs of the banking group are equal to the sum of the capital needs of all its CESE subsidiaries. Since the SAS approach presumes that all subsidiaries are self-sufficient, the capital needs under SAS would have to be covered by individual subsidiaries themselves, either by raising funds in the capital market or from other sources (such as the assistance from the local authorities).

As an additional exercise, the capital needs of sample banks are also computed taking into account the parent bank's losses from direct cross-border exposures to the CESE countries. This is done in two steps: first, the 2009 cross-border losses are estimated as direct cross-border exposures * additional NPLs * LGD; second, the 2009 net profits of parent banks are adjusted by adding back 50 percent of the 2009 estimated cross-border losses to the actual or estimated 2009 net profits (50 percent provisioning assumption)[22]. This conservative approach is used because the data on provisions on direct cross-border exposures parent banks are not available.

8.4.2. Results

Using the framework and assumptions described above, the capital needs of the sample banking groups are first computed for their indirect CESE exposures via subsidiaries, assuming that subsidiaries have to restore their post-shock CARs up to the regulatory minimum levels. Next, the banking groups' capital needs are computed for both indirect exposures via subsidiaries and direct cross-border exposures to the CESE region. Finally, the simulations are repeated using a different definition of capital needs for the subsidiaries, namely the amount of capital required for the subsidiaries to restore the post-shock CARs back to the pre-shock (end-2008) levels; because these pre-crisis CARs were generally above the regulatory minimums, capital needs computed under this alternative definition are higher.

Focusing only on indirect exposures via subsidiaries, the results are as follows (see Figure 5):

(i) eight out of 25 banking groups have no capital needs related to their CESE subsidiaries (i.e., CN(4)=0);

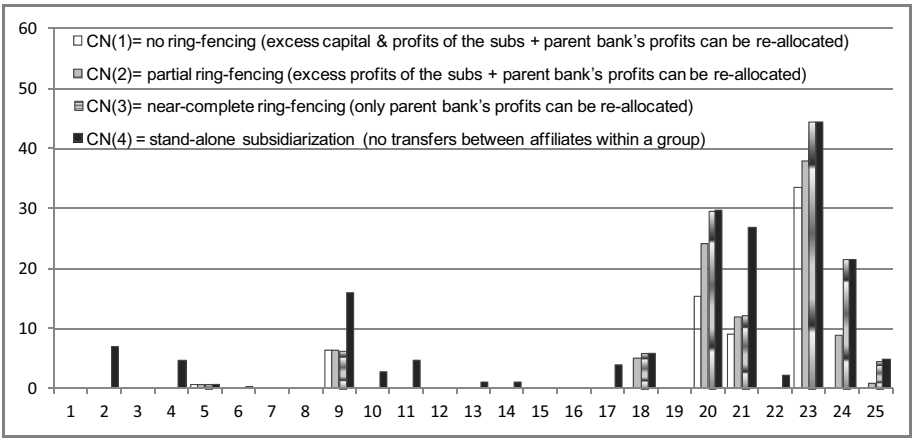
(ii) five out of 25 banking groups have significant capital needs related to their CESE subsidiaries (i.e., CN(4) > 10 percent of the banking group's regulatory capital). As expected, the capital needs of the banking groups to ensure adequate capitalization of all parts of the group after the shock are higher under near-complete/partial ring-fencing than under no ring-fencing, with the differences being larger for more diversified groups. For example, one of the

[22] The detailed discussion of how cross-border exposures are imputed from the BIS data is in Appendix 7.

banking groups (#24), which faces the CESE related capital needs of over 20 percent of its regulatory capital under the SAS model (CN(4)), has zero capital needs under no ring-fencing (CN(1)). In the cases when the parent banks' profits are zero/negative (meaning that they cannot provide support for their subsidiaries), CN(3)=CN(4). More generally, in the no ring-fencing scenario (which allows reallocation of both excess profits and capital), only five out of 25 banking groups would still face non-zero capital needs after re-allocation, compared to 17 in case of the SAS (where no transfers are allowed within a group).

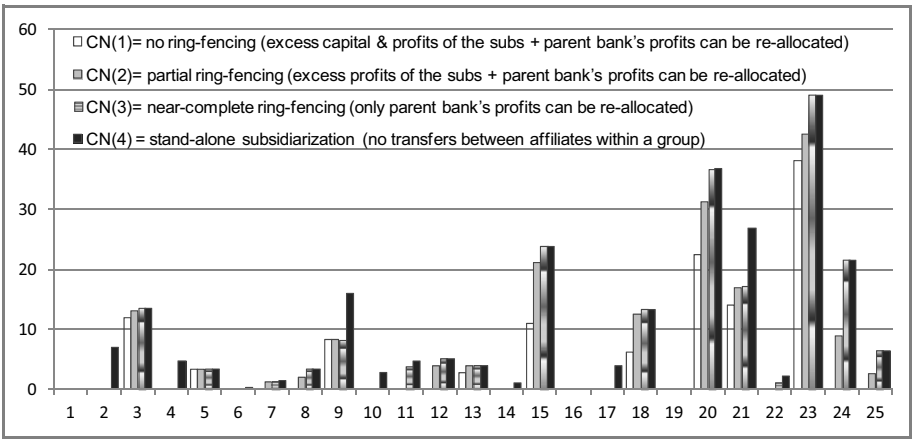
Figure 6 presents the estimated capital needs taking into account direct cross-border exposures and lending via branches, in addition to the exposures via subsidiaries in the sample. While the CN measures in Figure 6 are notably higher than in Figure 5, the results are broadly similar, that is, more ring-fencing entails larger capital needs for most banking groups, with 9 banks (in the no ring-fencing scenario) to 22 banks (in the SAS scenario) in need of extra capital.

Figure 5. Estimated Capital Needs Resulting From a CESE Shock – Only Indirect Exposures via Subsidiaries in the Sample (as a percent of the group's regulatory capital)



Source: Authors' estimates.

Figure 6. Estimated Capital Needs Resulting From a CESE Shock – Indirect Exposures via Subsidiaries and Direct Cross-border Exposures (as a percent of the group's regulatory capital)



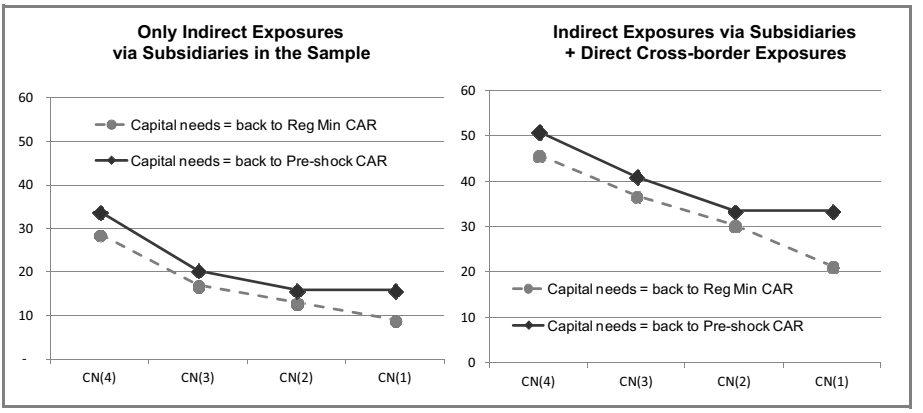
Source: Authors' estimates.

Recall that the simulations presented in Figures 5-6 use the definition of capital needs, which requires that the post-shock CARs of all affiliates of the banking groups in the sample are restored to their respective country regulatory minimum levels. One could argue, however, that it may be prudent to maintain higher-than-regulatory minimum capital buffers, especially in crisis times, when uncertainty about credit quality is particularly high. To account for this possibility, capital needs are re-computed assuming that the post-shock CARs of all affiliates of the banking groups have to be restored back to their pre-shock levels. While the latter means that the overall capital needs are somewhat higher, the main result – that in the case of ring-fencing/SAS, the sample banks' aggregate capital needs are much higher than in the case of no ring-fencing – still holds (Figure 7).

To sum up, the results shown in Figures 5-6 suggest that under ring-fencing/SAS the sample banks' aggregate capital needs resulting from a CESE shock are 1.5-3 times higher than in the abscence of ring-fencing (see Figure 7). These estimates appear to be within the range of the loss/recapitalization estimates provided by private analysts at end-2008 or early 2009 for different economic downturn scenarios in Eastern Europe during 2009-10[23].

[23] See Appendix 8 for details.

Figure 7. Aggregate Capital Needs of Sample Banks Resulting From a CESE Shock (in billions of dollars)



Source: Authors' estimates.

8.5. CONCLUSIONS

The simulation of the capital needs of 25 large European banking groups resulting from a credit shock affecting their CESE subsidiaries, under different ring-fencing scenarios, shows that these groups would need to have substantially higher capital buffers at the parent and/or subsidiary level if they face a risk of being unable to transfer capital and/or profits across borders. The extent to which this would have a material impact on individual groups would depend on the significance of the CESE subsidiaries for each group as a whole.

As discussed above, the use of ring-fencing by regulators, as well as proposals, such as the SAS approach, have been largely motivated by the difficulty of resolving cross-border banking groups and the lack of agreed upon principles on cross-border resolution and burden sharing. This highlights the policy dilemma that emerges from tensions between the increasingly international nature of banking activities and the national nature of regulatory/legal frameworks.

There seem to be two possible alternative paths going forward:

(i) a credible international resolution and burden-sharing mechanism would reduce the need for and incidence of ring-fencing, and allow greater scope for cross-border banking groups to manage their capital and liquidity in a centralized manner, provided that it is in line with the bank's business model;

(ii) in the absence of such burden-sharing mechanisms, regulators would need to consider setting minimum capital requirements for cross-border banking groups at a higher level, taking into account the possibility of ring-fencing, especially in crisis situations. In order to ensure that a banking group is resil-

ient to all types of ring-fencing, all legally independent parts of the group (parent company and subsidiaries) would have to hold capital buffers that ensure self-sufficiency. The latter is likely to have implications for the banking group structures, the scope/scale of their cross-border activities, the supply of credit, and competition between local and foreign banks.

The choice between (i) and (ii) would ultimately depend on the balance of potential benefits and costs, including those associated with higher capital requirements, as well as possible political constraints involved in choosing either one of the two paths. In particular, the European experience before the crisis showed that reaching an agreement on a credible resolution and burden-sharing mechanism may be challenging. That said, the crisis provided additional impetus towards reaching an international consensus on a cross-border resolution framework, as evidenced by the ongoing work of the Financial Stability Board (on principles for cross-border resolutions), as well as of other international organizations[24].

[24] See, for example, IMF (2010b).

APPENDICES

Appendix 1. Capital Adequacy Rates by Country and Bank Type

Table A1.1. Average CARs of Foreign-owned Sample Subsidiaries vs. the Country-level Average CARs

Country	CAR (Sample subsidiaries) 1/	CAR (Foreign-owned and domestic banks) 2/
Albania	16.4	17.2
Belarus	14.3	21.8
Bosnia	14.0	16.3
Bulgaria	13.6	14.9
Croatia	14.4	15.4
Czech Republic	11.0	12.3
Estonia	15.2	13.3
Hungary	9.4	11.1
Latvia	12.3	11.8
Lithuania	11.5	12.9
Poland	10.9	10.8
Romania	13.7	13.8
Russia	15.0	16.8
Serbia	18.6	21.9
Slovakia	10.0	11.1
Slovenia	11.7	11.7
Turkey	15.8	18.0
Ukraine	16.1	14.0
Cross-country Average	**13.5**	**14.7**

Source: Bankscope and Bank reports (sample), GFSR (country level data).

1/ Authors' calculations;
2/ Global Financial Stability Report (IMF).

Appendix 2. Sample of Banking Groups and their Subsidiaries

Table A2.1. Sample Description

	Parent Bank	Home country	Subsidiary	Host country
1	RZB	Austria	RAIFFEISEN BANKA DD	Slovenia
2	Bank Austria	Austria	UNICREDIT BANKA SLOVENIJA D.D.	
3	Hypo Alpe Adria Group	Austria	HYPO ALPE-ADRIA-BANK DD	
4	KBC	Belgium	NLB DD-NOVA LJUBLJANSKA BANKA	
5	SocGen	France	SKB BANKA DD	
6	Intesa	Italy	BANKA KOPER D.D.	
7	Erste Group	Austria	CESKA SPORITELNA	Czech Republic
8	RZB	Austria	RAIFFEISENBANK AKCIOVA SPOLECNOST	
9	Volksbank	Austria	VOLKSBANK CZ	
10	Bank Austria	Austria	UNICREDIT BANK CZECH REPUBLIC	
11	KBC	Belgium	CESKOSLOVENSKA OBCHODNI BANKA	
12	KBC	Belgium	CESKOMORAVSKA STAVEBNI SPORITELNA	
13	SocGen	France	KOMERCNI BANKA	
14	Erste Group	Austria	PRVA STAVEBNA SPORITELNA AS	Slovakia
15	Erste Group	Austria	SLOVENSKA SPORITEL'NA AS	
16	RZB	Austria	TATRA BANKA A.S.	
17	Volksbank	Austria	VOLKSBANK SLOVENSKO, AS	
18	Bank Austria	Austria	UNICREDIT BANK SLOVAKIA A.S.	
19	KBC	Belgium	CESKOSLOVENSKA OBCHODNA BANKA	
20	RZB	Austria	RAIFFEISEN BANK POLSKA SA	Poland
21	KBC	Belgium	KREDYT BANK SA	
22	DNB Nor	Norway	DNB NORD	
23	BNP Paribas	France	FORTIS BANK POLSKA SA	
24	Commerzbank	Germany	BRE BANK SA	
25	Deutsche	Germany	DEUTSCHE BANK POLSKA S.A.	
26	Allied Irish Bks	Ireland	BANK ZACHODNI WBK S.A.	
27	Unicredit	Italy	BANK POLSKA KASA OPIEKI SA-BANK PEKAO SA	
28	ING	Netherlands	ING BANK SLASKI S.A. - CAPITAL GROUP	
29	Nordea	Sweden	NORDEA BANK POLSKA SA	
30	Bank Austria	Austria	YAPI VE KREDI BANKASI A.S.	Turkey
31	Dexia	Belgium	DENIZBANK A.S.	
32	BNP Paribas	France	TURK EKONOMI BANKASI A.S.	
33	Credit Agricole	France	Calyon Yatırım Bankası Türk A.Ş.	
34	Deutsche	Germany	DEUTSCHE BANK AS	
35	Eurobank EFG	Greece	EUROBANK TEKFEN	
36	NBG	Greece	FINANSBANK A.S.	
37	ING	Netherlands	ING BANK AS	
38	RZB	Austria	RAIFFEISENBANK (BULGARIA) EAD	Bulgaria
39	Bank Austria	Austria	UNICREDIT BULBANK	
40	KBC	Belgium	CIBANK PLC	
41	SocGen	France	SOCIETE GENERALE EXPRESSBANK	
42	Credit Agricole	France	EMPORIKI BANK - BULGARIA EAD	
43	Commerzbank	Germany	PROCREDIT BANK (BULGARIA) AD	
44	Eurobank EFG	Greece	EUROBANK EFG BULGARIA AD (POSTBANK)	
45	NBG	Greece	UNITED BULGARIAN BANK - UBB	
46	Allied Irish Bks	Ireland	BULGARIAN-AMERICAN CREDIT BANK	

	Parent Bank	Home country	Subsidiary	Host country
47	Erste Group	Austria	ERSTE BANK HUNGARY NYRT	Hungary
48	RZB	Austria	RAIFFEISEN BANK ZRT	
49	Volksbank	Austria	MAGYARORSZAGI VOLKSBANK RT	
50	Bank Austria	Austria	UNICREDIT BANK HUNGARY ZRT	
51	KBC	Belgium	K&H BANK ZRT	
52	Bayern LB	Germany	MKB BANK ZRT	
53	Deutsche	Germany	DEUTSCHE BANK ZÁRTKÖRUEN MUKÖDO RÉSZVÉNYTÁRSASÁG	
54	Intesa	Italy	CIB Bank Zrt	
55	Erste Group	Austria	BANCA COMERCIALA ROMANA SA	Romania
56	RZB	Austria	RAIFFEISEN BANK SA	
57	Volksbank	Austria	VOLKSBANK ROMANIA	
58	Bank Austria	Austria	UNICREDIT TIRIAC BANK	
59	SocGen	France	BRD-GROUPE SOCIETE GENERALE SA	
60	Credit Agricole	France	EMPORIKI BANK - ROMANIA SA	
61	Commerzbank	Germany	PROCREDIT BANK S.A	
62	Alpha	Greece	ALPHA BANK ROMANIA	
63	Eurobank EFG	Greece	BANCPOST SA	
64	NBG	Greece	BANCA ROMANEASCA S.A.	
65	Intesa	Italy	INTESA SANPAOLO ROMANIA SA	
66	RZB	Austria	RAIFFEISEN BANK ALBANIA	Albania
67	SocGen	France	BANKA POPULLORE SH.A	
68	Commerzbank	Germany	PROCREDIT BANK (ALBANIA) SH.A	
69	Piraeus	Greece	TIRANA BANK SA-BANKA E TIRANES SHA	
70	Intesa	Italy	INTESA SANPAOLO BANK ALBANIA	
71	Bank Austria	Austria	UNICREDIT BANK	Bosnia
72	Hypo Alpe Adria Group	Austria	HYPO ALPE-ADRIA-BANK A.D., MOSTAR	
73	Hypo Alpe Adria Group	Austria	HYPO ALPE-ADRIA-BANK A.D. BANJA LUKA	
74	Erste Group	Austria	ERSTE & STEIERMÄRKISCHE BANK DD	Croatia
75	RZB	Austria	RAIFFEISENBANK AUSTRIA D.D., ZAGREB	
76	Volksbank	Austria	VOLKSBANK DD	
77	Bank Austria	Austria	ZAGREBACKA BANKA DD	
78	Hypo Alpe Adria Group	Austria	HYPO ALPE-ADRIA-BANK DD	
79	Hypo Alpe Adria Group	Austria	SLAVONSKA BANKA DD, OSIJEK	
80	SocGen	France	SOCIETE GENERALE - SPLITSKA BANKA	
81	Erste Group	Austria	ERSTE BANK A.D. NOVI SAD	Serbia
82	RZB	Austria	RAIFFEISENBANK A.D.	
83	Bank Austria	Austria	UNICREDIT BANK SERBIA JSC-UNICREDIT BANK SRBIJA A.D	
84	Hypo Alpe Adria Group	Austria	HYPO ALPE-ADRIA-BANK AD BEOGRAD	

	Parent Bank	Home country	Subsidiary	Host country
85	SEB	Sweden	SEB PANK	Estonia
86	Swedbank	Sweden	SWEDBANK AS	
87	Bank Austria	Austria	UNICREDIT BANK AS	Latvia
88	DNB Nord	Denmark	DNB NORD	
89	SEB	Sweden	SEB BANKA AS	
90	Swedbank	Sweden	SWEDBANK AS	
91	DNB Nord	Norway	DNB NORD	Lithuania
92	SEB	Sweden	SEB BANKAS	
93	Swedbank	Sweden	SWEDBANK AS	
94	RZB	Austria	ZAO RAIFFEISENBANK	Russia
95	Bank Austria	Austria	UNICREDIT BANK ZAO	
96	KBC	Belgium	ABSOLUT BANK	
97	BNP Paribas	France	BNP PARIBAS VOSTOK	
98	SocGen	France	BANK SOCIÉTÉ GÉNÉRALE VOSTOK	
99	SocGen	France	JSC ROSBANK	
100	Commerzbank	Germany	COMMERZBANK (EURASIJA)	
101	Intesa	Italy	KMB BANK/ SMALL BUSINESS CREDIT BANK	
102	ING	Netherlands	ING BANK (EURASIA) ZAO	
103	Nordea	Sweden	NORDEA BANK	
104	Swedbank	Sweden	SWEDBANK	
105	Erste Group	Austria	ERSTE BANK OJSC	Ukraine
106	RZB	Austria	RAIFFEISEN BANK AVAL	
107	Bank Austria	Austria	UKRSOTSBANK	
108	BNP Paribas	France	JSIB UKRSIBBANK	
109	Intesa	Italy	PRAVEX BANK	
110	ING	Netherlands	ING BANK UKRAINE	
111	Swedbank	Sweden	PUBLIC JOINT STOCK COMPANY SWEDBANK	
112	RZB	Austria	PRIORBANK	Belarus
113	SocGen	France	BELROSBANK	

Sources: Bankscope, Bank reports, and Analysts' reports.

Appendix 3. Panel Regression Analysis

Basic specification: We estimated the fixed-effects and random-effects specifications of the following panel regression model:

$$npl_{i,t} = \alpha + \beta_1 \Delta GDP_{i,t} + \beta_2 \text{interest}_{i,t} + \varepsilon_{i,t} \quad (1)$$

where *npl* stands for non-performing loans (as a share of total loans), ΔGDP for the real GDP growth on an annual basis and *interest* for the short-term nominal interest rates (T-bill rate). ε is the error term, $i = 1, 2, \ldots N$ denotes the country and $t = 1, 2, \ldots T$ the period. The results are presented in the Table below. Based on the Hausman test, the random effects specification is more appropriate than the fixed-effects specification.

Table A3.1. Panel Regression Analysis (Dependent Variable: NPLs)

Variable	Fixed Effect	Random Effects
GDP (t)	–0.1864***	–0.1797***
Interest (t)	0.2325***	0.2301***
Constant	5.8369***	5.7222***
Number of Observations	178	178
Number of Groups	18	18
R^2	0.23	0.23

Source: Staff estimates.

*Note: ***, **, * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.*

Robustness checks:

In order to investigate the *differences in NPL definitions* across countries, we compared the average level of bank provisions to NPLs over time. For most of the 18 countries, this ratio varies between 60 percent and 90 percent. In the case of Estonia, where the level of provisions ranges between 150 percent and 300 percent of NPLs during 2003-06 (the years for which the data is available), the level of NPLs seems particularly low, suggesting that the definition of NPLs in Estonia may be different from the one used in other countries. Estonia has, therefore, been excluded from some regression specifications as a means of robustness check. In addition, the ratio of provisions to NPLs in Russia fluctuated between 120 percent and 160 percent during 2003-08, which can again be seen as a sign that the definition of NPLs is relatively narrow (i.e., not as conservative) as in other countries. For Romania and Ukraine, the opposite seems to be true, which indicates that NPLs may be based on a fairly broad definition of potential losses.

For countries with *structural breaks* (Latvia, Lithuania, Poland, Slovakia, Serbia, Ukraine), we also checked whether there were any major changes in the levels of

NPLs observed around the timing of structural breaks in definitions. Since this was not the case, all NPL data from these countries were included in the regression models. Similarly, the regression results remained robust when excluding countries with structural breaks.

Appendix 4. Interest Rates Used for Regression Analysis

Table A4.1. Overview on Data Sources for Short-term Interest Rates

Country	Explanation	Source
Bosnia-Herzegovina	Interest rate is constructed as 2/3 times Deposit Rate + 1/3 times Lending Rate, starting in 2002 (other data is not available)	MBTS
Czech Republic	Treasury Bill Rate	MBTS
Latvia	Treasury Bill Rate	MBTS
Bulgaria	Treasury Bill Rate when available (2 years), otherwise inferred from Interbank Rate (3 months, Bloomberg), otherwise from Lending Rate	MBTS and Bloomberg
Croatia	Treasury Bill Rate from Bloomberg (from 2002 onwards), before that: adjust Money Market Rate weighted by the relative portion of T-Bill rates on money market rates from 2002 to 2008	IFTSTSUB (for 1992 to 2001), Bloomberg (from 2002)
Lithuania	Treasury Bill Rate (12 months) where possible, otherwise Government Bond Yield (12 months, from Bloomberg), recalculated to 12 months level, otherwise Interbank Rate, recalculated to 12-month T-Bill rate	MBTS and Bloomberg
Romania	Interbank short-term lending rate, similar to Treasury Bill Rate (91 days) (which is only available for some years)	MBTS
Slovakia	Average Deposit Rate (1993-1999), Government Bond Yield (2002-2006), Government Bond Yield (1 yr, from Bloomberg (2007 to 2009)	MBTS, Bloomberg
Slovenia	Treasury Bill Rate (from 1999), before that: Money Market Rate adjusted to Treasury Bill Rate	MBTS
Russia	Treasury Bill Rate for 2000-2003, after 2003: avg of money market rate and interbank rate (3 months), before 1999: Money Market Rate	MBTS, Bloomberg
Turkey	Treasury Bill Rate, if available; (before 1999: Money Market Rate), after 2007: 1-yr government bond yield.	IFTSTSUB, Bloomberg
Hungary	Treasury Bill Rate	MBTS
Poland	Weighted Average Treasury Bill Rate	MBTS
Serbia	Money Market Rate	IFTS
Ukraine	Money Market Rate	IFTS
Albania	Treasury Bill Rate	IFTS
Estonia	Money Market Rate	IFTS
Belarus	Data are scarce; adjusted deposit rates according to money market rates to deposit rates in Ukraine	IFTS

Source: International Financial Statistics (IFTS), Money and Banking Statistics and Bloomberg.

Appendix 5. Regulatory Minimum Capital Requirements by Country

Table A5.1. Regulatory Minimum Capital Requirements in the CESE Countries

Country	Minimum Capital Adequacy Requirements (CARs) (in percent)
Albania	12
Belarus	10
Bosnia	12
Bulgaria	12
Croatia	10
Czech Republic	8
Estonia	10
Hungary	8
Latvia	8
Lithuania	10
Poland	8
Romania	10
Russia	10
Serbia	12
Slovakia	8
Slovenia	8
Turkey	12
Ukraine	8

Source: IMF country desks.

Appendix 6. Loss Given Default Ratios in the CESE Countries

The country-specific Loss Given Default Ratios (LGDs) are taken from the World Bank Doing Business webpage and are based on work of Djankov *et al.* (2008). The differences in LGDs across countries reflect the differences in bankruptcy codes, the duration of the proceedings and legal costs. The CESE long-term average LGDs range from 51 percent (Lithuania) to 90 percent (Ukraine). The CESE average of 68 percent is above the LGD for senior unsecured credit under the Basel II Foundation IRB approach (45 percent), which is often used as a benchmark for a through-the-cycle LGD.

In order to account for the empirical finding that LGDs increase during downturn periods, we use a formula proposed by the Federal Reserve Board (2006) to derive the downturn LGDs:

$$\text{Downturn LGD} = 0.08 + 0.92 * \text{Long-term average LGD}$$

The downturn LGDs for the CESE countries range from 55 percent (Lithuania) to 92 percent (Ukraine) (Table A6.1). The estimated CESE downturn LGDs are thus substantially higher than those observed for senior bank loans in the OECD countries, which range from 30 percent and 45 percent (see Moody's 2010, Doing Business database).

Table A6.1. Loss Given Default Ratios by Country

Country	Long-term Average LGDs	Downturn LGDs
Albania 1/	N/A	70.0
Belarus	66.6	69.3
Bosnia	64.1	67.0
Bulgaria	67.9	70.5
Croatia	69.5	71.9
Czech Republic 2/	41.3	46.0
Estonia	62.5	65.5
Hungary	61.6	64.7
Latvia	71.0	73.3
Lithuania	50.6	54.6
Poland	70.2	72.6
Romania	71.5	73.8
Russia	71.8	74.1
Serbia	74.6	76.6
Slovakia	54.1	57.8
Slovenia	54.5	58.1
Turkey	79.8	81.4
Ukraine	90.9	91.6
Average	***68.3***	***70.7***

Sources: www.doingbusiness.org, and local authorities.

1/ For Albania, the downturn LGD is assumed to be equal to its peer country average (70 percent);
2/ for the Czech Republic, the average LGD is the one for corporate credit published by the Czech National Bank (CNB 2009, p. 81).

Appendix 7. Using BIS Data to Capture Remaining Banking Groups' Exposures to the CESE Countries

The portfolio of subsidiaries included in the sample does not necessarily capture the full CESE exposures of the sample banking groups, as it is missing their direct cross-border claims and lending through their branches in the host countries. In order to capture these exposures, the subsidiaries' balance sheet data are combined with the consolidated BIS international banking statistics, which reports, at the country level, the consolidated claims of BIS reporting banks on each CESE country.

The BIS total foreign claims data (on the immediate borrower's basis) include both the cross-border claims of foreign banks and all foreign affiliates – subsidiaries and branches – claims. In order to separate direct cross-border and branches' claims, the domestic lending to customers by sample subsidiaries is subtracted from the total foreign claims (e.g., the customer lending by Greek controlled subsidiaries operating in Turkey is subtracted from the consolidated foreign claims of the BIS reporting Greek banks on Turkish residents).

A few caveats need to be highlighted:

(i) the residual labeled as "direct cross-border and branches claims" could also include non-lending claims by subsidiaries, such as government bonds held by a subsidiary. Nevertheless, the potential recap needs calculated for each subsidiary were based on their lending portfolio, and hence, the treatment of other non-lending claims as claims directed linked to the parent bank seems appropriate;

(ii) as documented in other papers, there are some discrepancies between the BIS data and other sources. In our case, we found that there would be a potential small downward bias in the BIS total claims of Italian banks on Ukraine and Swedish banks on Latvia, based on the subsidiaries balance sheet data. This is similar to the discrepancies found by Maechler and Ong (2009) when comparing the BIS data with the central bank data sources. These discrepancies could be due to the differences in the consolidation method and the group structure classification used by different internationally active banks;

(iii) the residual exposure indentified at a parent bank's home country level is distributed across the sample banking groups of each home country as a proportion of the group's assets. Since the sample of banking groups in this paper was put together with the objective to capture all major European cross-border banking groups with significant presence in the CESE region, is it unlikely that the BIS data includes a large cross-border banks with operations in the CESE region that is not already included in the sample.

Appendix 8. Analysts' Estimates of Losses and Capital Needs

Table A8.1. Private Analysts' Estimates of Losses and Capital Needs of Western European Banks on their CESE Exposures

Source	Publication date	NPL scenario (Percent)	LGD (Percent)	Period	Loss (billion EUR)	Capital needs
JP Morgan	3/5/2009	10 to 30 (2)	75	2 years	32	Average Loss: 22 (in percent of equity)
Barclays	2/27/2009	10/20/30 (1)	N/A	2 years	67/133/200	EUR 100-150 billion
Deutsche Bank	2/23/2009	1 Scenario, no details available	N/A	2 years	34	Average Loss: 17 (in percent of tangible common equity)
Goldman Sachs	1/29/2009	10/20/30/ Differentiated NPLs (1/2)	N/A	N/A	19/62/106/ 59	N/A
Merrill Lynch	10/27/2008	7/11/20/33 (2)	N/A	3 years	43	EUR 20 billion

Source: Analyst reports.

1/ Different NPL scenarios with uniform level of NPLs;
2/ different NPL assumptions for different asset 'buckets'.

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9. Spillover Effects from the Crisis to the Role of Government Debt Management Offices

Ove Sten Jensen & Claus Johansen

9.1. Introduction

The financial crisis, which intensified with the collapse of Lehman Brothers in September 2008, has had a significant impact on the role of Government Debt Management Offices (DMOs) and the markets in which they operate. The sphere of DMOs has widened, as DMOs have played a significant role in financing rescue packages. The importance of the work of DMOs has subsequently been stressed as a result of the higher funding needs following the financial crisis and the economic downturn.

During the financial crisis, bond markets were severely affected in both primary markets and secondary trading. As a result of investor preference for the most secure and liquid securities, it was no longer possible to issue corporate bonds and covered bonds in most countries. Due to high liquidity and low credit risk, government bond markets were to a large extent an exception. However, demand fluctuated significantly and at times investors distinguished sharply between sovereign issuers. As a result, issuance was periodically both difficult and expensive for some issuers.

In secondary markets, market making obligations were suspended in most countries for all types of bonds. Contrary to other bond types, it was still possible for investors to trade government bonds. However, much of the activity was transferred from electronic platforms to OTC markets. As a result, investors' pre-trade information collecting process (the price discovery process) was prolonged. A high degree of price transparency is important to investors, as it removes the uncertainty of prices from a specific market maker while increasing mark-to-market certainty.

During 2009, market making obligations were gradually re-introduced in either a traditional or a new type of setup. The traditional type of setup is based on fixed but adjustable bid-ask spreads. The new setup is based on compliance evaluation of each primary dealer relative to the group of primary dealers.

