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Monetary Policy Normalization: Scenarios and Risks

Key findings from a SUERF conference hosted by EY
London, 10 April 2018

Conference Report

By Ernest Gnan, OeNB and SUERF, Tom Huertas, EY, Patricia Jackson, Lloyds’s of London, Atom Bank, BGL, SMBC Nikko and SUERF, and Clement Wyplosz, EY

Monetary policies worldwide are at a turning point. After a long period of ultra-expansionary policies in response to the financial, economic and sovereign debt crises, monetary policy is returning towards a more neutral stance. The buoyant world economy is helping this process, while consumer price inflation globally remains unusually muted. A normalization of the monetary policy stance is necessary with a view to avoiding the build-up of dangerous financial imbalances and to creating policy space for future downturns. But it also involves risks given high valuations in a number of asset categories and high debt and financial vulnerabilities in several sectors, including banking, insurance, pension funds and government budgets. A careful and smooth management of the process of monetary policy normalization makes effective central bank communications central. Central banks’ task of normalization is also rendered challenging, because usual monetary policy guideposts, such as potential output and the output gap, the NAIRU, the natural rate of interest and the inflation process itself, have been affected by the crisis and by globalization.

This SUERF conference, hosted and sponsored by EY, London, brought together leading academics, policy makers, and industry representatives to examine scenarios for central bank policies in the next few years. It also discussed in detail what the “new normal” of interest rates and central bank balance sheets might be, and what the economic drivers and underlying policy choices are. Various implications for financial markets and firms were discussed.

Mark Gregory, Chief Economist, EY, opened the conference. He welcomed the long-standing and fruitful cooperation between EY and SUERF. The course of monetary policies in the years to come has important implications for the financing conditions of the real economy. Bringing together academic research, policy makers’ perspectives and views from the private sector is particularly valuable in such a period.

Urs Birchler, University of Zurich and President of SUERF, appreciated the opportunity for this joint conference and dialogue and thanked EY for their loyal support for SUERF.

Ewald Nowotny, Governor of the Oesterreichische Nationalbank, gave this year’s SUERF Annual Lecture. Monetary policy in the euro area is at an important turning point. After ten years of non-standard policies, a broad-based economic expansion has taken hold giving the ECB Governing Council the opportunity to start thinking about normalization. Previous experiences with exiting from very accommodative monetary policies like the early 2000s suggest that balancing the risks of tightening too early and tightening too late is not easy. A key challenge is the real-time availability of measures for the output gap and underlying inflation. A
second challenge is the impact of prolonged accommodative monetary policy on financial markets.

Today, a key question concerns the nature of the “new normal.” Several observers argue that the functioning of our economies has changed, citing the apparent decline in long-run real interest rates over the last decades and a flattening of the Phillips curve due to the globalization of goods and labor markets, which makes domestic inflation increasingly depend on global factors beyond the remit of individual central banks. While some economists have argued for adjusting existing inflation-targeting frameworks by lowering the inflation target or switching to explicit target ranges, Governor Nowotny found that the framework of the ECB is already well equipped to deal with the evolving economic setting. The ECB has from its beginnings focused on the medium term, thereby explicitly taking into account lags in monetary policy transmission. If lags have become longer, this can be accommodated accordingly. But longer lags also mean that the side-effects on financial stability are more likely to materialize.

The ECB has lowered monthly net asset purchases from 60 billion EUR to 30 billion EUR from January 2018. But even after a possible end to net asset purchases, the broad set of measures currently in place will ensure that the ECB’s policy will continue to be very accommodative. The ECB is the only major central bank operating with negative interest rates and has signaled that rates will remain at very low levels well past the horizon of net asset purchases. Monetary stimulus will also be provided by the stock of APP asset holdings and by the ECB’s reinvestment policy. The Eurosystem should not wait too long to get the next steps of the monetary policy normalization process started.

Session 1, chaired by Patricia Jackson, dealt with fundamental drivers of interest rates and discussed scenarios for the future.

Cinzia Alcidi, Centre for European Policy Studies, began by decomposing long-term interest rates into two components: expectations and the term premium. Both have been declining over the past 30 years across the globe. In some countries, the term premium has even turned negative. The recent fall of the term premium may be due to a number of factors. First, low inflation expectations may lead bonds to be viewed as an insurance against deflation. Second, quantitative easing (QE) absorbs the supply of bonds, and thereby depresses the term premium. Third, investors are seeking safe assets, such as US Treasuries and German bunds. These factors may reverse in the near future.

What drives the natural rate of interest? One approach is to investigate the demand and supply of savings. However, as the sensitivity of interest to savings and investment is hard to identify and changes over time, it is more promising to study secular trends in potential drivers of desired investment and savings. The latter are driven by a number of factors. First, an ageing population implies that the cohort of people with a higher propensity to save increases; as they retire, the future effect from demographics becomes less clear but will likely keep depressing equilibrium interest rates. Second, income inequality implies that income and wealth are concentrated among people with higher savings rates, and no reversal is in sight. Third, the savings surplus from emerging market economies is also unlikely to be reversed in the next years.

The propensity to invest is depressed by a number of secular drivers. First, in the last few years the equity risk premium (the spread between risk-free rates and the cost of capital) has increased, which may reflect increased risk aversion. As a result, the weighted average cost of capital (including debt and equity financing) has increased, thus depressing investment. Second, public investment has been falling since the 1980s. Third, the relative price of capital goods has fallen, which implies that a lower share of production is required to maintain a certain level of capital. Fourth, the profitability of
investment has sharply fallen since 2007. Fifth, increased concentration of market power may imply that the many firms with less market power earn less, leading to lower investment. It is very hard to predict whether these trends are permanent or might be reversed. A reversal of monetary policies will likely affect short-term interest rate expectations and the term premium. But it will not affect equilibrium real long-term rates.

Phurichai Rungcharoenkitkul, Bank for International Settlements, juxtaposed the above arguments from a long historical perspective. While saving-investment factors such as productivity and demographics seem to work very well in explaining the interest rate decline over the last three decades, any correlation becomes elusive once one adopts a longer-term perspective. Overall, real factors as explanations for secular real interest rate trends find little empirical support outside of the recent period. Even the marginal product of capital, the linchpin of natural interest rate in most models, has a very tenuous relationship with real interest rates in the data.

What then are alternative explanations? A research conducted at the BIS looks at 19 advanced economies since late 19th century, and finds that reversals of real interest rate trends typically coincided with changes in monetary policy regimes. In fact, monetary policy regimes consistently explain level shifts in real interest rates over long horizons, even after accounting for real saving-investment factors. The result implies that monetary policy is not as neutral as commonly presumed. Furthermore, the study shows that the synchronized movements of global interest rates can be explained by monetary policy in the dominant country being propagated to other countries through global financial integration. Real interest rates therefore have a substantial global component, with a monetary policy root.

The question then arises whether central banks have really been passively tracking an exogenous natural real rate of interest, or whether they themselves may have been actively influencing the secular trends of real interest rates. If it were the latter, what could be the underlying mechanism? One possibility is that monetary policy induces a long-lasting real effect via demand hysteresis and endogenous growth. Also potentially important is the role of financial booms and busts, which allows monetary policy to have a more persistent real effect than through aggregate demand. Ultimately, the debate is about the usefulness of the natural rate of interest as a practical guide for monetary policy. Indeed, most central banks use it as just one input into policy analysis, with a large grain of salt.

Where then is monetary policy headed? One scenario is that central banks continue to perceive persistently low natural rates and target the lower new normal, at least as long as inflation remains subdued. The risk is that this could lead to asset prices overshooting and even greater debt service burden. Another scenario is that central banks revise upward the trajectory of the natural rates, either because they see a reversal in saving-investment factors (e.g. ageing) or because a continued economic expansion validates a perception of higher potential growth. This would bring us closer to the old normal, with less concern about secular stagnation and the zero lower bound of interest rates.

Session 2, chaired by Tom Huertas, addressed implications of monetary policy normalization for financial firms and markets: Are we heading towards a volatile and challenging future?

William Perraudin, Imperial College and Risk Control Limited, presented a report prepared by Risk Control for the European Commission on liquidity in corporate bond markets. The report aimed to bridge the gap between regulatory and industry perspectives. While the industry remains quite pessimistic about liquidity in the corporate bond market, regulators tend to have a more optimistic view, believing that liquidity is improving after having dried up during the crisis. However, studies on which regulators base their conclusions tend to conflate risk and liquidity, such that a perceived reduction in liquidity problems may only be a reflection of a reduction in risk following the financial crisis.

Perraudin’s report seeks to avoid these pitfalls by studying subsets of the market, and by considering bonds that are not traded. Having compiled the most comprehensive dataset on European bond liquidity ever
investigated, Perraudin conducted a statistical analysis that allowed him to control for risk. For example, when looking at price-based indicators of liquidity such as bid-ask spreads at a high level of aggregation, those appear to have risen dramatically during the crisis but to have been coming down to more normal levels since 2014. However, controlling for different levels of volatility shows that spreads have not really fallen since the crisis, and that there is now an enormous gap in the trading costs for bonds of different volatilities – and this raises serious questions as to whether there would be sufficient liquidity in the market in case of a crisis.

Likewise, looking at dealer inventories as a proxy for dealer profitability, it appears that there was a break in inventories towards the end of 2011, particularly for non-financial bonds. This suggests that there was a significant negative trend until the ECB began its corporate bond purchasing programme. There is no clear moment when inventories fell and markets became less liquid, which suggests that these changes are not due to a single factor, but rather to multiple forces operating simultaneously, including regulations such as the liquidity coverage ratio (LCR) and net stable funding ratio (NSFR), which together made it more difficult for institutions to offer intermediation services. As a result, questions may be asked as to whether regulations have gone too far, or at least whether it might be possible to de-risk banks’ trading books without excessively increasing the cost of holding bond inventories, or whether corporate bonds might be treated differently under the LCR. In any event, the report shows that there has been a significant deterioration to liquidity in the corporate bond market, and this should be of concern to both banks and regulators.

Peter Hahn, London Institute of Banking and Finance, discussed the implications of monetary policy normalisation for financial firms and markets, and raised a number of questions to encourage a debate on how widely present liquidity issues in the financial system are. Most generally, when there is a liquidity crisis or a perceived change in liquidity, the critical factor is the sequencing of which assets are dumped first, and then which subcategories degrade. How to price those assets then becomes a big issue.

With the withdrawal from QE and subsidized funding programmes, banks will want to sell assets, but this could be disruptive if all banks decided to sell at the same time. Considering that loan quality has also been steadily declining, there is a re-pricing risk. While banks have taken substantial profits on the sizeable bond portfolios they hold, buyers of such instruments will be different as QE ends. Commercial banks are starting to think about whether deposits will become more competitive in a higher rate environment. In any case, it is likely that banks will be unwilling to help other banks in times of crisis, because many of the institutions that did so previously have suffered post-crisis. When thinking about who will provide liquidity if there is a challenge, it may be helpful to consider whether regulators would introduce risk-weighted capital dynamics to deal with loans that today have a certain risk weighting, but may need to change quite quickly.

From the perspective of bond investors, the increase in interest rates poses a number of challenging questions: Will some sectors of the market simply lose interest in corporate bonds? What will happen if all the bond funds exit the market at the same time? If derivatives are used more, will there be collateral shortages? All these issues point to the fact that the validity of pricing and valuations will be particularly challenging. A further question is about the effects of the lack of experience of bond trading in an increasing rates environment. In particular, Hahn is concerned about innovations such as artificial intelligence and algorithmic trading that increase the speed of trading, and thinks the prospects are potentially frightening.

As far as commercial banks are concerned, there are many questions as to whether net interest margins will actually increase, as many banks have been expecting for several years. Indeed, the supply and demand of loans and deposits are not as tightly tied as they were historically. Further, in order to satisfy their Liquidity Coverage Ratio (LCR) requirements, banks have been taking liquid money on the derivatives curves to earn more yield. They are now locked-in on those kinds of yields for many years. As a result, an increase in interest rates could mean an increase in costs for banks, but not an increase in yield for quite some time.
For central banks, the main question as rates go up is whether they will be smoothing, assuming they have the capacity to do so. The concern is that if they did so, they would effectively start guaranteeing the market again.

Nicholas Lincoln, LCH, offered a perspective from financial market infrastructures (FMIs), and in particular central counterparties (CCPs), for whom volatility is a key concern when considering increasing interest rates. Explaining how CCP margin models work, Lincoln argued that the issue for FMIs is not so much the absolute level of rates, but rather their relative movements. Considering a couple of examples to illustrate how risk models would behave in an increasing rate environment, Lincoln showed that models using absolute and relative returns are very different. While the former are relatively stable, the latter become “explosive” when rates approach zero, because the relative return could be infinite once rates start increasing. The upshot is that in a low rate regime it is critical to test the performance of models for a high rate regime, and in particular for the transition from low to high rates.

