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EBA Report

On Net Stable Funding Requirements under Article 510 of the CRR

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Abbreviations

ABSs	Asset-backed securities
ASF	Available stable funding
BCBS	Basel Committee on Banking Supervision
BSS	Balance sheet structure
CCPs	Central Counterparty Clearing Houses
CDS	Credit default swap
CIUs	Collective investment undertakings
CRD	Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC
CRR	Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012
DGS	Deposit Guarantee Scheme
EBA	European Banking Authority
ECA	Export credit agency
EU	European Union
FX	Foreign exchange
GDP	Gross domestic product
HQLAs	High-quality liquid assets
ICC	International Chamber of Commerce
IMF	International Monetary Fund
IPS	Institutional protection scheme
L/C	Letter of credit
LCR	Liquidity coverage ratio
LCR DA	Liquidity coverage ratio Delegated Act
MBS	Mortgage-backed security
MRO	Main refinancing operation
NCBs	National central banks
NPEs	Non-performing exposures
NSFR	Net stable funding ratio
OC	Overcollateralisation
OTC	Over the counter
P&L	Profit and loss
PSE	Public sector entity

QIS	Quantitative impact study
RRE	Residential real estate
RSF	Required stable funding
RWAs	Risk-weighted assets
SFR	Stable funding requirement
SFTs	Securities financing transactions
SMEs	Small and medium-sized enterprises
TLTRO	Targeted longer term refinancing operation
TRS	Total return swap

Executive Summary

Background

In December 2010, the Basel Committee on Banking Supervision (BCBS) announced the introduction of a liquidity coverage ratio (LCR) and a net stable funding ratio (NSFR), to be put in place in 2015 and 2018, respectively.

These regulatory developments responded to the inappropriate funding structures and low liquidity buffers observed during the crisis, where the liquidity and funding positions of banks were seriously hit. Liquidity and funding stresses proved to be lasting over time and led, in many cases, to public interventions. Banks hoarded liquidity, which harmed the funding structures of other banks and other non-bank financial entities. The lack of appropriately stable financing structures thus led to bank failures and costly interventions, contributing to the contraction in credit from banks to the economy. There is clear evidence of the need to intervene through regulations in banking liquidity management.

The LCR promotes the short-term resilience of a bank's liquidity risk profile by ensuring that it has sufficient high-quality liquid assets (HQLAs) to survive a significant stress scenario lasting for one month. It basically sets the minimum liquidity buffer to bridge liquidity mismatches for one month in a crisis scenario. The Basel standard on the LCR was published in January 2013.

The NSFR has a time horizon of one year and requires that banks maintain a stable funding profile in relation to the composition of their assets and off-balance-sheet activities. The Basel standard was published in October 2014.

In June 2013, Regulation (EU) No 575/2013 and Directive 2013/36/EU (CRR/CRD IV) were published as part of the European Union's (EU's) implementation of internationally agreed banking regulatory reforms.

In the area of liquidity, these texts required adequate liquidity coverage and empowered the EU Commission to adopt a delegated act to specify this requirement. The resulting Delegated Act on the LCR was published in January 2015 and was applicable from 1 October 2015.

The CRR contains specific mandates for the European Banking Authority (EBA) to develop draft technical standards and reports related to liquidity and funding in order to enhance regulatory harmonisation in Europe through the single rulebook.

Mandate of the report

Article 510 (1) and (2) of the CRR mandates the EBA to report to the Commission by the end of 2015 on:

- Whether and how it would be appropriate to ensure that institutions use stable sources of funding.

- An assessment of the impact of a stable funding requirement on:

    - the business and risk profile of institutions established in the Union;

    - financial markets;

    - the economy and bank lending, with a particular focus on lending to small and medium-sized enterprises (SMEs); and

    - trade financing, including lending under official export credit insurance schemes and pass-through financing models, including match-funded mortgage lending.

- Methodologies for determining the amount of stable funding available to and required by institutions and on appropriate uniform definitions for calculating such a net stable funding requirement.

This mandate has been complemented by a call for advice from the Commission in June 2015 requesting, in particular, an analysis of proportionality.

By 31 December 2016, the European Commission, considering the EBA report and the diversity of the European banking sector, shall assess the appropriateness of submitting a legislative proposal to the co-legislators on a requirement concerning stable funding.

This report fulfils the cited mandate in Article 510 (1) and (2) of the CRR and the call for advice from the European Commission.

Methodology of the report

This report assesses the externalities that lead banks to choose excessive levels of short-term wholesale funding and why they do not internalise all the costs of their funding's potential instability.

To limit the impact of these externalities, an appropriately designed stable funding requirement (SFR) should aim at reducing the risk of both funding instability and asset illiquidity in the balance sheets of financial entities. This is done by limiting the amount of unstable liabilities that are allowed to fund illiquid or immutable assets and commitments. The Basel NSFR was developed according to this design principle. The Basel NSFR is considered as a starting point and as a benchmark for the final specification and calibration of a stable funding requirement for the EU.

The report includes a description of the current levels of the Basel NSFR for a representative sample of EU banks. This description includes statistics on the evolution of the NSFR levels and on

the ratio's components, along with measures of shortfalls for the whole sample and in each business model category.

The report contains a section describing the impact of introducing a stable funding requirement on the business and risk profiles of institutions. It analyses how non-compliant banks can be expected to restructure their balance sheets to meet the requirement. For this purpose, a simulation method was used. The simulation exercise was run on the overall sample of EU banks and also separately on each business model category. The simulation model assesses, among other things, the impact on lending activity, doing so for each business model category and on an aggregate basis (as one aspect of assessing the impact of a stable funding requirement on the balance sheet structure of banks). This analysis is complemented by a multivariate regression analysis, which explains whether there is a relationship between an improvement of the NSFR and a reduction of their lending activity, particularly their lending to SMEs and public sector entities (PSEs), and of residential mortgages.

The report includes two specific sections that assess the particular impact on trade finance and pass-through financing models of introducing a stable funding requirement and how these transactions would be reflected in the calculation of available stable funding (ASF) and required stable funding (RSF).

The report analyses the potential consequences of introducing a stable funding requirement for investment in financial assets, different funding markets, secured funding, market making, investment banking activities, and the risk capacity of a financial system. The report includes a correlation exercise between total trading book positions (broken down by derivatives and securities financing transactions (SFTs) exposures and other trading book exposures) and the NSFR shortfall.

The report has a chapter dedicated to proportionality, with an impact assessment of its introduction by size buckets.

The report contains a proposal for the definition and calibration of a stable funding requirement. The Basel NSFR calibration is a starting point and a benchmark in the report, but, where necessary, European specificities have been considered.

Data sample and collection process

This report, pursuant to Article 510 (1) and (2) of the CRR, aims to assess the impact of introducing a stable funding requirement for the purposes of developing a methodology for its calibration. The Basel NSFR has been considered as a starting point and as a reference definition for the impact assessment of its introduction in the EU and for the subsequent analysis of the potential needs of a recalibration. In this regard, the data on stable funding reported by institutions in accordance with the ITS on supervisory reporting proved to be inadequate for a calibration report. As a result, the EBA conducted a voluntary exercise for institutions to contribute quantitative impact study (QIS) data based on the Basel templates. The reference data

used in most of the results has been collected as part of the end-December 2014 reporting period (the most recent available date at the time of drafting this report) and is reported according to the final definition of the NSFR (published in October 2014). Therefore, the analysis of this report has considered the final Basel NSFR standard, with the limitation that this is not available for previous data collection dates and is, therefore, not available for the whole historical time series (as the definition has changed during the time the NSFR was discussed by the Basel Committee).

The sample from December 2014 was composed of 279 credit institutions. We have not had a sufficient number of investment firms to be able to develop an analysis that would be robust enough to draw policy conclusions for these institutions. Therefore, the conclusions of the report and its recommendations are limited to credit institutions. The sample represents 75% of total assets in the 28 EU countries and encompasses 13 business models. In some cases, and mainly due to the low number of banks in some of these business models, the quantitative analysis has been complemented by qualitative discussions.

The following points summarise the nature of the quantitative analysis contained in the report:

- For the descriptive analysis of the Basel NSFR of the EU banking sector, only one data period (December 2014) is available to capture the final definition of the Basel standard. However, five dates have been considered for the whole analysis, from December 2012 to December 2014.

- For the assessment of the impact of introducing the NSFR to the real economy and financial markets, it should be noted that:

    - Running the methodology of the simulation exercise only uses one data period (December 2014). This could be seen as a weakness of the methodology if this period were deemed non-representative. However, the fact that the NSFR ratio has a certain degree of stability over time is expected to minimise the risk of drawing conclusions based on a non-representative time sample, even though the short-term funding conditions for banks applied in most EU countries at this point in time have comforted the overall stable funding profile of banks.

    - The regression analysis considers three data points (December 2013, June 2014 and December 2014) for which sufficiently large and comparable samples are available. There is no definition change between the first two of these three periods. The impact for each firm of the definition change between June and December 2014 is estimated and filtered from the data.

    - The correlation analysis conducted for trading book positions is based on these three data points for the same reasons.

For analysing the volatility of the NSFR level, two different samples have been used to study variations over time. First, a sample composed of 88 banks (broken down into buckets of different

bank sizes), which reported NSFR data during the period between June 2011 and December 2014, was used. Second, a broader sample of 237 banks (also broken down by size), data on which was available for June and December 2014, was used.

Consultations

Following the consultation process envisaged in article 510 (2) CRR with the European Systemic Risk Board (ESRB) on methodologies for determining the amount of stable funding available to and required by institutions and on appropriate uniform definitions for calculating a net stable funding requirement, the ESRB submitted its response on 26 November 2015 to the EBA.

In general terms, the ESRB is of view that the NSFR is the best available instrument to address structural liquidity and maturity transformation by banks. The ESRB has already published several documents, discussing the macro-prudential use of liquidity instruments, being the NSFR one of the most prominent. Indeed, the ESRB notes that the ultimate goal of EU authorities should be the implementation of a credible and sound NSFR requirement in the EU.

The ESRB response also addresses the following points:

- The ESRB would support an amendment to Article 458 CRR so that it includes an explicit mention to the NSFR as a potential macro-prudential tool, allowing for a cross-sectional and time-varying application of the NSFR and its components. Nevertheless the ESRB acknowledges that further analytical work is needed to gain experience on the impact and effects of such a macro-prudential tool. Similarly the ESRB would support amendments to Articles 103 and 104 CRD to reflect the introduction of the NSFR in the context of Pillar 2 requirements.

- The ESRB supports relying, in general, on the same RSF and ASF weights as agreed by the BCBS. The opposite would have in their view undesired and unknown effects for the EU banking system, in terms of incentives and systemic liquidity risk.

- A majority of ESRB members is of view that proportionality is not to be applied to the methodology for the computation of the ratio, but rather, to the supervisory reporting of the NSFR. They consider that the liquidity and maturity mismatches which the NSFR aims at addressing are also relevant for smaller institutions. They defend that, as proposed in the EBA report, the same methodology must be defined for smaller and larger institutions.

- The ESRB proposes not to introduce preferential treatment for specific business models unless it is proven that they do not pose systemic liquidity risk.

- The ESRB agrees with the proposed scope of application of the NSFR recommended in the EBA report: on a consolidated basis and individual basis, subject to appropriate waivers or exemptions.

- The ESRB proposes to maintain the reporting of the NSFR by significant currency in line with the EBA report. A majority of ESRB members also proposes to introduce a NSFR requirement by significant currency. The ESRB states that there is a potential systemic risks stemming from transactions in foreign currencies and that macro-prudential tools, being the NSFR one of them, are needed to act to prevent and mitigate them.

- The ESRB is supportive of the EBA report determining the supervisory actions to be implemented in the situation of breach of the minimum level of the NSFR to avoid unintended consequences in terms of financial stability.

- The ESRB also points out that the NSFR can influence the composition of the portfolios of banks (on those items requiring less stable funding), but considers that the essence of the NSFR is not directing the composition of the portfolios but addressing maturity and liquidity mismatches between assets and liabilities.

The EBA has also conducted other consultations. In particular, a public hearing (organised on 15 October 2015), a consultation of the EBA's Banking Stakeholder Group (BSG), and multiple bilateral meetings with diverse stakeholders have been held.

Findings and recommendations of the report

General NSFR framework and calibration

The following is a summary of the findings derived from the analysis conducted in the report. These findings rely on the methodologies and data used (including the identifying assumptions made). While we are able to indicate in relative terms which results are more statistically significant within our analysis, it would not be possible to fully quantify our uncertainty regarding the validity of these results outside these methodologies and in populations other than the sample used here. This is a general potential limitation of econometric investigations: while they are a rigorous way of presenting the information contained in a dataset, they can only be used to support economic judgements and policy conclusions subject to identifying assumptions (e.g. assuming that the sample of past observations studied in the econometric analysis is representative of the population of banks on which the reform will be conducted and which will be subject to the requirement in the future). In particular, the outcome obtained from the empirical analysis (including the quantitative impact of a stable funding requirement in the real economy and in the financial markets) should be read with the necessary caution, largely because of the limitations in data availability indicated in the relevant sections of the report.

To mitigate the externalities leading to excessive funding risks in banks' balance sheet structures, it is necessary to require an appropriately stable funding structure in relation to the degree of asset illiquidity. This design principle underpins the Basel NSFR. The objectives of the NSFR are not already achieved by other Basel III requirements.

Applying the NSFR on a consolidated basis provides an overall picture of a group's funding structure. However, even if a banking group reaches a high NSFR at the consolidated level, this does not always mean that its subsidiaries are individually adequately protected from funding risks, even under a model of centralised liquidity and funding management within the group. This is also the rationale behind the current solo and consolidated requirements on liquidity in the CRR, which envisage, under certain circumstances, waivers for individual requirements and preferential treatment for intragroup transactions or for credit institutions permanently affiliated to a central body in order to alleviate the solo requirements of these banks. The CRR also generally envisages liquidity requirements on a sub-consolidated basis subject to a competent authority's decision.

There seems to already be strong compliance with the NSFR in most EU credit institutions. In a sample of 279 banks in December 2014 (representing 75% of total assets in the EU), 70% of banks are already compliant and only 14% of the banks in the sample have NSFRs below 90%. The average NSFR is 104% for the whole sample. The average NSFR of non-compliant banks is 90.5%. Nevertheless, the shortfall of non-compliant banks in this sample in December 2014 amounts to EUR 595 billion. This significant shortfall is mainly concentrated in a small fraction of banks, where, in some cases, significant and difficult adjustments could be expected.

On the basis of the simulation exercise and the regression analysis, the report does not find strong statistical evidence suggesting a detrimental effect of the NSFR on bank lending. In particular, it does not find a systematic statistical association between lending to SMEs and changes in the NSFR shortfall. These results suggest that the NSFR would not be expected to trigger a large switch to the shadow banking sector, as banks do not appear to need to engage in large deleveraging efforts in order to meet the requirement. These results are, however, based on a single year of observation—2014—due to data availability issues.

The report does not find evidence that the NSFR would result in significant distortions in financial assets markets or trading book positions in banks, but certain assets, like equities, or certain activities, like market making or equity derivatives, might be affected. In particular, the report provides a correlation analysis in which no statistical evidence of a relationship between trading book activities and the NSFR has been found. Banks seem to be able, on average, to increase their NSFR without in parallel decreasing these trading activities. As stated in the previous paragraph, this analysis only relies on data from 2014.

The report has paid particular attention to some transactions of special interest for the industry. For instance, on securities borrowed to cover clients' short sales and interrelated repo and reverse repo transactions, the report concludes that there is a funding risk created by the maturity mismatch between the two sides of these transactions when, for franchise reasons, the providing bank would have an incentive to continue sourcing the security or the cash to its client even when the other counterparty might not be willing to roll over the matched transaction.

For these reasons, even though some adjustment in prices could arise, material consequences in financial markets as a direct result of introducing an NSFR requirement are not expected to

happen. Rather, the suggested calibration of the NSFR is expected to protect against the existing funding risks entailed by these transactions. That said, the EBA stands ready to provide, where needed, further technical advice on the potential impact of the NSFR on derivatives in the context of possible developments at international level in particular.

Special consideration should be given to paragraph 45 in the NSFR Basel standard on interdependent assets and liabilities. This paragraph grants national discretion to apply 0% RSF and ASF factors to certain interdependent assets and liabilities of transactions where certain general criteria need to be met. The implementation of this treatment is proposed for some specific transactions in this report. In the future, specific and new transactions could emerge, for which the application of this treatment could be raised. For these cases, it would be appropriate to consider tasking the EBA with the monitoring and assessment of the appropriateness of the application of this treatment. We recommend a specific mandate to the EBA in the potential legislative proposal on the NSFR to conduct such assessments in the future.

Recommendation 1: A net stable funding requirement (NSFR) should be introduced for credit institutions in the EU.

Recommendation 2: The NSFR should be applied on a consolidated and individual basis, in which case an approach based on waivers and intragroup preferential treatment for the individual requirements of the banks forming part of a group or affiliated to a central body should be considered. Therefore, this recommendation follows the general approach to liquidity envisaged in the CRR, where sub-consolidated requirements are subject to a competent authority's decision.

Recommendation 3: The calibration and definition adopted in Basel fit well with the European banking system, except for those cases where European specificities justify a different calibration of factors for specific transactions. These cases are described separately in the report (see also the table at the end of this section). The report recommends taking into consideration the upcoming Basel review on derivative margining and adopting its recommendations.

Recommendation 4: A minimum amount of available stable funding should be imposed in relation to assets and off-balance-sheet commitments. An appropriate balance is to be set between the liquidity of the assets and the stability of the funding.

NSFR (Net stable funding requirement) = Available stable funding (ASF)/Required stable funding (RSF), where:

- ASF captures all funding sources, weighted by stability factors; and
- RSF captures all assets and off-balance-sheet commitments, weighted by illiquidity factors.

Trade finance

The report considers that there are fundaments to providing specific treatment for off-balance-sheet transactions, where Basel leaves it to jurisdictional discretion, and a differentiated treatment of some particular trade finance on-balance-sheet transactions in relation to their general treatment in the Basel standard.

The proposal is to apply graduated and low RSF factors for contingent trade finance products, reflecting the low funding risk, conversion factors and secured nature of the activity. Indeed, these transactions generally have matched inflows and outflows and are even uncommitted transactions, which could allow the cancellation of the financing in the event of any doubt about the creditworthiness of the obligor. Nevertheless, effective cancellation is dependent on effective monitoring of the financial condition of the obligor and on effective control systems immediately detecting deterioration of the credit quality of the obligor. All of this needs to be considered in the conversion factors and therefore in the RSF factors.

Trade finance on-balance-sheet commitments are considered to have higher funding risk than off-balance-sheet exposures to the extent that the latter need first to be drawn and, therefore, there is originally a lower probability of contingent transactions needing funding. On-balance-sheet transactions need to be funded. But short-term trade finance transactions are not expected to be subject to the same rollover needs as other types of loans to non-financial counterparties. The crisis showed how banks could downsize these transactions in practice. Given that factoring transactions have short-term maturities reflecting the underlying trade of goods and services, a greater differentiation of RSF could be considered within on-balance-sheet transactions.

However, the treatment suggested for trade finance transactions should also consider that excessively preferential treatment could result in these transactions being under-priced (relative to the funding risks and the associated costs considered in general terms) and could create cyclicality in this business over liquidity/credit/business cycles (e.g. with sharp reductions in trade finance in times of bank funding stresses).

Recommendation 5: The calibration of a net stable funding requirement for trade finance-related transactions needs to be differentiated:

- For off-balance-sheet commitments, low and graduated RSF factors are suggested, e.g. 5% if the residual maturity is below six months, 10% if up to one year, and 15% if above one year.
- For on-balance-sheet exposures:
    - in the case of import and export loans, an RSF factor between 10-25% is suggested if the residual maturity is below six months, 50% if up to one year, and 85% if above one year; and

- in the case of factoring/forfaiting, some alternative treatments are suggested, either a similar treatment as for import/export loans, or a lower NSFR requirement or a waiver on a solo basis.

Pass-through models

Relative to pass-through models, the report concludes that, in the case of non-matched funded lending, there is generally a funding risk derived from this mismatch. The existence of an extendable maturity trigger on the bond can mitigate this risk. For fully matched funded lending, the report considers that there is a smaller funding risk, and this risk is probably eliminated if there is no need or incentive for the bank to roll over the loan.

In the particular case of fully matched funded mortgage lending, a stable funding risk is not appreciated. This is for the following reasons: first, there is perfect matching in terms of the amounts and tenors of the cash flows stemming from the mortgages and passed through to the securities holders. Second, there are no reasonable expectations of the funding needed to roll over the underlying loans as they are mortgages (as long as they have long tenor and are amortised). As a consequence, and only for these specific transactions within pass-through models, the implementation of paragraph 45 of the Basel standard on interdependent assets and liabilities, which is envisaged there as exercisable at jurisdictional discretion, seems reasonable. The rest of the pass-through transactions would follow the general treatment envisaged in the Basel standard.

Recommendation 6: The treatment of interdependent assets and liabilities, as envisaged in the Basel standard (as in paragraph 45), is recommended in the case of fully matched funded amortised mortgage lending.

CCPs

Central Counterparty Clearing Houses (CCPs) do not generally rely on maturity transformation and are not expected to rely on short-term funding in order to fund long-term assets and off-balance-sheet activities as captured in the NSFR. Therefore, in these cases, without prejudging the other risks they might run in their activity (which are beyond the scope of this report), CCPs are probably not subject to the type of risk that banking regulation intends to mitigate through the NSFR requirement.

As indicated in recommendation 1, the report proposes the application of the NSFR for credit institutions (as a reminder, the data sample of the report is built on credit institutions) and this includes CCPs with a banking licence. However, the report, for the reasons explained in the paragraph above, considers that CCPs with a banking licence that do not perform maturity transformation could be exempted from the NSFR. Every CCP with a banking licence that performs maturity transformation is, therefore, recommended to be subject to the NSFR.

Recommendation 7: As long as CCPs' activity (CCPs having banking licence) is focused on acting purely as mediators between counterparties without incurring the specific type of banking

maturity transformation risk that the NSFR is designed to capture, CCPs could be exempted from the net stable funding requirement.

Centralised regulated savings

Where banks are required to transfer a pre-determined part of regulated savings accounts' outstanding to a dedicated state-controlled fund that provides loans for public interest operations, where inflows and outflows on the corresponding savings accounts are transferred at least monthly, and where the public fund is legally bound to reimburse the bank in the event of a decrease of the amount of regulated savings due to observed withdrawals, a funding risk does not arise. The part of regulated savings account deposits subject to centralisation in the public fund and the corresponding asset held by the bank are interdependent. Under a similar background, the LCR regulation contemplates the calculation of outflows netted by inter-dependent inflows. A consistent treatment should be applied for LCR and NSFR purposes.

Recommendation 8: In the case of banks due to transfer received customer-regulated savings to a centralised state-controlled fund that provides loans for public interest operations and where there is an institutional scheme of transfer of deposit inflows and outflows to the centralised fund at least on a monthly basis, the corresponding liability towards the retail customer and the claim towards the state-controlled fund should be analysed as interdependent assets and liabilities in the sense of paragraph 45 of the Basel standard.

Residential guaranteed loans

Residential housing retail loans guaranteed by a bank or insurer where, in the event of the default of the borrower, the corresponding loan is transferred by the originating credit institution to the guarantor, which then takes over the recovery process. In exchange, the guarantor swiftly reimburses all funds claimed by the credit institution on the loan. If the guarantor cannot be reimbursed by the borrower, it can benefit from a mortgage on the real estate. Indeed, the guarantee is only provided under the initial contractual agreement that the guarantor can benefit from a mortgage on the real estate in case of default. As a consequence, residential guaranteed loans can become mortgage loans at the end of the process. These loans can be analysed as having the same potential liquidity as mortgages, since they are commonly securitised or used as underlying assets of covered bonds issuances. The RSF factor applicable to mortgages should, therefore, also be granted to residential guaranteed loans.

Recommendation 9: Residential loans guaranteed by banks or insurers who, in the case of default of the borrower, would repay the loans to the originating credit institution and contractually benefit from a mortgage on the real estate should be assimilated into mortgage loans and have an equal treatment under the NSFR.

Analysis of the NSFR by banks' balance sheet size

The analysis reveals that the relative or absolute size of banks is not an impediment by itself to compliance with a net stable funding requirement. Moreover, there does not seem to be

evidence that the impact on lending activity derived from the introduction of NSFR requirements would be different among different categories of banks and particularly among banks of different sizes. The report also explains that, from a conceptual perspective, size is not necessarily the right criterion to measure the benefits of a regulation on a stable funding requirement. Indeed, the aggregated impact of fragilities in the funding structures of smaller banks could have a very large magnitude and should not be underestimated. The supervisory experience also shows that funding risk is not necessarily lower if banks are smaller. The report, therefore, does not suggest the exemption of a stable funding requirement based on banks' size. Nevertheless, the report recommends (in recommendation 2) the application of the general treatment of waivers of individual liquidity requirements in the CRR for NSFR requirements on a solo basis in the case of banks forming part of a group or institutions being permanently affiliated to a central body.

