EUROPEAN CENTRAL BANK

EUROSYSTEM

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Cross-border Financial Risk Sharing in the Euro Area

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Private financial risk sharing…

- **Cross-country (or cross-regional) asset holdings may allow economic agents to better smooth income and consumption over time, because in a downturn (an upturn) in their home country they benefit from income streams of the assets they hold in countries that have an upturn (can lend to countries that have a downturn)**

- **Requires ("quality") financial integration**

- **Different assets foster different degrees of risk sharing**

- **Financial integration and risk sharing are more or less resilient to shocks depending on the assets through which they work**

1) Equity tends to dominate debt (state contingency)

2) Long-term debt tends to dominate short-term debt

3) Retail bank lending tends to dominate interbank lending (Fecht et al. 2007)
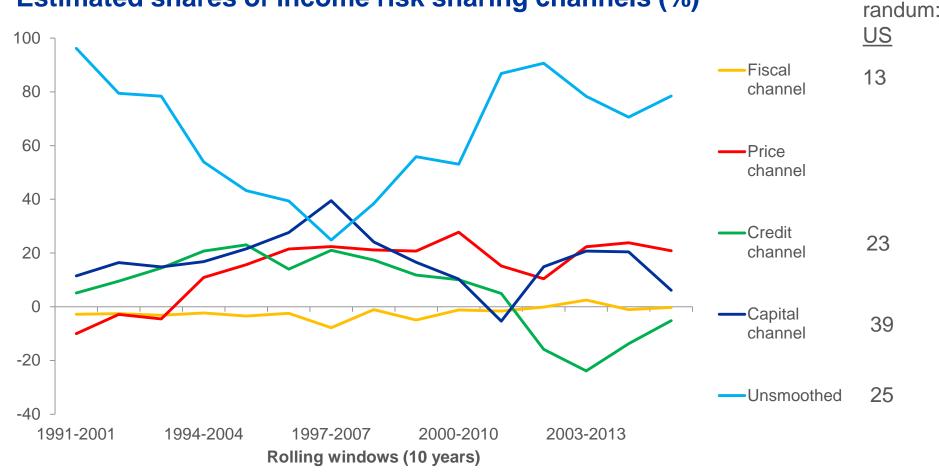
...may play an important role in the euro area

- **Households of euro area countries that are financially integrated and whose economic and financial cycles are not aligned can benefit from such private financial risk sharing**

- **Cross-country fiscal risk sharing, as observed within federal nation states, is very limited in the present European Economic and Monetary Union**

- **ECB monetary policy is area-wide and there is no exchange rate**

- **EMU will function better with cross-country risk sharing**

- **Early evidence suggests that the introduction of the euro fostered risk sharing (Kalemli-Ozcan et al. 2005)**

- **But it collapsed for distressed countries in the European sovereign debt crisis (Kalemli-Ozcan et al. 2014)**

- **As part of our financial integration work we now monitor private risk sharing and its resilience (see special feature A in ECB 2016)**

Risk sharing in the euro area is low now, with bank credit even acting as a "shock amplifier"
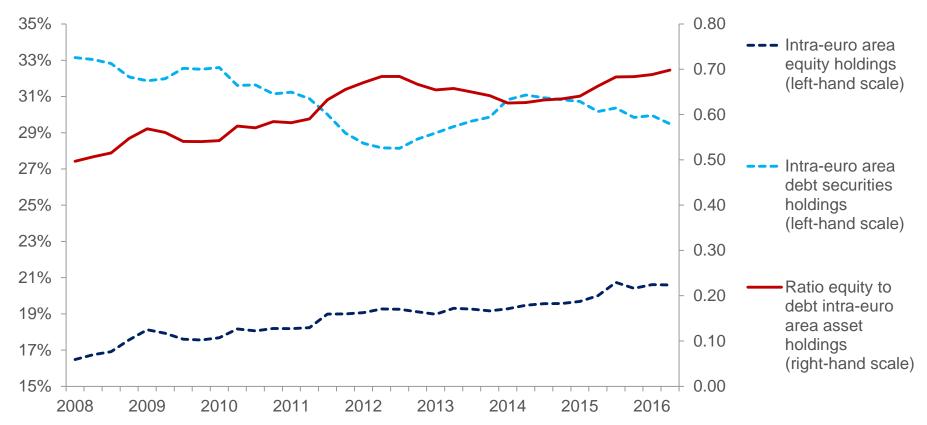
Estimated shares of income risk sharing channels (%)

