
VIRTUAL UNCONVENTIONAL POLICIES. THE EURO AREA RECOVERY AND THE ROLE OF ECB POLICY

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1. INTRODUCTION¹

The financial crisis has posed many new challenges for central banks. Nowhere have these challenges been more acute than in the euro area. In the face of threats to financial and macroeconomic stability as market activity seized up, central banks throughout the world were forced to take actions supporting market functioning and financial institutions.

As a consequence of the unique institutional structure of monetary union, demands on the ECB were even greater than elsewhere. The lack of area-wide fiscal and regulatory authorities placed more responsibility on the ECB, while the fragmentation of Euro markets on national lines as the perceived threat of break-up rose have both intensified the challenges and made responses more difficult to implement.

The ECB has acted to address financial dislocations through a variety of measures that are discussed in more detail in the remainder of this paper. Overall, the rewards to these interventions have been substantial: of course it is hard to assess the counter-factual, but ECB measures have served to stabilise the financial system, preserve the integrity of the euro area and ultimately underpin the current recovery in economic activity.

Yet these interventions have also come with risks. A comprehensive assessment of the ECB's interventions should analyse the risk / reward profile of its measures. Since many of the downside risks associated with such interventions accrue over time –largely as a result of other actors exploiting the moral hazard that ECB interventions may create– such an assessment requires a thorough examination of the institutional framework in which the ECB operates and how that is evolving over time.

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II. LIQUIDITY VS. SOLVENCY

Conventional central bank wisdom draws a sharp distinction between liquidity and solvency problems in the sovereign and financial markets. Endowed with the ‘printing press’, central banks are able to produce monetary liquidity costlessly and in potentially unlimited amounts. They are thus uniquely well-placed to deal with liquidity crises. But central banks have proved understandably reluctant to take responsibility for solvency problems. Restructuring insolvent banks and/or sovereigns is essentially an exercise in distributing unavoidable (and potentially very large) losses. Independent and unelected central bankers are ill-suited to taking fiscal decisions with such significant distributional consequences: they have no mandate to do so.

Nevertheless, through their prior claim on monetary income (or seigniorage), central banks have access to fiscal resources. Avoiding entanglement in solvency problems is therefore –at least to some extent– a matter of choice rather than a matter of logic, reflecting concerns about how such involvement will influence incentives and, ultimately, the ability of the central bank to reach its primary objective of price stability.

More precisely, scope exists for central banks to channel seigniorage from general government revenue to specific ends, including addressing solvency concerns.² Yet these resources, while potentially significant, are limited.³ As a result, central banks can address solvency difficulties by diverting seigniorage revenues – but only up to a point. Beyond that point, fiscal claims on the central bank that exceed its fiscal capacity threaten to generate inflation (for reasons that ultimately derive from the emergence of fiscal dominance over the price level), and thus run counter to the central bank’s price stability mandate.⁴

All this creates well-known incentive problems. To manage these, normal practice has been for central banks to refrain from directing seigniorage on a discretionary basis. Rather responsibility has been left with the fiscal authorities: seigniorage has been distributed to governments, for politicians to take the distributional decisions – including whether to offer solvency support. In the euro area, these norms took institutionalised form in the Lisbon Treaty’s prohibition of monetary financing (Article 123), as well as in the procedures underlying central bank operations (including the provision of emergency liquidity assistance).

Experience during the financial crisis has tested this established thinking.

² See Durré and Pill (2010).

³ See Pill (2011).

⁴ See Kocherlakota and Phelan (1999).

III. PROVIDING LIQUIDITY SUPPORT

A welfare-optimising central bank will always choose to satiate the private sector's demand for liquidity. This is an implication of the Friedman (1969) rule. Because the marginal cost of creating fiat money –in the modern context, the cost of electronically crediting banks with reserves at their central bank accounts– is essentially zero, welfare theory implies that the opportunity cost of holding reserve money should also be zero. In turn, this entails that reserves should be supplied elastically by the central bank at a price (interest rate) equal to the remuneration offered on reserve holdings.

