05

FINANCIAL MARKETS: GAPS IN REGULATION, GROWING RISKS

This is a translated version of the original German-language chapter "Finanz-märkte: Lücken in der Regulierung, steigende Risiken", which is the sole authoritative text. Please cite the original German-language chapter if any reference is made to this text.

Summary

Ten years since the start of the global financial crisis, there are still **gaps in European financial market regulation**. Although considerable progress has been made, above all through strengthening banks' capital requirements, creating a European resolution regime for banks and introducing macroprudential regulation, further reforms are needed. At the same time, **financial system risks continue to mount** due to the persistent low interest rate environment.

Europe's **Single Resolution Mechanism** established in 2016 was triggered for the first time this year, effecting resolution of a medium-sized Spanish bank without generating any systemic effects or using public funds. However, the new regime has also revealed its weaknesses. The Italian government exploited the **exemptions to the new resolution regime** in order to bail out banks with taxpayer money instead of fully bailing in creditors. These gaps should be closed by more precise and tighter conditions for exemptions, by reinforcing the liability cascade, in particular through a tightening of state aid rules, and by limiting national leeway through greater harmonisation of national insolvency law.

Particularly in southern European member states, banks still have high levels of **non-performing loans** (NPLs). However, progress in reducing NPLs can meanwhile be seen, likely due in part to more determined supervisory action. The reduction of NPLs should be swiftly continued. Banks that are non-viable without external support should be wound down. The creation of publicly funded national or even European asset management companies to carve out NPLs bears the risk of hidden transfers of public funds to the banking sector and is thus viewed as problematic.

The demand for more **proportionality in banking regulation** is a legitimate concern. However, alleviations for smaller institutions should fall within the uniform regulatory framework. Demands for **milder capital and liquidity requirements** should **be rejected**, as these could pose a threat to financial stability. Even small banks can be systemically important, particularly if their risks are highly correlated. Inefficiencies in regulation and supervision should be addressed.

The risks within the financial system have grown further due to the persistent low interest rate environment, particularly as a result of **price developments on asset markets** and rising **interest rate risks**. As a lesson from the global financial crisis, **macroprudential instruments** were introduced to be able to counteract risk build-up at an early stage. The evidence suggests that **loan-specific and borrower-specific instruments** are particularly effective. It is therefore all the more regrettable that the Federal Government has not fully implemented the Financial Stability Committee's recommendation and has refused to introduce income-based instruments.

Some financial system risks may have migrated to less regulated sectors **as a result of regulatory arbitrage**. **Investment funds**, in particular, have seen strong growth since the financial crisis. Risks to financial stability could arise, above all, from substantial liquidity transformation and high leverage. The macroprudential toolkit, however, has been largely directed towards the banking sector thus far. With the rapid growth of the investment fund sector, thought should be given to **macroprudential measures beyond the banking sector**.

I. GAPS IN REGULATION SHOULD BE CLOSED

426. The **international regulatory process** is **faltering**. Negotiations on completing the revision to the Basel Accord (Basel III) have still not come to a conclusion. This is due partly to the rejection of the planned reforms by some European countries, particularly France and, until recently, Germany, and partly to the lack of priority given to completing Basel III by the US administration. The United States is instead headed towards **deregulation**. The goal of ensuring financial stability has given way in many countries to attempts to gain competitive advantages for their domestic financial systems.

427. In Europe, the regulatory measures taken after the crisis are also being called into question, as the discussion on **bank rescues and bail-ins** has shown. The new resolution regime that came into effect at the beginning of 2016 has faced its first real tests. While the Spanish Banco Popular was successfully put into resolution without triggering any systemic effects or using public funds, problem banks in Italy have not been handled in the spirit of the new resolution rules. **More reforms** are therefore **necessary** to further strengthen the credibility of the new resolution regime. In particular, the conditions for exemptions should be refined and tightened, the liability cascade reinforced (for example by tightening state aid rules) and national leeway limited (for instance by greater harmonisation of national insolvency law).

Particularly in southern European member states, many banks are still suffering from **high levels of non-performing loans** (NPLs). However, signs of progress are gradually emerging, not least thanks to more determined supervisory action. Supervisory authorities should continue to push for a rapid reduction in NPLs. This also applies to countries like Germany, where concentrations of NPLs are only seen at a few financial institutions. Financial institutions that have no long-term viability without external support should be wound down. However, the German Council of Economic Experts takes a critical view of the creation of publicly financed national and European asset management companies to carve out NPLs, as these could lead to hidden transfers of government funds to the banks.

428. The increasing burden of stricter regulation and the low profitability of the banks due to the low interest environment have led to **calls** from the financial industry to tailor regulation more closely to the size of the institutions (**proportionality**). It seems appropriate to ease reporting and disclosure obligations for very small institutions, as the European Commission has demanded. However, the common set of rules should still be maintained in the process. A **reduction in capital and liquidity requirements** for small banks is **not appropriate**. Even small institutions can cause systemic risks if they follow highly correlated strategies. This particularly applies to banks that are part of a banking association, such as the German savings banks and credit cooperatives. Instead, initiatives should be pursued to tackle the **inefficiencies of regulation**, particularly in the area of data collection.

429. **Risks to financial stability have grown further** due to the persistent low interest rate environment, and primarily as a result of increased asset prices and rising interest rate risks. The **importance of macroprudential policy** is therefore **increasing**. However, there has been little research to date on the impact of the new regulations. A comprehensive evaluation of the existing regulatory tools is needed. The available empirical evidence points to relatively high effectiveness of loan- and borrower-specific instruments. It is thus all the more regrettable that, in Germany, not the full set of instruments has been introduced.

430. With the tighter regulation of the financial sector, some risks may have migrated to less regulated sectors (the "**shadow banking sector**") as a result of **regulatory arbitrage**. **Investment funds**, in particular, have seen strong growth in business volume. The investment fund sector in Germany itself is relatively small. However, this is primarily because many funds are set up in other European countries. With the assets managed by these funds growing rapidly, this sector is becoming **increasingly important to financial stability**. The spotlight should not only be on highly leveraged hedge funds or money market funds that risk a sudden run by their investors. Risks to financial stability can emerge even from standard funds if they perform large-scale liquidity transformation. This raises the question as to whether regulation offers adequate protection from stability risks or whether **macroprudential regulation** is also needed **beyond the banking sector**.

II. ROOM FOR IMPROVEMENT IN THE BANK RESOLUTION REGIME

431. One of the most important achievements of post-crisis regulation has been the creation of a resolution **regime for banks**. This is anchored at EU level in the Bank Recovery and Resolution Directive (BRRD). In the euro area, the regime was complemented by the Single Resolution Mechanism (SRM) in 2016. This moves responsibility for the resolution of significant banks to the European level to the Single Resolution Board (SRB). The aims of the resolution regime are to ensure that shareholders and creditors, rather than taxpayers, bear the costs of banks in distress (**bail-in**), to lower bail-out expectations that rose in the wake of the financial crisis and to restore **market discipline**. This makes it an important instrument in loosening the ties between banks and governments and solving the time inconsistency problem of bank rescues (GCEE Annual Report 2014 items 299 ff.).

432. The new regime faced its **first real tests** this year. Spain's Banco Popular Español ("Banco Popular") was resolved at European level and sold to the major Spanish bank Banco Santander. The Italian bank Monte dei Paschi di Siena (MPS) was kept alive with a precautionary recapitalisation. The European rules applied here too. Meanwhile, two smaller Italian banks (Veneto Banca and

Banca Popolare di Vicenza) are to be liquidated under national insolvency law. Parts of them will be acquired by the large Italian bank Banca Intesa Sanpaolo. All these cases involve a **bail-in** of shareholders and junior creditors. Nevertheless, the events raise **doubts about the credibility of the new resolution regime**. Further reforms are therefore needed to strengthen the credibility of the new rules.

1. Gaps in the resolution regime

433. The events in Italy and Spain reveal major differences in approach and outcome. ⬃ TABLE 19 Only the case of the Spanish **Banco Popular** was clearly handled in the spirit of the new resolution rules. This bank was **resolved swiftly and without the use of public funds**. No government funds were involved in the sale to Banco Santander for the symbolic price of one euro. The losses were largely borne by shareholders and the holders of additional tier 1 and tier 2 capital instruments. Contagion effects were avoided and the bank's critical functions preserved. However, Banco Santander announced subsequent compensation for retail investors.

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Capital adequacy rules divide regulatory capital into three groups based on how effectively it absorbs losses: common equity tier 1 capital (CET 1) largely consists of shares or similar capital instruments and reserves. Additional tier 1 capital comprises financial instruments similar to equity, such as CoCo bonds (contingent convertible bonds). Tier 2 capital includes long-term subordinated liabilities, for example.

434. This was in marked contrast to the protracted restructuring processes in Italy. Two of the three affected Italian banks showed **substantial capital shortfalls** in the **European Banking Authority's** (EBA) **stress test** back in 2014. Monte dei Paschi had the greatest shortfall of all the banks involved by some margin. **Delaying restructuring** can increase its costs, as was manifestly the case in Japan in the 1990s (Hoshi and Kashyap, 2004) and in Cyprus in 2012 and 2013 (Philippon and Salord, 2017). Such delays can also have distributional effects if professional investors withdraw early when losses are imminent. A bail-in becomes even more politically problematic when it largely affects retail investors (Hellwig, 2017a).

435. Different justifications have been offered for the use of public funds in the case of the Italian banks. A **precautionary recapitalisation** was carried out at MPS which allows, according to BRRD, to avert a resolution. An injection of own funds by the state is permitted if is required to avoid a serious disturbance in the economy of a member state and to **preserve financial stability**. As state aid, this funding requires approval and is only permissible for **solvent institutions**. The European Central Bank (ECB) defines solvency as fulfilling the "Pillar 1" capital requirements and passing the baseline scenario of the EBA stress test (ECB, 2016a). Precautionary recapitalisation is intended to provide

temporary support and should not be used to offset losses incurred in the past or expected in the future (BRRD, 2014).

The use of a **precautionary recapitalisation** for Monte dei Paschi **raises** a series of **questions**. The precautionary nature of the recapitalisation can be called into question given the long-standing problems, the very weak performance in the prior stress tests and the high level of NPLs. The possibility of public money being used, at least partially, to cover already incurred or

Comparison between Monte dei Paschi di Siena, Banco Popular Español, Veneto Banca and Banca Popolare di Vicenza

	Monte dei Paschi di Siena	Banco Popular Español	Veneto Banca and Banca Popolare di Vicenza
Country	Italy	Spain	Italy
Total assets on 31 Dec. 2016	€153.2 bn	€147.9 bn	€28.1 bn / €34.4 bn
Total assets in % of total assets of all banks in the country[1]	3.9 %	5.4 %	0.7 % / 0.9 %
Capital shortfall in stress test of 2014[2,3]	€4.3 bn (€2.1 bn)	–	€0.7 bn (€0.0 bn) / €0.7 bn (€0.2 bn)
Capital shortfall in % of total assets in 2013[3]	2.1 % (1.1 %)	–	1.9 % (0.0 %) / 1.5 % (0.5 %)
"Failing or likely to fail" (ECB)	No	Yes	Yes
Public interest pursuant to Art. 18 (1)(c) of the SRM regulation	Article not applicable	Yes	No
"Threat to financial stability"	Yes (pursuant to Art. 32 (4d) of the BRRD) according to the European Commission	Yes (pursuant to Art. 14 (2) (b) of the SRM regulation) according to the SRB	No (pursuant to Art. 14 (2) (b) of the SRM regulation) according to the SRB
Action taken	Precautionary recapitalisation pursuant to Art. 32 (4d) of the BRRD	Resolution according to European law: corporate sell-off to Banco Santander pursuant to Art. 38 of the BRRD	Liquidation under Italian insolvency law: corporate sell-off of the 'good bank' to Banca Intesa Sanpaolo
Bail-in	Shareholders, junior creditors; no bail-in of senior creditors	Shareholders, junior creditors; no bail-in of senior creditors necessary	Shareholders, junior creditors; no bail-in of senior creditors
Compensation of small investors	Yes	Yes[4]	Yes[4]
State aid due to the use of public funds	Yes	No	Yes

1 – Calculations based on the MFI statistics (ECB) without Eurosystem central banks. 2 – Adverse scenario based on the Comprehensive Assessment 2014 (data basis at the end of 2013); projection for 2016. 3 – Figures in parentheses show the capital shortfall taking into account the interim net equity issuance. 4 – Compensation shall not use public funds.

Sources: ECB, European Banking Authority (EBA), European Commission, annual reports of banks

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expected losses, especially from the large portfolios of NPLs, cannot be ruled out.

436. The **state aid rules** (European Commission, 2013) proved to be an effective instrument for ensuring a **bail-in of junior creditors**. Nevertheless, the liability cascade envisaged in the BRRD was violated as there was **no bail-in of MPS's senior creditors**. The subsequent compensation of retail investors also contravenes the spirit of the resolution rules. This is a measure that may be justified if the junior bonds have been **mis-sold**, provided that investors were not given sufficient information about the risks. The question arises, however, why the Italian supervisory authority did not put a stop to the sale of junior bank bonds to retail investors earlier, or even force a repurchase of the bonds before the new resolution regime took effect (Véron, 2017).

437. The two considerably smaller **Venetian banks** are being liquidated under Italian insolvency law, thereby **avoiding a bail-in of senior creditors** that would otherwise be necessary. Here, too, it is only the state aid rules that provide a binding minimum standard. The SRB's view that there is no public interest justification for the resolution of these banks can hardly be questioned. Yet the case reveals the broad **leeway the member states have** when it comes to liquidation under national insolvency law. The treatment of the three Italian banks raises doubts about the willingness to consistently apply the resolution regime.

438. Analyses of CDS spreads show, however, that these events had no significant spillover effects on other countries. In the case of MPS, there are signs that bail-out expectations rose for senior debt, though only for domestic banks. ↘ BOX 13 The markets seem to regard **Italy** as a **special case**. Meanwhile, the results in the case of Banco Popular and the two Venetian banks point to a **reduction in risks in the banking system**. CDS spreads on junior debt in particular show sharp declines, even though such debt was not exempt from the bail-in.

↘ BOX 13

Impact on CDS spreads of resolution events in Spain and Italy

Following the approach of Schäfer et al. (2017), we examine whether the resolution events in Italy and Spain contributed to a **change in bail-out expectations** in the European banking sector. In the event of an increase (decline) in bail-out expectations, investors would anticipate lower (higher) default risks in future, meaning that a decline (increase) in CDS spreads on bank bonds would be expected. In addition to bank-specific risks, CDS spreads reflect the **risks in the banking sector**. If a bank resolution or rescue reduces the risks in the banking system CDS spreads should decline.

An **event study** is used to identify abnormal changes in CDS spreads relative to a reference model in response to relevant events associated with the resolution events in Italy and Spain. CDS spreads for 39 banks from the 28 EU member states and Switzerland are examined. A distinction is drawn between credit default swaps for senior and junior debt. The charts below illustrate the abnormal reactions of CDS spreads to the main event of each bank resolution. ↘ CHART 49 The full regression results for all banks, for global systemically important banks (G-SIB) and domestic banks and for the associated control groups can be found in the appendix. ↘ TABLE 22 The estimation window

encompasses 80 trading days before the event, while the event window looks at the date of the event and the day after the event.