A volatility analysis of the NSFR for different bank size buckets has been conducted. It has been undertaken on the basis of two different samples. One sample is based on a very narrow sample (88 firms, including 14 small ones) for the period between June 2011 and December 2014. The other sample is broader (237 firms, including 88 small ones), but only for the data observed for two dates: June 2014 and December 2014. As a result, this analysis does not show a clear relationship between the size and the variation of the NSFR and cannot be used to make a recommendation to introduce differentiation. It should be noted that this is the result of an approach fully based on bank size. We cannot disregard that other approaches to proportionality based on different variables could lead to different outcomes. More generally, the EBA stands ready to conduct further work on possible metrics for an effective application of the principle of proportionality.

Recommendation 10: Following the analysis described, smaller banks should be subject to the same stable funding requirement as the rest of the banks.

Furthermore, the volatility analysis does not provide clear substantiation for differentiated reporting requirements for smaller banks. Nevertheless, the possibility of providing smaller banks with reduced frequency and/or lower granularity reporting requirements will be further explored by the EBA on the basis of the relevant mandates in the context of the necessary future update of the ITS on reporting on a net stable funding requirement. The cost-benefit analysis will explore the implementation cost of the reporting requirements for smaller banks in particular, depending on the granularity and the frequency of these requirements.

Flexibility

The report assesses the rationale of the NSFR under the Basel standard where the flexibility of the ratio reaching levels below 100% is not contemplated. A net stable funding requirement is not calibrated to reflect stress and does not provide for a buffer that is intended to be used in times of stress. Moreover, the NSFR is a structural ratio calibrated to match a one-year maturity horizon; therefore, it changes more slowly over time, including in times of stress. Furthermore, an explicit reference to supervisory flexibility could also weaken the NSFR requirement.

Recommendation 11: The net stable funding requirement should be equal to at least 100% on an ongoing basis.

Where an institution expects not to meet the net stable funding requirement, it shall immediately notify the competent authority. It is expected that the supervisory dialogue between the competent authority and the supervised institution subject to the net stable funding requirement is intensified in cases where this requirement would experience a sudden or regular decrease towards the minimum of 100% in order to understand the rationale for such a deterioration, and if it is of a structural or conjunctural nature or if it is of an idiosyncratic or more systemic nature.

In the same way, where an institution no longer meets the net stable funding requirement, it shall immediately notify the competent authority and submit without undue delay a plan for the timely restoration of the requirement to a level above 100%. The competent authority shall monitor the implementation of the restoration plan and shall require a more speedy restoration if appropriate.

Other findings and discussions

Credit unions

Not-for-profit financial co-operatives, otherwise known as credit unions, have a significant presence in some EU jurisdictions. Their lending activity and their funding are concentrated on their members. Generally, they are limited (mainly for legal reasons) to investing their excess liquidity in specific items, namely government bonds and bank deposits. Their liquidity risk profile (stability factors) is considered in the LCR DA to be the same as that of non-financial institutions.

The report highlights potential unintended consequences if the same approach as in the LCR DA is not followed in the NSFR for bank deposits they make below six months (i.e. if credit unions are not treated as non-financial customers when acting as bank depositors).

The NSFR and currencies

The report includes a discussion on the pros and cons of an NSFR by significant currency. The report considers that the reporting of the NSFR by significant currency is something already envisaged in EU legislation.

The conclusions in the draft report do not show major deviations from the Basel NSFR. Nevertheless, some specifications have been made, mainly based on existing national discretion:

Item	Basel	Report
Trade finance	Off-balance-sheet: national discretion; On-balance-sheet: general treatment on loans to non-financials: RSF: 50% if < 1 y and 85% if above 1 y.	Off-balance-sheet: 5% RSF (< 6m), 10% (6m-1 y) and 15% (> 1 y); On-balance-sheet: 10%-25% RSF (< 6m) and as Basel if > 6m. Factoring, alternatively, could also have a lower NSFR or waiver.
Interdependent assets and liabilities	National discretion with minimum criteria to be met.	The report suggests it for match-funded mortgage lending and centralised regulating savings.
CCPs	No specific mention.	The report suggests waiving CCPs from an NSFR.

The conclusions in the draft report would contemplate derogations in similar cases where they are considered in the LCR regulation:

Item	Report	LCR
Centralised regulated savings	Suggests applying the treatment of interdependent assets and liabilities (0% RSF and 0% ASF).	Under a similar background, the LCR regulation contemplates the calculation of outflows netted by inter-dependent inflows.

Credit unions	Highlights potential unintended consequences if the deposits received from credit unions with a maturity below six months are applied a different ASF factor than that applied in the case of deposits received from non-financial customers.	The LCR regulation applies to deposits received from credit unions, the same outflow rate as that applied in the case of deposits received from non-financial customers.
Factoring	Suggests a preferential treatment in terms of RSF factors, a lower NSFR, or a waiver.	The LCR regulation envisages a potential exemption from the inflow cap for banks specialised in factoring.
Fully matched funded mortgage lending in pass-through business models	Suggests applying the treatment of interdependent assets and liabilities (0% RSF and 0% ASF).	The LCR regulation envisages a potential exemption from the inflow cap for inflows from loans related to this business model.

1. Motivation for introducing a stable funding requirement

One of the key tasks performed by banks is liquidity and maturity transformation. However, the level of mismatch they choose to support in their balance sheets can be excessively high because of externalities such as interconnectedness (which means that liquidity hoarding by one bank would impact other banks), the impact of fire sales, and expectations of public support. These externalities lead banks to issue more instable liabilities than they would if they internalised all the costs to others, including the rest of the financial system, the broader economy, and taxpayers.

The appropriate policy response to limit these externalities consists of limiting the risks of both funding instability and asset illiquidity. In the balance sheet of financial intermediaries, this can be done by measuring the stability of liabilities and the need for stably funded assets (where continued funding represents an important business commitment, or where terminating or liquidating the asset could be operationally difficult). Following these principles, the Basel Committee developed the NSFR. Such a requirement is needed in addition to the solvency requirements (capital and leverage ratio) and the LCR, because these existing requirements miss important aspects of structural funding stability.

To tie these principles with practice, there is a growing body of empirical literature that points to the effectiveness of stable funding requirements in reducing bank failures and banking crises. Thus, the economic literature on the topic (i) makes a convincing case for a regulatory intervention to improve banks' funding stability; and (ii) suggests the introduction of a stable funding requirement for achieving this objective.

1.1 Liquidity externalities

One of the key tasks performed by banks is maturity and liquidity transformation: they finance some illiquid but economically important activities. On the liability side, many of banks' liabilities are considered very liquid instruments for investors. For instance, deposits can be directly used to make payments.

But the level of mismatch they support in their balance sheet can be excessively high because of externalities. When a bank chooses its balance sheet structure, it does not consider all the implications of its choice on the rest of the economy. Because more stable types of funding are sometimes more expensive, some banks may choose a funding structure that is more cost

efficient for them in the short term but also potentially more fragile in the long run. This fragility can cause damage:

- to other financial intermediaries (via interconnectedness and through the impact of fire sales); and
- most importantly, to the rest of the economy, which will suffer from a credit reduction every time significant parts of the financial system have trouble refinancing their own liabilities unless a public intervention mitigates this.

Thus, when banks choose their balance sheet structure, they may choose an excessively fragile funding profile because they do not sufficiently internalise the costs of doing so—these costs accrue elsewhere.

There are three externalities that lead banks to take on, ex ante, an excessively short-term or unstable funding profile relative to the illiquidity of their assets.

1.1.1 Interconnectedness

Banks are interconnected, both in a transaction sense (through balance sheet exposures) and in an informational sense—in the sense that investors may treat a category of debtors as an undistinguished class, or in the sense that counterparties may worry not only about their own creditors, but also about who their creditors' creditors might be, and so on. Moreover, if financial institutions tend to face correlated shocks, then transactional and informational connections are reinforced.

To the extent that the short- or medium-term debt of a financial entity is funded by other financial entities, the liquidity requirement imposed on the latter (the set of banks) benefits the former because it makes the latter less likely to stop rolling over their funding and hoard liquidity for their own survival. Thus, imposing a liquidity requirement on the financial entities that provide credit to another financial firm (or are seen to be similar) would reduce the probability of a run on that borrowing (or seemingly similar) financial firm. Hence, the benefits from improved liquidity structures do not accrue in their entirety to those firms that undertake such improvements. This leads to suboptimal efforts being exerted by banks if they are left to their own choice. In order to make all banks in the system safer, each bank should be required to meet a minimum standard and no bank should be allowed to free ride on the efforts made by others to improve their own funding stability and the financial system's overall stability.

1.1.2 Fire sales of securities used as collateral

What the academic literature has described as 'fire sale externality' constitutes a particular form of interconnectedness that is worth mentioning on its own. Banks issue secured short-term debt, which is particularly attractive to some investors, collateralised by pledging securities, the value of which covers the amount borrowed. In a situation where either (i) the value of securities is affected by a negative shock; or (ii) some banks sell securities in fire sales to honour their short-

term debt contracts, a feedback loop might start whereby the ability of all other banks to use the same types of securities as collateral is diminished, leading them to sell these securities since they can't fund them anymore. This, in turn, aggravates the dislocation of the price of these securities on secondary markets, increases valuation uncertainty and price volatility, and further depresses their value as collateral in repurchase agreements (repos). Such adverse feedback loops can be mitigated if banks are better able to withstand liquidity shocks and if it is ensured that they collectively rely on such short-term financing in a proportionate manner.

1.1.3 Moral hazard – socially costly bailouts

As noted in Farhi and Tirole (2012), governments and central banks would be unable to credibly commit not to rescue the banking sector in a liquidity crisis—indeed, a key function of central banks is to be a lender of last resort and the government's debt capacity should provide insurance against the worst macro shocks. Such rescues in liquidity crises have entailed abnormally loose monetary policy, exceptional government debt guarantees aimed at stabilising banks' funding, and a broadening of the range of collateral accepted at the central bank. These are costly interventions. Their cost is felt broadly through far-reaching economic impacts.

But since they expect a rescue in case of crisis, banks tend to choose to issue more runnable liabilities than they would otherwise (in the absence of this expectation). 'Lender of last resort' is a policy destined to avoid coordination failures and bank runs. This useful policy has the unintended but probably unavoidable consequence of introducing a moral hazard: it gives incentives for banks to act less prudently. Banks should be held to a regulatory standard in order to counter this type of incentive.

1.1.4 Exuberance and performance benchmarks

Lastly, collective exuberance has led banks in the past to rapidly grow their balances during credit booms, relying on unstable sources of funding, in an attempt to meet performance benchmarks, each one vis-à-vis its competitors. A stable funding standard acts as a brake against excesses and contributes to preventing booms, justified by improvements in macroeconomic fundamentals, from becoming credit-fuelled exuberant episodes that burst with real and severe economic consequences.

1.2 Addressing these externalities: a stable funding requirement

Given these externalities, a policy intervention is needed. The appropriate approach to limiting these externalities is to reduce the risk of both funding instability and asset illiquidity in the balance sheets of financial entities.

Both funding risks and asset illiquidity risks should be tackled by a policy intervention that aims to reduce the risk of a run on a financial entity. Here, run should be understood not so much in the sense of a depositor run on a bank as in the modern sense of a coordination of those amount its creditors who have the contractual ability and sophistication to try and withdraw their funding

ahead of other in times when they think others are likely to reason in a similar manner. In a modern and more general sense, a run is a coordination of creditors who rush to the exit in order to avoid being trapped in a bankruptcy or resolution. In a stress situation, such an adverse coordination of short-term creditors on a run is all the less likely since the bank has better capacity to withstand funding shocks. That capacity depends on (i) the ease with which assets could be pledged or sold without impairing the bank's business model or going concern value; and (ii) the total amount of funding that could potentially be withdrawn in a run. Thus, the intermediate objective of the externality limiting policy should be to ensure that each bank has amounts of stable funding that are sufficient, in relation to the portion of its assets that it could not reasonably dispose of or pledge without critically injuring its business.

This can be done by reviewing each asset, each liability, and also the relevant off-balance-sheet commitments at a horizon of one year, and measuring:

- for liabilities (and equity), and the extent to which they would remain stable (i.e. cannot or are unlikely to be withdrawn);

- for assets, and the extent to which they need to be stably funded (because continued funding represents a business-essential commitment or because no cash or funding could be obtained through pledge or disposal); and

- for other (off-balance-sheet) transactions, and the extent to which they may drain collateral.

The aggregate measure for liabilities should then be compared to the aggregate measure for assets in order to determine the depth of the mismatch (i.e. the amount of risk taken). This methodology, because it looks at each type of activity that banks engage in on both sides of their balance sheet, enables the standard to be adapted to very different business models. If a bank's assets are predominantly liquid securities, then its liabilities need not be as stable as those of a bank that invests in illiquid loans; setting weights on assets and liabilities before connecting the two sides enables the standards to apply to all business models.

When following this method, a set of assumptions should be made to attribute weights to each of the components.

First, the relevant measure for both assets and liabilities is largely behavioural—not just maturity based; highly liquid assets, even with long maturities, do not represent high risks. Similarly, some short-dated claims with highly sticky behaviour (e.g. fully insured retail deposits) do not represent a high funding risk.

Second, as the illiquidity of assets and the instability of liabilities are endogenous and interlinked, measurement should be done in a manner that is robust, even in adverse circumstances.

Third, the weights should take into account not just the resilience of an individual bank, but also—where it could lead to a different assessment—the resilience of the financial system as a whole.

For instance, chains of rehypothecation with collateral passed on between financial intermediaries to secure an influx of short-term funding pose fire sale risks. Setting higher weights for these transactions when they are recorded as assets, compared to when they are recorded as liabilities, enables the measure to take into account the risks from long intermediation chains.

These considerations guide the method for setting ASF and RSF factors. Requiring that a bank's total ASF is sufficient in relation to its total RSF is equivalent to imposing the condition that the ASF/RSF ratio be no less than 100%.

1.3 A stable funding requirement in addition to existing requirements

If these frictions are considered an important concern, do they justify introducing an NSFR in addition to the current capital adequacy requirements and the LCR? The key consideration is whether the NSFR would usefully complement existing requirements, or whether these frictions could already be addressed by capital adequacy and the LCR.

The LCR does not address the frictions considered here, because it is a flow rather than a stock measure and it ignores the coordination of flighty depositors beyond a one-month horizon. The LCR might be seen as a backstop that gives regulators and the government breathing space to decide on an appropriate course of action. If the affected bank meets capital requirements and has a strong stable funding requirement, it may be able to gradually re-access market funding. Otherwise, it may be necessary to provide a bridge towards a new structure. In both cases, the LCR offers time to make better decisions, while a strong stable funding requirement and good capital position decrease the likelihood that a bank may face a run.

Leverage ratios also measure stocks, but not the ones identified by the literature cited here. They ignore the stock of insured retail deposits as a proportion of the balance sheet, which is a stable source of funding. In other words, a bank can meet a 10% leverage ratio requirement and still fund up to 90% of its balance sheet with wholesale funding at maturities ranging from a few months to a year—therefore not captured by the LCR either. If a large fraction of this bank's assets are illiquid, it may be vulnerable to runs.

1.4 Effectiveness of a stable funding requirement

The effectiveness of a stable funding requirement relies on its capacity to improve the resilience of individual banks and the banking system. A fast-growing body of literature has developed in the past few years to deal with this issue. It assesses, for a sample of banks considered in various countries and time periods, whether the existence of a stable funding requirement, to which they would have been subject, would have significantly diminished the number of failures relative to what happened in the absence of such a requirement. The answer is yes if, in a regression, low levels of stable funding relative to asset illiquidity result in a higher probability of failure, public assistance, or large cuts to real economy lending. Other studies control for other explanatory

variables (such as capital ratios, the LCR) and provide an additional degree of evidence that a stable funding requirement is an effective policy.

As Figure 1 shows, existing empirical studies are distinguished by the (i) sample, (ii) dependent variables, (iii) SFR tested, and (iv) major controls they used. They all find that SFRs have a statistically significant impact on the dependent variables.

A notable contribution is the International Monetary Fund (IMF) Working Paper produced in 2012 by Francisco Vazquez and Pablo Federico: *Bank Funding Structures and Risk: Evidence from the Global Financial Crisis*. It explores systematic differences in the relationship between structural liquidity, leverage, and the subsequent probability of failure across bank types (globally active banks and domestically focused banks). The authors compute the leverage ratio and estimate the NSFR for a sample of banks using publicly available data (Bankscope). They then assess the power of each bank's pre-crisis levels of the NSFR and the leverage ratio to predict the subsequent probability of failure, controlling for some measures of risk taking. They find a significant impact for both variables: higher levels of the SFR or the leverage ratio decrease the probability that a bank will subsequently fail. The impacts are somewhat more pronounced for the subset of banks with low leverage ratios and low SFRs.

Huang and Ratnovski (2011) model what they call the 'dark side' of bank wholesale funding; they describe how providers of short-term wholesale funding have lower incentives to conduct costly monitoring, and may instead withdraw based on negative public signals, triggering inefficient liquidations.

Bologna (2011) tests the role of different banks' liquidity funding structures to explain the bank failures that occurred in the United States between 2007 and 2009. The results highlight that funding is indeed a significant factor in explaining banks' probability of default and confirms the role of funding as the driver of banking crises. Based on this, the author recommends a stable funding requirement.

Dagher and Kazimov (2013) find that banks that were more reliant on wholesale funding curtailed their credit significantly more than retail-funded banks during the global financial crisis. Their empirical approach enables them to separately identify demand for credit and supply of credit, and they are thus able to make this point while controlling for the simultaneous decrease in credit demand.

Using detailed supervisory data on the Colombian banking sector from 1994-2012, Haman et al. (2013) find that shifts from low non-core liability ratios to higher ones during the upward phase of the leverage cycle can be early warning indicators of financial vulnerability in the system.

Lallour and Mio (2015) examine the empirical predictive power of various stable funding ratios (SFRs) in identifying (a) banks' problems in the recent crisis, and (b) risk-taking appetite, measured by their asset growth during the crisis. They find that funding metrics are a key predictor of future failures in times of crisis, which shows that a solvency-focused regulatory approach is insufficient

to achieve resilience in the banking sector. In particular, a simple deposit-to-asset ratio has very strong predictive power in both dimensions (failures and lending contraction), and a number of SFRs have good predictive power, even once controlling for capital ratio, leverage ratio, and a proxy for the LCR. The sample contains more than 100 (mostly internationally active) banks whose ratios are measured as of 2006 (based on publicly available data from Liquidatum). The experiment here is to identify which profiles led to subsequent failures (as defined above) in subsequent years. One of the findings is that the Basel 2010 NSFR is not a good predictor, while the final NSFR (endorsed by the Basel Committee in 2014) is a predictor of failure. The predictive power increases as weights on assets are set more uniformly (in particular as weights on lending to financials and derivatives are increased) and as the ASF weight on retail deposits is increased (and the rate on wholesale funding, even at longer maturities, is decreased).

Hahm et al. (2011) study country-level data on the banking systems of various samples of countries (up to 120 countries) over the decade 2000-2010. They find that various measures of non-core liabilities, and especially liabilities to the foreign sector, serve as good indicators of vulnerability to crisis, including a collapse in the value of the currency and a credit crisis where lending rates rise sharply.

Authors	(I) Sample	(II) Dep. Variable	(III) SFR tested	(IV) Major controls
Andersen [2008]	Norway 00/Q3-05/Q2	Failure dummy	CFR	CAMEL
Bologna [2011]	US 2007-2009	Failure dummy	Deposit-to-Asset Loan-to-Deposit	CAP, NPL, ROE, Interest rates
Giordana and Schumacher [2012]	Luxembourg 03/Q2-11/Q3	Z-Score	2010 ASF-to-Asset 2010 RSF-to-Asset	CAP, LCR, ROA, Interest rates
Goldsmith-Pinkham and Yorulmazer [2010]	UK Sep09	Equity prices (Abnormal return)	Deposit-to-Asset	CAP, Mortgage loans
Kapan and Minoiu [2013]	Global Jan06- March10	Syndicated loan growth growth	Deposit-to-Asset CFR	CAP, LAR, NPL, ROA
Poghosyan and Čihák [2009]	EU 1996-2007	Failure dummy	Deposit-to-Asset	CAMEL
Ratnovski and Huang [2009]	Global 2006-2009	Equity prices Failure dummy	Deposit-to-Asset	CAP, LAR
Vazques and Federico [2012]	Global 2001-2009	Failure dummy	CFR	CAP, Credit growth, GDP growth

Figure 1: Recent literature on the empirical predictive power of various SFRs

Note: We considered that the deposit-to-asset ratio is chosen as the metric of SFRs in a paper if the paper tests the predictability of wholesale funding to balance sheet size. Abbreviated major controls are defined as: CAMEL; components typically used in CAMEL ratings;[1] CAP: capital ratio, either risk-adjusted or non-adjusted; NPL: non-performing loans; LAR: liquid assets ratio.

[1] The CAMEL rating system was used by US regulators and produced a composite rating of an institution's overall condition and performance by assessing five components: capital adequacy, asset quality, management administration,

2. The Basel NSFR requirement

The Basel Committee published the NSFR in October 2014. It constitutes a starting point in this report for the calibration exercise of a stable funding requirement in the EU. Indeed, the report assesses the potential impacts of the implementation of the Basel NSFR in the EU. Therefore—since the Basel NSFR is both the starting point and the benchmark for defining the EU requirement—a clear explanation of the design developed by the Basel Committee is necessary.

This chapter is aimed at providing the rationale behind the definitions within the Basel NSFR methodology for every item category. It is helpful to understand the fundaments of the final methodology for a stable funding requirement in Europe, either in the case that the Basel calibration is proposed or in the case that a recalibrated definition is suggested. This chapter also provides explanations on when the definitions are linked to the other liquidity metric, the LCR, and when these definitions are materially different.

2.1 Economic fundaments and general characteristics of the calibration of the Basel NSFR

The Basel III NSFR is aimed at assessing the appropriateness of the funding structure of a bank based on the composition of its asset portfolio. The NSFR requires that certain assets be financed in a stable fashion over time, as their continuity in the banking activity is deemed a priority (assets linked to the banking lending activity or others, the liquidation of which is difficult in the short term). The NSFR is aimed at minimising the funding risk of these assets. The calibration of the NSFR is, therefore, framed in a risk context and, as a consequence of that, the requirements derived from this ratio must necessarily be **prudent**.

The NSFR is intended to be a metric that can ensure an appropriately matched funding structure, without unduly hampering maturity transformation.

The NSFR has a 'business as usual' background in its conception but it ultimately also contributes to minimising the probability of liquidity and funding stress situations as well as their intensity. It is, therefore, a **structural liquidity metric** rather than a stress liquidity metric. As such and to the effects of its calibration it does not require an excessive degree of granularity where the impact of every asset and liability would need to be assessed under stress. Therefore, there is scope to aggregate items that behave in the same way under normal conditions.

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earnings, and liquidity. In 1995, the Federal Reserve and the OCC replaced CAMEL with CAMELS, adding the 'S', which stands for financial (s)ystem. This covers an assessment of exposure to market risk.

Conceptually, the NSFR is bound to interact with other definitions in Basel III, namely those in the **LCR**. The design of the NSFR is done in a way that its compliance should minimise any conflict with the elements of the LCR.

The NSFR is designed to avoid **procyclicality**. The mitigation of funding risk in the NSFR by means of stable funding does not rest on an undue reliance on funding from other financial institutions or vehicles that are vulnerable to funding runs in times of stress, or on sales of illiquid assets in times of stress.

The NSFR requires holding ASF for an amount equal to 100% of that required by the assets and off-balance-sheet commitments of the banks. ASF is calculated by weighting the relevant liabilities by their stability factors (ASF factors), and RSF is calculated by multiplying the relevant assets and off-balance-sheet commitments by their RSF factors.

2.2 Fundaments and general principles of the calibration of the Basel NSFR

From the previous general characteristics of the calibration of the Basel III NSFR, the following general criteria are defined. The final concrete weights for the valuation of liabilities and assets must build on these criteria to assess the appropriate balance between stable funding and assets requiring stable funding.

2.2.1 General treatment of tenor

The amounts of available and required stable funding specified in the Basel NSFR reflect the presumed degree of stability of liabilities and the liquidity of assets. Tenor is one of several relevant features of assets and liabilities. Other things being equal, longer term liabilities are initially expected to remain more durably within banks than short-term liabilities.[2] Other things being equal, short-term assets are assumed to require less stable funding than long-term assets,[3] as banks are supposed to be able to allow some proportion of those assets to mature instead of rolling them over.

In this context, the Basel text considers one year as the reference to differentiate short- and long-term assets and liabilities. The one-year time horizon matches the reference period used by the industry for similar metrics, therefore avoiding unnecessary complexity.