In pre-crisis times, the ECB achieved this outcome by: (1) imposing reserve requirements on banks that exceeded the natural demand for liquidity arising from inter-bank payments; (2) supplying reserves via the so-called 'benchmark allotment' at its regular weekly operations, thereby ensuring that the banking system as a whole had sufficient liquidity to meet reserve requirements in aggregate; and (3) paying interest on required reserves equal to the rate at which those reserves were borrowed at the weekly operation. Crucially, this approach relied on a functioning inter-bank market to distribute liquidity across individual institutions.

With the onset of financial crisis in 2007-08, the inter-bank money market seized up. It could no longer be relied upon to distribute liquidity efficiently across banks.⁵ The ECB stepped in, offering its own balance sheet as a vehicle to conduct the inter-bank transactions that could no longer take place in the market. Central bank intermediation substituted for private intermediation: the ECB supplied liquidity in place of private provision.⁶

Central to the ECB's approach was the adoption of fixed rate / full allotment (FRFA) tenders in its regular monetary policy operations.⁷ Against a broad range of collateral, banks could obtain liquidity on demand at a pre-specified interest rate. The excess liquidity created through recourse to these operations ended up on the ECB's deposit facility.

⁵ Heider *et al.* (2009) argue that concerns about counterparty credit risk in interbank transactions emerged after the failure of Lehman in 2008. Given the information asymmetries created by uncertainty about the quality of asset-backed securities on.

⁶ Durré and Pill (2012) argue that this has been observed in previous financial crises, albeit in different form reflecting the different nature of the crisis. Many recent unconventional measures mimic central bank responses to 'sudden stops' in emerging markets. For example, foreign exchange intervention and expansion of domestic assets during the Asian crisis reflected the central bank balance sheet being substituted for cross-border funding of the domestic bank system, another example of substituting central bank intermediation for private intermediation.

⁷ See Lenza *et al.* (2010) and Giannone *et al.* (2012) for an empirical analysis of such central bank intermediation and a comparison with the responses implemented in other jurisdictions).

Rather than have banks with excess liquidity lending to banks short of liquidity through the inter-bank market, the ECB acted as an intermediary, collecting the excess liquidity at its deposit facility and lending it on via monetary policy operations. The difference between the interest rate at the ECB's refinancing operations and the rate on its deposit facility became the bid / ask spread on such central bank intermediation.

Implicit in its performance of this intermediation function was the ECB's assumption of counterparty credit risk embodied in inter-bank transactions. In the account of Heider *et al.* (2009), the seizing up of the money market reflected adverse selection stemming from concerns about the solvency of some market participants following the failure of Lehman. To the extent that these concerns owed to information asymmetries rather than genuine solvency problems, the ECB's intervention was well-targeted: in a surgical manner, it overcame a specific market failure.

IV. PROVIDING SOLVENCY SUPPORT

Yet the ECB was not necessarily in a better position than other market participants to form a judgement about the fundamental strength of bank balance sheets, given the opacity of asset-backed securities (ABS) at the heart of bank solvency concerns. In providing central bank intermediation, the ECB may have been taking on and (more importantly) mis-pricing the fundamental (as opposed to perceived) counterparty credit risk (e.g., by wrongly valuing the ABS it accepted as collateral, by having too narrow a bid / ask spread on central bank intermediation). Any such mis-pricing would represent an implicit 'quasi-fiscal' subsidy to the financial sector. Providing such a subsidy goes beyond the uncontroversial central bank role of supplying liquidity elastically.

In this context, an alternative rationale for ECB intervention emerges. The externalities supplied by a functioning money market in terms of broader financial and macroeconomic stability justify the provision of a subsidy to private market participants on conventional Pigovian grounds. Subsidising market participants by assuming counterparty credit risk on preferential terms is justified to correct another form of market failure: the under-provision by the market of positive externalities coming from the public good properties of market liquidity.