↘ CHART 49

Reactions of CDS spreads of European banks to resolution events

Italy
MPS[1]: rescue plan based on precautionary recapitalisation

Basis points[3]

Spain
Banco Popular Español: takeover by Santander

Basis points[3]

Italy
Venetian banks[2]: takeover by Intesa

Basis points[3]

Senior CDS spreads: —— Domestic ······ Non-domestic   Junior CDS spreads: —— Domestic ······ Non-domestic
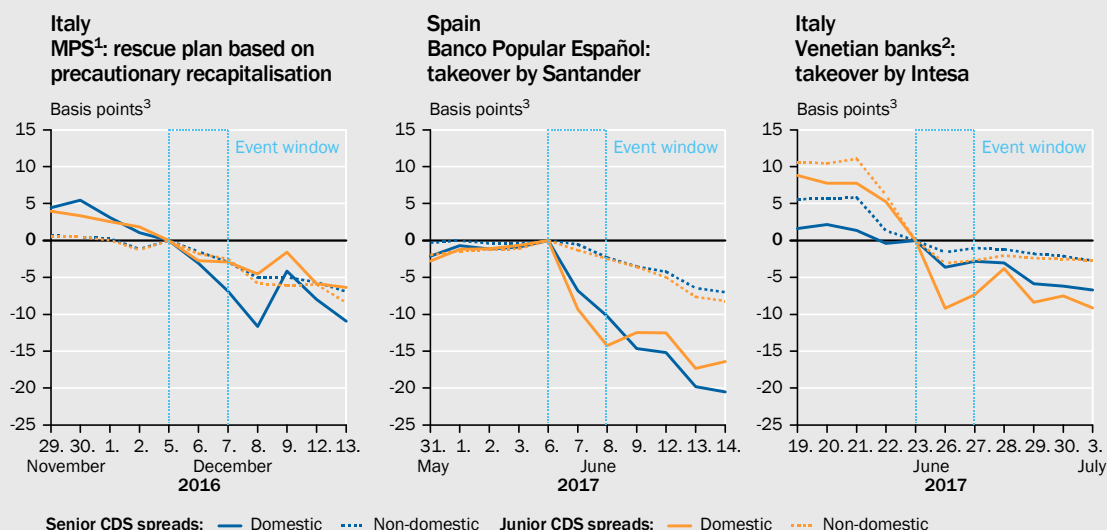
1 – Monte dei Paschi di Siena. 2 – Veneto Banca and Banca Popolare di Vicenza. 3 – Average of individual values from which the respective value as of 5 December 2016 (left), 6 June 2017 (centre) and 23 June 2017 (right) was subtracted.

Source: own calculations

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In the case of all three events, the effects for the total sample are negative but not statistically significant. The division into domestic and non-domestic banks shows **significant negative effects only for domestic banks**. These are particularly pronounced in the case of **Banco Popular**. However, we can rule out an increase in bail-out expectations here, as a full bail-in occurred. To the extent that the risk of a bail-in was already anticipated by the markets, we would not expect any change in bail-out expectations. The decline in senior CDS spreads and even sharper decline in junior CDS spreads immediately after the event might be interpreted as a sign that the risks in the Spanish banking sector were reduced by the successful takeover of Banco Popular. The results for the Venetian banks (**Veneto Banca** and **Banca Popolare di Vicenza**) also suggest a reduction in risks in the banking sector as the decline in junior CDS spreads is particularly large here too. If bail-out expectations had increased, we would have expected to see a sharper decline in senior CDS spreads. This is because, in the case of the Venetian banks, it was the senior creditors in particular who were left unscathed. There is no evidence of such a risk effect in the case of **MPS**. Only the domestic senior CDS spreads declined significantly, which could point to an **increase in bail-out expectations**. Even here, however, there was no significant spillover of these effects into other European countries.

2. How to reform the resolution regime

439. The first applications of the new resolution regime clearly show that there has been **major progress** compared to the approach taken during the global financial crisis. Several banks have been successfully resolved and shareholders and junior creditors have borne a significant share of the costs. The case of Banco Popular in particular indicates that it is possible under the new regime to resolve a significant bank **without triggering systemic effects**. However, these experiences have also shown that **reforms** are necessary to increase the

credibility of the new resolution regime: more reliable proceedings without unnecessary delays, strengthening of the liability cascade and a reduction in national leeway where this negatively impacts the resolution regime as a whole.

The German Council of Economic Experts has already criticised the **exceptions and scope of discretion** in the new resolution regime in the past (GCEE Annual Report 2014 items 338 ff.). While it must remain possible for the state to intervene with public funds in order to prevent contagion effects in the event of a systemic banking crisis, the barriers to such intervention (as with the systemic risk exception in the United States) must be high. The events of this year, however, confirm the fear that **creditor liability** can be **circumvented** even in cases where there is little risk of a systemic crisis. Moreover, in the Italian decisions, the criteria were interpreted differently depending on the interests at play in order to fulfil the requirements for the desired course of action. To improve the reliability and predictability of the process, the conditions for using the various instruments must be clarified and in some cases tightened up.

440. What constitutes a **threat to financial stability** should be assessed solely by the supervisory authority and applied consistently to resolution and state aid decisions. A clear catalogue of criteria should be used, in a similar fashion to the definition of systemically important banks. The decision on institutions' **solvency** is already made by the responsible **supervisory authority**. However, the criteria are **comparatively lenient**. Eligibility for a precautionary recapitalisation, for example, merely requires that a bank has no capital shortfall in the baseline scenario, even if – like MPS – it has substantial shortfalls in the adverse scenario. The structure of the scenarios thus has enormous consequences for the resolution process and could promote precautionary recapitalisations (Philippon and Salord, 2017).

To ensure that existing problems are **swiftly overcome**, the supervisory authority should be able to urge a rapid recapitalisation if capital shortfalls emerge in the adverse scenario of the stress test. If this does not take place within a specified short period of time, the bank should be categorised as "failing or likely to fail". In addition, the **resolution authority** should be enabled to categorise a bank as "failing or likely to fail" independently from the supervisory authority. This would reduce any delays in the supervisory authority taking action. Such a measure would require direct access to the necessary data.
↘ ITEM 466

441. **Tightening up the state-aid rules** could **reinforce the liability cascade**. According to the Banking Communication of 2013 (European Commission, 2013), the fragile situation in the European banking sector continues, in principle, justifying state aid under Article 107 (3b) TFEU. This no longer appears appropriate in the current situation. Moreover, the only condition imposed by the Banking Communication for approval of state aid is a bail-in of junior creditors. The bail-in of senior creditors is explicitly not required. Amendment of the Banking Communication would be advisable in order to subject the award of state aid to stricter examination and make clear that senior creditors should generally be bailed in as well. Retail investors should not be

exempted from the bail-in, but provided with sufficient information to make them fully aware of the potential losses before assuming risks.

The events in Italy and Spain show that subordinated debt can contribute to better resolvability of banks, but also that creditor bail-in can be fraught with difficulties even in comparatively calm times. If a systemic crisis occurs, destabilising effects of a bail-in cannot be ruled out. Maintaining an **adequate level of capital thus remains essential** and cannot be replaced by requirements for bail-inable debt (TLAC, MREL) (GCEE Annual Report 2016 items 534 ff.).

442. Greater standardisation of the resolution process across the member states is also advisable. Resolutions under the European regulations are required to leave **"no creditor worse off"** than an insolvency handled under national law. This limits the leeway of the SRB and prevents a standard approach across all member states. **Harmonisation of national statutory provisions** in the area of insolvency law could prevent national insolvency law being played off against the European regulations. This would be an important step as the actions of the member states have externalities for the entire currency area.

It would make sense, for instance, to introduce **harmonised resolution instruments**. These would simplify the resolution process and harmonise the liquidation of collateral and out-of-court insolvency proceedings. Such measures would also facilitate the creation of a secondary market for NPLs and help to create an integrated capital market (GCEE Annual Report 2016 items 521 f.). In the medium term, convergence towards a common European legal basis for the liquidation of financial institutions would be welcome. This would, in addition, facilitate the implementation of other European projects such as the European Capital Market Union (GCEE Annual Report 2015 items 435 ff.) and the common deposit insurance scheme (GCEE Annual Report 2016 items 546 ff.).

443. Finally, the impact of resolution processes on the **market structure** must be considered. The cases described show that resolution tends to result in **greater concentration in the national banking sector**. Italy and Spain in particular had already witnessed a considerable increase in market concentration compared to the period before the crisis. Greater concentration is welcome in many member states to reduce overcapacity in the banking system. However, it is important to ensure that the resolution of small institutions does not create ever larger banks that are almost impossible to resolve given their systemic relevance. The Association of German Jurists (Deutscher Juristentag) proposed as long ago as 2010 that **special merger control** be introduced for **financial institutions** to take into account both market dominance and systemic importance (Zimmer and Rengier, 2010). This would also serve to facilitate cross-border takeovers, which raises fewer concerns about systemic importance at national level, and thus strengthen financial integration.
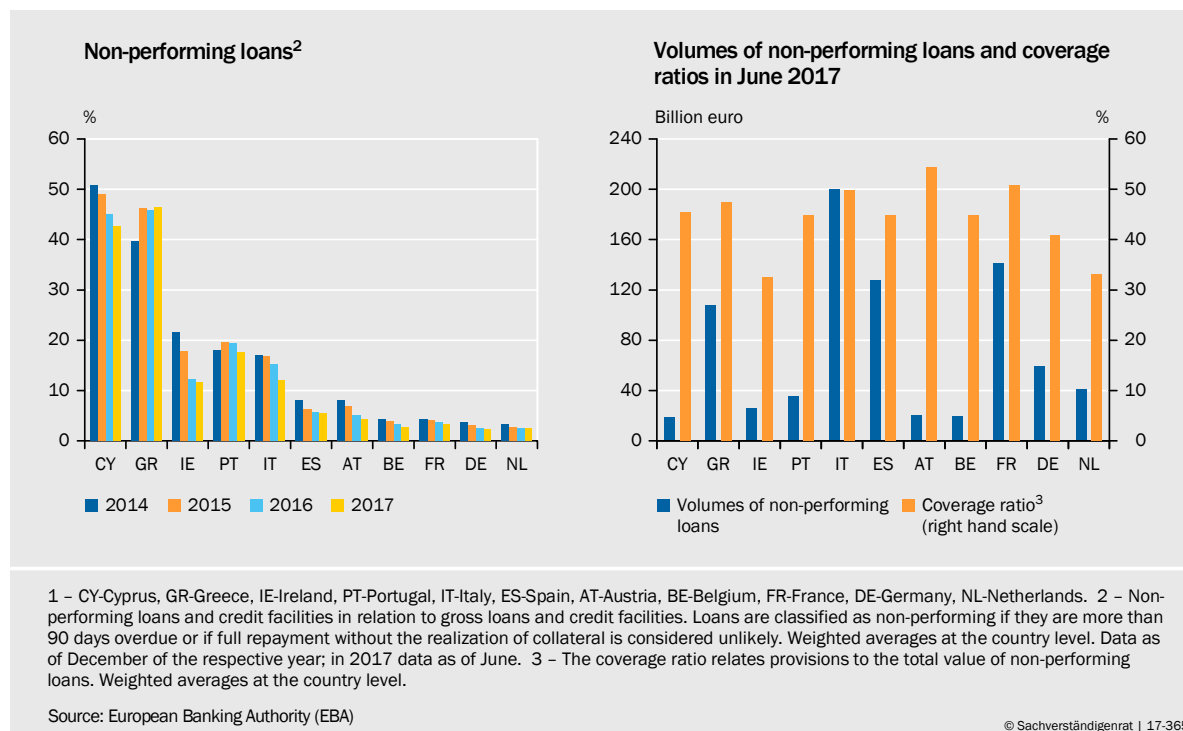
3. The legacy of non-performing loans

444. An important reason for the pressure on the new resolution regime is the fact that it has been confronted with a task for which it was never designed: reducing the large legacy portfolios of non-performing loans (NPLs) in the euro area (GCEE Annual Report 2016 items 514 ff.). Loans are considered to be non-performing when payments are more than 90 days overdue, or where full repayment is unlikely without liquidation of collateral (European Commission, 2015). A **rapid reduction in NPLs** is thus key to truly ending the crisis and, at the same time, a prerequisite for a workable resolution regime. Supervisory authorities and policymakers are now giving high priority to this problem, and progress is being made in reducing NPLs. ↘ CHART 50 LEFT The strong economic recovery in the euro area is likely to have contributed to this positive development. The coverage ratio for NPLs ranges between around 30 % and 55 %. ↘ CHART 50 RIGHT In absolute terms, the NPLs of Italian banks particularly stand out. ↘ CHART 50 RIGHT Despite the recent successes, further **determined action is needed** to make progress in driving down the still high volumes of NPLs.

445. Advances have been particularly apparent in member states subject to an ESM or EFSF programme focused on the banking sector. In Ireland and Spain, for instance, NPLs have been reduced considerably by transferring them to partially state-funded **asset management companies** (AMCs), i.e. entities for liquidating non-performing assets. ↘ CHART 50 LEFT Creating such entities is no longer a straightforward matter, as the injection of public funds is now subject to stricter conditions under the BRRD with respect to creditor bail-ins.

    Reforms have also now been initiated in **Italy** to accelerate insolvency proceedings and foreclosures. However, these measures will only achieve their full effect over the medium to long term, and further reforms will probably be needed to reduce the large volume of NPLs (Garrido, 2016). Initial progress in reducing NPLs in Italy has already been seen in 2017. Banks have managed to sell larger volumes of NPLs to financial investors. The resolution events described above are likely to further reduce the remaining NPLs.

446. Last year, the **ECB** declared reducing NPLs to be one of the priorities of its supervisory activities. In March 2017 it published the final version of its **guidance to banks on non-performing loans**, which applies to the institutions under its direct supervision (ECB, 2017a). This requires banks to develop "realistic but sufficiently ambitious" plans for reducing NPLs. The recommendations are not legally binding. Nevertheless, as part of the **Supervisory Review and Evaluation Process (SREP)**, supervisors are able to take into account the extent to which banks implement the recommendations. The intensity of supervision or the capital requirements can then be increased as appropriate.

    In October 2017, the ECB also opened a consultation on an addendum to its guidance on NPLs. This is intended to encourage banks to create sufficient and timely provisions for NPLs (ECB, 2017b). The proposals contain **minimum**

⊿ CHART 50

Non-performing loans and loan-loss provisions in the euro area[1]

Non-performing loans[2]

Volumes of non-performing loans and coverage ratios in June 2017

1 – CY-Cyprus, GR-Greece, IE-Ireland, PT-Portugal, IT-Italy, ES-Spain, AT-Austria, BE-Belgium, FR-France, DE-Germany, NL-Netherlands. 2 – Non-performing loans and credit facilities in relation to gross loans and credit facilities. Loans are classified as non-performing if they are more than 90 days overdue or if full repayment without the realization of collateral is considered unlikely. Weighted averages at the country level. Data as of December of the respective year; in 2017 data as of June. 3 – The coverage ratio relates provisions to the total value of non-performing loans. Weighted averages at the country level.

Source: European Banking Authority (EBA)

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levels of prudential provisions for loans newly categorised as non-performing from 2018 onwards. Banks must provide full coverage for the unsecured portion of NPLs within two years, and for the full volume of NPLs within seven years. Should banks deviate from these requirements, they must offer an explanation. The supervisory authority will then examine whether additional supervisory measures are needed. As these requirements only address **newly recognised NPLs**, the ECB also announced additional measures from spring 2018 to reduce existing NPLs.

447. At European level, various working groups have already formulated proposals for cutting back portfolios of NPLs. In July of this year, the **Council of the European Union** published an **action plan** containing proposals for **solving the NPL problem in Europe** (Council of the European Union, 2017). This shows a need for reforms to supervision, insolvency law and collateral liquidation, the development of secondary markets for NPLs and the removal of obstacles to restructuring in the banking system. A number of the proposals are particularly welcome: the extension of supervisory competencies concerning prudential provisioning for NPLs, additional capital requirements for the risk of inadequate risk provision, the development of blueprints for establishing AMCs, and the strengthening of secondary markets for NPLs by creating transparency and new sales channels through trading platforms.

448. The **European Systemic Risk Board (ESRB)** also published a report on dealing with NPLs in July this year (ESRB, 2017a). This defines five **basic principles** on which an NPL strategy should be based: (1) swift recognition of losses from NPLs and avoidance of fire sales, (2) losses to be borne by bank shareholders and creditors, (3) compliance with the EU rules on resolution and state aid, (4) assessment of the long-term viability of the affected banks, and (5)

a comprehensive combined consideration of accounting, tax, insolvency law and supervisory aspects.

The report also suggests the following systematic **approach for handling NPLs**. First, individual loans should be examined to identify NPLs. NPLs should be separated from the healthy part of the bank, either by creating an internal resolution unit or by transfers to an external AMC, securitisation or direct sales. Next, the viability of the healthy part of the bank must be examined, and a restructuring initiated if necessary. Finally, all NPLs should be analysed individually to ensure the most efficient liquidation possible.

