

Paradigm lost: Rethinking international adjustments

Benoît Cœuré, Berkeley, 21 November 2015

Ladies and gentlemen, ^[1]

Let me first thank the organisers of this conference for inviting me to deliver the Egon and Joan von Kaschnitz Lecture. It is an honour for me to speak to an audience of distinguished academics who have shaped the intellectual debates in the field of international economics and finance over the past decades.

Central banks today operate in a highly interconnected world. To fulfil our mandates we have to both anticipate and react to swings in global commodity markets, trends in foreign demand and spillovers from international financial markets. And in recent years, these swings and adjustments have occurred more rapidly and with higher amplitudes, further complicating the life for central bankers. Our reaction functions therefore become commensurately more complex, tied not only to how domestic markets for products, labour and capital adjust to shocks and react to policy impulses, but also crucially to adjustments in cross-border markets. This requires a profound understanding of the international macroeconomic adjustment process.

In particular, during the past two decades, policy discussions in fora such as the IMF, the G7 and G20 have been predicated on three key assumptions about that process. The first assumption, in response to shocks hitting individual economies, is that a reallocation (or “rotation” in policymaker parlance) of aggregate demand across economies would sustain an appropriate pace of global growth. The second assumption is that freely floating exchange rates would support such shifts in demand and generally act as shock absorbers in the global economy. And the third is that cross-border capital flows bring the benefit of risk-sharing and make international adjustments smoother, in addition to supporting an efficient international allocation of capital.

The starting point of my remarks today is the recognition that recent theoretical and empirical research has started challenging these three assumptions.

First, the capacity of the global economy to generate growth is under question. In an environment of low global growth, export-led strategies may be relevant for one economy, but in the aggregate they are bound to fail and they risk leading the global economy into a high saving, low real interest rate trap. There is in other words a fallacy of composition. We lack a clear vision of the combination of demand and supply side policies, and the broader design of the global economy, which will support growth beyond the short-term impulse provided by fiscal or monetary policy at the individual country level.

Second, a body of recent research has suggested that global interconnectedness may not have enhanced the shock-absorbing role of floating exchange rates, but rather eroded it, or at least modified it in many ways. If this is confirmed, we may have to modify the prior that under flexible exchange rates, economies become more resilient, when each of them becomes more open.

And finally, there is a paradox of international financial integration: as Raghuram Rajan famously suggested, for all its theoretical appeal, financial development may have “made the world riskier”. ^[2] Academics have questioned the resource allocation and risk-sharing benefits of cross-border capital flows; capital controls, or as recently dubbed capital flow management measures, are once again part of the policy discussion; and financial deglobalisation, some indicators say, may be already

under way. Can we let this happen with a light heart? Or can we shape financial regulation and other policies so as to keep reaping the benefits of global financial integration?

The way in which we address these open issues will condition the *resilience* of the global economic system, i.e. its capacity to return to equilibrium without policy intervention. This is of key importance for central bankers. If we ignore these issues, there is a risk that monetary policies may become ineffective, overburdened, and/or collectively trapped in suboptimal equilibria. Although my remarks today are focused on international adjustment, the challenges faced by the euro area – as a “microcosm” of the global economy – can provide useful insights.

Global growth: the fallacy of composition

My first point is motivated by the ongoing discussions about economic policies that can incentivise sustainable growth globally. This matters for central banks locally because monetary policy cannot do all the heavy lifting of stabilising our economies in place of other policies; and it matters globally, to avoid low global growth encouraging central banks to adopt beggar-thy-neighbour policies.

In principle, the process of opening global markets – or globalisation – should make global growth more resilient by allowing policymakers around the world to factor in external demand when designing their growth strategies. If global business cycles are not fully synchronised, external demand acts as an automatic stabiliser – economies in downswings can export their way out while those in upswings generate the necessary domestic demand. And indeed, it is well known that global growth in recent years has been supported by emerging markets, at a time when several advanced economies were mired in post-crisis balance sheet recessions.