Sub-annual buckets have been defined for specific balance-sheet items in the Basel III NSFR, namely a bucket up to six months and another bucket from six to twelve months. The introduction of the buckets responds to various purposes:

[2] Tenor is only one of several relevant features to be taken into account to assess the stability of liabilities. Indeed, short-term liabilities may be behaviourally stable on a renewable basis (e.g. retail deposits).

[3] Tenor is only one of several relevant features to be taken into account to assess the ease of liquidating or pledging assets (or terminating the corresponding lending activity).

- If the NSFR were limited to a one-year horizon, there could be cliff effects when the tenor of the ASF falls just below one year, causing unnecessary volatility in the NSFR ratio. The NSFR would drop in a very short period of time if the funding factor would fall abruptly from 0% to 100%. Therefore, a more gradual decrease of the stable funding over time was designed to reflect the fact that stable funding matures gradually on an ongoing basis. This was done by creating two sub-annual buckets of six months and giving lower weights when the maturity of funding falls below six months.

- It incentivises banks to extend the term of their short-term (below one year) funding. Without sub one-year buckets, the NSFR would be indifferent between overnight funding and funding on six months. Fostering medium-term funding is key for a structural liquidity requirement.

- It provides some flexibility and avoids constraining banks to perfectly match their funding, which would be detrimental to maturity transformation. Some short-term funding should be able to partly finance long-term investments and this is reflected in the weigh they receive as stable funding. Since short-term funding is easier and cheaper for banks to obtain, this makes compliance with the NSFR easier, while keeping consistency in the maturity of assets and liabilities.

- At the same time, the granularity in the time horizon of the NSFR was limited to two maturity buckets, to avoid adding too much complexity to the NSFR (simplicity being another core principle of the Basel NSFR).

2.2.2 General criteria for liabilities

For liabilities (and equity), the ASF factors reflect the extent to which they would remain stable (i.e. cannot or are unlikely to be withdrawn).

This is measured across two dimensions:

(a) Funding tenor – The NSFR is generally calibrated such that longer term liabilities are assumed to be more stable than short-term liabilities.

(b) Funding type and counterparty – The NSFR is calibrated under the assumption that short-term (maturing in less than one year) deposits provided by retail customers and funding provided by SME customers are behaviourally more stable than wholesale funding of the same maturity from other counterparties.

Funding tenor

The ASF factors applied represent the capacity of the funding to finance long-term investments. In general, a higher factor is assigned to a liability with a longer maturity to reflect the benefit of holding longer term funding for NSFR purposes. Liabilities exceeding the one-year time horizon receive a 100% factor of usability for funding long-term assets. Under one year, liabilities with a

maturity of more than six months have a higher stable funding factor. On the consideration of sub-annual buckets, please refer to section on the 'General treatment of tenor'.

Funding type and counterparty

Short-term liabilities are assumed to be more stable if stemming from retail customers rather than responding to wholesale funding. All long-term liabilities (> 1 year) are considered to be fully stable, as is regulatory capital.

The degree of stability of short-term liabilities is related to run-off factors, the level of which differs according to the type of counterparty. Funding from retail customers shows in principle a very low run-off expectation because retail depositors are explicitly or implicitly protected against losses and do not tend to withdraw for reasons other than their own liquidity needs. This behaviour is in marked contrast to that of providers of wholesale funding, who are generally sophisticated investors, more yield oriented, and not necessarily within an insurance scheme (financial institutions, collective investment undertakings (CIUs) or non-financial corporates, among others). Only when wholesale funding is sufficiently long term can it be considered a reliable source that would not be at risk. That is why wholesale funding has a smaller stability factor and its calibration depends on its maturity. The NSFR also differentiates wholesale funding by the nature of the counterparty. Funding provided by non-financial corporates receives a higher funding factor compared to funding provided by financial firms.

In general, the NSFR does not distinguish between secured and unsecured funding. This responds to the fact that secured funding is not proven to be necessarily more stable/likely to be rolled over than unsecured funding under normal conditions.

Calibration of the ASF factors

The calibration of the factors results from the combination of the cited dimensions. For the two sub-annual buckets (up to six months and from six to twelve months of residual maturity), the stability factor varies depending on the expected stability of the funding source, whereas the long-term funding is considered able to finance long-term assets and therefore gets an 100% ASF factor together with regulatory capital.

Short-term funding with a residual maturity above six months is deemed stable funding in at least 50% of its value.

Nevertheless, for the reasons mentioned above, short-term retail deposits get 90% ASF factors, or 95% if they are deemed to fall within the category of stable deposits in the LCR.

Also, funding from non-financial corporates and public institutions below six months and operational deposits receive a 50% weight.

Within the wholesale deposit category, the BCBS differentiates (in the LCR context) operational deposits from non-operational deposits. The higher stability factor of the former in the LCR

reflects the difficulty an operational customer would have in moving its relationship within the 30-day stress period. This argument has less merit in relation to the NSFR one-year time horizon. That is why the operational deposits are only granted more favourable treatment compared to non-operational deposits in a few cases (deposits from financials below six months). The NSFR treatment for these deposits grants a much smaller stability factor compared to the LCR treatment.

2.2.3 General criteria for assets and off-balance-sheet transactions

For assets, RSF factors reflect the extent to which they need to be stably funded, either because continued funding represents a business-essential commitment or because no cash or funding could be obtained through pledge or disposal.

For other (off-balance-sheet) transactions, RSF factors reflect the extent to which these transactions may drain collateral.

In particular, the following criteria were taken into account for determining the appropriate amounts of RSF for various assets:

(a) *Resilient credit creation* – The NSFR requires stable funding for some proportion of lending to the real economy in order to ensure the continuity of this type of intermediation.

(b) *Bank behaviour* – The NSFR is calibrated under the assumption that banks may seek to roll over a significant proportion of maturing loans to preserve customer relationships.

(c) *Asset tenor* – The NSFR assumes that some short-dated assets (maturing in less than one year) require a smaller proportion of stable funding because banks would be able to allow some proportion of those assets to mature instead of rolling them over.

(d) *Asset quality and liquidity value* – The NSFR assumes that unencumbered, high-quality assets that can be securitised or traded, and thus can be readily used as collateral to secure additional funding or sold in the market, do not need to be wholly financed with stable funding.

The continuity of lending activity to the real economy, inherent in banks' behaviour to preserve customer relationships, makes it necessary for banks to have available sufficient stable funding that can ensure the appropriate rollover or substitution of such loans or contingent funding obligations. This allows proper maintenance of the current composition of the lending portfolio, assuming it will not be downsized. For some loans, Basel contemplates two sub-annual buckets (up to six months and above it) in parallel with its consideration of the funding side.

In contrast **HQLA**, like assets easily able to be converted into cash by means of outright sales or as collateral in secured transactions, need a smaller proportion of stable funding. Consistent with this principle, HQLAs could be required stable funding to the extent that these assets are not expected to be converted into cash easily. That is why there is consistency between the haircuts applied for these assets in the LCR and the required stable funding in the NSFR. These assets do

not need any bucketing per maturity as banks' ability to monetise these assets is assumed to not be significantly related to the remaining maturity of the security, i.e. a bond with a five-year remaining maturity is not assumed to be more difficult to monetise than one with a six-month remaining maturity.

In any case, the standard is calibrated to avoid securities being treated more favourably (irrespective of the fact that a higher liquidity value could be assigned to them) than loans of the same quality. This is to prevent banks from converting loans into security to benefit from an improvement of their NSFR without improving their underlying liquidity position and also to avoid creating disincentives to lending by requiring relatively more stable funding.

Regarding **short-term loans up to six months between financials**, the BCBS proposes specific treatment for these transactions and recognises the existence of funding risk in them; stable funding is required to ensure a minimum rollover rate of the underlying loans.

Basel does not distinguish banks from other financials in the treatment given as it is not considered that the lack of this differentiation could impact the transmission of the monetary policy through the interbank market. In contrast, such differentiation could negatively impact the evolution of SFT markets.

For transactions below six months, the Basel NSFR initially assigns a 15% RSF factor. It also allows preferential treatment of 10% RSF (10% in order to prevent banks from having incentives to hold Level 1 HQLAs through collateralised transactions rather than holding them directly, in which case they are subject to 5% RSF) if the loans are secured by Level 1 HQLAs and the collateral is susceptible to being rehypothecated during the life of the loan. Even though, on the liability side, funding received from financials with a maturity below six months is not deemed stable, on the asset side some stable funding is required on these loans to at least ensure the funding of a minimum rate of rollover of these loans. These factors are considered to be small enough so as to not interfere with the implementation of the monetary policy or to not negatively affect intra-financial flows.

As to **loans between financials from six to twelve months** of residual maturity, Basel proposes a symmetrical treatment for those transactions (secured or unsecured), thus setting a rate of 50% as stable funding required for the loans aligned with the 50% rate of available stable funding received on the liability side. Secured and unsecured transactions are not differentiated to reflect the assumption that the firm's lending capacity is not likely to be affected by underlying collateral requirements and also for simplicity. The 50% rate set out for these transactions equals the rate for stable funding required from holding outright unencumbered Level 2B assets (lowest quality HQLAs).

Regarding **short-term loans given to and received from non-financials**, the Basel NSFR follows a symmetrical approach with respect to these transactions between financials. Therefore, loans to non-financials maturing within a year require stable funding by 50% of their amount. At the same

time, funding from non-financials with a maturity below one year receive a stable funding factor of 50%.

For the treatment of **derivatives**[4] in the NSFR, 100% of stable funding is required for the net derivative assets position (as a result of deducting derivative liabilities – net of all variation margins posted – from derivative assets – net of cash variation margin received). If derivative liabilities exceed derivative assets, the difference will be considered 0% stable funding. As an add-on, 20% of the total derivative liabilities would be required as stable funding to limit its offsetting power and its stable funding consideration, thus ensuring a minimum RSF. In addition to that, further stable funding is required as the 85% of the initial margin posted on banks' own behalf to which a review clause has been included.

On the treatment of **long-term loans to non-financials** (a residual maturity above one year), Basel considers that the ability of the asset to be liquidated lies basically in the asset quality and is therefore dependent on the assigned credit risk. Therefore, it differentiates the funding required for loans with risk-weighted assets (RWAs) below 35% and loans with RWAs above 35%, assigning RSF factors of 65% and 80% respectively. This is stated under the assumption that the loans are unencumbered and hence can be liquidated. The rest of the assets, like long-term loans to financials or non-performing loans, are subject to 100% RSF.

Encumbrance: Assets encumbered for medium- to long-term periods require more stable funding than otherwise identical but unencumbered assets. Indeed, encumbered assets cannot be monetised during the period for which they are encumbered. If the period of encumbrance exceeds the one-year NSFR time reference, then the encumbered asset requires full stable funding as it will remain on the balance sheet and it is impossible to monetise it during that time. If an asset is encumbered for a remaining period of six to twelve months, then it should be subject to a stable funding requirement of no less than 50%. In practice, this means that HQLAs encumbered for six to twelve months receive a 50% RSF factor, while loans and mortgages that are encumbered for similar remaining durations receive the same treatment as otherwise identical but unencumbered loans and mortgages. If an asset is encumbered for a remaining period of less than six months, it then receives the same stable funding requirement as an otherwise similar asset that is unencumbered. Indeed, the NSFR is a structural metric that considers the ease with which assets could be pledged or liquidated at a relevant (six month to one year) horizon. Assets that are only encumbered for a short remaining duration (below six months) should not be treated differently from unencumbered ones, because they are in principle not more difficult to pledge or monetise once their encumbrance period has come to an end.

As for liabilities, the inclusion of a six to twelve months bucket aims to reduce potential cliff effects that would have arisen if only two categories (less than 12 months, more than 12 months) had been used. To avoid complexity, no further granularity in the bucketing was proposed.

[4] A further description of the treatment of derivatives is included in Chapter 9, which is on the impact on the financial markets.

Encumbrance is typically a very short-term activity (repos, collateral swaps) or a very long-term activity (covered bonds and securitisation). The identification of these transactions by means of a look-through approach is necessary to capture the right measure of the necessary stable funding.

2.2.4 Interdependent assets and liabilities

Basel confers special treatment to interdependent assets and liabilities when some requirements are met.

Interdependent assets and liabilities are referred to those operations where the bank operates a pass-through conduit between two parties, directly channelling the funding received into specific assets, while keeping the booking of the assets and liabilities in its balance sheet.

Basel contemplates the possibility of national discretion applying 0% RSF and ASF to interdependent assets and liabilities respectively when some conditions are met, among which full matching must exist in terms of amounts and tenors.

The definition is not intended to include covered bonds or similar funding schemes (where the cover pool often changes over time and the characteristics of the assets and liabilities are not necessarily identical) or to open the door for indiscriminate netting of operations that are due or may be due on the same date.

2.2.5 Summary of liability categories and associated ASF factors (source: Basel standard on the NSFR, October 2014)[5]

Summary of liability categories and associated ASF factors

ASF factor	Components of ASF category
100%	• Total regulatory capital (excluding Tier 2 instruments with residual maturity of less than one year) • Other capital instruments and liabilities with effective residual maturity of one year or more
95%	• Stable non-maturity (demand) deposits and term deposits with residual maturity of less than one year provided by retail and small business customers
90%	• Less stable non-maturity deposits and term deposits with residual maturity of less than one year provided by retail and small business customers
50%	• Funding with residual maturity of less than one year provided by non-financial corporate customers • Operational deposits • Funding with residual maturity of less than one year from sovereigns, PSEs, and multilateral and national development banks • Other funding with residual maturity between six months and less than one year not included in the above categories, including funding provided by central banks and financial institutions

[5] These factors are considered alongside the analysis in the report.

0%	• All other liabilities and equity not included in the above categories, including liabilities without a stated maturity (with a specific treatment for deferred tax liabilities and minority interests) • NSFR derivative liabilities net of NSFR derivative assets if NSFR derivative liabilities are greater than NSFR derivative assets • "Trade date" payables arising from purchases of financial instruments, foreign currencies and commodities

2.2.6 Summary of asset categories and associated RSF factors (source: Basel standard on the NSFR, October 2014)[6]

Summary of asset categories and associated RSF factors

RSF factor	Components of RSF category
0%	• Coins and banknotes • All central bank reserves • All claims on central banks with residual maturities of less than six months • "Trade date" receivables arising from sales of financial instruments, foreign currencies and commodities.
5%	• Unencumbered Level 1 assets, excluding coins, banknotes and central bank reserves
10%	• Unencumbered loans to financial institutions with residual maturities of less than six months, where the loan is secured against Level 1 assets as defined in LCR paragraph 50, and where the bank has the ability to freely rehypothecate the received collateral for the life of the loan
15%	• All other unencumbered loans to financial institutions with residual maturities of less than six months not included in the above categories • Unencumbered Level 2A assets
50%	• Unencumbered Level 2B assets • HQLA encumbered for a period of six months or more and less than one year • Loans to financial institutions and central banks with residual maturities between six months and less than one year • Deposits held at other financial institutions for operational purposes • All other assets not included in the above categories with residual maturity of less than one year, including loans to non-financial corporate clients, loans to retail and small business customers, and loans to sovereigns and PSEs
65%	• Unencumbered residential mortgages with a residual maturity of one year or more and with a risk weight of less than or equal to 35% under the Standardised Approach • Other unencumbered loans not included in the above categories, excluding loans to financial institutions, with a residual maturity of one year or more and with a risk weight of less than or equal to 35% under the standardised approach

[6] These factors are considered alongside the analysis in the report.

85%	• Cash, securities or other assets posted as initial margin for derivative contracts and cash or other assets provided to contribute to the default fund of a CCP • Other unencumbered performing loans with risk weights greater than 35% under the standardised approach and residual maturities of one year or more, excluding loans to financial institutions • Unencumbered securities that are not in default and do not qualify as HQLA with a remaining maturity of one year or more and exchange-traded equities • Physical traded commodities, including gold
100%	• All assets that are encumbered for a period of one year or more • NSFR derivative assets net of NSFR derivative liabilities if NSFR derivative assets are greater than NSFR derivative liabilities • 20% of derivative liabilities as calculated according to paragraph 19 • All other assets not included in the above categories, including non-performing loans, loans to financial institutions with a residual maturity of one year or more, non-exchange-traded equities, fixed assets, items deducted from regulatory capital, retained interest, insurance assets, subsidiary interests and defaulted securities

3. The Basel NSFR of the EU banking sector

This chapter describes the extent to which EU banks meet the Basel calibration of the NSFR, using the latest voluntary QIS collection (as of December 2014). In particular, it describes the following aspects:

- *the aggregate shortfall in the sample, expressed in EUR, as a portion of total assets and total ASF, both for the whole sample and for each business model category; and*
- *the evolution of EU banks' compliance with the NSFR and its main components over time on an aggregate basis.*

Most banks in the sample are already compliant. On the basis of a sample of 279 banks in December 2014, 70% of banks are compliant, while 14% of the banks in the sample have NSFRs below 90%. Non-compliant banks[7] have a shortfall of around 3% of the total available funding in the sample. The average NSFR (104%) is in excess of 100%, which means that the banks with excess ASF have more excess than is needed by non-compliant banks to become compliant. On the basis of a constant sample, the analysis reflects that, from December 2012 to December 2014, most firms reported either an improvement (93) or an NSFR in a similar range (80). Some firms (24) reported a significant degradation of their NSFR.

Most business model categories have a majority of compliant banks and small shortfalls. Four business model categories show more important shortfalls or a higher proportion of non-compliers. These categories are: auto and consumer loans, securities trading houses, pass-through banks and diversified without deposits.

3.1 Sample of participating banks

The analysis in this chapter is based on a sample of EU banks. The sample includes 279 banks, which held EUR 31.5 trillion in assets (around 75% of the total assets held by credit institutions in the EU) as of December 2014. This section provides a descriptive analysis of the sample at this reference date. It also includes an analysis of the evolution of the NSFR since December 2012 for a consistent sample of 149 banks.

Table 1 shows the number of participating banks in the sample since December 2012. The EBA asked national supervisors to classify each bank into a business model category from Table 3. In

[7] The average NSFR of non-compliant banks is 90.5%.

the case of several business model descriptions being relevant for a given bank, supervisors had to choose the predominant business model characteristic in order to classify it.

Table 1: Number of banks in the sample per business model since December 2012

	Dec-14	Jun-14	Dec-13	Jun-13	Dec-12
Auto & cons.	6	8	11	12	10
CCPs	3	3	19	21	21
Co-operatives	46	46	36	43	44
Custodian	1	2	1	1	1
Diversif. no retail dep.	3	9	56	65	68
Local univ.	80	66	29	39	27
Mrtg. & build. soc.	20	17	22	24	25
Other specialised – taking retail deposits	20	21	4	6	7
Other specialised no retail deposits	12	17	11	9	11
Pass-through	7	10	21	50	46
Savings	40	41	1	3	3
Sec. trading house	9	10	14	17	6
Univ. cross-border	32	22	29	37	36
Total	**279**	**272**	**254**	**327**	**305**

Table 2 shows the geographical coverage of the sample. DE and IT banks represent a 40% share of the sample. Most business sectors (except local universal and universal cross-border) include banks from a small number of countries.

Table 2: Banks included in the sample by business model and country

	AT	BE	CY	CZ	DE	DK	ES	FR	GB	HU	IE	IT	LT	LU	LV	MT	NL	NO	PL	PT	SE	SK	Total
Auto & cons.					4			2															**6**
CCP		1			2																		**3**
Co-operatives	2	1	1		22	1	1					16		1			1						**46**
Div. no retail dep.											2	1											**3**
Local univ.		6	3	11	10	6	4	2	2	2	2	8	2	2	2	1	3	2	5	4		3	**80**
Mrtg. & build. soc.	1				10				4		3					1	1						**20**
Other		1		2	7	1					1	2		1		1	4						**20**
Other no retail dep. [1]		1		1	2			4	1		1						2	1					**13**
Pass-through						4		2													1		**7**
Savings		2			29		4					1		1		1	1					1	**40**
Sec. trading					1			3	3		1						1						**9**
Univ. cross-border	4	2			2	2	2	4	3		3	2					2			2	4		**32**
Total	**7**	**14**	**4**	**14**	**89**	**14**	**11**	**17**	**13**	**2**	**13**	**30**	**2**	**5**	**2**	**4**	**15**	**3**	**5**	**6**	**5**	**4**	**279**

[1] For confidentiality, in this chapter, the only custodian bank in the sample has been included in the 'other no retail dep.' category.

Table 3 provides more details on the characteristics of the banks included in each category of the business model.

Table 3: Description of the business models used

Abbreviation	Full name	Description
Auto & cons.	Auto bank, consumer credit bank	Banks specialised in originating and/or servicing consumer loans to retail clients.
CCPs	CCPs	Banks facilitating trading done in derivatives and equities markets by mainly guaranteeing the obligations under the contract agreed between two counterparties.
Custodian institutions	Custodian institutions	Banks facilitating trading done in derivatives and equities markets by mainly holding securities and other assets for safekeeping and record keeping on behalf of corporate or individual investors.
Sec. trading houses	Securities trading houses	Banks facilitating trading done in derivatives and equities markets by holding and managing securities portfolios on behalf of corporate or individual investors.
Co-operatives	Member of the European Association of Co-operative Banks (EACB)	Locally operated banks owned by the depositors and often offering rates more favourable than for-profit banks.
Local univ.	Other well diversified (predominantly nationally active banks)	Institutions engaged in diversified banking activities (including retail, corporate and investment banking) and operating predominantly in their domestic market.
Mrtg. & build. soc.	Mortgage banks and building societies	Banks specialised in directly originating and/or servicing mortgage loans.
Other specialised – no retail deposits	Other specialised – no retail deposits	Other specialised banks such as promotional banks, ethical banks, banks specialised in leasing (asset-based financing) and/or factoring (a financing method in which a business owner sells accounts receivable at a discount to a third-party funding source to raise capital) activities, and banks specialised in directly and/or servicing mortgage loans, which do not take retail deposits.
Other specialised – taking retail deposits	Other specialised – taking retail deposits	Other specialised banks such as promotional banks, ethical banks, banks specialised in leasing (asset-based financing) and/or factoring (a financing method in which a business owner sells accounts receivable at a discount to a third-party funding source to raise capital) activities, banks specialised in trade finance, and banks specialised in providing wealth management services to high-net-worth individuals and families, which take retail deposits.
Pass-through	Pass-through financing	Banks facilitating mortgage lending by forming a pool of mortgages and selling shares in the pool to investors. The cash flow from the collateral pool is 'passed through' to the security holder as monthly payments of principal, interest, and prepayments.
Savings	Member of the European Savings Banks Group (ESBG)	Banks focusing on retail banking (payments, savings products, credits and insurances for individuals or SME)s and those which operate thought a decentralised distribution network, providing local and regional outreach.
Cross-border univ.	Large cross-border well diversified banks	A large cross-border banking group engaged in several activities, including retail, corporate, investment banking and insurance.
Div. no retail dep.	Diversified no retail deposits	Institutions engaged in diversified banking activities (including trade finance, corporate, investment banking, and insurance) on a cross-border or domestic basis and which do not take retail deposits.

Table 4 shows a mapping between the business model categories used in the EBA LCR calibration report in 2013 and the current EBA NSFR calibration report in 2015. Seven out of the thirteen categories used in the 2013 EBA LCR calibration report have been split into banks that take retail deposits and those that do not take such deposits. One LCR business category has been split into three categories (the LCR CCPs category was split between CCPs, custodians and securities trading houses). These decisions were made to ensure that enough firms were included in each group while retaining some homogeneity among the firms included in the same group.