449. **Transferring NPLs** to a **private AMC** may be advisable as external asset management companies may be able to build greater expertise in handling NPLs (ESRB, 2017a). They are also likely to suffer from fewer incentive problems concerning the realisation of losses when liquidating NPLs. In addition, AMCs can target investors who specialise in liquidating NPLs. **Fully or partly state-owned AMCs** can be reconciled with the state aid rules, but always involve the risk of **hidden transfers of public funds to the owners and creditors of banks** if the sale takes place at a fictitious "true economic value" instead of the market price (Hellwig, 2017b). On the other hand, carving out NPLs on a purely private basis may be difficult in many cases. As market prices will usually be relatively low due to problems of asymmetric information, it is likely that many banks will be unwilling to sell the loans (Financial Services Committee, 2017).

450. In January 2017, the Chairperson of the EBA proposed creating a publicly financed **AMC at European level** to take over NPLs (Enria, 2017). To avoid the mutualisation of risk, **claw-back rights** were to be created for cases where the NPLs can only be sold at low prices. The proposal of a public European AMC should be **rejected**. An effective claw-back right would counteract the aim of removing risks from bank balance sheets. A mutualisation of risk would however reduce the member states' incentives to create the best possible legal framework for liquidating NPLs. Overall, there is a concern that a publicly financed AMC, whether at European or national level, would be used first and foremost to **circumvent a resolution process** and thus the **bail-in of creditors**.

451. Instead, the **reduction of NPLs** should be **further promoted**. Supervisory authorities should **set targets** for the pace of reduction and appropriately sanction banks where progress is too slow. Losses arising from NPLs should be realised promptly and borne by bank shareholders and creditors. **Banks that are non-viable without external assistance** should **not be kept alive**. Excessive regulatory forbearance can lead to zombification of the financial system and the economy, hinder necessary structural change and entail high economic costs (GCEE Annual Report 2016 item 518). It would be better to restructure such banks or allow them to exit the market in order to strengthen the banking system as a whole. In addition, the **legal framework** for insolvency proceedings in and out of court should be **improved** so as to enable the swift execution of foreclosures, increase the recoverability of NPLs and strengthen the European secondary markets for NPLs (GCEE Annual Report 2016 items 521 f.).

452. Although the problem of NPLs in Europe is largely concentrated on the southern European member states, ↘ CHART 50 **individual banks** in Germany also have **large portfolios of NPLs**. Banks heavily involved in **ship financing** are particularly affected. Increasing overcapacity and shrinking margins have led to growing problems and payment defaults, especially in the container shipping industry. **HSH Nordbank** is currently in the spotlight and has already received considerable injections of taxpayers' money to offload NPLs (Schrooten, 2015; Hellwig, 2017c). This **state aid** was only approved by the European Commission on the condition that the bank be **sold without further state aid** by no later than February 2018.

453. The application for state aid was made prior to the Banking Communication of 2013 and before the BRRD came into effect. The proceedings relating to HSH are therefore subject to a **different legal framework**. In particular, there was **no compulsory bail-in** of junior creditors. Should it prove impossible to sell the bank without further state aid, however, the new resolution regime could apply. In this event, it may be necessary to bail in shareholders and junior creditors. The former include the federal states of Hamburg and Schleswig-Holstein and the Savings Banks and Giro Association Schleswig-Holstein.

In addition, the **institutional protection scheme of the Sparkassen-Finanzgruppe** may come into play (GCEE Annual Report 2013 box 15). This protects senior creditors and depositors from losses. It consists of three levels: the guarantee fund of the Landesbanken and Girozentralen, the regional Sparkassen reserve fund, and finally the system-wide joint liability scheme of all the Sparkassen-Finanzgruppe's guarantee funds. This means that losses at HSH Nordbank could **affect the entire public banking sector**. It is unclear to what extent payments could be made from existing emergency funds and whether the member institutions would have to top these up.

454. The German government should set a good example in such circumstances and **apply the resolution rules** consistently if they become relevant. Government transfers to protect creditors or the banks in the institutional protection scheme would not be justifiable. They would also jeopardise the credibility of the institutional protection scheme, and with it the **membership privilege** (i.e. the zero risk weighting of intra-association receivables in the capital requirements). If political decision-makers in Germany do not themselves act in the spirit of the new resolution regime, the Federal Government's critique of the Italian government's approach would be entirely without credibility.

III. PROPORTIONALITY OF REGULATION

455. The tightening of banking regulation after the global financial crisis and the pressure on profitability at many banks have triggered a debate as to whether regulation is sufficiently proportionate. When implementing internationally agreed regulations in the banking sector, Europe – unlike the United States –

has opted to regulate all banks in the same way to create a **level playing field**. This principle is now being questioned by calls for greater **proportionality**, demanding a regulation based on the size and systemic relevance of institutions.

1. Routes to more proportionality

456. **Proportionality** is an important legal principle that applies to any exercise of public power and has therefore to be taken into account in banking regulation too. **Prudential regulation** is based on the prevailing risks and is thus already proportionate per se. Macroprudential regulation sets **more extensive requirements** for **large banks**, due to their higher systemic importance, than it does for smaller ones. The Basel III regulation, for instance, includes additional capital buffers for systemically important banks. The requirements for recovery and resolution planning also differ.

457. German banking associations complain that current regulation **disadvantages small institutions** (BVR, 2016; DSGV, 2017; Peters, 2017). One reason is the high fixed-cost component of regulation. The high implementation costs mean that the use of internal risk models is rather profitable for large institutions. Small institutions, meanwhile, rely on the standardised approach, which tends to result in higher capital requirements. Such economies of scale, originating in regulation, distort competition and create **incentives for consolidation**, thereby contradicting efforts to solve the "too big to fail" problem and potentially harming financial stability. It is thus welcome, in principle, that various proposals are now being discussed at European and national level to alleviate regulation for small, less complex banks.

458. In its revision of the capital requirements, the **European Commission** consulted on amendments to increase the proportionality of regulation (European Commission, 2016a, 2016b). Its proposals would **ease** reporting and disclosure requirements **for small banks**, provided their average total assets over the previous four years did not exceed €1.5 billion. In addition, simplified remuneration rules would apply to institutions with total assets of up to €5 billion. Finally, banks with small trading books would be exempted from applying the enhanced requirements for market risks in the trading book. The European Commission's proposals are aimed at increasing proportionality **within the existing regulatory framework**, with all banks thus remaining subject to the same regulations. Exemptions and relief for smaller banks would only be possible if explicitly specified in the regulation.

459. The **German banking supervisory authorities criticise** the European Commission's proposals. The Federal Financial Supervisory Authority (BaFin) believes that the proposed changes do not go far enough, given the particularities of the German banking system, and that the thresholds up to which the exemptions and relief would apply are set too low (Röseler, 2017). A specialist working group has been created to improve the proportionality of regulation, consisting of the Federal Ministry of Finance, BaFin, Deutsche Bundesbank and five banking industry associations (Deutsche Bundesbank,

2017a). It proposes an **end to the existing uniform regulation** and the creation of a **three-tier regulatory regime**. The intensity of regulation would depend on the institutions' systemic importance (Deutsche Bundesbank, 2017a; Dombret, 2017). It is not planned to reduce the capital and liquidity requirements, however.

The working group proposes that systemically important institutions and institutions with the potential to pose systemic risks should be subject to the full requirements of Basel III. Selective relief should be provided for medium-sized banks through amendments to existing regulations. Meanwhile, small banks, whose total assets do not exceed a fixed threshold (yet to be decided) should be subject to a **separate regulatory regime ("small banking box")**. For these institutions, the exemptions and relief would go further than proposed by the European Commission. For instance, certain disclosure requirements, recovery and resolution planning and remuneration rules would no longer apply to small banks. There would also be reduced reporting requirements. These proposals would simplify regulation for a majority of German banks.

460. The proposal by the German banking supervisory authority has similarities to the **multi-tiered regulatory regime in the United States**, where the regulations that apply to banks depend on the size of the institution. The Basel III requirements only fully apply to banks with total assets of more than US$250 billion or an external position of at least US$10 billion (BCBS, 2014). The Dodd-Frank Act also tailors requirements to the size of the bank. Annual stress tests and supervision by the Consumer Financial Protection Bureau only apply for banks with total assets of US$10 billion or more. When total assets exceed US$50 billion, extended regulatory requirements apply, and annual resolution plans must be prepared.

The adequacy of the existing regulatory regime is also being questioned in the United States. The **Financial Choice Act**, a reform proposed by the Republican Party, would give banks with an **unweighted capital ratio of at least 10 %** the right to choose between the existing regulatory regime and a much simplified one (Rutkowski and Schnabel, 2017; U.S. House of Representatives Financial Services Committee, 2017). However, the proposal has been heavily criticised, particularly for doing too little to take into account the banks' risk profiles (Financial Economists Roundtable, 2017).

2. Size of banks and systemic relevance

461. The proposals by the German banking supervisory authorities are based on the view that small banks can be considered less systemically important than large banks. In reality, the **size** of a bank is **only one of the criteria for systemic relevance**. Additional aspects such as an institution's interconnectedness, complexity and substitutability must also be taken into account (BIS, FSB, IMF, 2009; BCBS, 2013). What is more, even small, non-complex banks may be systemically important if their business strategies are highly correlated with each other, making them highly likely to fall victim to a crisis simultaneously. In

such cases, these banks are **systemically important as a group** (**"too many to fail"**, Mitchell, 1998; Acharya and Yorulmazer, 2007; Brown and Dinç, 2011).

462. The "too many to fail" problem has a particular relevance in Germany. A majority of the country's approximately 1,700 banks are **members of the public sector or cooperative banking associations**. These banks are linked by similar business models and shared marketing strategies, IT and risk management systems. Most importantly, however, they are interconnected through **joint liability schemes** (GCEE Annual Report 2013 items 405 ff.).
↘ ITEM 453

This means, on the one hand, that they can achieve economies of scale through their association membership, such that fixed costs are less of an issue for them. On the other hand, members of the same association are likely to show **considerable correlation**. Due to their business models, many credit cooperatives and savings banks face extensive **interest rate risks** that have the potential to materialise at the same time. ↘ ITEMS 476 FF. There are thus doubts that banks which are part of a banking association should be regarded as small banks at all. Any move to **ease regulation** for these institutions solely on the grounds of their small size should therefore be viewed in a **critical** light.

463. Given the "too many to fail" problem, the **easing** of **prudential regulation** (particularly capital and liquidity requirements) for small or even medium-sized banks should be **rejected** if it poses a potential threat to financial stability. Simplified procedures, such as the standardised approach in the capital adequacy rules, make sense, but could be accompanied by stricter requirements if appropriate from a financial stability perspective. Advantages for larger banks that may arise due to the use of internal risk models can be effectively limited using the reform of the **output floor** being planned in the Basel III negotiations. The output floor limits the extent to which the risk-weighted assets calculated in internal models are permitted to fall below those that would apply in the standardised approach A final agreement on the design of the output floor has not yet been reached.

3. Making regulation more efficient

464. There has been **little quantitative evidence** to date that regulation has a disproportionate impact on smaller banks. However, there is no denying that the reforms since the financial crisis have considerably increased the regulatory burden on all banks. The results of a **consultation process** conducted by the European Commission in 2015 and 2016 provide some useful pointers (European Commission, 2016c).

The findings suggest that there is considerable **potential to increase the efficiency of regulation**. The high compliance costs appear in large part to be the result of **increased complexity in regulation and supervisory structures**. The exercise of national options and the different legal and administrative implementations of EU law raise complexity and make cross-

border activities more difficult. Banks today must also report to considerably more institutions than before the financial crisis. This sometimes leads to inconsistencies and duplication.

465. There are therefore indications that the regulatory burden could be lessened substantially without a loss in quality. Greater **standardisation** using harmonised templates and definitions could reduce existing inefficiencies in reporting, for example. **Convergence in the implementation and application of EU rules** is also desirable. National options make this harder and should therefore only be permitted in well justified exceptional cases.

466. In the long term, a greater **centralisation** of **data collection in Europe** should be pursued, along with consistent, harmonised reporting. This would involve collecting granular data that could then be prepared in various ways for statistical or supervisory purposes. This is precisely the aim of an initiative by the European System of Central Banks to create a **European Reporting Framework** (ECB, 2015a). It would be advisable, however, to store the data outside the institutions using it, for example at Eurostat or at a newly established institution that focuses on financial market data. This would enable frictionless exchange of data between various stakeholders, for example between the central bank, supervisory authority and resolution authority, and would also give researchers a central contact point to access data.

467. While centralisation of data collection at European level will require an extensive consultation and implementation phase, solutions for centralising data collection at national level are already being tested. In **Austria**, banks transfer information to a central service provider using standardised specifications in the **model for common regulatory reporting** (*Gemeinsames Meldewesen-Datenmodell*) (Hille, 2013; Piechocki, 2016). The service provider then prepares the data using criteria set by the central bank. The supervisory authority can access the desired information through an interface with the central service provider. Such a model avoids duplication and enables changes to reporting to be implemented by the central service provider in some cases. The supervisory authority can obtain information directly from the database operated by the central service provider, without long waiting times. Improved efficiency of data collection appears essential in view of the increasing granularity of the data required, such as in the context of the information on individual loans to be collected through AnaCredit. This could lead to **substantial** long-term **cost savings**.

4. No departure from uniform regulatory system

468. Generally, improving the proportionality of regulation is a **legitimate concern** of small institutions. From the perspective of financial stability, it makes sense to counteract a trend towards consolidation that is based on distortions due to regulation. A diverse financial system can contribute to resilience. However, consolidation processes that are reasonable from an economic perspective should not be impeded.

469. The German Council of Economic Experts believes that rules on proportionality should be tied in with the existing regulations and that a **separate regulation regime for smaller banks** should be avoided. It thus takes a critical view of the suggestions by the German banking supervisory authorities regarding a "small banking box". The introduction of separate regulation for small institutions would lead to segmentation of the regulatory system. This could distort competition, call the harmonisation achieved into question and thus **make it harder to create a European banking market** that has the same rules for all banks. In addition, it can scarcely be ruled out that the different supervisory regimes would develop even more divergently in the future.

470. **Inefficiencies** in regulation should be addressed. Relief measures and exemptions for small institutions may be appropriate in individual areas, particularly that of reporting requirements. A cost-benefit assessment of regulatory measures should always include the regulated institutions' administrative costs. However, these relief measures must **not be at the expense of financial stability**. The capital and liquidity requirements should therefore not be lowered for smaller banks. It would nevertheless be conceivable to waive certain finely calibrated measures or permit simplified processes if the corresponding requirements were increased in return.

Most importantly, the existing regulations should be comprehensively evaluated in accordance with scientific criteria on a regular basis in order to identify **ineffective regulations** and, if appropriate, **abolish** these. This particularly concerns the area of **consumer protection**, which has so far largely escaped evaluation and is associated with high costs for financial institutions.

IV. MACROPRUDENTIAL REGULATION

471. Ongoing expansionary monetary policy and the persistent low interest rate environment have caused the risks in the financial system to rise further. ↘ ITEMS 372 FF. The prices of many assets are at a historically high level and **interest rate risks** have further increased. This has caused many countries to **activitate macroprudential instruments**. In Germany, where the real estate market continues to exhibit considerable price increases, new macroprudential instruments have now been created in order to counteract exaggerations in the real estate market if necessary. However, how they work in practise and how effective they will be remains unclear. It is all the more important to make **initial evaluations** of the new instruments.

1. Mounting risks within the financial system

472. Mounting risks can be observed in the **real estate sector**, which is exhibiting **significant price increases** in a number of countries. In November 2016, the ESRB issued **warnings** to eight member states (Belgium, Denmark, Finland, Luxembourg, the Netherlands, Austria, Sweden and the United Kingdom) about

their residential property markets (ESRB, 2016a). Although Germany was not one of the countries warned, it shows abnormalities in price growth in particular (ESRB, 2016a, table 2.1).

Common indicators of a boom in the residential property market show a **mixed picture**. Austria, Sweden, Germany, the United Kingdom and Belgium in particular have been exhibiting a sharp price rise since 2010, both in absolute terms and relative to rents. ↘ CHART 51 LEFT But at the same time, the **credit-to-GDP gaps are inconspicuous**. ↘ CHART 51 RIGHT Only France currently shows a small positive gap. However, credit-to-GDP gaps can be biased downwards after periods of strong credit growth.