To my mind, however, this is not a sustainable global growth model as it relies, as I said, on a fallacy of composition. While it may hold in a situation where economies face a stream of negatively correlated idiosyncratic shocks, it clearly breaks down when all economies are hit by the same shock or a set of positively correlated shocks. By definition not all jurisdictions can simultaneously run a current account surplus – one cannot export to the moon. We are in fact seeing this today, as emerging markets slow down while demand growth in advanced economies is not sufficiently robust to pick up the slack. If every economy were to react to their domestic challenges by exporting their slack, it would only trigger a race to the bottom. A global growth model where each relies on the other’s external demand yields an inferior Nash equilibrium.

That equilibrium is likely to be further worsened in a situation where interest rates run up against the zero lower bound (ZLB), as we see across advanced economies today. This not only reduces the scope for conventional monetary policy to support domestic demand. Recent research by Ricardo Caballero, Pierre-Olivier Gourinchas and Emmanuel Fahri suggests that the ZLB also prevents global interest rates from falling low enough for global asset markets to clear (i.e. global demand for financial assets exceeds their supply).^[3] In such an environment, if countries would run continuous current account surpluses, the world interest rate would fall until it hits the zero bound. The global economy would be in a permanent liquidity trap, at which point the adjustment would take place in the form of a world recession propagated by global imbalances. In other words, the model suggests that in a global ZLB environment, surplus countries can hold world output down, and even countries which in autarky would avoid falling in a liquidity trap may then be dragged down.

The role of current account surpluses in suppressing global growth – or the so-called “global savings glut” – was identified by Ben Bernanke back in 2005.^[4] Since then, the euro area has added to that global glut in a time while others have been reducing it. While the US current account deficit has decreased by half and Japan’s has disappeared, the euro area has built up an increasing current account surplus, driven by a lasting incapacity to revive domestic demand. What all this points to is a need to rebalance the sources of global growth.

Admittedly, there is plenty of literature on how to address the problem from the demand side. Obstfeld and Rogoff famously argue that national policymakers who pursue domestically optimal

stabilisation policies can come close to achieving a globally optimal solution. ^[5] This includes, of course, a role for monetary policy, and central banks should not shy away from that responsibility. But as already explained, in a global ZLB environment the "own house in order" argument may not be valid any more.

In the framework of Caballero *et al.*, the best policy responses to the "global liquidity trap", which are not zero-sum at the global level, include safe public debt issuance and increases in government spending. Likewise, Larry Summers recently argued that the best way to avoid a permanent liquidity trap and the resulting secular stagnation is to promote public or private investment. ^[6] In economies that have sufficient fiscal space, it is indeed hard to see how fiscal expansions at the zero lower bound would not be a positive sum for the global economy. I would however qualify the policy advice for economies where the fiscal space is squeezed by high and growing public debt, as is the case across most of the euro area today.

Still, achieving sustainable economic growth is always about both demand and supply. ^[7] And what I think is missing from our current understanding is a coherent view of what to do on the supply side. The composition of demand that we see in many advanced economies suggests that supply is also a drag on stronger global growth. In the euro area in particular, private investment is not playing the accelerating role that one would expect at this stage of the business cycle, despite domestic demand gradually strengthening. One reason for that is the depressed expectations of future potential growth, which lead firms to expect permanently lower incomes and profits. ^[8] Public investment, in particular in infrastructure and education, as the October 2014 IMF World Economic Outlook has pointed at as an additional source of stronger growth of current as well as potential output, is also not being accorded much of a role, as advanced countries tend to see this as a preferred source for cutting high public deficits. ^[9]

But weak investment demand in turn adds to the downward pressure on the equilibrium real rates generated by a combination of low economic growth and high external surpluses, and makes it more likely that monetary policies will repeatedly hit the ZLB. Another reason for weakening investment is the existence of debt overhang. High levels of corporate short-term debt in combination with increasing rollover risk can hold back real investment in the economy. ^[10]

What all this suggests is that, if countries wait for others to move first rather than taking action to raise future income or to address high level of debt overhang, they risk trapping themselves in a low growth, low interest rate equilibrium – and holding the global economy hostage.