Looking at the evolution of Italian treasury bond yields during and after the crisis, Lincoln argued that if QE is reversed too quickly, some countries may struggle to meet interest payments on their outstanding debt without borrowing more money, which in turn could lead to a repeat of the stress events observed in Italy at the height of the crisis. Such a situation would then make it necessary to return to some form of quantitative easing. In other words, policy normalization involves a delicate balance, and it is important not to move quickly, and to keep in mind that different countries in the Euro area will have different sensitivities to increasing rates.

Klaus Wiener, German Insurance Association (GDV), examined the impact of policy normalization on insurers. Noting that unorthodox monetary policies have had a number of undesirable side effects (for example an inefficient allocation of resources, bubbles in bond markets, discouraging retirement saving and removing incentives for structural reforms in the EU), Wiener showed that yields (and in particular short-term yields) have hardly moved since the end of the crisis. This poses a challenge for insurers, as it has reduced the propensity to save – and insufficient old-age provisions are a particular concern given looming demographic changes. In terms of their investments, insurers have already been active in response to the low yield environment (e.g. increasing the duration in fixed income portfolios and the share of investments in corporate bonds), but have not been on an excessive search for yield. However, most of their portfolios are in fixed income, and investment strategies cannot be easily changed given both regulatory constraints and the need for stable, foreseeable income. As such, policy normalization would be unambiguously positive for the insurance industry, as yields for new investments would be higher, and the present value of liabilities would be smaller. In terms of liabilities, insurers have mainly responded by increasing the variety of their products, notably with more flexible, less capital-intensive products.

As far as interest rates are concerned, since 2010 there has been a strong decline in short-term real interest rates, while potential output has not declined much. The biggest risk is a “1994-style” quick increase in interest rates. If yields snapped back up quickly, this would be problematic for the industry for a number of reasons, but mainly due to losses of reserves on fixed income products. Therefore, policy normalization and higher, more flexible bond market yields would be positive for the economy at large, old-age savings and the insurance industry. However, doing so will likely be much more difficult than it was to adopt unorthodox monetary policy measures during the crisis.
The conference afternoon was devoted to future central bank policies and challenges. Paul Fisher, Kings College London, Centre for Data Analytics for Finance and Macroeconomics, in his keynote speech addressed the implications of choices for central bank balance sheets. Balance sheets are central banks’ main tool for influencing market interest rates, and it is also through the balance sheet that central banks perform their lender of last resort function.

Central banks strongly expanded their balance sheets during the crisis, and in Fisher’s view they are now likely to unwind them by less than some might expect. First, most of the expansionary effect of QE has already worn off. Second, financial markets are no longer dysfunctional, so QE no longer has a notable impact. Thus, what will be more relevant for future decisions on the size of central banks’ balance sheets are financial stability considerations. New liquidity and capital requirements for one thing affect how monetary policy functions. However, little attention has been paid to the operational features of central banks’ monetary policies, including how their balance sheets affect financial institutions’ liquidity metrics (e.g. liquidity coverage ratios, net stable funding ratios) and leverage ratios. Central banks should become more aware of these effects, and be more proactive rather than reactive in making policy choices. Given the limitations of established macro-prudential instruments, central banks might also use their balance sheets positively as a macro-prudential tool, without, however, compromising monetary policy objectives. As central banks pump liquidity into the financial system, this by necessity also increases bank reserves. This has immediate effects on the liquidity coverage ratio and on the leverage ratio.

What then are the key issues that central banks should consider when making choices regarding their balance sheet?

• First, the size of the balance sheet. Before the crisis, when reserve balances were small, central banks aiming at a certain level of interest rates had to adjust the quantity of reserves provided to the banking system to achieve this. But the interest sensitivity of reserve balances is quite weak. So central banks have considerable leeway in choosing the quantity of reserves, without destabilizing interest rates. Banks now demand a much higher amount of reserves. Before the crisis, they held them only for payment purposes. Now they hold central bank reserves as liquidity buffers. This is also reflected in the strong increase in the scope and number of financial institutions with access to the Bank of England’s balance sheet since the onset of the crisis.

• Second, before the crisis most central banks relied on a structural liquidity shortage in the banking system and on a corridor around the policy rate to control market rates. Going forward, many central banks may keep an excess supply of liquidity and switch to an interest rate floor system.

• Third, the choice between providing central bank liquidity through loans to banks versus outright purchases has financial stability implications. Loans (e.g. repo operations) are of shorter duration, they do not help banks to meet liquidity metrics, and the need for collateral implies that liquid assets become encumbered. By contrast, liquidity injected through outright purchases might come back to the banking system in many forms, including long-term funding. As such, outright purchases are favorable to banks’ liquidity metrics. Therefore, QE will more generally have a role in the future as a financial stability tool, in addition to its monetary policy function.

• Fourth, it makes a difference which assets the central banks buys. Buying high quality liquid assets held by banks does not help them at all, as it just replaces one type of liquid assets in bank balance sheets for another. Buying non-bank assets, by contrast, net increases bank’s liquid assets. Buying illiquid, lower quality assets increases the financial system’s liquidity.

• Fifth, central banks may lend to banks longer-term, particularly during crises, thus benefitting banks’ net stable funding ratio.

• Sixth, the rules on collateral eligibility and haircuts influence banks’ liquidity situation.

• Finally, financial regulators may exempt reserve accounts with the central bank from leverage ratio calculations, as has been done by the Bank of England, in order not to damage banks’ leverage ratio as a result of the central bank’s balance sheet expansion.
So, central banks should be aware of these active choices, rather than letting them happen by default. Whether central banks have a financial stability mandate or not, they are influencing financial stability through their choices on their balance sheet.

Session 3, chaired by Ernest Gnan, on the future course of monetary policy started out with a discussion paper by Charles Goodhart, London School of Economics, who wondered why central banks have not managed to bring inflation back up to target, despite their very expansionary monetary policies. In his view the reason is the floor system for interest rates, whereby banks can deposit unlimited amounts at the central bank, safely and at zero cost, and these central bank deposits do not negatively affect banks’ leverage and capital ratios. As a result, central banks have lost control over the monetary policy transmission mechanism via the banking system. What is more, central banks’ non-conventional operations have damaged the monetary transmission mechanism by flattening the yield curve and, in some cases, even pushing interest rates below zero, thus damaging bank profitability.

Underlying trends have been favorable for central banks and their operational independence over the past 30 years. Interest rates, both nominal and real, have trended down. As a result, while debt ratios have been rising dramatically (except for banks since 2009 and except for Germany), debt service ratios have remained low and steady. Borrowers, especially public sector and corporate, have gained from low interest rates, as have those already holding assets, i.e. the old and the rich. Losers have been savers without assets, i.e. the young and poor, but they blame their governments, rather than central banks. Why has this been the case? Over the past 30 years, the world has seen the largest ever positive labor supply shock. The baby boom implied that the dependency ratio declined very sharply in industrialized countries, and workers were available abundantly. Subsequently, the lifting of the Iron curtain and the rise of China, combined with globalization, meant that large swaths of the world were entering the global production and trade system. As a result, the global workforce more than doubled, creating strong deflationary forces. Therefore, inflation targets until five years ago should actually have been zero, and this would have prevented some of the decline in interest rates, which have caused the sharp increase in debt ratios.

Despite very low interest rates and high corporate profitability due to cheap labor, corporate debt ratios have risen strongly in many countries. Yet, the investment ratio was quite low. There are many possible explanations. One is that debt was used for stock buybacks, raising the return on equity and benefiting firms’ management. Another is that cheap labor reduced the incentive to invest as a means of achieving productivity gains. Real wages and productivity positively influence each other mutually. A third explanation is the lack of further big technological advancements.

This will have important implications if and when monetary policy normalizes and central banks are no longer borrowers’ best friends. How will politicians react? As highly indebted corporates and private households are hit by the end to very low interest rates, how will insolvencies be handled? We end up in a debt trap, in which, on the one hand, it becomes virtually impossible for central banks to raise interest rates fast and very far and, on the other, indebtedness would further deteriorate, if central banks keep interest rates quite low instead.

How to get out of this debt trap? First, growth would be the nice way out, but it is precluded by ageing populations. Countries in continental Europe would actually be quite well off if they could do as well as Japan, where the output growth per worker of the past 10 years was around 2%. Second, debt could be cancelled. But in today’s financial system this would mostly hurt financial intermediaries, with negative systemic consequences. Third, inflation might be a serious possibility, as central banks’ independence could be threatened as they try to
raise interest rates. With hindsight, the last 30 years of central banking may turn out to have been the golden years of central banking. Fourth, default is unlikely as it would spell financial and economic disaster. The best option in Goodhart’s view would be to switch debt into equity. The information requirements for this to become feasible might become possible with the advance in big data.

Stephen King, HSBC, weighed the benefits and risks from globally synchronized economic growth, and asked whether historically such periods might have the seeds of crises built into them. Looking at data from 50 countries since the late 1980s, he defined a period of synchronized global growth as one where more than 30 countries grew simultaneously above trend. There were not many years with such situations: 1994, 1997, 2000, 2004, 2006-2007, 2010 and 2017. A first category among these episodes comprises 2004 and 2010, which were periods following unusually weak growth. As a second category, years associated with financial shocks were 1994 (major bond market sell off and Mexican crisis) and 1997 (Asian crisis). A third category were years with financial crises and economic upheaval combined. These episodes were 2000 (bursting of the dot com bubble and the following recession) and 2006-2007 (global financial crisis and Great Recession).

The current situation does not fit the first category and might be associated with financial or economic upheaval. A possible reason might be collective excessive risk-taking due to a mistaken feeling of safety, à la Minsky cycles. A second reason might be that if many countries experience a boom at the same time, inflationary pressures are more likely to build up, including in asset prices. A third possible reason is monetary surprise. Years associated with a financial or economic shock, i.e. 1994, 1997, 2000 and 2006-2007, were periods when the Fed raised interest rates by more than what markets anticipated. Given the current high levels of debt, we might expect central banks to tighten monetary policies cautiously. But the synchronized boom might lead to an unexpectedly rapid monetary tightening, which might lead to abrupt asset price adjustments and economic upheaval. Besides bond markets, stock markets also appear particularly vulnerable, given high current valuations, which are comparable to the years 2000 and 1929. In such an adverse scenario, central banks would now have little leeway left to provide additional necessary stimulus.

King found it surprising how narrowly central banks keep gearing monetary policy towards maintaining consumer price stability. In 300 years of Bank of England history, the only recessions associated with high inflation were in times of war and in the 1970s. The majority of recessions were linked to financial crises. Over the past months, bond markets have been soft, stock markets until recently very strong and the US dollar exchange rate was weak. The last situation with such a mix was 1987, when the international coordination of monetary policies broke down. Similarly, at the moment, we are witnessing a breakdown of global trade coordination.

Christian Schulz, Citigroup, provided Citigroup’s assessment of prospects for economic growth, inflation and monetary policy in the US, the UK and the euro area. The baseline forecast is that there will be strong global growth and low inflation, trade disputes will only have limited effects, US fiscal expansion will not result in a recession, Brexit will be made with relatively long transition periods and will not trigger a recession, and the euro area will not experience another crisis. Assuming this quite optimistic base case, he set out the following monetary policy scenarios:

- Regarding net asset purchases, the Fed stopped them four years ago. The Bank of England never had open ended QE but made another expansionary monetary policy package after the Brexit referendum. The ECB will likely end net asset purchases in December 2018.
- Regarding interest rates, the orthodoxy of sequencing now seems to have become that interest rate hikes follow only some while after the end to net asset purchases (although the sequencing could, in principle, also be chosen differently). In the case of the Fed, it took 14 months – longer than expected. In the UK, it took 9 months. For the ECB, it is unclear how long “well past” the end of net asset purchases will eventually be. Citibank expects the first rate hike for June 2019. The Fed and Bank of England both chose the standard 25 basis points for the first rate hike. The ECB might initially hike the deposit facility by 15 basis points. After the first hike, it took the Fed another year until the second
one, since then it has raised rates in three steps per year. Regarding the Bank of England, Schulz expects them to hike rates every 9 months, by all means very gradually. At the ECB, President Draghi has introduced the new term „at a measured pace“. In practice, the second rate hike might happen six months after the first one.

• At some point thereafter, central banks choose to somewhat reduce the size of their balance sheets. In the case of the Fed, this happened when the Federal Funds rate reached 1 ¼ % in September 2017. The Bank of England provided guidance in 2015 that they would end reinvestments once they can cut the bank rate in the case of an emergency by 150 basis point, i.e. when the bank rate will have reached 1.5%, which will probably be in 2021. But given the uncertainties about the UK economic outlook, it might also be later. The ECB will possibly face risks of sovereign bond market upheavals once it starts to reduce its holdings.