While investor preference for the most liquid and secure securities kept the government bond markets open during most of the financial crisis, the preference increased the difference between sovereign issuers, measured by interest-rate spreads between government bonds. As a consequence, the close co-variation

between government bond markets within the euro area, which exists during stable periods, decreased. During the same period, the co-variation between American and European sovereign bond markets increased.

Since countries within the euro area seem to have been traded as separate stories during the crisis, the importance of market liquidity, fiscal discipline and rating has been highlighted. The crisis has therefore stressed the DMOs' role in securing liquidity in government securities, and at the same time the crisis has stressed the importance of sustainable economic policy.

At the beginning of 2010, the financial markets have stabilised compared to the situation one year ago. In this respect, 2010 got off to a better start than the previous year. However, the outlook for the government funding needs is higher in 2010 than in 2009. At the same time, conditions in the financial markets are highly dependent on the exit strategies for fiscal and monetary policy initiatives.

This paper analyses the impact of the financial crisis on the sphere of DMOs and on the markets in which DMOs operate.

9.2. IMPACT ON THE ROLE OF DMOS

The primary objective of DMOs in most countries is to cover the central-government financing requirement at the lowest possible long-term borrowing costs, while taking the degree of risk into account. DMOs also have a role in securing the access of the central government to the financial markets in the longer term and to support a well-functioning domestic financial market[1].

The financial crisis has underlined the importance of the role DMOs play in securing access to the financial markets. Sovereign issuers returning to the market after a period without issuance experienced that many investors no longer had open lines to these specific issuers, and that the issuer's name was not included in the investors' analysis of investment alternatives. Hence, absence from international markets during stable years was a drawback for some sovereign issuers as borrowing needs re-emerged during the financial turmoil when conditions for re-establishing connections to investors were particularly bad.

9.2.1. The special role of government securities as benchmarks

Most models for pricing of financial instruments are based on a valuation of the subcomponents of the financial instrument. For example, the price of a bond can

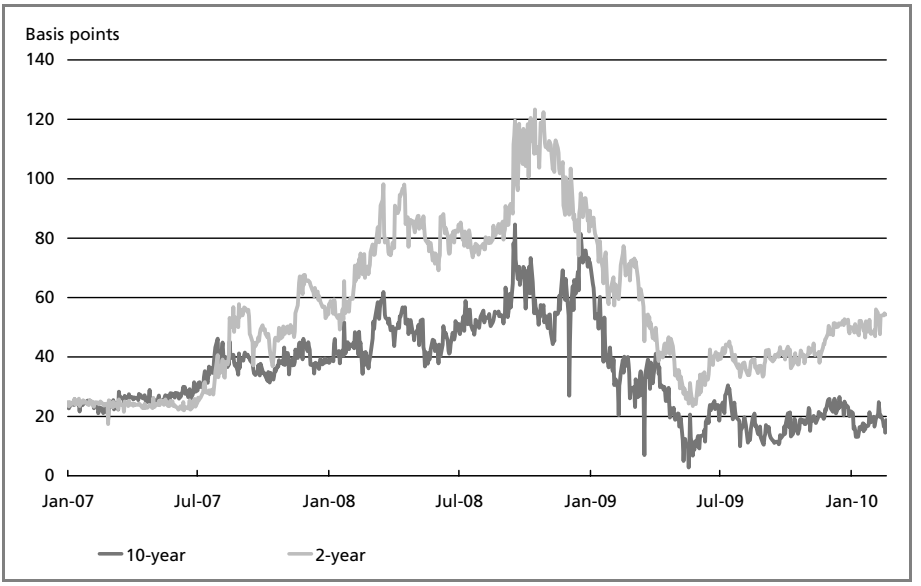
[1] *Guidelines for Public Debt Management*. Prepared by the Staffs of the International Monetary Fund and the World Bank (Amended on December 9, 2003).

be divided into the risk-free interest rate and a compensation for the risk it carries.

Government securities are standardised instruments with low credit risk and high liquidity. Hence, the market for government securities provides a good proxy for the risk-free interest rate. Other securities are also used to provide proxies for the risk-free interest rate. In recent years, the swap market has increasingly been used in this respect. Firstly, because liquidity in this market has increased significantly; secondly, because swaps are standardised instruments that cover the most important points on the yield curve.

However, it may be a challenge to use the swap curve instead of the government yield curve. As swap rates are based on uncollateralised interbank interest rates, the swap curve depends on the credit standing of the underlying banks. When uncertainty increases in the market, the swap spread will typically widen, as was the case during the financial turmoil, *cf.* Chart 1. Consequently, it may be inexpedient to use the swap curve for price comparison over time due to its higher vulnerability to uncertainty and risk aversion. Therefore, the financial crisis stressed the special role that government securities have as a price benchmark.

Chart 1. German Swap Spreads 2007-09



Note: The swap spread is the difference between the fixed leg in a swap and the government bond yield in the same maturity.

Source: Bloomberg.

9.2.2. Financial rescue packages and the role of DMOs

In the period from September 2008 to February 2009, most countries introduced various stimulus packages primarily in the shape of rescue packages for the financial sector. These rescue packages have given rise to higher financing requirements and at the same time the packages have resulted in the build-up of new assets in the central-government debt portfolio. For the asset-liability management within the DMOs, the assets and liabilities obtained related to financial rescue packages have entailed complex elements in the portfolios.

9.2.2.1. Government guarantees

The rescue packages in most countries include government guarantees for banks. By guaranteeing deposits in banks and banks' bond issuances, the central government assumes contingent liabilities that take effect when individual banks fail to honour their payments to either depositors or bond holders. Although the various government guarantee schemes are not expected to entail a higher financing requirement for the central government, the contingent liability will have to be taken into account by the DMOs.

9.2.2.2. Capital injections

The financial crisis has had a significant impact on the banks' capital bases. In order to counteract the tendency of banks to reduce lending and create credit squeezes as a result of lower capital bases and to prevent banks from failing, several countries have introduced financial rescue packages comprising direct capital injections from the government. Capital injections have been financed by the DMOs, and the interest cost to the banks has been determined from the credit standings of the individual banks. Consequently, there is both a potential up-side and a potential down-side for the central government, depending on the banks' ability to pay back the injected capital.

Recapitalisation of the banking sector through capital injections affects the DMOs' borrowing requirement. An alternative is to support the banks through government guarantees. This kind of support to the banking sector was introduced in Sweden, where banks that wanted to participate in the programme had to apply for participation, and on acceptance they had to pay a fee to the central government[2]. The borrowing requirement did not increase as a direct result of this initiative. However, the central government has taken on a contingent liability that has to be incorporated into the risk management. Like direct capital injec-

[2] See www.riksgalden.se for a more detailed description of the Swedish programme.

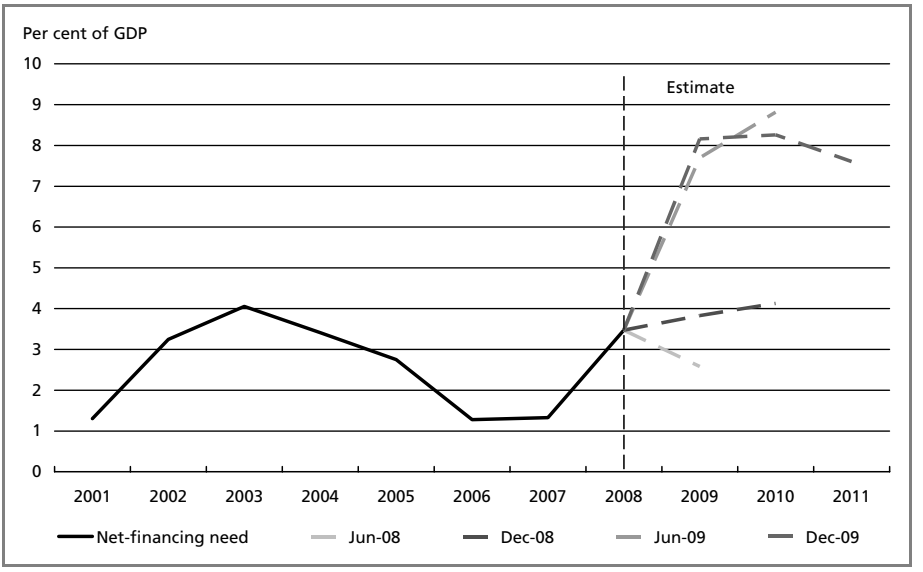
tions, a government support programme may give rise to both losses and gains for the central government depending on the extent of defaults.

9.3. IMPACT ON GOVERNMENT BOND MARKETS

9.3.1. Primary markets

As the financial crisis evolved, it became clear that the real side of the economy would be affected. As a consequence of the economic crisis as well as the financing requirement related to rescue packages, the borrowing requirements of central governments were adjusted significantly upwards during 2008-09. In the period from December 2008 to December 2009 the expected net borrowing as a percentage of GDP doubled in the group of OECD countries, *cf.* Chart 2.

Chart 2. Government Net Borrowing in OECD Countries

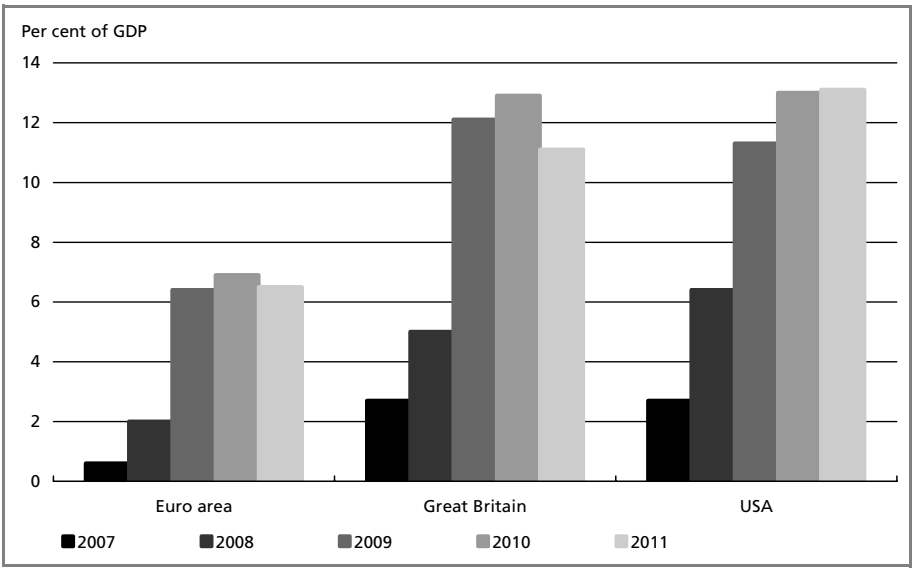


Note: Net borrowing is total borrowing net of redemptions and buy-backs. Each forecast stems from the OECD report from the specific month.

Source: OECD.

The estimated high level of net borrowing in the OECD countries covers significant differences between regions, *cf.* Chart 3. In addition, the deficits vary significantly within the euro area.

Chart 3. General Government Deficits

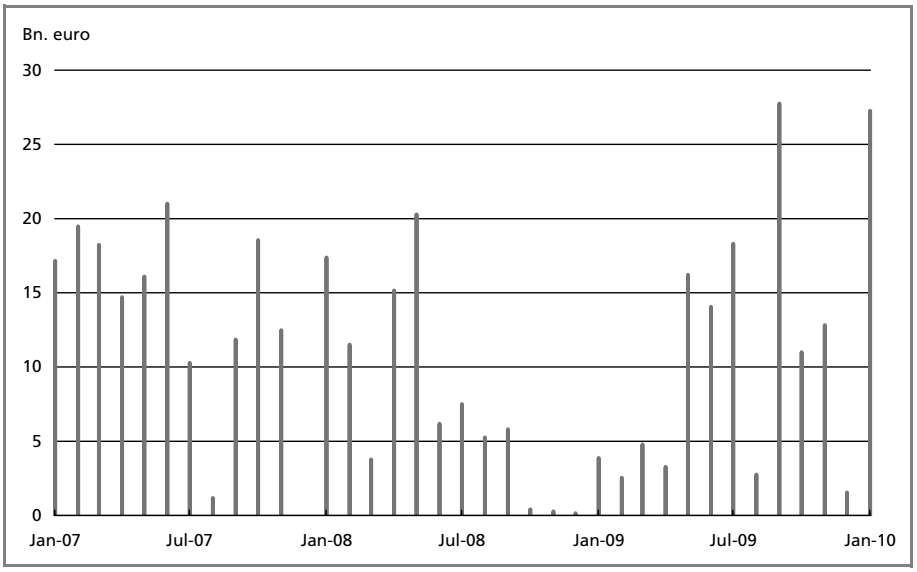


Source: European Commission: European Economic Forecast Autumn 2009.

In addition to the higher borrowing requirements of central governments, commercial banks in many countries were able to issue bonds with explicit government guarantees. This created a new asset class of highly rated quasi-government bonds.

The international bond markets were significantly affected by the expected increase in – and the uncertainty about – the supply of government bonds and government-guaranteed bonds around the turn of the year 2008 to 2009. However, the effect was more pronounced in other bond markets than in the market for government bonds. During the 4th quarter of 2008 and the 1st quarter of 2009, markets for issuance of corporate bonds were closed and most of the financing of European mortgage loans shifted from liquid jumbo issues to commercial paper and government-guaranteed bank issues. As a result, the issuance of covered bonds in the euro area was roughly zero in the 4th quarter of 2008 and low in the surrounding quarters, *cf.* Chart 4.

Chart 4. Issuance of Covered Bonds in the Euro Area

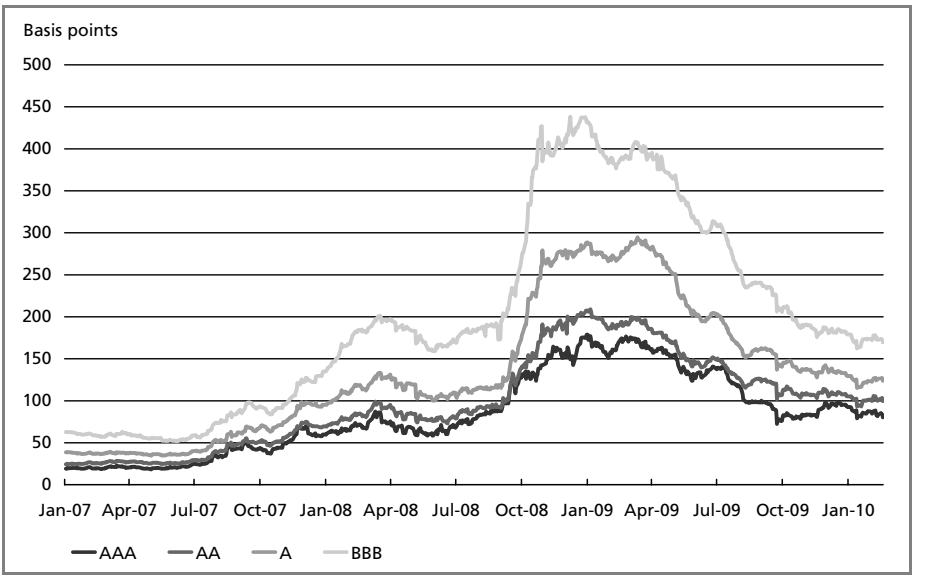


Note: Only jumbo issues have been included.

Source: Commerzbank Research.

The high demand for the most secure and liquid bonds also gave rise to a widening of spreads between corporate bonds and government bonds. The widening was significantly dependent on ratings, *cf.* Chart 5. Investors who had to sell positions in corporate bonds during the period with highest turbulence therefore had to sell at highly elevated credit spreads.

Chart 5. Spreads between European Corporate Bonds and the European Government Curve



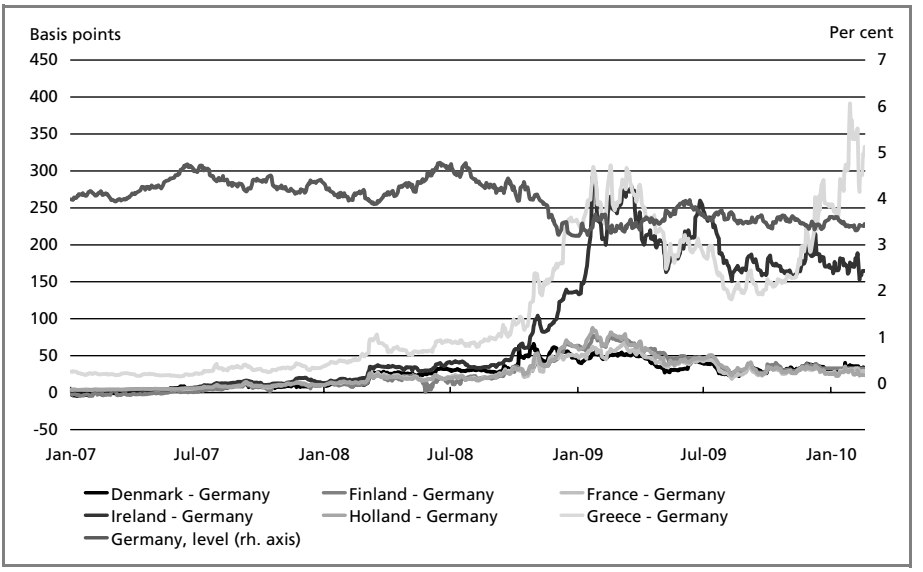
Note: Average spread to a weighted average European government curve. Each rating category consists of a broad group of corporate bonds with the same rating.

Source: Bloomberg.

Investors normally have an interest in being able to trade positions without impacting the market. For that reason, investors are willing to pay a premium for liquid series. Unlike jumbo issues, private placements and government-guaranteed bank issues are typically less illiquid.

As a result of investors' preference for the most liquid and secure securities, interest spreads between various bond markets and government bonds markets increased during the last half of 2008. At the same time, the spreads between different European countries' government bonds increased, *cf.* Chart 6. As the German government bond market is considered to be the most liquid in Europe as a result of a well-functioning and highly liquid government bond futures market, among other factors, this increase reflects flight to liquidity.

Chart 6. 10-Year Interest Spreads to Germany



Note: The spread to Germany for each country is calculated as the difference between 10-year zero-coupon rates.

Source: Bloomberg.

Although interest spreads to Germany increased, the investors' demand for the most secure and liquid securities has counteracted the increasing supply of government bonds. In effect, the governments' borrowing costs have not increased in most countries. However, the crisis has changed the covariation of government bond yields between countries, which is analysed in more detail in part 4 of this paper.

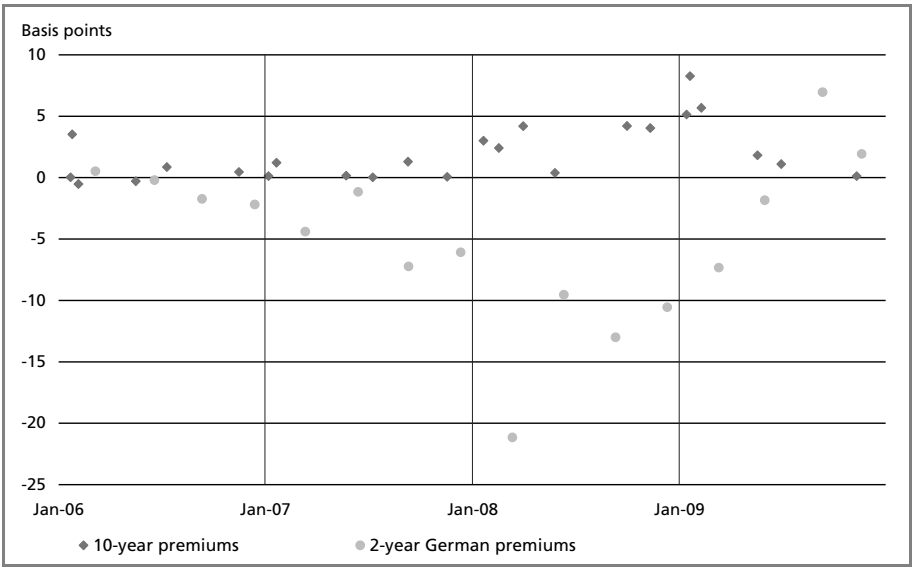
Despite the fact that government bond markets continued to be open for issuance, DMOs perceived a significant difference between conditions for issuing new short and longer-term bonds. The strong demand for short and liquid papers gave rise to oversubscriptions and willingness on the part of investors to pay a higher price for new issues of short-term papers from issuers in the most liquid markets. On the other hand, DMOs had to pay a concession premium related to new issues of bonds with longer maturities in order to attract investors.

Concession premiums are typically paid to investors to compensate them for moving away from already known and liquid series to new bond series with lower liquidity and lower price transparency. In stable periods this concession premium is typically very low or even negative depending on investor demand in the market.

While European countries have experienced that they had to pay a concession premium related to openings of medium and long-term securities, the most liquid and less interest-rate sensitive securities have had the opposite effect. German 2-year securities are a case in point. Also Treasury bills from several countries have been subject to high investor demand and very low interest rates.

As market conditions gradually normalised during 2009, the concession premiums in both short and longer-term bonds stabilised at a level corresponding to the situation before the crisis, *cf.* Chart 7.

Chart 7. Concession Premiums for New Government Securities 2006-09



Note: Concession premiums are calculated as the difference in asset swap spreads between existing and new securities in the same maturity segment. In the 10-year premiums, observations from Belgium, Denmark, France, Germany and the Netherlands are included.

Source: Bloomberg.

9.3.1.1. Investor relations and issuance strategies

The higher borrowing requirements have increased focus on investor relations in order to avoid that investors disregard an issuer on the basis of incomplete information.

At the same time, issuers have shown a higher degree of flexibility with respect to borrowing throughout the crisis. Notably, investor demand for short-term securities has been exploited to issue a relatively high share in this segment. In addition, off-the-run securities have been used for issues, and issues have taken place under various loan programmes, including CP and MTN programmes.

As market conditions have normalised and borrowing requirements have become more certain, DMOs have gradually shifted back to more predictable and traditional issuance strategies.

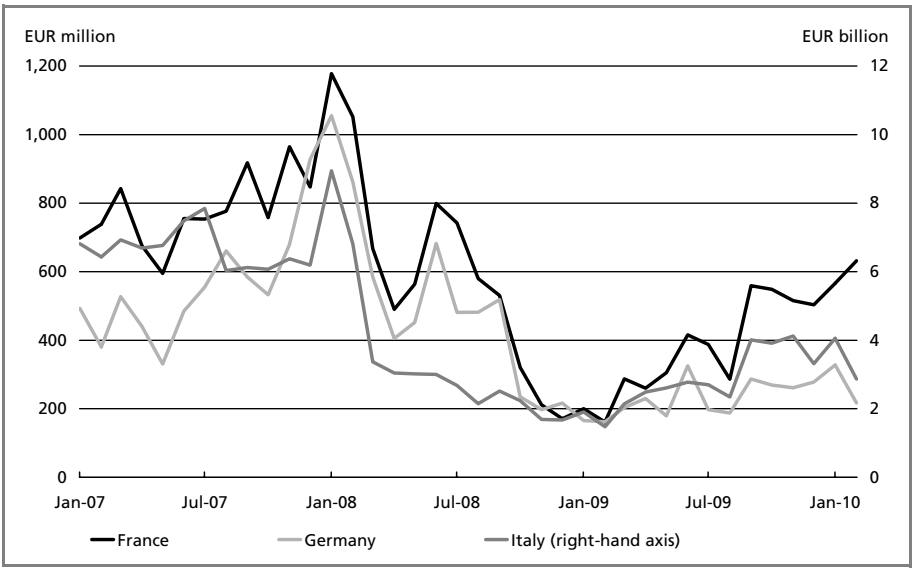
9.3.2. Secondary markets

Primary dealer systems are in place in the government bond markets of most OECD countries. They comprise agreements concluded between issuers and a number of banks (the primary dealers) as part of an objective to ensure well-functioning wholesale markets for government securities. The primary dealer systems entail a combination of rights and obligations for the primary dealers. The aim for the issuer is to have access to the financing markets. This is achieved by giving the primary dealers an obligation and incentive to use the opportunities on the electronic trading platform, thereby increasing the liquidity, efficiency and transparency in the market.

Contrary to other bond markets, it has been possible to re-establish market making in government bonds after the most turbulent periods. However, compared to the primary market for government bonds, the secondary markets have been affected by the financial crisis for a longer period.

Although market conditions gradually normalised during 2009, which allowed tightening of maximum bid-ask spreads, liquidity has not returned to the pre-crisis level. As a consequence, activity on European electronic platforms has decreased, *cf.* Chart 8.

Chart 8. Average Daily Turnover on Three European MTS Platforms



Source: MTSData.com.

One reason for the lower liquidity in the secondary markets is that banks have a smaller balance at their disposal for market making in each market. The willingness to hold securities in their portfolios and to buy larger amounts of a single security in preparation for sale to big investors has consequently decreased.

DMOs have a role in securing liquid and well-functioning secondary markets for government bonds. Investors, market makers and issuers may all benefit from a liquid and transparent market.

Investors have an interest in being able to trade positions without affecting market prices. Investors holding positions in an illiquid series, where the price discovery process is typically longer, may be forced to accept a price compromise if they need to sell a position in the market. Consequently, investors are willing to pay a liquidity premium when buying bonds in liquid series with good price discovery.

Market makers benefit from liquid markets through higher levels of market activity. For issuers, a liquid market will result in a liquidity premium and continuous access to issues and buy-backs of bonds without affecting prices.

9.3.2.1. A new setup for market making obligations

There is no international standard for primary dealer systems. Traditionally, market making obligations have been shaped as an explicit maximum bid-ask spread and a minimum quoting amount for a certain period each day. In such a setup, it

is necessary to adjust market making obligations when market conditions change. Recognising this fact as well as the fact that it is hard to determine the right level for compulsory bid-ask spreads, a number of DMOs introduced a new type of compliance setup during the financial crisis and the subsequent recovery. In this new setup, market making obligations for primary dealers fluctuate with the market making of peers.

Generally, the calculation of market making obligations in this setup can be divided into two. Some base the maximum bid-ask spread on a fixed factor times the average bid-ask spread among primary dealers. Others base the calculation on the average plus one standard deviation among primary dealers. Both types of calculations have in some countries been combined with a minimum under which all primary dealers are compliant, to avoid that spreads become inappropriately low.

9.3.2.2. Non-competitive allotments

The new type of market making obligations is more flexible to changes in market conditions. At the same time, the system makes it possible to increase competition in the secondary market among primary dealers. In some cases this is done through allotment of non-competitive bidding rights at auctions.

The term non-competitive bidding rights is used as a general designation for bidding rights that do not include submission of a bid price. For example, non-competitive bidding rights are given to small investors at auctions of American Treasury bills. At these auctions, small investors can bid for a limited amount which will then be allocated to them at the average price. In addition, non-competitive allotments are used at auctions of government bonds in several countries. Depending on the specific primary dealer's participation at an auction, the primary dealer will subsequently have access to an extra amount.

In connection with the introduction of the new market making obligations, a number of countries have introduced non-competitive allotments where the allotment is contingent on a sufficiently good compliance in the secondary market. This makes it possible to increase incentives for primary dealers in both the primary and secondary markets through non-competitive bidding rights.

9.4. INTERNATIONAL INTEGRATION AND THE FINANCIAL CRISIS

Since the dramatic fall in international stock markets in October 1987, the correlation between different financial markets has been the topic for many papers in the academic literature.

In relation to government bond markets, this kind of analysis is of interest to investors as well as to issuers and central banks. Investors who are trying to diversify interest-rate risk by using a variety of government bond markets are interested in diversification. Therefore, they are interested in finding markets which are not too closely correlated.

Both investors and issuers may have an interest in analysing bond market correlations related to hedging strategies. A hedge in another market is good if the correlation between two markets is close to one. In addition, it is important for investors and issuers to analyse the stability of correlations, since episodes such as a financial crisis may significantly change the correlation between markets and thus the efficiency of the hedge.

Central banks may also have an interest in correlation analysis of bond markets. Bond markets which are highly correlated with international trends are difficult to influence through monetary policy[3]. In bond markets which move independently of international trends, the interest rates should reflect expectations of future short-term rates as well as inflation rates. In such markets, monetary policy will have an impact on the longer-term interest rates as well.

9.4.1. International correlations during the crisis

To analyse the impact from the crisis to the government bond markets, we use various composite indices for government bonds in each of the seven countries Denmark, Finland, Germany, Holland, Ireland, Spain, and the US over the period from January 1999 to December 2009. To take account of different currencies, all returns are calculated in euro.

The impact on the short-term segments of government bond markets is analysed through EFFAS[4] 1-3 years indices. The effects on the longer-term segments are analysed through corresponding EFFAS 7-10 years indices.

It is evident that the common currency has tied the bond markets within the euro area closely together both in the short and the longer end, *cf.* table 1. As a result of the exchange rate peg, the Danish return shows a close correlation with the euro countries, but the focus on the exchange rate peg in monetary policy gives rise to lower correlations in the short end.

[3] The very short end of the yield curve is, of course, an exception.

[4] EFFAS indices consist of outstanding government bonds of a specific maturity. Thus, the return of EFFAS 1-3 years corresponds to the weighted return on government bonds in the 1-3 years maturity segment from a specific country.

Table 1. Correlations of Weekly Bond Returns, 1999-2009

EFFAS 1-3 years	Denmark	Finland	Germany	Holland	Ireland	Spain	US
Denmark	1.00	0.78	0.83	0.81	0.57	0.80	0.12
Finland		1.00	0.96	0.95	0.69	0.94	0.15
Germany			1.00	0.99	0.71	0.97	0.15
Holland				1.00	0.76	0.98	0.15
Ireland					1.00	0.74	0.23
Spain						1.00	0.13
US							1.00
EFFAS 7-10 years	**Denmark**	**Finland**	**Germany**	**Holland**	**Ireland**	**Spain**	**US**
Denmark	1.00	0.96	0.96	0.95	0.69	0.94	0.35
Finland		1.00	0.99	0.99	0.73	0.97	0.35
Germany			1.00	0.97	0.68	0.94	0.35
Holland				1.00	0.76	0.98	0.34
Ireland					1.00	0.77	0.23
Spain						1.00	0.31
US							1.00

Source: Bloomberg and own calculations.

The high correlation between European countries in the two maturity segments covers dramatic structural breaks for some countries. In the sample of countries used in this article, this is especially evident for the long-term segments in Ireland and Spain, where the correlations with the German benchmark market have decreased significantly as a result of the crisis, *cf.* table 2.

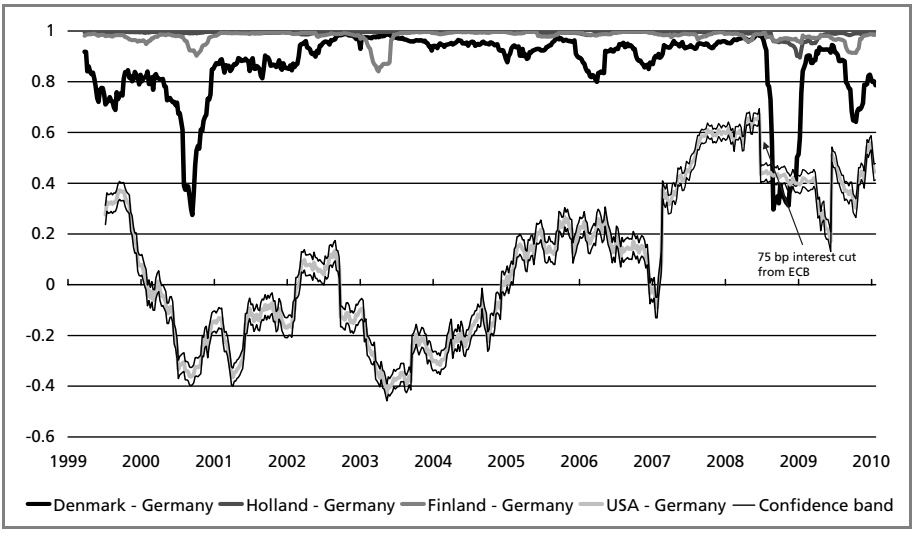
Table 2. Correlations with the German Market

Ireland	EFFAS 1-3	EFFAS 7-10
1999 - 2007	0.80	0.80
2008 - 2009	0.61	0.53
Spain	**EFFAS 1-3**	**EFFAS 7-10**
1999 - 2007	0.98	0.98
2008 - 2009	0.94	0.84

Source: Bloomberg and own calculations.

A closer analysis of the correlations between the other countries in the two maturity segments unveils that these correlations have also varied over time and, especially, that they have oscillated as a result of the financial crisis, *cf.* Chart 9 and Chart 10. The correlations for Ireland and Spain with the rest of the market have, however, been subject to greater variation.