Table 4: Mapping between the business model categories used in the EBA LCR calibration report (2013) and the EBA NSFR calibration report (2015)

NSFR business categories	LCR business categories
Diversified – no retail deposits	Co-operatives – no retail deposits
	Trade finance – no retail deposits
	Cross-border diversified – no retail deposits
	Local diversified – no retail deposits
Cross-border univ.	Cross-border diversified – taking retail deposits
Local univ.	Local diversified – taking retail deposits
Auto & cons.	Auto & cons.
Co-operatives	Co-operatives – taking retail deposits
Mrtg. & build. soc.	Mrtg. & build. soc. – taking retail deposits
Savings	Savings
CCP	CCP
Custodians	Custodians
Sec. trading house	Sec. trading houses
Other specialised – no retail deposits	Leas. & fact. – no retail deposits
	Mrtg. & build. soc. – no retail deposits
	Other specialised – no retail deposits
Other specialised – taking retail deposits	Other specialised – taking retail deposits
	Leas. & fact. – taking retail deposits
	Trade finance – taking retail deposits
	Private banking
Pass-through	Pass-through

3.2 Degree of compliance with the Basel NSFR

3.2.1 At the sample level, many banks already meet the 100% Basel NSFR

Table 5 shows the funding shortfall for the whole sample in December 2014. Most banks in the sample (70%) meet the Basel NSFR requirements, and the shortfall from non-compliant banks represents 3% of the available funding in the sample. From this table, we see that there is not much difference in the sample if we look at the shortfall for all the banks included, or if we take out the subsidiaries of the banks included in the sample. It can be appreciated the difference between the shortfall figure when considering all the data submitted and when the individual

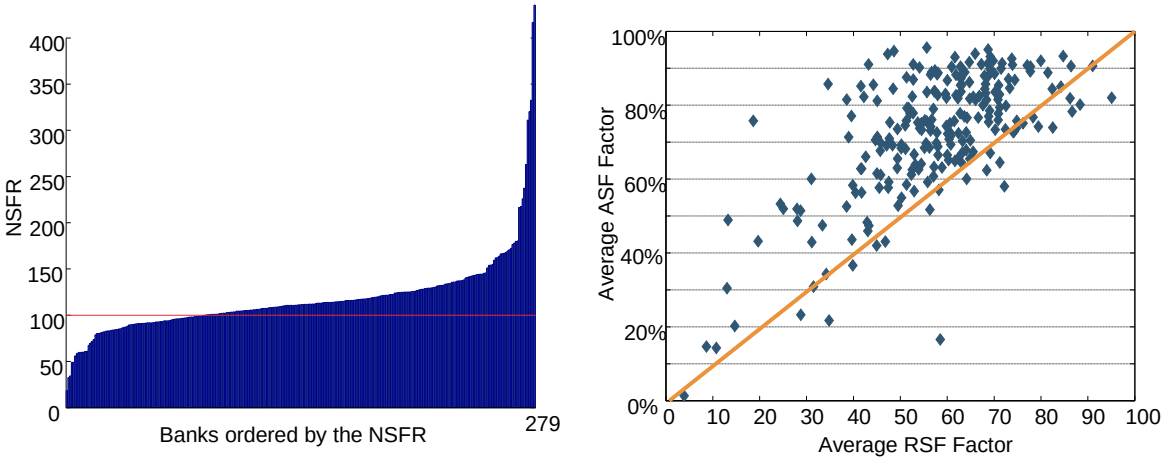
data of subsidiaries identified as double counting in their parent's, under the best estimate, has been removed. The risk of considering no double counting figures is that the shortfall could be underestimated, leading to a non-prudential outcome; it might exclude subsidiaries of financial institutions and their shortfalls, which may not be part of the QIS exercise. This is something that cannot be fully confirmed on the basis of the data received. By including all data, maximal data usage and narrower confidence intervals are achieved. In this case, the risk is that the shortfalls of some individual institutions appear twice.

Table 5: NSFR shortfall (December 2014)

	Banks	Number of compliant banks	NSFR	NSFR shortfall (bn EUR)	NSFR shortfall (% available funding)
Total banks in the sample	279	196 (70%)	103.6	594.7	3.5
Consolidated results (removing identified subsidiaries of banks included in the sample)	234	169 (72%)	103.6	522.7	3.2

Figure 2 shows the distribution of the NSFR ratio in the sample. Most compliant banks have an NSFR ratio well above 100%. A few non-compliant firms have an NSFR below 50%, but most non-compliant firms have an NSFR above 75%.

Figure 2: Distribution of the NSFR ratio in the sample



3.2.2 Business models show various levels of non-compliance in the sample

We have aggregated the business model category into three broad types: diversified (diversified – no retail deposits, cross-border universal, and local universal), retail (auto bank and consumer

credit bank, co-operatives, mortgage and building society, and savings), and specialised (CCP, custodians, securities trading houses, other specialised, and pass through).

Figure 3 shows compliance by type of business. Specialised business models have a relatively higher share of non-compliant banks, but they hold a small share of the total assets held in the sample.

Figure 3: Range of compliance according to type of business

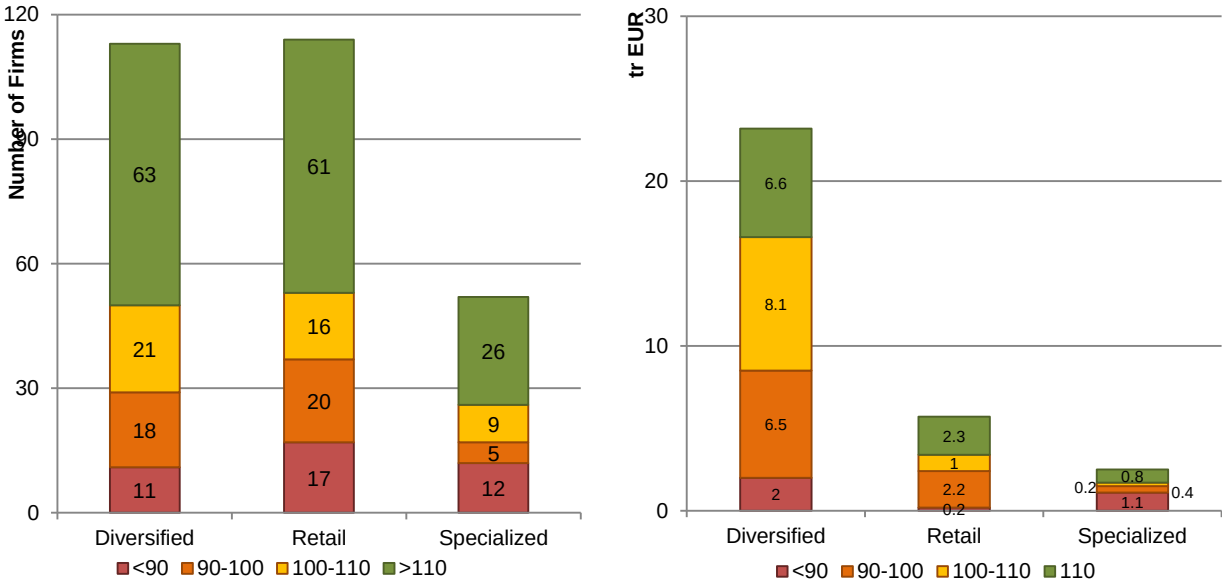


Figure 4 and Table 6 show firms' compliance by business model. Auto and consumer loans, pass-through banks, diversified without deposit, and securities trading houses show the highest amount of shortfall relative to total assets (above 2%), accompanied by a relevant fraction of non-compliant banks. Local Universal and Savings banks segment have one of the largest shortfalls in the sample (EUR 106 billion and EUR 13 billion, respectively), but on average the NSFR of their sector is above 100% and most firms are compliant. It is likely that the high shortfalls in this category are concentrated among a few outliers.

Figure 4: Compliance with the NSFR by business model category

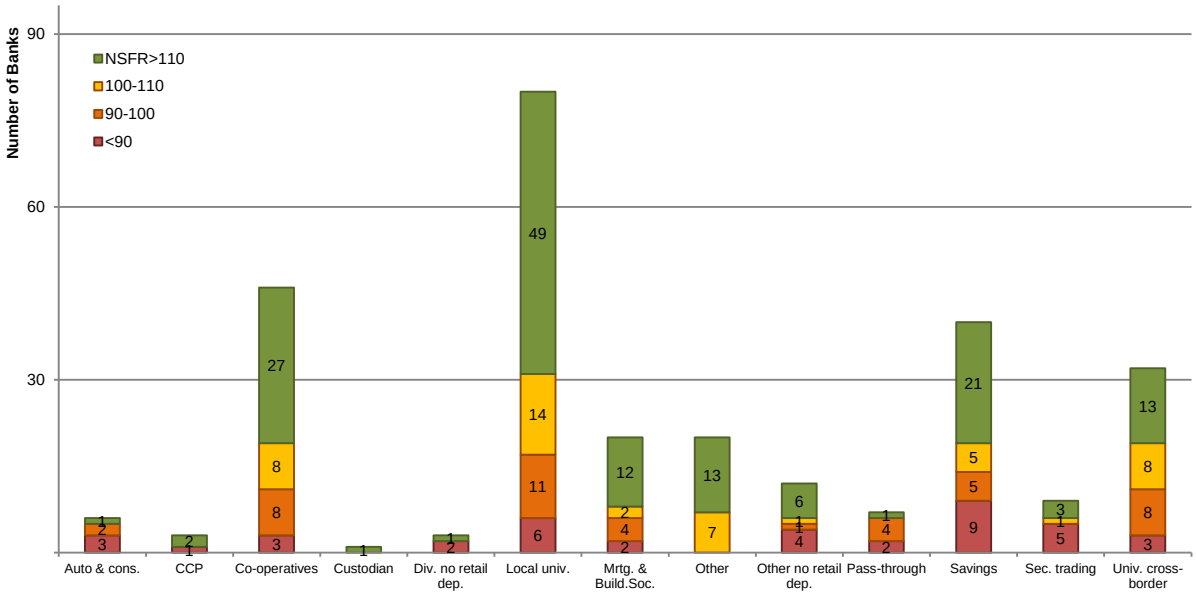


Table 6: Compliance with the NSFR by business model category

	Number	NSFR				NSFR shortfall			Compliance	
		Weighted average	Min.	Median	Max.	Abs. shortfall in bn EUR	Relative to total stable funding in %	Relative to total assets in %	Fraction of compliant banks in %	Fraction of compliant total assets in %
Auto & cons.	6	97.3	78.9	93.0	110.5	5.0	4.3	2.9	16.7	12.7
CCP	3	98.4	34.3	114.6	127.0	0.6	13.9	1.2	66.7	53.8
Co-operatives	46	106.7	67.3	113.8	332.5	29.9	2.2	1.5	76.1	65.1
Div. no retail dep.	3	94.1	59.8	80.9	162.2	5.2	25.0	8.5	33.3	20.2
Local univ.	80	103.7	71.8	114.0	435.5	106.7	3.1	1.9	78.8	71.6
Mrtg. & build. soc.	20	111.8	59.7	117.1	166.4	12.4	1.9	1.6	70.0	75.0
Other	20	116.4	101.0	117.8	320.2	—	—	—	100.0	100.0
Other no retail dep.	13	108.9	49.2	110.6	237.4	9.0	2.5	1.6	61.5	76.9
Pass-through	7	93.7	86.3	96.7	142.1	33.0	8.6	7.2	14.3	7.1
Savings	40	114.9	49.1	110.4	416.8	13.6	2.1	1.6	65.0	89.5
Sec. trading	9	60.1	18.5	83.1	176.5	100.0	80.3	10.1	44.4	10.1
Univ. cross-border	32	102.9	56.0	107.8	128.0	279.3	2.9	1.4	65.6	58.5
Total	**279**	**103.6**	**18.5**	**111.3**	**435.5**	**594.7**	**3.5**	**1.9**	**70.3**	**60.8**

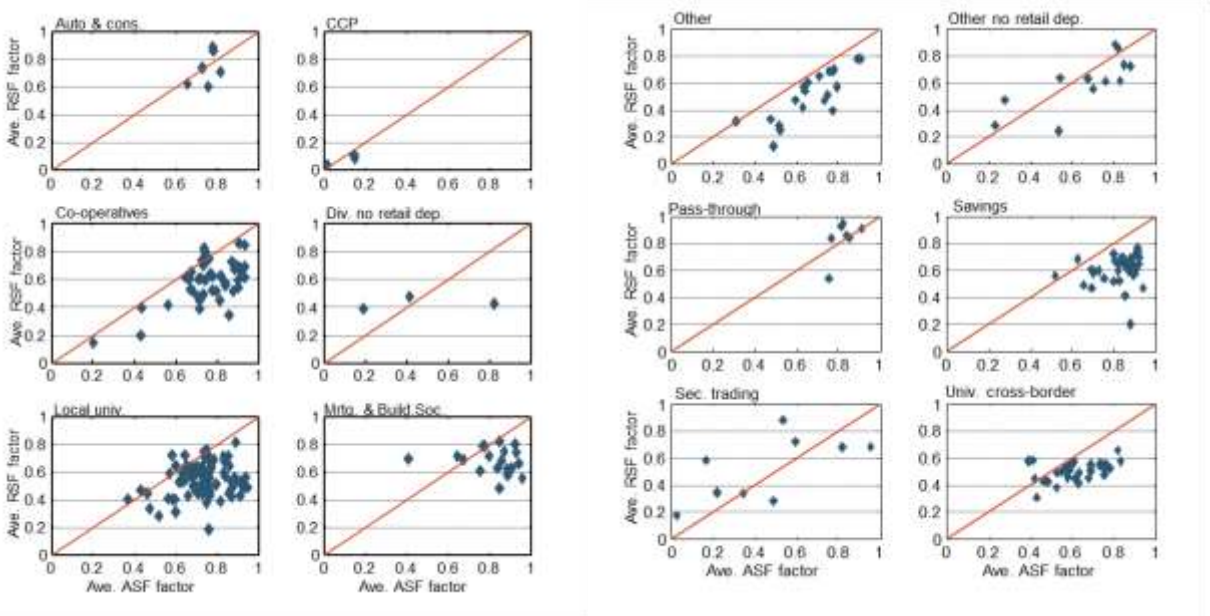
Figure 5 shows the average weighted ASF and RSF of each firm by business model. The red line corresponds to an NSFR ratio of 100%. Banks in the lower corner have an NSFR above 100% and those in the upper corner are non-compliant.

This graph is helpful to illustrate the logic of the NSFR. The absolute level of stable funding matters less for compliance than its alignment with the level of funding required. For instance, in the co-operative business model, some compliant firms hold a relatively low amount of stable funding (their average ASF factor is around 20%). These firms have an NSFR over 100% as they hold a relatively high amount of liquid assets, to which is attached a lower funding requirement (they have an average RSF factor of 18%).

In most business models, the majority of the firms tend to cluster around the same combination of average ASF and RSF. The exceptions are in the securities trading, diversified no retail deposits and other no retail deposits business models. A few outliers are also included in the co-operatives and mortgage and building society categories.

Most of the firms that are the furthest from compliance are included in the securities trading business category. In the categories in which there are the greatest number of non-compliant banks, the difference between the average ASF/RSF combinations of these firms and the average ASF/RSF of compliant banks is generally not large (this is the case for the auto bank and consumer credit bank, local universal, and mortgage and building society categories, for instance). This suggests that, on average, the liabilities of both compliant and non-compliant banks have a similar degree of funding stability and their assets are also likely to be equally liquid or pledgeable on average.

Figure 5: Average ASF and RSF factors by business models



3.2.3 Variation of the NSFR through time

This section examines the evolution of the NSFR for the firms that have reported consistently since 2012. These results should be viewed with caution since the calibration of the NSFR (and also the LCR, which has had an indirect impact) has changed significantly during this period and it is therefore difficult to make comparisons and draw significant conclusions from these results.

Figure 6: Evolution of the NSFR ratio and shortfall for a consistent sample of 123 credit institutions

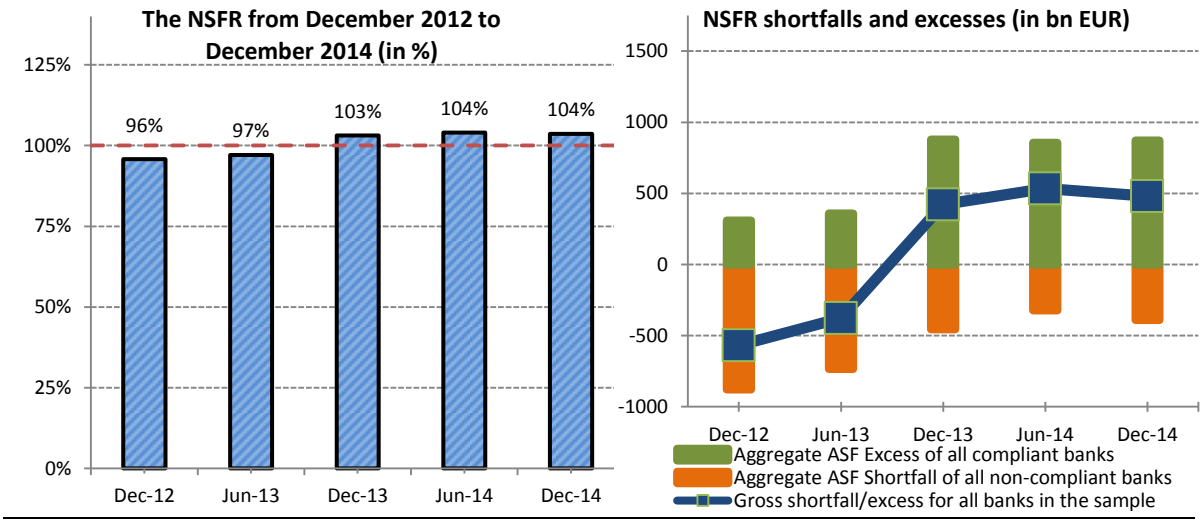


Table 7 shows, for firms having reported their NSFR in December 2012, whether the range of the NSFR they disclosed had changed or not in December 2014. Most firms reported either an improvement (93) or an NSFR in a similar range (80). A few firms reported a significant degradation of their NSFR (24).

Table **8** shows how large the firms are in term of assets. Most of the firms that reported a degradation of their NSFR were holding a small share of the total assets of the firms (EUR 132 billion out of EUR 24.4 trillion).

Table 7: Migration of NSFR levels in numbers between December 2012 and December 2014

		December 2014			
		< 90	**90-100**	**100-110**	**> 110**
Dec 2012	**< 90**	18	14	6	15
	90-100	—	12	12	17
	100-110	2	2	4	29
	> 110	6	3	11	46

NSFR improved | Same range | NSFR degraded

Table 8: Migration of NSFR levels in total assets (in trillion EUR) between December 2012 and December 2014

		December 2014			
		< 90	**90-100**	**100-110**	**> 110**
Dec 2012	**< 90**	2.06	3.27	0.84	0.50
	90-100	—	4.65	2.99	1.20
	100-110	0.04	0.01	2.29	4.12
	> 110	0.04	0.00	0.57	1.82

3.2.4 ASF/RSF Composition

Figure 7 shows the composition of the unweighted RSF/ASF as a percentage of the total. SME/retail is the largest source of weighted available funding (42% of the total), but represents only 28% of the unweighted balance sheet. Non-financial corporate and retail exposures drive most of the ASF requirements (33% and 25%, respectively).

Figure 7: Unweighted and weighted ASF/RSF composition for the whole sample (as % of the relevant total)

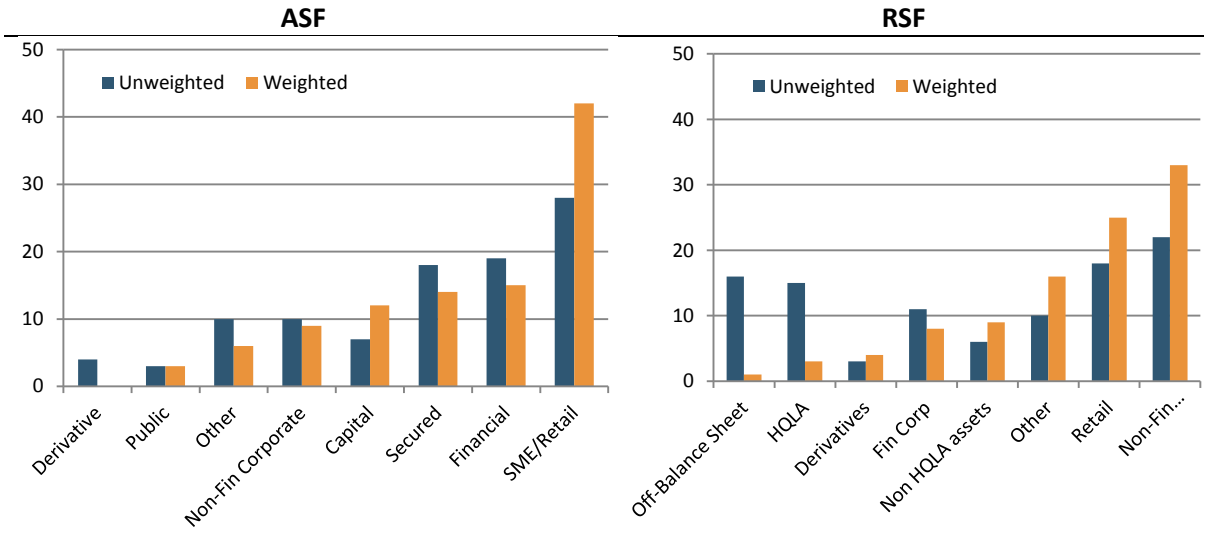


Table 9: Funding structure by business model, by % of total weighted ASF

	Number	Capital	Retail deposits	Non-financial corp.	Sov., PSEs and CB	Financial corp.	Secured funding	Deriv.	Other
Auto & cons.	**6**	**10.9**	**17.8**	**9.8**	**—**	**41.2**	**1.4**	**0.6**	**18.3**
CCP	**3**	**4.1**	**—**	**0.5**	**4.9**	**89.3**	**—**	**—**	**1.2**
Co-operatives	**46**	**7**	**29.4**	**7.6**	**4.7**	**25.4**	**21**	**0.9**	**4**
Div. no retail dep.	**3**	**7.5**	**—**	**9.5**	**—**	**44.8**	**35.7**	**2.1**	**0.3**
Local univ.	**80**	**7.6**	**33**	**9.3**	**4.3**	**15.6**	**17.8**	**2.1**	**10.2**
Mrtg. & build. soc.	**20**	**5.6**	**49.1**	**2.8**	**0.5**	**12.2**	**23.3**	**2.7**	**3.9**
Other	**20**	**11.4**	**11.1**	**4.2**	**0.6**	**31.2**	**6.4**	**6.5**	**28.6**
Other no retail dep.	**13**	**3.3**	**—**	**4.1**	**1.2**	**72.1**	**12.1**	**4.5**	**2.7**
Pass-through	**7**	**4.1**	**—**	**—**	**—**	**7**	**80.1**	**0.2**	**8.5**
Savings	**40**	**7.2**	**51.8**	**5.6**	**4.6**	**9**	**13.3**	**1.2**	**7.3**
Sec. trading	**9**	**10.7**	**0.4**	**0.3**	**0**	**13.4**	**26.8**	**30.8**	**17.6**
Univ. cross-border	**32**	**6.9**	**27.3**	**11.8**	**3.1**	**18.3**	**17**	**5.1**	**10.6**
Total	**279**	**7.1**	**27.9**	**9.8**	**3.2**	**19.1**	**18.4**	**4.5**	**10.1**

Table 10: Composition of funding requirements by business model, by % of total weighted RSF

	Number	HQLA	Fin. corp.	Non-fin. corp. and public	Retail	Non-HQ assets	Other	Deriv.	Off balance
Auto & cons.	6	2	5.4	18.9	19.7	4.7	42.9	0.6	5.9
CCP	3	29.4	46.8	4	—	0.1	0.4	0	19.3
Co-operatives	46	14.6	9.3	23.8	23.1	6.3	10.4	1.1	13
Div. no retail dep.	3	29.1	24.5	30.2	—	9.5	0.6	0	6.1
Local univ.	80	14.3	7.3	21.9	19.7	7.2	14.2	1.7	13.7
Mrtg. & build. soc.	20	11.4	5.8	23	46.8	5.7	7.7	0.8	7
Other	20	20.6	20.6	26.2	4.2	9	8.5	2.8	8
Other no retail dep.	13	15.1	15.6	47.0	0.5	7.6	7.3	2.2	4.8
Pass-through	7	5.6	17	16.4	36.9	6.2	17.3	0.1	0.4
Savings	40	14.3	5.2	18.6	29.1	7.8	12.4	0.8	11.8
Sec. trading	9	13.2	39.5	3.5	0.3	13.4	9.5	19.4	1.2
Univ. cross-border	32	15.7	12	22.5	15.9	4.7	7.7	3	18.7
Total	**279**	**15.1**	**11.3**	**22.4**	**17.8**	**5.6**	**9.6**	**2.7**	**15.8**

3.3 Shortfall analysis by business models

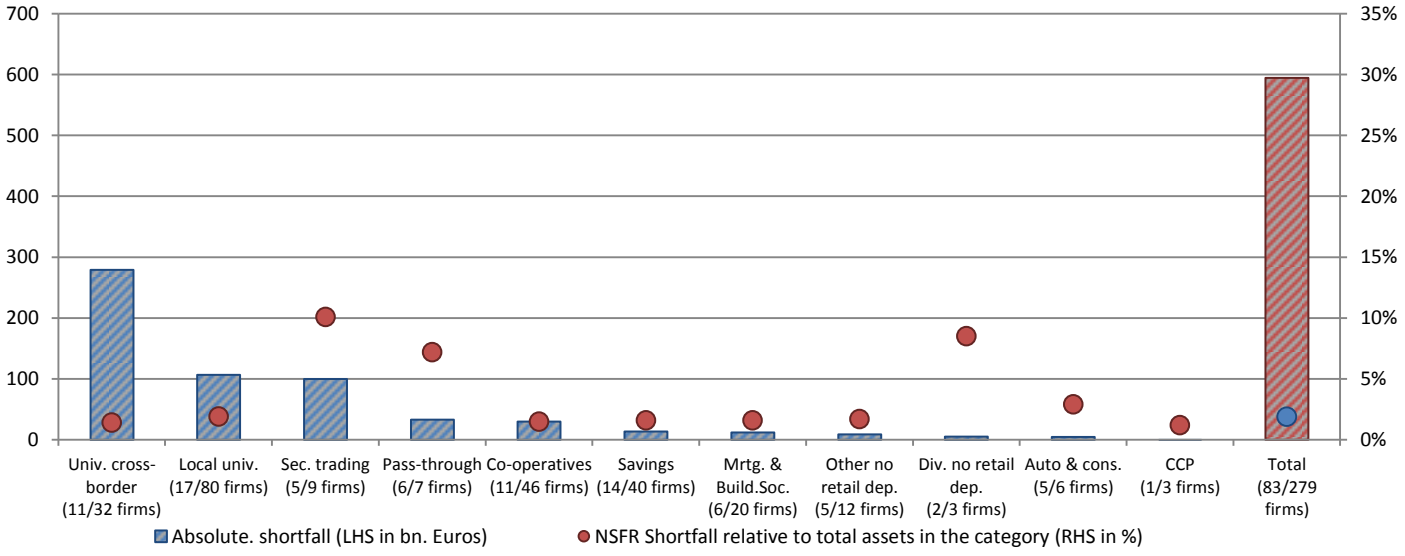
This section compares, for a certain number of business models, the composition of the balance sheet of the firms that did not meet the NSFR with those that are already compliant. Eighty-three firms out 279 did not meet the NSFR in the December 2014 sample. The ASF shortfall of the non-

compliant institutions was around EUR 595 billion, which equals 1.9% of the total assets of all the banks in the sample (EUR 31.2 trillion). The analysis is based on weighted averages of the compliant and non-compliant groups, so in groups that are very heterogeneous in terms of size, the composition of the balance sheet of the groups is most likely to reflect the balance sheets of the largest firms.