• Central bank balance sheets will ultimately end up much larger than before the crisis, e.g. because of increased cash in circulation and banks’ increased demand for central bank reserves post-crisis.

• Schulz expects the Fed interest tightening cycle to stop at 3%, the Bank of England between 2% and 2 ½% and the ECB will reach 1 ½% in 2022.

Pasquale Diana, Morgan Stanley, discussed the prospects for monetary policy normalisation in smaller economies in Central and Eastern Europe and Scandinavia. To capture the increasing policy divergence among those countries, Diana grouped them into three broad categories, based on where their central banks’ fall in terms of four major “fault lines” that are likely to determine the speed, shape and extent of policy normalization: 1) does the economy show signs of overheating; 2) are there price and wage pressures; 3) is the central bank concerned about financial stability (and in particular the housing market); and 4) is the central bank worried about an FX appreciation if it exits from unconventional policies before the ECB does.

The first category of countries is the frontrunners, such as the Czech Republic and Romania. Their central banks have started raising rates ahead of the pack, in response to a perceived threat from wage growth, and a desire to bring rates closer to neutral. Neither central bank is concerned about FX gains that may come from being ‘ahead of the pack’. The Czech central bank started hiking rates last summer in response to faster wage growth, and wants to take rates towards neutral via a mix of higher rates and stronger FX. The ECB’s outlook might influence the speed and timing of rate increases but does not determine what the CNB does. In Romania, excessively loose fiscal policy has led to overheating. The central bank raised rates twice this year already in response to overheating and inflation headed to 5%, double its target. The NBR does not have to worry about the FX when it raises rates, given that the current account deterioration represents a headwind to the currency.

The second category, which includes Poland and Hungary, are the “Goldilocks.” They perceive no serious threat to the inflation outlook, and believe that wage pressure is not serious enough to warrant tightening. They believe that the trade-off between growth and inflation is extremely favorable and does not require policy action. Despite strong growth, the Polish central bank now feels that the strong growth it has witnessed can coexist with low inflation for a long time. The NBP has guided the market to expect no rate hikes this year, and possibly the next. The Hungarian central bank remains adamant that loose conditions need to stay in place and risks of overheating are negligible. Hungary’s large external surplus and improving fundamentals have bought the NBH significant leeway versus the past.

Finally Sweden and Norway, which are in the third group, “Getting the House in Order”, show an intent to normalize policy from an extremely loose current stance, but concerns about leverage, housing, disappointing core inflation and FX appreciation act as headwinds. These countries are heading towards an exit, but with differing levels of confidence. Inflation in Sweden has lost momentum, and there are some concerns about housing. There are indications that a postponement of the first rate hike is likely given repeated CPI disappointments. The Riksbank would probably rather err on the side of being too late to normalize rather than too early. In Norway, the central bank has been paving the way for a rate hike by upgrading its growth outlook and its interest rate path. The recent lowering of the inflation target also implies a somewhat tighter policy in the near term.
Green finance, regulation and monetary policy

Key findings of a SUERF conference jointly organised with the Oesterreichische Nationalbank (OeNB) and Vienna University of Economics and Business (WU Wien)

Vienna, 4 May 2018

Conference Report

By Emanuele Campiglio, WU Wien, Ernest Gnan, SUERF and OeNB, and Irene Monasterolo, WU Wien

The dynamic links between the financial system and environmental sustainability have rapidly moved to the center of the public debate. Terms like ‘sustainable finance’, ‘green bonds’, ‘climate-related risks’ are increasingly spread buzzwords among policy-makers, financial practitioners and civil society. The topic exhibits several layers of complexity. First, climate change creates substantial new uncertainties for economic agents, whose repercussions need to be studied. For instance, the potentially large losses faced by insurance firms are pushing them towards a better assessment of physical risks. For investors, climate change might pose both risks and opportunities. Existing investments might dramatically lose in value, some firms might vanish, while others may enter and flourish. Green investment thus goes far beyond ethical behavior and may have very concrete financial drivers. Second, financial and banking regulation can influence the allocation of finance in environmentally friendly or harmful economic activities. Central banks’ monetary policy operations might unintentionally favor environmentally harmful activities. New empirical research findings help to identify such unintended effects and show avenues to correct for them. Finally, innovative green financial instruments might actively encourage investment in climate-saving sectors, R&D and clean technologies.

This conference, which was jointly organised by SUERF, the Vienna University of Economics and Business, and the Oesterreichische Nationalbank and hosted by the OeNB, aimed to provide an overview of the current state of research and policy debates on these themes. Non-technical presentations encouraged discussions among academics, policy makers and financial practitioners.

Climate change is the result of market failures - central banks aim to foster sustainability

In his opening remarks, Governor Nowotny stated that climate change touches on the core mandate of central banks – to maintain price stability and financial stability. According to Nowotny, climate science robustly confirms the human sources of rapidly rising greenhouse gas concentration amid industrial growth based on fossil fuels. Underlying problems are the lack of price for carbon and the fact that future generations will feel the impact rather than current actors. Even so, the need for world-wide action has finally culminated in the Paris Agreement of 2015 signed by 195 parties, which aims to limit the global temperature rise in this century to less than 2 degrees Celsius above pre-industrial levels. The financial community has reluctantly taken an interest in global warming, recognizing that the insurance sector and – less directly – banks are hit by climate (policy) risks. However, the transition to a sustainable development model also offers opportunities for the financial system given huge investment needs of an estimated 180 billion euro per year in Europe alone. Nowotny alluded to the main policy instrument of supervisors: disclosure of risks with the objective of performing carbon stress tests as well as supporting the process of market creation for “green assets”. Nowotny announced that the OeNB has recently become member of a newly founded international Central Banks and Supervisors Network for Greening the Financial System (NGFS). In his view, the typical mid- to long-term horizon of central banks can contribute to a smooth transition to a sustainable economy. The Governor emphasized how much the OeNB appreciates the fruitful long-standing and close cooperation with SUERF. The
OeNB is looking forward to many future joint events. He also warmly welcomed the very fruitful cooperation with WU Wien in designing the conference scientifically.

Prof. Jakob de Haan, President of SUERF, Head of Research, DNB, and University of Groningen, appreciated the opportunity for this joint conference on an important and topical subject and thanked the OeNB for their long-standing and generous support for SUERF. He also welcomed warmly the cooperation with the Vienna University of Economics and Business on board for this event, which continues SUERF’s long tradition of acting as a bridge between academia and policy, as well as financial practitioners.

Limiting temperature rise to 2°C requires a huge effort: need for an integrated socio-ecological perspective

The opening address was given by Prof. Sigrid Stagl, Head of the Institute for Ecological Economics at the Vienna University of Economics and Business. Prof. Stagl emphasized the exceptional nature of the current period, characterized by the intense pressure that the global population is exerting on climate dynamics and other planetary boundaries. While some steps towards a more sustainable society were taken in the past, scientific evidence suggests that these will not be enough to contain the rise in the level of global temperature to below 2°C. The respect of planetary boundaries should also be combined with the flourishing of individuals and the satisfaction of their basic needs.

The aim is thus to reach the ‘safe and just space for humanity’ that satisfies social objectives while respecting ecological constraints. In order to achieve this goal, there is the need to move to an integrated socio-ecological perspective, properly framing economic dynamics within the larger biophysical basis in which it takes place.

How to solve the gridlock between policy makers and the private sector?

The first keynote speech was presented by Stefano Battiston, Professor of Banking at the University of Zurich, and director of the FINEXUS center on Financial Networks and Sustainability. He discussed the relation between climate risks and financial stability from the point of view of financial interconnectedness. He had four key messages.

1. Climate is not yet another type of exogenous shock but the relation between climate policy and players’ expectations is characterized by circularity. Indeed, climate policy implementation is affected by market players’ perception of the introduction of the climate policy itself.

2. In the presence of scientific, technological, policy and political shocks, market players may not fully anticipate climate related price shocks, thus leading to price volatility and mispricing. This has implications for financial stability and thus for the role of central banks.

3. We are confronted with a gridlock that awaits to be solved. Indeed, the EU has embraced a low-carbon transition path, but the investment challenge is well beyond the capacity of the public sector. Increasing financial disclosure would not be sufficient to move the market towards climate-risk aware investment decisions but market players need credible signals from policy-makers to calculate the expected cash-flows from investments.

4. Usable metrics for portfolios’ climate risk and impact assessment already exist and can help financial authorities and private institutions to better assess risk, but more research is needed.
Climate stress tests help to create risk awareness

Battiston then presented the first climate stress test of investors’ portfolios to unlock the gridlock. The climate stress test is based on peer-reviewed research, co-developed in collaboration with researchers at WU1, and provides a framework to assess portfolios’ exposure to climate risks and impact of climate action (i.e. mitigation and adaptation) to bridge information and financing gaps. In particular, the climate stress-test allows to i) integrate climate risk (physical and policy) into standard financial risk measures (e.g. Value-at-Risk); ii) classify banks’ individual projects and derive overall portfolios’ contribution to climate adaptation/vulnerability, and iii) introduce a workflow to mainstream the climate risk management and impact assessment at every stage of the credit cycle.

The application of the climate stress-test to real portfolios (e.g. commercial and development banks) shows that financial actors are highly exposed to price changes that could affect large asset classes, in particular in the case of pension funds and investment funds. However, the effects on portfolio gains and losses depend on the timing and magnitude of climate policies and range from capital reallocation, distributive effects, aggregate and potential systemic effects. Indeed, individual exposures to climate risks due to portfolio allocations on carbon-intensive assets and sectors could be amplified by financial interconnectedness.

Battiston noted that the nexus between financial interconnectedness and financial stability is widely recognized today, and it is not only an urgent societal issue but also a fundamental scientific question with high-rank status. Therefore, more academic research is needed, supported by public and private funding, and by collaboration with central banks and policy-makers. To conclude, he discussed the implications of climate stress test results for central banks, highlighting the role of macro-prudential regulation to prevent the buildup of systemic climate-finance risks, and the need to exploit synergies and collaborations between academic research and regulators.

Climate change and the transition to a low-carbon economy: risks and opportunities for investors

The first panel session was moderated by Irene Monasterolo and aimed at understanding to what extent climate change could represent a risk for investors’ portfolios, and how to move from risks to opportunities. The session hosted four speakers: Angela Koeppl, environmental economist at the Austrian Institute of Economic Research (WIFO), Jakob Thomae, managing director of 2° Investing Initiative (2dii); Frank Packer, regional adviser at the Bank for International Settlements (BIS); and Simon Dietz, professor of environmental policy at the London School of Economics (LSE).

The speakers addressed three interconnected research questions for green finance, i.e.:

1. Would a paradigm change for the energy system help investors and policy-makers managing the transition to a low-carbon economy?
2. Under which conditions could climate-related financial disclosure effectively contribute to aligning the financial system to sustainability? In particular, what role could climate risk and impact metrics and standards for green bonds play in this process?
3. What lessons could be learnt from a pilot initiative aimed at tracking carbon-intensive companies’ carbon management and emissions performance?

This information is relevant for policy makers to introduce coherent and effective policies for the low-carbon transition; for investors to align their portfolio management strategies to the Paris Agreement and the Sustainable Development Goals; and for central banks

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and regulators to assess sources of climate risks for price and financial stability, and to identify proper tools to mitigate them.

The global energy system needs a fundamental paradigm shift – green finance has a central role

First, it was highlighted that the Paris Agreement called for a deep system-wide transformation to make finance flows consistent with a low Greenhouse Gases emission pathway and a climate resilient development (Article 2.1c). The Paris Agreement is a signal for investors to avoid fossil lock-in investments, putting pressure on the profitability of fossil fuels-based industries. The transition to a low-carbon economy could introduce both risks and opportunities for investors. However, in order to mitigate risks and exploit opportunities, a paradigm shift for the energy system based on interconnected stocks and flows and systemic thinking are needed.

Green finance is central in this paradigm shift. Nevertheless, it requires a regulatory framework to i) mainstream climate information into investors’ decision making, ii) identify climate risks and opportunities for investors within a systemic approach, and iii) implement a forward looking analysis of portfolios (i.e. aligned to the 2°C scenario).

What is a “green” investment? The need for disclosure, taxonomies and metrics

Then, the role of climate-related financial disclosure was addressed in terms of metrics and methods, as well as in terms of standards and labelling.

On the one hand, scenario analysis and stress testing for climate-risk disclosure would allow governments to set targets to decarbonize the economy, and investors to identify portfolio strategies to manage the potential mispricing of long-term risks related to the low-carbon energy transition. However, according to the 2°C Investing Initiative’s experience, current obstacles to disclosure are a lack of shared evidence on short term material impacts for regulators, missing standards on metrics for investors, and the absence of reference scenarios for issuers. A novel approach for disclosure based on climate stress tests and scenario analysis, using physical asset-level data that links economic activity to financial instruments, could reduce the costs and time needed for disclosure and ensure the comparability of results.