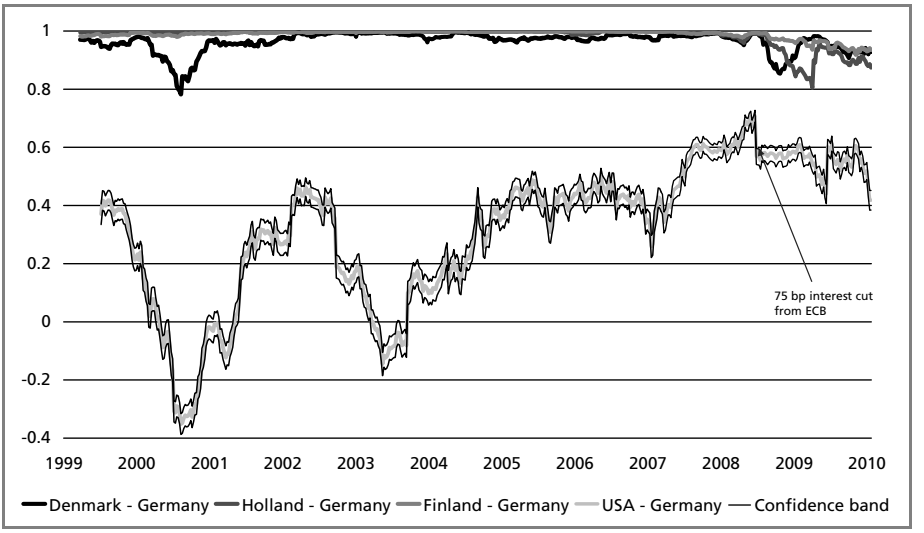
Chart 9. Correlation between Weekly Government Bond Market Returns, EFFAS 1-3 Years



Note: Calculated as the centralised moving correlation over 21 weeks (51 weeks for the correlation between the US andGermany due to higher volatility). The confidence band is a 95 per cent band calculated from Fisher's r to Z transformation.

Source: Bloomberg and own calculations.

Chart 10. Correlation between Weekly Government Bond Market Returns, EFFAS 7-10 Years



Note: Calculated as the centralised moving correlation over 21 weeks (51 weeks for the correlation between the US andGermany due to higher volatility). The confidence band is a 95 per cent band calculated from Fisher's r to Z transformation.

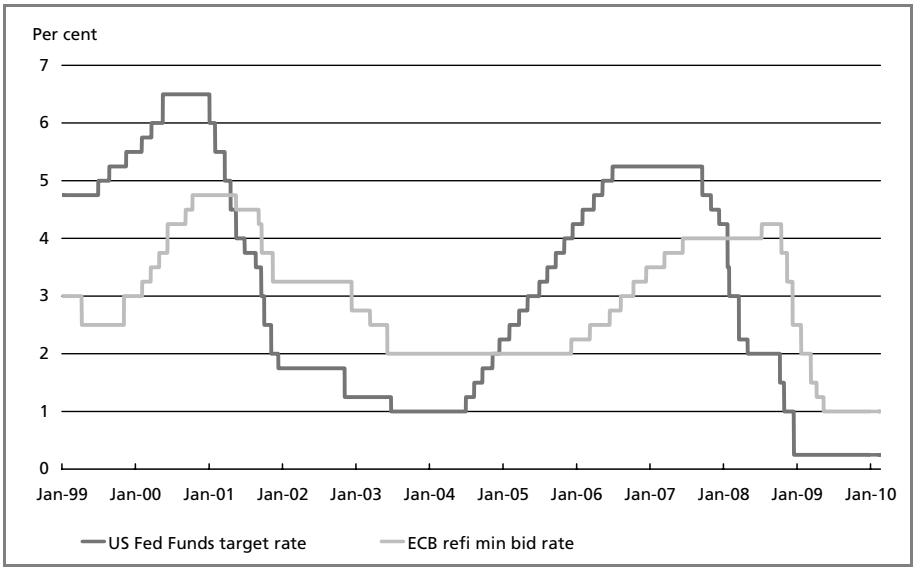
Source: Bloomberg and own calculations.

The pattern in correlations is similar between the two maturity segments. However, oscillations seem to be more distinct in the short segment, which corresponds to the higher volatility that normally exists in shorter-term interest rates.

Four points are worth stressing with regard to the results in Charts 9 and 10:

1. in the short-term segment, the correlation between euro countries remained very high. This result is closely linked to the common currency and monetary policy;
2. the correlation between Denmark and Germany decreased significantly in the short-term segment as a result of the crisis. During this period, Denmark actively used the monetary policy interest rate to keep the exchange rate pegged to the euro. A similar pattern was seen in September 2000, when a Danish referendum resulted in a 'no' to the introduction of the euro in Denmark;
3. during the time of crisis, the correlation between the German return and the US return was higher than previously in the observation period in both the short and the long-term segments. The result in these two segments may, however, have different backgrounds. In the long-term segment, investors will typically increase demand for government bonds, and especially from these two countries. In the short segment, monetary policies play an important role. During the financial crisis, monetary policy rates tend to co-move with a smaller time-lag, *cf.* Chart 11;

Chart 11. Monetary Policy Rates



Source: Bloomberg.

4. in the longer maturities, correlations between Germany and other EMU countries fell as interest-rate spreads increased. Furthermore, the correlations have still not normalised. One reason behind this result is the special role of the German market as the most liquid in the euro area. This typically causes higher demand for German securities when markets are turbulent. Another reason behind the result is that the financial crisis has caused investors to pay more attention to the difference between countries. Consequently, each country is traded as an individual case to a greater extent than before the crisis.

Based on the findings listed in bullets 3 and 4, the lesson from the crisis seems to be that in volatile periods EMU countries' bonds are to a greater extent traded as separate stories where factors such as market liquidity, fiscal discipline and rating are of significance to investors. The crisis has therefore highlighted the DMOs' role in securing liquidity in government securities while emphasising the importance of sustainable and reliable economic policy.

9.5. STATUS AFTER TWO YEARS OF FINANCIAL TURMOIL

At the beginning of 2010, the conditions in the financial markets have stabilised significantly compared to the situation at the beginning of 2009. The various stimulus packages introduced by central governments and quantitative easing by central banks have had a stabilising effect on the financial markets. Nevertheless, markets are still nervous and sensitive to macroeconomic news.

The outlook for central governments' borrowing requirements in the coming years has been adjusted upwards during the crisis. Firstly, the extensive rescue packages resulted in higher short-term borrowing requirements. Secondly, the continued downturn in the global economy has affected the outlook for government budget deficits in the years to come.

There is considerable uncertainty linked to a roll-back of the expansionary monetary and fiscal policies. If these policies are rolled back too late, fear of a debt spiral and inflation may push up interest rates. On the other hand, if they are rolled back too early, the economy and the financial markets may, once again, come under pressure.

10. The Global Economic and Financial Crisis – a comparative Assessment of its Impact on the CESEE Region and Latin America[1]

Sonsoles Gallego[2], Sándor Gardó[3], Reiner Martin[4], Luis Molina[5] & José Maria Serena[6]

Keywords: Financial crisis, Central, Eastern and Southeastern Europe, Latin America

JEL-Classification: F15, F32, G01, G15, G18, H30

10.1. Introduction

This paper looks at the impact of the global economic and financial crisis on two geographically distant and economically diverse emerging market regions: Central, Eastern and Southeastern Europe (CESEE) and Latin America[7]. Similar to other emerging economies, both regions were initially surprisingly resilient to the global financial crisis for over one year. However, they were both strongly affected by the sharp retrenchment in capital inflows and the collapse of global demand that followed Lehman Brothers' bankruptcy in September 2008. Although there were differences in the channels of transmission and the intensity of the propagation, the short-term outcome in 2009 has been one of the worst recessions in decades for both regions.

To set the stage, it is expedient to recall some key features that characterize the CESEE and Latin American regions and that are important for analyzing the impact of the global crisis on these two regions. First, CESEE and Latin America display some differences in income levels. GDP per capita in 2008 reached on average USD 18,000 at PPP in CESEE, while it was USD 12,000 in Latin America. These levels correspond to somewhat over 50% and about 35%, respectively, of

1 The authors thank Peter Backé (OeNB), Enrique Alberola and Juan Ruiz (both Banco de España) for valuable comments. The views expressed in this chapter are exclusively those of the authors and do not necessarily reflect those of the Banco de Espana, the European Central Bank or the Oesterreichische Nationalbank.

2 Banco de España, International Affairs, Alcalá 48, Madrid 28013 T (+34-1-91 338 70 72, sonsoles.gallego@bde.es.

3 Oesterreichische Nationalbank.

4 European Central Bank.

5 Banco de España.

6 Banco de España.

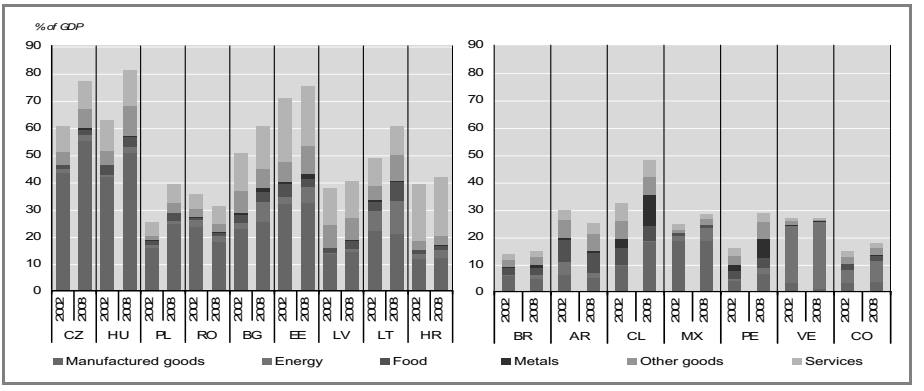
7 In CESEE we look at nine countries, which can be divided into three geographical sub regions, namely three Central European countries (CEE) Czech Republic, Hungary and Poland, the three Southeastern European countries (SEE) Bulgaria, Croatia and Romania and the three Baltic countries Estonia, Latvia and Lithuania. CESEE euro area countries (Slovakia and Slovenia) are thus not covered in this paper. For the purposes of this study, Latin America means the seven largest economies of the region (Argentina, Brazil, Chile, Colombia, Peru, Mexico and Venezuela).

the euro area average. In terms of total GDP, Latin America is three times as large as the CESEE countries covered in this study, given that it has an overall population of 460 million, which compares with 100 million in the CESEE region.

Notwithstanding these differences there were remarkable similarities in the economic development of these regions in the run up to the global economic and financial crisis. Both regions were experiencing booming economic conditions, with rapid GDP and credit growth. Average annual GDP growth was 5% in the CESEE region and 4.3% in Latin America between 2002 and 2008. Both regions were receiving large amounts of foreign capital on the back of easy global liquidity conditions and favorable growth prospects. Economic growth in both regions was led by domestic demand, with private consumption providing the largest positive contribution to GDP growth, followed by investment. Net exports contributed negatively to GDP growth during the 2002-08 period, in particular in the CESEE countries (-1.6% per annum on average in CESEE, however with very wide cross-country variation, and -0.8% in Latin America).

In addition to favorable global conditions, there were also region-specific features that have underpinned the strong growth momentum before the global crisis. The CESEE countries went through a deep and historically unprecedented transformation from planned to market economies[8]. This implied significant investment needs in physical as well as human capital within a short period of time. In addition, it meant an almost complete redirection of international trade flows towards the EU and a marked increase in the degree of trade openness (chart 1). Moreover, the regional reorientation of trade flows went hand in hand with a shift from resource-based/low-tech exports to medium- and high-tech exports.

Chart 1: Exports of goods and services



Source: NCBs. OeNB. BdE.

[8] On this issue see also MARTIN and WINKLER (2009).

The issue of regional trade reorientation is closely related to the second key distinguishing aspect of CESEE economies, namely their participation in the European integration process. Except for Croatia – which is expected to join the EU in the next few years – all CESEE countries under review have become members of the EU. This has anchored and promoted economic development in CESEE, although the advent of EU membership may also have contributed to overly-optimistic expectations during the boom years before the crisis and the associated build-up of financial vulnerabilities in some CESEE countries. In addition, the policy tool-box (e.g. as regards the management of capital inflows) was constrained by EU accession and the increasing depth of financial integration, including cross-border ownership of financial institutions. Finally, all CESEE countries are sooner or later set to adopt the euro and are thus committed to striving towards the fulfilment of the convergence criteria laid down in the Treaty (ECB 2003).

Latin America was enjoying, during the five year period running up to 2008, its longest and most dynamic growth period ever since the 1970s, having left behind the financial crises that had affected some countries of the region in the late 1990s and early 2000s. A key driver of this performance was the rally in commodity prices that took place during this period, and which meant an accumulated positive terms-of-trade shock for this commodity exporting region of more than 150%. A second key factor to be highlighted when analysing the impact of the crisis on Latin America is the outstanding reduction in financial vulnerabilities that took place over the 2002-08 period, on the back of improved economic policy management in most countries, though not all. Learning from the crises of the 1990s and past policy mistakes, most countries in Latin America pursued sounder monetary and fiscal policies, adopted more flexible (though somehow managed) exchange rate regimes, and paid attention to signs of excessive capital inflows, asset price bubbles, currency mismatches and credit booms.

Against this background, the paper first reviews the macrofinancial strengths and vulnerabilities in CESEE and Latin America in the run up to the global economic and financial crisis in 2007/2008. In doing so, it delves on a broad list of vulnerability indicators which allow a comparison across regions, indicators and time. It is important to keep in mind that the analysis is conducted at a regional level and that considerable heterogeneity exists among countries both in Latin America and – even more so – in CESEE. Therefore, the regional results are not necessarily indicative for the vulnerability profile of individual countries. Section 2 also contains a box investigating the link between vulnerability indicators and the financial and real repercussions of the crisis and it looks to what extent economic policies in both regions helped to mitigate financial vulnerabilities in the run-up to the global economic and financial crisis. This provides the background for section 3, which reviews financial and real economic developments in these coun-

tries since the crisis started to impact CESEE and Latin America. Section 4 includes a description and an assessment of the policy responses to the crisis in the two regions. Section 5 concludes.

10.2. MACROFINANCIAL STRENGTHS AND VULNERABILITIES AT THE BEGINNING OF THE CRISIS

Standard vulnerability indicators can be used to gauge the relative strengths and vulnerabilities of Latin America and CESEE in the run up to the current global crisis. By standard vulnerability indicators we refer to economic variables which according to the literature on crises[9] represent potential risks or which have good properties as leading crisis indicators. In this paper, we do so by comparing the status of those indicators before the current crisis with their relative position before other previous regional and global crises[10]. Clearly, these regional averages are not necessarily indicative for the vulnerability profile of individual countries. It is also important to note, that the link between vulnerabilities and performance during crisis periods is neither simple nor straightforward. In fact, empirical evidence from earlier crisis episodes is not conclusive on how, when and to what extent vulnerabilities materialize when a shock hits.

More specifically, we are looking at six sets of indicators which are described in more detail in table 1. The cut-off date we use for the current crisis is September 2008 (Lehman collapse), given that the extension of the crisis to emerging countries happened mostly after this event[11]. The reference points in time are December 2001 (Argentine crisis) and August 1998 (Russian crisis).

We present the vulnerability indicators as cobweb charts, which can be read as follows: a data point closer to the origin of the cobweb represents a lower degree of vulnerability and a data point farther away from the centre represents a higher degree of vulnerability. Data are normalised to allow a clearer picture of the development of each indicator over time and across regions[12].

[9] See among other KAMINSKY and REINHART (1996).

[10] As a caveat, note that the methodology used allows for an indirect comparison across regions, but not a direct one, as the cobweb charts depict the deviations of each indicator from a long-term average. Also, when comparing vulnerabilities of each region over time, another important caveat is the possible trends in the series, which are not accounted for.

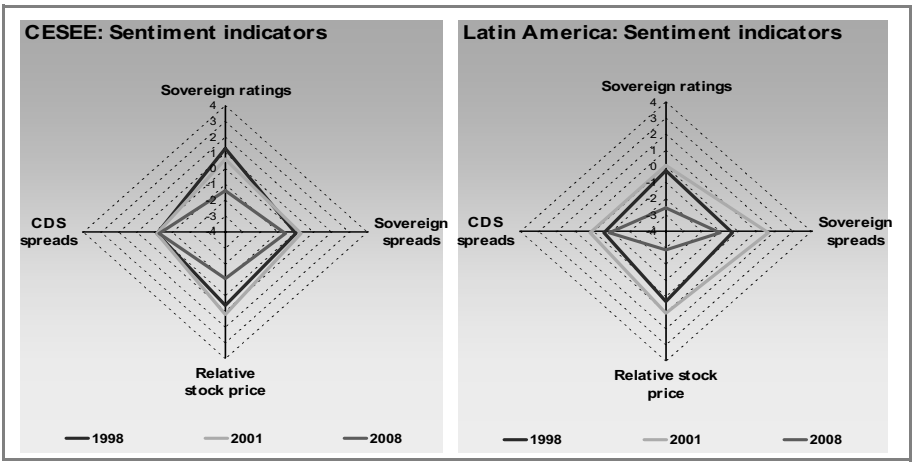
[11] For daily and monthly data we use the weighted average of the six months before the month of the respective crisis. For quarterly data we use the weighted average of the four quarters before the quarter of the respective crisis. For Latin America regional aggregates are weighted averages of country data based on World GDP shares. CESEE aggregates are calculated as weighted averages of country data based on each country's share in regional GDP.

[12] Observations are standardized based on the long-term average and the standard deviation of the series. A value above zero means a positive deviation from the long term average expressed in standard deviations. In order to maintain that a cobweb closer to the origin represents less vulnerability some variables are inverted (sovereign ratings, domestic stock index, budget balance, deposit growth, industrial output growth, current account balance, FDI, net portfolio investment flows, net foreign assets, basic balance, return on equity, capital adequacy ratio, long-term foreign exchange deposit rating and relative bank stock price).

Table: Vulnerability indicators

Group	Indicator	Interpretation
Sentiment indicators	EMBI spreads	Proxies for market and international investor sentiment; also gauges contagion from a global or emerging market crisis.
	CDS sovereign spreads	
	Sovereign rating (average of Fitch, Moody's and S&P)	
	Relative stock exchange index (to world index)	
Vulnerability indicators, of which:		
External indicators	All	Measure of balance of payments pressures or the capacity and willingness of a country to deal with its external liabilities (ultimately including the possibility of sovereign default)
	Current account balance	Measure of external financing needs
	FDI and basic balance	Measure of which part of external financing needs is covered by long-term and relatively stable capital inflows
	Short-term debt over foreign exchange reserves	Estimate of the capacity to confront a sudden stop in short-term capital inflows or short-term debt rollovers with central bank resources
	External debt (and external debt service)	Capacity to repay external liabilities
	Net portfolio investment inflows	Measure of potential short-term outflows in case of a sudden stop
	Net foreign assets (NFA)	Structural measure of a country's position as external creditor or debtor and of the potential impact of a more pronounced depreciation of the currency
Banking indicators	All	Indicator of imbalances in an industry with high externalities over the rest of the economy
	Domestic banks' foreign liabilities over foreign assets	Proxy for currency mismatches in case of a devaluation and the dependence of banks on external sources of funds
	Long-term foreign exchange deposit rating (Moody's)	Measure of foreign investor sentiment about a country's banking sector
	Relative stock price index for domestic banks	Measure of investor confidence vis-à-vis listed banks relative to the rest of the stock exchange
	Loan-to-deposit ratio	Measure of whether credit is increasing faster than deposits and is financed through other – possibly less stable – sources
	Share of foreign currency loans in total loans	Measure of the currency mismatch of bank clients, and the potential increase in nonperforming loans in case of a strong depreciation
	Nonperforming loans (NPLs)	Gauge of the pressure from nonperforming loans on banking sector balances
	Capital adequacy ratio (CAR)	Indicator of the solvency of the banking sector
	Return on equity (ROE)	Indicator of the profitability of the banking sector
Fiscal indicators	Budget balance	Signal of pressures from public finances on monetary and exchange rate policies and indicator of financing pressures on the public sector
	Public debt	
	Interest payments over budget revenues	Indicator of debt servicing pressures on public accounts and proxy for the sustainability of a certain debt level
Monetary indicators	Real M2 growth	Measures meant to capture issues related to monetary policies, credit growth and the way it is financed
	Real deposit growth	
	Real credit growth	
Real indicators	Industrial output growth	Leading indicator of current and future economic growth
	Nominal interest rates	Variables determining investment and consumption propensity
	Consumer price inflation	
	Export growth	Proxy for external demand and international competitiveness

Chart 2: Sentiment indicators



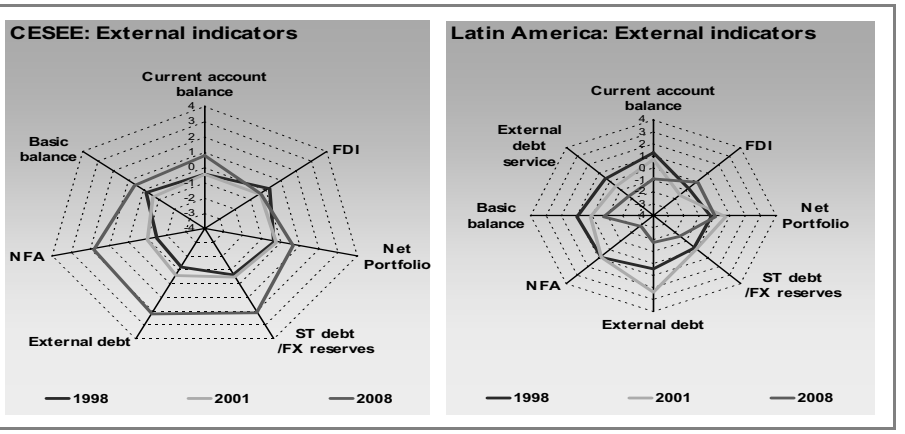
Source: JP Morgan, Moody's, Fitch, Standard and Poor's, Datastream. OeNB. BdE.

The sentiment indicators (chart 2) illustrate that both regions were more positively assessed by financial markets in 2008 than before previous crises. Latin America was even better assessed than CESEE, with spreads reaching historical lows right before the outburst of the crisis[13].

But has there been a corresponding decrease in external vulnerability behind these optimistic assessments? At least in Latin America the answer is yes, but the conclusion is not so clear for the CESEE region. As chart 3 shows, external vulnerability in Latin America, the traditional Achilles heel of the region, had been reduced considerably.

[13] On market perceptions regarding the CESEE region see e.g. LUENGNARUEMITCHAI and SCHADLER (2007).

Chart 3: External indicators



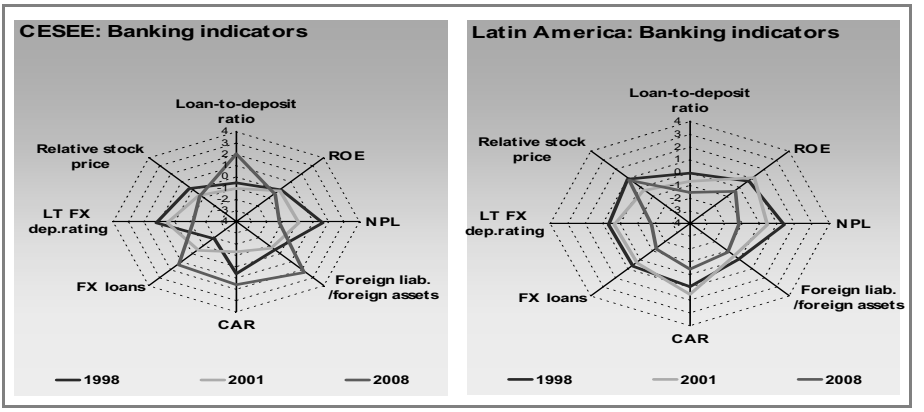
Source: NCBs. OeNB. BdE.

In 2008, Latin America had a more balanced current account, thanks in part to the increase in commodity prices since 2003 and the current account deficit was financed by long-term foreign investment (higher basic balance). Also, Latin America reduced the ratio of short-term external debt to reserves (by increasing reserves but also by actively extending external debt maturities) and switched external debt for domestic debt. This was led by the public sector which was instrumental in reducing aggregate currency mismatches. The net foreign asset position has also improved, especially in the public sector. On the other hand, FDI was in 2008 less abundant than it was in August 1998 or December 2001, something explained by the extraordinary inflows due to the large privatization processes of the nineties. Even in countries considered more vulnerable such as Venezuela or Argentina, external vulnerability indicators had improved.

In the CESEE region as a whole external vulnerability indicators tended to be worse in 2008 compared to previous crises periods. In particular the Baltics and SEE experienced a considerable widening of their current account deficits. This was partly a result of booming domestic demand as well as adverse developments in global raw material prices. FDI inflows remained large, but – in most cases – were not fully covering the current account deficits, which resulted in a pick-up in external debt levels over time. In particular, short-term external debt increased so that, despite a strong build-up in foreign exchange reserves, the ratio of short-term debt to reserves deteriorated in recent years. Notwithstanding this general picture, some CESEE countries successfully reduced their external vulnerability by strengthening their export base and thus lowering their current account deficits. Also, short-term debt developments show a large cross-country variation.

When looking at banking sector vulnerability indicators Latin America also seems to have performed better than before previous crises (see chart 4). Ratings were higher, credit delinquency rates lower, the share of credits denominated in foreign currency was reduced, banks held a net asset position in foreign currency, and bank loans were on average increasing at similar rates as deposits. Only the banking sector stock exchange index was performing as in 1998, probably due to a bad domestic investor valuation of the sector after two decades of banking crises and also from the fact that many of the strongest banks are foreign owned and are not listed in domestic stock exchanges.

Chart 4. Banking indicators



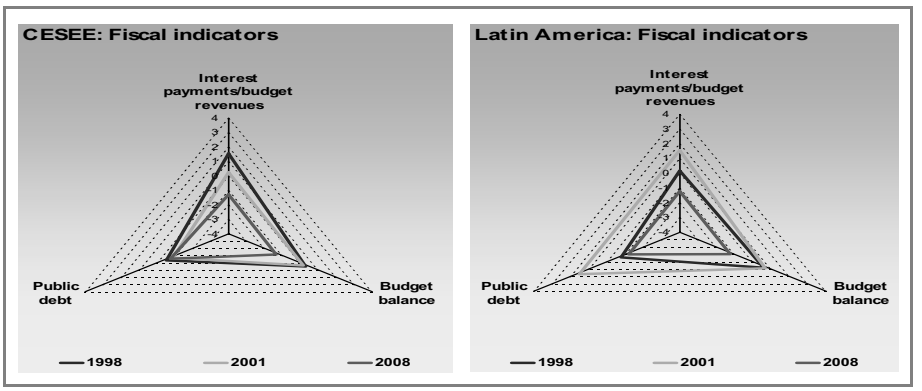
Source: NCBs. OeNB. BdE.

On the contrary, the increasing loan-to-deposit ratio in the CESEE region signals that deposit growth could not keep up with credit growth, so that banks had to rely increasingly on other refinancing sources, in particular foreign funding. This shows up in an increasing ratio of foreign liabilities over foreign assets (with the Czech Republic and Poland being notable exceptions). In a number of CESEE countries a large share of credits were issued in foreign currency, but again, average numbers hide substantial differences across countries (foreign currency credit in the Czech Republic is e.g. minimal). Against the background of banks' changing credit business profile (shift from government to private sector financing), bank capitalization moderated slightly over time, although the average capital adequacy ratio remained well above legal requirements. The non-performing loan ratio (NPL) improved also, following transition-related banking reforms and the recent expansion of bank balance sheets due to strong credit growth. At the same time, until 2008, lower provisioning requirements, booming credit growth, rising bank efficiency and better bank governance (a result of the large-scale entry of foreign banks and improved bank supervisory and regulatory structures) led to increased bank profitability.

As chart 5 shows, in 2008 fiscal vulnerability was in both regions less pronounced than before (strongly improving headline fiscal balances, interest payments on public debt clearly below historical averages, and public sector debt more or less at the same level as in previous crises). Moreover, as the primary balances were better and interest payments put less pressure on revenues, debt was probably more sustainable than before, and very low in the case of most CESEE countries except Hungary and to a lesser extent Poland. In the case of Latin America, also the composition of public debt had a positive influence on vulnerability levels (long maturities and less dependence on external or USD linked debt).

As shown in chart 6, monetary indicators for Latin America showed a less favorable situation, and a deteriorating picture for the CESEE region as a whole. In Latin America, real M2 and real credit to the private sector rose before September 2008 at high rates. Deposit growth was, however, also considerably higher, a factor that limits the potential risks of high credit expansion. In addition it was believed that such growth was part of a catching-up process to levels of credit over GDP in line with regional per capita GDP. For the CESEE region the indicators suggested a credit boom, as credit rose much faster than deposits, and this was reflected also in real money supply growth, supporting the view that the banking sector had accumulated some vulnerabilities before the current crisis. Again developments were diverse across countries and, as in Latin America, convergence factors have played an important role. In the second half of the current decade, however, levels of private sector credit to GDP had already become fairly elevated relative to the underlying fundamentals and there are indications that credit overshot in some CESEE countries towards the end of the boom[14].

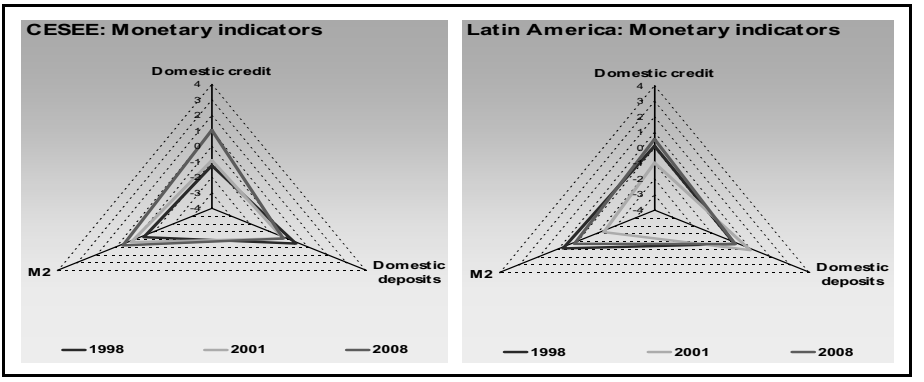
Chart 5: Fiscal indicators



Source: NCBs. OeNB. BdE.

[14] For more details see BACKÉ, ÉGERT and WALKO (2007) and ZUMER, ÉGERT and BACKÉ (2009).

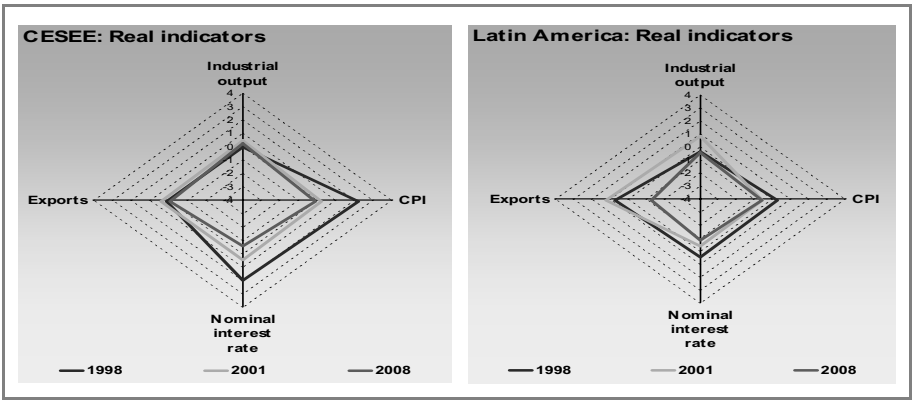
Chart 6: Monetary indicators



Source: NCBs. OeNB. BdE.

Finally, in chart 7 real and price indicators are presented suggesting that both regions were better off in September 2008 than before. In particular in CESEE, the monetary stabilization coupled with favourable global inflationary developments have contributed to a more benign inflationary environment and falling nominal interest rate levels. In addition, the deep-rooted economic restructuring of the 1990s and EU integration allowed for a gradual expansion of industrial production capacities and export growth.

Chart 7: Real and price indicators



Source: NCBs. OeNB. BdE.