Although the **credit-to-GDP gap** is considered one of the best individual early warning indicators for systemic banking crises (Borio and Lowe, 2002; Borio and Drehmann, 2009; CAE and GCEE, 2010; Detken et al., 2014) and serves as a guidance for the counter-cyclical capital buffer (ESRB, 2014a), the credit-to-GDP gap as a statistical measure can be biased downwards after a phase of excessive credit growth if the statistical trend is biased upwards due to the excessive growth of the past (ECB, 2017c).

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473. Deutsche Bundesbank and the German Financial Stability Committee (Ausschuss für Finanzstabilität – AFS) have for some time pointed to **growing excess valuations in the German residential property sector** in urban areas (Deutsche Bundesbank, 2016, 2017b; AFS, 2017). Loan-to-value (LTV) ratios have also risen year-on-year at more than a third of smaller banks (Deutsche Bundesbank, 2017c). In view of the moderate credit growth, however, risks are currently still considered rather low (AFS, 2017). Because the macroprudential instruments available in Germany were felt to be insufficient to deal appropriately with possible systemic risks in the residential property sector,

↘ CHART 51

Indicators of the real estate market in selected member states of the European Union

House price growth in relation to rents[1]

% change (1st quarter of 2010 to 2nd quarter of 2017)

Credit-GDP gap[3]

Percentage points

■ House prices ■ Price-rent ratio[2]

— Austria — Belgium — France — Germany
— Italy — Spain — Sweden — United Kingdom

1 – AT-Austria, SE-Sweden, DE-Germany, UK-United Kingdom, BE-Belgium, FR-France, ES-Spain, IT-Italy. 2 – House price index in relation to the respective consumer price index for apartment rents (HICP). 3 – Deviation of the credit volume to GDP ratio from its long-term trend.

Sources: Eurostat, ECB, Oxford Economics, own calculations

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the AFS recommended the introduction of **new macroprudential instruments** in June 2015, whose legal basis has now been created.
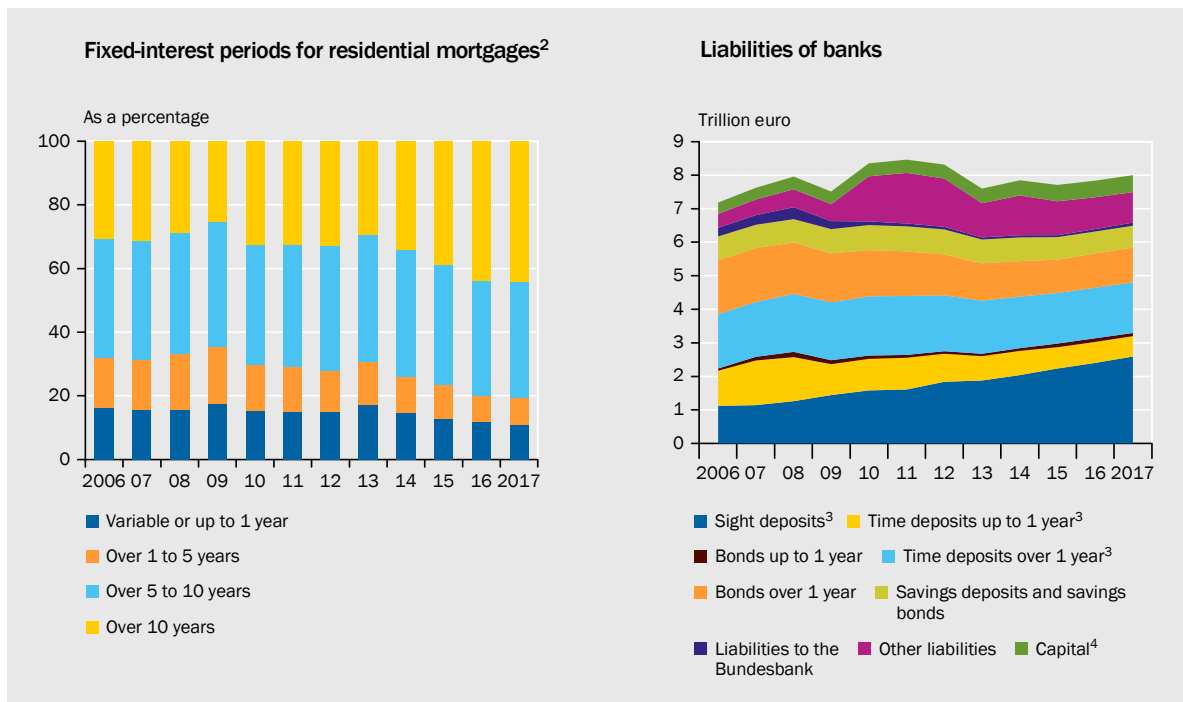↘ ITEMS 487 FF.

474. In other asset markets, prices have also reached a historically high level. But this is not necessarily evidence of the presence of "asset price bubbles". Due to low interest rates alone, bond prices in particular are significantly higher in many countries than they would be without monetary policy interventions, and are very sensitive to interest rate changes (GCEE Annual Report 2015 items 392 ff.). There is thus a **risk of an abrupt price correction on markets for fixed-rate bonds** if interest rates rise (ECB, 2017c).

475. The low interest rate environment creates incentives encouraging increased risk taking, which is described as the **risk-taking channel** of monetary policy (GCEE Annual Report 2015 items 387 ff.). In addition to loosening lending standards, the proportion of home construction loans with long fixed-interest periods has significantly increased in Germany. ↘ CHART 52 LEFT At the same time, the proportion that short-term funding forms make up of bank funding as a whole has increased, ↘ CHART 52 RIGHT meaning that **interest rate risks** are likely to **have risen significantly**. If there were a rapid rise in interest rates, funding costs would increase immediately, which could compress interest margins and put a massive strain on banks. In the life insurance sector too, turbulence could arise in such a scenario (GCEE Annual Report 2015 item 406).

↘ CHART 52

Fixed-interest periods for residential mortgages and liabilities of German banks[1]

Fixed-interest periods for residential mortgages[2]

As a percentage

- Variable or up to 1 year
- Over 1 to 5 years
- Over 5 to 10 years
- Over 10 years

Liabilities of banks

Trillion euro

- Sight deposits[3]
- Bonds up to 1 year
- Bonds over 1 year
- Liabilities to the Bundesbank
- Time deposits up to 1 year[3]
- Time deposits over 1 year[3]
- Savings deposits and savings bonds
- Other liabilities
- Capital[4]

1 – The figures on fixed-interest periods refer to the last quarter of the respective year or the first quarter of 2017. The figures on liabilities relate to the year-end or May 2017. 2 – Residential mortgages comprise secured and non-secured loans that are granted for the procurement of housing, including construction and modernisation. 3 – Includes deposits by banks and non-banks. 4 – Includes published reserves, participation rights capital, funds for general banking risks.

Sources: Deutsche Bundesbank, own calculations
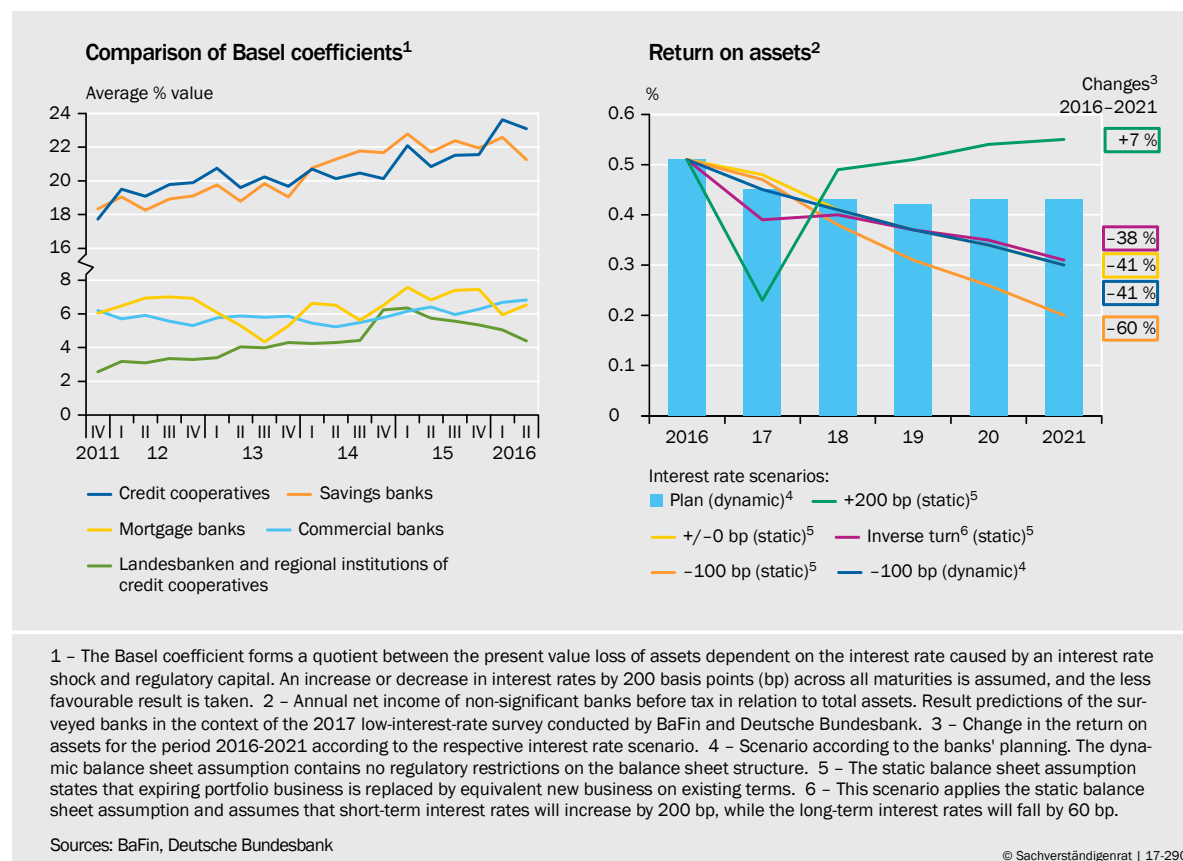
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476. The **Basel interest rate coefficient** (Basel coefficient) can be used to quantify the interest rate risks. It shows the ratio of the present value of the loss in value by the interest-sensitive assets due to a hypothetical interest rate shock to regulatory capital. An abrupt interest rate hike or cut of 200 basis points is assumed across all maturities here. A change in the slope of the yield curve is, by contrast, not taken into account.

   On average, savings banks and cooperative banks have considerably higher **Basel coefficients** than other credit institutions in Germany, and these have **risen** significantly in the past few years. ↘ CHART 53 LEFT Banking supervision considers the interest rate risks to be heightened if the Basel coefficient exceeds the threshold of 20 % of capital. A majority of savings banks and cooperative banks already exceeded this threshold in the second quarter of 2016. The interest rate risks thus have reached a significant level (Deutsche Bundesbank, 2016). Interest rate risks in the banking book are **not covered by the capital requirements in Pillar 1**, but only as part of SREP in Pillar 2, where the supervisory authority has the option of levying a capital charge for interest rate risks.

477. BaFin and Deutsche Bundesbank's **2017 low-interest-rate survey** confirmed the relevance of interest rate risks among non-significant banks (Deutsche Bundesbank, 2017c). In the scenario of an abrupt interest rate rise by 200 basis points, the return on assets falls by more than 50 % in the short term, but in the medium term it rises. ↘ CHART 53 RIGHT In the interest-rate-risk stress test, which

↘ CHART 53
Basel coefficients and return on assets

Comparison of Basel coefficients[1]
Average % value

Return on assets[2]
%
Changes[3] 2016–2021

+7 %
−38 %
−41 %
−41 %
−60 %

Credit cooperatives — Savings banks
Mortgage banks — Commercial banks
Landesbanken and regional institutions of credit cooperatives

Interest rate scenarios:
Plan (dynamic)[4] — +200 bp (static)[5]
+/−0 bp (static)[5] — Inverse turn[6] (static)[5]
−100 bp (static)[5] — −100 bp (dynamic)[4]

1 – The Basel coefficient forms a quotient between the present value loss of assets dependent on the interest rate caused by an interest rate shock and regulatory capital. An increase or decrease in interest rates by 200 basis points (bp) across all maturities is assumed, and the less favourable result is taken. 2 – Annual net income of non-significant banks before tax in relation to total assets. Result predictions of the surveyed banks in the context of the 2017 low-interest-rate survey conducted by BaFin and Deutsche Bundesbank. 3 – Change in the return on assets for the period 2016-2021 according to the respective interest rate scenario. 4 – Scenario according to the banks' planning. The dynamic balance sheet assumption contains no regulatory restrictions on the balance sheet structure. 5 – The static balance sheet assumption states that expiring portfolio business is replaced by equivalent new business on existing terms. 6 – This scenario applies the static balance sheet assumption and assumes that short-term interest rates will increase by 200 bp, while the long-term interest rates will fall by 60 bp.

Sources: BaFin, Deutsche Bundesbank

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was carried out as part of the low-interest-rate survey, the core tier 1 capital ratio decreases by more than one percentage point; 80 % of this effect is driven by valuation losses on interest-bearing assets.
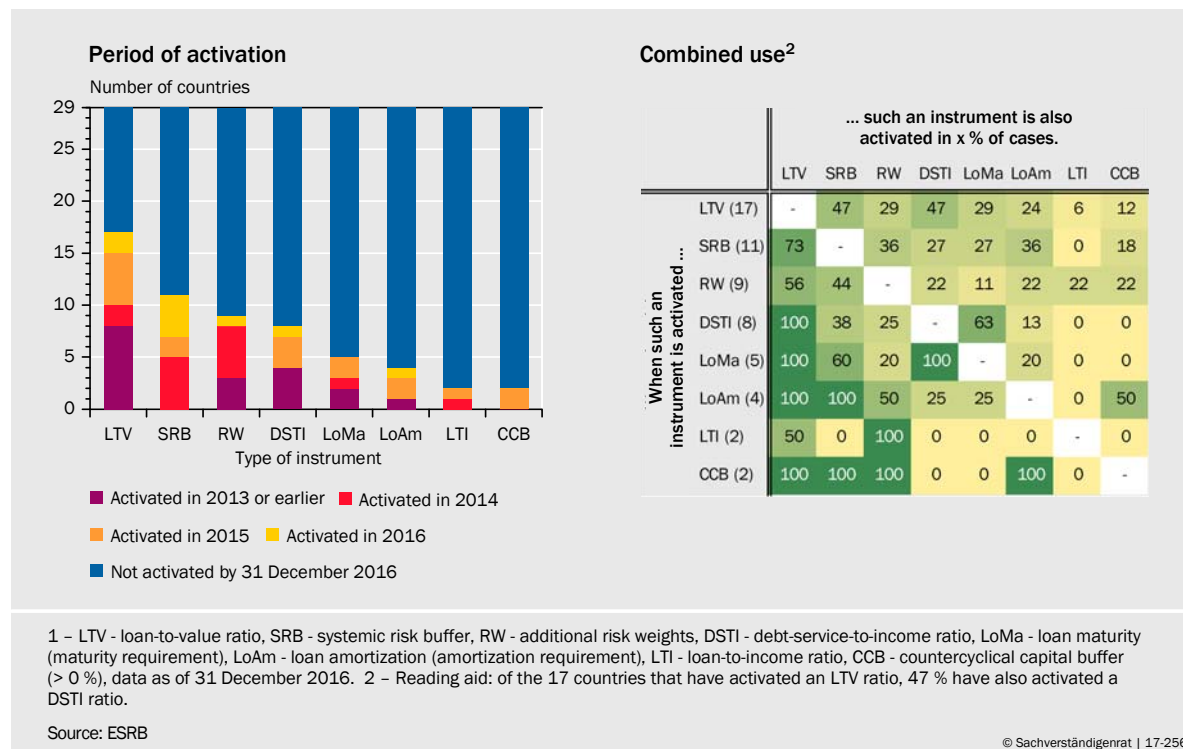
478. In view of the rising interest rate risks, it would seem questionable to conclude from moderate credit growth that financial stability risks are currently low. **Considerable risks** may build up in bank portfolios as a result of a low interest rate environment **even when there is moderate credit growth**. From the perspective of financial stability, a **timely and gradual rise in interest rates** would probably be associated with much less turbulence for the banking and insurance sectors than a rapid interest rate rise. A gradual return to a steeper yield curve could also help to reduce interest rate risks. ⌐ ITEM 385

2. Effectiveness of macroprudential instruments

479. Following the financial crisis, a macroprudential perspective was added to banking regulation and supervision worldwide. For example, a new supervisory architecture was created (GCEE Annual Report 2014 items 375 ff.), which was accompanied by the introduction of a large number of **new macroprudential instruments** (GCEE Annual Report 2014 items 382 ff.). Many of these instruments are now in use in Europe. ⌐ CHART 54 Nevertheless, understanding of how they work and the interactions between various instruments remains limited because comprehensive evaluations of the measures have not yet been carried out.