On the other hand, the introduction of a harmonized taxonomy for green investments is fundamental to inform divesting strategies. In the case of green bonds, institutions and mechanisms of certification could decrease investor uncertainty on the environmental benefits of green bonds and avoid “green-washing”. This point is crucial because it is still unclear to what extent green bonds could provide a hedge against environmental risks that investors are expected to price in their portfolios’ strategies. Indeed, research shows that on average, green bonds are more, not less exposed to environmentally related risks than traditional bonds. Therefore, the introduction of a common language and harmonized taxonomy for green bonds, such as that promoted by the European Investment Bank and the China Green Finance Committee, is needed to increase clarity for investors and avoid unintended effects. In addition, current green bond labels could be enhanced to reflect environmental risks.

Finally, the importance of metrics and criteria to assess the carbon intensity of companies and portfolios was discussed in relation to the results of the Transition Pathways Initiative. Several carbon-intensive companies have already taken initial steps for disclosure, such as recognizing climate change as significant and material risk, disclosing operational and some value-chain emissions, and setting initial energy emission targets. However, advanced steps, such as setting long-term emissions targets or assigning boardroom responsibility for climate change, are embraced only by a minority of firms. Achieving these company targets would allow carbon-intensive companies to align with the 2°C target. Thus, investors and other stakeholders could play a relevant role in portfolio de-carbonization, by getting companies to set long-term corporate targets, and holding them accountable for delivery of announced targets.

2 https://goo.gl/C8mUzf
3 https://goo.gl/CbmJyL
All speakers agreed on the need to strengthen the dialogue and collaboration between academic research, central banks and regulators in order to promote advances on green finance, and to provide relevant and timely information to policy-makers and investors. In particular, the panelists identified three promising areas for collaboration: (i) the development of climate stress tests of central banks’ and financial actors’ portfolios; (ii) research on green labelling and standards; (iii) research on the pricing in of carbon risks into financial market prices.

In conclusion, three messages for central banks in relation to green finance could be taken away: (i) Central banks could play a key role to raise awareness of environmental and climate-related risk in financial markets, also through regulation. (ii) An interdisciplinary approach is important to provide a comprehensive assessment of the exposure to climate risks of the various actors in the financial system, also through collaboration between academia and policy-makers (e.g. for the analysis of supervisory data). (iii) Both the micro and macro-prudential implications of investors’ exposures to climate risks should be considered to preserve financial stability.

**Huge funding needs for the transition to a low-carbon economy**

The second keynote speech was given by Christian Thimann, Senior Advisor to the Chairman at AXA and Chairman of the High-Level Expert Group (HLEG) on Sustainable Finance. He started by stressing the relevance of the financial system in supporting the achievement of a sustainable prosperity. The main question will be how to mobilise the required funding to invest in green infrastructure, sustainable cities, low-carbon energy, and so on. This is more important than the exposure of the financial system to climate-related risks. Neither of these questions are currently included in a systematic way into regulatory frameworks. The HLEG has concluded that a complete restructuring of the rules governing the financial system is not necessary. However, no single simple switch is available to make the financial system sustainable. It is necessary to go through every piece of regulation and identify the areas in which changes are needed. This has been the aim of the HLEG, which formulated four broad areas of recommendation to the European Commission.

**Greening the financial system requires a comprehensive strategy**

First, it has listed some key recommendations, which include the development a common sustainability taxonomy at the EU level; a strengthening of the disclosure of environmental risks; a strengthening of investors’ duties; and strengthened supervisory engagement.

Second, the HLEG has provided some sectoral recommendations. Thimann focused in particular on the banking sector, insurance companies and the credit ratings industry. All the financial actors in these sectors should be supported in integrating ESG and climate-related considerations more closely in their risk assessment frameworks, as these can be financially material. This would help banks and insurance companies in investing with a longer-term perspective, and banks to be better protected from the risks attached to high-carbon lending. In its current form, Basel regulation might penalise banks that engage in long-term lending. Insurance companies would benefit from regulatory incentives that allow them to invest in equity more easily.

Third, the HLEG has drafted some cross-cutting recommendations, two of which were discussed in detail by Thimann. For one thing, given the crucial importance of benchmarks in orienting investments and evaluating the relative performance of asset managers, benchmark providers should be encouraged to disclose to what
extent they take into account climate-related risks. For another, policy-makers should put in place a set of measures oriented at limiting the impact of short-termism in the financial sector. While low-carbon physical investment is oriented towards the long term, a substantial proportion of financial investments follow day-by-day, or even shorter-term, objectives.

Finally, Thimann highlighted several possible pitfalls and risks. First, while more regulation is needed, policy-makers should steer away from ‘soviet-style economic planning and remain open to both emerging technological innovations and diversity in the application of policies depending on the socio-economic context. Second, there is the risk of discussing excessively the risks attached to a low-carbon transition, while the biggest risk is the lack of investment. The debate should focus on how to mobilise the required finance. Third, ‘visible’ actors (companies, banks, pension funds and insurance companies) risk being overcharged compared to the ‘invisible’ ones (e.g. hedge funds, high-frequency traders). Fourth, the focus should not be exclusively on climate-related themes, as is often the case. Other environmental issues - such as water, fishing, or biodiversity – should not be overlooked. Agriculture is a particularly pressing issue. Fifth, there are competitiveness concerns for actors operating in long-term oriented regulatory contexts compared to those based in contexts with prevalence of short-term thinking.

How to align financial regulation with climate-friendly incentives?

The second panel, chaired by Emanuele Campiglio, focused on financial regulation and climate-related incentives. The aim of the panel was to discuss what potential role financial regulation could play in mitigating climate-related risks. The three speakers were Francesco Mazzaferro, Head of the Secretariat of the European Systemic Risk Board (ESRB); Josh Ryan-Collins, Head of Research of the Institute for Innovation and Public Purpose (IIPP) at University College London; and Olaf Slejpen, Director of the Supervision Policy Division of De Nederlandsche Bank (DNB).

The structure and content of the panel mirrored the current debate around the adjustment of capital requirements for private banks to account for climate-related financial risks. The European Commission, first with the report of the High-Level Expert Group on Sustainable Finance and later with its Sustainable Finance Action Plan, plans to explore the option of introducing ‘green-supporting’ or ‘brown-penalising’ capital adjustment factors. The strengths and weaknesses of these policy proposals are currently being debated.

There was agreement among the panellists on the potential financial risks attached to both climate change impacts (physical risks) and the transition to a 2°C-compatible economic system (transition risks). There was also a broad agreement on the pertinence of including them into prudential regulatory frameworks, if solid evidence of the systemic relevance of climate-related financial risks were to be produced. However, it was also noted that, despite ongoing research on the topic, this evidence is currently unavailable.

Panellists expressed concerns whether, in the event that systemic climate-related risk were indeed to be identified, differentiated capital requirements would be the best instrument to use. The precedent of the supporting factor for small and medium enterprises (SMEs) provides mixed evidence on the effectiveness of such measure in steering bank credit creation.

Panellists’ opinions differed on what could provide a suitable policy alternative. One panellist argued that measures included in Pillar II of the Basel supervisory framework (e.g. capital add-ons) might be more effective than those in Pillar I. Another panellist hinted instead to more pro-active stances by central banks in guiding bank credit, as is the case in some emerging economies. The point that government fiscal policy (e.g. through the implementation of a carbon price) should be leading the policy process was also put forward.

There seemed to be agreement that, if capital requirements were to be implemented, a brown-penalising factor would be a more appropriate choice than a green-supporting factor. It was noted that low-carbon sectors also feature several elements of risk. Reducing capital requirements on loans to low-carbon activities could get into conflict with regulators’ prudential objectives by facilitating a ‘green bubble’. However, the green-supporting factor currently seems to
have more support by both European policy-makers and private financial institutions.

**How could monetary policy make their policies and operations greener? Should they?**

The third panel, chaired by Ernest Gnan, Counsel to the Board and Head of Economics, OeNB, and Secretary General, SUERF, focused on how central banks might incorporate green considerations into their monetary policy-related economic analysis and implementation as well as in their official and own reserve management. Three speakers contributed a variety of arguments and views on these issues: Misa Tanaka, Head of Research at the Bank of England, Pierre Monnin, fellow with the Council on Economic Policies (CEP), and Guido Schotten, economic policy advisor at De Nederlandsche Bank.

The session addressed several questions:

(i) through which channels climate change may affect the economic environment in which monetary policy operates, and what the implications may be for monetary policy;

(ii) whether and how monetary policy operations, in particular asset purchases and eligibility rules for collateral in open market operations, currently exhibit a bias toward “brown” assets;

(iii) whether central banks should correct for any such bias, and to what extent this would be practically feasible;

(iv) whether and how central banks should even go beyond such correction of a brown bias, if any, and themselves favour green assets in their monetary policy operations;

(v) to what extent this would be covered by central banks’ mandates, what would be potential risks for incorporating green secondary objectives in their mandates, and what would be a useful division of responsibilities with other areas of economic policy;

(vi) how and to what extent central banks might apply green and sustainable principles in the management of official and own reserves.

**Climate change and low-carbon adjustment imply shocks and volatility – early preparation is key**

Regarding the first theme, panellists pointed out several channels through which climate change may affect the economic environment within monetary policy operates. First, more volatile temperatures may change seasonal patterns in output and prices and make food and biofuel prices more volatile. As a result, economic data might become more noisy and it may become harder to identify underlying inflationary pressure. Second, weather-related catastrophes may become more frequent. The resulting negative output shock is likely to be larger and more persistent if losses are uninsured. Depending on the supply/demand side components of such shocks, monetary policy may need to respond accordingly. Finally, in the medium- to long-run, higher temperature may reduce labour productivity, reduce capital accumulation through long-term damage to capital and land, and reduce TFP growth by diverting resources towards adaptation to climate change. Thus, the Phillips curve might shift. Overall, climate change will likely increase uncertainty facing both economic agents and economic policy makers, rendering private agents’ and policy makers’ decisions more difficult and prone to errors. To avoid any unnecessary turbulence, transition to a low-carbon economy should be prepared early, be planned well in advance and be communicated transparently. Several central banks, including the Bank of England and De Nederlandsche Bank, are currently working actively to incorporate climate-related risks, energy transition and climate policies into forecasting and stress-testing economic models.

**Do current central bank operations favour “brown” sectors?**

On the second theme, panellists quoted empirical work which documents that the ECB’s and Bank of England’s corporate bond purchase program is skewed towards high-carbon sectors, such as electricity and gas,
manufacturing and transport. To take the example of the Bank of England, this resulted from the fact that the Bank purchased only investment grade bonds, denominated in GBP, of firms that make a material contribution to economic activity in the UK, and that purchases were allocated to match the proportion of total outstanding eligible issuance accounted for by each sector. Also for the ECB’s corporate sector purchase programme (CSPP), a strong bias towards brown sectors has been shown empirically. However, due to their narrow focus on corporate bonds, these studies neglect the impact of the far more substantial purchases of supranational development banks by the ECB, which may overcompensate the bias introduced by the CSPP. There was also disagreement among the panel to what extent this actually put low-carbon sectors at a disadvantage in terms of financing costs compared to high-carbon sectors. To take again the example of the Bank of England, the announcement of the Bank of England’s corporate bonds purchase scheme (CBPS) sharply reduced all investment grade corporate bond spreads, both eligible and ineligible. Indeed, upon the following announcement of the list of bonds eligible for the purchase program, yield spreads between eligible and non-eligible corporate bonds widened markedly. However, this effect dissipated quickly, and overall the CBPS reduced spreads of eligible over ineligible investment grade corporate bonds by a mere 2-5 basis points. So, any unintended effect of favouring high-carbon sectors in terms of financing costs differentiation was likely small.

Practical limitations to correcting for brown biases in central banks’ operations

Regarding the third topic, central bank representatives on the panel emphasised practical limitations: For now, there is simply not enough volume of green bonds available to satisfy central banks’ required volumes. Excluding high-carbon assets would, at prevailing conditions, curtail the range of eligible assets, and thus unduly limit central banks’ ability to stimulate aggregate demand. This triggered a discussion of which comes first: available supply of bonds or demand from central banks. For example, the ECB with its ABS purchase program explicitly aimed at developing issuance activity in this market segment, by creating a constant stream of demand by the central bank. While in the case of the ABSPP this aim was ultimately not achieved, similar considerations could nevertheless be applied to green assets.