The general conclusion from this set of indicators is that, even if there are important differences across countries, Latin America was better prepared than in the past to weather the global crisis. Vulnerabilities had been strongly reduced, not only in the banking sector but also in areas which have been the origin of previous crises in the region, like the public and external sectors. Vulnerabilities in the

CESEE region as a whole had increased in some areas in the years prior to the current crisis, notably in the external and banking sectors and with respect to some monetary indicators (in particular credit developments). By contrast, sentiment, fiscal and real indicators suggested a decline in the region's macrofinancial vulnerabilities over time. However, as mentioned above, these regional tendencies hide major differences in levels and dynamics across individual CESEE countries.

Box: Vulnerability indicators and crisis impact – an empirical analysis for EMBI spreads and growth

In this box we make a first attempt to assess empirically to what extent the vulnerability indicators used in the paper can also be used to predict the impact of the crisis. More specifically, we regress the changes in selected financial and real indicators (the EMBI spread and GDP growth rates) after the crises of 1998, 2001 and 2008 on vulnerability indicators before the crises[15].

Our dataset comprises 20 countries, 11 from CESEE (we have added Slovakia and Slovenia to the sample used in the rest of the paper) and 9 from Latin America (adding Ecuador and Uruguay to the sample). Our dependent variables trace the initial impact of the crises on financial and real conditions. More specifically, we take the two month average EMBI+/EMBI-Global spreads before the crisis minus the two month average spreads after the crisis and the difference between real GDP growth rates in the quarters before and after the crisis[16].

In line with the analysis above, we have aggregated the 31 vulnerability indicators described in this paper into six major groups (sentiment indicators, external indicators, banking indicators, fiscal (public sector) indicators, monetary indicators and real and price indicators)[17]. All the indicators are taken as normalized deviations from the long-run mean up until the moment when the crisis hits[18]. A positive sign always means a decline in vulnerability. We also divide the sample into two sub-regions, CESEE and Latin America, to check for regional differences[19].

First we calculate bilateral correlations. As shown in the chart, the change in EMBI spreads after the crisis is negatively correlated with sentiment, real and public sector (fiscal) vulnerability indicators before the crisis. Countries where

[15] We are aware of the limitations of this analysis such as the presence of multicolinearity in the regressors and the low number of observations in our sample.

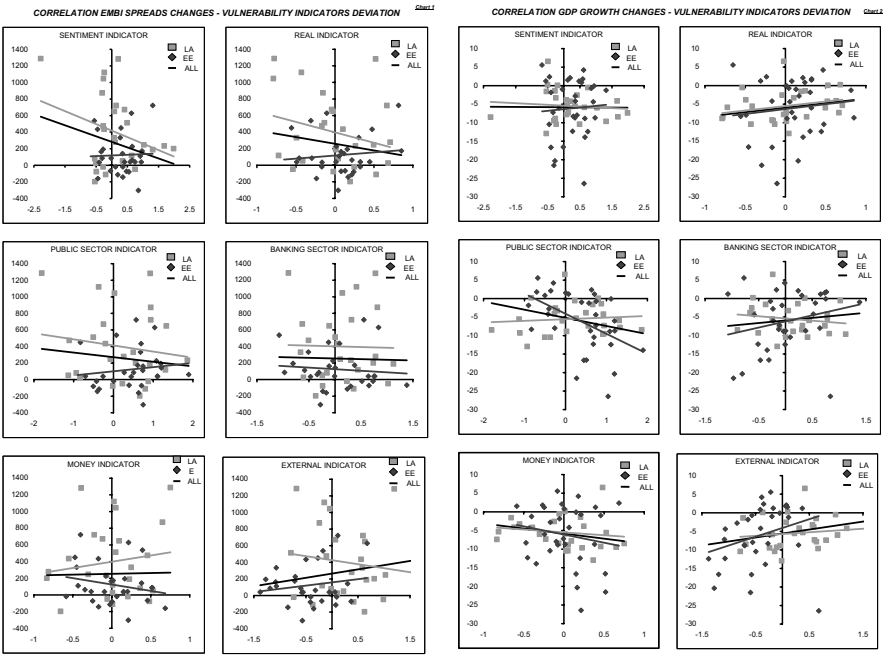
[16] We date the crises as follows: for the Russian crisis in 1998, the announcement of GKO default (17-Aug-1998); for Argentina in 2001 the sovereign default and currency board abandonment (31-Dec-2001) and for the subprime crisis in 2008, the bankruptcy of Lehman's Brothers (15-Sep-2008).

[17] We have added 'exchange rate misalignment' to the set of real and price indicators. This is defined as the difference between the observed nominal effective exchange rate and the long run (equilibrium) nominal effective exchange rate which maintains the real effective exchange rate.

[18] We calculate for each vulnerability indicator the average and standard deviation between 1993 and July 1998 in the case of the Russian crisis, from 1993 to November 2001 in the case of Argentina default, and from 1993 to August 2008 for the Subprime crisis. Then we normalize the data for August 1998, December 2001 and September 2008. By doing so we avoid endogeneity problems in the regressions.

[19] Database summary statistics are presented in the Annex.

these vulnerabilities are less pronounced before the crisis typically register a smaller increase in risk premia. These effects are, however, mainly driven by Latin American countries. In the CESEE countries, it is mainly the monetary indicator which is correlated with the EMBI change. EMBI spreads after a crisis do not seem to be correlated with either banking or monetary vulnerability indicators and external vulnerability indicators are correlated with the change in EMBI spreads only for Latin American countries (chart 1). Turning to post-crisis changes in GDP growth, the correlation analysis suggests that GDP holds up better after a crisis in countries with smaller banking and external vulnerabilities (chart 2).



The correlation coefficients matrix (Table 1) confirms this visual inspection.

Table 1. Correlations coefficients matrix

	EMBI change (bps)	GDP growth change (%)	Sentiment	Real	Public	Banking	Money	External
EMBI change (bps)	1.000							
GDP growth change (%)	-0.286	1.000						
Sentiment	-0.244	-0.006	1.000					
Real	-0.172	0.149	***0.323***	1.000				
Public	-0.117	-0.265	***0.372***	0.242	1.000			
Banking	-0.024	0.118	***0.413***	0.190	0.228	1.000		
Money	0.020	-0.153	***-0.429***	***-0.437***	-0.112	-0.191	1.000	
External	0.180	0.208	***0.296***	0.092	0.093	***0.371***	-0.266	1.000
VIX	0.298	***-0.550***	0.279	0.048	***0.477***	-0.082	-0.205	-0.049

(a) Significative correlations in bold and italics

Some other interesting issues also arise from the correlations coefficients analysis. First, sentiment indicators are strongly correlated with other vulnerability indicators, confirming the fact that market perceptions typically reward countries that have reduced their 'actual' vulnerabilities[20]. Second, the correlation between the sentiment and monetary indicators is significantly negative. We thus use real deposit growth, a one-sided variable whose increase represents a reduction in vulnerability, as monetary variable in the regressions.

We estimate two different regressions, one for each dependent variable, following this very simple model:

$$\text{Reaction}_{t,i} = \alpha + \delta * \text{VIX}_t + \beta * \text{Vulnerability}_{t,i} + \varepsilon$$

We also include a common factor VIX[21] representing the effect of each crisis on the reaction of each individual country[22].

First, EMBI spreads after crises are driven by the VIX change during the crisis and by sentiment and public sector indicators before the crisis (column 1). The coefficients suggest for example that an improvement in the public sector vulnerability indicator before the crisis by one standard deviation dampens the increase in the EMBI spread after the crisis by approximately 177 basis points. In column 7 we present the full model. The signs and significance of public sector indicators and of the VIX do not change. Splitting the sample into the two regions does not materially change the results either except for the sign and significance of money and external indicators in the case of CESEE[23].

The main results are presented in table 2.

[20] Econometrically, this implies, however, that multicolinearity in the regressions may be a problem. To solve this, we estimate sequentially the model presented below, and eliminate the sentiment indicators from the final estimations.

[21] The VIX index measures the volatility implicit in Standard and Poor's options, and is generally considered an indicator of global financial stress.

[22] We pool the data and estimate the model using OLS techniques. To avoid heteroscedasticity we use the standard White correction matrix. Alternatively we could use panel techniques with fixed effect representing individual reaction to a global crisis, but as we have a small time dimension we prefer OLS regressions.

[23] This initially counter-intuitive result is dominated by some 1998 outliers in the CESEE countries. Excluding 15% of the extreme EMBI global variations provides a negative and significant coefficient for banking sector indicators. In other words, CESEE countries which have improved their vulnerability in the banking sector have registered a smaller increase in sovereign spreads after the crisis. The real and monetary coefficients turn to be non significant.

Table 2. Main results

Variable	EMBI							LA	CESEE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sentiment	-206.26 (*)								
P > | t |	0.06								
Real		-181.27					-141.99	-263.77	174.16
P > | t |		0.32					0.36	0.22	0.21
Public			-176.61 (**)				-190.85 (**)	-196.84 (*)	-118.42 (**)
P > | t |			0.05				0.02	0.11	0.04
Banking				30.29			30.83	-70.54	-99.94
P > | t |				0.76			0.73	0.58	0.19
Money (a)					7.68		45.34	36.29	150.44 (***)
P > | t |					0.94		0.57	0.74	0.00
External						102.05	122.82 (*)	-144.30	294.03 (***)
P > | t |						0.18	0.09	0.34	0.00
VIX	3.37 (***)	2.80 (***)	3.63 (***)	2.70 (***)	2.72 (***)	2.82 (***)	3.93 (***)	6.03 (***)	3.59 (***)
P > | t |	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Obs	55	55	55	55	55	55	55	26	29
F-test (Probability)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000
R2	0.423	0.361	0.407	0.337	0.336	0.358	0.461	0.613	0.649
VIF	1.11	1.01	1.55	1.00	1.01	1.02	1.43	1.70	2.28

Variable	GDP							LA	CESEE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sentiment	1.49								
P > | t |	0.16								
Real		2.67 (*)					3.18 (*)	3.30 (**)	3.42
P > | t |		0.10					0.08	0.05	0.22
Public			0.20				0.11	2.52 (*)	-2.48
P > | t |			0.86				0.92	0.08	0.10
Banking				0.53			0.37	0.07	-0.64
P > | t |				0.73			0.77	0.96	0.77
Money (a)					-1.53		-2.11 (*)	-1.41	-2.19
P > | t |					0.18		0.06	0.13	0.23
External						2.04 (**)	1.99 (**)	1.89	0.37
P > | t |						0.06	0.03	0.24	0.91
VIX	-0.07 (***)	-0.07 (***)	-0.07 (***)	-0.07 (***)	-0.07 (***)	-0.07 (***)	-0.07 (***)	-0.07 (***)	-0.07 (***)
P > | t |	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Obs	60	60	60	60	60	60	60	27	33
F-test (Probability)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R2	0.601	0.603	0.588	0.589	0.609	0.610	0.657	0.752	0.696
VIF	1.19	1.02	1.44	1.00	1.00	1.03	1.35	1.62	2.21

(a) Real deposit growth
(*) Significant 10% (**) Significant 5% (***) Significant 1%

Second, the fall in GDP after crises appears to be driven by real and external vulnerabilities before the crisis and by the increase in the VIX during the crisis – with the expected sign, but with a less significant impact on the dependent variable. These regularities are maintained in the full model but are largely driven by Latin American countries, where we also observe a positive and significant effect of public sector (fiscal) vulnerabilities (column 8). Except for the VIX index we do not find any significant effect of vulnerability indicators on GDP fall in the CESEE countries.

Turning to the impact of pre-crisis economic policies on the regional strengths and vulnerabilities, economic policies played an important role in containing vulnerabilities in Latin America. Monetary policy achieved low rates of inflation and inflation expectations close to the objectives. Latin American central banks also monitored carefully overall credit growth and took measures to mit-

igate the emergence of imbalances. For instance, some central banks tightened reserve requirements to curb credit growth, when they perceived that increases in interest rates were ineffective, or were inducing capital inflows. The more credible commitment to exchange rate flexibility, coupled with more stringent oversight of balance sheet currency mismatches, contributed to mitigate further increases in financial dollarization. Authorities also managed actively other risks, such as those posed by episodes of large capital inflows. FDI inflows during the last few years, driven by improvements in political stability and economic perspectives, were not a cause of concern, but short-term inflows, pushed by high commodity prices and low global risk aversion, posed risks of credit and asset price bubbles and eventually of sudden capital outflows. In this context, most central banks took a number of measures to mitigate these risks, e.g. interventions in foreign exchange markets and price-based capital controls, such as unremunerated and compulsory reserve requirement on some of the financial inflows. When the global financial crisis impacted Latin America, these burdens on foreign capital inflows were removed, so that at the end of the day capital controls have been countercyclical policy instruments. The assessment on fiscal policies is more mixed, as public debt was reduced, but the improvement of fiscal balances was to some extent due to cyclical reasons and increased commodity revenues.

In the CESEE countries, the recent academic and policy debate on capital inflows was strongly conditioned by EU accession and tended to be less sceptical about the risk of capital flow reversals than in Latin America (von Hagen and Siedschlag 2008). The accession process implied the need to lift all capital controls at the latest at the time of EU entry and it resulted in a range of institutional provisions that arguably fostered capital inflows (Lane 2008). Moreover, the region's increasing financial integration with the rest of the EU, in particular the widespread foreign ownership of CESEE banking sectors also contributed to these inflows and played an important role in boosting credit growth (Herrmann and Winkler 2008). There were also other reasons for the more positive attitude towards capital inflows in CESEE countries. First, a relatively large share of capital inflows were FDI, which are seen as less volatile and more beneficial for economic development than short-term, speculative capital flows (Abiad, Leigh and Mody, 2007). Second, unlike Latin American countries, CESEE economies had less experience with large-scale capital inflows, including their possible negative side effects.

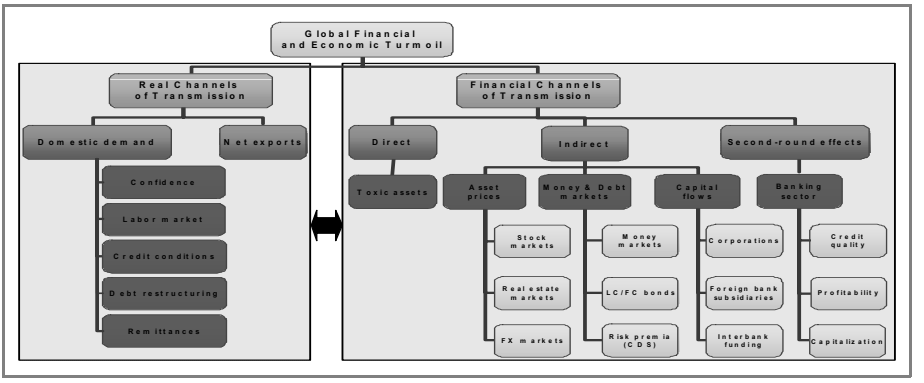
However, most CESEE central banks took measures to rein in overall credit growth and/or the growth in foreign currency-denominated credit. Measures included increases in the reserve requirements as well as administrative and prudential measures such as credit ceilings and a tightening of provisioning requirements. However, such measures often had only limited and at best temporary

effects in achieving the desired results[24]. Some CESEE countries also used fiscal policy to partly offset the expansionary macroeconomic effects of capital inflows. Overall, however, fiscal tightening was relatively limited in most countries (von Hagen and Siedschlag 2008).

10.3. THE IMPACT OF THE FINANCIAL AND ECONOMIC CRISIS ON CESEE AND LATIN AMERICA

Disruptions in global financial markets were transmitted to CESEE and Latin America through direct, indirect and second-round financial transmission channels (chart 8)[25]. Losses due to changes in the prices of 'toxic' financial asset in the portfolio of financial institutions (the main direct channel of transmission of the crisis) were limited in both CESEE and Latin America because financial sectors in these countries tended to exhibit a low degree of 'sophistication', including a negligible market penetration by complex financial products. In addition, capitalising on the profitable and booming local lending business in largely unsaturated markets seemed more promising for banks in CESEE and Latin America than engaging in foreign structured products for which demand was low or non-existent.

Chart 8. Transmission channels of the global crisis to emerging markets



Indirect financial channels of transmission are the negative developments in asset prices, money and debt markets and capital flows due to the deterioration of foreign investor sentiment toward emerging markets. Losses of investor confidence hit emerging markets firstly via foreign exchange and stock markets. In some but not all CESEE economies real estate markets also suffered with negative

[24] A certain exception in this respect is Croatia which took a host of measures to rein in credit growth.

[25] According to BALAKRISHNAN *et al.*, 2009, second-round effects of spillovers from affected emerging economies to developed countries and/or spillovers among emerging economies would be conceivable as well.

impacts on the real economy. In addition, a weakening of currencies can drive up inflation and pose a challenge for banking sectors in countries with sizeable foreign currency lending to unhedged borrowers. At the same time, increases in risk aversion could reduce the access to financing for governments (but also corporations and banks) on money and debt markets and/or make it more expensive. Finally, a slowdown (or a sudden stop) in capital inflows would hit particularly companies and banks in countries with heavy reliance on foreign funding.

Second-round effects refer to feedback loops from a slump in economic activity which may affect financial institutions (predominantly banks), inter alia via deteriorating credit quality, rising non performing loans, declining profitability and increased problems to retain necessary capitalisation.

Emerging markets went through different stages as the financial and economic crisis intensified. Given no or negligible exposures to subprime or subprime-related assets and the ongoing raw material boom (relevant in particular for Latin America), emerging markets weathered the international financial market turbulences relatively well until mid-September 2008. However, after the failure of Lehman Brothers in September 2008 the global financial market turmoil gained markedly in depth and intensity and waning foreign investor confidence dashed the hope of decoupling[26]. In fact, at the turn of 2008/2009 emerging markets were hit hard via the indirect financial transmission channels, with the CESEE region in many respects being hit even harder than Latin America. At the same time, in light of the slump in global demand the foreign trade channel has started to unfold.

Driven by highly accommodative monetary policies in the industrial world as well as large-scale coordinated support measures (e.g. by the IMF and the EU), global investor sentiment improved starting from the second quarter of 2009 and led to a strong recovery of financial markets in both regions. The real transmission channels (especially the domestic demand channel) operated, however, with some time lag and real economic activity remained weak. It remains to be seen how long the period of weak economic activity will last given feedback loops on the banking system through rising non performing loans and second-round effects on labor markets.

10.3.1. Impact on Financial Markets

As argued above, emerging markets were hit hard after the collapse of Lehman Brothers via the indirect financial transmission channels. The CESEE region was in many respects hit even harder than Latin America but financial market and

[26] See FRANK and HESSE (2009).

exchange rate developments diverged also within the two regions with national differences largely explained by country-specific political, economic and social aspects, adversely impacting (foreign) investor sentiment.

Since Spring 2009 a general recovery of financial markets could be observed in both regions with Latin America usually experiencing a somewhat stronger recovery than CESEE. At the end of 2009 stock markets in all Latin American countries were for example again at or above pre-Lehman levels. In CESEE, however, even the best performing stock markets reached only 70-75% of their pre-crisis levels[27]. Also as far as exchange rates are concerned, Latin American currencies quoted stronger at the end of 2009 than before the collapse of Lehman whereas the flexible CESEE currencies were still some 10-25% below their September 2008 levels.

In this section we focus on capital flows to the two regions and on banking sector developments. Developments in these financial market segments are likely to have a particularly pronounced and lasting impact on future economic developments in both CESEE and Latin America.

10.3.1.1. Capital Flows

Emerging economies have also been affected by the financial turmoil via the tightening of global credit conditions, resulting in a slowdown (or temporary reversal) of capital inflows. In order to draw a comprehensive picture of capital flows, we look at total capital flows according to balance-of-payments statistics, external debt statistics and claims and liabilities of BIS reporting banks.

Looking first at total capital flows according to balance-of-payments data, the CESEE region as a whole experienced larger adjustments during the crisis than Latin America. However, total inflows into CESEE remained in positive territory[28]. In more detail, in the final quarter of 2008 and the first quarter of 2009 net capital inflows dropped in CESEE from levels above 10% of GDP to around 4% in the first half of 2009 (chart 9). In Latin America, however, net capital inflows shifted into net outflows in the last quarter of 2008 and the first half of 2009. Almost all CESEE and Latin American countries recorded temporary portfolio investment withdrawals which were rather significant in some countries, mainly in the last quarter of 2008. The picture in CESEE changed in the second quarter of 2009, when portfolio investments turned positive on the back of improved global foreign investor sentiment. In CESEE, net FDI inflows deceler-

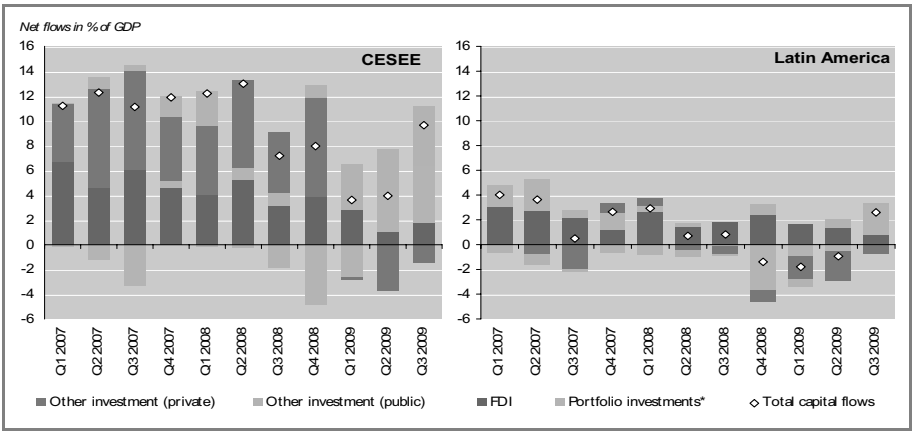
[27] In most Latin American or CESEE countries stock markets are not too relevant for the economic performance. They are generally small and much less important as a source of finance or wealth than alternative markets such as bank loans. They are, however, of considerable value as 'thermometers' of market sentiment.

[28] A number of CESEE countries had sizeable current account deficits in late 2008, and thus required higher capital inflows at that time, while Latin America's current account was close to balance.

ated as well, but remained positive in most countries and FDI inflows to Latin America were almost unchanged.

For some CESEE countries, private financial flows were not enough to cover the financing needs in the final quarter of 2008 and some countries thus had to take recourse to IFI/EU credits. This is an important difference with Latin American countries, where financing needs were covered with international reserves. More recently, capital flows show signs of improvement and the worst-case scenario of a financial meltdown neither occurred in the CESEE region nor in Latin America. In this regard, international support measures from the IMF and the EU were instrumental in restoring confidence and so was the increased role of emerging economies in the international policy discussions, notably in the G20.

Chart 9. Capital flows



*Source: NCBs. OeNB. BdE. *Including financial derivatives.*

Second, external debt statistics show that the corporate sectors' gross foreign debt stock (excl. intercompany loans) has fallen or remained stable in absolute terms in most CESEE countries from mid-2008 to the first quarter of 2009. This suggests that fewer or no new credit lines were granted and/or some existing credit lines have not been rolled over or were called due early, although demand side factors might have played a role too. Given the more favorable global environment in the second quarter of 2009, however, this trend seems to have reversed thereafter. In Latin America the corporate sector's external debt relative to GDP increased moderately in most countries until the last quarter of 2008 or even the first quarter of 2009, but tended to decline in the second quarter of 2009. In this context, however, the IMF's Global Financial Stability Report (October 2009) suggests that rollover rates of foreign exchange-denominated corporate debt were during the peak of the crisis substantially lower in Latin America than in CESEE.

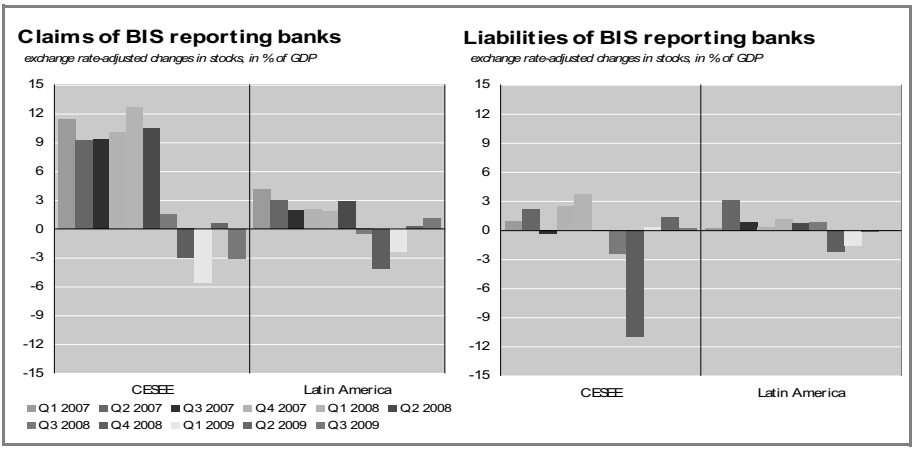
By contrast, intercompany loans (non-financial corporations) increased or remained stable in almost all CESEE countries during the whole period, suggesting that parent companies continued to provide financing to their subsidiaries. In Latin America, intercompany loans appeared generally less important as a source of finance than in CESEE, but in those countries where they have some importance (notably Brazil or Argentina) they increased marginally during the crisis (until the first or second quarters of 2009). Changes in CESEE banking sectors' external indebtedness are rather heterogeneous, but overall tended to decrease (especially in the first quarter of 2009). However, it seems that foreign parent banks continued to support their subsidiaries, in some cases as an explicit commitment in the context of international stabilization packages. By contrast, the external indebtedness of the Latin American banking sectors tended to either remain stable or decrease marginally in recent quarters, in the latter cases suggesting that access to foreign funding did become more difficult for Latin American banks. Having said that, banks´ reliance on foreign funding in Latin America is substantially smaller than in CESEE countries when measured as a share of GDP, something that is probably related to the major presence of foreign bank subsidiaries (instead of branches) in Latin America, and also to the low loan-to-deposit ratios prevalent in the region.

Third, looking at claims and liabilities of BIS reporting banks (chart 10, based on the BIS locational statistics), capital inflows to Latin America and in particular to CESEE have remained fairly strong until and including the first half of 2008. Following the Lehman collapse, however, capital inflows slowed down, with the claims of BIS reporting banks decreasing noticeably in the fourth quarter of 2008 and the first quarter of 2009 in line with the process of global deleveraging. In particular, in CESEE there have been outflows in countries with rather liquid banking systems (especially Czech Republic), implying that parent banks may have temporarily withdrawn liquidity from these markets to meet their liquidity needs at home (Mihaljek, 2009). While banking outflows where sizeable in a few cases, claims of BIS reporting banks have remained surprisingly steady in most CESEE countries, which can be traced back to the stability of parent bank financing (see EBRD 2009, ECB 2009). The liabilities of BIS reporting banks vis-à-vis CESEE and Latin America turned negative in the second half of 2008 (first quarter of 2009). At first sight, this seems to be an indication that tight global liquidity conditions and limited access to foreign funding entailed banks and corporations in Latin America and especially in CESEE to repatriate parts of their foreign assets[29]. In some cases this was in fact supported by central bank measures (e.g. Croatia). A closer look, however, shows that for CESEE a large part of the reduction of liabilities of BIS reporting banks vis-à-vis CESEE is due to transactions of

[29] The figures may be distorted by valuation effects apart from exchange rate changes which, however, can not be separately identified.

the National Bank of Poland which are related to foreign exchange reserve management (shift out of deposits with foreign banks and into foreign government securities) and balance sheet shortening (presumably to limit counterparty risk).

Chart 10. Claims and liabilities of BIS reporting banks



Source: BIS. OeNB. BdE.

Overall the global economic and financial crisis had a major impact on capital flows to CESEE and Latin America, although the magnitude of the impact differed, depending on the type of capital inflows and the receiving country. External financing problems mounted in a few CESEE countries in late 2008 and early 2009, and IFI/EU assistance was needed to stabilize the situation. The available data suggest that capital outflows were temporary and that in particular FDI inflows, intercompany loans, and, for some CESEE countries, also multilateral assistance played a positive role since the outbreak of the crisis.

10.3.1.2. Banking Sector Developments

Banking sectors in CESEE and Latin America remained fairly resilient to the global financial turmoil until autumn 2008. The tight global liquidity conditions (also before Lehman), the slowdown in capital inflows (after Lehman) and banks' increased risk aversion affected, however, bank lending throughout CESEE and Latin America thereafter.

In most countries credit growth decelerated sharply or came to a halt in 2008 and the first half of 2009[30]. In Latin America credit growth moderated especially in the retail segment, while in CESEE loans to nonfinancial corporations decelerated

[30] This process started already in 2007 in the Baltic States (in line with the earlier start of the economic downturn) and in Croatia (mostly due to restrictive central bank measures).

more strongly[31]. Deposit growth also moderated, in CESEE especially in the Baltic and SEE countries. This can be attributed to worsening labor market conditions and, in a few countries, temporarily waning public confidence in banks[32]. At the same time the share of foreign currency deposits remained fairly stable. In Latin America, deposit growth also slowed down markedly in most countries and some countries (e.g. Argentina) saw a temporary increase in the proportion of foreign currency deposits (mainly US dollar) together with an important deposit flight.

The worsening economic fundamentals amplified credit and foreign exchange risks (especially in many CESEE countries). The deteriorating global economic environment started to take a toll on borrowers' ability to repay their loans, in particular in countries with depreciating nominal exchange rates and a high share of foreign currency denominated loans (e.g. Hungary, Poland and Romania). Consequently, the share of non-performing loans in total loans started to pick-up throughout Latin America and even more so in CESEE towards end-2008 and increased further in the first half of 2009. In CESEE, this development was particularly pronounced in Latvia, Lithuania and Romania[33]. The increased credit risks and the related higher need for provisioning also started to put a strain on banking sector profitability. In CESEE, profitability indicators deteriorated particularly strongly in the Baltic States and Romania, where the banking sectors even recorded losses in the first half of 2009.

On a more positive note, CESEE and Latin American banking sectors are well capitalized. Despite isolated episodes of individual bank rescues in Latvia and Venezuela banking stability seems not to be at risk in the countries under review. Capital adequacy remained stable at fairly high levels of over 10% in all CESEE and Latin American countries, well above the internationally propagated 8%. This reflects higher capital adequacy requirements in many CESEE and Latin American countries. In CESEE this may also be the result of the dominant position of foreign banks, with parent banks committing themselves to keep their subsidiaries' capitalization at elevated levels.

10.3.2. Impact on the Real Economy

Before comparing the real economic impact of the global crisis in Latin America and CESEE, it is essential to account for the different starting points in terms of vulnerabilities at the onset of the crisis. First, as noted above, while most Latin

[31] Within Latin America, the tightening of banking credit conditions was particularly important in Brazil but the decline in credit growth was cushioned by the pick-up in credit granted by state banks and the national development bank (BNDES). Moreover, the central bank took measures to loosen credit conditions.

[32] Some countries (e.g. Bulgaria and Croatia) experienced temporary deposit withdrawals by households in late 2008. For further details see DVORSKY, SCHEIBER and STIX (2009).

[33] It is important to note, however, that given possible differences in classification rules, the comparability of non-performing loan levels across countries might be limited.

American countries started from a favorable economic and financial situation, some CESEE countries piled up sizeable domestic and external imbalances during the pre-crisis boom period. In these countries the real spillovers from the global crisis might have worked not so much as a trigger but more as an amplifier of an economic downturn that was already in train when the global crisis hit. Second, some of the real transmission channels – especially the domestic demand channel – unfolded their full impact with some time-lag[34]. Only in the final quarter of 2008, in parallel with the indirect financial transmission channels, the foreign trade channel started to kick in on the back of a slump in global demand. This channel was particularly strong for CESEE, given its trade openness and the large share of manufactured products in CESEE's exports[35]. Third, despite a high degree of overall synchronization across countries, the various CESEE and Latin American countries seem to differ notably in terms of the relative significance of different channels.

The trade channel appears to have been the most prominent real transmission channel of the crisis for both regions. This is not surprising, given the regions' high degree of trade integration with the EU, respectively with the US, and more broadly the world economy through commodity markets. The effects of the plunge in foreign trade volumes on GDP depended on each country´s trade openness and trade specialization. Alongside volume effects, sharp (but temporary) downward adjustments in global commodity prices have put additional pressure on exports of major commodity exporters (e.g. Argentina, Chile, Venezuela and Peru). At the same time, imports collapsed on the back of a slump in domestic demand and gloomy export prospects, given the high import content of exports in some Latin American and CESEE economies. However, with imports falling stronger than exports, the contribution of net exports to GDP growth turned positive in most countries.