In real-time, making fine distinctions between these two rationales for ECB intervention was, at most, a second-order concern (if that). The first order objective was to arrest the vicious downward spiral in market functioning and financial and macroeconomic stability.

With the (considerable) benefit of hindsight, the ECB's actions on these dimensions appear successful. Moreover, when compared with other leading central banks, the ECB's performance in the immediate post-Lehmann phase of the crisis can be seen as strong. The design of its operational framework for monetary policy implementation –the large number of banks that could access monetary policy operations, the broad set of instruments that were accepted as collateral in those operations, etc.– served the ECB well, whereas other central banks had to introduce a range of more ad hoc instruments and operations.

Yet this experience begs the question of how far central banks should be prepared to undertake quasi-fiscal actions and obligations.

On the one hand, such actions may prove crucial in arresting self-reinforcing crisis dynamics. Financial crises demand politically controversial decisions are taken quickly and decisively. In this context, the decision-making autonomy and insulation from day-to-day political pressures afforded by independence –as well as the immediate availability of financial resources outside the constraints of normal, slow-moving budgetary procedures– gives a strong rationale for central bank quasi-fiscal action.

On the other hand, such actions come with their own dangers, which may become more pronounced the longer time passes. Initially well-intentioned (even necessary) interventions to prevent a systemic crisis may morph into an ongoing, growing and ultimately excessive drain on the central bank's fiscal resources as solvency problems mount and dependence on central bank support builds. Ultimately, this can threaten fiscal dominance and put price stability at risk.

Admittedly, back-of-the-envelope calculations to estimate the capitalised value of future seigniorage revenues suggest this is a quite distant prospect (see Table 1). Yet, of itself, this leaves little room for complacency. First, in a context of systemic financial crisis and/or sovereign default, demands for solvency support can also be large, certainly of the same order of magnitude of central bank fiscal resources as future seigniorage revenues, if not larger. And second, with forward-looking price and wage setting behaviour, it is expectations that drive inflation developments: these can be influenced by the possible emergence of fiscal dominance long before the financial flows themselves reach the critical point.

Such considerations reveal the time consistency problem that lies at the heart of this discussion. Using a central bank's fiscal capacity more proactively to address immediate crisis pressures may undermine attempts to limit recourse to that capacity in the future and thereby threaten the credibility of price stability. As is apparent from the traditional literature on monetary policy and

TABLE 1
**ESTIMATES OF CAPITALISED SEIGNIORAGE INCOME OF CENTRAL BANKS RELATIVE
 TO NATIONAL FISCAL POSITIONS**

Central Bank	NPV of Seigniorage		Fiscal Stance (end-2011)	
	$a = 0.5$	$a = 1$	Debt level	Deficit
ECB	EUR 1.4 tr	EUR 2.5 tr	EUR 6.3 tr	EUR 305.5 bn
FED	USD 1.5 tr	USD 2.7 tr	USD 11.0 tr	USD 1,259.5 bn
BoJ	JPY 142 tr	JPY 259 tr	JPY 612.6 tr	JPY 41,489.1 bn
BoE	GBP 67 bn	GBP 122 bn	GBP 1.2 tr	GBP 103.9 bn

Notes: a = income elasticity of demand for central bank money. See sources for details on underlying macroeconomic assumptions.

Sources: Pill (2011), *IMF World Economic Outlook*.

the (expectations augmented) Phillips curve,⁸ resolving such time consistency problems lies at the heart of the central bankers' job.