480. The ESRB (2014a) names four **objectives of macroprudential instruments**, which should also be used as a benchmark in an evaluation of the instruments: (a) to mitigate excessive credit growth and leverage, (b) to mitigate excessive maturity mismatch and market illiquidity, (c) to limit overly high direct and indirect exposure concentration and (d) to reduce misaligned incentives and moral hazard. The instruments introduced with the CRD IV package (the European implementation of the international Basel III accord) apply at individual credit institution level and mostly target the bank's capitalisation (GCEE Annual Report 2014 items 383 ff. and table 16). In addition to the instruments from the CRD IV package, further instruments can be created **at national level**. Prominent examples include **loan-specific instruments** such as the restriction of the loan-to-value ratio (LTV ratio) and **borrower-specific instruments** such as the limitation of the debt-to-income ratio (DTI ratio) or the debt-service-to-income ratio (DSTI ratio). In contrast to institution-based instruments, loan- and borrower-specific instruments directly limit the risk in the household sector.

481. In response to rising risks ⌐ ITEMS 472 F., many European countries have **activated macroprudential instruments**. It can be seen that to date, loan- and borrower-specific instruments have increasingly been used, particularly the restriction of the LTV ratio. ⌐ CHART 54 LEFT The systemic risk buffer has also frequently been used. However, it targets risks in the **cross-sectional dimension** (systemic relevance of financial institutions) rather than risks in the **time dimension** (regulation of the financial cycle; GCEE Annual Report 2014

↘ CHART 54

Application of macroprudential instruments in the EU and in Norway[1]

Period of activation

Number of countries

Type of instrument

- ■ Activated in 2013 or earlier
- ■ Activated in 2014
- ■ Activated in 2015
- ■ Activated in 2016
- ■ Not activated by 31 December 2016

Combined use[2]

| | ... such an instrument is also activated in x % of cases. | | | | | | | |
	LTV	SRB	RW	DSTI	LoMa	LoAm	LTI	CCB
LTV (17)	-	47	29	47	29	24	6	12
SRB (11)	73	-	36	27	27	36	0	18
RW (9)	56	44	-	22	11	22	22	22
DSTI (8)	100	38	25	-	63	13	0	0
LoMa (5)	100	60	20	100	-	20	0	0
LoAm (4)	100	100	50	25	25	-	0	50
LTI (2)	50	0	100	0	0	0	-	0
CCB (2)	100	100	100	0	0	100	0	-

When such an instrument is activated ...

1 – LTV - loan-to-value ratio, SRB - systemic risk buffer, RW - additional risk weights, DSTI - debt-service-to-income ratio, LoMa - loan maturity (maturity requirement), LoAm - loan amortization (amortization requirement), LTI - loan-to-income ratio, CCB - countercyclical capital buffer (> 0 %), data as of 31 December 2016. 2 – Reading aid: of the 17 countries that have activated an LTV ratio, 47 % have also activated a DSTI ratio.

Source: ESRB

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item 364). The use of loan- and borrower-specific instruments in Europe is often not limited to an individual instrument. ↘ CHART 54 RIGHT For example, when a cap for the LTV ratio is used, the DSTI ratio is typically limited at the same time. However, the number of cases is often very low. This is especially true of the countercyclical capital buffer.

482. There is **very little empirical evidence** on the effectiveness of the CRD IV package's instruments in Europe due to its short history. The existing empirical literature on macroprudential instruments is largely based on experience from other countries. It can be seen here that the instruments' effectiveness depends on many factors, such as the characteristics of the country, the phase in the financial cycle, the target variable that the instrument is intended to impact and the type of instrument. ↘ BOX 14

Overall, the empirical literature suggests that **loan- and borrower-specific instruments are particularly effective**. For the EU, Gadatsch et al. (2017) confirm that loan- and borrower-specific instruments have had an economically and statistically **significant curbing influence on credit growth** in the past few years. ↘ BOX 14 In addition, risks in a specific sector, such as the real estate sector, can be combated in a targeted manner. Negative spillover effects on other sectors are less likely than in the case of institution-based instruments. With the exception of targeted increases in risk weights, these generally impact all sectors' loans. They could thus negatively influence lending in other sectors (AFS, 2015).

483. The benefit of macroprudential instruments is lessened by a number of practical problems. This particularly affects the instruments that target risks in the time dimension and are thus intended to be used countercyclically. It is essential that these are activated at the **right time**. If they are activated too early, they could

unnecessarily stifle an upswing without promoting system stability. By contrast, if they are activated too late, they could have a pro-cyclical effect.

484. The danger of **late activation of the instruments** may be intensified by institutional factors. For example, Lim et al. (2013) show that macroprudential measures are more likely to be activated at the right time if the central bank plays an important role in the macroprudential authority. Political influence may, by contrast, delay the use of the instrument. In an extreme case, there may be an **inaction bias**. This is relevant particularly to countries such as Germany where the macroprudential supervisory body (the AFS) is dominated by political representatives (GCEE Annual Report 2014 item 379). Less discretionary leeway and **more stringent rules** for countercyclical measures, such as in the case of the countercyclical capital buffer, may counteract this problem to a certain extent (GCEE Annual Report 2014 items 367, 392). However, they require a good understanding of how the instruments work, which is currently lacking.

↘ BOX 14

The effectiveness of macroprudential instruments

The empirical literature confirms the **effectiveness of macroprudential instruments**. Studies at country level conclude that macroprudential instruments have a significant impact on variables that describe the financial cycle, for example the growth of credit or house prices (Lim et al., 2011; Kuttner and Shim, 2016; Akinci and Olmstead-Rumsey, 2017; Cerutti et al., 2017). Studies on the basis of microdata (Claessens et al., 2013; Ayyagari et al., 2017) and country-specific studies that link the individual data of banks and loans (Aiyar et al., 2014, 2016; Jiménez et al., 2017) come to a similar conclusion.

The effectiveness of the instruments depends on various **factors**: the countries under review, the phase of the financial cycle, the target variable and the instrument itself. For instance Cerutti et al. (2017), Cizel et al. (2016) and Claessens et al. (2013) find that macroprudential instruments are in some cases less effective in industrialised nations than in developing countries, which could be due to the availability of lending alternatives in unregulated areas in the former countries. With regard to the **timing**, it can be seen that macroprudential instruments are more effective the more pronounced the phases of the financial cycle are (Claessens et al., 2013; Cerutti et al., 2017). In addition, there is evidence that they are particularly effective in the upswing phase of the financial cycle (Claessens et al., 2013; McDonald, 2015).

The large number of instruments available means that it is of great importance for macroprudential supervision to know which instrument is particularly effective. Many studies show that **loan- and borrower-specific instruments are particularly effective** for curbing credit growth (Claessens et al., 2013; Akinci and Olmstead-Rumsey, 2017; Cerutti et al., 2017). Cizel et al. (2016) look at instruments that introduce quantity restrictions. These particularly include loan- and borrower-specific instruments. They find statistically and economically significant effects for this group of instruments. Such instruments appear particularly effective in the case of housing loans (Kuttner and Shim, 2016; Akinci and Olmstead-Rumsey, 2017) and loans to households (Cerutti et al., 2017). Within the group of loan- and borrower-specific instruments, the differentiation between the LTV ratio and income-based instruments such as the DTI ratio or DSTI ratio is of interest. However, it is difficult to differentiate the effects of these instruments from each other empirically because they are frequently employed together. CHART 54 RIGHT For example, the studies under review generally find that both types of instrument work. Kuttner and Shim (2016) are an exception. They only find a

statistically and economically significant effect on credit growth for the DSTI ratio, while the effect of the LTV ratio appears to be statistically dependent on the frequently simultaneous use of the DSTI ratio.

There is **less unequivocal empirical evidence** for the effectiveness **of institution-based instruments**. For instance, Cerutti et al. (2017) find no significant effects for industrialised countries, but Ayyagari et al. (2017) do. Cizel et al. (2016) review capital-based instruments that influence the financial institution's internal pricing and find no significant effects for industrialised countries. Akinci and Olmstead-Rumsey (2017) examine a group of instruments that are not aimed at the real estate sector, such as countercyclical buffers and provisions, and find no significant effect for industrialised countries.

Effectiveness of macroprudential instruments in the EU following the financial crisis

The estimation of the effectiveness of macroprudential measures is made harder by the existing **endogeneity problem**. Macroprudential instruments are generally used in response to the development of variables that they attempt to influence. The identification of a causal effect is therefore difficult. Gadatsch et al. (2017) propose a new instrumental variable to **solve the endogeneity problem**. They postulate that macroprudential instruments, particularly politically sensitive instruments, are more likely to be used if the central bank plays a leading role in the decision process. The role of the central bank in the institutional framework of macroprudential supervision has indeed explanatory power for the use of loan- and borrower-specific instruments in the EU for the period after the financial crisis. However, this is not the case for institution-based instruments that are politically less sensitive. Moreover, because the **central bank's responsibility** does not directly influence a country's credit growth, it is a suitable econometric instrumental variable for the use of loan- and borrower-specific instruments.

↘ TABLE 20

Effect of macroprudential instruments on lending in 2015[1]

	Data at bank level		Data at country level
	Baseline regressions	Regressions including additonal control variables	
	Dependent variable		
	Gross growth rate of loans		Growth rate of loans to the private sector
Macropru$_1$	−4.197 **	−1.826 *	−4.204 **
	(0.034)	(0.058)	(0.029)
Macropru$_2$	−2.887 **	−1.168 *	−2.858 **
	(0.035)	(0.062)	(0.030)

1 – The table only shows the most relevant regression coefficients. The full regression results are given in the appendix. Macropru$_1$: index of borrower-specific macroprudential instruments (limitations of the LTV, LTI and DSTI ratios); Macropru2: index of borrower-specific macroprudential instruments (limitations of the LTV, LTI and DSTI ratios; maturity and amortization requirements); p-values in parentheses. ** and * denote significance at the level of 5 % or 10 %, respectively.

Source: Gadatsch et al. (2017)

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Data at bank level and aggregate data at country level is used to estimate the effects of macroprudential instruments on lending. APPENDIX 2 The coefficient of the macroprudential instruments is **negative and statistically significant** in all regressions. However, the level of the coefficient and its statistical significance in the regressions at bank level fall if additional control variables are included. TABLE 20 The activation of a loan- or borrower-specific instrument decreases

credit growth by more than a percentage point, which can be considered an economically significant effect. The results therefore suggest that such **macroprudential instruments** can be **appropriate for limiting lending growth** at country and bank level.

485. The instruments that target the time dimension of systemic risk are typically based on the financial cycle. Measures for the financial cycle such as the credit-to-GDP gap are considered leading indicators for systemic banking crises (Borio and Lowe, 2002; Borio and Drehmann, 2009; CAE and GCEE, 2010; Detken et al., 2014). The financial cycle is, however, a purely statistical concept that has little theoretical foundation.

Using macroprudential instruments at the right time requires a good level of information about the **current position in the financial cycle**. It is a great challenge to measure the financial cycle in real time, and large **measurement errors** are highly likely when doing so. For example, Edge and Meisenzahl (2011) show that the current credit-to-GDP gap can only be estimated with a high level of uncertainty. Furthermore, it is possible that the domestic financial cycle only covers part of the risk potential. For example, according to calculations by Deutsche Bundesbank (2015a), the countercyclical capital buffer would not have been activated in Germany in advance of the global financial crisis due to a negative credit-to-GDP gap.

Another important question relates to the **macroeconomic stabilisation effect and the interaction of macroprudential policy and monetary policy** (GCEE Annual Report 2014 items 365, 394). Structural macroeconomic models including the banking sector allow the investigation of how strongly various macroprudential instruments should respond to loan or asset price development and the extent to which this depends on the systematic reaction of monetary policy to inflation and growth. Due to the high level of uncertainty about suitable modelling of the financial sector and the macroprudential instruments, it is advisable not to optimise policy based on a single model approach, but to identify **robust rules** that achieve an adequate result across different approaches (Angelini et al., 2011; Binder et al., 2017a, 2017b).

486. The **availability of suitable data** is key to designing macroprudential policy. The data situation is frequently unsatisfactory, particularly in real estate, which caused the ESRB in October 2016 to recommend closing data gaps in the area of residential and commercial real estate (ESRB, 2016b). In addition, unlike microprudential supervisors, macroprudential supervisors do not generally have direct access to data. This increases the macroprudential supervisors' dependence on data suppliers, which could limit the effectiveness of supervision. A centralised data warehouse could be an improvement here. ↘ ITEM 466

3. New macroprudential instruments in Germany are inadequate

487. The AFS recommended creating **loan- and borrower-specific macroprudential instruments for the residential real estate sector** at national level in Germany back in June 2015. The AFS (2015) had recommended creating loan- and borrower-specific macroprudential instruments because it did not see the existing capital-based instruments as effective enough to respond to systemic risks arising from the real estate market in a targeted way. The ECB (2016b) had also recommended creating such instruments in all the member states of the euro area, and the empirical literature supports this view. ⊿ BOX 14

The discussion about the completion of the toolkit should be separated from that about the activation of the instruments. The creation of suitable instruments is prudent irrespective of the current risk situation. The creation of the instruments should not be left until risks materialise. Instead, the instruments should already exist to enable a rapid response in the event of rising risks.

488. In Germany, the legal basis allowing the use of loan- and borrower-specific macroprudential instruments in the future was created by the Act Supplementing Financial Supervision Law (*Finanzaufsichtsrechtergänzungsgesetz*) in June 2017. The **AFS's recommendations** were, however, **only partially taken into account**. For example, of the four proposed instruments, only the LTV ratio and the amortisation requirement were implemented, the two income-based measures (the DSTI and the DTI ratio) were not. In addition, the LTV ratio and the amortisation requirement do not apply to follow-up financing when activated. At the same time, the instruments' scope of application is limited through exemptions, de minimis thresholds and excess quotas. In addition, time-consuming consultation obligations were introduced that could impede rapid use of instruments. Commercial real estate did not even feature in the AFS's recommendation. The data requirements recommended by the AFS did not find their way into the law.

489. Precisely the omission of the income-based instruments could **reduce the effectiveness** of the new instruments. The empirical literature considers the LTV ratio and income-based instruments particularly effective. ⊿ BOX 14 Gelain et al. (2013) use a DSGE model to show that the DTI ratio curbs the volatility of credit growth more effectively than an LTV ratio. The DTI ratio works as an "automatic stabiliser", i.e. it has a stronger countercyclical effect (AFS, 2015; He et al., 2016). The reason is that in a real estate boom, house prices tend to increase more than disposable income and loans can be increased in step with the exploding prices. The LTV ratio therefore has a less binding effect than income-based instruments. In the United States, for example, in the course of the rise in real estate prices, the DTI ratio rose from 2000 onwards, whereas the LTV ratio remained constant (Gelain et al., 2013).

490. On the other hand, it is frequently argued that the **German real estate market is structurally particularly stable**. The DSTI ratio observed in Germany is very low in comparison to other European countries. ↘ CHART 55 TOP LEFT The proportion of variable rate loans in house purchases is also very small compared to other European countries. ↘ CHART 55 BOTTOM RIGHT There would thus be some delay before an interest rate increase affected the majority of households. In addition, the rental market in Germany is more important than in other countries (AFS, 2015). The rate of home ownership in Germany is correspondingly low. ↘ CHART 55 BOTTOM LEFT Finally, **transaction costs are relatively high** in Germany (Voigtländer, 2012), and the borrowers are liable to the full extent of their assets. This is different than in some US states, where liability is restricted to the collateral furnished (AFS, 2015).

In terms of the **LTV ratios** observed, however, Germany is not among the countries with the lowest figures. ↘ CHART 55 TOP RIGHT The median value is **mid-table**, whereas the figure for the 9th decile is relatively high in comparison with other European countries.