Legend	US
Fiscal channel	13
Price channel	23
Credit channel	39
Capital channel	
Unsmoothed	25

Rolling windows (10 years)

x-axis labels: 1991-2001, 1994-2004, 1997-2007, 2000-2010, 2003-2013

y-axis: 100, 80, 60, 40, 20, 0, -20, -40

Notes: ECB staff calculations applying the Asdrubali and Kim (2004) approach enhanced for relative price adjustments. Memorandum item on the US from Asdrubali et al. (1996).

But financial integration is becoming more resilient and cross-border equity claims are increasing

Foreign equity versus debt investments in other euro area countries

Legend:
- **Intra-euro area equity holdings (left-hand scale)** — dashed dark blue line
- **Intra-euro area debt securities holdings (left-hand scale)** — dashed light blue line
- **Ratio equity to debt intra-euro area asset holdings (right-hand scale)** — red line

Notes: The dashed dark blue line shows euro area countries' holdings of equity (including investment fund shares and other equity) issued by other euro area countries in % of total euro area equity holdings. The dashed light blue line shows euro area countries' holdings of debt securities issued by other euro area countries in % of total euro area debt securities holdings. The red line shows the ratio of the two shares. (See also chart 1 in special feature A of ECB 2016.)
Source: ECB and ECB calculations

Market and policy initiatives that develop capital markets, notably equity, and integrate retail credit markets can enhance private risk sharing

- **Only selected considerations due to time constraint**

- **Retail credit side**
    - Valuable initiatives (existing BU, EDIS proposal, green paper on retail financial services, addressing national options and discretions in CRD/CRR etc.)
    - But hard to see how cross-border retail lending could be taken to the next level without cross-border consolidation and more pan-European banks

- **Capital market side**
    - CMU action plan very important, even though ECB would have liked a clearer vision and more ambition
    - A real difference could make pension reforms in a number of European countries and the creation of European pension schemes
    - Next perhaps an accommodating approach towards pan-European asset management companies (while adequately supervising their risks)
    - Improvement of framework conditions (contract enforcement, insolvency harmonisation, financial education   etc.)

Selected literature 1

- **Asdrubali and Kim (2004), Dynamic risk sharing in the United States and Europe, Journal of Monetary Economics, 51(4).**

- **Asdrubali, Sorensen, and Yosha (1996), Channels of interstate risk-sharing: United States 1963–1990, Quarterly Journal of Economics, 111(4).**

- **Athanasoulis and van Wincoop (2001), Risk-sharing within the United States: What do financial markets and fiscal federalism accomplish?, Review of Economics and Statistics, 83(4).**

- **Balli and Sorensen (2007), Risk sharing among OECD and EU countries: The role of capital gains, capital income, transfers, and savings, MPRA Working Paper, no. 10223.**

- **Del Negro (2002), Asymmetric shocks within the US States, Journal of International Economics, 56(2).**

Selected literature 2

- **Demyanyk, Ostergaard, and Sorensen (2007), U.S. banking deregulation, small businesses, and interstate insurance of personal income, Journal of Finance, 62(6).**

- **European Central Bank (2016), Financial integration in Europe, April.**

- **Fecht, Grüner and Hartmann (2007), Welfare effects of financial integration, CEPR Discussion Paper, no. 6311, May**

- **Fecht, Grüner, and Hartmann (2012), Financial integration, specialization and systemic risk, Journal of International Economics, 88(1).**