Practical steps towards greening central banks’ monetary policy operations

On the fourth theme, there was agreement that current financial market financing flows do not yet reflect the needed transition to a low-carbon economy. Financial prices do not adequately reflect the needed shift in production structures. What are the implications for central banks’ role? One line of argument taken in the panel and in the following discussion with the audience was that central banks importantly influence the cost of funding through interest rates. With their current bias towards brown finance, central banks cement existing financial market misalignments. A promising avenue to widen eligibility for green assets is to separately and explicitly consider climate-related financial risks, if climate-related risks were to be substantial and not fully reflected in credit ratings. Pursuing this approach, however, requires further development in methodologies for assessing climate-related financial risks; work on this is currently being completed and is soon going to be published by the three panellists and co-authors.

In practice, central banks might include climate risk considerations in their monetary policy operations by (i) a re-evaluation of risk-return profiles (use of external credit ratings that account for climate risk, integration of climate risk in internal risk assessments); (ii) higher haircuts for climate-risky assets as well as eligibility criteria that account for climate risk; and (iii) using sustainability indices for asset purchase allocations. By doing so, central banks would send a strong signal to financial markets the effects of which might go far beyond the mere portfolio flow effects.

Are green policies covered by central bank mandates?

This led to the fifth theme: compatibility with central bank mandates. Among the panel and in the audience, there were three different views on this:
(i) A first view was that, in order to correct for financial markets’ current distortions which hamper the transition to a low-carbon economy, central banks should support climate goals, as long as this does not conflict with price stability. Article 3 of the EU Treaty was quoted, according to which the Eurosystem, without prejudice to price stability, should support the EU’s general economic policies, including environmental sustainability.

(ii) Central bankers held against this that incorporating environmental and sustainability considerations in central banks’ objective function would dilute their focus on consumer price and financial stability. The secondary objective in Article 3 of the EU Treaty are so broad and diverse that it would be impossible for the central bank to decide on which among these many goals to support in practice, all the more so since there might be trade-offs between the various secondary goals. Embarking on such an approach would open a dangerous Pandora’s box. The difficult choices and potentially strong distributional effects of “green” monetary policy operations would overstretch the scope of an independent technocratic institution, whose democratic accountability requires a clear and narrow mandate. Overextending the mandate would ultimately risk central bank independence. Furthermore, the Tinbergen principle reminds us that with one instrument, central banks cannot and should not pursue several objectives. The role of monetary policy in supporting a smooth transition to a low-carbon economy will require further study. Normally, the focus of monetary policy is on business cycle frequencies of 2-3 years. Even regarding the incorporation of financial cycles, which are far longer, in monetary policy considerations there is no consensus. Monetary policy is usually not geared towards addressing long-term structural issues.

(iii) A third view held by some in the audience was that central bank mandates should be more fundamentally questioned. These representatives called for going back to an approach like the one prevailing in many countries in the post-war era until the 1970s, which actively involved central banks in industrial and sectoral policies.

Case study DNB: current practical limits to central banks’ green own investment policies

Regarding the sixth and final theme, the DNB’s approach to include green investments in their own account portfolio was presented. This might be the area where central banks could most easily implement green policies quickly. However, as the DNB example showed, such policies currently quickly find their limits in the lack of supply of suitable issues, both in terms of overall volumes and more specifically in maturities offered. Again, the question of which should come first – supply by issuers or demand by central banks – was raised.

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Feedback by participants signalled that the aim of the conference, namely to bring views from academia, policy makers and the financial sector together for a fruitful exchange, was achieved. The strong involvement of NGOs and think tanks among speakers, the audience and in the very lively questions and answers sessions reflected the open nature of these discussions, which is useful and necessary to enhance public awareness of, and create solutions to, these complex and interdisciplinary topics, in which financial aspects are just one, albeit an important, element.

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A conference photo album is available at:
www.suerf.org/gallery
Central bank digital currencies (CBDC) have become a vividly discussed topic over the past few years, and the speed of the debate has gained pace recently. To gain an overview of various perspectives on this topic, SUERF and the BAFFI CAREFIN Centre at Bocconi University convened an expert conference. The conference focused on these questions:

- Is physical or paper cash really vanishing? How far is this process across the world? How big are differences across countries?
- What exactly is a CBDC? What are defining properties of a CBDC? What technical options are there? Depending on the combined features, what different types of CBDC might be conceived, and what properties would they each offer?
- What are the consequences – pros and cons as well as risks - of the various conceptions of CBDC for society at large (e.g. power balance between state and individual, personal privacy), for citizens and businesses, for the banks (e.g. business model), for central banks (e.g. role, size of balance sheet) and monetary policy (e.g. effectiveness of monetary policy transmission) as well as for financial stability (e.g. bank runs)?
- What might be the political economy processes governing the drive towards (or against) the introduction of CBDCs? How might voters’, politicians’, central banks’ und banks’ interests and preferences influence this process?
- Would an economic system without cash and without a replacement for central bank money, which is available to the general public, be problematic?
- Should central banks therefore, if cash were indeed be nearly fully replaced by private payment services, actively offer an electronic alternative issued by the central bank, i.e. a CBDC? Or should central banks actively pursue the transition from paper cash to CBDC? Can central banks decide this themselves? Or is this an issue of such far-reaching consequences, and legal implications, that the democratic instances need to be actively involved?
- What are potential risks in the transition and in a potential future CBDC-based system? How about robustness to cyber-crime, electrical outages and extreme crisis situations?
- What are first experiences from a pilot project in Uruguay and what is the thinking of pioneering central banks in this field, such as Sveriges Riksbank and the Bank of Canada?

A first overview

Fabio Panetta, Deputy Governor of the Bank of Italy, in his opening keynote embedded the topic in the wider digital revolution, the fourth industrial revolution, and the digitization of the financial system, which has been underway for many years (e.g. dematerialization of financial assets, electronic trading platforms, digital and mobile banking etc.). So, why should cash not also become digital? Before developing on this topic further,
Panetta emphasized that CBDC has nothing to do with private crypto assets such as bitcoin. The former would be currency like cash and be governed by the same standards on stability as physical cash, while the latter is not currency but just an asset not backed by any clear governance, mandate, laws or other assets. Concerning the pros and cons of CBDC, Panetta first considered them as a means of payment. CBDC would add another digital payment alternative. However, given the already large range of electronic payments options available and the resulting existing strong competition, the marginal value of central banks’ additional involvement in an area already well served by the private sector would appear small. However, CBDC might improve access to digital payments to non-banked consumers, a non-negligible fraction of the population even in highly developed countries. Whether this potential advantage would indeed materialize depends on the reasons why these groups are non-banked (cost of banking, remoteness, lack of digital literacy) and needs further research. Finally, CBDC might help save on the high costs associated with physical cash handling, which is estimated to cost at least ½ % of GDP in EU countries. Regarding CBDCs role as store of value, again physical cash involves high storage costs, estimated in the order of 0.5-1% of the value stored, compared to quite negligible storage costs of CBDC. Contrary to bank accounts, CBDC would also be free of credit and liquidity risks. However, this advantage might deprive private banks of a major source of funding, which in the euro area currently makes up 20% of the euro area banking system’s funding, with potentially adverse consequences for the cost and supply of bank lending. CBDC might even trigger a “digital bank run”. In any event, CBDC would likely push banks’ business models towards “narrow banking”.

The most important issue is whether it should be traceable or to guarantee, as best as possible, anonymity, as cash perfectly does. Weighing the pros and cons of the privacy of payments transactions is a choice that does not belong to central banks alone but also to the political sphere, as it affects the heart of personal freedom and modern liberal democracy. This is also linked to the question whether CBDC would be token-based or account-based. The former would safeguard privacy better; the latter would imply a huge IT and human resources effort by central banks. Another important issue is whether CBDC should be interest-bearing. This choice would affect the central bank’s role, scope of monetary policy action and seigniorage. The monetary transmission mechanism would become more immediate, and, absent physical cash, negative interest rates would become fully feasible. If CBDC were remunerated, it would also become a closer substitute to commercial bank accounts and facilitate digital bank runs. Seigniorage would fall due to the interest paid on CBDC but it would increase through savings on cash handling and increasing demand for central bank liabilities. The overall impact is ambiguous, the distributional impact for society as a whole is non-trivial. An important challenge is also cyber-security and resilience to technical failure and hacking. Finally, there are a number of legal issues to be clarified, such as the legal tender nature of CBDC, whether this would imply that every citizen will need to have the technical means to use it, and whether central banks need authorization by government to issue it.

Weighing the costs against the benefits and considering potential risks, in Panetta’s view, the case for CBDC is as yet unclear. The impact and risks of a CBDC on the financial system, the real economy and on society depend on their specific design characteristics. If remunerated and available to anyone at no cost, CBDC would substantially boost central bank balance sheets. If account-based, central banks would directly interact with the private non-financial sector. This would substantially increase central banks’ role in the economy. Society, through its democratic instances, should first decide on its preferences on fundamental matters such as privacy of payments transactions before the central banks comes in with implementing CBDC. Given it well-established nature, its robustness and general acceptance and usability, cash is here to stay, at least for a while.

Is cash really obsolete? Would a CBDC satisfy people’s needs as well as cash?

Ruth Judson, Federal Reserve System, offered insights on the evolution of the demand for banknotes in the US and in other countries and offered speculations about the effects from CBDC on cash banknote demand. US banknote demand trended down from the 1960s through the mid-1980s and in the years prior to the financial
crisis. The upswing between 1985 and the early-2000s as well as since the financial crisis was driven by large denominations (USD 50 and 100), with smaller denominations trending further down. Much of the upswing was likely the result of foreign demand and coincided with crises. By contrast, US domestic banknote demand has been flat or been falling for all denominations, except for the year 2008, when also domestic demand for large denominations was strong. At a global level, in almost all countries banknote demand rises, with large denominations dominating in almost all countries. Relative to GDP, cash demand varies widely across countries; there is no correlation with income levels. In most countries, currency holdings are relatively large and on a stable or rising trend. Sweden with very low and rapidly further diminishing cash holdings is an extreme exception to the broader global pattern. If a CBDC were introduced alongside paper cash, its voluntary use would depend on who is now using currency and why. Foreign users would probably have no access to CBDC. Regarding use of large denominations by US citizens, little is known about motivations. They might include precautionary savings for fear of financial instability, privacy concerns, which have always existed but may be increasing in recent years, and gray/black market activities. Very little is known about the relative importance of these three factors, but is is unlikely that users driven by any of them would find a CBDC attractive. Regarding smaller denominations, demand is trending down in the US but very slowly. Circulation in the US is still very high: USD20 notes in circulation are over USD500 per person, USD10 and smaller notes are USD140 per person. It is unclear whether a CBDC would be more appealing than other already existing payments media replacing cash.

CBDC would continue the history of money – various options to design CBDC

Morten Bech, Bank for International Settlements, started by the observation that in the evolution of money, after primitive money, coins and notes, electronic money and digital money, we are now on the verge of creating digital money 2.0, the form and characteristics of which are as yet unknown, though. While globally the use of card payments (transactions as share of GDP) has consistently increased over the past decade, so has the amount of cash in circulation as a share of GDP in most countries. Notable exceptions to the latter trend were Sweden and some EMES; in the UK, Canada and Australia cash circulation grew only marginally, while card payments grew strongly. Bitcoin as a peer-to-peer version of electronic cash challenged the established centralized model prevalent until then. Various forms of money can be usefully categorized using four criteria: wide accessibility, whether they are physical or electronic, whether they are issued by the central bank or privately, and whether they allow peer-to-peer transactions. In this four-dimensional structure, central bank reserves, banknotes, fractional reserve money, bitcoin, Uruguay’s e-Peso, central bank retail and wholesale crypto-currencies all fill specific niches and needs. Bech then compared three forms of CBDC – retail tokens, retail accounts, and wholesale-only tokens - with existing paper cash and reserves and settlement balances using five criteria. Retail CBDC tokens could fulfil all five criteria, i.e. ensure 24/7 availability, ensure anonymity vis-à-vis the central bank, allow peer-to-peer transfers, bear interest and be capped regarding the size of transactions. CBDC retail accounts could also be available 24/7, anonymity and peer-to-peer transfers would not be possible, while they could also bear interest and be capped. Wholesale-only tokens could be designed to satisfy all five criteria. So, CBDC offers vast degrees of freedom in implementing specific features. Most notably, for monetary policy CBDC would enable the application of negative interest rates on CBDC and the issuing of helicopter money. Regarding financial stability, CBDC might alter the nature of bank runs and disrupt banks’ business models.

Alternative CBDC conceptions, four scenarios, and their quite different consequences

Santiago Fernandez de Lis, BBVA Research, defined CBDC as central bank-issued instruments combining cryptography and digital ledger technology to achieve four goals: improved inter-bank settlement, improved payment system efficiency, improved monetary policy effectiveness through overcoming the zero lower bound on nominal interest rates, and stronger surveillance and better financial system stability. He analyzed various conceivable forms of CBDC by combining three features: access, anonymity and yield. Contrary to physical cash, access to CBDC might not need to be universal but could also be restricted. Contrary to
physical cash, transactions in CBDC might be identifiable. Contrary to physical cash, CBDC might yield interest.