Figure 8 shows how the ASF shortfall is distributed between the different business model categories. It also shows, for each category, how large this shortfall is compared to the total assets held by all the firms included.

The 33 non-compliant firms in the universal cross-border, local universal and securities trading categories are the biggest contributors to the ASF shortfall (81.7%, in total around EUR 486 billion). In relative terms, when comparing the shortfall to all the assets held by the firms in the category, securities trading (10%), diversified no retail (9%) and pass-through (7%) have the highest shares. Auto bank and consumer credit bank (with 3%) also has a marginally higher share than the sample average (2%).

Figure 8: Absolute shortfall for the non-compliant firms in each business category (in billion EUR), and shortfall relative to total assets (in %) for December 2014



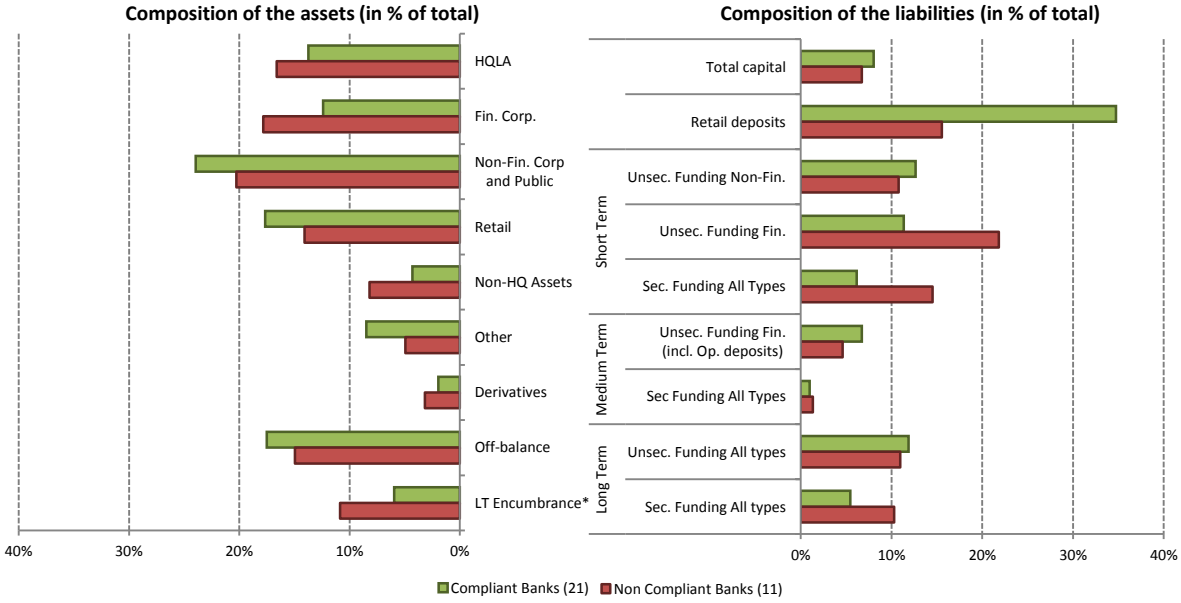
3.3.1 Univ. cross-border firms

Non-compliant and compliant universal cross-border firms in our sample differ mainly on the composition of their liabilities (see Figure 9 below).

Compliant universal cross-border firms hold a much greater share of retail deposits on their balance sheet (35% of the total liabilities vs 16% for non-compliant). Non-compliant firms hold relatively more unsecured funding, which attracts a very high discount factor and does not provide as much stable funding as deposits. Non-compliant firms especially hold a relatively higher share of unsecured funding from financial firms (22% of their liabilities, whereas compliant firms hold 11%).

On the asset side, there is not as much difference between compliant and non-compliant firms. Aside from a higher encumbrance level (11% vs 6%) and a higher share of financial corporate exposure (18% vs 12%), the composition of the balance sheet of both groups is not significantly different.

Figure 9: Balance sheet comparison between compliant and non-compliant firms in the universal cross-border business model



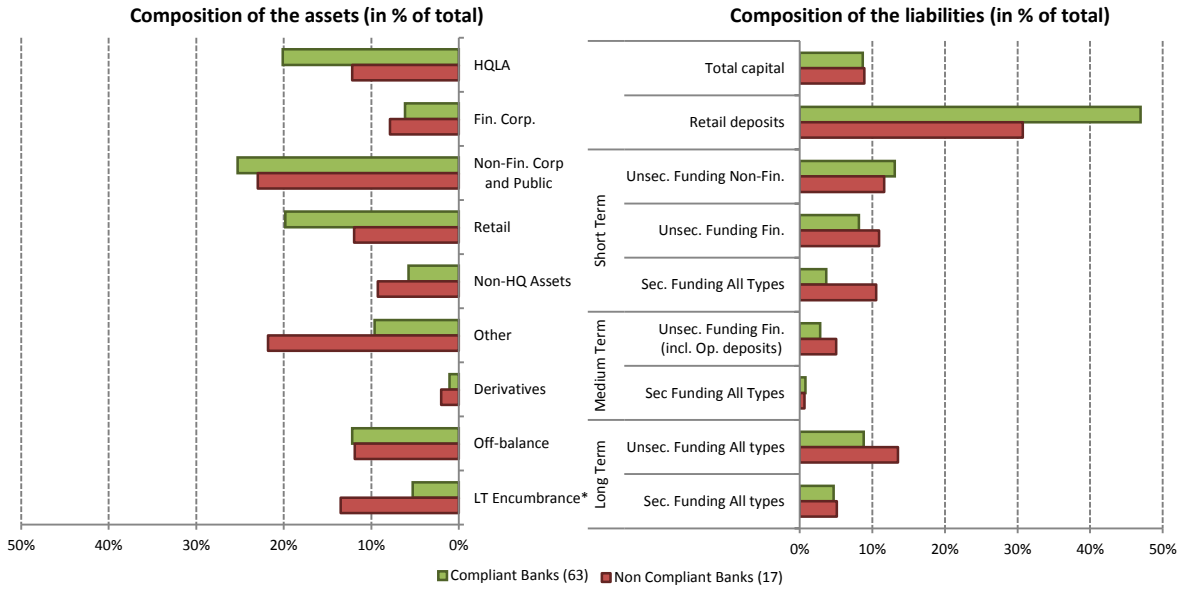
* LT Encumbrance is measured as total assets encumbered for more than six months over total assets.

3.3.2 Local universal firms

Similarly to universal cross-border firms, the main difference between compliant and non-compliant banks in this segment lies in the composition of the liabilities. For this category, the non-compliant banks again hold relatively more short-term wholesale deposits (in particular secured (11% of all liabilities, vs 4% for compliant firms)) than retail deposits (31%, vs 47% for compliant firms).

On the asset side, non-compliant banks have a higher level of encumbrance (13% vs 5%), relatively fewer HQLAs (12% vs 20%), and less retail exposure (12% vs 20%), but they also have more exposures that are not targeted by any particular treatment in the NSFR and which receive a 100% RSF factor ('others', 22% vs 10% for compliant firms).

Figure 10: Balance sheet comparison between compliant and non-compliant firms in the local universal business model



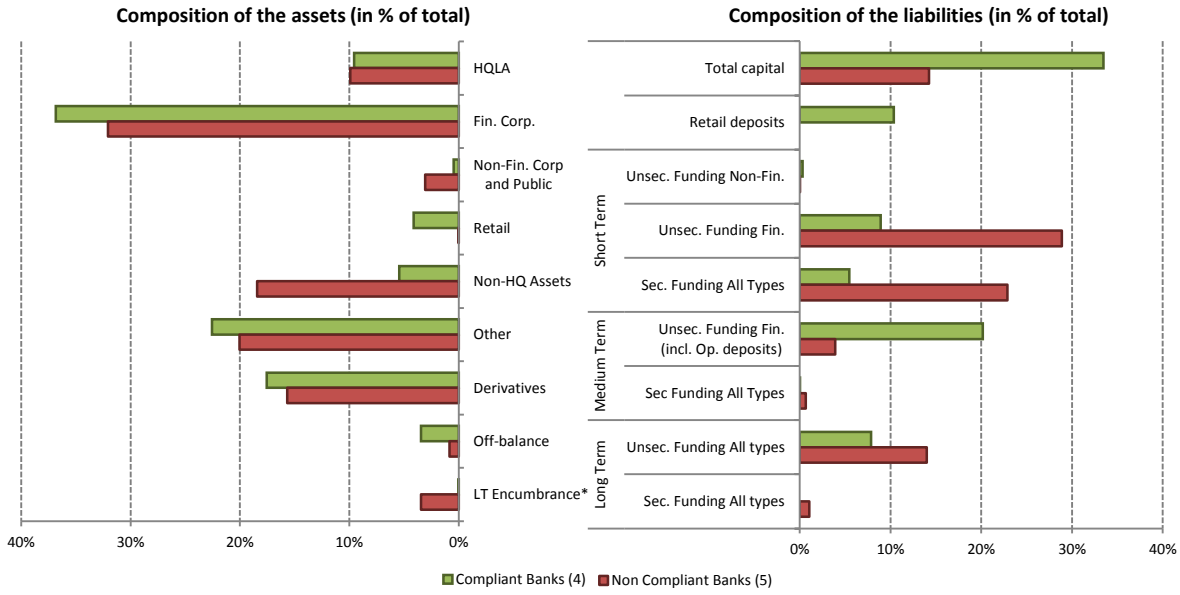
* LT encumbrance is measured as total assets encumbered for more than six months over total assets.

3.3.3 Securities trading firms

The five non-compliant banks in our sample that operate in the securities trading business model have a very different liability structure from the four compliant ones. They have no retail deposit (compared to 10% of their liabilities in the compliant firms) and, on average, less capital (14% vs 33% for the compliant firms). Non-compliant firms also hold much less medium-term unsecured funding (4% vs 20% for the compliant-firms). Non-compliant securities firms tend to rely instead on short-term unsecured funding from financial firms (29% vs 9% for compliant firms), which does not provide much stable funding under the NSFR. They also hold a relatively high share of short-term secured funding in their liabilities (23% vs 5% for compliant firms).

On the asset side, there are fewer differences. Non-compliant banks tend to hold a higher share of non-high-quality assets (18% vs 5%) and have a slightly higher level of encumbrance (3% vs almost 0% for compliant firms).

Figure 11: Balance sheet comparison between compliant and non-compliant firms in the securities trading business model



* LT encumbrance is measured as total assets encumbered for more than six months over total assets.

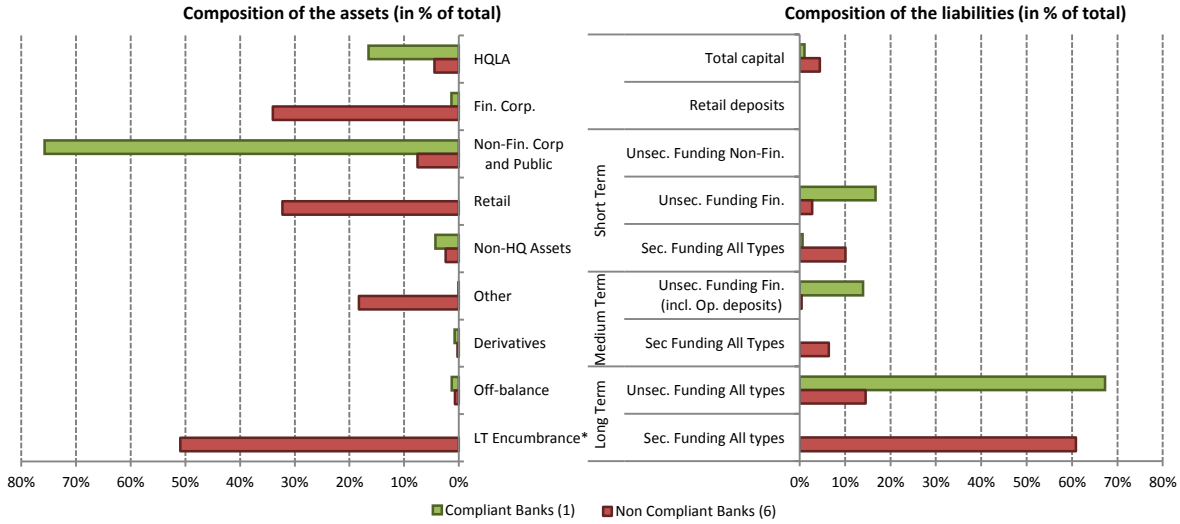
3.3.4 Pass-through firms

The comparison between compliant and non-compliant firms for this business segment may not yield much information since there is only one compliant firm.

Both assets and liabilities differ greatly between the compliant firm and the non-compliant firms. On the liability side, the compliant firm holds mostly unsecured funding (short term (17% of its total liabilities), medium term (14%) and long term (67%)). The non-compliant firms hold mostly long-term secure funding (61%).

On the asset side, what probably drives the funding requirements is the encumbrance (51% for the non-compliant firms). The compliant firm holds mostly non-financial corporate and public exposures (76%) and HQLAs (17%), whereas the non-compliant firms hold a mix of financial corporate (34%), retail (32%) and non-classified (18%) exposures.

Figure 12: Balance sheet comparison between compliant and non-compliant firms in the pass-through business model



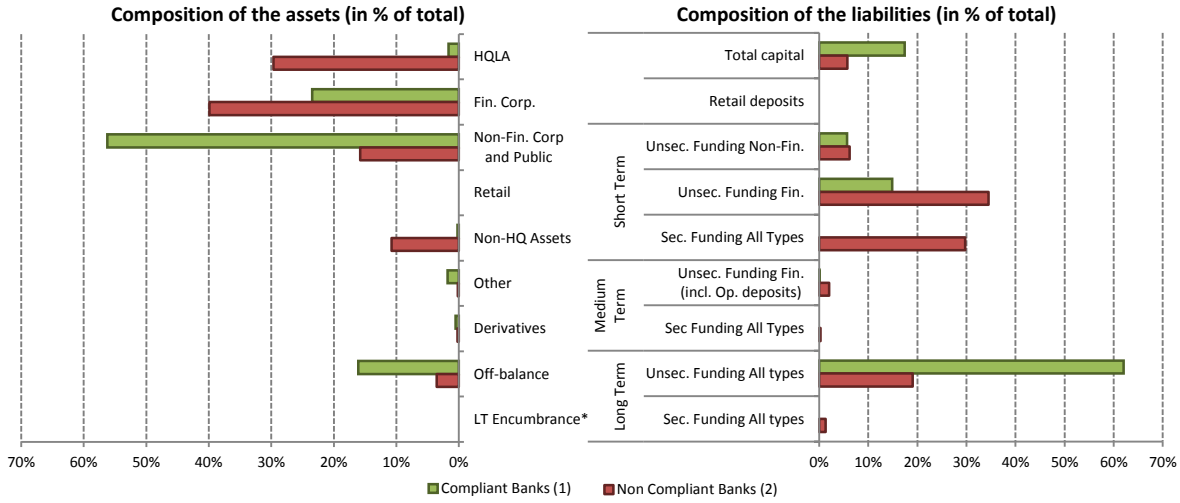
* LT encumbrance is measured as total assets encumbered for more than six months over total assets.

3.3.5 Diversified firms with no retail deposit

Given the size of this business group (one compliant, two non-compliant), the benefits of analysing their differences are limited. The compliant diversified firm holds mostly long-term unsecured funding (62%) and capital (17%). Non-compliant firms hold mostly short-term unsecured funding from financials (35%) and short-term secured funding (30%), which both have a high discount factor.

On the asset side, non-compliant firms hold a lot more HQLAs (30% vs 2% for the compliant firm) but also relatively more financial exposure (40% vs 23% for the compliant bank) than non-corporate exposure (16% vs 56% for the compliant firm). Surprisingly, the balance sheet of the compliant firm is also much more encumbered (16% vs 4% for the non-compliant banks).

Figure 13: Balance sheet comparison between compliant and non-compliant firms in the diversified without retail deposit business model



3.4 Sensitivity analysis

This section considers the impact on banks' NSFRs if the methodology for calculating the NSFR is modified. Our mandate requires that the report elaborate on the calibration of the requirement, including categories of assets and liabilities and their weighting in the calculation. As an input to this, this section of the report would consider the impact on banks' NSFR if the methodology for calculating available and required stable funding is modified.

This analysis is important for understanding how calibration changes are likely to affect banks' NSFR compliance. But it would be silent on how calibration changes might deteriorate the NSFR's effectiveness as a tool to address funding and liquidity risks and overcome the market failures and externalities analysed earlier in the report. The two aspects would obviously need to be considered in conjunction.

This section analyses the sensitivity of banks' NSFR to the calibration of the weights for different categories of available and required stable funding. This is done by measuring the impact on

banks' NSFR of a 1 percentage point change in the RSF and ASF factors of specific asset and liability categories. The results merely reflect the relative concentration of assets and liabilities that banks have on their balance sheets, but nevertheless provide a relatively comprehensible way of thinking about how calibration changes affect NSFR compliance.

The impact of a certain funding source or type of exposure on a bank's NSFR depends on 1) the item's relative importance in the bank's balance sheet; and 2) its associated weight in the calibration of the NSFR. This section analyses the impact on banks' NSFRs if the weights for calculating available and required stable funding are changed. The sensitivity analysis is performed 'ceteris paribus'.

Table 11 shows the result of the sensitivity analysis for a number of liability and asset categories. It shows the change to the aggregate NSFR that would follow a 1 percentage point increase in the weight of each type of asset or liability when calculating ASF and RSF. For example, if the weight (ASF factor) for Tier 1 capital were increased by 1 percentage point, this would lead to a 0.09 percentage point increase in the aggregated NSFR of the EU bank sample.[8] Similarly, a 1 percentage point increase in the weight (RSF factor) for cash would result in a 0.04 percentage point decrease in the aggregated NSFR.

On an overall level, this analysis shows that, for the aggregated EU sample, the NSFR is most sensitive to changes to the weighting of long-term liabilities. Specifically, if the weight for liabilities with a remaining maturity above one year were reduced (increased) by 1 percentage point, this would lead to a decrease (increase) in the aggregated NSFR by half of that (i.e. 0.5 percentage points). The large sensitivity to this weight is due to the fact that long-term liabilities comprise a relatively large share of banks' total liabilities. Furthermore, with respect to liabilities with a shorter maturity, the aggregated EU bank NSFR is sensitive to changes in either the weight on funding from financials with a maturity below six months, or the weight on stable retail deposits. Again, this is explained by the relatively large shares of these liabilities in the balance sheets of many banks. Changing the weight on funding from financials with a maturity below six months would cause the aggregated NSFR to change by 0.19 percentage points, while the same change to the weight for stable retail deposits results in a 0.18 percentage point change to the aggregated NSFR.

On the asset side, the aggregated EU bank NSFR is most sensitive to changes in the weight applied to encumbered assets. A 1 percentage point increase (decrease) in the weight for encumbered loans results in a 0.39 percentage point decrease (increase) in the aggregated NSFR. Also, a change in the RSF factor of long-term loans to retail counterparties and non-financial counterparties would have a relatively large impact on banks' NSFR, reflecting that these assets constitute the main activities of EU banks. On average, the impact of a 1 percentage point change in the RSF factor for loans to retail counterparties and loans to non-financial corporates impacts the total aggregated NSFR by approximately 0.3 percentage points.

[8] The example is somewhat hypothetical since for capital the base case weight is already 100%. However, a 1% *decrease* would have the symmetrical effect of *decreasing* the NSFR by the same amount.

Table 11: Percentage point change to the aggregate sample NSFR due to a 1% increase/decrease to the ASF and RSF weights used to calculate the NSFR

Balance sheet item	Percentage point impact on the aggregated total sample NSFR
Available Stable Funding	
Tier 1. Tier 2 and other long term capital instruments >1 year	0.09
Other long term liabilities with remaining maturity >1 year	**0.50**
Retail deposits	
"Stable" non-maturity and term deposits < 1 year provided by retail and small business customers	**0.18**
"Less stable" non-maturity and term deposits < 1 year provided by retail and small business customers	0.15
Other funding <1 year	
of which from non-financial counterparties:	0.15
- o/w from non-financial corporates	0.13
- o/w from sovereigns, multilateral development banks and PSEs	0.02
From financial counterparties:	0.34
- o/w operational deposits from financial counterparties	0.02
- **o/w other funding from financials 0-6 months**	**0.19**
- o/w other funding from financials 6-12 months	0.11
- o/w other funding from central banks 0-6 months	0.02
- o/w other funding from central banks 6-12 months	0.01
All other liabilities and equity categories not included in the above categories	0.14
Required Stable Funding	
Cash and HQLA securities	
Cash, central bank reserves that can be drawn in times of stress	-0.04
HQLA (securities)	-0.18
Unencumbered Level 1 securities	-0.13
Unencumbered Level 2a securities	-0.04
Unencumbered Level 2b securities	-0.01
Loans	
Lending to retail counterparties	**-0.27**
- of which retail lending below 1 yr	-0.02
- of which unencumbered mortgages >1yr qualifying for a 35% risk-weight	-0.22
Loans to non-financials	**-0.30**
- of which unencumbered loans with a maturity <1 yr	-0.10
- of which unencumbered loans with a maturity >1 yr	-0.20
Loans to financials	-0.16
- of which secured and unsecured loans to banks and financials between 0-6 months	-0.09
○ *of which to banks*	-0.08
○ *of which to financials*	-0.01
- of which secured and unsecured loans to banks and financials between 6-12 months	-0.01
- of which secured and unsecured loans to banks and financials with a maturity above 1 year	-0.06
Encumbered loans and other assets	**-0.39**
All other on balance assets	-0.13
Off-balance sheet exposures	-0.12

4. Possible structure of an EU stable funding requirement

The stable funding requirement should be applied on an individual and consolidated basis, as with other prudential requirements. This approach is in line with that envisaged in the CRR in Articles 6(4) and 11(3)(5) on the level of application of the liquidity requirements laid down in Part Six (Liquidity) of the CRR. This proposed level of application is also consistent with paragraph 50 of the NSFR Basel standard on the scope of application of the requirement.

In the context of EU groups or sub-groups where the liquidity/funding is centrally managed, a net stable funding requirement at a solo level could impede the effective liquidity management. To avoid this problem, the report discusses the following methods:

- *to waive the application of the funding requirement for individual institutions and subject them to a consolidated requirement at a group or sub-group level based on conditions consistent with those for the LCR (laid down in Articles 8 and 10 of the CRR); and*

- *to apply preferential treatment to intragroup exposures for the calculation of the funding requirement on a solo basis when no waiver is granted because supervisory attention is still needed on the overall structural funding risk situation at the level of each entity within the group.*

According to the LCR DA, the preferential treatment of intragroup transactions should only be given to the liquidity and credit line transactions on the basis of objective criteria that shall be met and only with the prior approval of the competent authorities involved. Taking into account these rules and the nature of the stable funding ratio requirement, the report expresses that the transactions eligible for the preferential treatment and the criteria to be met (safeguards to be met for the application of preferential treatment to the group's entities) should not be more stringent than those applied to the LCR under stress conditions.