My point here is not to disregard the complex interaction between demand and supply factors, and the possibility that hysteresis has contributed to the post-crisis slowdown in output growth. ^[11] And as I said, fiscal policy should contribute where it is available. But I want to stress that we need to enhance our understanding of the supply side so we can better appreciate its interactions with demand. For instance, we know too little about which policies will extend the benefits of micro-level reforms to the macroeconomy. The empirical debate is also still raging over the short-term impact of such reforms on output, especially at the lower bound. ^[12] And the optimal pace of supply side reforms has not been established empirically, although recent euro area experience teaches us that gradualism can entrench disinflationary expectations in a much deeper way than a one-off adjustment would have achieved. ^[13] Neither is the optimal sequencing of structural reforms sufficiently well understood beyond the general consensus that such reforms should initially be more demand than supply-enhancing, hence focused more on product than on labour markets at the outset, in order not to add to a deflationary wage/price spiral.

So here, in my view, is a gap that research needs to fill. Forging an intellectual consensus around these issues would inform both the G20 debate at the global level on how to create a framework for "Strong, Sustainable and Balanced Growth", as well as national discussions on how to raise weak potential output. "Structural reform" is a term that policymakers like to utter, but it is often too vague to be meaningful.

In particular, my hope is that work in this area can help policymaking escape the obsession of “competitiveness” which, when narrowly defined, focuses on export market shares, real exchange rates and unit labour costs (Cœuré, 2014). Such an approach indeed risks perpetuating the fallacy of composition where all economies aim to export low demand. A positive-sum solution to global growth requires a global productivity shock, and in that regard we need better evidence on two things. First, on what types of policies will spur domestic total factor productivity growth through innovation, technology adoption and reallocation, and how to optimally sequence those policies to yield the largest short-term gains. Second, we need better evidence on the broader design of the global economy which will encourage productivity spill-overs and the reallocation of capital and labour between economies, restarting what researchers at the OECD have termed the stalled “diffusion machine”. ^[14]

Similar reflections are needed for the euro area, where most countries have now restored an external balance after a painful but necessary period of internal devaluation, and where corporate investment is inhibited by expectations of depressed long-term output growth. It is high time that the growth narrative is shifted from a narrow view of “competitiveness” towards a broader understanding of “productivity”, both within countries and across countries, including through a stronger Single Market. Countries should no longer wait for each other to generate sustainable growth.

Exchange rates: the role of openness

My second point is related to the importance of flexible exchange rate for the international macroeconomic adjustment. The case for flexible exchange rates as macroeconomic shock absorbers was made as early as 1953 by Milton Friedman. Evidence for developing countries in the post-Bretton Woods era seemed to confirm that view, at least for emerging market economies. ^[15] The world’s major central banks have been operating on the basis of the Mundell-Fleming assumption that their ability to conduct independent monetary policy relies on exchange rates being flexible – and that assumption is still hardwired into G7 and G20 doctrine. ^[16] This benign view of the role of exchange rates, however, has been challenged on several accounts.

Early on, Mike Mussa noted that contrary to the notion of nominal exchange rate regime neutrality, real exchange rates were much more volatile under flexible than under pegged nominal exchange rate regimes. Another widely-known stylised fact questioning their role as shock absorbers is that, while exchange rates display far greater volatility under floating regimes, macroeconomic variables do not – another manifestation of the so-called “exchange rate disconnect”. ^[17] But now we know that certain real-world features that were not originally part of our structural models explain the “Mussa puzzle” and related observations. ^[18]