↘ CHART 55
Key figures of the real estate sector in selected member states of the European Union[1]
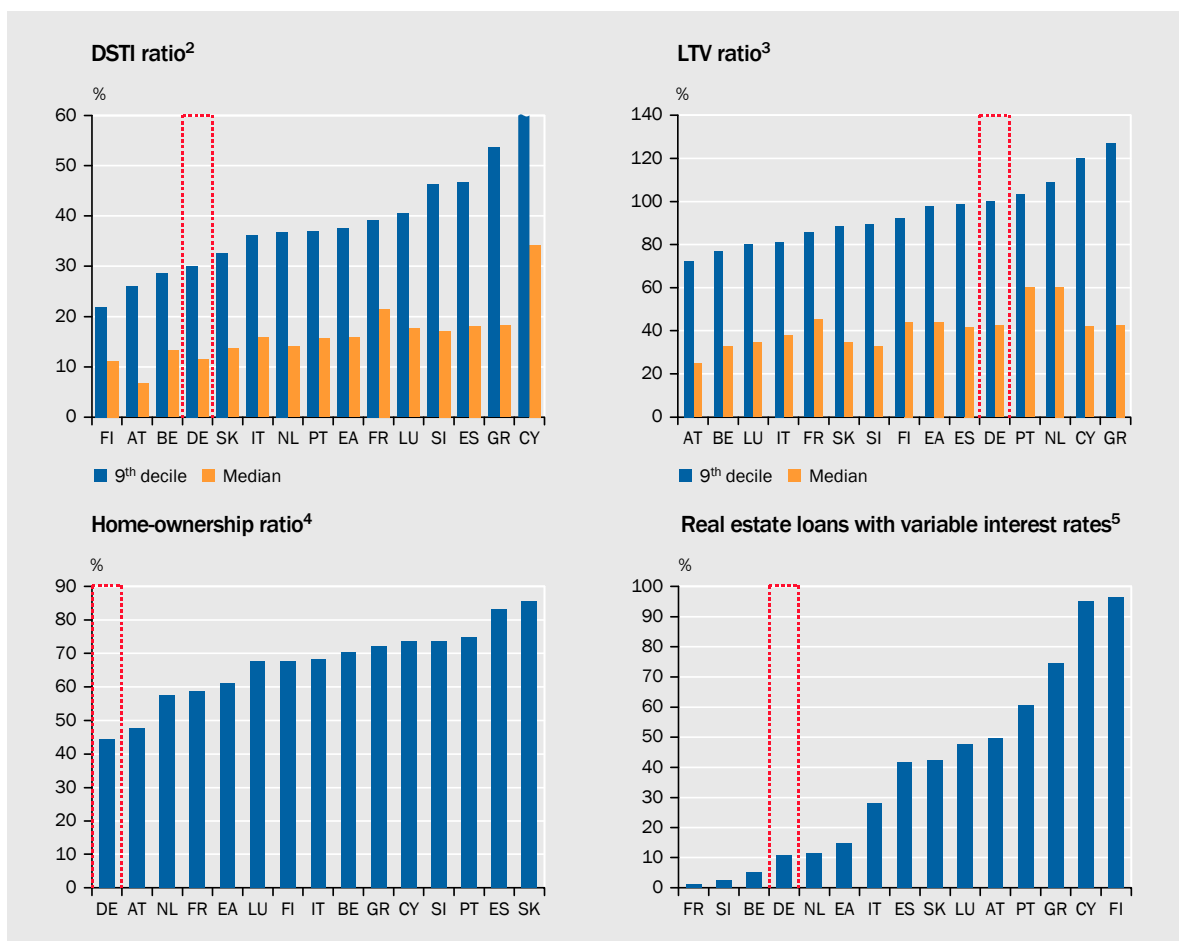
1 – AT-Austria, BE-Belgium, CY-Cyprus, DE-Germany, EA-euro area, ES-Spain, FI-Finland, FR-France, GR-Greece, IT-Italy, NL-Netherlands, LU-Luxembourg, PT-Portugal, SI-Slovenia, SK-Slovakia. 2 – Debt-service-to-income ratio; data from 2014. Figure for Cyprus for the 9th decile is 163.8. 3 – Loan-to-value ratio; data from 2014. 4 – The home-ownership ratio is the proportion of homes inhabited by their owners; data from 2014. 5 – Proportion of new residential real estate loans with variable interest rates or an initial period of fixed interest rates of up to one year; data from March 2017.

Sources: ECB, HFCS

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491. In any case, the structural characteristics of the German real estate market are no valid arguments against **creating the legal basis for such instruments**. After all, the real estate market in Germany is non immune against undesirable developments either, as the experiences in East Germany in the 1990s have shown (GCEE Annual Report 2013 box 26). Particularly in an environment of historically low interest rates, an erosion of lending standards could arise in parts of the banking sector due to a search for yield. Effective macroprudential instruments that can be used in a targeted manner should be readily available for such a scenario (AFS, 2016).

4. Shadow banks on the rise

492. Macroprudential regulations are currently almost exclusively directed towards the banking sector. In view of the stricter regulation in the banking sector, it is, however, feared that risks could migrate to less regulated sectors (**regulatory arbitrage**). Buchak et al. (2017) confirm this empirically for residential mortgages in the United States between 2007 and 2015. Institutions such as the Financial Stability Board (FSB) and the ESRB are therefore increasingly focusing on **macroprudential policy beyond the banking sector**. Financial market players who perform banking functions but are not regulated as banks are described as **shadow banks**. In the broadest definition, which is used, for example, by Deutsche Bundesbank (2015b), the shadow banking sector includes all financial market players that are not part of the group comprising banks, insurance companies and pension funds. The shadow banking sector is further subdivided into **money market funds, investment funds and other financial institutions**, with the latter including, for example, special purpose entities for securitisation.
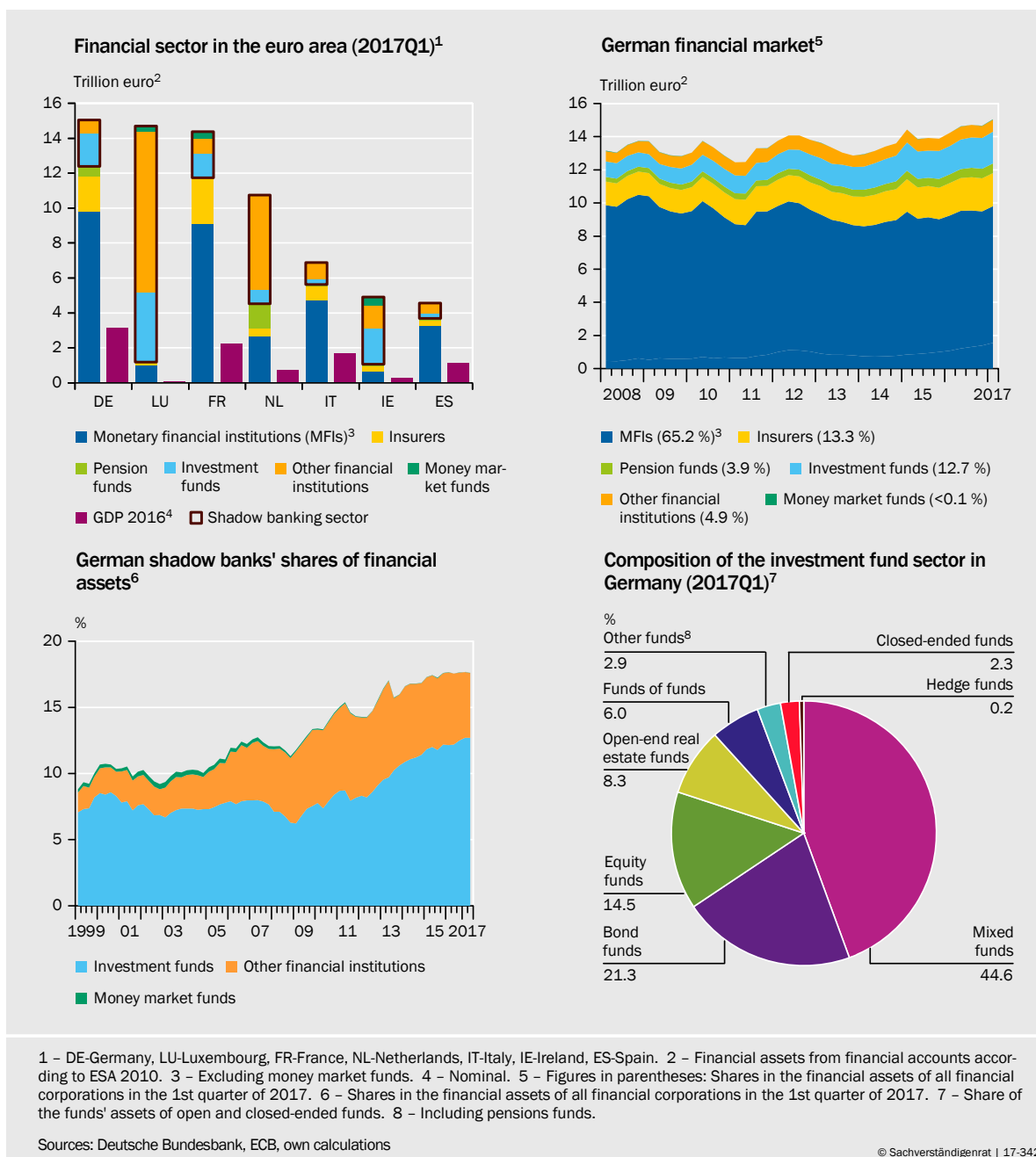
The Financial Stability Board (FSB, 2017a) has developed a **narrower definition of shadow banks**. Only non-banks that engage in credit intermediation and that may pose financial stability risks are classified as shadow banks. The FSB differentiates between five economic functions of shadow banks in its definition: (1) management of collective investment vehicles with features that make them susceptible to runs, (2) loan provision that is dependent on short-term funding, (3) intermediation of market activities that is dependent on short-term funding, (4) credit services and (5) securitisation-based credit intermediation and funding. Pure equity funds and closed-ended funds without leverage are excluded from the narrow definition.

493. A comparison of the shadow banking sectors in the **euro area** shows significant **heterogeneity**. While Germany was significantly below the 42.5 % euro-area average at a share of 17.6 % of the financial assets of all financial corporations as of the first quarter of 2017, Luxembourg, the Netherlands and Ireland are home to significantly larger shadow banking sectors. Luxembourg in particular stands out at a proportion of around 92 %, which is a multiple of its GDP. This could be associated with tax and supervisory advantages and with the accumulation of expertise in the investment fund sector.

494. The shadow banking sector has become more important in Germany and the euro area since the financial crisis. In contrast to the banking sector, the shadow banking sector – and particularly investment funds – have seen **rapid growth**. For example, the share of the financial assets of all financial corporations in Germany accounted for by the German shadow banking sector increased from 12.1 % in 2008 to 17.6 % as at the end of the first quarter of 2017. ↘ CHART 56 BOTTOM LEFT The shadow banking sector is thus similar in size to pension funds and insurance companies combined. ↘ CHART 56 TOP RIGHT The European Capital Markets Union has the aim of strengthening capital market financing and could therefore further boost this development.

↘ CHART 56

Overview of the shadow banking sector

Financial sector in the euro area (2017Q1)[1]

Trillion euro[2]

Monetary financial institutions (MFIs)[3]   Insurers
Pension funds   Investment funds   Other financial institutions   Money market funds
GDP 2016[4]   Shadow banking sector

German financial market[5]

Trillion euro[2]

MFIs (65.2 %)[3]   Insurers (13.3 %)
Pension funds (3.9 %)   Investment funds (12.7 %)
Other financial institutions (4.9 %)   Money market funds (<0.1 %)

German shadow banks' shares of financial assets[6]

%

Investment funds   Other financial institutions
Money market funds

Composition of the investment fund sector in Germany (2017Q1)[7]

%
Other funds[8] 2.9
Funds of funds 6.0
Open-end real estate funds 8.3
Equity funds 14.5
Bond funds 21.3
Closed-ended funds 2.3
Hedge funds 0.2
Mixed funds 44.6

1 – DE-Germany, LU-Luxembourg, FR-France, NL-Netherlands, IT-Italy, IE-Ireland, ES-Spain. 2 – Financial assets from financial accounts according to ESA 2010. 3 – Excluding money market funds. 4 – Nominal. 5 – Figures in parentheses: Shares in the financial assets of all financial corporations in the 1st quarter of 2017. 6 – Shares in the financial assets of all financial corporations in the 1st quarter of 2017. 7 – Share of the funds' assets of open and closed-ended funds. 8 – Including pensions funds.

Sources: Deutsche Bundesbank, ECB, own calculations

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495. The investment fund sector represents the largest part of the German shadow banking sector. ↘ CHART 56 BOTTOM LEFT However, according to a study by Deutsche Bundesbank (2015b), 84 % of its rapid growth between September 2009 and August 2015 can be attributed to **increases in the value of fund assets** and only 16 % can be attributed to **net cash inflows**. The proportions of money market funds and hedge funds are very low in Germany at less than 1 % each. ↘ CHART 56 BOTTOM The shadow banking sector in Germany continues to be **significantly smaller than the traditional banking sector**. However, in view of its growth to around a sixth of the financial assets of all financial corporations and the possible spillover effects from other European countries, the potential financial stability risks cannot be ignored.

5. Systemic relevance of investment funds

496. Due to the rising significance of investment funds, there is increasing discussion of their role in financial stability. This first raises the question of whether private investors making **direct investments** without the involvement of an investment fund as an intermediary would not make the same contribution to systemic risk (Danielsson and Zigrand, 2015). There are several arguments in favour of higher systemic risk from investment funds. For example, investment funds can if necessary employ higher **leverage** and make **different investments** than private investors themselves. Furthermore, there is a danger that investors will place excessive trust in the investment fund's **liquidity and maturity transformation**. Finally, fund managers have **incentive structures** that may lead to undesirably high **risk**-taking (Elliot, 2014; Danielsson and Zigrand, 2015).

497. In comparison to banks, whose systemic importance is generally recognised, investment funds are **less susceptible to crises** because they do not usually promise fixed redemptions. US money market funds are an exception. They experienced runs in the financial crisis when they were unable to keep the promise of a fixed redemption amount (constant net asset value). But even conventional investment funds engage in **liquidity transformation** by issuing units or shares redeemable at any time and investing the funds in less liquid assets. Liquidity transformation has increased in the past few years in the case of bond funds in particular. ↘ CHART 57 RIGHT If a large number of investors simultaneously redeem their units or shares, there is a danger of **liquidity spirals** if too many securities need to be sold at the same point in time. The problems of individual funds can spread to the rest of the financial system via **price externalities**. Herd behaviour and first-mover advantages can amplify such processes. ↘ BOX 15

498. **Exchange traded funds** (**ETFs**) have increased in importance since the financial crisis. A large number of ETFs are **passively managed** and track the performance of stock market indices (Deutsche Bundesbank, 2013; ECB, 2017c). From the customer's perspective, passively managed ETFs have the advantage of a comparatively high level of liquidity and transparency and a relatively low level of management fees (Deutsche Bundesbank, 2013). There is a distinction

between **physical** and **synthetic ETFs**. Physical ETFs invest directly in the index securities. In synthetic ETFs, on the other hand, the portfolio differs from the index to be tracked, while the performance of the portfolio replicates index performance using a swap. This implies a **counterparty risk**.

499. With regard to financial stability, an increase in passive trading strategies in the investment fund sector could increase the correlation in the system and **encourage herd behaviour** (Deutsche Bundesbank, 2011, 2014). In addition, there is a risk that liquidity will concentrate in certain securities included in funds, while decreasing for other securities. In the European ETF market, for example, ETFs mainly track liquid market indices. Although the volume of European ETFs is currently low at a proportion of around 5 % of all open-ended funds (ECB, 2017c), an eye should be kept on this market segment because of its rapid growth.

↘ BOX 15

Systemic risks of investment funds

The traditional banking sector is used as a benchmark to assess the systemic relevance of investment funds. ↘ TABLE 21 Investment funds differ from other financial intermediaries such as banks and life insurance companies in that they typically do not invest on their own account, but in the name of their customers (Elliot, 2014). This means that profits and losses from the fund assets (including any fees) are borne by the customer.