The slump in domestic demand in Latin America and CESEE in late 2008 and early 2009 was inter alia caused by tightening credit conditions, deteriorating business and consumer confidence, worsening labor market conditions and a slowdown in remittance flows. The composition of GDP growth thus showed major adjustments in domestic demand, especially in the first half of 2009. The biggest adjustments were seen in gross fixed capital formation, which is the most cyclical component and affected most directly by changes in the availability and cost of funding[36]. The slowdown in investment was generally more pronounced

[34] In the Baltic countries the economic slowdown (triggered by domestic factors) started somewhat earlier.

[35] As a notable exception in CESEE, Poland continued to record positive economic growth in 2009. This can be traced back to fairly low initial vulnerability levels, a comparatively low degree of export dependence, a strong temporary fall in the exchange rate, some fiscal stimulus and infrastructure investment, which was partly financed by the EU and partly driven by preparations for the European Soccer Championship 2012.

[36] In some Latin American countries the fall in commodity prices might have added to the slump in Gross fixed capital formation (GFCF), as investments in the commodity sector explain a substantial portion of industrial investment.

in CESEE (especially in the Baltics, Romania and Bulgaria, where this component of domestic demand had shown very strong dynamics in the years before the crisis) than in Latin America, although in this region Argentina, Brazil, Chile and Mexico showed an important slowdown. Developments were similar, albeit not as severe, in private consumption, with the slowdown being more pronounced in the Baltics, Romania and Mexico.

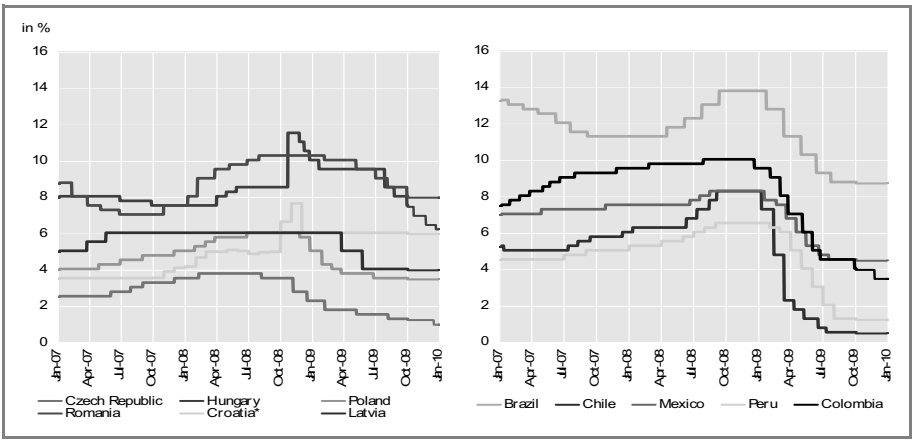
10.4. THE POLICY RESPONSE SO FAR

The policy response to the crisis in both regions comprised standard monetary policy action, non-standard monetary and financial policy measures as well as fiscal steps. In addition, international policy measures also played a key role.

10.4.1. Standard Monetary Policy Measures

Widespread inflationary pressure characterised both regions when the crisis hit emerging markets in October 2008 and most CESEE and Latin American central banks (with flexible exchange rates) were in an upward interest rate cycle. Therefore, monetary policy remained very cautious in most CESEE and Latin American countries until the end of 2008. At that time the severity of the economic downturn became clear and the possibility of deflation could no longer be excluded.

Chart 11. Policy rate developments



Source: NCBs. OeNB. BdE.

**Weighted averages of weighted repo rates achieved at regular reverse repo auctions of the Croatian National Bank (CNB) in the reporting month.*

Towards the end of 2008 most CESEE countries with flexible exchange rates started a process of monetary easing (Hungary after a sizeable interest rate hike in October) (chart 11)[37]. Except for the Czech Republic, however, rates remain at higher levels than in major industrialised economies. Among the (quasi-) fixed exchange rate countries, Latvia cut its main refinancing rate by 200 basis points over the course of 2009, while other countries eased monetary conditions mostly by non-standard monetary policy measures. At the end of 2008, also Latin American inflation targeting countries (Brazil, Chile, Colombia, Mexico and Peru) reduced interest rates, initially at different speeds, with the majority of them 'front-loading' the monetary stimulus.

10.4.2. Non-standard Monetary and Financial Policy Measures

Authorities in CESEE and Latin America have also taken a range of extra-ordinary policy measures to counter the impact of the crisis on their economies[38]. Broadly speaking, the aim of these measures was to safeguard financial system stability and to avoid – respectively minimise – spillovers from adverse financial market developments to the real economy.

Most CESEE central banks took domestic liquidity easing measures (e.g. reductions of domestic reserve requirements, broadening eligible collateral and increasing the frequency of auctions). At the end of 2008 some countries also agreed on cross-central bank repurchase or currency swap arrangements in order to ease foreign exchange liquidity pressures[39]. CESEE central banks did not, however, undertake credit or quantitative easing measures. Governments in CESEE broadened guarantee schemes for bank deposits in order to prevent bank runs[40]. The possibility of state capital injections into banks has been established throughout the region, but banks have been reluctant to draw on that form of relief and only Latvia was forced to recapitalise a failing bank (OeNB 2009).

Most Latin American central banks (notably Brazil, but also others) also set in train a wide range of non-standard monetary policy measures to mitigate the effects of the credit contraction, with particular emphasis on facilitating the provision of dollar funding. This was possible because Latin American central banks

[37] In addition, some CESEE central banks intervened verbally or through market operations to support their currencies (e.g. the Czech Republic, Croatia, Hungary, Poland and Romania).

[38] See PETROVIC and TUTSCH (2009) for an overview of measures taken in EU countries and Ishi, Stone and Yehoue (2009) for an overview of measures taken in 40 emerging economies.

[39] The ECB established repo agreements with Hungary and Poland. In addition, the central banks of Estonia and Latvia signed swap arrangements with Sveriges Riksbank and the Bank of Latvia also with Danmarks Nationalbank.

[40] In accordance with a proposal by the European Commission, all CESEE EU countries as well as Croatia now guarantee deposits up to the equivalent of at least EUR 50.000 and some countries implemented an unlimited guarantee.

had accumulated over USD 500 bn of international reserves (about 10% of the regions' GDP), partly as a strategy to self-insure against external shocks and volatile capital flows and partly due to a reluctance to accept the conditionality usually attached to multilateral lending. The strategy was not without costs (or criticism) but this time was nonetheless instrumental to deal with the 'sudden stop' of capital flows.

Latin American central banks took measures in many areas including export credit (e.g. Brazil, Argentina), the refinancing of banking or corporate sector liabilities through the provision of US dollars (e.g. Brazil, Mexico and Chile), the extension of local currency-denominated liquidity provision via lower reserve requirements (e.g. Argentina, Brazil, Peru, Colombia and Venezuela), broadening of the range of acceptable collateral to the central bank (e.g. Mexico, Argentina) and promoting state banks to facilitate new lending (e.g. Brazil, Chile). Financial sector rescue packages have so far not been needed in Latin America and financial sector support measures (e.g. Chile, Brazil) have not been anywhere near the same scale as in industrial countries. Latin American central banks also stepped in to mitigate depreciation pressures. In Brazil and Mexico, reserves sold in the spot market for intervention reached 10% and 20% respectively of their international reserves, while intervention in the swap market amounted to an additional USD 32 bn in Brazil. A greater relative effort to sustain the currency was apparent in Peru, where the degree of exchange-rate flexibility is limited by the high level of financial dollarization and the risk of stronger balance sheet effects[41].

All these measures met at least some of their objectives. International reserves proved effective for (temporarily) addressing specific problems in foreign trade financing, refinancing foreign currency-denominated loans and supplying the market with US dollars. From a broader perspective, the far-reaching changes in capital inflows did not result in a financial crisis in the Latin American region, which is a significant achievement. Government intervention was, however, not able to fully offset the significant tightening of credit conditions in either Latin America or CESEE.

10.4.3. Fiscal Policy

Fiscal policy responses to the crisis varied within and across the two regions. Generally, the fiscal response was determined by two key factors: First, the shape of government balances at the beginning of the crisis (charts 12 and 13). Second, countries with high external financing needs – mostly in CESEE – needed to take

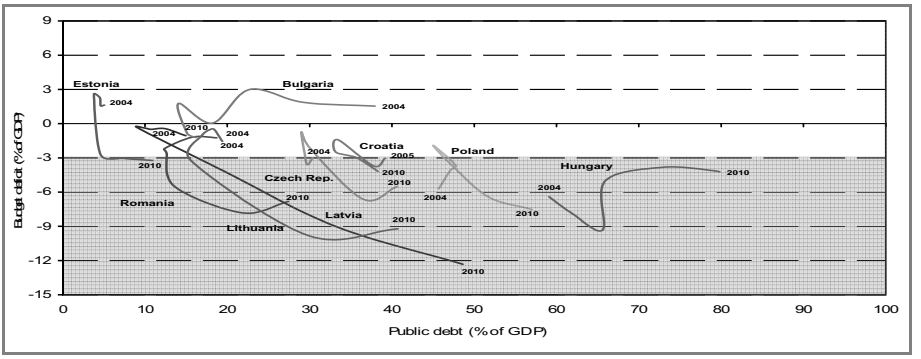
[41] For a more detailed account of the measures taken by Latin American central banks please see BANCO DE ESPAÑA (2009).

account of a possible weakening of investor confidence which would complicate access to foreign funds[42].

Looking first at the CESEE countries, the Czech Republic and Poland decided on fiscal stimulus packages of around 1% of GDP in 2009 (broadly in line with the EU and the euro area average). The net impact of fiscal policy measures in Bulgaria, Romania and Hungary is, however, neutral or even deficit-reducing, i.e. procyclical.

A relatively sound fiscal position has allowed most Latin American governments to respond to the global crisis with a moderately countercyclical fiscal policy, which is in sharp contrast with the past. The average size of the fiscal packages (1.3% of GDP) has been above the level in CESEE. Chile is, however, the only Latin American country which has been able to put a forceful countercyclical fiscal policy into practice, thanks to its fiscal rule that allowed saving funds up to 12% of GDP. In addition, the implementation of the expansionary fiscal policy plans has fallen behind schedule in most Latin American countries except Chile.

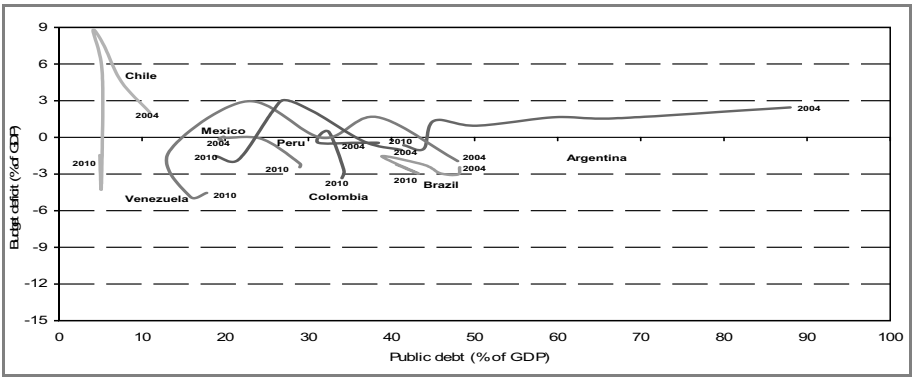
Chart 12. Public finances in CESEE (2004-2010)



Source: EU Commission - Autumn 2009 Forecast. OeNB.

[42] It should also be noted that most CESEE and many Latin American countries are rather small and open economies. A strong fiscal stimulus would thus not only lead to higher domestic demand but also to an increase in imports. This consideration may have been an additional determinant of the fiscal policy response in some countries.

Chart 13. Public finances in Latin America (2004-2010)



Source: IMF. OeNB. BdE.

10.4.4. International Support Measures

In addition to national support measures, some countries have received financial support from the IMF and other lenders. In Latin America, in October 2008 the IMF and the US Federal Reserve announced a non-conditional short-term liquidity facility and a swap facility with Brazil and Mexico, respectively. The IMF short term liquidity facility was later changed into the new Flexible Credit Line (FCL) facility[43] that Mexico and Colombia requested for precautionary reasons, but which has not been drawn upon. Taking into account all multilateral and bilateral financing facilities, México would have at its disposal an amount close to 8% of GDP (Brazil 2.3% and Colombia 3%). In addition, Argentina signed a swap agreement with the People´s Bank of China in the order of 3.4% of GDP.

In the CESEE region, Hungary, Latvia and Romania have received financial support from the IMF, the EU and other international financial institutions. The size of these Stand-By arrangements (SBA)[44] amounts to some EUR 20 bn for Hungary and Romania (18% and 14% of 2008 GDP, respectively), and EUR 7.5 bn (32% of GDP) for Latvia. In the case of Poland the IMF has approved a credit line amounting to some EUR 15 bn (5% of 2008 GDP) under the FCL facility. For Hungary, Latvia, Romania, IFI/EU support packages were instrumental in stabilizing their economies and in sustaining private capital flows but these IFI/EU programs have also helped support private flows to other CESEE countries, although there is no direct evidence underpinning such spill-over effects.

[43] Following the IMF definition, an FCL is designed for countries with very strong fundamentals, policies and track records of policy implementation and is particularly useful for crisis prevention purposes.

[44] Following the IMF definition, SBAs are designed to help to address short-term balance of payments problems, by enabling countries to rebuild international reserves, stabilize currencies, continue paying imports and restore conditions for strong economic growth, while undertaking policies to correct underlying problems.

Finally, in early 2009 the 'Vienna initiative' was created to co-ordinate the response of the main public and private stakeholders to the financial crisis in CESEE (EBRD 2009). As part of this initiative, EU-based parent banks pledged to refinance and, if needed, recapitalize their CESEE subsidiaries, home governments allowed the parent banks to access national banking sector support packages for operations at home and abroad and International Financial Institutions as well as host-country governments gave assurances of financial and policy support.

Overall, the international support measures for Latin America and even more so for the above-mentioned CESEE countries helped to calm financial markets and contributed to the stabilization of most financial market segments after the first quarter of 2009.

10.5. CONCLUSIONS

This paper has compared the impact of the global economic and financial crisis on CESEE and Latin America. Up to the third quarter of 2008, both regions were remarkably resilient against the global crisis. Part of this resilience is reflected by standard vulnerability indicators, which at the onset of the crisis indicated a relatively better position than at the start of previous crises. The main exceptions were the heightened external, banking and monetary vulnerabilities in some CESEE countries, precisely in areas that proved to be particularly sensitive in the context of the global economic and financial crisis. Also, cross-country variation has been considerable in both regions, but even more so within the CESEE region.

It appears that improved economic policies may have played a significant role in containing macrofinancial vulnerabilities before the crisis, in particular in Latin America, where authorities had learned the lessons from past crises and paid substantial policy and regulatory attention to signs of excessive short term capital flows, credit booms and the formation of potential asset price bubbles. By contrast, in most CESEE countries large capital inflows and rapid credit growth were perceived as manageable and supportive to the catching-up process, while downside risks were seen as being contained. Measures to dampen credit growth were taken in a number of countries, but generally, the policy tool-box in CESEE (e.g. as regards the management of capital flows) was constrained by EU accession and the depth of financial integration. Vulnerabilities seem to have played a role as well when it comes to the relative impact of the crisis in the two regions.

After the collapse of Lehman Brothers in September 2008, CESEE and Latin America were severely hit by the crisis which initially led to massive falls in asset prices including stock prices, fixed income securities, and – in the case of some CESEE countries – also house prices. In addition, nominally flexible exchange rates depreci-

ated substantially in the latter part of 2008. Overall, the more financially vulnerable as well as the more open countries tended to be affected most severely by the spillovers of the global economic and financial crisis in both regions. The financial market turmoil peaked in early 2009 and more recently, CESEE and Latin America saw a recovery of equity markets, an appreciation of exchange rates and a fall in risk premia. Financial markets in most Latin American countries recovered to pre-crisis levels or even beyond, but in CESEE in many instances financial markets have still not reached their pre-Lehman levels.

The crisis had a major impact on capital flows to both regions which materialized in particular in the last quarter of 2008 and the first quarter of 2009. However, the magnitude of the impact differed again notably, depending on the type of capital inflows and the receiving country. Overall, capital flows moderated more substantially in CESEE than in Latin America. At the same time, CESEE displayed net inflows also during the crisis, while Latin America recorded outflows in the last quarter of 2008 and about zero inflows in the first half of 2009. This difference, however, is partly due to IFI-EU financial assistance to three CESEE countries. For these countries, international support packages were instrumental in stabilizing their economies and in sustaining private capital flows. More in general, international support measures proved instrumental in restoring confidence and so was the increased role of emerging economies in the international policy discussions, notably in the G20. In CESEE, integration into European banking networks turned out to be an asset (although it certainly also played a role in boosting the boom before the crisis) as a key factor in sustaining overall capital flow dynamics was that intra-group loans of banks remained stable or even expanded[45]. In Latin America, in turn, foreign bank funding was generally much less relevant as a source of finance, since most credit was financed by the local deposit base. The worst-case scenario of a fully-fledged regional meltdown has neither occurred in CESEE nor in Latin America.

As a consequence of the crisis, credit and deposit growth decelerated markedly and banks in both regions (but more so in a number of CESEE countries) are now confronted with increasing non-performing loans and declining profitability. Bank capitalization has remained at high levels though in all countries under review. The above-mentioned disruptions in domestic and international financial markets together with the real transmission channels also had a very pronounced effect on real economic developments from late-2008 onwards, ultimately resulting in severe recessions in most countries in both regions. However, the real economic downturn in 2009 is more pronounced in the CESEE region as a whole than in Latin America. This is due to the financial vulnerabilities in several CESEE countries as well as their high dependence on the export of manufactured goods.

[45] See also BERGLÖF *et al.* (2009), EBRD (2009), ECB (2009) as well as HERRMANN and MIHALJEK (2010).

The policy response to the crisis in both regions focused on standard and non-standard central bank and financial policy actions as well as on fiscal measures. Standard monetary policy remained very cautious in most countries until the end of 2008 when the severity of the recession became clear and most countries embarked on a process of monetary easing. Nevertheless, in most CESEE and Latin American countries policy rates have remained at higher levels than in major industrialised economies. Authorities in both regions have also taken a range of extra-ordinary policy measures to stabilise financial systems and to reduce spillovers to the real economy. Fiscal policy responses to the crisis varied within and across the two regions and were mainly determined by the fiscal situation at the beginning of the crisis and the threat of a possible weakening of investor confidence. Only a few CESEE countries were in a position to run moderate counter-cyclical fiscal policies, while others even had to engage in procyclical tightening to retain or regain investor confidence. In contrast, relatively sound fiscal positions prior to the crisis allowed most Latin American governments to respond to the global crisis with – at least moderately – countercyclical fiscal policy, although implementation has fallen behind schedule in most countries.

Looking forward, even though the economic downturn seems to have reached a bottom, the pattern of economic recovery is still unclear. According to current projections, Latin America is expected to record, on average, higher growth rates in 2010 than CESEE countries. The main reasons for the better prospects for Latin America over the near-term are the renewed increase in commodity prices, and the more limited impact of the financial shock. Growth projections for the medium term are broadly similar for both regions, although subject to considerable uncertainty.

The EU anchor has also been beneficial for CESEE countries, as it provides a functioning institutional and regulatory framework that promotes the convergence process and is expected to prevent extreme policy slippages. Latin America, in turn, has benefited from policies that have reduced its vulnerabilities prior to the crisis and have been able to become countercyclical after it, contrary to past experiences. Latin American countries have a less clearly anchored convergence process and possibly also slower productivity gains, which may entail additional efforts to consolidate macroeconomic and financial stability in the years to come.

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ANNEX

Table 1. Main statistics of the sample

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Dependent						
EMBI change (bps)	55	253	142	372	-303	1287
Real GDP growth change (%)	60	-5.8	-5.7	6.6	-26.4	6.5
Regressors (a)						
Sentiment	60	0.215	0.202	0.697	-2.279	1.985
Real	60	0.052	0.066	0.404	-0.789	0.852
Public	60	0.282	0.474	0.791	-1.802	1.894
Banking	60	0.056	-0.002	0.565	-1.073	1.381
Money	60	-0.005	0.010	0.370	-0.834	0.751
External	60	-0.112	-0.182	0.640	-1.378	1.552

(a) Normalized deviations from a long run average. See text for an explanation of the calculations

11. The contribution of poor economic policy mix to economic vulnerability – the case of Latvia[1]

Violeta Klyviene[2] & Lars Tranberg Rasmussen[3]

Abstract

In this paper we review, how Latvia developed during the boom period and discusses key structural features of the Latvian economy. We show, that combination of monetary and fiscal expansion contributed to a greater vulnerability to external shocks. We also discuss, that GDP growth was largely driven by capital deepening, while productivity gains played a significantly smaller role. As a result, one of the most important explanations for the exceptionally deep recession in Latvia should be found in the distortions created in the non-traded sectors of the economy. Finally, we give a brief analysis on policy measures that have been taken to correct distortions and possible pros and cons of an external devaluation.

Key words: financial integration, external vulnerability, unit labour cost, cyclically adjusted budget, non-traded sector, internal devaluation, external devaluation.

11.1. Introduction

Since the start of the new millennium, the Baltic region has enjoyed one of the highest growth rates in the world. Key reasons for this included a housing investment boom, fuelled by large capital inflows and cheap credit due to a very loose monetary regime and pro-cyclical fiscal policy. Further, growth was certainly also driven by economic catching-up and financial deepening effects after obtaining EU membership in 2004. However, even adjusting for these effects there seems little doubt that external imbalances, credit growth rates, inflation and property prices reached unsustainably levels in the final years of the boom period, leading Latvia into financial turbulence. No doubt the global credit crunch deepened the recession in Latvia, but global crisis or not, alarm bells were already ringing for Latvia back in 2006-2007.

How do empirical studies assess these huge external imbalances in the Baltic states? Schadler *et al.* (2006) tests a model of regional income convergence and concludes that the Baltics' current account deficit can be explained in terms of a

1 All opinions expressed are those of the author and have not been endorsed by the Danske bank.
2 Danske bank.
3 Danske bank.

long-term catch-up process with the EU. He finds that in Europe, financial integration has a strong relationship with the current account deficit (CAD), with the direction of that relationship depending on a country's income. Schadler *et al.* (2006) finds that the relatively large CAD in Lithuania and Latvia between 2000-2004 has been in a range consistent with per capita income. However a key issue in this respect is whether a large CAD is constructively utilized to facilitate the catching-up process or whether it just reflects excessive private spending?

As growth in the Baltic States was largely driven by credit growth, tighter lending standards in the wake of the global credit crisis and falling house prices put an end to expanding domestic demand. The Baltic economies have furthermore been hit particularly hard by lower capital inflows as capital markets froze completely, resulting in major economic contractions in the Baltic economies. Latvia was hardest hit among the Baltic states, although it was also the most imbalanced country compared to the other two Baltic states. Overall, the stability of the entire region came under serious stress as well. Amongst Baltic states, only Latvia suffered financial strain as early as 2007.

With nearly 100 banks in the Baltics owned by Western European counterparts, financial integration and borrowing in foreign currencies has been substantial. Financial integration brought some disadvantages by encouraging credit booms, excessive borrowing and a trend towards foreign currency borrowing (EBRD, 2009). The crisis has highlighted the need for policy measures to reduce dependency on external lending (especially in foreign exchange) and to manage demand for credit more effectively.

Furthermore, the fact that the Baltic economies act under fixed exchange rate arrangements probably enhanced the buildup of excessive (through cheap) credit. A fixed exchange rate setup effectively disables monetary policy. Instead, fiscal policies should play the key role in short run stabilization. However, Latvian fiscal policy did not, as we will show, comply with proper macroeconomic stabilization according to the Stability and Growth Pact (SGP). As our calculations concerning the cyclically adjusted primary budget balance suggests, fiscal policies were largely pro-cyclical during the boom years.

For a small open economy the fixed exchange rate arrangement may be a reasonable choice. However it requires strong fiscal discipline. In our paper we seek to show that a poor monetary and fiscal policies mix contributed to the buildup of a large vulnerability towards external shocks.

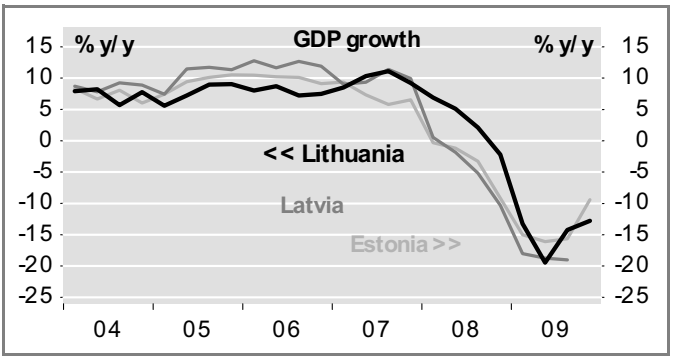
Consequently, Part II of this article describes how Latvia developed during the boom period and discusses key structural features of the Latvian economy. Part III focuses on the country's poor policy mix, which significantly contributed to a greater vulnerability to external shocks. We discuss, that GDP growth was largely

driven by capital deepening, while productivity gains played a significantly smaller role. As a result, one of the most important explanations for the exceptionally deep recession in Latvia should be found in the distortions created in the non-traded sectors of the economy. Section III analyze the importance of financial sector integration. It is obvious that the presence of western banks encouraged excessive foreign currency borrowing. For the future, better ways of curbing foreign currency borrowing should be implemented to reduce limit excessive foreign currency borrowing. Due to complexity of the issue some problems touched upon by the article are left for further discussions. At Section IV, we provide a discussion on the way out of the crisis together with the pros and cons of two policy options, internal and external devaluation. The so called two 'Ds' (devaluation *vs* deflation) policy options have originated much discussion between economic analysts and politicians in the country. There are various options regarding the future for Latvian economy, but none of them are painless.

11.2. EARLY WARNING SIGNALS – THE SIGNS OF OVERHEATING

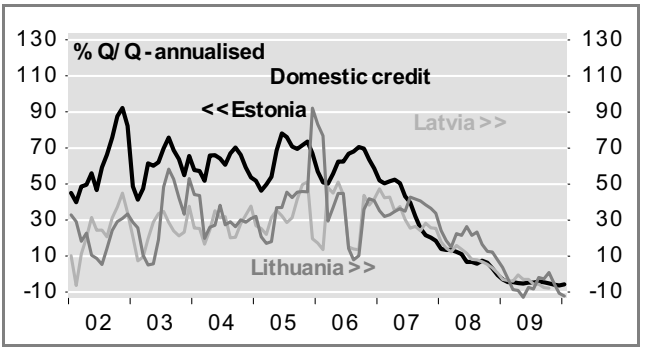
Between 2000 and 2007 the three Baltic economies recorded some of the highest growth rates in the world. The annual growth rate of gross domestic product (GDP) was around 10% in Latvia between 2005 and 2007 and it averaged almost 9% annually between 2000-2007. Decomposing growth accounting shows that capital deepening was the most important driving force behind economic growth. Thus, the robust growth was mainly stimulated by the domestic demand, especially by private consumption and investments. Main drivers behind the fast growth of private consumption include favourable monetary environment (negative real interest rates), strong income growth and increased employment. External trade contributes negatively, mostly reflecting buoyant domestic demand and strong import growth. Credit driven boom in real estate prices plays an important role in fostering economic growth in all the three Baltic States. There is a clear argument that too little of the borrowed funds were directed to productive activities rather than construction activities and simple spending of goods.

Figure 1. Terrible GDP numbers



Sources: Reuters EcoWin.

Figure 2. Growth of domestic credit



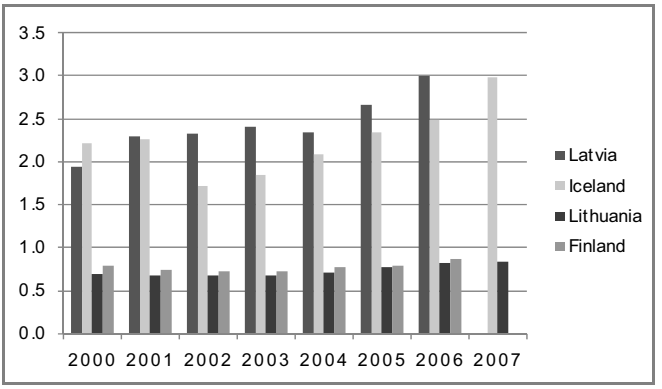
Sources: Reuters EcoWin.

Thus, despite dynamic investment developments, productivity of investments was a clear matter of concern. A high proportion of investments were concentrated in the real estate sector and, therefore, do not contribute significantly to the overall medium-term efficiency gains. Further, as both corporate and household sector debt levels soared, this may impair the economy's ability to repay the external debt. It is notable though that some of the very high growth can be explained by catching-up. However, even allowing for those effects, external imbalances and credit growth in the Baltics did reach unsustainably high levels, which in the end finally contributed to the significant economic downturn.

The Baltic economies have experienced the so called financial deepening process, when credit supply was boosted as a result of bank privatization and financial integration with the European Union. In general, we expect that the financial deepening process will play a positive role in *spurring* economic *growth – this is already backed by* several literature reviews. Levine's (2004) is one of the most extensive in this area. However, there are many empirical surveys that show that

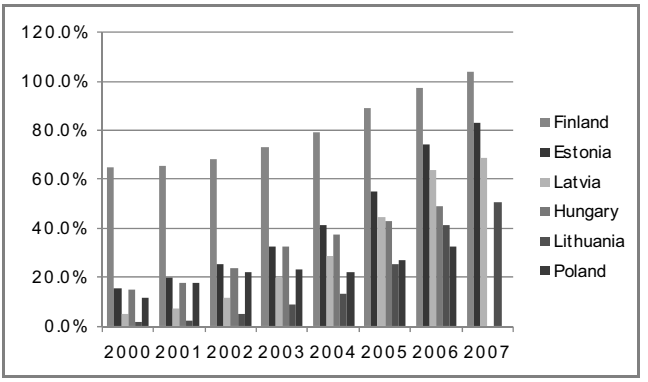
an extraordinary pace of the financial deepening process could lead to pressure in financial systems[4]. In 2005-06, in Latvia lending to the corporate sector rose 50% annually, while lending to households rose more than 70% y/y (in the case of mortgage loans by more than 90% y/y). Thus, the pace of financial deepening in Latvia has been extraordinary, even in an emerging market context (EBRD, 2009).

Figure 3. Debt/equity ratio in the corporate sector



Sources: National statistics, authors' calculations.

Figure 4. Household debt-to-income ratio



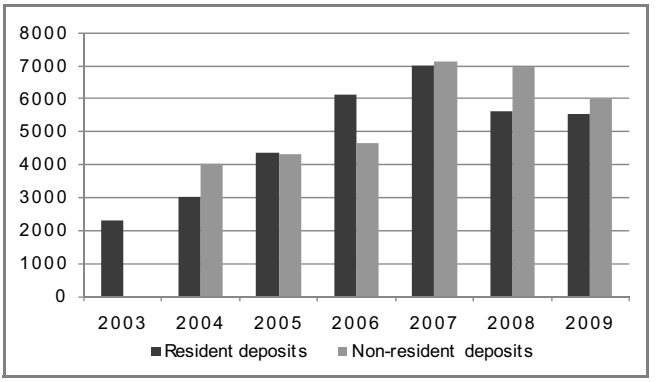
Sources: National statistics, authors' calculations.

The debt-to-equity ratio, a measure of the indebtedness in the corporate sector, rose sharply during 2005-2006 in Latvia. The Latvian household sector debt also rose sharply between 2000-2007. Between 2006 and 2007, household debt-to-income ratio jumped close to *one*. High household borrowing constituted to some

[4] A different literature (see, for recent examples, COTTARELLI *et al.*, 2003; BUITER, 2008; OTTENS *et al.*, 2005) emphasizing the link between financial deepening and credit boom.