One such feature is trade invoicing patterns. ^[19] Specifically, under producer-currency invoicing exchange rate fluctuations impact on an economy’s import prices, and thereby on its inflation rate, while under local-currency invoicing exchange rate pass-through is smaller. At the same time, for quantities, producer-currency invoicing implies a high elasticity of foreign demand to exchange rate fluctuations, while local-currency invoicing implies that foreign demand responds less strongly and the profit margins of exporters fluctuate more. Recent studies indeed suggest that the impact of exchange rates on domestic prices differs substantially across countries. For the euro area, ECB staff research recently found that an increase in the share of the euro as an invoicing currency can lower exchange rate pass-through considerably. ^[20]

Indeed, structural changes can have a significant impact on the role of the exchange rate as a shock absorber. But a rise in openness, in contrast to the results of earlier international macro-models, does not necessarily lead to an increase in exchange rate pass-through. As countries become more vertically integrated via global value chains, exchange rate variations will have a diminishing impact on the terms of trade. Vertical integration means that exports are produced using imported inputs. And this means that the prices of imported intermediates move in the same direction as the price of

the economy's exports. For example, recent research from the World Bank finds that between 1996 and 2012 the elasticity of manufacturing export volumes to the real effective exchange rate has decreased, and that the rise of participation in global value chains explains on average 40% of the fall in the elasticity. ^[21]

Another feature that can alter the role of the exchange rate as a shock absorber is related to the existence of global financial cycles. Some have suggested that rather than being driven by the response to traditional demand and supply shocks, exchange rates react to shocks to the leverage and risk appetite of financial intermediaries. ^[22] As a result, exchange rates are largely determined by capital flows unrelated to fundamentals and seldom act as shock absorbers for the real economy. Others have even claimed that in major advanced economies exchange rates are a source of macroeconomic fluctuations. ^[23] For example, Hyun Shin and co-authors have argued that exchange rates can contribute to the global financial cycle by reducing the perceived credit risk in countries experiencing capital inflows, only to precipitate crises when flows reverse and credit risk soars. ^[24]

Moreover, even the traditional trilemma arguing that exchange rate flexibility is a sufficient condition for monetary policy autonomy under the assumption of globalised financial markets is not as robust as we thought. Hélène Rey has recently argued that in the presence of largely unrestricted capital flows driven by a global financial cycle, flexible exchange rates are not a sufficient condition for monetary independence. ^[25] As result, the 'trilemma' in international macroeconomics may have grown smaller and become a dilemma. This, as such, does not question the usefulness of flexible exchange rates. In a small open economy where financial conditions are driven by a larger economy (the "centre"), exchange rate adjustment can still mitigate the monetary policy reaction when the centre lifts its interest rates up or down. But given the financial frictions likely to be involved, it cannot be taken for granted that monetary policy will be fully insulated.

These insights lead me to ask the following question: do freely floating exchange rates along with largely unrestricted capital flows still provide the basis for a well-functioning international monetary system? I don't intend to provide an answer today. I know very well that when it comes to the Marshall-Lerner elasticities, the devil lies in the econometric details, and I acknowledge that exchange rate adjustment has served us well in many instances, allowing monetary policies to adjust to national circumstances. Neither do I underestimate the difficulties in a world of nation-states of altering the parameters of the current system. But whether the shock absorbing role of exchange rates can be taken for granted is a question we should all reflect on. It is clear to me that there is much more about the functioning of the international monetary system that we need to understand. It's another field in which we as policymakers, once again, depend on you as researchers.

Importantly, this discussion suggests that a frequently heard explanation for the challenges facing the euro area – that its participating economies are suffering from having given up exchange rate flexibility – may be too simplistic. Indeed, it is worth remembering that monetary union was created precisely because cycles of repeated devaluations did not yield macroeconomic stability, and that was in a world of less intense capital flows. Indeed, as Charles Engel and co-authors have argued, there is little evidence that real exchange rates under floating rates adjust in a desirable way. And a currency union can actually deliver a superior performance, because it reduces the deviations from price equality for traded goods that can occur under a floating regime. ^[26] Still, for that to hold, the ability to engineer internal devaluation is crucial. And that is another reason why a better understanding of the impact of the nature and sequence of structural reforms in the euro area is crucial.