A discussion is also included on the advantages and disadvantages of considering an NSFR by significant currency. This is irrespective of the necessary reporting by significant currency, which is already envisaged in the EU legislation.

This section also includes considerations around potential NSFR flexibility as a regulatory metric.

Links with the LCR definitions are described here, together with an analysis of their potential impact on the NSFR definition and on the calculations of the shortfalls in this report.

4.1 Consolidated/solo NSFR

The Basel III NSFR standard sets out in paragraph 50 that the NSFR should be applied to all large and internationally active banks on a consolidated basis, but may be used for other banks and on any subset of entities of internationally active banks as well, to ensure greater consistency and a level playing field between domestic and cross-border banks.

Applying the NSFR on a consolidated basis provides an overall picture of a group's funding structure. However, even if a banking group reaches a high NSFR at the consolidated level, this does not always mean that its subsidiaries are individually adequately protected from funding risks, even under a model of centralised liquidity and funding management within the group. For instance, there could be legal, regulatory and operational limitations to the transferability of liquidity within the group. These limitations may arise when the entities forming a group are located in different countries, but they are not limited to such situations. Consolidation only at the highest level of EU groups' structure does not ensure effective implementation of the NSFR's objectives at the level of individual legal entities or sub-groups within the group.

Because of these limitations, in order to ensure an appropriate funding structure in every EU institution, the application of the NSFR on a consolidated *and* on a solo basis as a general rule is fully justified. The consolidated NSFR ensures adequate funding stability for the group seen as a whole, while the solo requirements ensure that each subsidiary is itself adequately funded, i.e. that for each subsidiary, liabilities are sufficiently stable in relation to assets. For instance, if a banking group has two distinct subsidiaries, each of the subsidiaries would need to individually meet the NSFR, even if the group as a whole meets it.

This approach is in line with what is envisaged in the CRR in Articles 6(4) and 11(3) on the level of application of the liquidity requirements set out in Part Six. Consequently, the definition of the perimeter of consolidation for NSFR purposes should follow what Articles 11(3) and (5) state. Note that this proposed level of application for the EU implementation is consistent with paragraph 50 of the NSFR Basel standard (which defines the application of the requirement).

The application of the NSFR at a solo level supports the liquidity soundness and funding stability of each entity within a group, which is essential for improving the whole group's resilience to internal and external shocks. But in some cases, it could cause problems in centralised liquidity management at a group level (for instance, if the parent entity is issuing debt in the market or raising deposits and extending a loan to its subsidiary). In other words, while it is in some cases imprudent to assume that imposing a requirement at the consolidated level will protect the stability of all subsidiaries, there are also cases where funding is truly shared within a group and where this should be recognised. In those cases, two approaches can be used:

- a waiver can be given to the individual entities in a group, authorising them to disregard the solo requirement and only fill a consolidated return and meet the NSFR at a group or sub-group level; or

- preferential treatment can be given to some intragroup exposures when granting a waiver would be imprudent because supervisory attention is still needed on the overall structural funding risk situation at the level of each entity within the group or sub-group, while recognising that some aspects of joint liquidity and funding management are in place.

4.1.1 Waivers of solo NSFR

In the context of EU groups or sub-groups where the liquidity/funding is centrally managed, the net stable funding requirement at the solo level could be waived in the same way as for the LCR case. Such an approach would be consistent with Recital 105 of the CRR, which envisages that, subject to stringent conditions and the individual agreement of all the competent authorities involved, competent authorities should be able to waive the application of the liquidity/funding requirement for individual institutions and subject them to a consolidated requirement instead, in order to allow them to manage their liquidity/funding centrally at a group or sub-group level.

There are important advantages to maintaining the same level of application in the NSFR (and therefore the same waiver procedure) as for the LCR:

- avoiding the burden and additional costs (for institutions and supervisors) of different reporting and monitoring scopes;
- ensuring harmonisation in the area of regulations on stable funding and liquidity coverage requirements; and
- giving a 'clear picture' about the group/institution liquidity profile when the LCR is complemented with the NSFR at the same level of consolidation in both reporting and disclosure.

Thus, for the sake of simplicity, it would seem preferable to use the approach already defined in the LCR. If, however, a different approach were to be adopted, it would seem coherent to make sure that the conditions for considering that a group has a joint approach and a centralised management should not be more stringent for the NSFR than for the LCR. Indeed, the LCR is defined in reference to an acute stress, though, in the context of the NSFR, joint management of funding need not necessarily imply the same immediacy.

Application on a solo level approach to the net stable funding requirement, based on the conditions consistent with those for the LCR, entails the need to determine a centralised management of liquidity, pursuant to Articles 8 and 10 of the CRR, as criteria for using the derogation from the liquidity requirements on an individual basis.

Article 8 of the CRR provides for a full or partial waiver to the individual application of liquidity requirements under Part Six (Liquidity) of the CRR, provided supervision is carried out on the basis of a single liquidity sub-group. While institutions in the single liquidity sub-group are authorised in several Member States, the waiver could only be applied after the competent authorities involved

all reach a joint decision. The terms and conditions of the joint decision procedure—stipulated in Article 21 of the CRR—provide a safeguard against inappropriate application of the waiver in relation to the stable funding requirement.

The application of the waiver laid down in Article 10 of the CRR is limited to the one or more credit institutions situated in the same Member State, provided that these institutions are permanently affiliated to a central body that supervises them and is established in the same Member State. Where the competent authority is satisfied that the stringent conditions set out in Article 10(1) are met, and where the liabilities or commitments of the central body are entirely guaranteed by the affiliated institutions, the competent authority may waive the application of Part Six (Liquidity) of the CRR to the central body on an individual basis. Taking into consideration that the central body is empowered to issue instructions to the management of the affiliated institutions (Article 10(1)(c)), the application of the NSFR only to the central body ensures long-term liquidity management and control of all the affiliated institutions.

According to the CRR provisions, where a waiver is granted under Articles 8 or 10, the central body/an institutional protection scheme (IPS) member institution/a parent institution on a consolidated basis or a subsidiary institution on a sub-consolidated basis has a responsibility to measure and report the LCR (NSFR) liquidity standard. Other members of a group (sub-group) that is centrally managed do not have to comply with this prudential liquidity requirement on an individual basis.

4.1.2 Preferential treatment of intragroup exposures

(i) Rationale behind the preferential treatment of intragroup exposures

As the previous subsection explains, waiving the solo requirement is appropriate for groups where funding is centrally managed and funding problems would be dealt with centrally. But there are intermediate cases where waiving the solo requirement would be imprudent and yet, some joint management is recognized and should not be discouraged by imposing too strict solo requirements. When this is the case, preferential ASF and RSF factors could be applied to some intragroup claims and liabilities. Under a preferential treatment:

- the involved institutions still have to comply with the prudential liquidity requirements, which would not be the case under a waiver;
- supervisory attention is still needed on the overall structural funding risk situation at the level of each entity, which is more appropriate for prudential reason; and
- the obligatory reporting and disclosure requirements apply.

This approach is envisaged in Recital 106 of the CRR for the liquidity coverage requirement and could be reasonably extrapolated to the context of the NSFR, also under compliance with stringent and objective conditions.

(ii) Objective criteria and transactions eligible for the preferential treatment of intragroup exposures

The CRR and the LCR Delegated Act (DA) set out the safeguards that need to be met by the group entities[9] or by the entities within an IPS for the application of preferential treatment in the context of the LCR within both domestic and cross-border intragroup transactions.

According to Recital 15 of the LCR DA, the preferential treatment of intragroup flows should only be given on the basis of additional objective criteria and only with the prior approval of the competent authorities involved. These objective criteria are listed in the LCR DA, in Articles 29(1)(2) and 34(1)(2)(3), separately, in regard to domestic and cross-border intragroup transactions. In particular, when the related institutions are established in different Member States, the liquidity provider and receiver are required to introduce legally binding arrangements regarding the credit or liquidity line and adequate liquidity risk management. Moreover, both the liquidity provider and the receiver have to present a low liquidity risk profile.

The LCR promotes the short-term resilience of a bank's liquidity profile by ensuring that it has sufficient HQLAs to survive a significant stress scenario lasting for 30 days. In this context, the preferential treatment of intragroup exposures takes on special significance as the source of a potential internal early intervention measure in stress times. By contrast, the NSFR is not confined to stress situations but to normal scenarios without prejudice to the fact that an appropriate funding structure should be kept under stress. In practice, this could mean that the safeguards that should be met to ensure a flow of liquidity/funding in the context of the NSFR would not need to be as stringent as in the case of stress situations in the very short term. Therefore, the report would suggest that the safeguards/conditions to be met for the application of the preferential treatment of the NSFR should not be more stringent than those in the LCR. The same applies with respect to the activities that could benefit from preferential treatment. The LCR DA applies the preferential treatment to liquidity and credit lines. The EBA, in its LCR IA report from December 2013, found some arguments to suggest only these transactions for a preferential treatment under stress for prudential and market reasons. Therefore, it would be expected that at least these transactions could also benefit from the application of preferential treatment in the NSFR.

[9] The preferential treatment could be applied to an institution that is:

- an affiliate of a network or co-operative group as referred to in Article 10 of the CRR;
- linked by a relationship within the meaning of Article 12(1) of Directive 83/349/EEC; or
- a parent or subsidiary institution of the credit institution.

4.2 Considerations for defining foreign currency funding requirements

4.2.1 The CRR and the EBA mandate

The mandate to the EBA states that the impact assessment should look at the NSFR on the basis of the items to be reported in accordance with the liquidity reporting requirement in the CRR (Part Six, Title III) outlining the reporting requirements. Following on from Article 415, banks should report this information separately for each of their significant currencies. The European Systemic Risk Board (ESRB), in its recommendations for 2011/1[10] and 2011/2,[11] also highlighted funding risks in foreign currencies. In the last financial crisis, the substantial maturity and currency mismatch in several European countries contributed to the increase of the banking system's vulnerability. Against this background, the EBA considers it appropriate to discuss the relevance of some form of separate stable funding requirement in significant currencies, even though it is not explicitly stated in the mandate.

4.2.2 Current liquidity regulation and significant currencies

In the existing European liquidity regulation, institutions should report information not just in their reporting but also in significant foreign currencies. Article 415/2/a of the CRR states that 'a currency is significant, if it exceeds 5% of the institution's or the single liquidity sub-group's total liabilities' or 'a significant branch in accordance with Article 51 of Directive 2013/36/EU in a host Member State using a currency different from the reporting currency under paragraph 1 of this Article'.

The European Regulation gives national competent authorities the opportunity to require restriction on currency mismatch. The Commission Delegated Regulation (EU) 2015/61, Article 8/6, states that 'Credit institutions shall ensure that the currency denomination of their liquid assets is consistent with the distribution by currency of their net liquidity outflows. However, where appropriate, competent authorities may require credit institutions to restrict currency mismatch by setting limits on the proportion of net liquidity outflows in a currency that can be met during a stress period by holding liquid assets not denominated in that currency…'.

The EBA does not consider it necessary to differ from the current practice of significant currencies, which was defined in Article 415/2/a of the CRR.

[10] http://www.esrb.europa.eu/pub/pdf/recommendations/2011/ESRB_2011_1.en.pdf?800e8ee1f3f4c92a8c9f78456c198240

[11] https://www.esrb.europa.eu/pub/pdf/recommendations/2011/ESRB_2011_2.en.pdf?a2bf8ae8f89ad09eb0b464628ccc9e7f

4.2.3 Rationale for some form of stable funding requirement in significant currencies

Banks' balance sheets often comprise assets and liabilities in several different currencies. There are two main reasons for this. First, banks may operate in several markets, in which case they may have both assets and liabilities in several different currencies. Second, assets in one currency may be financed in a different currency.

In the latter case, there could be several factors that influence the use of different funding currencies; for instance, diversification (by sourcing funds in several markets, banks may access a different or broader base of investors, reaping cost advantages), supply factors (interest rate environment), and structural factors that may affect the supply of funds in one market vis-à-vis another.

Depending on the maturity structure of the assets and liabilities in each specific currency, banks may run a larger funding risk in a specific currency than is the risk manifest in the overall maturity mismatch between assets and liabilities across all currencies. For instance, a bank can have short-term liabilities that fund long-term assets in a specific currency, but where this maturity mismatch is obfuscated at the balance sheet level by a reverse maturity structure in another currency.

As long as the bank has an overall surplus of stable funding, this risk may be manageable because the bank can transform the currency of their stable funding using foreign exchange (FX) swaps. But this may not always be possible, especially during more stressed situations where counterparty credit risk and currency-specific liquidity risk can cause dislocations in FX swap markets, leading to prohibitively increased prices or reduced access to funding in foreign currencies. In this case, banks may find themselves in a situation where they cannot roll over liabilities in the specific currencies. If funding strains continue over a longer time horizon, banks may need to deleverage. This could then impact institutions' solvency if assets need to be sold at a discount, or the real economy when banks need to scale back certain activities. Hence, a bank's having stable funding may not be sufficient if that stable funding is denominated in a different currency to the assets it needs to fund.

A stable funding metric applied to the aggregated balance sheet does not properly reflect funding risk in specific currencies. This is particularly true if a bank has a surplus of stable funding in one currency that would counterbalance stable funding requirements in a different currency. By contrast, a stable funding ratio that is also applied for significant currencies would reflect such risks.

4.2.4 Examples that highlight the need for some form of foreign currency funding requirement in significant currencies

One well-known example of funding stress occurring in specific currencies is the liquidity strain in US dollar funding markets in 2008 and 2011, which significantly affected, among others, European banks. In its recommendation on US dollar funding, the ESRB concludes that this stress was, to a

large extent, amplified or caused by banks having material maturity mismatches in US dollars; long-term assets were funded with short-term liabilities.

Another oft-mentioned example is the case of central and eastern European countries (CEE). Institutions in CEE typically financed their loans with short-term liabilities denominated in foreign currencies (mostly CHF and EUR), which caused not just maturity but also currency mismatch in their balance sheets. Before the crisis, the level of loans (mostly to households) denominated in foreign currency had reached a significant level; this contributed to the vulnerability of the financial system. In CEE, banks financed the fast build-up of foreign currency assets in two ways: (i) by raising foreign currency denominated external funding (mostly from parent institutions); and (ii) by switching local currency funding to FX funding via FX swaps. The maturities of the FX swaps were usually short term, which also caused significant rollover risk. Risks continued to increase following the outset of the crisis because of the shortening of foreign funds and the increasing dependence on swap markets. When the financial crisis materialised, the FX swap markets dried out and the institutions had difficulties rolling over their FX swaps.

4.2.5 Practical aspects of some form of funding requirement in significant currency

There are many possible ways to take into account the currency mismatch in the banks' balance sheets. One possible approach could be to introduce an NSFR requirement in separate currencies. This would, however, require some modifications compared to the aggregated ratio as well as some additional considerations. This would include, but is possibly not limited to, the following points:

- Banks' balance sheets are often not matched across assets and liabilities in each currency, which implies that a metric for separate currencies thus needs to take into account how surplus assets or liabilities should be considered.

- The treatment of FX swaps would need to be carefully considered to ensure a proper reflection of funding risks in specific currencies. For instance, the Basel NSFR only considers the market values of derivatives, which may not be reflective of the underlying currency mismatch. Instead, nominal amounts exchanged could be a more suitable metric in this particular case.

- At the same time, as a stable funding requirement is a medium-term metric and should also reflect banks' continued need for stable funding, it is reasonable to allow some reliance on FX markets.

- The treatment of the issue of own funds that are almost entirely denominated in the local currency in some Member States. Own funds not being a stable funding item in foreign currency could create difficulties in meeting the unmodified NSFR requirement.

The main arguments to support having NSFR requirements in foreign currencies are the following:

- As we have seen in several European countries, the maturity and also the currency mismatch caused severe problems in the financial system. The introduction of the ratio will further increase banks' shock resilience.

- Supervisors will have a complete view of the institution's funding profile.

- It can provide a harmonised solution across Member States that may serve microprudential, as well as macroprudential, purposes.

The main arguments that oppose having strict NSFR requirements in foreign currencies are the following:

- The components of the NSFR ratio should be modified to reflect that the ability to capture the denomination risk and the ratio will also be slightly more complicated.

- National competent authorities can best assess the risk of currency mismatch for their own institutions, which could differ from country to country (for example, differences in the foreign currency markets may require distinct regulatory reactions).

- This will impose additional cost for institutions.

- In the QIS voluntary data collections, institutions do not provide information in significant currencies; therefore, the report cannot quantitatively assess the impact of a minimum ratio requirement in foreign currencies.

Arguably, another possible solution could be similar to Commission Delegated Regulation (EU) 2015/61, Article 8/6. This approach could provide national discretion to Member States to decide whether and how they restrict on an individual level the currency mismatch of a single institution.

The main arguments to support having discretion (similar to 2015/61, Article 8/6) to restrict the foreign currency mismatch are the following:

- It will provide an additional option for supervisors to intervene in case an institution's currency mismatch deteriorates.

- This approach will provide flexibility to supervisors.

- It will be consistent with the LCR regulation.

The main arguments that oppose having discretion (similar to 2015/61, Article 8/6) to restrict the foreign currency mismatch are the following:

- It is probably not the most efficient way of restricting currency mismatch at a systemic level.

- In the absence of clearly defined requirements, regulatory inaction bias may delay intervention.

- Limited practical experience.

Lastly, another approach could be to continue the current practice to maintain the reporting in significant currencies (as defined in the CRR) without defining a stable funding requirement. As we have seen previously, currency mismatch significantly contributed to the financial system's vulnerability in several Member States. Therefore, in the absence of a uniform solution, Member States may maintain or introduce national regulation to cope with the currency mismatch at a national level.

4.2.6 Conclusion

Different initiatives are in place for the purposes of ensuring appropriate monitoring of funding risk. Reporting of stable funding by significant currency is already required by the CRR. In addition, the ESRB has issued some recommendations for the monitoring of USD funding risks. Arguably, information related to banks' funding risks in specific currencies can be valuable for supervisors. Therefore, introducing some form of separate stable funding requirement or providing national discretion to restrict the currency mismatch in significant currencies would further strengthen the monitoring and control of these risks. Nevertheless, introducing a separate stable funding requirement per currency would necessitate some adjustments (compared to the aggregated stable funding requirement) to make it operational.

4.3 Links with the LCR definitions

4.3.1 Estimation of the impact of the HQLA definition given in the EU LCR DA on the NSFR

The aim of this analysis is to obtain an estimate of the potential impact on the NSFR of the differences between the EU LCR DA and the Basel Committee LCR.[12] To recall, the LCR and the NSFR are closely related, given that HQLAs eligible for the LCR obtain lower RSF factors in the NSFR. An estimate is needed given the mandate to assess the impact of the NSFR and explore the impact of different methodologies.

This section starts with a brief overview of the differences between the LCR DA and the BCBS LCR, with a focus on the definition of HQLAs.

The main differences in HQLA definitions relate to:

[12] The EBA LCR calibration report from 2013 also discussed the impact on the LCR based on different scenarios under different definitions of HQLAs.

- The inclusion of certain covered bonds held with External Credit Assessment Institutions (ECAI) 1 in Level 1 rather than Level 2A
    - for the NSFR, this modification implies assigning an RSF factor of 7% rather than 15%.
- Securities issued by promotional banks are included in Level 1 rather than non-HQLAs:
    - for the NSFR, this implies assigning an RSF factor of 5% rather 85%.
- CIUs are included in either Level 1 or Level 2A depending on the underlying securities:
    - for the NSFR, this implies assigning an RSF factor of either 5% or 15%, rather than 85%.
- Covered bonds with ECAI 2 included in Level 2A rather than non-HQLAs:
    - for the NSFR, this implies a lower RSF factor of 15% rather 85%.
- Additional asset-backed securities (ABSs) included in Level 2B rather than non-HQLAs:
    - for the NSFR, this would imply an RSF factor of 50% rather than 85%.

The templates for the QIS were used to approximate the potential impact of these changes on the NSFR. However, there are important data limitations in these templates. First, the NSFR templates do not provide a separate breakdown of the five different categories of securities that are affected by the modifications in the EU DA. For this reason, the LCR and the EU LCR template were also used to approximate the amount of securities held by EU banks. With regard to unencumbered ECAI 1-rated covered bonds, the LCR template provides a separate reporting item and thus allows for a relatively exact estimate of this specific modification. The change in the NSFR due to this inclusion is calculated by applying an RSF factor lower than 15%. For this analysis, it was assumed that the RSF factor would be 7% and thus larger than the factor applied to Level 1 assets, which is 5%. This is in line with the LCR DA, which applies a higher haircut (of 7%) to Level 1 covered bonds.

With regard to promotional banks, CIUs and ECAI 2 covered bonds, the LCR template does not separately report these items. However, they are reported in the EU LCR template if they are unencumbered. Consequently, the RSF factor for these assets was adjusted from 85% to 5% or 15% subject to their inclusion in either Level 1 or Level 2A under the LCR.

Finally, the estimation of the impact of including additional ABSs in Level 2B and subsequently in the 50% RSF bucket under the NSFR presents additional challenges, given that they are included with other central bank eligible collateral in the EU LCR template. Within this reporting item, a wide range of other securities and even loans could have been reported. Hence, when all assets reported under this item are included in the 50% RSF bucket the NSFR estimate should be read with caution, given the potential for a large upward bias overstating the actual impact.

Results

Table 12 provides weighted average NSFRs for banks across the EU and for different business model categories.[13] Figures are based on December 2013 data. The first column reports the NSFR based on the Basel III standard published in the January 2014 consultation paper, which sets our benchmark for comparison. The second column reports the EU NSFR when ECAI 1-rated covered bonds are included with an RSF factor of 7% rather than 15%. Column 3 further takes into account that promotional banks, CIUs and ECAI 2-rated covered bonds obtain an RSF factor of 5%/15% rather than 85% under the EU NSFR. Column 4 adds the effect of lowering RSF for additional eligible ABSs from 85% to 50%. It should be noted that the different elements are cumulatively included in subsequent columns, implying that in column 4 the impact of all previous changes plus additional ABSs is taken into account.

With regard to the results, the change in reported NSFRs is marginal when the RSF factor is lowered for ECAI 1-rated covered bonds. Across all banks, the NSFR increases by 0.2 percentage points; banks with a pass-through business model benefit the most from this modification. Adding the modification to the treatment of CIUs, promotional banks and ECAI 2-rated covered bonds also changes the NSFR only marginally (by 0.3 percentage points overall). Finally, column 4 reports the potential impact on the NSFR when the treatment for additional eligible ABSs is incorporated. Clearly, the effect on the NSFR is more material but, as mentioned above, this overstates the actual impact given that eligible ABSs are not the only things included under this reporting item.

To conclude, the impact on the NSFR of the modifications in the LCR DA appears to be marginal. However, it should be noted that reporting banks in the QIS may not always have fully reported their holdings of unencumbered assets in the different reporting items, and thus the impact may be larger. Moreover, banks may also change their holdings of assets once the NSFR is modified in line with the LCR DA. Given that the LCR DA was only published after December 2013, banks in the sample of observations used here could not have taken into account the modifications of the LCR DA to the definition of HQLAs.

Table 12: Comparison of the Basel III NSFR and the EU NSFR

	(1)	(2)	(3)	(4)
NSFR in %	Basel III	EU NSFR 1	EU NSFR 2	EU NSFR 3
by business model				
Auto & cons.	111.0%	111.0%	111.0%	111.3%
CCPs	67.9%	68.1%	68.3%	71.0%
Co-operatives	101.8%	101.9%	102.7%	103.4%
Leas. & fact.	102.8%	102.8%	102.8%	102.8%
Local univ.	109.0%	109.1%	109.3%	113.7%

[13] Unlike the rest of the report, this analysis uses the business model categories defined in the EBA's *Report on impact assessment of liquidity measures under Article 509 (1) of the CRR*.

Mrtg. & build. soc.	110.0%	110.0%	110.5%	112.8%
Other specialised	115.1%	115.4%	118.8%	120.0%
Pass-through	139.4%	140.7%	146.1%	147.1%
Private	91.4%	91.6%	92.5%	92.6%
Savings	103.4%	103.5%	104.0%	105.1%
Shariah compliant	95.9%	95.9%	95.9%	95.9%
Trade finance	116.4%	116.4%	116.5%	118.6%
Univ. cross-border	101.6%	101.7%	101.9%	103.8%
Total	**103.1%**	**103.3%**	**103.6%**	**105.6%**

	(1)	(2)	(3)	(4)
Shortfall in bn EUR	Basel III	EU NSFR 1	EU NSFR 2	EU NSFR 3
		by business model		
Auto & cons.	4.7	4.7	4.7	4.6
CCPs	84.9	84.9	84.9	83.1
Co-operatives	87.3	86.0	80.3	72.2
Leas. & fact.	0.0	0.0	0.0	0.0
Local univ.	16.6	16.1	14.9	12.7
Mrtg. & build. soc.	13.2	13.2	13.0	11.9
Other specialised	0.1	0.1	0.1	0.1
Pass-through	0.0	0.0	0.0	0.0
Private	6.4	6.4	6.4	6.4
Savings	47.1	46.5	45.3	44.7
Shariah compliant	0.0	0.0	0.0	0.0
Trade finance	0.0	0.0	0.0	0.0
Univ. cross-border	310.4	301.3	298.3	241.3
Total	**570.9**	**559.3**	**548.1**	**477.1**

4.3.2 Potential impact of EU definition versus Basel definition of retail and SME deposits in the calculation of shortfalls

The NSFR QIS templates form the basis for the calculation of the NSFR shortfalls in the descriptive analysis of this report. These templates follow the Basel NSFR text and include two items on retail and SME deposits in the list of liability items: 'stable' deposits (as defined in the LCR Basel text, stemming from retail and SME customers) and 'less stable' deposits (as defined in the LCR Basel text, stemming from retail and SME customers).