Combining these three design elements, Fernandez de Lis chose four scenarios (more combinations would of course be conceivable) for CBDC to illustrate the wide range of possible conceptions.

A. A non-yield-bearing CBDC with restricted access and full identification might be conceived for interbank settlement. In the speaker’s view, this would improve wholesale money market efficiency, and the reduction of barriers to entry would open participation of third-party providers.

B. A non-yield bearing CBDC with universal access and anonymity might replace physical cash, at lower cost and with higher efficiency. In the speaker’s view, this would improve retail payments efficiency. Having an account with the central bank might need to be made obligatory. As a result, bank deposits and credit might fall. Overall, it would be convenient for end-users. Given anonymity, the informal economy might be encouraged.

C. A yield-bearing CBDC with universal access and anonymity would appear to help central banks overcome the zero lower bound on interest rates. However, this measure amounts to financial repression: thus, negative interest rates might as a further measure prompt the introduction of capital controls to avoid flight to higher yielding assets. Physical cash would also need to be actively abolished by the authorities to make the negative interest rates work. Due to the far-reaching impact of financial repression and the fiscal nature of negative interest rates on CBDC, the frontiers between monetary and fiscal policy would be blurred, raising questions of central bank legitimacy and ultimately threatening central bank independence. Overall, this scenario would therefore be highly disruptive.

D. A non-yield bearing CBDC with universal access and full identification would make the central bank a deposit-taking institution for the general public, increase surveillance and reduce financial system instability. This approach might sharply reduce bank credit unless the central bank redirects funds to the financial systems. This form of CBDC would amount to a total disruption of banking systems as we know them today, implying a potentially painful transition phase. The lack of bank credit might give rise to new credit mechanisms, e.g. through crowd-funding. The very far-reaching nature of this form of CBDC would again raise issues of central bank legitimacy.

The probability of introduction and the extent of disruption of these four scenarios are plausible to be inversely related. In Fernandez de Lis’ assessment, the less disruptive scenarios A and B are likely to be introduced within a five year horizon. Central banks are aware of the more serious disruption of the financial system in scenarios B to D: they would thus move forward only with gradual testing and implementation. Increasing competition from private cryptocurrencies might push central banks towards adopting CBDCs. The example of first-mover central banks may increase incentives by other central banks to follow.

EMEs have different needs

Fernandez de Lis concluded with some thoughts on the special situation in emerging market economies (EMEs). Using CBDC for interbank settlements (Scenario A) might have merits in EMEs in the event that existing wholesale payment systems are not yet well developed and efficient. An anonymous CBDC cash replacement (Scenario B) might be particularly helpful to enhance financial inclusion and efficiency in EMEs, while risking to consolidate tax evasion. If not credible, such a CBDC could also easily fail, as multiple examples of dollarization have shown. Using CBDC to enhance monetary policy with negative interest rates (Scenario C) is less relevant in EMEs given their usually higher inflation rates. Non-anonymous CBDCs as public deposits at the central bank (Scenario D) would reduce informality but might hamper bancarization in EMEs.

How to design a CBDC, and which consequences would arise?

Andrew T. Levin, Dartmouth College, formulated broad design principles for CBDC based on the requirements to provide a legal tender with stable value that facilitates transactions, provides a stable unit of account and serves as a store of value. A stable unit of
account is a public good, like metric units etc., which the state should provide. Because of the enabling the use of negative interest rates, CBDC enables the central bank to pursue true price stability in the sense of zero average inflation, thus facilitating decisions of households and firms and increasing economic efficiency. CBDC would be much more cost-efficient than physical cash. Central banks should implement CBDC not in the form of digital tokens using distributed ledger technology: while these would provide anonymity, they might facilitate criminal activity and are costly and non-instantaneous. Thus, central banks should provide CBDC through accounts, using well-established, cheap and fast technology. Rather than providing accounts directly to the public (which might exacerbate bank runs), central banks could provide such accounts in public-private partnerships through commercial banks overseen by the central bank. This would enhance privacy and financial system stability. In the spirit of Friedman’s rule for optimal monetary policy, CBDC should yield the same rate of return as other safe assets. While in the case of physical cash this implies steady-state deflation, digital cash can be interest-bearing, with essentially the same rate of return as short-term government securities, thereby eliminating the costs of holding cash, seigniorage, and thus any conflict between price stability and efficiency. In Levin’s view, while paper currency should not be abolished it will become obsolescent. Given network externalities inherent in payment systems, retailers have strong incentives to curtail the use of paper cash and coins. This in turn will diminish consumers’ incentives to carry cash. This feedback loop has proven to be very rapid in Sweden and will become evident elsewhere.

By establishing graduated fees for transfers between digital and physical cash, central banks can eliminate the effective lower bound on interest rates if the fees are sufficiently substantial for large transactions. This new freedom with regard to interest rate setting would enable to rest on this tool also in severe downturns or crisis and thus to refrain from opaque and discretionary balance sheet tools. Monetary policy would thus become more systematic, transparent and effective. The central bank's balance sheet could become quite simple, with assets of short-term government securities matching its digital cash liabilities. Monetary operations would simply adjust the supply of digital cash to meet demand at the pegged interest rate, with corresponding adjustments in holdings of government securities. As the central bank no longer generates seigniorage and will cover its costs through minimal transaction fees, central banks would be better shielded from pressures and political interference. In a crisis, the central bank could fulfill its lender of last resort role by providing digital cash to financial institutions in need for assistance.

Central banks should act pro-actively now

To conclude, Levin warned that the payments system is evolving very rapidly now. Instability and price level indeterminacy could arise of all payments were made with private currencies. Systemic risks could be exacerbated by the emergence of quasi-monopolistic payments. With the present system, central banks might be unable to mitigate severe deflationary shocks. Thus, central banks should engage in an active dialogue with elected officials, the private sector and the general public on whether and how to proceed with launching CBDC.

Is a cash-less society problematic?

Ben Fung, Bank of Canada, defined CBDC as central bank liabilities, widely available to the general public which can be used to make payments. Thus, besides physical cash and electronic central bank reserves, they would represent a third possible form of central bank (“outside”) money. There are many possible motivations for the introduction of CBDC: responding to a decline in the use of physical cash, the preservation of seigniorage and ensuring an adequate share of central bank money in the monetary system; improving the contestability and efficiency of payments; the elimination of the zero lower bound and the facilitation of quantitative easing; improving financial stability; enhancing financial inclusion; and fighting criminal activities.

Fung then focused on two questions: first, whether a cashless society is problematic, and how the central bank should respond. The use of cash for payments transactions has been declining in Canada. The rise in the volume of cash circulation is mostly due to high denominations. Nevertheless, cash plays no role in large value payments. The abolition of paper cash would hit those in society that do not have access to bank accounts or electronic payments; but instead of taking this as an
obstacle, one could work on financial and digital inclusion. There is also the question whether the abolition of paper cash would reduce competition in retail payments systems. The loss of seigniorage for central banks due to the abolition of paper cash would be small given the small fraction of cash in central banks' balance sheets. Fung then offered some considerations on the financial stability implications of a (nearly or completely) paper-cash-less monetary system. Would the abolition of paper cash reduce the probability of bank runs and thus weaken market discipline on banks? In Fung's view not necessarily, since depositors can in any case already now transfer money to other, safer banks or buy government securities, which would remain options for a run also in the absence of paper cash. Furthermore, during episodes of severe financial instability, wholesale runs by large firms were more important than retail runs by small depositors. While periods of financial crises have in the past indeed been associated with a flight to cash as a safe store of value, they continued to use credit and debit cards. To meet the increased demand for risk-free assets in a systemic banking crisis in a (nearly) cash-less monetary system, the central bank could (a) provide cash from a large emergency stock that it holds for contingencies; (b) rely on government securities as a safe store of value, possibly in smaller denominations in order to widen access to the general public; (c) temporarily open the possibility for savers to open deposits with the central banks (temporary or contingency CBDC).

What would be the consequences of CBDC for payment systems and financial stability?

The second question addressed by Fung was whether the central bank should issue a CBDC to promote the competition and efficiency in payments systems, and what the consequences for the financial system would be. First, he sketched the attributes that a CBDC in his view should have: it would be legal tender in national currency convertible to banknotes and reserves at par, it could bear an interest of zero, positive or negative value, it would not involve fees, access would be non-exclusive, it would be available 24/7, supply would be entirely demand-driven, distribution would be channeled through financial institutions, there would be counterparty anonymity, but no anonymity to the financial institution and central bank (to avoid tax evasion and criminal activity), payments processing would be close to real time, the timing of irrevocability would depend on the technical solution, and the CBDC payment network structure would be distributed and bilateral, not tiered. Such a CBDC would likely reduce paper cash demand but would increase overall central bank seigniorage, there would likely shifts from bank deposits to CBDC, in response banks would raise deposit interest rates, bundle services, rely more on wholesale funding or else reduce lending. Monetary policy would be affected since the central bank would be able to directly influence retail interest rates on CBDC.

Fung concluded that much more in-depth studies are needed to shed light on these and many other issues including potentially high set-up and operating costs, as well as cyber and reputational risks.

What influences the drive towards CBDC: a political economy perspective

Alessandra Cillo and Donato Masciandaro, Bocconi University, reported on an ongoing project which investigates whether people would like CBDC in Italy. They started from the observation of two seemingly contradictory developments: on the one hand, the use of cash has further increased in the euro area over recent years; on the other hand, new private electronic currencies have gained prominence and increasing acceptance. So, there seems to be the need for the safety of assets issued by a state authority, on the one hand, and the technological progress as represented by e.g. private crypto-currencies. Is CBDC, being electronic public legal tender, the answer to this combined need? How high would actual demand for CBDC be? What would the interest elasticity between CBDC and bank deposits be? The presentation then consisted of a theoretical and an empirical part. First, the authors presented a theoretical model to identify the drivers of the political consensus in favor or against a CBDC. Given three different properties of a currency (two standard functions of medium of exchange and store of value and a third, less explored one of store of information, in other words the risks for privacy from using money for exchanges) and three different types of money (paper currency, banking currency and crypto-currency) and if individuals are rational but at the same time can be subject to behavioral biases (loss aversion), three
different groups of individuals – CBDC lovers, neutrals and haters – emerge. Given the alternative opportunity costs of the different types of currencies, CBDC issuing is more likely to occur, the stronger the preference for a legal tender and/or the more they are indifferent with respect to anonymity. The probability of a CBDC being introduced also increases if it is remunerated and if its implementation can guarantee at least counterparty anonymity. Second, the authors presented a planned experiment among 82 Bocconi University students. Subjects will have to choose among 18 types of currencies or payment methods, with different liquidity risks, expected returns and levels of anonymity. Using a three-step experimental set-up, the aim is to find out about individual's relative preferences attached to the above three properties. This should help to better anticipate public acceptance of various forms of CBDC.

A first CBDC pilot project: considerations, experiences and first results from Uruguay

Jorge Ponce, Central Bank of Uruguay, shared the Bank of Uruguay’s experiences with a just finished real world pilot test of a digital version of the Uruguayan Peso, called e-Peso. The e-Peso was designed as an electronic platform for Uruguayan Peso with legal tender status. To begin with, the legal framework was verified to allow the issuing of electronic bills as a complement to physical ones. Cyber-, information-, financial and reputational risks were reasonably hedged and mitigated. The pilot was performed to test various technical aspects, such as e-Peso production, the digital vault, digital wallets, the transactions system, infrastructure and business continuity. The central bank conducted it in close cooperation with a telecom provider, and a handful of IT and payment solutions providers. The pilot lasted for 6 months from 17 November 2017 until 18 April 2018. A volume of 20 million e-Pesos (equivalent of around EUR 550,000 as at June 2018) was issued. 10,000 mobile phone users, chosen on a first-come-first-serve basis, were involved. E-Pesos were generated at the central bank, transferred from the e-vault to users' digital wallets, and could from there be used for payment transactions in registered stores and businesses as well as for peer-to-peer transfers among registered users. Digital wallets were limited at an equivalent of EUR 800 (EUR 5,500 for registered businesses). Participants were incentivized to initially convert cash into e-Pesos and then to actively use the system for transactions. At the end of the pilot, e-Pesos were converted back into conventional Pesos, and the e-Pesos were destroyed by the central bank. Currently, the pilot is being evaluated and further steps are being decided. The pilot system provided for instantaneous settlement, relied merely on a working mobile phone line, not requiring an internet connection, the users’ wallets and the encrypted e-note manager were designed to render transactions anonymous yet traceable; e-Pesos were secured even if users lost their phones or the password for their digital wallet; unique traceable bills prevented double-spending and falsification.