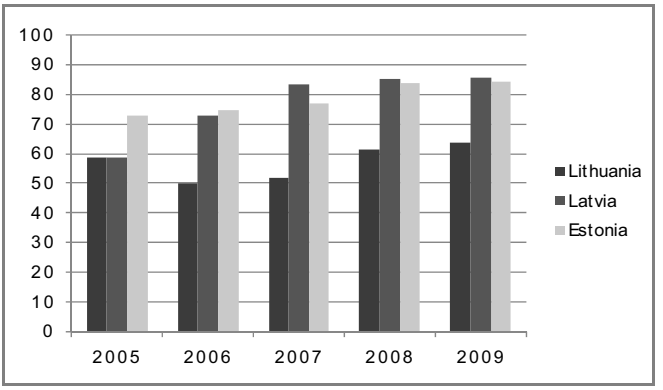
extent a rational expectations response to favourable lending conditions and consumption smoothing, however, the level of indebtedness in Latvia at the end of 2007 exceeded that of many other economies with relatively similar *per capita* income performance, such as Poland or Hungary.

Figure 5. Latvian deposit market (mln.EUR)



Sources: National central banks, authors' calculations.

Figure 6. Foreign currency borrowing, loans in euro (as a share in total loans, %)



Sources: National central banks, authors' calculations.

This might reflect too high expectations about future growth potential. High private sector indebtedness and the current deep recession have already led to a sharp rise in the stock of overdue loans. Hence, the share of stock of overdue loans in the loan portfolio of the five biggest banks in Latvia jumped to almost 10% in September 2009. The banking sectors of the Baltic States were dominated by increased presence of foreign own banks, and their presence played a crucial stabilisation role in the Baltic markets. The Latvian banking boom story was a bit different from the other Baltic economies for several reasons. *Firstly*, the Latvian

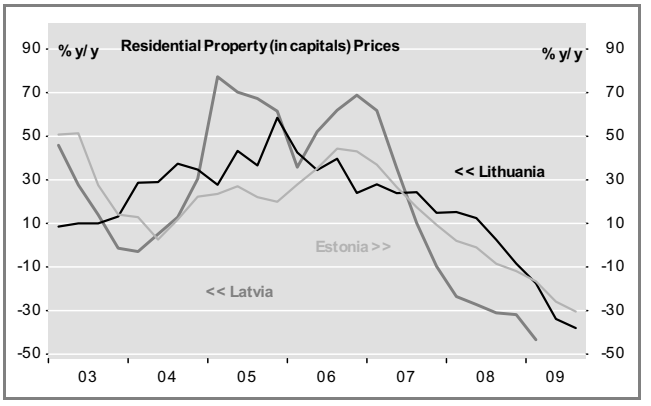
banking system was less dominated by foreign banks. Locally owned banks, which made up 40% of the Latvian banking system, during the boom period, borrowed heavily from abroad. *Secondly*, Latvian banks relied more on fragile forms of financing as almost half of total deposits in the Latvian market came through non-resident deposit banks. Hence, due to external funding constraints the second largest bank, Parex (locally controlled) suffered a crippling bank-run in the end of 2008 and finally was nationalized. This significantly deepened the economic crisis in Latvia in 2008-2009.

The high degree of economic and financial integration had resulted in substantial economic benefits, but it also created important vulnerabilities linked to increased exposure towards foreign exchange liabilities, rising external indebtedness and bubbles in the property markets.

11.2.1. Overheated real estate market

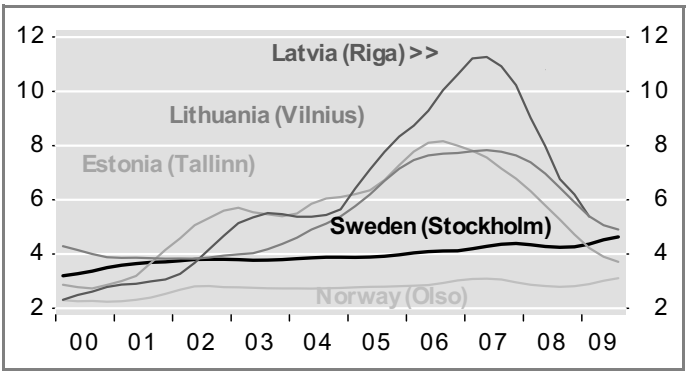
In combination with excess borrowing, the real estate boom in the Baltic economies played a special role, as it supported a sharp increase in domestic demand via a positive wealth effect. Better credit conditions from 2003-2004 in addition to the strong income growth, decreasing unemployment and increasing optimism likely due to growing expectations about the future in the wake of obtaining EU-membership in 2004, fuelled an explosive rise in property prices. The lack of housing supply at the early stage of price adjustments stimulated a surge in housing prices as well. A surge in demand, especially for new housing, was also determined by the need for better quality. Ten years ago, the majority of residential housing in the Baltics was built in Soviet time and characterized by bad thermo and sound insulation conditions.

Figure 7. Housing affordability indicators



Sources: Statistics Lithuania, Estonia, Latio real estate agency data.

Figure 8. Ratio of apartment prices to gross annual wages



Sources: Statistics Lithuania, Estonia, Latio real estate agency data.

A number of measures can be employed to assess the valuation of the real estate market, typically including international comparisons, price-to-income ratio, number of years needed to acquire housing, price to rent ratio and several other factors. One of the most popular measures used to assess housing market conditions is the price-to-income ratio. If this ratio rises above its long-term average, it could be an indication of overvaluation – and vice versa. In all Baltic countries the price-to-income ratios[5], have risen substantially in the last few years and were way above the levels seen in some other countries.

The Latvian property market was the most overvalued in the Baltic region, and especially the Latvian capital, Riga, saw soaring prices. According to data provided by a local real estate developer, *Latio,* the price of a 70sq metre apartment in Riga peaked at close to 12 times gross annual wages – significantly higher than in Estonia and Lithuania (see figure below). In general, real estate prices in the Baltic States quickly closed the gap to those in the Western Europe and were clearly too high for the current levels of incomes and rents.

The overheated housing market created strong indirectly increased tensions in the labour market as well. Workers of highly demanded professions, namely construction, real estate intermediation, some activities of manufacturing (furniture production), enjoyed very strong real wage increases and spillovers of wage pressures were felt across the whole economy. That created a strong income effect, in fact much stronger than can be justified by productivity growth rates, which led to a further rise in domestic demand. This in turn led to a build-up of external imbalances such as a large C/A deficit.

Fiscal policies favoured speculative investment in real estate as well, due to absence of real estate taxes and tax exemption schemes. In 2007, after prolonged

[5] Because of the lack of data, we use the average wage instead of disposable income per capita.

public debate, some tax measures were introduced (higher taxes were imposed for investments in the third consecutive real estate purchase for the same purpose).

Fiscal policies favoured speculative investment in real estate as well, due to absence of real estate taxes and tax exemption schemes. In 2007, after prolonged public debate, some tax measures were introduced (higher taxes were imposed for investments in the third consecutive real estate purchase for the same purpose).

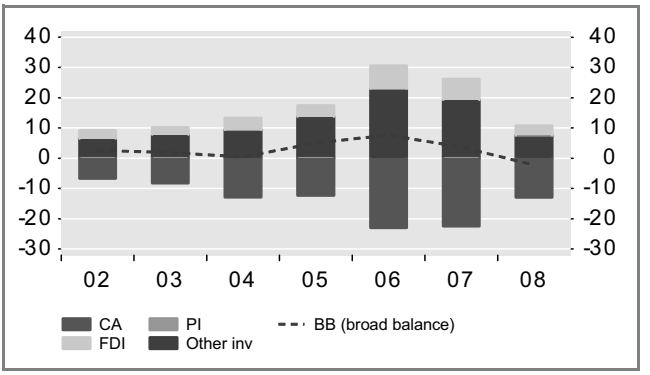
11.2.2. Sizeable external sector deficits

The fast growing environment created sizeable macroeconomic imbalances – first of all large C/A deficits – as was pointed out by Christensen and Rasmussen (2007). What can the macroeconomic indicators tell us about the current account deficit sustainability in the Baltic States? As import growth, due to very strong domestic demand, was considerably more buoyant than export growth in the last few years, external deficits rose markedly in the Baltic region. However, the C/A deficit was considerably higher in Latvia than in the other Baltic economies. In 2007 the CAD in Latvia reached a historically high level – almost 25% of GDP.

Figure 9. Current account deficits in the Baltics

Sources: Reuters EcoWin.

Figure 10. Latvia: net flows in percent of GDP



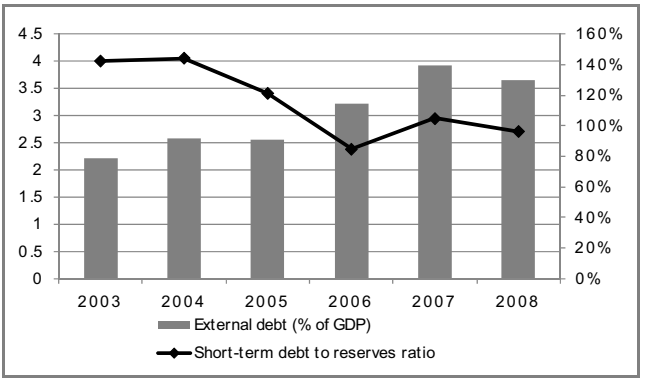
Sources: Reuters EcoWin.

The current account development and structural features across the Baltic States are similar and differences are mostly quantitative. As the privatization process came to an end, the importance of foreign direct investment (FDI) inflows in financing CAD has declined from more than 70% on average over the period from 2001 to 2002 to a bit more than 30% from 2003.However, this may indicate a slight decrease in the attractiveness of the region as destination best suited for so-called 'greenfield' investments. Financing CAD through loans (from local banks and other financial institutions) has picked up sharply in all three countries since 2005, enabling rising FX-reserves despite massive CAD. However, that kind of financing resources are much more risky and volatile than FDI, and there is no doubt that the reversal of this component from H2 2007 and onwards contributed to the deepening of the current recessions. No doubt that strong import growth led to exploding CAD, despite relatively strong export performance implying that at least part of the external deterioration comes from the low interest rate environment and financial deepening. All three Baltic states have exhibited the alarming feature of an extremely rapidly increasing foreign debt, which moreover, was rather short-termed. Thus, external vulnerability of the Baltic states has been extremely high.

There are many sources of vulnerabilities that are common for the Baltic States during the current crisis, and a risky financing profile of external liabilities is certainly one of the most important ones. The relation of foreign debt/GDP might indicate future problems of repayments if the figure displays high amounts. In the case of Latvia, the gross external debt surpassed GDP already in 2005. In 2008 it reached 130% in 2008, which seems to indicate a severe future burden. Turning to the assessment of the country's ability to service foreign debt in the medium to long run, it should be noted that according to the so-called Greenspan-Guidotti rule (GGR) see Olivier and Ranciere

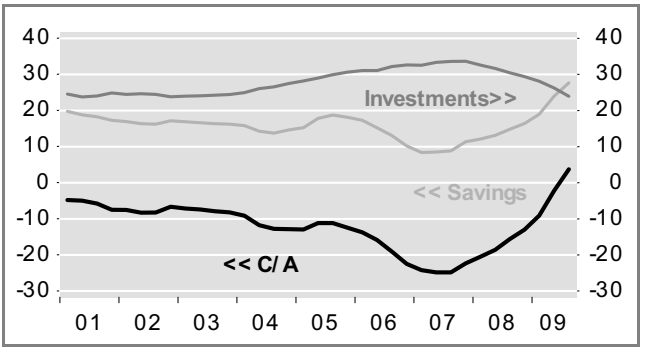
(2007)[6], a country is considered prudent or is believed to be less vulnerable if it holds foreign reserves in the amount of its total external debt maturing within one year. The original GGR rule was to condition the amount of access to the IMF's (now defunct) Contingent Credit Line (CCL), that is: access should be granted only if reserves plus CCL are higher than 12 months of debt being due. The Latvian short-term debt[7] to reserves ratio exceeds the allowable by more than two times. A high ratio of external debt is a clear signal of Latvian vulnerability, resulting from excessive short-term debt and exacerbated by insufficient FX-reserve. Thus, according to GGR, despite the falling trend short-term debt to reserves ratio exceeds the allowable more than two times.

Figure 11. Latvia: some indicators of sustainability of C/A



Sources: Latvian central bank, authors' calculations.

Figure 12. Latvia: saving-Investment gap (in percent of GDP)



Sources: Reuters EcoWin.

[6] Named after Alan Greenspan (ex Fed Chairman) and Pablo Guidotti, (ex Vice Minister of Argentina).
[7] Including non-resident deposits at call.

What can the other indicators tell us about the current account deficit sustainability in the Baltic States? The current account balance can be described as the difference between national savings and national investment.

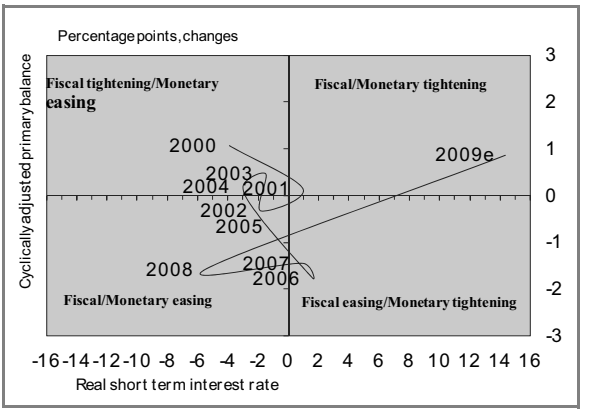
In the past few years of the boom period, investment picked up in all three countries, especially in Latvia, where gross capital formation to GDP ratios rose well above 30% of GDP and exceeded historical averages by far, while saving rates remain relatively stable. As the inter-temporal view on the CAD would suggest, a favourable interest rate environment provided a very strong stimulus to investment, while strong domestic demand (and rising domestic prices) ensured solid profit growth. At the same time, the impact of real interest rate dynamics on savings is not that univocal: risk-free assets were losing their attractiveness, whereas riskier alternatives provided attractive returns. Milesi-Ferretti and Razin (1996), following their theoretical and empirical studies, suggest that current account imbalance is likely to be less sustainable if the deficit is caused by reduction in savings rate rather than an increase in investment rates. They pointed out that high levels of investment imply higher future growth through the build up of large productive capacities. However, in Latvia as other Baltic economies it was a clear over-investment process mostly in non-productive activities.

The Latvian economy moved into free fall very suddenly in H2 2007 as domestic demand collapsed and the external environment deteriorated significantly. Tightening lending standards in the wake of the global credit crisis and falling house prices have put an end to expanding domestic demand. Due to the global deleveraging process the gap between investments and national savings has narrowed significantly in 2008-2009, mostly through the scaling down of investments, but some increase in national savings – through the collapse of consumption – has been observed as well. In fact the C/A balance turned positive in all three Baltic States. The negative aspect of the rapid adjustment is that it reflects a very sharp contraction in domestic demand in the Baltic States. A contraction that certainly has been enhanced by the fixed exchange rate setup. Hence, the negative cyclical effect has been significantly stronger in the Baltic States that in other Central East European economies, where depreciation of nominal currencies contributed to the re-balancing of C/A balances. In this context, a high level of indebtedness constrained the ability of the Baltic countries to respond to crisis.

11.3. THE ROLE OF NATIONAL ECONOMIC POLICIES

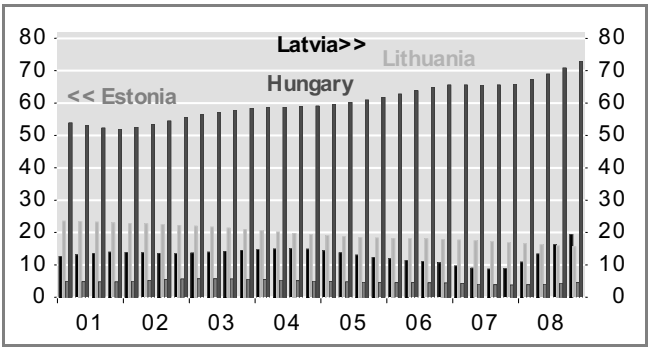
The economic development in Latvia was more imbalanced than in the two neighbouring Baltic states. One of the reasons is economic policy failures. The combination of monetary and fiscal expansion contributed to an acceleration of GDP growth that set the stage for the overheating of the Latvian economy in the years up to 2007.

Figure 13. Latvia: policy stance



Sources: EC, Reuters EcoWin, authors' calculations.

Figure 14. Public debt (in percent of GDP)



Sources: Reuters EcoWin.

Turning to monetary policy, if a country's economic policy is based on a currency peg option, the burden of adjustment to shocks falls mostly on fiscal policy. However, when assessing Latvian economic policies, our studies show that policymakers failed to halt excessive credit growth and did effectively use fiscal policy tools. Fiscal policy in Latvia during the boom period has been highly pro cyclical. Thus, due to the poor fiscal policy management, the fiscal and monetary policy mix at that time was far from optimal. It was a favorable monetary policy condition with negative end even declining real interest rate. Credit-fuelled domestic demand increased inflationary pressure, which lowered the real interest rate and stimulated credit growth.

Latvia's budgetary strategy during the boom period implied a significant fiscal loosening despite a very favorable macroeconomic environment. The cyclically-adjusted budget deficit rose significantly, suggesting that a tighter fiscal stance would have been more appropriate during the boom period, which was characterized by strong demand pressures and large external imbalances.

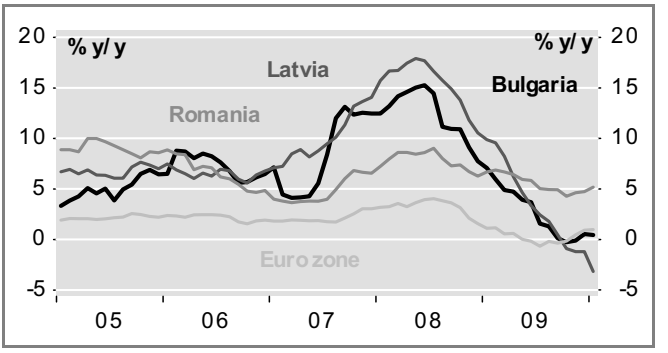
In the context of international standards, the measures of Latvian public debt were at a sustainable level before the crisis. It was well below Maastricht criterion (60% of GDP) and IMF sustainable level for typical emerging economies – 25% of GDP (IMF, 2003). However, the current credit crisis showed that even low public debt could raise significant concern. Despite the relatively low debt to GDO ratio Latvian CDS *(Credit default swap*) spread for five-year debt skyrocketed after the crisis. This clearly indicated a collapsed of confidence due to huge private external debt. Thus, financial markets have been closed and in the absence of any financial reserves the government was forced to ask the IMF for help.

11.3.1. Monetary policy

Regarding the monetary policy, the Latvian authorities started with a strong independent central bank with a flexible exchange rate arrangement. However, since February 1994 Latvia has had a de-facto peg to the IMF special drawing rights (SDR) basket of currencies and its policies are quite similar to those of a currency board. On 1 May 2004 Latvia together with nine other Central and Eastern European states joined the European Union (EU). Latvia joined ERM II in May 2005 and has chosen to maintain an exchange rate against euro within the range ±1%. The fixed exchange rate arrangement influenced Latvian monetary policy, and was supposed to restrict fiscal policy. Monetary policy became almost insignificant, and the fiscal policy had all economy-regulating levers.

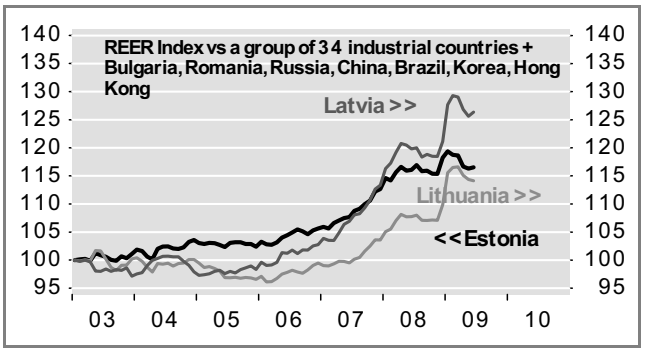
Empirical evidence shows that a fixed exchange rate policy is associated with lower inflation – see Ghosh *et al.* (2000). Indeed, currency boards in Lithuania and Estonia have, until mid-2007 – been remarkably successful at maintaining price stability, thereby contributing to the outstanding economic performance in the last decade. However, curbing inflation has been less successful in Latvia.

Figure 15. CPI development



Sources: Reuters EcoWin.

Figure 16. REER development



Sources: Reuters EcoWin.

On the other hand, it is clear that if a fixed exchange rate regime is not supported by sound fiscal policies, imbalances can built possibly leading to overvalued real effective exchange rates, which in turn lower growth potential. Thus, due to the increasing inflation rate and rising labour cost, Latvian real exchange rate (REER) appreciated, especially when based on the unit labour costs (ULC). This indicates that export competitiveness has been deteriorating sharply.

Regarding the exchange rate development in the long run, it is expected that all three countries will finally adopt the euro. But there is still a long way to go, and we think that fixed exchange rate regimes could be a risky policy option in preparation for the adoption of the euro. In the face of nominal convergence and positive capital inflows as was seen between 2002-2007, the fixed exchange rate prevents nominal appreciation and that created excess liquidity, which led to bubbles in asset markets. Therefore, price and current account deficit (CAD) pressures emerged.

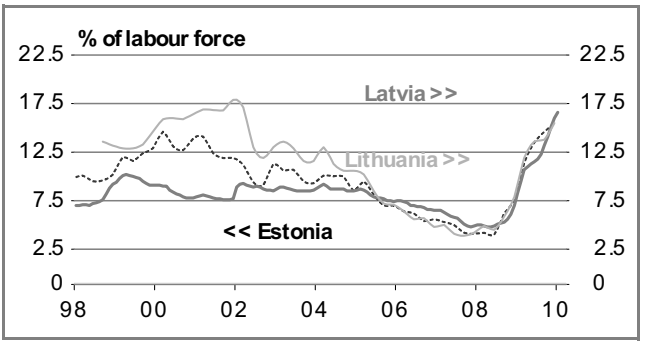
Although the currency pegs have encouraged price stability and restored stability to financial markets over the past periods, the extent of the recession has called attention to the drawbacks of the pegged currencies. First of all, the reliance on fiscal adjustments was the only policy tool available to restore competitiveness and growth.

11.3.2. The role of ULC development

There are many empirical studies that have examined the role of unit labor costs (ULC) in shaping inflation and competiveness dynamics. The evolution of ULC is a key determinate of inflation and competitiveness. High ULC growth can be explained by 1) strong wage growth, 2) low productivity growth, or a combination of both factors. Thus, despite strong productivity growth, a significant

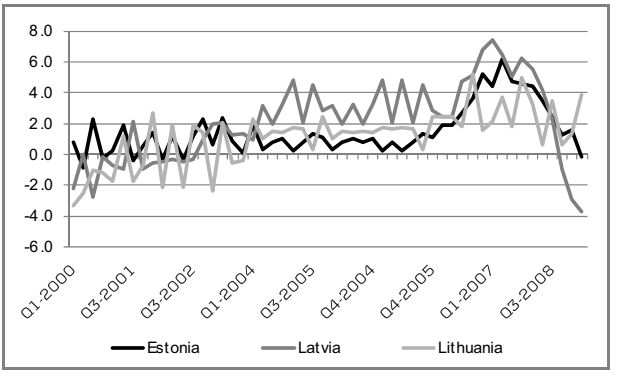
increase in wages can result in high ULC growth – and it did in Latvia as we will see below. It can be noted that in Latvia as well as in other Baltic economies labor cost growth started to accelerate soon after the EU accession.

Figure 17. Tension in labour market



Sources: OECD calculations.

Figure 18. Development of ULC (growth to previous period, s.a.)



Sources: Latvian Statistics, authors' calculations.

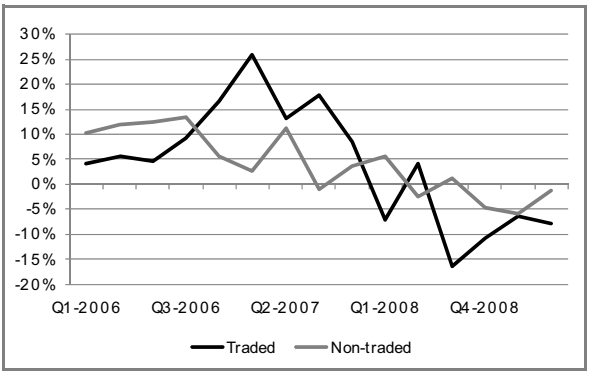
In the case of the Baltics, elevated growth in ULC was driven by strong domestic demand in non-traded sectors – especially in the construction and real estate sectors. Further, strong labour force emigration both internally and externally added to tightness in labour markets, which in turn pushed up wage growth excessively. This undermined the external competitiveness in the Baltic States, especially in Latvia where the share of high-tech and medium-high-tech products of total exports is relatively low.

When discussing the competitiveness issue, one might address the 'Balassa-Samuelson' (BS) effect. If productivity growth in the traded goods sector is higher than in the non-traded goods sector this leads to higher wages in the traded goods sector, but also in the non-traded goods sector even if not justified by productivity

gains in that sector. This effect assumes full employment and perfect labour mobility between sectors. One standard definition of the real exchange rate is the ratio of prices between non-traded and traded goods. Hence, a natural extension of the above argument is that real appreciation can follow in cases where the home country experiences higher productivity growth in the traded sector compared with the non-traded sectors.

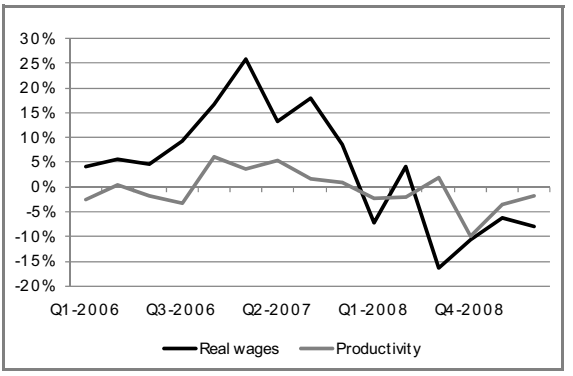
Some studies address the case of the adverse BS effect, which can occur when for example an increase in demand in the non-traded sector pushes up non-traded wages, which, through labour mobility force the traded sectors to increase productivity and wages. This effect was discovered by Grafe and Wyplosz (1997) for transitional economies. For many transitional economies the non-traded sector (mainly services) is in general underdeveloped providing large productivity potential compared to the traded goods sectors. Hence a relative price increase of non-traded to traded goods is caused by initial 'distortions' rather than by faster growth of productivity in manufacturing than in services.

Figure 19. Latvia: real wages development (annual growth rate)



Sources: Latvian Statistics, authors' calculations.

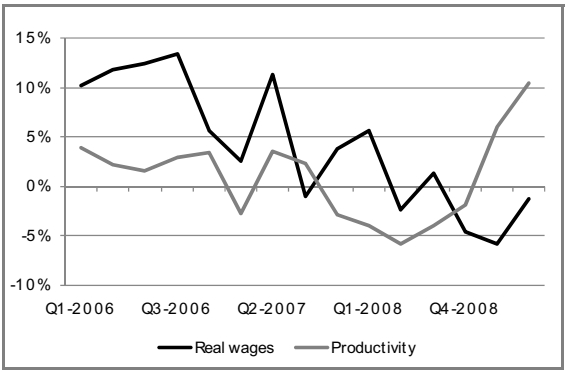
Figure 20. Latvia: traded sector (annual growth rate)



Sources: Latvian Statistics, authors' calculations.

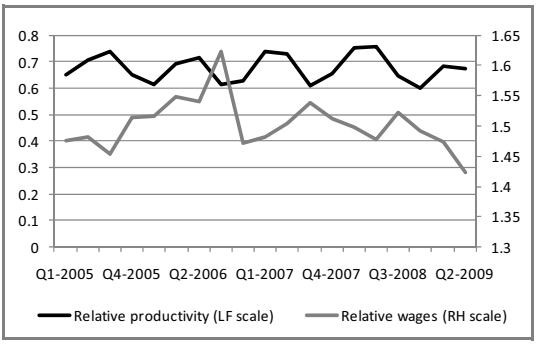
In order to support these arguments we have calculated labour productivity and real wage growth rates in the traded and non-traded sectors. In the traded sector we included manufacturing, agriculture, mining, transportation and communications, and hotels while the non-traded sector includes energy, construction, wholesale and retail trade, real estate and business services, education, health and personal services.

Figure 21. Latvia: non-traded sector (annual growth rate)



Sources: Latvian Statistics, authors' calculations.

Figure 22. Latvia: relative productivity and wages (ratio of traded to non-traded)



Sources: Latvian Statistics, authors' calculations.

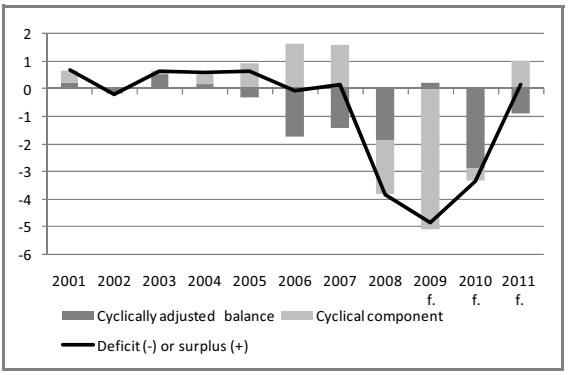
Overall we see limited empirical evidence of the Balassa-Samuelson effect at play in Latvia during 2005-2008. First of all, when we take the ratio of traded-to-non traded productivity growth, we detect almost no change in relative productivity since 2005, as both sectors experienced comparable productivity increases during this period. However, we see some mechanisms underlying the adverse Balassa-Samuelson effect to have some effect, as it looks like a real wage increase in non-traded sectors in 2005-2006 spilled into manufacturing and raised wages there. However, wage increases exceeded productivity growth in both sectors in general and this put upward pressure on ULC and inflation, ultimately hurting competition.

11.3.3. Fiscal policy stance

Over the period of the economic boom, the fiscal policy tended to be pro-cyclical in all Baltic states and Latvia was certainly no exception. Hence, fiscal policies enhanced the boom rather than acting in a counter-cyclical manner.

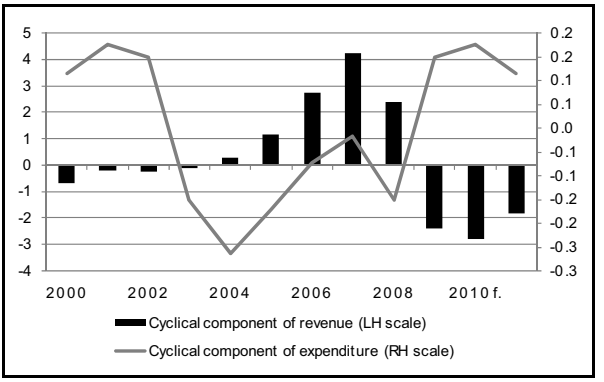
However, the deficit of the consolidated budget was compliant with the criteria of the Maastricht Treaty as it was below 3% of GDP and the gross debt was below 60% of GDP. However, the actual deficit does not show whether the fiscal policy matches economic conditions. Normal assessments regarding soundness and sustainability of public finances are usually based on cyclically adjusted budget balances. These focus purely on the development of the structural budget balance, which largely represents the result of discretionary fiscal policy. The cyclically adjusted budget balance represents the budget balance on a normal growth path. Adjusting budget balances for cyclical effects makes it possible to analyze the development of structural budget balances and to assess the effects of discretionary fiscal policy.

Figure 23. Latvia: fiscal stance (in % of GDP)



Sources: European Commission calculation (improvement +, deterioration-)

Figure 24. Latvia: cyclical adjustments



Source: European Commission calculation

In addition to the nominal Maastricht Treaty criterion the SGP introduced a commitment to reach a medium-term budgetary position that would allow dealing with 'normal' cyclical fluctuations while keeping the budget deficit below 3% of GDP over a business cycle. This measure is used as an assessment of whether or not the government finances in EU countries comply with the stipulations in the Stability and Growth Pact. According to this pact, the medium-term fiscal policy strategy must be targeted to the balanced, and the anti-cyclic fiscal policy costs should not exceed 3% of GDP. The 2005 reform of the SGP includes a revision of the criteria for the determination of medium-term budgetary objectives. They are allowed to be differentiated across countries reflecting differences in debt levels, sustainability and potential growth.

The deficit of a cyclically adjusted budget does not reveal the impact of the fiscal policy on the economy. In this case one should assess automatic budget stabilizers

mitigating the influence of economic fluctuations on state finances. Following the expert evaluation of the results (elasticity indices) and other factors (revenue and expenditure structures) it may be stated that the automatic stabilizer does not work for spending, and the one for revenue should be quite considerable taking into account the rather high dependency of indirect taxes on private consumption. This allows for the assumption that during a recession a lower deficit may be expected, if it is clear that no targeted policy to increase spending is going to be undertaken. However, the reality was quite the opposite due to the significant effect of the discretionary fiscal policy.