V. DISTINGUISHING LIQUIDITY AND SOLVENCY PROBLEMS

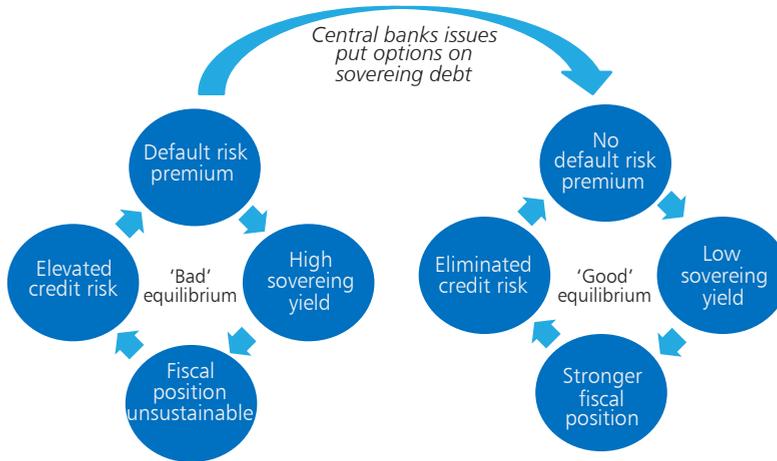
In managing this difficult time consistency problem, distinguishing between liquidity problems is crucial. But –as revealed by the discussion of the immediate post-Lehman phase of the crisis above– in practice distinguishing between liquidity and solvency problems is difficult in real time. Unfortunately, in modern financial markets, there is no time for procrastination in making this judgement.

The problem can be yet more formidable if the possibility of multiple equilibria emerges. Self-fulfilling dynamics can transform what is initially a liquidity problem into a solvency problem (and, in principle, vice versa). In such circumstances, drawing a hard distinction between liquidity and solvency issues may not even be possible.⁹

⁸ See Barro and Gordon (1983) for the seminal treatment.

⁹ See Cole and Kehoe (2000) for an analysis of this phenomenon and Corsetti *et al.* (2013) for a discussion of how such self-fulfilling dynamics can be used to explain developments in the Euro area financial markets after 2010.

FIGURE 1

MULTIPLE EQUILIBRIA IN SOVEREIGN DEBT MARKETS

Source: Own elaboration.

The classic example of such multiplicity stems from the implications of rollover risk (see Figure 1). If markets become concerned that cash flow problems arising from a failure to roll maturing debt will trigger default, they will incorporate a credit risk premium into yields, thereby driving up refinancing costs. Higher refinancing costs bring into question the debt sustainability of a highly indebted borrower, which, in turn, only serves to intensify concerns about default. And so on. What was originally a liquidity problem is transformed into a solvency problem.

In this context, the actions of the central bank help select among various possible equilibria. For example, by providing liquidity generously and underwriting debt issuance, a central bank can ensure that the self-fulfilling threat of rollover risk triggering a solvency problem is ruled out. Rather than simply responding to exogenous shocks, the central bank plays an active role in determining the nature of the equilibrium –and thus whether it raises purely liquidity concerns, or is a solvency problem.

Treating the problem as a liquidity problem ensures it remains a liquidity problem. Credible communication of the central bank's willingness to underwrite debt issuance by supplying liquidity as necessary (thus ruling out Pareto-dominated 'bad' equilibria embodying the threat of insolvency) will be sufficient to stabilise markets. The credible threat of action is enough to coordinate private

market behaviour on a 'good' equilibrium where debt can be rolled at yields that do not bring debt sustainability into doubt.

In all of this, the central bank is a strategic actor, taking decisions that influence the actions of others rather than simply reacting to a set of exogenous shocks and pre-defined private sector behavioural responses to them. But other actors will also be able to behave strategically in this context, responding to the incentives created by anticipated central bank measures.

For example, if governments and/or banks enjoy a central bank liquidity guarantee, moral hazard can be created, with borrowers undertaking or perpetuating activities that ultimately lead to bigger solvency problems. For example: (1) excessive public sector deficits can persist and expand if governments believe that the central bank will underwrite debt issuance, since market discipline on fiscal decisions is weakened;¹⁰ and (2) non-performing assets on bank balance sheets can be 'evergreened' (rolled over repeatedly, with unpaid interest being rolled into the principal) indefinitely if banks have access to an elastic supply of central bank funding against a very broad set of collateral. In this case, the strategic interaction between borrower and central banks in the face of a liquidity problem can create a moral hazard that ultimately generates a solvency issue.