- **Hepp and von Hagen (2010), Interstate risk sharing in Germany: 1970–2006, Fordham University Department of Economics Discussion Paper, no. 2010–04.**
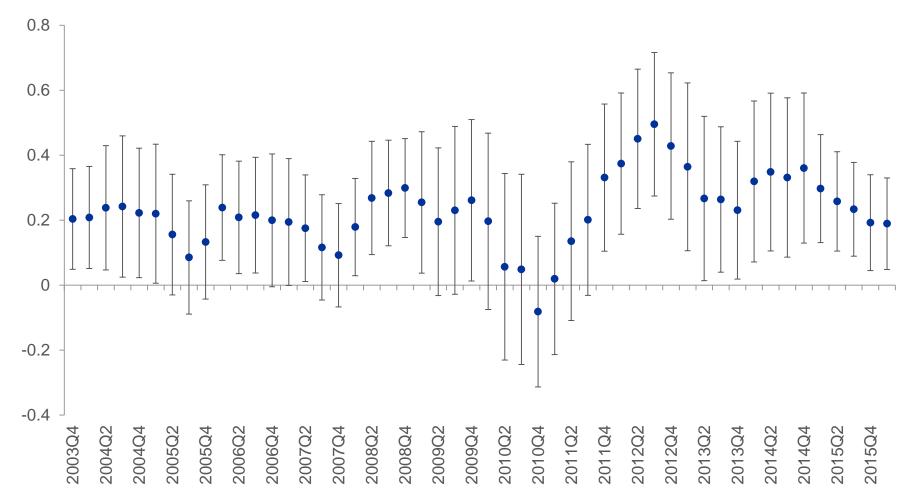
Selected literature 3

- **Kalemli-Ozcan, Luttini, and Sorensen (2014), Debt crises and risk sharing: The role of markets versus sovereigns, NBER Working Paper, no 19914.**

- **Kalemli-Ozcan, Sorensen, and Yosha (2005), Asymmetric shocks and risk sharing in a monetary union: Updated evidence and policy implications for Europe, in Huizinga and Jonung (eds.), The Internationalization of Asset Ownership in Europe, Cambridge University Press.**

- **Kose, Prasad, and Terrones (2009), Does financial globalization promote risk sharing?, Journal of Development Economics, 89(2).**

- **Sorensen and Yosha (1998), International risk sharing and European monetary unification, Journal of International Economics, 45(2)**

- **Sorensen, Wu, Yosha, and Zhu (2007), Home bias and international risk sharing: Twin puzzles separated at birth, Journal of International Money and Finance, 26(4).**

Annex

Outline

- **Role of private financial risk sharing**

- **Degree of risk sharing in the euro area and contributing channels**

- **Resilience of risk sharing in the euro area**

- **Policy directions: how can private financial risk sharing and its resilience be enhanced?**

- **Selected literature**

- **Annex**

Consumption risk sharing indicator: Euro area results

Notes: *The dots show the point estimates of the regression of change in per capita consumption in country i at time t on per capita GDP in country i at time, estimated over a 12 – quarter rolling window; lines show 95% confidence intervals.*
Source: ECB calculations

Consumption risk sharing indicator: Methodology

$$\hat{\beta}_y, \hat{\beta}_e, \text{and } \hat{\beta}_{rer}$$
$$\text{where}$$
$$\Delta C_{it} = \beta_y \Delta Y_{it} + \beta_e \Delta C_{EAt} + \beta_{rer} (\Delta CPI_{it} - \Delta CPI_{EAt}) + \varepsilon_{it}$$
$$(\text{estimated over a } 12 - \text{quarter rolling window})$$

- Measures the co-movement of domestic consumption with domestic output and average euro earea consumption, controlling for changes in relative prices

- Rationale: Under perfect risk sharing, $\hat{\beta}_y = 0, \hat{\beta}_e = 1, \text{and } \hat{\beta}_{rer} > 0$

- C_{it}: per capita consumption of goods and services in country i at time t

- Y_{it}: per capita GDP in country i at time t

- C_{EAt}: per capita average euro area consumption at time t

- CPI_{it} : consumer price index in country i at time t

- CPI_{EAt}: average euro-area consumer price index at time t

Income risk sharing indicator: Methodology 1

- One can rewrite GDP, for each country and in each year, as follows:

$$GDP = \frac{GDP}{GNP}\frac{GNP}{GDI}\frac{GDI}{\frac{CPI}{DEF_{GDP}}C}\frac{CPI}{DEF_{GDP}}C$$