Financial globalisation: the paradox of integration

Like the debate on the role of exchange rates, the discussion about the benefits and possible costs of financial integration has become more nuanced over time.

Conventional theory predicts that international financial integration fosters growth by allowing for a more efficient global allocation of capital, by facilitating organisational and technological spillovers

across economies, and by boosting domestic financial market development. And it should also allow for greater international risk-sharing and specialisation, thereby providing an automatic stabilisation tool. The years since the emergence of financial globalisation, however, have shown that it can also magnify spillovers and spillbacks, creating risks of financial instability, that interfere with central banks' mandates. The exact balance of these effects is, unfortunately, still unclear.

A very large body of empirical work – both at the macro- and micro-level – has been devoted to the effects of international financial integration on growth and risk-sharing. The literature has examined the issue by looking for gains following episodes of financial account liberalisation and by computing the gains arising from a shift from autarky to integrated financial markets in theoretical international macroeconomic models. Both strands of literature, however, have in my view failed to deliver conclusive results. That is likely to be for several reasons.

First, it might well be that the improved capital allocation across countries implies only a small increase in output. ^[27] Indeed, in theoretical models the gains from international financial integration have been found to be relatively small. The intuition is that imperfect capital mobility represents only a transitory distortion that delays, but does not hinder the convergence to a long-run equilibrium with higher capital. ^[28]

Second, as in the domestic finance and growth literature ^[29], some have argued that non-linearities play an important role: only if economies have reached a minimum level of financial and institutional development that allows them to cope with possible swings in capital flows, and to allocate large influxes of capital efficiently, can they reap the benefits of international financial integration. ^[30] Specifically, in the absence of developed and well-regulated domestic financial markets, foreign short-term funding may be used for inefficient borrowing, leading to excessive domestic credit cycles and even financial crises. ^[31] The euro area banking system is a case in point: the fragmentation of domestic money markets may have led to an excessive reliance on dollar funding before the crisis, ending in a sudden stop. Indeed, if one only considers economies with relatively sound institutions, there does appear to be a positive relationship between international financial integration and growth. ^[32]

This previously discussed global credit cycles are also relevant to policymakers' perception of financial globalisation. In particular, in emerging economies, it has reignited an old debate on the use of capital controls. In light of this discussion, a wave of theoretical work has emerged that rationalises the use of capital account restrictions as a welfare-optimising policy, when large global shocks to capital flows lead to over-borrowing and financial vulnerability due to financial frictions. ^[33] This work has also contributed to the IMF's revision of its view on the use of capital controls. ^[34] This new institutional view on capital flow management measures gives relatively ample space for the use of such tools, in particular when they bear the label "macro-prudential". And indeed, such measures have been used more actively in recent years. ^[35]

The exercise of these and other financial sector policies during the crisis, however, may have had a national bias, thus contributing to the fragmentation and deglobalisation of financial markets that we are currently witnessing. ^[36] Global and European banks in particular have reduced their foreign exposures in the aftermath of the crisis. While this may partly reflect a change in risk and return considerations, policies aimed at preserving domestic financial stability may have contributed. This reminds me of the notion that global financial stability may be compatible with either national financial stability or international banking, but not both. ^[37] There are also signs of "de-risking" of the global correspondent banking network and some countries are at a risk of being cut out of the international market for capital. ^[38] And at the macroeconomic level, such developments may have contributed to a re-emergence of the correlation between domestic saving and investment, known as the Feldstein-Horioka puzzle. While the correlation between savings and investment across OECD countries had fallen from 0.8 from mid-1990 when financial globalisation took off to essentially zero just before the global financial crisis, it has risen back to about 0.6 in the last couple of years. ^[39]

In view of the ongoing academic debates about the costs and benefits of international financial integration, it is not clear how to judge these trends from a normative perspective. Given the prevailing uncertainties, should we see the current pause or even reversal in financial globalisation as a desirable “new normal”? Or should we rather see it as the start of a harmful spiral of financial protectionism, against which the memories of the 1930 provide a potent warning? Should we then not use the current pause a window of opportunity to rethink more vigorously the institutional setting in which it is taking place, to establish a framework that can better contain the costs of financial integration while retaining its benefits? If so, what should that framework look like in terms of regulation and governance?