The Basel NSFR text (and therefore the NSFR QIS templates) applies the same treatment to retail deposits as defined in the LCR Basel text (which are those placed with a bank only by a natural person) and to deposits stemming from SMEs. The Basel NSFR text applies for both categories the distinction between stable and less stable deposits as set out in the Basel LCR text.

The Commission Delegated Regulation (EU) 2015/61, which specifies the liquidity coverage requirement for credit institutions in the EU, is applicable from 1 October 2015. Therefore, the data reported in the QIS templates used in preparation for this report use the Basel definition of retail and SME deposits, as cited above.

This chapter compares the definitions of those categories of deposits used in the NSFR QIS templates with their definitions in the Delegated Regulation. It assesses the potential impact that the usage of the European definitions could have on the calculation of the NSFR shortfalls in the report.

The QIS template captures the following information:

	Basel ASF factors based on maturity		
	< 6 months	> 6 months to < 1 year	> 1 year
'Stable' (as defined in the LCR) demand and/or term deposits from retail and small business customers	95%	95%	100%
'Less stable' (as defined in the LCR) demand and/or term deposits from retail and small business customers	90%	90%	100%

Confrontation of definitions

	Basel	LCR DA	Conclusion
Definition of retail and SME deposits	Deposits placed with a bank by a natural person or SMEs are included (paragraphs 22 and 23 of the NSFR Basel text, together with paragraphs 73, 90 and 91 of the LCR Basel text).	Liabilities to a natural person or to an SME are included (Article 3 (8) of the LCR DA).	No significant differences in the definitions under both frameworks.
Definition of stable retail and SME deposits	(Paragraph 19 of the NSFR Basel text, and paragraph 75 of the LCR Basel text.) Amount of the deposits fully insured by a Deposit Guarantee Scheme (DGS) and where: • either the depositors have other established relationships with the	(Article 24 of the LCR DA.) Amount of the deposits covered by a DGS and where the depositor is either: • part of an established relationship, making withdrawal highly unlikely; or • held in a transactional account.	No significant differences would be expected in the reporting of stable retail and SME deposits under both frameworks.

	bank that make deposit withdrawal highly unlikely; or • the deposits are in transactional accounts.		
Definition of less stable retail and SME deposits	(Paragraph 23 of the NSFR Basel text and paragraph 79 of the LCR Basel text.) Basel leaves it to national discretion to define additional buckets for less stable retail deposits.	(Article 25 of the LCR DA.) The LCR DA lays down additional buckets for less stable retail deposits.	No significant differences would be expected in the reporting of less stable retail and SME deposits under both frameworks.
Further criteria for the categorisation of retail and SME deposits	(Paragraph 80 of the LCR Basel text.) If a bank is not able to readily identify which retail deposits would qualify as 'stable', it should place the full amount in the 'less stable' buckets as established by its supervisor. (Paragraph 82 of the LCR Basel text.) Cash outflows related to retail term deposits with a residual maturity or withdrawal notice period greater than 30 days will be excluded from total expected cash outflows if the depositor has no legal right to withdraw deposits within the 30-day horizon of the LCR, or if early withdrawal results in a significant penalty that is materially greater than the loss of interest.	Article 25 of the LCR DA envisages an assessment to be made by banks for the identification of less stable retail deposits, which, if not fulfilled, would imply categorisation of those retail deposits as the least stable deposits. Article 25 (4) of the LCR DA sets out similar restrictions.	No significant differences would be expected in the reporting of retail and SME deposits under both frameworks following these instructions. No significant differences would be expected in the reporting of retail and SME deposits under both frameworks following these instructions.

Conclusion

From this assessment, the conclusion is that no significant differences are expected in the reporting of retail and SME deposits under the Basel or European frameworks. Therefore, the shortfall analysis in this report is not affected by the framework used.

4.4 NSFR flexibility and the supervisory response

The Basel text on the NSFR requires banks to maintain an NSFR equal to at least 100% on an ongoing basis. In contrast, the Basel text on the LCR and the EU Delegated Act explicitly foresee the possibility of the LCR falling below 100% during stress periods. The added flexibility during times of stress is beneficial for both banks and public authorities, providing time to take measures to address the sources of stress; additionally, it generally reflects the notion that the counterbalancing capacity of the LCR is available to be used in stress periods.

The **need for flexibility under the NSFR is less clear** given that the ratio is not calibrated to reflect stress and does not provide for a buffer that is intended to be used in times of stress. Moreover, the NSFR is calibrated to match a longer maturity horizon than the LCR and thus changes more slowly over time, including in times of stress. Hence, the need for an explicit reference to the possibility of falling below the minimum requirements is less obvious. Furthermore, an explicit reference to supervisory flexibility could weaken the NSFR requirement.

A counter argument is that *implicit* flexibility leaves a void in terms of clear supervisory reactions when a bank actually falls below the 100% requirement.

The Basel Committee discussed the pros and cons of including an explicit reference to the supervisory reaction when a bank falls below the minimum requirement. While the BCBS ultimately decided not to include an explicit reference, these arguments are repeated here for further consideration:

The **main arguments that have been raised <u>in support</u>** of an explicit reference to flexibility in supervisory responses to an NSFR that falls below 100% are the following:

- It would make it clear that the NSFR is not intended to be a hard limit in times of stress to facilitate local implementation and avoid inappropriate extrapolation of the NSFR as a hard limit for complementary frameworks (e.g. resolution authority).

- By avoiding inappropriate extrapolation of the NSFR as a hard limit, it could help in reducing the risk of procyclical behaviour. In the face of a funding stress scenario, some banks may decide to deleverage or substitute loans with liquid assets in order to continue to meet the NSFR if they or the market perceive 100% to be a hard limit.

- Given this risk of deleveraging behaviour, central banks may be even more pressured to implement measures to ease the situation of troubled banks, such as buying illiquid assets or increasing the term and adjusting the haircuts on their liquidity-provision facilities.

The **main arguments that have been raised <u>in opposition</u>** to an explicit reference to flexibility in supervisory responses to an NSFR that falls below 100% are the following:

- The NSFR is a structural metric more akin to capital and leverage ratio requirements (rather than a buffer of liquidity to be used), where there is no explicit mention that banks may be allowed to breach the minimum (but jurisdictions may allow banks to operate under such limits in certain conditions).

- Unlike the LCR, which may deteriorate suddenly and sharply, resulting in liquidity hoarding by banks, the NSFR is expected to deteriorate more gradually during a stress event. As a result, the concerns relating to banks' responses to a liquidity shock are not as significant.

- No industry comments were received on the question of the 'bindingness' of the NSFR 100% minimum, which suggests that flexibility may be clear or that the market is not concerned about this issue in the same way they were with the LCR.

- Explicit flexibility may lead to a relaxation of the standard and may reduce incentives for banks to stagger their long-term funding because banks would expect to be allowed to breach the requirement in the event of liquidity stress.

The BCBS conducted theoretical and empirical analyses on the evolution of the NSFR in stress scenarios. Although the theoretical analysis provided shows that NSFRs can be expected to decline rapidly in a crisis, the data analysis (based on a limited sample of banks) suggests that the overall reaction of a set of banks was to increase their NSFRs during the crisis, mainly through a reduction in financial exposures. Importantly, this analysis suggests that, in practice, some banks were able to improve their funding profiles in 'survival mode' without necessarily severely adjusting downward lending to the real economy. The analysis did not, however, reveal to what extent extraordinary central bank operations and government support facilitated the improvement in NSFRs. It is thus not clear how the banks would have performed in the absence of these support measures.

4.5 Treatment of long-term central bank operations in the NSFR: scenario analysis for Eurosystem targeted longer term refinancing operations

Generally, the NSFR would give a 100% RSF factor to collateral pledged in a transaction with a maturity longer than one year. The October 2014 revised NSFR framework envisages the

possibility of a reduced RSF factor for collateral pledged against exceptional central bank operations, like the targeted longer term refinancing operations (TLTROs), to avoid a regulatory impediment to such operations.[14] Conversely, preferential treatment might generate artificially large NSFR values and create an incentive for banks to tap central bank operations rather than market funding sources.

In operational terms, as many Eurosystem national central banks (NCBs) have pooling systems, it would have to be decided how to apply different RSF factors to the assets used to guarantee exceptional operations vis-à-vis standard operations, like the main refinancing operation (MRO).

A possible preferential treatment has been included to avoid the NSFR declining as a result of encumbering assets in long-term operations, as this could deter banks from participating in these operations. The following scenario analysis provides an estimate of the effect when a 100% (i.e. not lower) RSF factor is applied to assets that are encumbered for collateralising TLTROs.[15]

Example 1: A bank uses EUR 100 of a government bond in the TLTRO (LCR Level 1 asset)

Required Stable Funding Factor (RSF) unencumbered: 5%

RSF encumbered > 1 year: 100%

Available stable (ASF): funding obtained from the central bank is collateral value after haircut, e.g. EUR 94 (haircut: 6%)

ΔNSF = ΔASF - ΔRSF → 94-95 = -1

NSFR↓ bank is discouraged from participating.

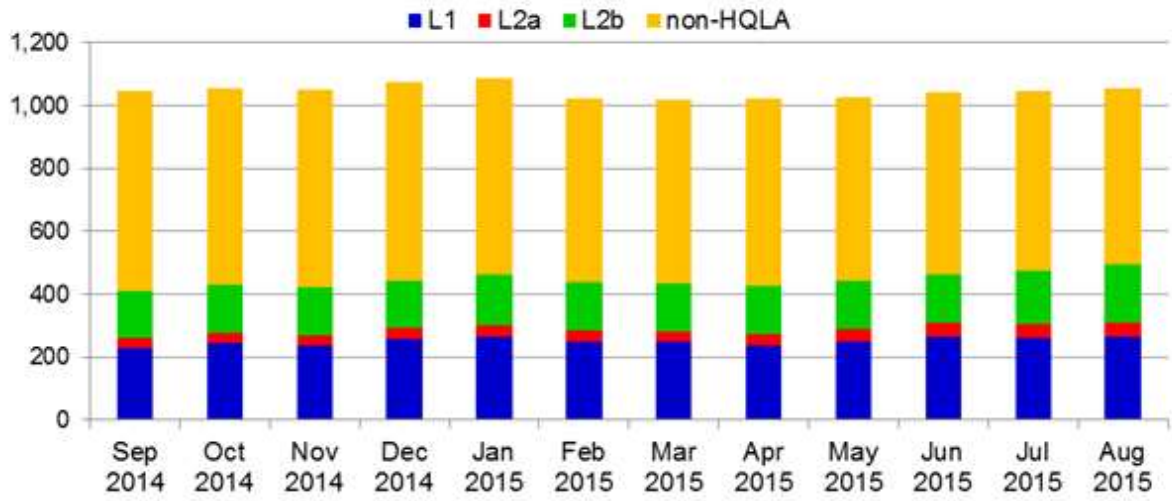
While example 1 suggests that this is an issue of concern, it should be noted that banks typically pledge a pool of different types of collateral, which are treated differently under the NSFR, obtaining different RSF requirements and haircuts.

Figure 14 below provides an overview of the composition of the collateral pledged by banks participating in the TLTRO according to the definition of liquid assets under the EU Delegated Act for the LCR. LCR eligibility provides the benchmark for the treatment of liquid assets under the NSFR. On aggregate, the collateral pool is composed of the full range of LCR eligible assets and is dominated by LCR non-eligible assets. Non-HQLAs obtain an RSF factor of 85% when they are unencumbered, which rises to 100% when they become encumbered, e.g. in the TLTRO. As a result, the positive effect on the NSFR under example 2 prevails.

[14] BCBS (2014), Basel III: the net stable funding ratio (see paragraph 31).

[15] As data on the NSFR for individual banks is not available to the ECB, the absolute amount in terms of the change in the difference between funding obtained (ASF) and RSF due to the change in the encumbrance is estimated.

Figure 14: Composition of the collateral of participating banks in the TLTRO by HQLA categories



Example 2: A bank uses EUR 100 of non-marketable assets in the TLTRO (non-HQLAs for the LCR)

Required Stable Funding Factor (RSF) when unencumbered: 85%

RSF encumbered > 1 year: 100%

Available stable (ASF): funding obtained from the central bank is collateral value after haircut, e.g. EUR 80 (haircut: 20%)

ΔNSF = ΔASF - ΔRSF → 80-15 = 65

NSF ↑ bank is encouraged to participate.

As a consequence, the incentive to participate in a long-term central bank operation hinges on the aggregate composition of the collateral pool for individual banks.

Allocation or earmarking of asset types in a collateral pool to various monetary policy operations: four different scenarios

The Eurosystem does not earmark the collateral used in its operations. Instead, a pool of collateral is pledged by the banks and the overall value of the pledged collateral needs to cover the funding obtained from the Eurosystem. This matters for the analysis, as many banks do not use the full collateral pool and thus a decision needs to be made on in what order the collateral is deemed to be used. Moreover, banks participate in a number of other central bank operations, also encumbering collateral. As of March 2015, the other operations of the Eurosystem all had a residual maturity of less than six months and the assets covering them are thus treated as unencumbered in the NSFR. Indeed, the NSFR assigns higher RSF factors to encumbered assets

only when the remaining duration of encumbrance is longer than six months. In order to understand the effect that the order in which assets are encumbered has on the NSFR, four scenarios are assessed below.

Scenarios 1 and 2 quantify the impact for the TLTRO following a bottom-up and a top-down approach, respectively. As the RSF factor increases less for non-HQLAs (because unencumbered non-HQLAs have a higher RSF factor than HQLA-eligible assets), scenario 1 is likely to lead to a more beneficial effect on the NSFR, i.e. it is less conservative. Scenarios 3 and 4 additionally take into account other operations, such as MROs. As a simplification, it is assumed that these operations encumber assets ahead of the TLTRO, but other mechanisms can also be envisaged, e.g. according to the order of take up over time. Under the bottom-up scenario, taking into account other operations first (scenario 3) is likely to lead to a less accommodating effect on the NSFR relative to scenario 1. Under top-down scenario 4, the effect should lead to an improvement relative to scenario 2. The expected order of the scenarios from best to worst in terms of improvements in net stable funding is S1 > S3 and S4 > S2. Table 13 summarises the four scenarios.

Table 13: Order of encumbrance of collateral pools

Scenario 1: Bottom-up	Scenario 2: Top-down	Scenario 3: Bottom-up & other operations	Scenario 4: Top-down & other operations
Level 1	Level 1	Level 1	Level 1
Level 2A	Level 2A	Level 2A	Level 2A
Level 2B	Level 2B	Level 2B	Level 2B
Non-HQLAs	Non-HQLAs	Non-HQLAs	Non-HQLAs

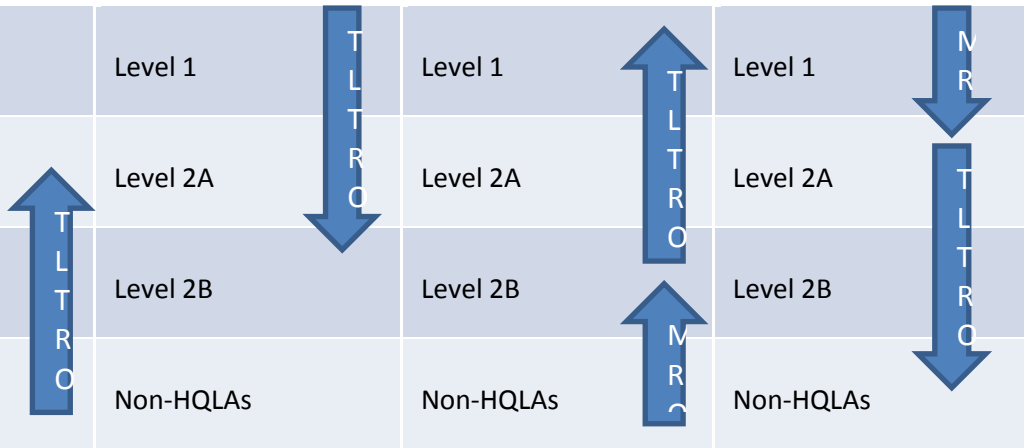


Table 14 shows the change in net stable funding (ΔNSF = ΔASF- ΔRSF) for all banks participating in the TLTRO under the four scenarios. There are 578 banks in the sample from 18 Euro area countries. As expected, scenario 1 yields the most favourable effect for the ΔNSF while scenario 2 is the least favourable. This conclusion is drawn from the fact that the mean, minimum and maximum values across the banks are higher under scenario 1 (bottom-up) than under scenario 2 (top-down). Moreover, scenarios 3 and 4 are in between the two baseline scenarios. The most important takeaway, however, is that, on average, banks benefit, in terms of a rising NSFR, from participating in the TLTRO. Only two banks would experience a decline under scenario 1 and, taking into account other operations, this would increase to 15 banks under scenario 3.

Table 14: Change in the net stable funding of individual banks in million EUR, 2014-2015

	Variable	Obs.	Mean	Min.	Max.	#banks ΔNSF < 0
Bottom-up	Scenario 1	2435	235	-123	11822	2
	Scenario 3	2435	212	-790	11822	15
Top-down	Scenario 2	2435	64	-593	8866	26
	Scenario 4	2435	132	-84	8866	15

Note: Monthly observations from September 2014 to February 2015 are used. The six data points, together with the number of banks, resulted in 2 435 observations.

Overall, the evidence provided by the currently pledged collateral suggests that a few banks would be adversely affected by the encumbrance treatment (i.e. without a preferential/lower RSF) under the NSFR for longer term central bank operations. **While this may provide justification for preferential treatment of banks in specific jurisdictions of the Euro area, a more general case cannot be derived from the available evidence.**

The evidence highlights that a majority of banks already benefit from the TLTRO in terms of higher NSFRs. Moreover, preferential treatment may also be undesirable for two reasons. First, banks may participate more in longer term central bank operations to merely mask low NSFRs. As a result, the exit from longer term operations may become more challenging for banks that are relatively dependent on central bank funding to meet the NSFR. Second, banks could further improve their NSFRs by changing the composition of their collateral pool, which may lead to a bias towards pledging non-marketable collateral. Both aspects may be undesirable for the Eurosystem.

5. Adjustment to compliance with the NSFR

In order to assess the impact of introducing an NSFR on the economy and on specific banking business models, we conducted a simulation exercise. In this exercise, we attempted to predict what the possible paths towards compliance could be for the non-compliant credit institutions. The structural changes in the balance sheets of these institutions were aggregated to estimate their total impact on lending to the rest of the economy. The simulation also helped us to identify those business models that seem to face relatively bigger challenges.

We did not find strong statistical evidence showing a significant impact on the economy. In the simulations, long-term encumbrance tended to decrease in aggregate. Derivative activity and market making in non-HQLA securities and commodities also showed some decline in the simulations. Non-compliant institutions adjusted in some of our forecasts by increasing retail or long-term funding and, at the same time, reducing their proportion of short-term (especially inter-bank) funding. However, at the level of the entire banking sector, the aggregated impact seemed likely to be limited.

The same analysis conducted at the business model level uncovered that, in general, more specialised business models are forecast to undertake the greatest adjustments to their balance sheet structures, while the retail-oriented firms are likely to engage in smaller changes. The business models without retail funding are likely to make most of their changes on the liability side, terming out their funding. Securities trading houses are expected to make strong adjustments on their liability side, while making more limited changes on the asset side.

We also specifically assess the impact on lending activity of introducing an NSFR requirement. We start by discussing the theoretical impact of the regulation on lending. We then provide empirical results based on two complementary methodologies: the simulation presented above, and a regression analysis. The simulation shows that lending does not appear to be impacted by the introduction of the NSFR. In fact, banks could increase lending (< 35% RW – risk weighted - mortgages and loans to non-financial entities) and achieve a higher NSFR at the same time, as long as lending remains unencumbered. Consistent with the simulation results, the regression analysis shows that NSFR shortfalls are not correlated to the change in lending. These results—only based on the year 2014—hold for total lending to the real sector, SMEs, residential estate, PSEs and trade finance activities. These results support the view that the NSFR should not trigger a large increase in the shadow banking sector, as banks do not appear to need deleveraging in order to meet the requirement.

Finally, in line with the conclusions expressed above, the cost of compliance with the NSFR is likely to be relatively higher for non-retail oriented non-compliant institutions.

5.1 Simulation methodology

The fundamental idea of the simulation methodology is that introducing the NSFR as a legal requirement would have an asymmetric impact on the already-compliant institutions and those that are not yet compliant. The latter would be legally obliged to change the structure of their balance sheet in a way that brings their NSFR above 100%, while the former would face no marginal requirement to adjust their current structure and consequently to modify the way in which they contribute to the economic activity. Therefore, the simulation technique presented below builds on the initial assumption that the impact of the NSFR is tantamount to the impact of the NSFR on non-compliant banks. Our approach measures the estimated impact on the economy of non-compliant banks changing their asset allocation and funding profile.

5.1.1 Balance sheet migration

In order to assess the impact of introducing the NSFR, a simulation of how every single non-compliant institution would shift its balance sheet structure (with or without also changing its size) to reach NSFR compliance is conducted. This shifting process is identified in the report as 'balance sheet migration'.

5.1.2 Target structure

For this exercise, we need to make assumptions on the 'direction point' or target structure towards which the balance sheet migration is geared. In order to ensure a certain degree of reasonableness and meaningfulness, we group banks by business model, under the assumption that the business model categorisation offers a broad, realistic indication of the balance sheet structure of a bank. Within each business model, banks are split between compliant and non-compliant. Each non-compliant institution is assumed to migrate its balance sheet structure towards a target balance sheet structure, which is built as a weighted average of the balance sheet structures of the compliant institutions with the same business model. Thus, the target structure is both representative of the business model and compliant.

For the purpose of this exercise, a balance sheet structure is defined as a vector measuring the proportions of each type of asset and each type of liability. Mathematically, for each bank *i*, the balance sheet structure (BSS) is represented as:

$$BSS_i = \left(\frac{a_{1,i}}{A_i} \; \frac{a_{2,i}}{A_i} \; \dots \; \frac{a_{N_a,i}}{A_i} \; \frac{f_{1,i}}{F_i} \; \frac{f_{2,i}}{F_i} \; \dots \; \frac{f_{N_f,i}}{F_i} \; \frac{o_{1,i}}{A_i} \; \frac{o_{2,i}}{A_i} \; \dots \; \frac{o_{N_o,i}}{A_i} \right)^T$$

where *T* represents the matrix transposition operator, $a_{j,i}$, $f_{j,i}$, $o_{j,i}$, represent categories of (pre-factor) asset-side, funding and off-balance-sheet items respectively, $A_{j,i}$ and $F_{j,i}$ represent the sum of total (pre-factor) asset-side and funding-side items, and N_a, N_f and N_o represent the number of types of assets, liabilities and off-balance-sheet elements. The expectation is that, if the data quality is good, for any bank *i* the total asset measure A_i is equal to the measure F_i of total liabilities (including equity), as both measures should represent the balance sheet size. Also, by

definition, the proportions of all types of assets (respectively, all types of liabilities) should sum up to one:

$$\sum_j \frac{a_{j,i}}{A_i} = 1 \ and \ \sum_j \frac{f_{j,i}}{F_i} = 1$$

The target balance sheet structure is constructed as a linear combination of the balance sheet structures of the compliant institutions within each business model:

$$BSS_{target} = \sum_{i=1}^{m} BSS_i * W(i)$$

where *m* represents the number of compliant banks per business model,[16] *i* represents the order number of the *m* compliant banks, and *W* is a vector of weights applied to each compliant bank in forming the target. *W(i)* represents the weight assigned to the compliant bank *i* when building the target. For example, the target of a certain business model can simply be set to the equally weighted average of the balance sheet structures of the compliant institutions within that particular business model—this would be achieved by setting *W(i) = 1/m*, for each compliant bank *i*.