- Taking logs and differences and multiplying through by $\Delta logGDP - E[\Delta logGDP]$ yields

$$\hat{\beta}_k + \hat{\beta}_g + \hat{\beta}_c + \hat{\beta}_p + \hat{\beta}_u = 1$$

where

$$\Delta GDP_{it} - \Delta GNP_{it} = \alpha_t{}^k + \beta_k\Delta GDP_{it} + \varepsilon_{it}{}^k$$
$$\Delta GNP_{it} - \Delta GDI_{it} = \alpha_t{}^g + \beta_g\Delta GDP_{it} + \varepsilon_{it}{}^g$$
$$\Delta GDI_{it} - \Delta C_{it} = \alpha_t{}^c + \beta_c\Delta GDP_{it} + \varepsilon_{it}{}^c$$
$$\Delta CPI_{it} - \Delta DEF_{GDP\,it} = \alpha_t{}^P + \beta_p\Delta GDP_{it} + \varepsilon_{it}{}^P$$
$$\Delta C_{it} = \alpha_t{}^u + \beta_u\Delta GDP_{it} + \alpha_{it}{}^u$$

Income risk sharing indicator: Methodology 2

- GDP_{it}: per capita output in country i at time t

- GNP_{it}: per capita gross national product by country i at time t

- $\text{GD}I_{it}$: per capita gross domestic investment in country i at time t

- C_{it}: per capita consumption of goods and services in country i at time t

- CPI_{it}: consumer price index in country i at time t

- $DEF_{GDP_{it}}$: GDP deflator in country i at time t

- Therefore:

  - $\Delta(GDP, GNP)$ captures net factor income from abroad (capital market channel)

  - $\Delta(GNP, GDI)$ captures net transfers from abroad (fiscal channel)

  - $\Delta(GDI, C)$ captures net lending abroad and domestic investment (credit market channel)

  - $\Delta\,(CPI_i, DEF_{GDP})$ captures valuation effects through relative prices (price channel)

- System of equations measures the contribution of capital markets markets ($\hat{\beta}_k$), fiscal tools ($\hat{\beta}_g$), credit markets ($\hat{\beta}_c$), and relative prices ($\hat{\beta}_p$) to risk sharing

- $\hat{\beta}_u$ measures the share of the output shock that remains unsmoothed

Income risk sharing indicator: Euro area results

- EA-12, 1991 – 2007

Year	GDP	Capital	Fiscal	Credit	Price	C (uns)	
(1) Impulse responses							
0	59.18	9.86	0.11	29.73	-6.79	26.26	
1	26.06	17.99	-4.27	-0.44	1.13	11.65	
2	8.74	15.78	-6.18	-15.40	1.53	13.01	
3	3.77	-17.30	11.94	-0.61	2.21	7.52	
4	2.92	0.82	-5.43	1.39	3.50	2.63	
5	-0.66	0.50	2.63	-3.94	1.52	-1.37	
(2) Cumulative impulse responses							
0	59.18	9.86	0.11	29.73	-6.79	26.26	
1	85.24	27.86	-4.16	29.29	-5.66	37.91	
2	93.97	43.63	-10.35	13.89	-4.12	50.92	
3	97.74	26.33	1.60	13.28	-1.91	58.44	
4	100.66	27.16	-3.83	14.67	1.59	61.07	
5	100.00	27.65	-1.20	10.73	3.11	59.70	