Finally, turning again to the euro area, it is clear to me that similar reflections are needed, namely, on how to redesign a pre-crisis financial integration model which failed to deliver either economic stabilisation or an efficient allocation of capital. ^[40] The European Commission's plan for a Capital Market Union provides the framework for these reflections.

These are the types of questions where we, as policymakers, are looking to the research community for answers. Important discussions are taking place in forums such as the Financial Stability Board, but on the fundamental issues – how much financial globalisation, if good, and what type – we need up-to-date evidence.

Conclusion

The overarching theme in my remarks was a call to review the narrative about the international macroeconomic adjustment process. Such a restored narrative will need to be a more nuanced one compared to what we used to call the ‘Washington Consensus’. But it will need to be convincing that it can deliver stronger and more sustained global growth, a better functioning international adjustment mechanism and more benefits from international financial integration than what we have been witnessing over say the past decade or so.

To successfully build such a new consensus, we need research in the area of international economics that is not just aimed at underpinning the growing evidence that the current system is unable to deal with the lingering problems, but that will also deliver the tools to allow policy makers to build and implement a better global international economic system. Otherwise, we risk policy being made on the basis of ideas that no longer hold – or as Keynes famously put it, based on “voices in the air”.

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^[2]See Rajan, R. (2005), “Has Financial Development Made the World Riskier?” NBER Working Papers, 11728.

^[3]See Caballero, R.C., Farhi, E., and P.-O. Gourinchas (2015), “Global Imbalances and Currency Wars at the ZLB”, NBER Working Paper No. 21670, October.

^[4]See Bernanke, B.S. (2005), “The Global Saving Glut and the U.S. Current Account Deficit”, Speech 77, Board of Governors of the Federal Reserve System (U.S.).

^[5]See Obstfeld, M., and K. Rogoff (2002), “Global Implications of Self-Oriented National Monetary Rules,” *Quarterly Journal of Economics*, 117, 503-536.

^[6]See Summers, L. (2015), “Rethinking Secular Stagnation After Seventeen Months.” IMF Rethinking Macro III Conference, 16 April.

^[7]See Cœuré, B. (2014), “Structural reforms: learning the right lessons from the crisis”, keynote speech at the Economic conference, Latvijas Banka, Riga, 17 October.

^[8]For a discussion on the sources of slow productivity growth, see Gordon, R. (2015), “Secular Stagnation: A Supply-Side View.” Presentation delivered at the 2015 AEA meetings, Boston, January 3. On the relationship between expected earnings and investment, see Gennaioli, N., Yueran, M., and A. Shleifer (2015), “Expectations and Investment.” NBER Macroeconomics Annual 2015.

^[9]See Bacchiocchi, E., E. Borghi and A. Missale (2011), “Public Investment under Fiscal Constraints”. Fiscal Studies 32(1), pp. 11-42.

^[10]See Kalemli-Özcan, S., Laeven, L., and D. Moreno (2015), “Debt Overhang, Rollover Risk and Investment in Europe”, mimeo.

^[11]See Blanchard, O., Cerutti, E., and L. Summers (2015), “Inflation and Activity – Two Explorations and their Monetary Policy Implications”, IMF Working Paper No. 15/230. The authors note that hysteresis can be sizeable, but depending on the evolution of the (unobservable) underlying growth trend, the consequences are conflicting for monetary policy: in the presence of hysteresis, output deviation from its optimal level can be long lasting and call for a strong monetary response; but the response may prove too strong if we understand too late that the underlying trend has in fact changed.