The cyclical influence on the fiscal position during the boom period in the Baltics was positive. However, cyclically adjusted or not the structural balance deteriorated during the boom time. In the context of strong demand pressures and external imbalances, contractive fiscal policy would be very desirable in Latvia.

Calculations[8] show that Latvia's nominal budget almost balanced during the boom period time. This was primarily due to the positive impact of the business cycle; fluctuations of macroeconomic variables do play a significant role. The dynamics of a cyclically adjusted primary balance are very close to those of a cyclically adjusted budget balance, as changes in interest rate payments relative to GDP were relatively moderate. It is apparent that the cyclically adjusted primary fiscal balance has deteriorated substantially in the last five years (see Figure 19-20). The largest deterioration has been observed in 2006-2007. It should be mentioned that the budgetary deterioration in 2006 mostly appeared due to parliamentary elections. The main fiscal measures for 2006 include an increase in personal income tax-exempt income and tax relief, as well as extra increases in public expenditure.

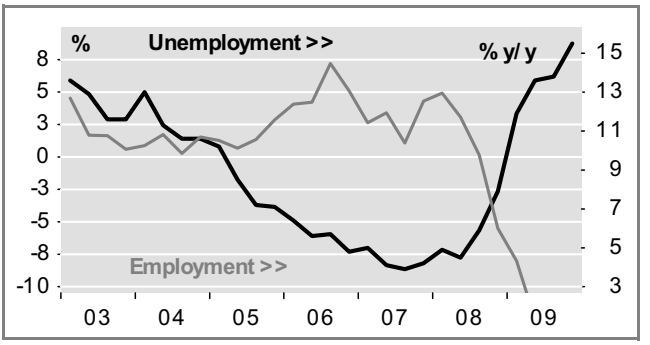
Thus, the risk to the government deficit might exceed the 3% of GDP reference value in the event of falling economic growth rates raised already in 2006. Significant deterioration of the cyclically adjusted balance has occurred in accelerated GDP growth conditions, which indicates that during the boom time the fiscal policy in Latvia shows strong pro-cyclical tendencies.

11.4. THE WAYS OUT OF THE CRISIS – INTERNAL DEVALUATION OPTION

A response to a crisis aimed at countering the drop in domestic demand depends upon a country's ability to implement counter-cyclical fiscal and/or monetary policies.

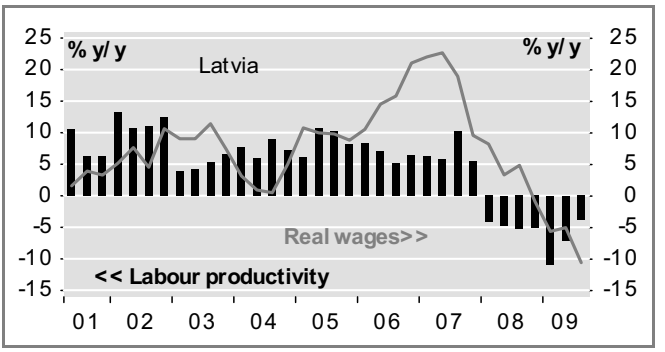
[8] Based on European Commission calculation.

Figure 25. Latvia: unemployment dynamics



Sources: Reuters EcoWin.

Figure 26. Latvia: wage – productivity gap



Sources: Reuters EcoWin.

The Baltic States, however, do not have any leeway for expansionary policies. First of all, the countries have been running budget deficits (except Estonia) in the past ten years. Thus, in this case, any attempt to raise domestic demand by running fiscal deficits will only widen trade deficits and current account imbalances and further stimulate imbalances in the economy. The current crisis has even elevated the need for painful adjustments in this region with relatively adverse economic impacts. Thus, a key policy choice for Latvia in this respect was the so-called internal devaluation where domestic wages and prices are adjusted down to restore competitiveness. Latvian *labour market* is described as being *very flexible, especially in terms of downward wage flexibility. Besides, u*nemployment changes are relatively well correlated with employment changes. Relatively high labour market flexibility has *allowed* it to *adjust* more readily to external shocks.

It looks like the wage/productivity gap finally is beginning to close as of H2 09 and the real effective exchange rate (REER) is thus correcting. However, a stronger adjustment is observed in REER deflated by CPI than ULC, which might

suggest a need for a continuation of wage disinflation for some time to come. It should be mentioned that internal devaluation particularly affected the distribution of social transfers – and in some cases with significant consequences. Most of the population is hit by these measures, but especially those with the lowest income levels. Latvia already experienced a jump in unemployment and ongoing internal deflation is likely to force unemployment up even higher in the short run.

In total, in the long-run internal devaluation is supposed to result in lower prices (costs) in the economy and will finally make local products more attractive to export markets as well as more affordable for local consumers. An increase in exports should revive other sectors of business and should lead to increased consumption and domestic demand.

However, this policy option would lead to deteriorating labour market indicators.

11.4.1. External Devaluation, its pros and cons

"When prices and wages adjust slowly, the immediate effect of devaluation is to improve international competitiveness" (Begg *et al*., 2001). The simplest argument in favour of external devaluation:

1. probably the quickest way of improving competitiveness;
2. should lead to lower real interest rates, if devaluation is carried out in a credible manner. A decline in real interest rates along with improved trade prospects, in turn, would stimulate economic activity and reduce unemployment;
3. higher inflation would help boost government tax revenues and improve nominal fiscal position;
4. lower relative prices would promote tourism.

Obviously there are arguments against these policy options:

1. higher inflation would hurt purchasing power of the households;
2. negative balance sheet effect (as most of Latvian liabilities are denominated in euro devaluation of the national currency would lead to a redistribution of wealth to creditors from debtors. However, the inflation that would follow devaluation would mitigate this wealth redistribution somewhat although it would bring its own set of problems;
3. devaluation would put substantial pressure on the Latvian financial system;
4. the higher costs of servicing the Latvian government's foreign debts following devaluation would increase the public budget deficit as well;
5. devaluation would cause immediate bankruptcies.

It should be noted that imports have a large impact on the Latvian economy, especially the importance of energy resources in imports is large as these goods are necessary both for domestic consumption and for manufacturing of exporta-

ble products (intermediate and capital goods account for 60% of Latvian imports). In the event of devaluation, the price of imports will rise significantly over the medium term and this could cancel out the positive effect of devaluation.

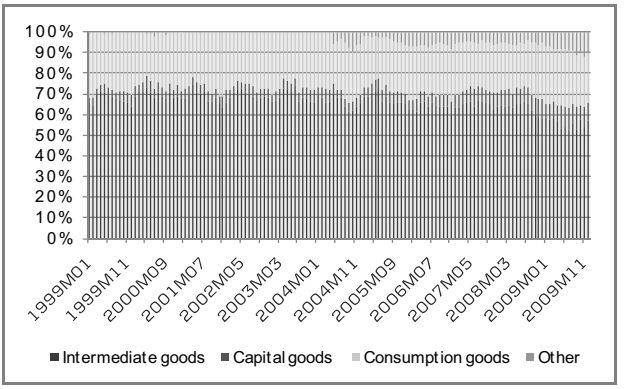
From a theoretical point of view depreciation of the exchange rate is thought to promote exports and decrease imports, leading to an improving trade balance holds true only if the sum of the price elasticity of export and import demand is higher than one – the Marshall-Lerner condition (Krugman and Obstfeld 2006).

Functioning of the Marshall-Lerner condition is also based on full exchange rate pass-through to import prices and zero pass-through to export prices (Coricelli *et al*., 2006). Only when we might expect that valuation effect in the case of devaluation would overwhelm the quantity effect. Thus, trade sector structure in terms of the response of import/export to changes in relative prices is important issue. Latvian import structure indicated a relatively high share of imported inputs. Taking into account that domestic substitute of those goods (for example, energy products) is narrow we might see that country's industries would be exposed to exchange rate movements through the cost of imported inputs into production than through their export markets. Latvia has a relatively high import share of material-intensive goods and we might expect to see only 'partial' aggregate exchange rate pass-through. In summary, Latvian external trade structure provides some pessimism about foreign trade elasticity given such import/export structure.

What about the impact of devaluation on domestic cost and as a consequence on exports? Domestic costs are affected by devaluation through two channels. Firsts of all, it causes the rise of the cost of imported intermediate inputs and thus increases in domestic cost. The significance of this effect will depend on the share of imported inputs in unitary cost of the production and the elasticity of substitution between domestic and imported goods. Second, devaluation would reduce real prices of domestic input – labour in terms of importable goods. Thus, devaluation would improve competiveness more in the sectors with high labour share in unitary costs compared with those with high imported intermediate inputs.

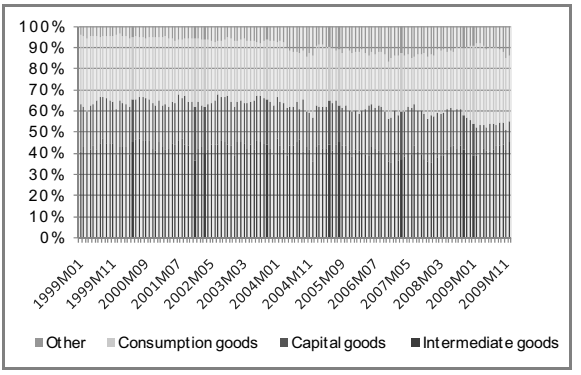
Relatively high concentration on low- and medium-tech products in total Latvian exports is associated with relatively high labour intensity. However, deeper sector analysis of Latvian manufacturing is needed.

Figure 27. Latvia: export structure



Sources: Eurostat.
Note: Other include motor spirit and passenger motor cars.

Figure 28. Latvia: import structure



Sources: Eurostat.
Note: Other include motor spirit and passenger motor cars.

Coricelli *et al.* (2006) draws a connection here between the exchange rate channel and the credit channel. The effect of the credit channel on the economic activity of firms constrained by external finance is exacerbated if these firms are in low mark-up sectors. If changes in the exchange rate impact significantly on firms balance sheets, they will influence these firms capacity to borrow externally (broad lending channel). A collapse in investment due to an exchange rate-induced fall in firms' net wealth may outweigh competitiveness gains, provided the Marshall-Lerner condition is verified. Consequently, individuals and corporations would prefer to hold their liquidity in foreign currency – keeping it safe at home or within a foreign bank. This was clearly demonstrated by concerns rising within the community about the stability of the Latvian lats in H1 09 and affect-

ing the behaviour of the population. Overall bank deposits in lats decreased by almost a tenth. However, as these concerns abated, this trend reversed.

The Marshall-Lerner condition is verified in the transition countries of central and eastern Europe (Coricelli *et al*., 2006) and we have no strong evidence, that the Marshall-Lerner condition is not met in Latvia. There are many complications to these conditions, according to empirical evidence the exchange rate pass through is typically not equal to 1 and many other things might occur at the same time as exchange rate devaluation and finally outweigh the positive/negative effects.

11.5. CONCLUSIONS

Relieving credit constraints and cheap money results in excessive bank lending and property bubbles in Latvia. Besides, such credit-stimulated domestic demand creates inflationary pressures, which, in turn, further support credit growth at lower real interest rates. All those factors increase concerns about the Baltics overheating well before the global credit crunch (Christensen and Rasmussen, 2007).

The presence of sizeable macroeconomic imbalances – including strong tensions in the labour market, rises in unit labour costs, large current account deficits, rising inflationary pressure, excessive borrowing and potential overvaluation – highlight the need for adjustment.

The biggest challenge was that combination of monetary and fiscal expansion contributed to an acceleration of credit and GDP growth that set the stage for the overheating of the Latvian economy in the years up to 2007. From one side, monetary authorities cannot effectively control the supply (or the price) of credit due to fixed exchange rate arrangements. That poses a challenge as to the first-best and second-best policies geared to containing the credit growth. Pro-cyclical fiscal policy fuelled the demand side as well.

Tightening lending standards in the wake of the global credit crisis and falling house prices have put an end to expanding domestic demand. However, the current crisis has elevated the need for painful adjustments. In the absence of exchange rate flexibility, the response to shocks will have to be mitigated only by tight fiscal policy as well as by policies enhancing structural flexibility. The real exchange rate appreciation, credit restraint and fragile recovery in external demand are making those adjustments even more challenging.

Other policy options, which would imply an immediate positive effect to exports, caused much discussion between experts both domestic and foreign. So far, according to our analysts, both deflation and devaluation would stimulate the

export of Latvian economy. However, with no strong empirical evidence confirming the Marshall-Lerner condition, which is crucial for expansionary effect of devaluation we cannot be sure whether the negative effects on import prices do not outweigh the positive effects on exports. This issue should be examined further.

Both, deflation and devaluation would further improve external account. On the other hand, the foreign account is not just an external competitiveness issue, especially when there is a huge external debt denominated in foreign currencies. Even, if devaluation improves the trade account external debt will be revalued. Thus, net effect on the foreign account will be uncertain.

A downside to devaluation policy option is the risk of high inflation or even hyper inflation. However, due to large negative output gap we might expect relatively low risk of this effect in Latvia.

Finally, large negative balance sheet effects. On the other hand, banks have already set aside reserves for loan loss provisions. Besides, foreign banks in Latvia announced that the size of losses are unaffected by devaluation. Only the timing of losses is affected.

It is also a fact that Latvian currency is still acutely overvalued and this reduces capital inflows to the country as well. Devaluation would probably lead to a rise in capital inflows. This was the case in Argentina after the default and devaluation in January 2002.

Finally, again we admit that there is no certainty that under given structure of Latvian economy devaluation would work as output expansionary policy option. However, it should be pointed out that despite the expected positive outcome in the long run, in short run internal devaluation will be a socially unfriendly course of policy. Thus, it is still an open question as to whether the right policy has been chosen. Deflation and a deteriorating labour market has caused a long-term recession for the Latvian economy, which would be difficult to recover from even if the global environment improved. There are various options regarding the future of Latvian economy, but none of them are simple and painless for society. What is clear is that in order to restore a balanced economic development and competitiveness, more complex policy options need to be implemented.

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12. Ukraine: the Story of Boom and Bust

Dimitry Sologoub

Abstract

In this paper we review Ukraine's economic developments in the last two decades since the collapse of the Soviet Union and provide our insights on why the country was hit so hard by recent global economic recession and what policies should be put in place in order to put the country on a sustainable growth path. We argue that robust economic performance in 2000-2007 (driven by strongly improving terms of trade and booming capital inflows, and enhanced by procyclical domestic economic policies) masked the fundamental weaknesses of the Ukrainian economy, such as low production efficiency, non-diversified foreign trade, rising currency mismatches in the banking system, mounting external debt, and vulnerable fiscal position. Consequently, given high trade openness, weak institutional environment and messy political landscape, the country fell into the severe recession as soon as the temporary drivers of growth evaporated. Moreover, given relatively depressed outlook for the global economy and financial markets for the next few years, these previous growth drivers are no longer available. Therefore, the country's future growth strategy should be based on developing sustainable domestic demand and diversifying foreign trade (redirecting exports to fast-growing countries and regions, such as China, India etc). The necessary policy actions include the implementation of certain structural reforms (judicial, pension, and land reforms, energy sector restructuring etc) and improvement in the macroeconomic framework. However, given unfavourable political outlook, we are moderately sceptical on the success of these reforms and do not expect major breakthrough in the near future.

12.1. Introduction

In the last 20 years since the collapse of the Soviet Union Ukraine has exhibited a remarkable feature of leaning to the absolutes – it is either one of the leading growth performers in the world or the worst. In 1990s Ukraine experienced the harshest transition in Eastern Europe (except war-battered countries) as cumulative fall in output constituted 60% between 1991 and 1999. Sharp improvement in the terms of trade (thanks to large-scale nominal depreciation and surge in global commodity prices), the implementation of long-awaited structural reforms, and the presence of substantial idle capacities in the industrial sector stimulated an impressive recovery of the Ukrainian economy since 2000. In 2000-2007 GDP grew 7.4% per annum on average making Ukraine one of the fastest growing countries in the region.

Remarkable events of Orange Revolution in late 2004 led to the profound change in Ukraine's public image – from ugly duckling it suddenly turned into everybody's darling. Consequently, foreign capital flew in attracted by huge catch-up potential and economy's bright growth perspectives against the background of high-quality human capital, favorable geographic location, vast natural resources, and deep domestic market. Large capital inflows, coupled with expansionary fiscal and monetary policies, have added further momentum to the economic growth, but also contributed to the growing macroeconomic imbalances such as high and volatile inflation, widening current account deficit, mounting external debt, real estate boom, and aggressive FX lending to the unhedged borrowers. Moreover, robust economic performance masked the fundamental weaknesses of the Ukrainian economy – it was characterized by low efficiency and sluggish productivity growth due to an unfriendly institutional environment (weak and corrupted legal system, buoyant shadow economy, excessive regulatory burden, the absence of transparent land market etc) and outdated infrastructure. Thus, despite impressive growth dynamics, Ukraine looked highly vulnerable in the face of adverse economic shocks.

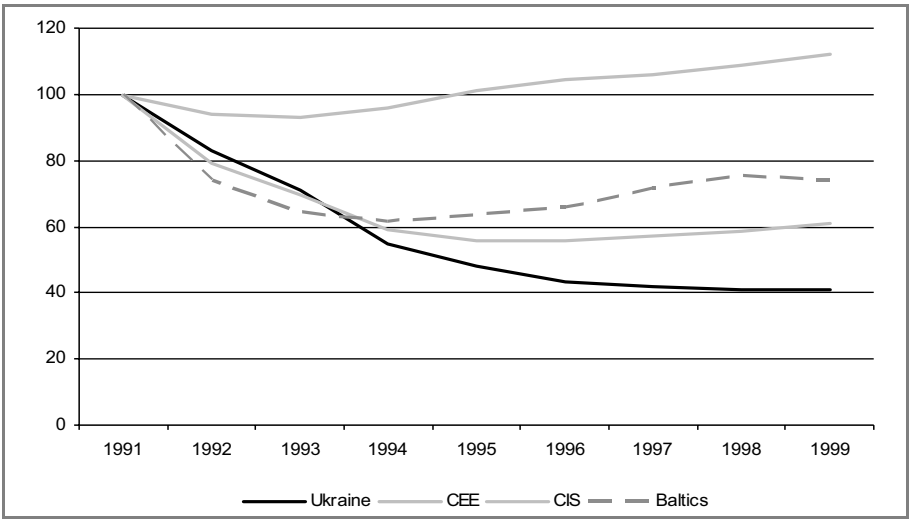
Therefore, not surprisingly, when an adverse economic shock eventually occurred (i.e. the collapse in global steel prices in mid-2008 followed by the global credit crunch in the aftermath of Lehman Brothers bankruptcy), Ukraine immediately slipped into a deep recession, becoming one of the main victims of the global economic downturn. Moreover, the adverse change in external conditions was also exacerbated by the domestic factors, such as plunging confidence in the national currency, run on deposits, and persistent political quarrels. As a result, the country experienced one of the most severe output declines in the region as GDP slumped by 15% in 2009.

In this paper we summarize the history of recent economic developments in Ukraine to understand why the country is so prone to the extreme points. Specifically, we would like to discuss three main questions. First, why Ukraine was hit so hard by the latest global economic crisis? Second, what were the channels of global crisis contagion to Ukraine? And, finally, which polices should be put in place in the future in order to ensure sustainable economic development? The paper is organized as follows: Chapter 12.2. reviews Ukraine's economic developments in the last two decades since the collapse of the communist system and prior to the recent crisis. Chapter 12.3. discusses the main vulnerabilities of Ukrainian economy built up in the era of fast economic growth. Chapter 12.4. overviews latest economic recession in Ukraine, pointing out the main crisis channels and policy responses (or rather the lack of them). Chapter 12.5. presents short-term economic outlook for Ukraine and briefly outlines the main policy actions necessary to unleash Ukraine's growth potential and ensure sustainable economic development. Chapter 12.6. concludes.

12.2. SUMMARY OF ECONOMIC DEVELOPMENTS: LOST 1990S AND BUOYANT 2000S

Similar to its Eastern European neighbors and CIS peers, Ukraine experienced an output collapse in early 1990s in the process of transition from a centrally-planned to a market-based economy. However, the magnitude of output collapse in Ukraine was unique across the region: according to Berengaut *et al.* (2002), cumulative output loss in Ukraine constituted 59%, in comparison to 23% for the CEE group, 38% for the Baltic countries, and 44% for the CIS group.[1] Dabrowski (2002) argues that the severity and duration of output decline in Ukraine cannot be explained by the inherited distortions (as all former communist economies had similar starting point) but should be rather attributed to bad economic policies. Specifically, it includes very expansionary monetary and fiscal policies in the beginning of the decade (leading to the hyperinflation in 1993), late and inconsequent liberalization and macroeconomic stabilization, slow and non-transparent privatization, buoyant rent-seeking activities, over-regulation of the economy and extremely bad investment climate. The first signs of output recovery appeared in 1997 against the background of improved macroeconomic policies (tightening budget constraints, introduction of a new national currency – the hryvnia, better payment discipline) and certain structural reforms (privatization, trade and price liberalization), but the Russian crisis of 1998 overshadowed the positive trend, leading to a continuation of the decline in output.

Figure 1: Index of real GDP growth in transition economies (1991=100)



Source: International Monetary Fund

[1] The decline is measured relative to 1991 for Baltic and CIS countries, and relative to 1990 for CEE region.

The year 2000 represented the important watershed in Ukraine's recent economic history – for the first time since the start of transition the country's GDP grew – by 5.9%. On the production side the economic recovery was primarily driven by robust growth in manufacturing, agriculture and trade, while a surge in exports was the main growth factor on the demand side. In 2001 economic growth accelerated to 9.2% supported by 14% increase in the industrial output. Berengaut *et al.* (2002) claim that the return to positive economic growth in Ukraine was primarily stimulated by the pickup in foreign demand for Ukrainian products as Ukraine's external position was boosted by a huge competitiveness gain following massive nominal depreciation and falling real wages (according to IMF calculations, real effective exchange rate (REER) depreciated by nearly 40% in 1998-1999). Moreover, the Ukrainian economy has benefitted from the strong rebound of Russia (its main trading partner) after 1998 crisis. These favorable external developments coincided with the availability of significant excess capacity in the industrial sector, which had remained from the Soviet period. Thus, the strong build-up in aggregate demand did not require large new investments and has been accommodated through existing production capacities.

In addition, the implementation of market-oriented reforms is often mentioned as an important factor of economic recovery in Ukraine in early 2000s (see, for example, Tiffin (2006)). Specifically, prudent fiscal and monetary policies (the elimination of barter transactions, broadening tax base, tighter monetary stance) helped to ensure a stable environment that at least was not inimical to output growth. At the same time, the government of Victor Yushchenko managed to push through vital structural reforms, such as simplifying the system of regulatory acts, reforming fiscal framework (via adoption of a new Budget Code), privatization of energy distribution companies and enforcing payment discipline in the energy sector, the adoption of a new Central Bank law etc.

Since 2000, Ukraine has embarked on impressive growth path – in 2000-2007 GDP grew 7.4% per annum on average.[2] On the one side, this robust growth performance represented a catch-up process after the deep slump during the previous decade. But also we attribute it to the considerable de-shadowing of the Ukrainian economy following improved regulatory environment and simplification of the tax system.[3] In 2000-2004 economic growth was primarily driven by steadily improving terms of trade[4] against the background of booming global commodity prices, subsidized energy prices and an undervalued exchange rate. In particular, since 2000 the hryvnia has been effectively pegged to USD, which was depreciating against the currencies of Ukraine's main trading partners (i.e. Russia

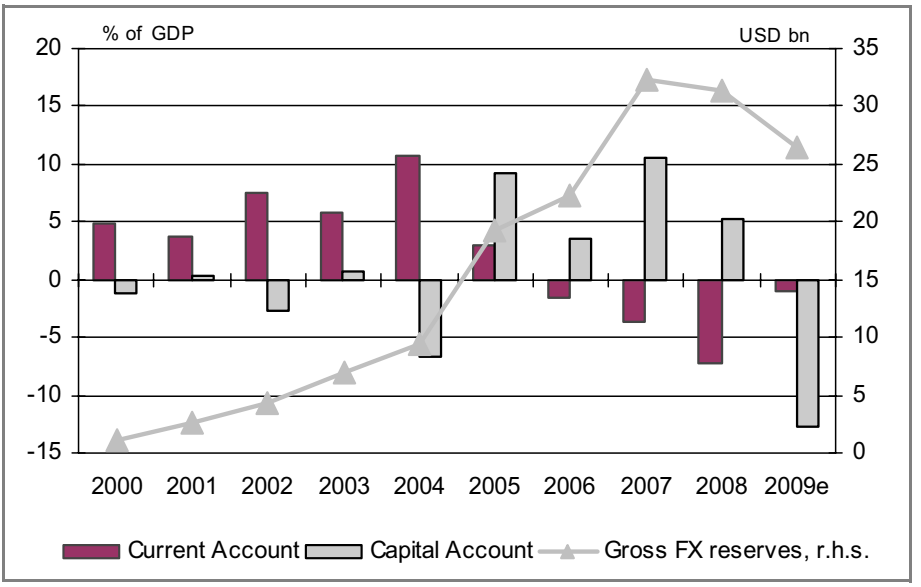
[2] Ukraine has experienced a growth hiccup in 2005, when GDP growth slowed down to 2.6% amid a temporary slump in global steel prices and the negative impact of reprivatization talks on investment behavior.

[3] According to the estimates of National Security Council, the ratio of shadow economy size to official nominal GDP fell from 45% in 1998 to 30% in 2004.

[4] OECD (2007) reported that the cumulative gain in Ukraine's terms of trade constituted 16% over 2001-2006.

and the EU), thus a nominal effective depreciation cushioned the effect of persistently high inflation differential on the dynamics of real effective exchange rate and sustained the competitiveness of Ukrainian exports. As a result, Ukraine persistently ran current account surpluses (peaking at 10.6% of GDP in 2004), while capital inflows remained weak. Specifically, excessive regulatory burden and protectionist measures (designed in favor of few oligarchic business groups) deterred the entry of foreign investors despite country's considerable long-term potential. Thus, while Ukraine had desperate investment needs, savings-investment balance was in high surplus as the benefits of robust economic growth were largely reaped by the corporate sector (which has high propensity to save).

Figure 2: Balance of Payments



Source: National Bank of Ukraine, Raiffeisen Bank Aval

Impetuous political developments in late 2004 inspired pivotal changes in the economic environment. Generous pension and wage increases before and after Presidential elections led to the redistribution of resources from the corporates to households (which have high propensity to consume). Specifically, public investment has been crowded out by social expenditures (according to OECD (2007), in 2003-2005 public fixed capital investment shrunk from 2.8% of GDP to 1.9%, while public transfers rose from 17.1% of GDP to 22.6%). At the same time, the Orange Revolution managed to stoke investors' interest in the Ukrainian market – incited by the spectacular political changes, foreign investors rushed in to explore deep domestic market with huge catch-up potential and bright long-term growth perspectives. Specifically, Ukrainian banking sector has been one of the

major recipients of FDI since 2004 – the share of foreign capital in the banking system has quickly jumped up from 13% in 2004 to 40% in 2008. The influx of foreign banks, improved macroeconomic environment and funding bonanza (owing to abundant global liquidity and de-shadowing of domestic savings) have stimulated a rapid expansion of the banking sector. The annual average credit growth rate amounted to 66% in 2005-2007, while the loans to GDP ratio jumped upwards from 25% at the end of 2004 to 60% as of the end of December 2007 – one of the highest figures across Eastern Europe, despite striking difference in the income levels.

Massive increase in social spending and widened access to credit unleashed remarkable consumption boom. Private consumption grew 17% per annum on average in 2004-2007 leading to a dramatic reversal in the external accounts.[5] Current account balance turned from the surplus of 10.6% of GDP in 2004 to the deficit of 3.7% in 2007, which was mirrored by capital account developments – it reversed from the deficit of 6.7% of GDP in 2004 to the surplus of 10.6% in 2007). Fast GDP growth and expansionary fiscal policy spurred a radical improvement in the living standards, which was reflected in surging household income (real disposable income grew 17.5% per year on average in 2004-2007), a reduction in unemployment (according to the methodology of International Labor Organization, unemployment rate fell from 11.6% at end-2000 to 6.5% as of end-2007), and a sharp decline in poverty (World Bank (2007) reported that the poverty rate, measured against an absolute poverty line, fell from 32% in 2001 to 8% in 2005).

12.3. MAJOR WEAKNESSES AND VULNERABILITIES OF UKRAINIAN ECONOMY

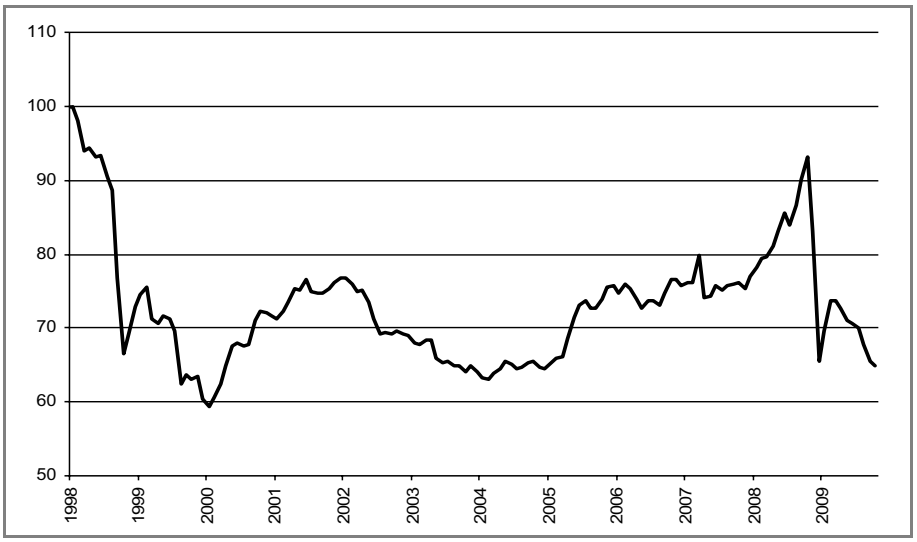
Despite robust economic growth and vast improvement in the living standards, economic challenges in Ukraine loomed large. In particular, the Ukrainian economy was apparently overheated: Rapid GDP growth was accompanied by skyrocketing inflation, a widening current account deficit, surging external debt, and enormous credit boom. At the same time, economic policies did not help to contain growing imbalances, but rather contributed to the build-up of the systemic risks. Specifically, in the recent years fiscal and monetary policies have been distinctively procyclical. For example, populist fiscal policy measures (aimed at 'buying' electoral preference) led to an increase in budget expenditures by 10% of GDP from 2003 to 2008. Consequently, despite booming fiscal revenues

[5] Sharp deterioration of trade balance was also fuelled by drastic reduction in import duties for consumer goods and food products in 2005.

(fuelled by the robust economic performance and the closing of certain tax loopholes), the authorities failed to create an adequate cushion against a sudden decline in revenues, e.g. a stabilisation fund (Raiffeisen Research (2009).

Monetary policy was equally expansive in the recent years mainly due to the country's FX policy of pegging the exchange rate to the dollar. In the environment of persistent external surpluses it required massive unsterilized FX interventions, resulting in buoyant base money growth and a build-up of FX reserves. The pace of the acceleration in broad money (M2) growth became even faster, increasing by about 40% per year, and the money multiplier (M2/base money) swelled from 1.9 to 2.9 as lending picked up starting in 2005. Given sluggish growth in productivity, high and volatile inflation rates, caused by economy's overheating and expansionary policies, led to the strong increase in unit labor costs, thus eroding country's competitiveness (according to IMF calculations, REER appreciated by 18% in 2004-2007[6]).