Due to the transformation of short-term deposits into long-term assets, banks are subject to particularly large **liquidity risks**. Therefore, from the perspective of the bank's customer, there is a risk that the liquidation value of assets will not be sufficient to satisfy claims to repayment of deposits (Diamond and Dybvig, 1983). Because investment funds do **not** typically provide for **fixed redemption claims**, their liquidity risks are significantly lower. Nevertheless, liquidity risks may exist if the share certificates can be sold at short notice, whereas the assets are relatively **illiquid**. This may lead to liquidity shocks if there are high outflows (IMF, 2015). Goldstein et al. (2015) empirically show that among bond funds with poor performance, less liquid invested funds are more sensitive to asset outflows than liquid invested funds. **Fire sales** are, for example, conceivable because of **first-mover advantages**. If fund managers sell their most liquid assets first when asset prices fall, there is an incentive for customers to shed their share certificates as quickly as possible in order to avoid future price falls (Elliott, 2014, IMF, 2015). This is particularly the case if a fund's redemption rules pass on the risks from the sale of illiquid assets to the remaining customers (IMF, 2015).

Furthermore, there are differences between banks and investment funds with regard to **risks of contagion**. Banks are interconnected through, inter alia, the interbank market, which serves as protection against liquidity shocks (Allen and Gale, 2000). Individual bank failures can consequently spread rapidly to the entire banking sector. Because the investment fund sector does not operate in a comparable system, contagion effects are lower. However, contagion effects may arise in the event of massive fund outflows if these are accompanied by strong **price distortions**, which in turn negatively impact the liquidity of the assets of other funds and financial intermediaries (Danielsson and Zigrand, 2015). Such outflows can be triggered by **correlated investment strategies** or **herd behaviour by fund managers**. The latter may occur, for instance, if fund managers rely on the same market signals or are tempted into identical investment decisions through competitive pressure (Choi and Sias, 2009; Elliot, 2014). When a single fund is distressed, there may also be incentives for

customers to withdraw their assets from its fund company's other funds. This is known as **brand name effects** (IMF, 2015).

↘ TABLE 21

Differences between banks and investment funds in relation to systemic relevance

	Banks	Investment funds
Liquidity risks, risk of runs:	comparatively high, since interbank and customer deposits can be withdrawn at short notice	comparatively low due to variable repayment claims; possible if shares can be obtained at any time, while investments are illiquid, especially in the presence of first-mover advantages
Contagion risk via institutional interconnectedness		
– within the respective sector:	high, because of strong interconnections via the interbank market	comparatively low; possible via price effects when investment strategies are correlated and there is herd behaviour, or via 'brand name effects' within the same investment company
– between the sectors:	contagion effects from banks to other financial intermediaries high; provision of loans and financial infrastructure	comparatively low; possible via 'step-in' risks, via price effects when investment strategies are correlated, via high leverage or via credit intermediation
Economic functions:	lending, creation of book money and provision of the payment system	possibility to invest small amounts into a diversified portfolio; pension schemes

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Contagion effects may additionally arise between banks and investment funds via what is known as "**step-in risk**". This refers to banks stepping in to support financially distressed entities to which they are connected despite not having any contractual obligations to do so (BIS, 2017). Systemic risks may also arise if funds assume functions typical of banks, such as **credit intermediation**, as is the case, for example, with **credit funds**. In this case, funds' distress could negatively impact credit provision and generate contagion effects if they are sufficiently interconnected with the banking system. Another potential contribution to systemic risk stems from the use of **leverage**. A high level of debt in the investment fund sector may have a **pro-cyclical** effect if the assets held by the fund serve as collateral for liabilities. If prices fall, the value of the securities decreases, meaning that creditors reduce lines of credit and funds could be forced to sell assets. This could contribute to further price falls and affect the entire financial system via **price effects** (ESRB, 2017b). Furthermore, leverage increases **interconnection** and consequently the risks of contagion between the investment fund and the banking sector. For example, distress in the investment fund sector hurts the banking sector through credit defaults, while distressed banks negatively impact funds if funds rely on banks as providers of debt financing.
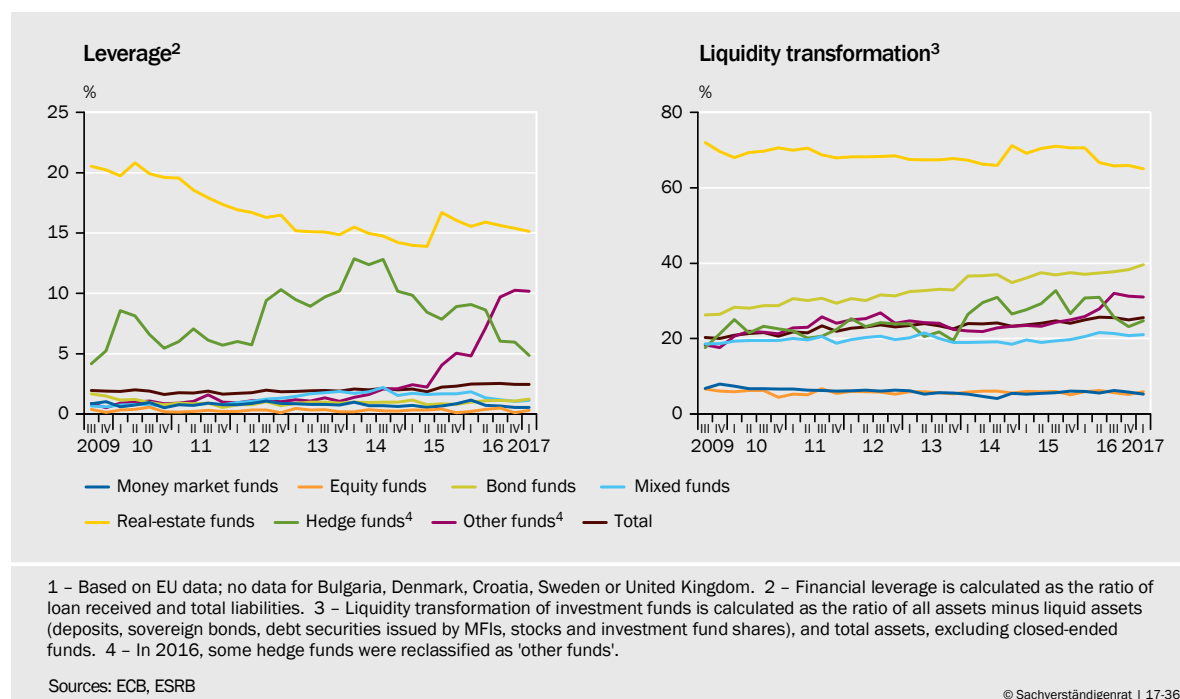
Finally, differences exist with respect to the fulfilment of **economic functions**. Banks grant loans, **create book money** and provide **payment systems** for the rest of the financial and non-financial sector. This further increases the banking sector's high systemic relevance. The investment fund sector, by contrast, enables investors with comparatively low levels of assets to invest in **diversified portfolios**. For this reason, the investment fund sector plays an important role in the accumulation of savings, particularly in **pensions**. It also promotes the investment of private savings in equities and other risky securities and thus contributes to improved risk sharing in the economy.

On the whole it can be concluded that the systemic importance of the investment fund sector is **significantly lower** than that of the banking sector. Nevertheless, it carries potential for systemic risks, particularly if the fund's asset and payout structures exhibit a **liquidity mismatch**, if **leverage** is used extensively, if funds engage in **credit intermediation** and if the **fund volume is sufficiently large** so that asset outflows lead to price distortions on financial markets.

500. In its financial stability review, Deutsche Bundesbank (2015b) classified the change in open-ended investment funds' risk indicators in Germany, with the exception of the strong growth in assets under management, as "stable". The risk from excessive use of leverage was considered low. However, the ESRB (2017b) points out that **European banks are highly interconnected** with entities that comprise the broad measure of the shadow banking sector in the euro area. According to the ESRB, over 8 % of banks' assets are linked to investment funds and other financial institutions from the shadow banking sector in the euro area. The interconnection with the shadow banking sector outside the EU must also be considered. For example, Abad et al. (2017) show that around 60 % of the exposures of European banks to the shadow banking sector are to institutions domiciled outside of the EU. The high degree of interconnection could point to a risk of contagion between shadow banks and the traditional banking sector.

501. The **use of leverage in the European investment fund sector** varies considerably across fund types. For example, the leverage of **bond funds and equity funds is low**. By contrast, hedge funds, real estate funds and other funds employ leverage to a greater degree. ↘ CHART 57 LEFT

↘ CHART 57

Leverage and liquidity transformation in European investment funds[1]

1 – Based on EU data; no data for Bulgaria, Denmark, Croatia, Sweden or United Kingdom. 2 – Financial leverage is calculated as the ratio of loan received and total liabilities. 3 – Liquidity transformation of investment funds is calculated as the ratio of all assets minus liquid assets (deposits, sovereign bonds, debt securities issued by MFIs, stocks and investment fund shares), and total assets, excluding closed-ended funds. 4 – In 2016, some hedge funds were reclassified as 'other funds'.

Sources: ECB, ESRB

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In terms of **liquidity transformation**, as measured by the ratio of all non-liquid assets to total assets, a high level of heterogeneity can likewise be seen in the European investment fund sector. **Real estate funds** engage in considerable liquidity transformation because they invest in long-term assets, while redemption is possible at short notice, at least in the case of open-ended funds. Liquidity transformation by other types of funds is comparatively low. The rise in **liquidity transformation by bond funds** is noteworthy. ↘ CHART 57 RIGHT This could point to a search for yield in the low interest rate environment through investments in higher yielding, less liquid assets.

502. One has to be careful not to overinterpret this aggregate data. The performance of individual funds could differ significantly from the above observations. Furthermore, redemption conditions at fund level play a decisive role. For example, **restrictive redemption conditions** can effectively **counteract liquidity shocks**. In addition, the data does not fully reflect **synthetic leverage**, which is created through the use of derivatives (ECB, 2015b; ESRB, 2017b).

6. Macroprudential regulation of investment funds

503. It is a common misconception that the shadow banking sector is an unregulated area of the financial sector. There is already **comprehensive regulation** at European level in this area. Regulation of investment funds depends on whether they fall under the **Undertakings for the Collective Investment of Transferable Securities (UCITS) Directive** or are classified as alternative investment funds under the **Alternative Investment Fund Managers Directive (AIFM)**. The latter covers hedge funds and private equity funds, for example.

The **UCITS Directive** encompasses far-reaching **quantitative restrictions** on investment strategy. For example, investment may only be made within defined limits in certain assets, such as securities, units in other UCITS-regulated funds, or derivatives. Moreover, there are detailed rules on the volume of **liquid assets** to be held (ESRB, 2016c). The quantitative restrictions of the AIFM Directive are less stringent than the UCITS Directive. There are no direct quantitative requirements on liquid assets, for instance. Instead, redemption terms are to be in accordance with the investment strategy (ESRB, 2016c).

504. The question is whether existing rules are sufficient to not only protect investors and funds at individual level but also **limit the systemic impact** of fund problems. It is possible that fund managers do not take full account of any systemic effects of their investment strategies and redemption terms and conditions. The search for yield in the current low interest rate environment results in reallocation to less liquid assets. In the event of macroecnomic shocks, such as an **abrupt rise in interest rates**, investment funds face a risk of high outflows. If funds do not have appropriate **liquidity management instruments** available, such as redemption gates or swing pricing mechanisms,

there is a risk of fire sales and price spirals, which can affect the rest of the financial system (ESRB, 2016c).

505. A number of initiatives now in place are aimed at **a more macroprudential approach to investment fund regulation**. At international level, the Financial Stability Board (FSB) is actively engaged in investigating potential systemic risks of non-bank non-insurer financial institutions. Following proposed regulation for global systemically important banks (G-SIB) and insurers (G-SII), efforts are now aimed at devising regulation for non-bank non-insurer global systemically important financial institutions (NBNI G-SIFI). In January 2014, the FSB, in collaboration with the International Organisation of Securities Commissions (IOSCO), published a proposal on assessment methodologies for identifying NBNI G-SIFIs. The proposal contains the categories size, interconnectedness, substitutability, complexity and global activities (FSB and IOSCO, 2014). These categories are closely based on those that have already been used to identify G-SIBs and G-SIIs.

506. In January 2017, the FSB also published qualitative recommendations to reduce structural risks in the investment fund sector (FSB, 2017b). Twelve of the 14 recommendations it issued refer to liquidity mismatch and leverage. The aim is to increase transparency through extended reporting and disclosure obligations and set up both **liquidity management instruments** to avoid first-mover advantages and **stress tests**. It calls for consistency in investment strategy and redemption terms, above all, in order to limit liquidity risks. IOSCO plans to develop these proposals by the end of 2017.

507. The ESRB (2016c) suggests **macroprudential stress tests** of investment funds' liquidity management. These could facilitate risk assessment by supervisory authorities and help fund managers to calibrate their liquidity management instruments (ESRB, 2016c). The ESRB (2016c, 2017b) also proposes taking a dual approach for identifying risks within Europe's shadow banking sector. This would imply supplementing traditional **entity-based supervision** with **activity-based supervision**, with the latter based on transaction-related information. Similar risks, even if they concerned completely different entities, could then be identified, in order to limit regulatory arbitrage between sectors.

508. Last but not least, data availability needs to be improved. Such improvement includes, in particular, improving data granularity and the collection of data at fund level (FSB, 2017c). Comprehensive data on individual funds – particularly on their leverage and liquidity transformation – could contribute to more effective collection of information on investment fund sector risks and **early identification** of systemic risks stemming from correlated strategies, for example. **Research** on systemic effects in the investment fund sector is still at an early stage (Danielsson and Zigrand, 2015; IMF, 2015). Improved availability of relevant data could further promote research on the impact of systemic effects of the investment fund sector.

509. It can be noted in conclusion that **risks from the investment fund sector are still significantly lower than those from banks**. Systemic risks can

result in particular from liquidity transformation and from price effects in the event of correlated sales. These could affect the entire financial system. Investment funds are already subject to comprehensive regulation. From the GCEE's point of view, macroprudential stress tests should be considered and appropriate liquidity management ensured. Better data availability could also help to identify investment fund sector risks early on.

APPENDIX

1. Analysis of bail-out expectations

510. Similar to Schäfer et al. (2017), an **event study** approach is applied to examine the bank resolution events in Italy and Spain with a view to the changes in **bail-out expectations** in the European banking sector. If, following a **resolution** or **recapitalisation**, bail-out expectations on the financial markets were to rise, risk premiums for banks would likely decline, which would manifest itself in a decrease in CDS spreads on bank bonds. Moreover, CDS spreads reflect **banking sector risks**, as well as bank-specific risks. If resolutions or bail-outs of banks result in a decline in banking system risk, CDS spreads can be expected to decrease.

511. The event study is based on CDS spreads of all banks in the 28 EU member states and Switzerland, for which time series for five-year **senior** and **junior** CDS spreads are available from Datastream (Thomson Reuters). The data sample contains 39 banks, after adjustment for banks for which prices are not available for a longer period. The data has been winsorized at a 1 % level to minimise the impact of outliers; this means that the values of the highest (lowest) percentile are set to the level of the 99th or 1st percentile. The analysis uses the day-to-day mid-prices (in first differences) of CDS spreads on an end-of-day basis.

    In order to test for heterogeneity, the sample is split into systemically important banks (G-SIB) and banks not considered systemically important (non-G-SIB). The division is based on the FSB selection of globally systemically important financial institutions. Domestic and non-domestic banks are analysed separately. Due to the heightened volatility of CDS spreads of banks undergoing resolution or recapitalisation, the estimates exclude the respective bank in each case.