^[12]See Eggertsson, G.A., Ferrero, A., and A. Raffo (2013). “Can Structural Reforms Help Europe?”, International Finance Discussion Papers 1092, Board of Governors of the Federal Reserve System.

^[13]A one-off price adjustment has distributional effects *ex post*, but it does not affect the perception of real rates going forward – insofar as it boosts future income, it may indeed raise inflation expectations and lower real rates. By contrast, if adjustment is gradual, it creates disinflationary expectations and real rates increase. In other words, a slower adjustment makes the contractionary effect of reforms more prolonged. See Cœuré (2014, *op. cit.*) for a comparison of euro area countries’ post-crisis structural adjustment,

^[14]See OECD (2015), “The future of productivity”, Paris.

^[15] See Broda, C. (2001), “Coping with Terms-of-Trade Shocks: Pegs versus Floats.” American Economic Review, 91, No. 2 May 2001.

^[16]See the G20 Finance Ministers and Central Bank Governors communiqué of 4-5 September 2015: “We reiterate our commitment to move toward more market-determined exchange rate systems and exchange rate flexibility to reflect underlying fundamentals, and avoid persistent exchange rate misalignments”.

^[17]The Mussa puzzle is laid out in Mussa, M. (1986), “Nominal exchange rate regimes and the behavior of real exchange rates: Evidence and implications”, Carnegie-Rochester Conference Series on Public Policy, 25(1), pp. 117-214. The evidence on the lack of relationship between the exchange rate regime and macroeconomic outcomes is discussed in Baxter, M., and A. Stockman (1989), “Business cycles and the exchange-rate regime: Some international evidence”, Journal of Monetary Economics, 23(3), pages 377-400; Flood, R., and A. Rose (1995), “Fixing exchange rates: A virtual quest for fundamentals”, Journal of Monetary Economics, 36(1), pp. 3-37. and Rose, A. (2011), “Exchange Rate Regimes in the Modern Era: Fixed, Floating, and Flaky.” Journal of Economic Literature, 49(3), pp. 652-72.

^[18]See Betts, C., and M. Devereux (2000), “Exchange rate dynamics in a model of pricing-to-market”, Journal of International Economics, 50(1), pp. 215-244. and Devereux, M., and C. Engel (2002), “Exchange rate pass-through, exchange rate volatility, and exchange rate disconnect”, Journal of Monetary Economics, 49(5), pp. 913-940.