Figure 3: Real Effective Exchange Rate Index, CPI-based (Jan-98=100)



Source: International Monetary Fund

Robust economic performance in recent years drew attention away from the disappointing progress of structural reforms. In fact, the key outstanding reforms (such as land and judicial reforms, the completion of a pension reform, energy sector restructuring etc) have completely stalled in the last 5 years since Orange Revolution (which was widely expected to bring long-awaited political and eco-

[6] Surging inflation and USD sharp weakening against hryvnia stimulated further real appreciation in 2008 – in Jan-Sep REER index grew 17%.

nomic changes) due to the persistent political quarrels against the background of ill-designed and half-implemented constitutional reform.[7] Specifically, the own short-term business and political interests of the main power groups dominated the political agenda leaving no room for the important long-term reforms that may push country forward. Therefore, while local expert community and international organizations have been consistently urging the authorities to make necessary policy steps to tackle major vulnerabilities and ensure growth resilience, this advice has mostly fallen on deaf ears as, given booming economy, the policymakers were highly reluctant to implement necessary but painful policy adjustment. As a result, the Ukrainian economy has been plagued by a number of major systemic weaknesses and vulnerabilities (which eventually contribute to the spectacular bust of Ukrainian economy in late 2008):

12.3.1. Low production efficiency

Tiffin (2006), using stochastic-frontier approach, found that Ukrainian economy is operating significantly below its potential. According to the author, the vast difference in productivity between Ukraine and developed countries could not be explained by differences in factors' accumulation (i.e. labor and capital) or in available technologies, and is mostly attributed to low production efficiency as a result of market-unfriendly institutional environment (i.e. widespread corruption, excessive regulatory burden, ill-defined property rights system etc). In particular, Ukraine scores extremely badly in the international rankings of economic transparency and investment climate – the 2010 Index of Economic Freedom, calculated by Heritage Foundation, puts Ukraine at 162nd place in the ranking (out of 179 countries), while according to the latest 'Doing Business' report produced by World Bank, Ukraine is ranked 146th (out of 183).

Large-scale gas price shock (from 2004 to 2008 the average annual price of imported gas leapt from USD 50 per 1000 cm to USD 195) have put the issue of Ukraine's poor energy efficiency in the spotlight. Davis *et al.* (2005) calculated that Ukraine has one of the largest energy intensities in the world due to the aging capital, outdated energy transformation technologies and distribution losses. Non-transparent pricing policy at the domestic energy market is considered to be the main reason for low energy efficiency (see OECD (2007)) – for the political reasons, the electricity and gas tariffs for retail consumers and budgetary institutions are set below cost recovery level, while industrial sector is subject to much higher energy prices. As a result, this cross-subsidization effect substantially dis-

[7] In late 2004, in attempt to resolve sharp political crisis in the aftermath of rigged presidential elections, the main political players agreed to implement constitutional reform, which envisaged the transfer of powers from the President to Parliament. However, the vague formulation of constitutional amendments and the weakness of the legal system (including Constitutional court) stirred up persistent political squabbles between President, Prime-Minister and the Parliament.

torts the incentives for improving energy efficiency.[8] Therefore, Ukraine's economy appears to be largely dependent on oil and gas, of which domestic production is far from sufficient to satisfy demand.

12.3.2. Lack of foreign trade diversification

Ukraine is highly open economy – the share of export in GDP reaches almost 50%. Thus, the country is highly susceptible to the changes in external demand. At the same time, Ukraine's foreign trade clearly lacks diversification. On the one side, the commodity structure of export is dominated by single commodity group – the share of steel exports in total exports constituted 41% at-end 2008 (surging from 32% in 2002). Furthermore, the sharp increase in steel exports in the recent years should be exclusively attributed to the price factor, while physical volume of exports virtually did not change. On the other side, more than a quarter of exports are concentrated on a single country – Russia (in particular, Ukrainian machine building industry is highly dependent on the Russian market). In fact, it's fair to say that Ukraine is hurt by the form of Dutch disease – highly profitable commodity exports (e.g. steel) stimulated large foreign exchange inflows causing strong appreciation of real exchange rate (via surging inflation), which, in turn, eroded the competitiveness of domestic manufacturing sector.

12.3.3. Mounting exposure of the banking system to FX risk

The banking sector in Ukraine has developed dynamically in recent years and was one of the driving forces of the domestic economy. The main characteristics of the banking industry were an enormous credit boom primarily fed by external borrowings (credit-to-deposit ratio surged from 107% in 2005 to 205% in 2008), intensified competition due to the rising presence of foreign banks (the share of foreign-owned capital leapt from 13% to almost 40% in 2004-2008), and widening access to banking services (especially in the retail segment). However, this unprecedented credit expansion contributed to the build-up of systemic risks in the banking industry, stemming from a large share of FX lending to unhedged borrowers, inadequate risk supervision practices, reliance on global capital markets and the absence of a long-term deposit base. Specifically, similar to some other Eastern European countries (i.e. Poland, Hungary, Romania), FX lending became extremely popular in the few last year amid visible difference in interest rates (FX loans are priced by at least 400-500 basis points below loans in the local

[8] In this respect, it is worth to note that the substantial increase in gas tariffs for industrial consumers in the recent years stimulated considerable improvement in their energy efficiency – the producers have massively invested into new energy-saving technologies, while putting outdated energy-inefficient production capacities out of the operation.

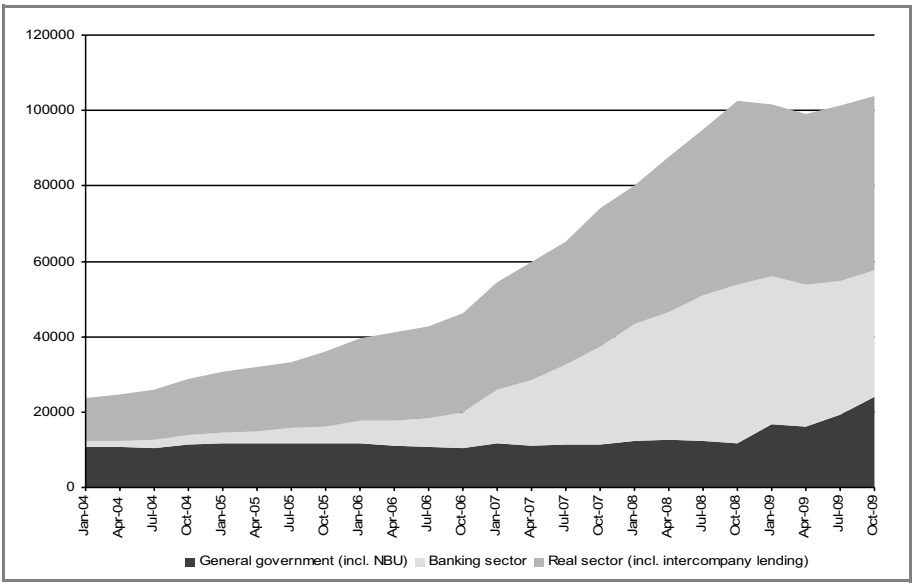
currency) and high degree of financial dollarization. As a result, the share of FX loans in total loans has risen from 39% at end-2004 to 51% in mid-2008, while, for example, in mortgage lending segment FX loans constituted more than 80% of total loan portfolio. At the same time, the most of retail borrowers (i.e. households, small businesses) do not have income in the foreign currency, and, thus, are unhedged against large-scale currency movements.

Moreover, according to anecdotal evidence, in the recent years the banks have substantially relaxed loan requirements hunting for a larger market share. The risk situation was also apparently aggravated by lax supervision practices of the National Bank of Ukraine (NBU) and the absence of adequate market infrastructure (i.e. credit bureaus, property register etc).

12.3.4. build-up in foreign liabilities of the private sector

While Ukraine's public debt has strongly diminished in the years of economic boom (declining from 45% of GDP in 2000 to 12% in 2007) amid robust economic growth and limited budget deficits, the private sector has built up substantial external liabilities in the recent years benefiting from abundant global liquidity and improved corporate transparency. Total external debt leapt from USD 23.8 bn at end-2003 to USD 102.4 bn as of end-2008 reaching the level of 56% of GDP. As a result, in mid-2008 the ratio of short-term external debt (including maturing long-term debt) to gross international reserves exceeded 100% indicating that domestic economy was highly vulnerable to the sudden reversal of capital flows (Raiffeisen Research (2008b)).

Figure 4: Gross external debt (USD mn)



Source: National Bank of Ukraine, Raiffeisen Bank Aval

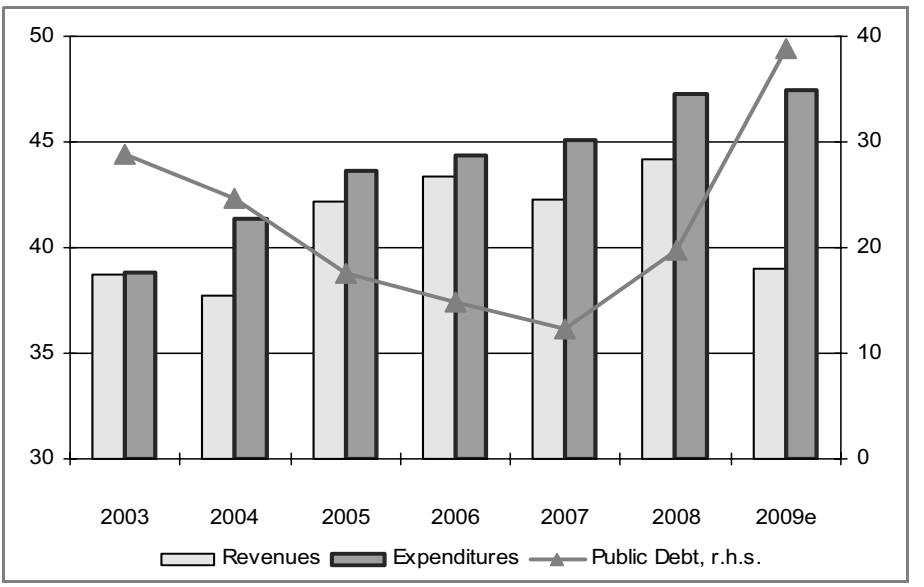
12.3.5. Vulnerable fiscal position

Despite the substantial strengthening of fiscal discipline since 1999 (reflected in low budget deficits and diminished public debt), Ukraine is facing high fiscal pressure stemming from the strong increase in the recurrent budget expenditures, accumulation of quasi-fiscal deficit in the energy sector, and overhang of contingent fiscal liabilities. Generous increases in public-sector wages and pensions in 2004-2005 led to the unsustainable trend in government spending pushing expenditure-to-GDP ratio to 45% as of end-2007, while state pension fund expenditures grew from 9% of GDP in 2003 to 16% as of end-2008 (one of the highest pension expenditures ratios in the world – according to OECD). This trend was supported by strongly improving terms of trade, but, at the same time, made fiscal framework extremely vulnerable to large external shocks.

Moreover, fiscal sustainability is damaged by the strong build-up in quasi-fiscal deficit in the energy sector arising from below-cost pricing, weak payment discipline and other inefficiencies. According to IMF calculations (see Tiffin (2004), Gonzalez (2007)), the size of quasi-fiscal deficit in the energy sector declined from 6% of GDP in 2003 to 3% in 2005 amid improved payment discipline and robust economic growth, but then jumped back to almost 4% in 2007 due to the incomplete pass-through of higher gas import prices on domestic tariffs.

Finally, Ukraine is facing substantial contingent fiscal liabilities due to the unresolved problem of 'lost savings'.[9] As of 2007, the total volume of residual liabilities stood at nearly 18% of GDP. The issue of lost savings reimbursement has popped up several times during the last decade (mainly in the course of pre-election populism), but the permanent solution has not been found yet. Consequently, the uncertainty around large contingent liability poses the risks for longer-term sustainability of Ukraine's fiscal framework.

Figure 5: Fiscal indicators (% of GDP)



Note: the data includes all general government accounts
Source: International Monetary Fund, Raiffeisen Bank Aval

12.4. UKRAINE'S PATH THROUGH THE CRISIS

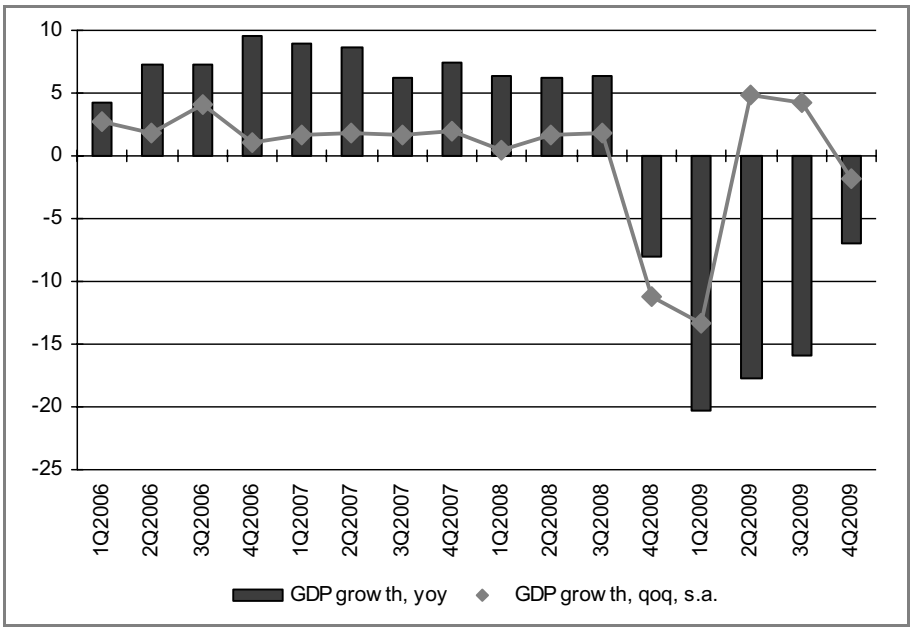
Ukraine has been unscathed by US sub-prime mortgage crisis erupted in mid-2007, as Ukrainian financial institutions (and their foreign parents) did not invest in 'toxic' assets. Despite inauspicious political developments (culminated in snap parliamentary elections in Sep-2007 and followed by several months of political horse-trading), the domestic economy continued to demonstrate robust performance driven by surging global commodity prices and lending boom. Berglöf *et al.* (2009) called this phase (from July 2007 to September 2008) 'decoupling' as economic boom showed no signs of abatement in most of Emerging Europe countries

[9] The so-called 'lost savings' arose during 1992, when hyperinflation wiped out frozen Ukrainian household savings deposits. A 1996 Law revalued the deposits, and established state liability.

(except Kazakhstan and Baltic states): capital inflows held up, credit growth continued, and domestic demand remained buoyant.

However, the economic growth abruptly came to the halt in the last quarter of 2008 as the economy plunged into a severe recession following the dramatic decline in domestic and external demand (due to a nosedive in global commodity prices, a sharp economic slowdown among the country's major trading partners and frozen credit activity). Specifically, the slump in steel prices (CIS steel billet export price has sharply risen in the 1st half of 2008 peaking at USD 1200 per tonne in July, but then plunged to USD 500 in mid-September, and eventually bottoming out at USD 300 in March 2009) was apparently the main crisis trigger for Ukraine. Apart from sharp reversal in terms of trade, the Ukrainian economy was hit by the sudden decline in external demand as main trading partners slipped to a recession as well. For example, machinery exports to Russia ceased completely in the 2nd half of 2008. Finally, the deterioration in external funding conditions due to the global credit crunch following the bankruptcy of Lehman Brothers on 15 September became another blow for the Ukrainian economy (especially for the banking sector) leading to the complete freeze in the domestic credit activity. These negative effects were further exacerbated by local factors such as a couple of bank runs, and persistent political turmoil, which reduced policymakers' ability to tackle the economic crisis (Raiffeisen Research (2009b).

Figure 6: GDP dynamics (%)



Source: State Statistics Committee, Raiffeisen Bank Aval

As a result, the industrial output had been falling by 20-30% year-on-year in the last quarter of 2008. Consequently, industrial production shrunk by 3.1% in 2008, while cumulative GDP growth rate fell to 2.1% by the end of 2008. The construction industry has been hit the most severely – the output in this sector plunged by 17.4% in 2008. Local currency has plunged by 60% against dollar in the 4th quarter of 2008 due to the sharp reversal in external conditions and allegedly buoyant domestic speculations. The banking sector was shaken by massive outflows of deposits (resulted in the erosion of 25% of total deposits' volume in the last quarter of 2008) and a sharp increase in the volume of non-performing loans (first of all FX-denominated) caused by large-scale hryvnia depreciation. Hence, due to the weak fundamentals and highly unstable expectations (fed by the tumultuous political conflict), the economy fell into a deep recession as soon as the temporary drivers of growth (favourable external conditions, easy access to credit) evaporated.

The sharp deterioration of the economic situation prompted the authorities to seek emergency financing from the International Monetary Fund. Consequently, in November 2008 the IMF approved a 24-month stand-by arrangement for Ukraine amounting to USD 16.4 bn. The IMF programme was designed to help the authorities stabilise the economy against the backdrop of deteriorating external position and a domestic crisis of confidence. Under the loan agreement, the authorities committed to implement a number of policy measures, namely the transition to a flexible exchange rate regime, the establishment of a recapitalisation mechanism for banks, the adoption of a deficit-free budget for 2009, an increase in the maximum deposit insurance coverage and a freeze on public wages, pensions and other social payments in real terms. In fact, given persistent political quarrels, IMF program emerged as the only comprehensive anti-crisis policy package.

However, the implementation of IMF program has been marred by authorities' reluctance to carry out unpopular and painful reforms (such as limiting budget expenditures, increasing retail energy tariffs etc) ahead of presidential elections and parliament's resistance to pass necessary legislative amendments. As a result, the IMF program was suspended in February 2009 due to the government's attempts to curb NBU independence but then resumed in April despite little progress made by Ukrainian policymakers in making necessary policy steps. Moreover, contrary to its standard practices of providing the loans for supporting balance of payments adjustment, IMF agreed to channel the substantial portion of stand-by loan into the financing of budget deficit. In our opinion, IMF's leniency towards Ukraine was explained by Fund's fears that fallout of IMF program in Ukraine may spread contagion to other 'crisis' countries in the region. Thus, at that stage, IMF officials considered stand-by arrangement with Ukraine 'too important to fail'. Nevertheless, Fund's patience has finally given way in Novem-

ber 2009 as IMF decided to suspend the disbursement of the 4th loan tranche until the conclusion of presidential elections (the visible improvement of economic situation in Ukraine and in Eastern Europe in the 2nd half of 2009 apparently reduced the risks of immediate economic collapse in Ukraine and contagion across the region).

After the initial months of the crisis when the economy seemed to be in a freefall and government default looked imminent, the economic situation has gradually started to improve (Raiffeisen Research (2009b)). Specifically, given Ukraine's high trade openness, the country has apparently benefited from the gradual recovery of global economy started in mid-2009. Moreover, Ukraine's external position was boosted by large-scale nominal effective depreciation (hryvnia lost almost 60% to USD, while the currencies of Ukraine's main trading partners experienced 10-20% losses). As a result, GDP growth rate bottomed out in the first quarter of 2009 (plunging by 20.3% in year-on-year terms) but then bounced back driven by reviving external demand and robust performance of the agricultural industry. Furthermore, the trade balance has adjusted dramatically, the currency has stabilised, inflation has fallen quickly, and the strains in the banking system have eased due to the resumed deposit inflow and massive capital and liquidity injections by foreign banks operating in Ukraine.[10] In addition, unemployment figures surprised on the positive side – unemployment rate increased from 6.4% to 8.6% in Jan-Sep 2009, while most of the economists predicted it breaking 10% level against the background of 20% GDP slump.

Thus, Ukraine apparently managed to escape full-scale social disaster (i.e. massive layoffs, public unrest, sharp increase in poverty etc). In our opinion, economy's resilience to the severe economic shock could be explained by the substantial cushion built up in the private sector during the preceding economic boom (such as households' cash savings, which according to some estimates, may amount to at least 30% of GDP; offshore savings by the business groups). Consequently, since most of this cushion is concentrated in the shadow economy and thus is not fully covered by the official data, we believe that the official figures tend to overestimate the degree of economic slump in Ukraine.

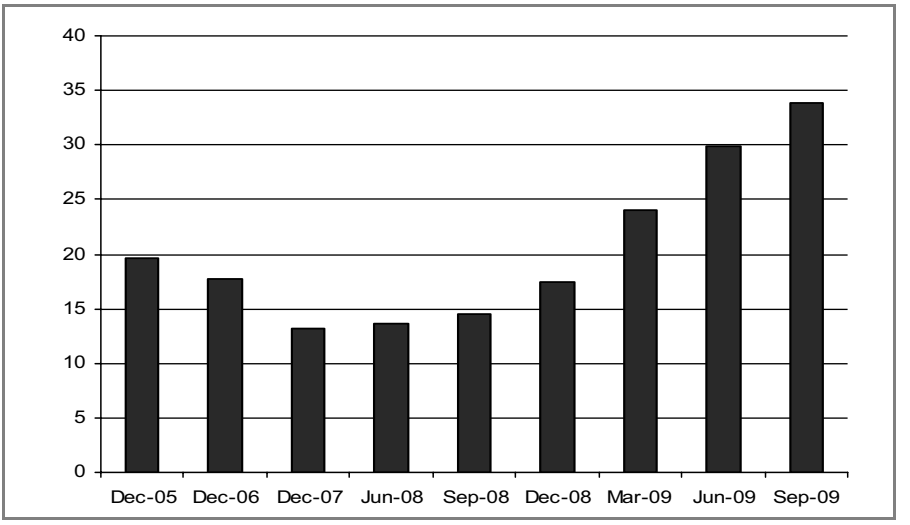
At the same time, the recently achieved stability still appears to be extremely fragile in the light of several negative factors that pose major risks for the economy. The first and most immediate danger is a widening fiscal gap. Despite the economy's slide into a severe recession in Q4 2008, the authorities failed to adjust fiscal policy accordingly. As a result, a full-scale budget disaster is underway – total fiscal deficit reached nearly 11% of GDP in 2009 (including quasi-fiscal deficit of Naftogas and bank recapitalization costs) amid the absence of feasible

[10] None of more than 40 foreign banks operating in Ukraine has pulled out of the country so far – they remain committed to their Ukrainian subsidiaries by injecting liquidity and replenishing eroded capital.

financing sources (due to the privatization stalemate and blocked access to the international debt markets). However, due to the ongoing elections' campaign, the authorities are reluctant to pass corrective fiscal measures, while the parliament a few months ago voted for a purely populist increase in social payments, which may aggravate the situation further. Moreover, government's fiscal position is also undermined by near-insolvency of state-owned gas company Naftogas Ukraine (it had to restructure its outstanding external debt and is experiencing persistent difficulties to pay for imported gas). Consequently, near-term fiscal outlook is highly challenging at the moment and the authorities will most likely have to rely on IMF to bridge the financing gap.

Secondly, despite a certain level of stabilisation in the banking sector (amidst the improving liquidity situation), the default risk remains on the upside given imperfect legal procedures concerning bankruptcies and foreclosures and sluggish economic recovery (according to IMF, non-performing loans ratio in the banking system has exceeded 30% – see Figure 7). Therefore, more bankruptcies in the banking sector might be expected in the near-term, which may undermine public confidence in the currency and banking system.

Figure 7: Non-performing loans in the banking sector (% of total loans)



Source: International Monetary Fund

12.5. FUTURE PROSPECTS: IS THERE LIFE AFTER RECESSION?

Nevertheless, we believe that Ukraine has already passed the trough of the economic crisis. Given Ukraine's extremely high share of exports in GDP and the absence of domestic economic stimulus, the short-term economic outlook for

Ukraine is heavily dependent on global economic trends for the next 6-12 months. Therefore, based on the scenario of a gradual (but sluggish) recovery of the global economy in the near term, Ukraine's economy is expected to bounce back as well – following highly negative growth in 2009, GDP is set to grow by 3-5% in 2010-2011. External accounts will be close to the balance in 2010 given drastically reduced trade balance deficit and lower capital outflows. Inflation rate is expected to level off further, albeit the long-awaited (and inevitable) sharp adjustment in retail energy tariffs to cost recovery levels will keep inflation elevated.

However, the certain improvement in economic conditions (from the extremely low base of 2009) might be proven short-lived given the relatively depressing long-term outlook for the global economy and financial markets. Therefore, the main growth drivers of the Ukrainian economy in recent years are no longer available, while it remains highly inefficient and thus extremely vulnerable to domestic and external shocks. Moreover, given falling life expectancy, one of the lowest birth rates in Europe and unfavourable migration pattern (see World Bank (2009)), the country is facing relatively bleak long-term demographic outlook. Consequently, the country needs radical changes in the economic and institutional environment to unleash its long-term potential and embark on a sustainable growth path. In particular, we believe that the country's growth strategy should be based on developing sustainable domestic demand and diversifying foreign trade (redirecting exports to fast-growing countries and regions, such as China, India etc) by implementing a set of structural reforms including regulatory, judicial, pension, land ownership and other reforms (see Table 1 for the details). It will allow to improve institutional environment, increase country's attractiveness for domestic and foreign investors, and raise production efficiency, thus making domestic products more competitive both on internal and external markets. We also see large room for improving the functioning of macroeconomic policy framework, i.e. enhancing the independence of the Central Bank, strengthening the coordination between fiscal and monetary policies, introducing inflation targeting framework etc.

Unfortunately, Ukraine (contrary to some other crisis-hit countries) has missed the chance to push through necessary reforms during economic downturn (when it might be easier for the policymakers to 'sell' vital but painful reforms to the public) due to the lack of political consensus further aggravated by pre-election fever. Moreover, we expect that persistent political quarrels will continue to haunt Ukraine's economic developments. Specifically, in our opinion, the main political players are not capable to reach the consensus on the key economic and political issues, while we do not see any external force that may help to find such consensus.[11] Hence, the

[11] For example, the goal of EU accession was rather efficient external yardstick for the Eastern European countries in early 2000s and helped to push through important domestic reforms despite unfavorable political environment.

political turmoil will most likely not instantly cease with a new President. Therefore, we remain cautious on the reforms' progress, at least in the time horizon of 6-12 months.

At the same time, we see the risk of Ukraine stepping into the same path as 10 years ago. Specifically, some politicians and economic experts are currently calling for stimulating a recovery of the Ukrainian economy by keeping the hryvnia undervalued in order to promote exports. This was exactly the mistake made by Ukrainian policymakers in the early 2000s when a weak hryvnia, combined with surging global commodity prices, drove the recovery of the Ukrainian economy but eliminated incentives for structural reforms. We want to stress that efforts to regain competitiveness should be based on faster productivity growth and sustainably lower inflation, not an undervalued exchange rate.

Table 1: Key outstanding reforms

Economic and trade policy	– Enhance independence of the Central Bank – Transit to inflation targeting framework – Sign free-trade agreement with EU – Raise efficiency of monetary instruments (liquidity and FX market regulations, functioning of money market)
Financial sector	– Develop domestic debt market – Improve bank supervision framework – Strengthen the supervision of non-bank financial sector (insurance companies, credit unions, mutual funds) – Develop market infrastructure (credit bureaus, IFRS adoption etc)
Fiscal policy	– Implement Pension Reform – Implement comprehensive reform for State Tax Administration – Introduce medium-term fiscal framework – Reform the system of unfunded social standards and replace it with a targeted social protection system
Energy sector	– Reform Naftogas Ukraine – Implement the restructuring of coal industry – Bring energy prices to cost recovery levels, eliminate cross-subsidization – Complete privatization of electricity distribution companies
Business climate	– Implement land reform (lift the moratorium on the resale of agricultural land, remove restrictions on non-agricultural land ownership, create registries for real estate and agricultural land) – Implement reform of the court system – Enhance and enforce antitrust regulation – Amend the legislation on bankruptcy procedures, taxation, protection from unfair competition etc

Source: International Monetary Fund, World Bank, EU-Ukraine Action Plan, Raiffeisen Bank Aval

12.6. CONCLUSION

Having reviewed the history of Ukraine's economic developments in the last two decades we are now well positioned to answer three main questions laid out in the introduction. First, the country was hit so hard by the global economic downturn due to the build-up of several systemic risks during the era of robust economic growth (such as non-diversified foreign trade, widening external imbalances, growing currency mismatches in the banking system, asset prices' bubble, unsustainable growth in recurrent fiscal expenditures), while the policymakers were unable to tackle mounting vulnerabilities in the environment of persistent political quarrels. Second, the collapse in global trade and sudden stop in capital flows have been the main crisis triggers for Ukraine putting the country on the brink of survival. The sharp deterioration of external conditions was also coupled with unfavorable domestic factors, such as political turmoil, banking sector turbulences, plunging confidence in the national currency. As a result, Ukraine slid into the severe recession with GDP contracting by 15% in 2009 and local currency losing around 60% of its value to US dollar.

At the same time, the country apparently managed to escape the worst scenario (as some doomsters were predicting imminent sovereign default, massive public unrest, and even country's break-up) thanks to the IMF support, improvement in global economic conditions since Q12009, and the substantial financial cushion built up by the private sector in the era of economic boom. Therefore, the economy is set for the gradual recovery in 2010-2011 mostly driven by the rebound in external demand boosted by large competitiveness gain following massive nominal depreciation. Nevertheless, we argue that without radical changes in the economic and institutional environment, Ukraine is risking to lose its competitive advantages (such as high-quality human capital) and fall into the prolonged economic stagnation. Hence, we would like to stress the importance and urgency of necessary policy actions – implementing structural reforms, improving macroeconomic framework etc. However, to conclude the paper on the cautious note, we see major reforms' breakthrough unlikely unless main political players will be able to reach the consensus on key long-term issues.

ANNEX

Ukraine: Key economic figures, 2000-2011

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009t	2010f	2011f
Real sector												
Nominal GDP (USD bn)	31.1	38.0	42.4	50.1	64.9	86.6	108.2	143.3	180.6	112.3	137.3	162.0
GDP (% yoy)	5.9	9.2	5.2	9.6	12.1	2.6	7.3	7.9	2.1	-15.1	3.5	4.0
Industrial production (% yoy)	13.2	14.2	7.0	15.8	12.5	3.1	6.2	10.2	-3.1	-21.9	5.0	6.0
Private consumption growth (% yoy)	2.5	9.6	9.5	11.5	13.1	20.6	15.9	17.2	11.8	-12.0	0.6	5.7
Investment growth (% yoy)	24.6	17.9	-1.5	24.3	5.6	14.0	18.5	25.9	5.2	-50.7	7.0	9.7
Real disposable income (% yoy)	n/a	n/a	18.0	9.1	19.6	23.9	11.8	14.8	7.6	n/a	n/a	n/a
Unemployment rate (%)	11.6	10.9	9.6	9.1	8.6	7.2	6.8	6.5	6.7	9.0	8.5	7.2
External sector												
Current Account balance (% of GDP)	4.8	3.7	7.5	5.8	10.6	2.9	-1.5	-3.7	-7.2	-1.7	-0.5	-1.4
Export growth (% yoy)	14.4	8.0	10.7	24.0	42.6	7.5	13.2	27.4	33.8	-36.7	10.9	15.6
Import growth (% yoy)	17.8	14.1	5.0	28.7	31.3	20.4	22.0	35.4	38.8	-43.1	8.8	17.8
Terms of trade (% change)	-14.5	-3.7	1.4	1.6	9.2	8.1	4.9	10.7	7.1	-5.2	1.5	-2.0
FDI (USD bn)	0.6	0.8	0.7	1.4	1.7	7.5	5.7	9.2	9.7	4.5	6.0	7.5
Gross external debt (% of GDP)	38.5	32.3	30.3	47.5	47.2	45.8	50.4	55.8	56.3	91.6	76.5	71.0
Monetary sector												
Inflation rate, eop (% yoy)	25.8	6.1	-0.6	8.2	12.3	10.3	11.6	16.6	22.3	12.3	11.0	9.0
Key interest rate, eop (%)	27.0	12.5	7.0	7.0	9.0	9.5	8.5	8.0	12.0	10.25	9.0	8.0
Base money (% yoy)	40.1	37.4	33.6	30.1	34.1	53.9	17.5	46.0	31.6	4.4	11.0	11.0
Broad money (% yoy)	45.5	41.9	41.8	46.5	32.3	54.4	34.5	52.2	29.8	-5.5	14.9	14.3
USD/UAH exchange rate (avg)	5.46	5.37	5.33	5.33	5.32	5.10	5.03	5.03	5.26	8.02	7.70	7.40
EUR/UAH exchange rate (avg)	5.04	4.81	5.04	6.04	6.62	6.34	6.32	6.89	7.73	11.17	10.70	10.36
Fiscal sector												
General budget balance (% of GDP)	0.6	-0.3	0.7	-0.2	-3.2	-1.8	-0.7	-1.0	-1.5	-8.6	-6.0	-3.0
Public debt (% of GDP)	45.3	36.5	33.5	29.0	24.7	17.7	14.8	12.3	19.9	33.5	36.0	34.5

Source: National Bank of Ukraine, State Statistics Committee, Ministry of Finance, International Monetary Fund, Raiffeisen Bank Aval

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