512. The empirical model for estimating abnormal CDS spread differences is based on the constant mean return model (Campbell et al., 1997). Instead of the traditional two-step procedure for event studies, this empirical model uses a **dummy variable approach** to determine the abnormal changes of the CDS spreads (Karafiath, 1988). The dummy variable is equal to one at an event date and zero otherwise. Coefficients are simultaneously estimated using Zellner's **seemingly unrelated regression model** (1962). The first differences in CDS spreads are regressed on a bank-specific intercept and the dummy variables. The system of equations looks as follows:

$$\Delta CDS_{1t} = \mu_1 + \sum_{n=T-1}^{T+1} \tau_{1n} D_{1nt} + \epsilon_{1t}$$

$$\cdots$$

$$\Delta CDS_{jt} = \mu_j + \sum_{n=T-1}^{T+1} \tau_{jn} D_{jnt} + \epsilon_{jt}$$

$$\cdots$$

$$\Delta CDS_{Jt} = \mu_J + \sum_{n=T-1}^{T+1} \tau_{Jn} D_{Jnt} + \epsilon_{Jt}$$

513. ΔCDS_{jt} denotes the first difference of CDS spreads of bank j at time t, μ_j is the mean of first differences of bank j within the estimation window, and D_{jnt} indicates the vector of the dummy variables. The estimation window contains 80 trading days, the event window three trading days. For all identified events, the coefficient of the event date itself *(T)* and the cumulated coefficient of the event date and the following day *(T+1)*, i.e. of the enlarged event window, are analysed. Furthermore, an additional dummy variable is used to capture potential anticipatory effects on the day prior to the event *(T-1)*.

514. The following table displays the coefficients of the average abnormal difference in CDS spreads of all banks, the coefficients for systemically important banks (G-SIB) and banks not considered systemically important (non-G-SIB), and the difference between G-SIB and non-G-SIB. ↘ TABLE 22 In order to analyse the CDS spread reactions of the respective Italian or Spanish banking sector affected, the coefficients of the domestic banking sector, the non-domestic banking sector and the difference between the two are observed. The enlarged event window (0+1) contains the cumulated coefficients of the event date and the following day. All estimates were conducted for senior and junior CDS spreads. The values in parentheses below the coefficients contain the p-values.

↘ TABLE 22

Reactions of CDS spreads of European banks to resolution events[1]

Event	Date	All banks	G-SIB	Non-G-SIB	G-SIB vs. non-G-SIB	Domestic banks	Non-domestic banks	Domestic vs. non-domestic banks
(1) Monte dei Paschi di Siena: rescue plan based on precautionary recapitalization								
(i) Senior CDS spreads	6.12.16	–1,664	–2,201	–1,350	–0,851	–3,208	–1,374	–1,834
		(0,291)	(0,293)	(0,356)	(0,553)	(0,245)	(0,347)	(0,351)
Extended event window (0+1)		–3,356	–4,808	–2,509	–2,300	**–7,079** *	–2,658	–4,421
		(0,134)	(0,106)	(0,227)	(0,260)	(0,071)	(0,201)	(0,114)
(ii) Junior CDS spreads	6.12.16	–0,384	–1,680	0,371	–2,051	–0,089	–0,440	0,351
		(0,914)	(0,730)	(0,902)	(0,466)	(0,985)	(0,899)	(0,900)
Extended event window (0+1)		–3,273	–4,711	–2,434	–2,276	–1,640	–3,579	1,939
		(0,516)	(0,496)	(0,567)	(0,568)	(0,808)	(0,465)	(0,623)
(2) Banco Popular Español: takeover under the SRM								
(i) Senior CDS spreads	7.6.17	–0,742	–1,636	–0,198	–1,438	**–6,444** ***	–0,239	**–6,205** ***
		(0,524)	(0,301)	(0,846)	(0,152)	(0,001)	(0,833)	(0,000)
Extended event window (0+1)		–2,307	–3,363	–1,664	–1,699	**–9,491** ***	–1,673	**–7,818** ***
		(0,163)	(0,135)	(0,250)	(0,233)	(0,000)	(0,299)	(0,000)
(ii) Junior CDS spreads	7.6.17	–1,851	–2,343	–1,551	–0,792	**–9,048** *	–1,216	**–7,832** ***
		(0,564)	(0,599)	(0,559)	(0,763)	(0,074)	(0,695)	(0,009)
Extended event window (0+1)		–3,194	–4,704	–2,276	–2,428	**–13,749** *	–2,263	**–11,486** ***
		(0,482)	(0,456)	(0,545)	(0,514)	(0,056)	(0,607)	(0,006)
(3) Veneto Banca and Banca Popolare di Vicenza: national liquidation and take-over with state aid								
(i) Senior CDS spreads	26.6.17	–1,658	–1,419	**–1,803** *	0,384	**–3,627** *	–1,277	–2,351
		(0,175)	(0,388)	(0,097)	(0,716)	(0,058)	(0,284)	(0,107)
Extended event window (0+1)		–0,830	–0,102	–1,273	1,171	–2,884	–0,433	–2,452
		(0,632)	(0,965)	(0,408)	(0,435)	(0,287)	(0,798)	(0,235)
(ii) Junior CDS spreads	26.6.17	–3,742	–3,769	–3,726	–0,043	**–8,923** *	–2,740	**–6,183** **
		(0,188)	(0,346)	(0,115)	(0,986)	(0,021)	(0,325)	(0,013)
Extended event window (0+1)		–2,726	–1,471	–3,489	2,018	–6,821	–1,933	–4,887
		(0,499)	(0,795)	(0,296)	(0,562)	(0,213)	(0,624)	(0,163)

1 – Results based on an event study. The abnormal reactions of the CDS spreads were estimated on the basis of a constant mean return model in the context of a seemingly unrelated regression. The analysis looks at the day of the event and the cumulative reaction on the day of the event and the following day. Cf. Schäfer et al. (2017) on methodology.

p-values in parentheses.
***, ** and * denote significance at the level of 1 %, 5 % or 10 %, respectively.

Source: own calculations

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2. Analysis of the effectiveness of macroprudential instruments

515. In an empirical analysis, Gadatsch et al. (2017) use the national design of macroprudential supervision as an **instrumental variable (IV)** for the activation of national macroprudential measures. The hypothesis of the paper is that central bank responsibility in macroprudential supervision influences the willingness to use the measures (Lim et al., 2013). It is also assumed that the form of macroprudential supervision does not directly affect credit growth.

516. The econometric instrument is measured based on an ESRB recommendation on the macroprudential mandate and policy framework of national authorities in the EU (ESRB, 2011, 2014b) This captures **central bank responsibility** ("B3") within the macroprudential authority. The instrument is based on the ESRB assessment (2014b) regarding the B3 recommendation, which calls for the national central bank to play a leading role in national macroprudential policy. The assessment took account of the current legislative status. A higher value on the B3 index indicates greater central bank responsibility. ↘ CHART 58

517. The first-stage estimates indicate that B3 is a valid econometric instrument for borrower-specific macroprudential measures but not for capital-based macroprudential measures in the banking sector. This seems plausible as borrower-specific measures are politically more sensitive than capital-based measures. Hence, the evidence supports the idea that a politically independent central bank is more likely to use politically sensitive instruments to deal with emerging risks.

518. Due to data restrictions, the regressions at bank level are conducted as a single-period IV estimation for 2015. A multi-period IV estimation based on country data was also performed to check for robustness. The estimation equation for the bank-level regressions is:

↘ CHART 58
Responsibility of the central bank (B3)[1]
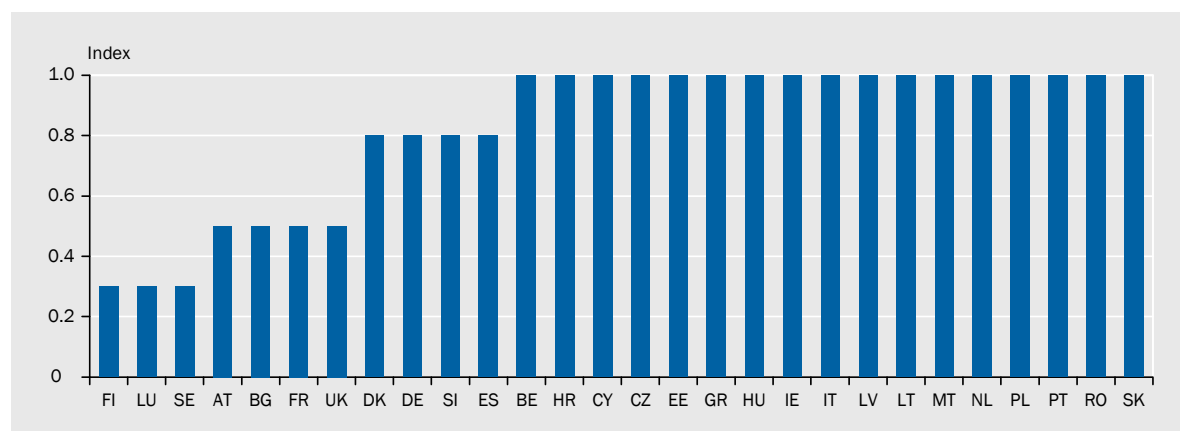
1 – Data basis: ESRB (2014b). The B3 index can take values between 0 and 1 and has a higher index value when the central bank has a higher degree of responsibility in macroprudential policy. FI-Finland, LU-Luxembourg, SE-Sweden, AT-Austria, BG-Bulgaria, FR-France, UK-United Kingdom, DK-Denmark, DE-Germany, SI-Slovenia, ES-Spain, BE-Belgium, HR-Croatia, CY-Cyprus, CZ-Czech Republic, EE-Estonia, GR-Greece, HU-Hungary, IE-Ireland, IT-Italy, LV-Latvia, LT-Lithuania, MT-Malta, NL-Netherlands, PL-Poland, PT-Portugal, RO-Romania, SK-Slovakia.

Source: Gadatsch et al. (2017)

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$$LoanGrowth_{ci}$$
$$= \beta + \gamma LoanGrowth_{ci,2014} + \delta \cdot Makropru_c + \theta X_{c,2014} + \vartheta Z_{ci,2014}$$
$$+ \varepsilon_{ci}$$

$LoanGrowth_{ci}$ is the loan growth (gross) of bank i from country c in 2015, $LoanGrowth_{ci,2014}$ is the loan growth (gross) of bank i from country c in 2014. $Makropru_c$ are indices for borrower-specific macroprudential measures implemented in country c. A distinction was made between $Makropru_1$ and $Makropru_2$ for the analysis. $Makropru_1$ consists of LTV, LTI and DSTI ratios. $Makropru_2$ also comprises maturity and amortisation requirements. If one of the measures is in force in the relevant country, the index value increases by one. The source of data for both indices is the ESRB database of macroprudential measures in the EU. $X_{c,2014}$ and $Z_{ci,2014}$ contain country- or bank-specific control variables. The data was taken from the ECB, Eurostat, World Bank, IMF, Datastream and Orbis Bank Focus. In the first-stage estimations, the indices for macroprudential measures are each instrumented with B3.

Multi-period estimations using instrumental variables were made on the basis of quarterly country-level data to test the robustness of the results. The regression model is now:

$$Y_{ct} = \beta_t + \gamma Y_{ct-1} + \delta Makropru_{ct} + \theta X_{ct-1} + \varepsilon_{ct}$$

Y_{ct} is private-sector loan growth in country c in quarter t. The source of data is the ECB. Time fixed effects were used in the regressions (β_t). Borrower-specific macroprudential measures $Makropru_{ct}$ were instrumented with B3. X_{ct-1} consists of lagged control variables at country level.

519. The results of the bank-level regressions indicate that macroprudential instrumens have a negative and statistically significant effect on loan growth. The value of the coefficient and its statistical significance decline when additional control variables are used. ↘ TABLE 23 The results are confirmed by multi-period estimations based on country-level data. ↘ TABLE 24

↘ TABLE 23

Regression results, data at bank level[1]

Explanatory variables[2]	2015			
	Dependent variable: gross growth rate of loans			
	Baseline regressions		Regressions including additional control variables	
Macropru$_1$	–4.197 **		–1.826 *	
	(0.034)		(0.058)	
Macropru$_2$		–2.887 **		–1.168 *
		(0.035)		(0.062)
L. Gross growth rate of loans	0.416 ***	0.413	0.330 ***	0.329 ***
	(0.000)	(0.000)	(0.000)	(0.000)
L. Growth rate of GDP	0.961 **	0.824	0.491	0.401
	(0.020)	(0.036)	(0.214)	(0.329)
Euro area	–1.444	–0.773	0.665	1.090
	(0.447)	(0.651)	(0.539)	(0.310)
L. Change in the key policy rate	–8.694 ***	–8.886	–7.168 ***	–7.099 ***
	(0.002)	(0.002)	(0.000)	(0.000)
L. Capital ratio	0.004	–0.004	–0.153	–0.151
	(0.983)	(0.981)	(0.282)	(0.286)
L. ROAA			4.195 ***	4.130 ***
			(0.000)	(0.001)
L. Total assets			–1.344 ***	–1.349 ***
			(0.000)	(0.003)
Debt-to-GDP ratio			–0.054 ***	–0.058 ***
			(0.002)	(0.003)
Trade			–0.004	–0.005
			(0.638)	(0.642)
Current account			–0.047	–0.023
			(0.783)	(0.892)
Constant	1.705	1.255	23.140 ***	23.240 ***
	(0.536)	(0.624)	(0.001)	(0.001)
F	12.80 ***	13.50 ***	25.64 ***	23.94 ***
R²	0.171	0.156	0.299	0.297
Number of observations	3 182	3 182	3 179	3 179

1 – Instrumental-variable estimation for 2015. Observations weighted by the number of banks in a country. Standard errors clustered at country level. p-values in parentheses. F indicates the value of the F test and its significance for the instrument in the first stage. ***, ** and * denote significance at the level of 1 %, 5 % or 10 %, respectively. 2 – Macropru$_1$: index of borrower-specific macroprudential instruments (limitations of the LTV, LTI and DSTI ratios); Macropru$_2$: index of borrower-specific macroprudential instruments (limitations of the LTV, LTI and DSTI ratios; maturity and amortization requirements); euro area: indicator variable that assumes the value 1 if a country is a member state of the euro area; trade: sum of exports and imports in % of nominal GDP; current account: current account deficit or surplus in % of nominal GDP; debt-to-GDP ratio: public debt in % of nominal GDP; capital ratio: equity in % of total assets; ROAA: return on total assets; total assets: logarithm of total assets. Variables for which the value of the previous period has been used are marked by "L.".

Source: Gadatsch et al. (2017)

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Regression results, data at country level[1]

Explanatory variables[2]	2015		2011 – 2016	
	Dependent variable: growth rate of loans to the private sector			
Macropru$_1$	–4.204 **		–4.090 **	
	(0.029)		(0.020)	
Macropru$_2$		–2.858 **		–2.777 **
		(0.030)		(0.023)
L. Growth rate of loans to the private sector	0.145	0.170 *	0.253 ***	0.259 ***
	(0.127)	(0.060)	(0.000)	(0.000)
L. Growth rate of GDP	0.029	0.003	0.031	0.010
	(0.664)	(0.962)	(0.675)	(0.892)
L. Debt-to-GDP ratio	–0.090 ***	–0.098 ***	–0.051 ***	–0.054 ***
	(0.004)	(0.005)	(0.010)	(0.009)
L. Change in the key policy rate	–0.667	–0.510	0.050	0.106
	(0.160)	(0.262)	(0.834)	(0.627)
L. Trade	0.014	0.009	0.007	0.004
	(0.272)	(0.544)	(0.351)	(0.573)
L. Current account	–0.729 ***	–0.675 ***	–0.186	–0.155
	(0.001)	(0.002)	(0.171)	(0.283)
Euro area	–0.724	–0.024	–0.953	–0.600
	(0.811)	(0.994)	(0.566)	(0.706)
Constant	10.940 **	11.340 **	6.790 **	6.584 **
	(0.018)	(0.011)	(0.049)	(0.037)
F	17.61 ***	22.81 ***	10.76 ***	11.71 ***
R^2	0.257	0.231	0.089	0.095
Number of observations	104	104	598	598

1 – Instrumental-variable estimation. Standard errors clustered at country level. p-values in parentheses. F indicates the value of the F test and its significance for the instrument in the first stage. ***, ** and * denote significance at the level of 1 %, 5 % or 10 %, respectively.
2 – Macropru$_1$: index of borrower-specific macroprudential instruments (limitations of the LTV, LTI and DSTI ratios); Macropru$_2$: index of borrower-specific macroprudential instruments (limitations of the LTV, LTI and DSTI ratios; maturity and amortization requirements); euro area: indicator variable that assumes the value 1 if a country is a member state of the euro area; trade: sum of exports and imports in % of nominal GDP; current account: current account deficit or surplus in % of nominal GDP; debt-to-GDP ratio: public debt in % of nominal GDP. Variables for which the value of the previous period has been used are marked by "L.".

Source: Gadatsch et al. (2017)

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