To sum up, recent experiences have challenged conservative central bank doctrines. They point to a rationale for a more activist central bank responses to financial crisis – ones that seek to reinforce socially-desirable equilibria. But such activism comes with risks: if applied inappropriately or excessively, central banks activism can exacerbate the underlying problems and/or create new ones, especially over longer horizons, by accommodating unsustainable bank and government behaviour.

In this strategic context, central bank actions to underwrite the roll of potentially problematic outstanding debt can lead to three possible outcomes:

- (1) 'Risk-shifting', i.e. central bank liquidity support simply transfers any underlying fundamental solvency risk from the private sector to the central bank, to the extent that the latter is ultimately the 'buyer of last resort' for debt on issuance;
- (2) 'Risk-reducing', i.e. by ruling out risky equilibria created by self-fulfilling expectations of rollover-induced default, central bank actions can reduce

¹⁰ See Roch and Uhlig (2013) for a very elegant demonstration of how liquidity support to avoid self-fulfilling roll over crises creates a moral hazard that leads to higher steady state levels of sovereign debt.

the riskiness of the system as a whole (in a potentially Pareto improving manner);

- (3) 'Risk-creating', i.e. to the extent that they create moral hazard among borrowers, central bank actions can support unsustainable behaviour that ultimately increases the overall riskiness of the system.

In assessing the success of central bank measures, distinguishing among these three outcomes (and recognising that different effects may dominate at different horizons) is key.

VI. ADDRESSING THE EUROPEAN SOVEREIGN CRISIS

Owing to the impact of successive waves of sovereign debt crisis in Europe (starting with Greece in early 2010), financial market dysfunctionality was both more profound and more prolonged in the euro area than elsewhere. By the end of 2009, financial markets were functioning reasonably normally in the US and the UK: the quantitative easing programmes introduced by the Federal Reserve and Bank of England were conducted in that context. By contrast, dysfunctionality in euro area financial markets intensified from early 2010. With concerns about fiscal sustainability and Euro exit growing, capital fled the periphery. Banks as well as sovereigns were unable to obtain funding, as Euro markets segmented along national lines. Credit creation in bank-centric peripheral financial systems ceased, and the financial sector seized up.

Compounding these problems, the euro area suffered from institutional lacunae on the fiscal side. While the Federal Reserve and Bank of England faced cooperative and functional national treasuries, the ECB did not have a natural fiscal and regulatory counterpart. At the national level, fiscal capacity in the most severely affected peripheral countries was exhausted. The poor –in some cases, catastrophic– state of public finances (which had triggered the original sovereign crisis) implied governments lacked the resources to solve or contain difficulties arising in the financial sector. And at the area-wide level, the ECB faced a disparate and ill-coordinated set of national finance ministries and bank regulators, which were unwilling and/or unable to adopt a euro area approach that internalised the significant cross-border externalities created by spillovers and contagion.

The implications of this setting were twofold. From the end of 2009, relative to their colleagues in the Anglo-Saxon world, the euro area authorities faced a different (or at least additional) challenge – one that centred on re-establishing

market functioning rather than (simply) engineering monetary policy easing to sustain and stimulate demand. And the burden of meeting this challenge fell to a greater extent on the central bank than in other advanced economies, since the ECB was the only functioning euro area-wide institution with the autonomy, flexibility and financial resources to act effectively.

One important aspect of this European challenge was the contagion of sovereign market tensions across countries as markets re-segmented and foreign capital (from both outside the euro area and other euro area countries) withdrew. While solvency problems were evident in some peripheral countries, in others tensions appear to have been driven more by default concerns created as a result of rollover risk.