The overall experience with the pilot was positive: there were no technical incidents, transactions were mostly peer-to-peer, the number of participating stores and businesses increased over time, and also banks got interested in joining. Overall, Ponce highlighted many advantages of central bank digital currencies (lower costs, financial inclusion, prevention of crime and tax evasion, customer protection) and called for central banks to embrace new technologies, which are in any case unavoidable, and be pro-active in promoting further financial innovation in cooperation with the private sector and start-ups.

The Sveriges Riksbank’s e-krona project: motivation, state of play, and further plan

Bjorn Segendorf, Sveriges Riksbank, defined a CBDC as a central bank liability, denominated in national currency, available 24/7, more broadly accessible than current central bank deposits. Generally, motivations for issuing a CBDC can be rooted in socio-economic considerations, in financial stability goals, in monetary policy objectives and in the quest for efficiency. In Sweden, retail payments developments are the driver for considering an e-krona, as the use of paper cash is quickly dwindling. Thus, if cash disappears, the general public would no longer have access to central bank money. In the medium term, Sweden would no longer have a domestic infrastructure for retail payments, given the dominance of global card schemes, pan-European clearing and the ECB’s trend towards multi-currency settlement systems. A retail CBDC would ensure that the Swedish public has access to central bank money. It would provide a payment
infrastructure and may increase payment system resilience. The Riksbank’s current concept for an e-krona aims to provide a means of payment primarily between households and firms, it would be accessible 24/7 and process payments in real time. Currently, there is no legal basis for remuneration. The issues of (partial) anonymity and off-line functionality are as yet open.

A CBDC is, however, no free lunch. The advantages have to be weighed against the consequences. For instance, in the area of financial stability, many argue that it would enable instant bank runs by enabling depositors to shift savings from bank deposits into CBDC and lead to a dramatic expansion of the central bank balance sheet during crises. Segendorf challenged this assertion by showing that the consequences of a bank run on the overall size of the central bank balance sheet need not differ with CBDC as compared to the present situation (while the composition effects differ, of course).

The e-krona project is currently underway. Phase 1 in 2017 was devoted to drawing up a general proposal for an e-krona and a potential design for an e-krona system. During phase 2 in 2018 the e-krona concept is refined, deeper legal analyses are being conducted and monetary policy issues are being investigated. By end-2018, the decision to move to stage 3 or to conclude the project will be taken. Phase 3 might either lead to the development and implementation of an e-krona system or be used for a continuation of analyses.

CBDC in the broader context of the current discussion of crypto-currencies

Martin Summer, Oesterreichische Nationalbank, provided an introduction into various forms of money and payments methods, including cash, bank deposits, SEPA, crypto-currencies, emphasizing their distinctive features. Both paper and book money crucially rests on trust, be it in the monetary authority or the stability of banks. Trust in the current monetary system relies on a well-established combination of hierarchy between money created by the central bank and deposit institutions, of centralization and coordination with incentives for the parties involved to maintain the integrity of the system. Deposit money is the digital representation of cash, convertible at a fixed rate of 1:1. Traditional forms of money and payment systems function smoothly and efficiently. Crypto-currencies are privately issued value units convertible to actual currencies at flexible exchange rates. Contrary to the terminology of “digital coins” and “digital wallets”, they are conceptually closer to deposit money and accounts. Agents exchanging crypto-currencies are represented as addresses in computer networks, which do not reveal the owner’s identity. Transactions are authorized and verified using cryptographic techniques and the integrity of transactions is verified collectively and in a decentralized manner by “miners”. The latter verify transactions, batch them into blocks and append them to a register of all blocks of verified transactions that ever happened in the network, called the “block-chain”. The popularity of crypto-currencies rest on the fact that a central authority is deliberately excluded, it is open source, and everybody is free to participate. Anonymity adds to its attractiveness. A clever system of technology and economic incentives aims to ensure honest behavior among participants. Given the complex process of creation and encryption, payments in crypto-currencies are slower than e.g. SEPA, they have a much lower transaction capacity, and they are inefficiently resource intensive. For these reasons, the use of the block-chain technology would not make sense for CBDC. Even more, the concepts and technology implemented in crypto-currencies (in particular the block-chain technology) are irrelevant for a discussion of CBDC. If CBDC means direct access for citizens to central bank money through accounts at the central banks, this would imply a major structural change in monetary arrangements. Summer doubted, however, why central should go this way: there is no convincing case that the still widespread use of cash can be interpreted as a market failure that calls for public policy intervention.

A macroeconomic perspective: inside versus outside money, and the role of incentives

Dirk Niepelt, University of Bern and CEPR, offered a macroeconomic perspective. Would CBDC by substituting outside money (i.e. money coming from outside the private sector, in practice from the central bank) for inside money (i.e. money backed by credit from inside the private sector, in practice book money, i.e. deposits at banks which were created through postings in the banks’ account books) change
macroeconomic outcomes? Does inside money add social value? If not, could we abolish inside money along the lines of the Swiss “Vollgeld initiative”? Niepelt first considered arguments why substitution might not matter. As regards money as a store of value, the composition of money between inside and outside money does not affect the economy’s balance sheet; assets, saving and investment are unaffected. By contrast, there also arguments why substitution does matter. Incentives to screen borrowers might weaken, the incentive to lend might actually increase. Central banks’ incentives in a politico-economic equilibrium might change. As the monetary system becomes more transparent, support for implicit transfers from the central bank might dwindle. In conclusion, if incentives for central banks and politicians were held constant, “reserves for all” would not change much. However, in reality these incentives would change.

The discussion is still at an early stage and many issues are still open and controversial

The conference concluded with an extended, free, highly explorative discussion among all conference participants. This discussion highlighted the key controversies around CBDC. It was seriously doubted, and no-one contested, that a CBDC could ultimately guarantee anonymity, even if this were included in its design. It became obvious that the value attached to privacy of the individual versus state power was maybe THE central distinguishing feature between advocates and adversaries of CBDC. The issue of robustness to cyber-attacks, electric outages and natural catastrophes was highlighted as a weakness, and the solutions offered ranged from ensuring that a CBDC would have to be designed in a way to also operate without the internet, at least for a while, to the recommendation that the central bank should for contingencies always hold a stock of paper cash. Various important legal obstacles were highlighted, including the question whether it would actually be for the central bank or the government itself to issue CBDC.

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The highly focused conference topic as well as the ample room for informal discussion particularly in the last session were highly appreciated by conference participants. This approach ensured that the conference indeed increased all participants’ insight and reflection on the topic. SUERF thanks all speakers and participants for their engagement in this open yet constructive dialogue. SUERF particularly appreciates the long-standing and regular co-operation with the BAFFI CAREFIN Centre at Bocconi University and is grateful for generous sponsoring by Intesa Sanpaolo Bank.
Award of SUERF Honorary Membership to Professor Franco Bruni

The conference offered Ernest Gnan, SUERF’s Secretary General, the welcome opportunity to grant SUERF’s long-standing member and supporter, former SUERF President and Vice-President, Professor Franco Bruni from Bocconi University, SUERF’s Honorary Membership, SUERF’s highest award. Professor Bruni responded with very personal remarks on the benefits which membership in, and work for, SUERF offered him throughout his professional career and personal development. Besides stimulating discussions and important professional contacts, SUERF also brought him many close and long-standing friendships.

SUERF thanks Professor Bruni for his long-standing and continuing service for SUERF and warmly welcomes him among the small and distinct circle of SUERF Honorary Members!

www.suerf.org/membership/honorary-members

News from the Council of Management

We would like to congratulate Council Member and Chair of the Editorial Board Natacha Valla on her recent appointment as Deputy Director General for Monetary Policy at the European Central Bank, and Council Member Christian Upper on his new position as Head of Macroeconomic Analysis at the Bank for International Settlements.
Joint conference organised by SUERF and the Belgian Financial Forum (BFF)

10 Years after the start of the financial crisis in Europe: contours of a new normal

Friday, 14 September 2018
Auditorium National Bank of Belgium
Rue Montagne aux Herbes Potagères 61
1000 Brussels, Belgium

Keynote Speakers
Jan Smets, Governor of the National Bank of Belgium
Poul Thomsen, Director of the IMF’s European Department

Panel Sessions

Panel 1: Scars or scratches: how damaging is the fall-out from the crisis for the real economy and the natural rate of interest?
Cinzia Alcidi, CEPS; William De Vijlder, BNP Paribas; Eva Ortega, Banco de España; David Turner, OECD; Freddy Van den Spiegel, Vrije Universiteit Brussel and Belgian Financial Forum.

Panel 2: The financial sector and prudential policies in the new normal
Mathias Dewatripont, Université Libre de Bruxelles; Jo Sweyngedouw, National Bank of Belgium; Isabelle Vaillant, European Banking Authority; Rudi Vander Vennet, Universiteit Gent; Christine Van Rijnseghem, KBC Group.

Panel 3: Monetary policy beyond normalisation: objectives and instruments
Maria Demertzis, Bruegel; Andrew Filardo, Bank for International Settlements; Natacha Valla, European Central Bank and SUERF; Peter Vanden Houte, ING Belgium.

www.suerf.org/brussels2018
The world is changing fast and policymakers on both sides of the Atlantic face a wide range of challenges; be it pushing at bay the spectra of secular stagnation, lowering inequality, defining framework to manage new technologies or tackling climate change and migration. In this third edition of the EU and US Perspectives conference series, we zoom in on four major topics and contrast the policy choices being put in place in the US and the euro area, and debate whether these will ultimately deliver sustainable outcomes.

Growth and inequality demand side vs supply side policies
Low growth and inequality are common challenges on both sides of the Atlantic. When it comes to the policy response, however, very different choices are being made. In the US, the emphasis is on demand-side economics, while the euro area is leaning more towards the supply side.

Brave new finance - Fintech and crypto-currencies
The Bitcoin-bubble brought Fintech to the headlines, but it is more than crypto-currencies. Established financial firms are responding by embarking on Fintech themselves, accompanied by downsizing of traditional business modes. Regulators and central banks have yet to set the policy response, but a first few hints are emerging.

Labour markets, wages, robots and migration
Globalisation was the labour market buzzword of the 2000s; the debate is now moving to migration and robots and how this will shape labour markets and wage formation in the future. For developing countries emigration can mean a valuable loss of resources. Attention is turning in particular to the African continent and not least as a new frontier for infrastructure.

Regulation and climate change
Climate change scenarios differ in their extent, but regulatory changes and environmental requirements are already nudging both financial and non-financial corporations towards a new approach. This, in turn, will have very wide-reaching consequences.

Confirmed speakers:
SUERF/Banco de España Conference

Financial Disintermediation and the Future of the Banking Sector

Tuesday, 30 October 2018
Madrid

Preliminary Programme

08:30 Registration and Welcome coffee

09:00 Opening remarks
Pablo Hernández de Cos, Governor, Banco de España

09:15 Keynote speech
Philip Lane, Governor, Central Bank of Ireland

10:00 Session 1: Financial disintermediation and the role of monetary policy and financial regulation
Chair: Natacha Valla, Deputy Director General for Monetary Policy, ECB and SUERF Council Member
Óscar Arce, Banco de España
Leonardo Gambacorta, Monetary and Economic Department, BIS
Steven Ongena, University of Zurich

11:30 Coffee break

12:00 Session 2: FinTech and the future of the banking sector
Chair: Patricia Jackson, Non-executive Director, Atom Bank and SUERF Council Member
José Manuel González Páramo, Member of the Executive Board, BBVA

13:30 Lunch

14:30 Keynote speech
Luc Laeven, Director-General of the Research Department, ECB

15:15 Policy panel on Capital Markets Union
Chair: Michala Marcussen, Group Chief Economist, Société Générale and SUERF Council Member
Nathalie de Basaldúa, Deputy Head of Cabinet to Vice President Katainen, European Commission
Rodrigo Buenaventura, General Director Markets DG, CNMV
Andrea Enria, Chairperson, EBA
Nicolas Véron, Bruegel

17:00 Concluding remarks
Jakob de Haan, SUERF President and De Nederlandsche Bank

www.suerf.org/madrid2018
This high-level conference co-organised by the European Investment Bank and European Central Bank with the cooperation of the Massachusetts Institute of Technology, Columbia University and SUERF (The European Monetary and Finance Forum) will provide an opportunity for leading academics, policy makers and practitioners to share their views and understandings on investment finance and competitiveness, while raising awareness of the challenges posed by technological transformation and the need to adapt workforce skills. Participants will discuss under the Chatham House Rule.