- EA-12, 1991 – 2015

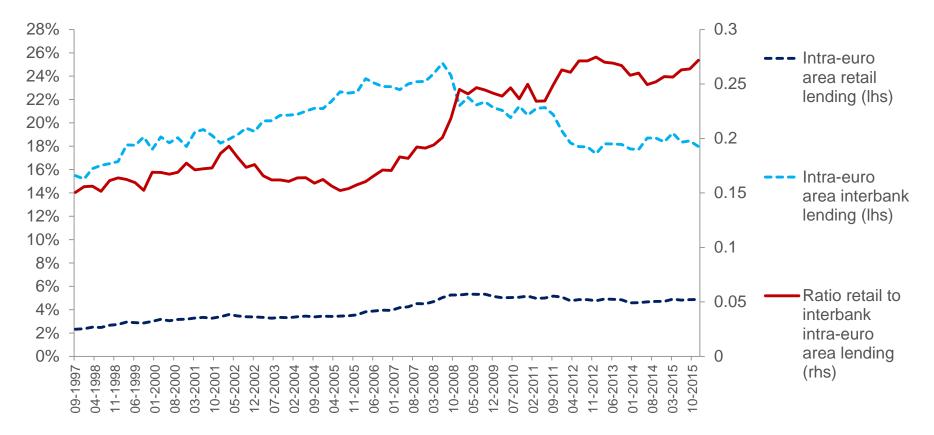| Year	GDP	Capital	Fiscal	Credit	Price	C (uns)	
(1) Impulse responses							
0	50.80	8.46	-2.03	15.98	-6.01	28.38	
1	33.29	-4.83	3.96	4.83	2.86	29.32	
2	13.92	6.40	-4.47	-7.78	6.43	19.76	
3	4.46	0.60	2.25	-6.38	6.53	7.99	
4	-0.39	-0.96	2.58	-2.46	5.18	0.45	
5	-2.08	3.40	-2.86	-2.09	3.06	-0.52	
(2) Cumulative impulse responses							
0	50.80	8.46	-2.03	15.98	-6.01	34.38	
1	84.08	3.63	1.93	20.82	-3.15	60.85	
2	98.00	10.03	-2.53	13.04	3.28	74.18	
3	102.47	10.63	-0.28	6.66	9.81	75.65	
4	102.08	9.67	2.30	4.20	14.99	70.92	
5	100.00	13.08	-0.57	2.11	18.05	67.33	

Risk sharing in the United States

- **High degree of income and consumption smoothing across regions in the United States (Asdrubali, Sorensen, and Yosha, 1996)**

- **Typically, only about 25% of state-specific shocks to GDP remain unsmoothed**

- **The bulk of a state-specific shock (39%) is smoothed through cross-border ownership of assets (capital markets)**

- **A further 23% is smoothed by borrowing and lending (credit markets)**

- **13% is smoothed by the federal tax and transfer system**

- **I.e., about 60 percent of state-specific shocks are smoothed through market transactions**
  - **Market mechanisms considerably more powerful than federal fiscal tools**

Risk sharing in Germany

- **High degree of income and consumption smoothing across regions in Germany (Hepp and von Hagen, 2010)**

- **Typically, only between 10% and 20% of state-specific shocks to GDP remain unsmoothed**

- **Before unification:**
  - **20% smoothed through capital markets;**
  - **17% smoothed through credit markets;**
  - **54% smoothed by the government sector.**

- **After unification:**
  - **51% smoothed through capital markets;**
  - **18% smoothed through credit markets;**
  - **Only 11% smoothed by the government sector.**

- **Post-unification differences between West and East Germany**
  - **Capital markets smooth 63% of shocks in the West vs. 35% in the East**

Resilience of risk sharing in the euro area (cont.)

Retail versus interbank lending to other euro area countries

Notes: The dashed dark blue line shows cross-border loans granted by euro area MFIs to euro area non-MFIs in % of total euro area retail lending. The dashed light blue line shows cross-border loans granted by euro area MFIs to other euro area MFIs in % of total euro area interbank lending. The red line shows the ratio of the two shares.
Source: ECB and ECB staff calculations.

Resilience of risk sharing in the euro area (cont.)

Cross-border holdings of long-term debt versus total debt holdings in the euro area

Notes: The dashed dark blue line shows the amount of long-term debt (maturity above one year) issued by euro area countries and held by residents of other euro area countries. The dashed light blue line shows all euro area debt held by residents of other euro area countries. The red line shows the ratio of the two.
Source: ECB and ECB staff calculations.