For the smaller peripheral countries, funding tensions were met through recourse to troika programmes financed by the IMF and European bailout mechanisms. But the financing needs of the larger peripheral economies (Italy and Spain) were simply too large to be addressed in this way.

VII. DOING “WHATEVER IT TAKES”

It was in this context that ECB President Mario Draghi announced his famous pledge to do “whatever it takes” to preserve the Euro. This commitment took institutional form in the ECB’s outright monetary transactions (OMT) programme introduced in September 2012.

The OMT scheme foresaw the possibility of central bank purchases of the shorter-dated government debt of countries that entered European Stability Mechanism (ESM) programmes (and accepted the implied conditionality). In essence, the OMT allowed the ECB to use its own balance sheet to leverage the capital in the ESM. This created the capacity for the ECB balance sheet to be used to warehouse the public debt of large peripheral countries in the face of roll over risk –just as had already been achieved for the small countries via the troika– while retaining the important element of conditionality to maintain incentives for fiscal discipline and contain moral hazard.

The introduction of the OMT has exerted a powerful effect on market sentiment, leading to a substantial narrowing of peripheral sovereign spreads over German yields. In turn, the stabilisation of financial markets has created an environment conducive to the stabilisation of the real economy, while providing breathing space for the necessary underlying area-wide governance improvements and national structural reforms and fiscal consolidation to be

implemented. In the framework developed above, at the time of writing the OMT has proved to be a risk-reducing intervention.

Crucially the OMT worked through expectational channels and the credibility of Mr. Draghi's "whatever it takes" announcement. The promise to underwrite sovereign debt has proved sufficient to re-coordinate private market participants on a 'good' equilibrium where debt rolls and sovereign credit risk premia remain contained. As a result, OMT purchases have never been made: the ECB has not bought one Euro of peripheral sovereign debt since the OMT was announced in September 2012, and the larger peripheral countries (Italy and Spain) have not entered ESM programmes to activate the possibility of such purchases.

The undoubted and substantial success of the OMT was founded on using an 'off-balance sheet approach' to stabilise sovereign markets. In essence, Mr. Draghi issued a put option on peripheral debt (albeit one with a vague strike price), rather than making outright purchases. This approach allowed him to navigate the dangerous waters between, on the one hand, understandable German concerns about the abuse of central bank financing stemming from the unique institutional set-up of the euro area and, on the other, market participants' concerns about the sustainability of peripheral fiscal positions in the face of both fundamental weaknesses in the public finances and roll over risk at a time of market tension.

But importantly this off-balance-sheet approach did not impose conditionality on the benefiting countries, which remained outside ESM programmes. Spain and Italy enjoyed substantial reductions in their financing costs as a result of the announcement of the OMT, but did not have to satisfy the conditions implied by participation in an ESM programme, comparable to those set for the small peripheral economies by the troika. Implementing the necessary macroeconomic adjustment was therefore a matter of trust.

To their credit, the Spanish authorities have pursued significant adjustment even without the imposition of explicit conditionality. Fiscal consolidation has been implemented aggressively over the past two years, resulting in significant deficit reduction – even if there remains some way to go before a sustainable fiscal position is achieved over the medium term.

Moreover, Spain has made progress on other dimensions. Reforms implemented in 2012 have led to a significant and rapid improvement in labour market flexibility, facilitating necessary wage moderation, reallocation of labour resources and improvements in productivity. Although wage moderation has brought inflation to very low levels (and is thus associated with the emergence of understandable

concerns about deflationary risks), these supply-side measures have substantially improved international competitiveness by lowering relative unit labour costs. Exports have recovered as a result, in part because internationally mobile production has relocated to Spain to exploit the cost advantages. As a result, the Spanish economy stabilised in the second half of 2013.