Confirmed speakers:
Werner Hoyer, Peter Praet, Klaus Regling, Jean Tirole, Catherine Mann, Claudio Borio, Vítor Gaspar, Pier Carlo Padoan, Jean-Pierre Mustier, Debora Revoltella, Klaus Zimmermann, Jan Švejnar, Reinilde Veugelers.
BOOK REVIEWS – BOOK REVIEWS – BOOK REVIEWS

Preparing for the Next Financial Crisis: Policies, Tools and Models

Edited by Esa Jokivuolle, Bank of Finland and Radu Tunaru University of Kent


Hardback: EUR 102.85.
Paperback: EUR 54.60.

Reviewed by Morten Balling, Emeritus Professor of Finances, University of Aarhus, SUERF Honorary Member

In September 2015, the Kent Business School at the University of Kent, UK in close cooperation with Bank of Finland organized a workshop. The invited specialists were asked to present contributions on how in their view regulators, policymakers, risk managers, academics and general practitioners can best prepare themselves for the next financial crisis. The organizers had brought together experts from a wide range of areas involving finance, policymakers, chief economists of investment banks, central bankers, academics and regulators from the United States, United Kingdom and the European Union. The resulting book is structured in two parts. The first part comprises more policy-oriented contributions while the second part contains some analytical studies from a “financial stability laboratory”.

In chapter 1, Huw Pill (Goldman Sachs) and Lucrezia Reichlin (London Business School) look at two rationales for central bank balance sheet expansions. One set of measures aims at maintaining the normal channels of monetary policy transmission during crisis times. Another set aims at exploiting unconventional channels of monetary policy transmission beyond the conventional impact of lower interest rates. ECB’s asset purchase programs belong to the second category. The central bank increases the incentive for the private sector to invest in riskier assets. The flatter yield curve implied by quantitative easing threatens bank earnings from maturity transformation. Expansionary emergency measures should, however, not blunt the incentives for governments, regulators and the private sector to address the underlying structural problems in the financial system and the economy more broadly.

ECB asset purchases reduce the sovereign spread of peripheral over core EU countries. At the beginning, asset purchases yielded a one-off capital gain for banks owning bonds from peripheral countries. In the longer term, the impact of quantitative easing on bank earnings is viewed as negative. The ECB has induced a “search-for-yield” in riskier and longer duration assets. Several German institutions have remained reluctant to shift into riskier peripheral and corporate instruments despite the yield differential that quantitative easing has opened up. In developing an appropriate macrofinancial policy mix, EU-authorities must take into account that German institutional investors traditionally have a home-bias in their asset holdings.
In chapter 2, Seppo Honkapohja (Bank of Finland) also discusses ECB’s outright monetary transactions (OMT) program. He refers to Mario Draghi’s famous statement from 26. July 2012: “Within (its) mandate, the ECB is ready to do whatever it takes to preserve the euro.” The ECB’s President’s intention was to convince the market participants that the persistence of the OMT program could be trusted. It worked! The author also gives an overview of (other) reasons for and risk consequences of the growth in the financial sector in recent years. Global imbalances, short-comings in risk measurement and lack of loss-absorbing capital are mentioned. The author is sceptical regarding financial innovation. Market expectations of public support in the event of crisis may weaken risk-management by private financial institutions. The different financial reforms after the crises – including the endorsement of the Basel III framework, the Single Resolution Mechanism and the Banking Union - have all contributed to re-establishment of financial stability. The author concludes by underlining the crucial importance of still having high minimum capital requirements.

In chapter 3, Larry D. Wall (Federal Reserve Bank of Atlanta) reviews the changes in prudential regulation of banking organizations adopted by the United States in the wake of the financial crisis. Regarding capital adequacy, the US supervisors decided in 2010 to require all US banks with assets greater than USD 500 million to comply with Basel III. The US requirements will, however, go beyond Basel III in a variety of ways. Thus, the US has added a second formula for calculating the systemic importance of a GSIB, which incorporates the bank’s reliance on wholesale funding and increases the maximum potential surcharge to 4.5 of risk-weighted assets. The US applies also stricter rules for the supplemental capital ratio, and US bank holding companies with more than USD 50 billion in assets are required to conduct an annual stress test using 3 scenarios as a part of the Federal Reserve’s Comprehensive Capital Analysis and Review. US Authorities have strengthened accounting rules for special-purpose vehicles and loan loss accounting. The full American version of Basel’s liquidity coverage ratio is somewhat more stringent than that required by Basel III. The author concludes the chapter by referring to prudential measures regarding OTC derivatives, proprietary trading, approval of mergers based on antitrust considerations, and living wills for globally systemically important financial institutions (G-SIFIs). In chapter 4, Jouko Vilmunen (University of Turku) presents his views about Dynamic Stochastic General Equilibrium (DSGE) models. DSGE macroeconomics is a very broad field. In his view, the DSGE Approach is the mainstream modelling framework. Most critics of the DSGE Approach base their arguments on the failure of the DSGE-models to predict systemic events such as financial crises. Systemic risk is a poorly understood and measured concept. The DSGE Approach impose two types of methodological restrictions: Conceptual restrictions and quantitative methods and restrictions. Being able to analyze the interaction between financial market disruptions and the macroeconomy requires more than what most of the current DSGE-models can handle. Recent advances in DSGE-modelling have only scratched the surface on how to extend these models to improve our understanding of the macroeconomic consequences of upheavals in financial markets – and to improve the quality of policy advice. Several open research questions remain. The author confesses that he is a DSGE enthusiast (p.60). On the other hand, he sees a need for more “out-of-box thinking” and methodological diversity in macroeconomics to test new ideas and aim to model them using a full-fledged DSGE Approach only ultimately, once we have found the best way to formalize them in a macroeconomic context.

In chapter 5, Juha Tarkka (Bank of Finland) offers a historical perspective on regulatory ideas of how banks should invest. The reviewer finds it quite charming that an author after in 2015 having been asked how best to prepare for the next financial crisis, answers by recommending works by Adam Smith (1776) and David Ricardo (1817). In the decades following the Second World War, liquidity considerations were progressively displaced by credit risk management and focus on capital adequacy. However, during the latest crisis in 2008 severe disruptions in the functioning of money and capital markets were experienced. This forced managers and regulators to reconsider the liquidity of bank
portfolios. A quotation from Adam Smith (1776) reminds the reader of the “Real Bill Doctrine”, which historically has represented “good practice” in bank liquidity management. The doctrine was reflected in the wording of the act of Congress founding the Federal Reserve System in 1913. In their critique of the Fed’s lending policy after 1929, Milton Friedman and Anna Schwartz (1963) also referred to the doctrine. One of the most important changes in banking practice in the last half century was the growth of liability management as a doctrine of bank balance sheet management. Large banks started to rely increasingly on their ability to borrow from short-term money markets as a source of liquidity. The global financial crisis, which culminated in 2008, was an enormous shock to the contemporary liquidity management practices. Interbank money markets dried up. The regulatory response was introduction of the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR). Today, regulators and bankers agree that solvency does not guarantee liquidity that must be taken separately into consideration.

In chapter 6, Adrian Pop (University of Nantes) provides an overview of stress testing in banking. Historically, the Basel Committee on Banking Supervision in its market risk amendment to Basel I (1996) give the first references to stress testing. Several examples of stress scenarios are listed based on past episodes of market turbulence. Basel II that entered into force in 2007 formally asked bank managers to carry out regular stress tests under the Pillar 1 guidelines for internal model validation purposes. Basel II also referred to stress tests under the supervisory approach in Pillar 2. Since 2009, stress testing programs have been developed in the United States as part of the Supervisory Capital Assessment Program (SCAP). The Basel Committee published in 2009 a study on sound stress testing practices pointing out some deficiencies in existing programs. The author of chapter 6 focus on a key methodological issue: the design and calibration of initial shocks to be used in stress scenarios. He lists main advantages and drawbacks associated to historical and hypothetical shocks and scenarios. He presents also a rigorous and flexible methodological framework to select initial shocks to be used in stress scenarios based on statistical techniques for detection of outliers in time-series of risk factors.

Chapter 7 is written by three authors, who are all affiliated with the European Central Bank: Timotej Homar, Heinrich Kick and Carmelo Salleo. There are two different approaches to engineer EU-Wide stress test impacts on bank capital: The ECB/EBA vulnerability measure and the SRISK approach. The ECB/EBA stress test starts by specifying a macro scenario and possible shocks to the financial markets and derives key metrics for credit losses such as probability of default and loss given default for loans. The SRISK Approach infers the stress impact from the long-term covariance of bank stock returns with market returns, specifying the initial shock in terms of a decline in the stock market. The ECB/EBA stress test was conducted on 130 Eurozone banks as a part of a Comprehensive Assessment in 2014 and utilized results from the asset quality review. SRISK is available only for publicly traded banks, limiting the regression sample to about 40 banks corresponding to 50% of total banking assets covered by ECB’s Comprehensive Assessment. The authors compare the explanatory power of the regressions. The comparison shows that the ECB/EBA approach, which relies on a much broader data foundation, shows more credible results. In a large table (p.130), the authors compare the stress impact of the ECB/EBA adverse scenario with the SRISK stress impact on a sample of individual banks. It shows that for poorly capitalized banks, the SRISK stress impact is only a small fraction of the impact under the adverse stress scenario. In their conclusion, the authors write that the SRISK stress impact is rather disconnected from both basic risk factors related to credit losses and market-implied measures of bank vulnerability. The authors deliver a strong defense for the ECB/EBA approach.

In chapter 8, Thomas Noe and Nir Vulkan (both affiliated with Said Business School, Oxford) study the role of personality in financial decisions and financial crises. The social psychology perspective on decision making is fundamentally different from the economic and financial economics perspective. Incorporation of personality into economics is therefore challenging.
Risk taking is associated with emotional stability. Empirical studies can document relations between personality variables and trading behavior. The authors find that personality has a strong effect in group decision contexts and an insignificant effect in individual decision contexts. This might reflect that in group contexts the participants care not only concerned about the monetary rewards but also about mutual status. The authors close the chapter with an optimistic note: The gain to society at large may be that economic models informed by personality will be better able to capture warning signs for looming financial crises and thus provide policymakers with the tools they require to avert them.

In chapter 9, Radu Tunaru (University of Kent) look at “model risk”. Large financial institutions have suffered serious losses due to use of inadequate internal pricing models. Portfolios of mortgage-backed securities, swaps and options, interest rate derivatives etc. have been mispriced and lead managers to wrong decisions. All models rely on simplifications. The author defines model risk as the inability of a proposed mathematical statistical structure to reflect homogeneously over time the object under analysis (p.160). In financial markets, the problem is that plenty of models work well during normal times but give very bad results in turbulent times. In order to illustrate how risk measures depend on the choice of models, the author calculates Value-at-risk (VaR) estimates obtained by four models. The production of “knowledge” in finance has grown enormously in recent years. A “mountain of research” is available. It raises the question of how many new ideas, results and techniques the staff working in a bank should take into consideration. There must be a limit somewhere. Decision makers should remember that the precision of models may be only illusory. Researchers should try to criticize models and techniques more.

This book is written by and aimed at academic specialists, practitioners and professionals in the field of finance and financial markets. The authors all have a deep knowledge of the very varying topics they write about. Readers can learn about or be reminded of the development of recent financial crises and the monetary policy and regulatory measures that have been applied in US and Europe to manage the crises. Structural conditions for and tests of resilience of banks are well explained in several chapters of the book. Most of the authors are, however, cautious when it comes to policy recommendations. Their common message to the readers seems to be, that our understanding of financial crises and the complexity of real world financial systems is not so good that we are allowed to draw strong policy conclusions. The agenda for future research is long.
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In memoriam Jean-Paul Abraham (1930 – 2018)

It is with great sadness that we learned about the passing of SUERF Honorary Member and distinguished European academic and banker Jean-Paul Abraham on 9 May 2018.

In his functions as Founding Member, Vice President and President of SUERF, Jean-Paul Abraham has been an important contributor in the evolving history of SUERF. We look back at many years of personal support and dedication, as well as the numerous contributions received by Jean-Paul for the benefit of SUERF and its mission.

Jean-Paul Abraham combined an academic career at the universities of Namur, Louvain and Bruges with different functions within Paribas Bank Belgium (secretary general, economic advisor, member of the executive committee, member of the board of directors). This was a perfect marriage between theory and practise, which is one of the fundamentals of SUERF. He was also an essential, yet modest inspiring contributor of the Center for Financial Studies, which became the Belgian Financial Forum in Belgium.

During his presidency in the second half of the 1990’s, he set up a renewed financial structure for SUERF. He was the author of the impressive SUERF study (2003/3) “Monetary and Financial Thinking in Europe – Evidence from Four Decades of SUERF”, published on the occasion of the 40th anniversary of SUERF. He was truly convinced that SUERF should and could be the platform by excellence for reflection and discussion of financial and monetary topics in the European Union.

Through his vigour and generosity, his numerous ideas, immense creativity and engagement he became one of the most appreciated SUERF supporters.

We will deeply miss him and will always hold fond memories of his life and contribution.

Council of Management
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