- ^[19]See Gopinath, G., Itskhoki, O., and R. Rigobon (2010), "Currency choice and exchange rate pass-through." *American Economic Review*, 100 (1), pp. 304–36.
- ^[20]See Gräß, J., and R. Lafarguette (2015), "Differences in exchange rate pass-through in the euro area: The role of currency invoicing". European Central Bank, mimeo, Frankfurt am Main.
- ^[21]See Ahmed et al. (2015), "Depreciations without exports: Global value chains and the exchange rate elasticity of exports", World Bank Policy Research Working Paper 7390; see also the IMF World Economic Outlook 2015, October, chapter 3.
- ^[22]See Maggiori, M., and X. Gabaix (2015), "International Liquidity and Exchange Rate Dynamics". *Quarterly Journal of Economics*, 3, pp. 1369-1420.
- ^[23]See Farrant, K., and G. Peersman (2006), "Is the Exchange Rate a Shock Absorber or a Source of Shocks? New Empirical Evidence". *Journal of Money, Credit and Banking*, 38, pp. 939-961.
- ^[24]See Bruno, V., and H.S. Shin (2015), "Cross-Border Banking and Global Liquidity". *Review of Economic Studies*, 82(2), pp. 535-564.
- ^[25]See Rey, H. (2013), "Dilemma not trilemma: The global financial cycle and monetary policy independence". In: Jackson Hole Economic Symposium 2013.
- ^[26]See Berka, M., Devereux, M., and C. Engel (2012), "Real Exchange Rate Adjustment in and out of the Eurozone". *American Economic Review: Papers and Proceedings*, 102(3), pp. 179-185.
- ^[27]See Obstfeld, M. (2009), "International Finance and Growth in Developing Countries: What Have We Learned?," IMF staff papers 56.; Van Wincoop, E. "Welfare Gains from International Risk Sharing," *Journal of Monetary Economics*, 1994, 34, pp. 175-200 ; Van Wincoop, E. (1999), "How Big are Potential Welfare Gains from International Risk Sharing?," *Journal of International Economics*, 47(1), pp. 109-135 ; Lewis, K. (1999), "Trying to Explain Home Bias in Equities and Consumption," *Journal of Economic Literature*, 37, pp. 571-608; Lewis, K. (2000), "Why Do Stocks and Consumption Imply such Different Gains from International Risk Sharing?," *Journal of International Economics* 52, pp. 1-35; Lewis, K., and E. Liu (2014), "Evaluating International Consumption Risk Sharing Gains: An Asset Return View," *Journal of Monetary Economics*, 71, pp. 84–98.
- ^[28]See Gourinchas, P.-O., and O. Jeanne (2006), "The Elusive Gains from International Financial Integration." *Review of Economic Studies*, 73, pp. 715-741 ; Coeurdacier, N., Rey H. and P. Winant (2013), "Financial Integration and Growth in a Risky World," mimeo; Other authors find larger gains if capital goods are imperfect substitutes, see Hoxha, I., Kalemli-Ozcan, S. and D. Vollrath (2013), "How Big Are the Gains from International Financial Integration?," *Journal of Development Economics* Volume 103, pp. 90–98.
- ^[29]See Cœuré, B. (2014), "On the optimal size of the financial sector," speech at the ECB Conference, Frankfurt, 2 September. See also Beck, T., Degryse, H. and C. Kneer (2014), "Is More Finance Better? Disentangling Intermediation and Size Effects of Financial Systems", *Journal of Financial Stability*, 10(C), pp. 50-64. Beck, R., Georgiadis, G. and R. Straub (2014), "k' Finance and Growth Nexus Revisited", *Economics Letters*, 124(3), pp. 382-385; Arcand, J., Berkes, E. and U. Panizza (2015), "Too Much Finance?", *Journal of Economic Growth*, 20(2), pp. 105-148.
- ^[30]See Kose, A., Prasad, E., and A. Taylor (2011), "Thresholds in the Process of International Financial Integration," *Journal of International Money and Finance*, 30(1), pages 147-179.
- ^[31]See Lane, P., and P. McQuade (2014), "Domestic Credit Growth and International Capital Flows", *Scandinavian Journal of Economics*, 116, pp. 218–252; Avdjiev, S., R. N. McCauley and H.S. Shin (2015), "Breaking Free of the Triple Coincidence in International Finance", BIS Working Papers 524.
- ^[32]See Kose, A., Prasad, E., and A. Taylor: "Thresholds in the Process of International Financial Integration," *Journal of International Money and Finance*, 2011, 30(1), pages 147-179.

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^[37]See Schoenmaker, D. (2011), "The Financial Trilemma". *Economics Letters*, vol. 111(1), pp. 57-59.

^[38]See Committee on Payments and Market Infrastructures (2015), "Correspondent banking". Consultative report, October.

^[39]Source: ECB calculation based on Cœuré, B. (2013), "Global liquidity and international risk-sharing in the post-crisis environment". Speech at the Bank of Korea International Conference 2013 "Assessing Global Liquidity in a Global Framework", Seoul, 3 June. A correlation between domestic savings and investment can, however also reflect an adjustment to certain shocks in the absence of obstacles to financial integration, see Giannone, D., and M. Lenza (2009), "The Feldstein-Horioka Fact", NBER Chapters, in: NBER International Seminar on Macroeconomics, pp. 103-117g

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