Yet the issue of moral hazard remains. In the context of OMT-induced market calm, Italy's macroeconomic adjustment has been more hesitant than that in Spain. Admittedly, this reflects a different starting point: on several dimensions, Italy has less adjustment to make. Having not experienced credit and real estate dislocations of the magnitude seen in Spain prior to the crisis, Italy's external and financial imbalances were of a different magnitude. The challenge for Italy is to restore growth in an economy that has stagnated for more than a decade, starting even before the onset of the financial crisis. With an ageing population, in the end restoring growth requires productivity-enhancing structural reforms. Thus far the Italian political system has failed to deliver on this dimension. And with market pressure diminished by the OMT, it remains to be seen whether the promising political and institutional changes being seen in Italy at present will allow more rapid progress to be made.

The impact of moral hazard has a time series as well as a cross-sectional dimension. Spain's substantial efforts in undertaking a necessary but painful restructuring of its economy were prompted by the financial crisis. The question remains as to whether they will be sustained as market pressures diminish, especially given political pressures to ease up dictated by the electoral timetable.

Should there be recidivism on structural reform and fiscal performance –i.e., if moral hazard leads to risk-creating behaviour– the danger exists that fundamentals deteriorate to the point where the 'good' equilibrium supported by central bank liquidity guarantees (such as the OMT) disappears. In that context, the risks implicit in the central bank support become manifest.

The put option nature of the ECB's OMT commitment implies it is taking a highly leveraged bet that this risk-creating bad outcome will be avoided. The success of the OMT will ultimately be determined not on whether it maintains market calm in the coming quarters, but on whether it supports a sustainable and lasting adjustment that avoids this outcome. That is why it remains crucial that the 'breathing space' bought by the OMT is used to build the necessary area-wide governance and institutions that will render the euro area more workable, as well as maintain and deepen the necessary fiscal consolidation, bank deleveraging and economic restructuring required to engineer the conditions for sustainable economic growth in individual euro area countries.

VIII. CONCLUDING REMARKS

The financial crisis has demonstrated the vulnerability of highly levered financial institutions and governments to liquidity and solvency crises. In this context, central banks have an important role to play in stabilising financial markets. Given institutional gaps on the fiscal side in the set-up of monetary union, the role of the ECB may be especially important in the euro area.

Fulfilling this stabilising role entails the assumption of risks. And given the political and practical constraints created by the unique structure of the euro area, these risks may be magnified for the ECB. Risk management –in the broad macroeconomic sense, as well as the narrow financial sense– is therefore crucial.

Initiatives such as the provision of central bank intermediation in the immediate aftermath of Lehman in 2008 or the introduction of the OMT in the face of the sovereign crisis in 2012 certainly entail the assumption of risk by the ECB. To make that assumption politically feasible, in the latter case it has taken an off-balance sheet option-like form. But simply because credit risk in peripheral sovereign debt does not explicitly appear on the central bank balance sheet as a result of QE-like outright purchases does not mean that economically that risk has not been assumed.

The assumption of risk by the ECB does not imply these interventions were misguided. On the contrary, they have been essential to preventing the collapse of the European financial system and the integrity of the euro area – outcomes which clearly both serve the ECB's ultimate objective. Viewed through the lens of risk management, the key issue is whether the trade-off between risk and reward has been favourable.

Coming to a comprehensive judgement on this question takes time. The risk-reducing benefits of central bank interventions have been seen relatively quickly in European financial markets. They have laid the basis for the stabilisation and slow recovery of the European real economy. But the risk-creating costs of such interventions will accumulate over time, should moral hazard influence the underlying fundamental behaviour of banks and governments.

Managing the trade-off between risk-reducing and risk-creating implications of central bank action in a time consistent manner is the central challenge for monetary policy makers.¹¹ We know from an earlier literature that institutional design is central to addressing this challenge. While progress has been made in

¹¹ See Pill and Smets (2013) for a richer discussion of what institutional and strategic structures would serve this purpose.

the euro area on this dimension, much further effort is needed to build trust between the relevant actors, both across constituent countries and between various policy responsibilities.

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