5.1.3 Path

For each business model, the simulation separately assesses the migration of every non-compliant bank towards the target balance sheet structure. It does so by building a path, unique for every non-compliant bank within a business model, which represents a straight line from the initial balance sheet structure of that individual non-compliant institution to the target balance sheet structure. As an illustration, consider the example of a business model with only three banks: one compliant institution (Bank A) and two non-compliant ones (Banks B and C), as depicted in Figure 15. The target balance sheet structure for this particular business model would be the balance sheet of Bank A, the compliant bank (W = *W(A) = 1*, $BSS_{target} = BSS_A$).

For simulating the balance sheet migration towards the target, the difference between the initial balance sheet structure of each non-compliant institution and the target structure is first divided into *n* equal steps (e.g. $(BSS_{target} - BSS_C)/n$). With each step, the balance sheet structure of each non-compliant bank (B and C in the example) shifts linearly towards the target balance sheet structure (A), such that after n steps the structure of the balance sheets of Banks B and C is identical to that of Bank A. For example:

[16] Outliers for which we observe differences between the unweighted total assets and the unweighted total liabilities higher than 5% of total unweighted assets are excluded.

$$BSS_{Bank\ C,step\ s} = BSS_{Bank\ C,initial} + \left(BSS_{target} - BSS_{Bank\ C,initial}\right) * \frac{s}{n}$$

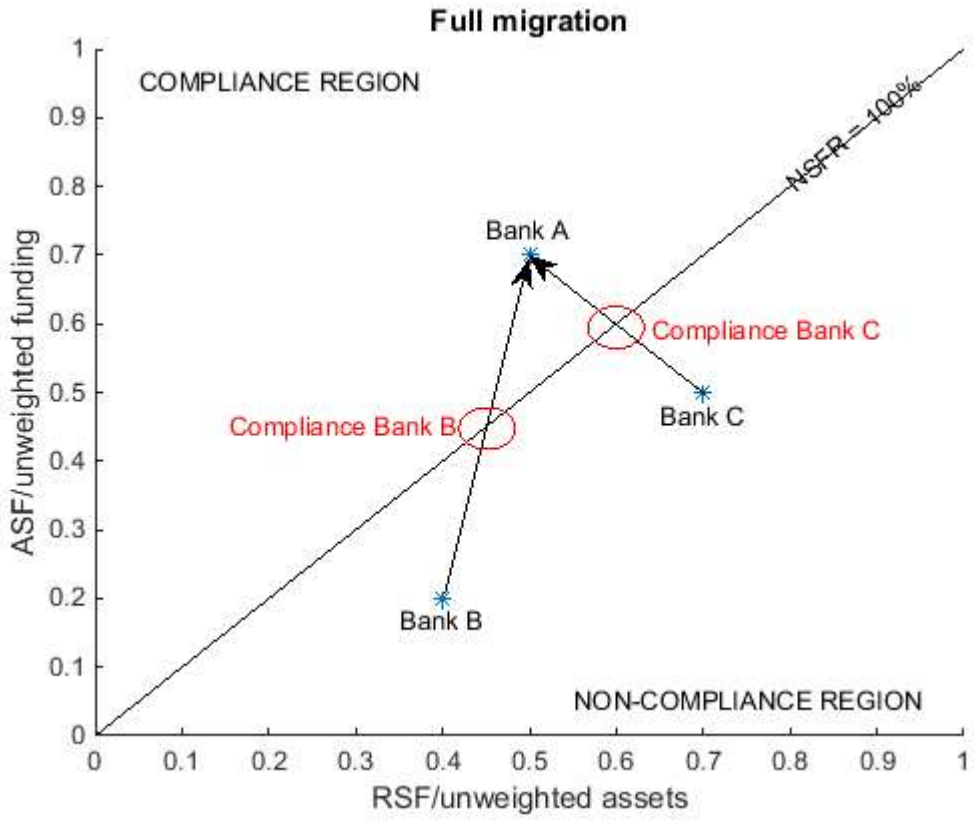


Figure 15: Illustration of balance sheet migration

We call this series of *n* steps a path.

Note that the size of the balance sheets is not affected by the structure of the balance sheets and does not change for any bank.

In general, the shift occurs by decreasing the proportion of liabilities with a low ASF factor and that of assets with a high RSF factor and increasing the proportion of liabilities with a high ASF factor and that of assets with a low RSF factor.

Each $BSS_{\ step\ s}$ has an associated NSFR, and the following relationship holds:

$$NSFR_{\ bank\ i,\ \ step\ s_2} > NSFR_{\ bank\ i,\ \ step\ s_1}\ for\ every\ s_2 > s_1$$

For each non-compliant bank, there is one step s such that $NSFR_{\ step\ s-1} < 100\%$ and $NSFR_{\ step\ s} > 100\%$. When that *s* is reached, we stop the simulation for that particular bank and assess its balance sheet as per step *s*. By comparing it to the initial balance sheet, we determine the impact on each asset/funding element as the relative change in balance sheet structure for that element multiplied by the size of the balance sheet.

After finishing this process for all the non-compliant banks within a business model, we sum up for all of them the impact on each balance sheet category and we arrive at the impact of introducing the NSFR on that particular business model, as it is represented in the sample. If the entire sample is used, we arrive at an estimated impact on the entire sample.

5.1.4 Simulation

As shown above, there are three elements that determine the calculated impact on lending and other balance sheet items: the initial balance sheet of the bank, the target balance sheet structure, and the path followed to reach the target from the initial state. The initial balance sheet structure is fixed—it is the one reported by the institutions.

The path is also fixed as discussed previously—it represents a straight line from the initial structure to the target. The choice of linear paths is justified by the simplicity of understanding computational implementation and interpretation. Moreover, linear paths don't require additional assumptions and they can be seen as representing expectations of non-linear paths. We have also assessed stochastically determined paths, but concluded that the feasibility of implementing them is reduced because the distribution used for the stochastic term for each balance sheet item is difficult to estimate and justify and, on top of that, we would have to introduce an additional element of distortion in order to ensure that the balance sheet remains balanced, i.e. the BS items cannot have independent trajectories.

In conclusion, the target is the only element over which we have modelling discretion and which could appear to entail some arbitrariness. In order to avoid unnecessary pollution of the results, in designing the target we aim to make as few assumptions as possible. To ensure good coverage of the compliant institutions per business model, our simulation uses a multitude of targets spanning the entire spectrum of compliant institutions within a business model and derives a distribution of the impact on the various elements of the asset and funding sides of the balance sheet.

5.1.5 'Multiple targets' simulation

In order to get a more realistic and comprehensive view on impact, we use a number *t* of different targets, each of them being a weighted average of two compliant banks per business model. We use combinations of every two compliant banks within one business model, thus resulting in *m(m-1)/2* pairs.

To state the obvious, of the *t* targets, some are the balance sheet structures of the complying institutions and some are intermediary points between every two banks.

We consider the same number of targets (*≈2t/[m(m-1)]*) between each two banks, regardless of the difference in the NSFR between them, such that we get a more realistic spectrum of targets within each business profile. The dispersion in terms of the NSFR, but also the ASF and RSF composition of the compliant banks belonging to one business model, is mirrored in the dispersion of the targets.

This method considers the potential diversity in the balance sheet structures of the compliant banks, and the intermediary points between each two banks account for potentially unobserved balance sheet structures. However, there are three issues that this method raises: first, there are outliers with very high NSFRs, sometimes even well above 500%, and it might not be realistic that the non-compliant banks aim to replicate the structure of the balance sheet of those banks. Second, if the compliant banks reported too high a difference between the unweighted total assets and liabilities, we might target unbalanced balance sheet structures, which is again not reasonable. Third, the simulation requires at least two compliant institutions per business model, which is not always the case.

We argue that there is no need to eliminate the outliers with very high NSFRs because the simulation for non-compliant firms stops in any case when an NSFR of 100% is reached and the simulated balance sheets would not be pushed towards unreasonably high NSFR levels. However, of the set of compliant banks, we eliminate the ones that reported a difference between total unweighted liabilities and total unweighted assets higher than 5% of total unweighted assets in order to limit distortions stemming from unbalanced balance sheets. At the same time, for those business models where only one institution is compliant we would only have one target. Rather than a distribution, we would instead only have one estimate of the impact, derived from the migration of all non-compliant institutions towards the complaint one. This is a limitation of the methodology that we acknowledge and the results for those business models should be interpreted with care.

An illustration of the method is provided in Figure 16 below:

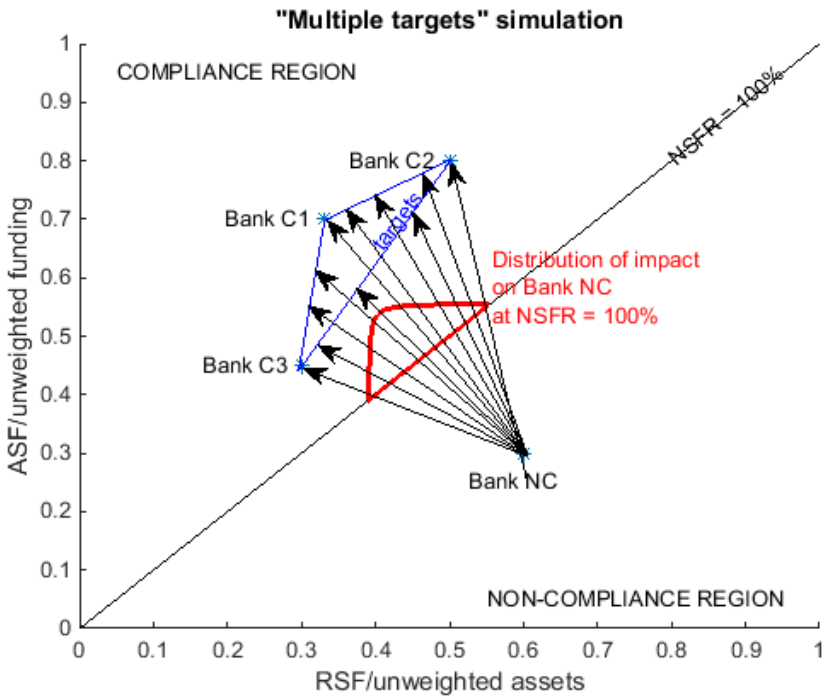


Figure 16: Multiple targets migration

5.1.6 Two-sided migration

Just as presented in Figure 15, both sides of the balance sheet are migrated towards the structure of the target, regardless of whether one of them is in fact superior to the target in terms of the NSFR treatment. An argument for which this approach can be realistic is that, while adjusting the worse-off side of the balance sheet implies costs associated with either more expensive funding or lower yielding assets, adjusting the better side of the balance sheet might also compensate for some of these costs.

Going back to the example in Figure 15, while we notice that Bank C is clearly dominated by Bank A on both sides of the balance sheet (A has better ASF and better RSF), this is not the case for Bank B, which in fact has better (lower) RSF than Bank A. Migrating the entire balance sheet means a worsening of the asset side in terms of the NSFR, as its average RSF factor[17] increases. As explained above, such behaviour would compensate for some of the costs associated with the more expensive funding.

We need to mention that this method can lead to some counter-intuitive results, such as banks needing to increase exposure to assets with an RSF factor of 1.

A one-sided migration has been considered, whereby only the side of the balance sheet that is inferior to the target's is migrated. However, it has been dropped because the latest version of the NSFR standard no longer allows for a perfect match between ASF/RSF and funding side/asset side by assigning a positive RSF factor to (derivative) liabilities.

5.1.7 Implementation

Our implementation groups all the data cells reported in the NSFR QIS template into 123 items (N_f = 47 on the liabilities side, N_a = 71 on the RSF side – 70 asset items and the gross derivative liabilities – and N_o = 5 off balance sheet). The simulation produces an impact on every single one of these items per business model. In order to keep the analysis manageable and make it easier to interpret, these 123 items can be grouped into 21 categories (6 on the liabilities side, 14 on the asset side, and 1 off balance sheet). Aggregating the impact in such a way yields an estimation of the impact on these 21 categories.

Also, in order to limit computational complexity, we implement a number of steps n=10 and we set the number of targets to t=20000.

5.1.8 Advantages of the methodology

This methodology has the advantage of needing only one data point, maximising the eligible sample. It is also able to produce results of very high granularity.

[17] By 'average RSF factor' we mean total RSF divided by total unweighted assets and by 'average ASF factor' we mean total ASF divided by total unweighted liabilities.

Rather than providing only a point estimate, the multiple targets simulation outputs an entire distribution for the impact, taking into account the whole spectrum of compliant banks per business model. This in turn allows for the analysis of low-probability, high-impact consequences.

In addition, the methodology separately takes into consideration every single non-compliant bank in the sample, ensuring that there would be no hidden effects on some of them, especially on outliers. It is in this respect superior to an approach based on means, where the impact on/from some institutions could simply be averaged out.

5.1.9 Disadvantages

The fact that this methodology relies on a single data point can also constitute a weakness; however, the NSFR ratio has a certain degree of stability over time, which minimises the risk of drawing conclusions based on a non-representative time sample.

In addition, the methodology takes a micro perspective; external factors such as gross domestic product (GDP), unemployment and inflation are not taken into account and the market is assumed to be capable of facilitating the change in the balance sheet structure of all non-compliant banks at the same time. Second-round effects, such as the impact that a behavioural change in enough players can have on the entire market equilibrium, are ignored.

Many of the advantages presented above cover the shortfalls of the regression methodology, while many disadvantages are eliminated in the regression analysis; the two methodologies are complementary and their results should be interpreted jointly.

5.2 Simulation results

Besides on a business level basis, the simulation methodology described can also be applied on the entire sample, on bank size categories, and generally on different ways of categorising the institutions in the sample, as long as there is an economic connection between the banks falling in the same category and a small degree of balance sheet convergence (from the NSFR-non-compliant to the NSFR-compliant institutions) could be justified. We present the results obtained for the entire sample, per business model (granular business model, aggregated business model) and by size (absolute size, relative to national GDP, relative to the national banking sector).

Our sample covers 75% of the assets of the EU banking sector. Therefore, the results we present hold for 75% of the EU banking system. We refrain in this report from multiplying by 100%/75% the estimated sample impact and presenting it as the population impact. The sample, though diverse and broad in terms of banking asset coverage, might not be a perfect mirror of the entire industry.

In order to present the results in a tractable manner, and given that from an NSFR perspective the same weight assigned to two different asset or liability items makes the two items completely

interchangeable and indistinguishable from each other, we aggregate the results based on NSFR weights. Moreover, we present the impact as a percentage of the balance sheet (total unweighted assets).

We have run 20 000 simulations for each of the ways of slicing the sample: entire sample, by size, and by business model. We present results assuming a constant balance sheet size. We believe that a constant balance sheet is the most informative scenario, allowing the reader to judge the impact against actually reported figures. This assumption is also compatible with the possibility that the change required in some balance sheet items for the non-compliant institutions is supported by the compliant institutions. Given that the aggregated NSFR for the sample is above 100%, these can be assumed to face the opposite change compared to the non-compliant firms, providing means for adjustment towards compliance for the latter.

In general, we don't observe a large macroeconomic impact from the introduction of the NSFR, but some structural shifts within bank balance sheets are likely to occur and might have a limited impact on the real economy.

5.2.1 Aggregated level results (entire sample)

When assessing different portions of the balance sheet, we generally do not observe a dramatic impact on the entire sample of banks and it is often the case that the simulated impact is not significantly different than zero. In other words, we normally observe the 0 estimated impact somewhere between the 5th and 95th percentiles of the simulated distributions. A small impact at the aggregate level does not mean that there might not be a significant impact at the individual bank level. However, a small impact on an aggregate level means that the impact on the real economy is likely to be reduced.

To begin with, on aggregate, it is more likely that non-compliant institutions would increase retail funding as a percentage of their total funding. The distribution of impact on both stable and less stable retail deposits lies mostly to the right of 0, meaning that we forecast more retail funding to be raised or at least that the compliant institutions currently benefit from a higher share of retail deposits relative to their balance sheet size. Our best estimation, albeit not statistically significant, would be that the non-compliant institutions would reach compliance by raising about EUR 600 billion in additional retail deposits, representing an increase of 37% compared to the currently reported amounts (of the non-compliant institutions only). The impact on capital and long-term funding is highly inconclusive, but it is still likely that the NSFR introduction will lead to an increase in such funding.

As explained in the previous section of this chapter, our simulation methodology rests on a key identifying assumption, which is that non-compliant banks will migrate their balance sheet structure towards that of compliant banks. While this assumption is perhaps justified when looking at a set of banks with the same business model (provided they are sufficiently homogenous), it is far less compelling when looking at our entire sample of EU banks. Indeed, this identifying assumption does not rule out that some business models that cannot take retail

deposits will migrate (in the simulations) towards the balance sheet structures of banks reliant on retail deposit funding.

It is worth mentioning that the non-compliant institutions that do not have the legal or strategic possibility of accessing deposits from the population might have to raise either capital or funding with a maturity higher than one year. We observe positive skewness for capital and funding longer than one year, meaning that there is a small chance that institutions would have to issue such instruments in amounts up to 5-7% of their balance sheet.

Furthermore, simulation results indicate that there is a relatively high chance of a small need (not statistically significant) to decrease the amount of liabilities receiving 50% ASF, such as corporate and government-related deposits. Unsurprisingly, non-compliant institutions would have to decrease their share of 0% ASF liabilities (e.g. short-term interbank funding), with most of the simulated impact distribution being placed to the left of 0. In the most likely scenarios, non-compliant institutions would decrease such liabilities by amounts equal to 2.5% of the aggregated balance sheet of the industry (compliant and non-compliant), equivalent to roughly 20% of the reported unweighted amounts of the non-compliant institutions.

On the asset side, we observe a rather clear impact on asset encumbrance: the amount of assets encumbered for more than one year would have to decrease by around 20% the amounts reported by the non-compliant institutions, and the results seem to be among the strongest (0 impact lies towards the right tail of the distribution). This is not compensated by an obvious need to increase the amount of highest liquidity assets (receiving 0% RSF, mostly cash and central bank reserves). However, it is rather likely that the share of Level 1 HQLAs as defined in the LCR would have to increase slightly. Also, the impact on the other asset classes does not seem to be significant on an aggregate basis, mostly revolving around 0. It is interesting to point out that, while lower quality performing loans (85% RSF) and short-term loans to corporates and governments (50% RSF) might increase or decrease with similar probabilities, it seems more likely that the non-compliant institutions would have to increase the share of 65% RSF loans (such as mortgages and other loans with a risk weight below 35%) they give out.

Finally, we forecast non-compliant institutions decreasing the share of non-HQLA securities and commodities they hold on their books (85% RSF assets); it also seems likely that non-compliant institutions would reduce their off-balance-sheet activity. This might indicate a potential negative impact on market making for the already less liquid assets as well as on off-balance-sheet items, such as trade finance-related contracts. Derivative activity is likely to be negatively impacted.

The results seem to be robust but, as highlighted above, the identifying assumption is quite strong as there is a lot more heterogeneity in the sample than within each business model category. They are much in line with the ones based on June 2014 data. Moreover, when implementing a

one-sided migration,[18] we observed a statistically significant impact for 0% ASF liabilities and assets encumbered for more than one year. Both of these categories would have to be reduced.

Annex 1 and Annex 2 contain aggregated level tables and aggregated level charts on the results, respectively.

5.2.2 Granular business model results

As a general note, the simulation exercise needs a certain critical mass of observations per business model to be meaningful. The more compliant and non-compliant institutions we have per business model, the more trustworthy and robust the results are. At the same time, it is important that the characteristics of the institutions assigned to a certain business model are similar, such that a migration of the non-compliant institutions towards the balance sheet structure of the compliant institutions within that business model becomes plausible.

The analysis per granular business model is affected for some business models by a small sample issue. More specifically, the auto bank and consumer credit bank, pass-through, and diversified no retail deposits business models each have only one compliant institution. This means that the simulation methodology does not work, as we cannot create multiple realistic targets. We only have one target to which we can compare the non-compliant institutions; we cannot derive a distribution of the impact. For these business models, the preponderance of non-compliant institutions is already an indication that the NSFR might be relatively more demanding. Moreover, there is only one bank in the sample of custodians and it is compliant; there are also 20 compliant banks in the other category with no non-compliant institutions. Therefore, the custodian and other business models seem to not be impacted in the sample, but the population might face some impact that cannot be quantified in our analysis.

We present the average impact per business model and focus on those results that are statistically significant, indicating in which areas the non-compliant banks in a particular business model might make the largest adjustments.

In general, we observe in our simulations that the more specialised business models (other no retail deposits, securities trading) tend to show the greatest adjustments. The NSFR gives incentives to all business models to decrease their stock of 0% ASF liabilities, and this appears in our simulations, as many firms reduce these liabilities by an amount we judge statistically significant. Long-term encumbrance is also likely to decrease for the majority of the business models. We also forecast a rather high correlation between the forecasted decrease in long-term encumbrance and the forecasted increase in unencumbered mortgages and other long-term lending for most business models.

[18] Under what we call a one-sided migration, only the side of the balance sheet that is inferior to the target's is migrated. If both are inferior, both are migrated. The ASF side is inferior if the average ASF factor of the non-compliant institution is lower than the target's, while the RSF side is inferior if the average RSF factor is higher than the target's. The one-sided migration was possible on the NSFR definition corresponding to the June 2014 data, since there was no RSF applied to liabilities. As explained before, a one-sided migration when RSF is applied to (gross derivative) liabilities is not possible because it could lead to balance sheet imbalances.

Cross-border universal banks are likely to adjust by attracting slightly more retail deposits and relying less on short-term interbank funding and similar short-term sources. The same behaviour is expected of local universal and mortgage and building society, which are additionally expected to reduce long-term encumbrance for their mortgages and other long-term lending. The co-operatives appear to have a good capital/long-term funding position, which places them in a relatively comfortable situation on the funding side; however, they are expected to reduce the encumbrance of some of their long-term loans. Non-compliant savings banks are expected to lengthen the term of their funding. The savings business model is the only one that is forecasted to increase both retail funding and capital/long-term funding at the same time by an important amount. We forecast that non-compliant other no retail deposits banks would decrease their short-term (inter-bank) funding by about 7% of their total funding and increase their capital or long-term funding by a similar amount. They also reduce long-term encumbrance by about 14% of their total balance sheet size.

Securities trading houses show the biggest adjustment on the liability side. They are forecasted to replace half of their short-term funding from financial counterparties with more stable funding sources. We need to issue a note of caution here, as it might be the case that the business models of the compliant and non-compliant securities trading houses are quite different. For example, we observe that in the sample of compliant institutions there are some that attract a small amount of retail funding, while none of the non-compliant ones take any retail deposits. However, some of this rather large impact is compensated for by their asset side, which leaves some room for manoeuvre.

The sample of CCPs is composed of two compliant institutions and one non-compliant institution, and therefore the results are not economically insightful or significant as they might be institution specific, rather than business model specific. Not being able to attract retail deposits, CCPs' options to increase their stable funding appear limited. However, they seem to hold a large pool of liquid assets, which is treated favourably by the NSFR, and thus do not need much stable funding either.

Our auto and consumer sample of institutions is split into one compliant and five non-compliant firms. Even so, it does not seem that the non-compliant institutions might need important adjustments. In fact, they might be the least impacted business model, with the non-compliant institutions being relatively close to 100% NSFR.

The pass-through sample is composed of one compliant and six non-compliant firms. The business model of the compliant institution, as also described in the pass-through chapter, is very different from the business model of the non-compliant ones. It does not do retail business and it does not issue covered bonds, while the non-compliant banks do both. We can therefore not draw conclusions. In any case, it seems that the pass-through models are well funded, the problem being the high encumbrance level.

For the diversified no retail deposits model, no robust results could be obtained. In order to support our conclusions, we present two types of graphs in the annexes. First, we present (across

20 000 simulations) the average impact on each balance sheet item for each business model in nominal terms. In order to offer a perspective on the impact, we also present the impact as a percentage of the entire balance sheet of each business model, composed of both compliant and non-compliant institutions. This gives an indication of the industry's capacity to absorb the forecasted changes. Finally, in order to better understand the feasibility of these changes, we also present the impact as a percentage of the sum of the balance sheet sizes of the non-compliant institutions within each business model.

The second type of graph focuses on the results that appear statistically significant. In other words, we present those balance sheet items for which the 5th and 95th percentiles (of the impact across 20 000 simulations) are to the same side of 0. Again, we present the impact in nominal terms, as well as relative to the balance sheet of the business model and relative to the balance sheet of the non-compliant institutions within the business model. To facilitate reading, we present each table twice: once sorted by business model, and once sorted by balance sheet item. We finally present charts of the distributions of the impact on the most relevant balance sheet items, per business model, as a percentage of the total balance sheet size of the entire business model—both compliant and non-compliant institutions.

Custodian and other business models are omitted from the analysis and from the tables because they have no non-compliant firms in our sample.

Annexes 3, 4 and 5 contain granular business model tables and charts on the results.

5.2.3 Aggregated business models

For some granular business models, we cannot draw strong conclusions (as explained in the previous section). Because of this, we have run the analysis per aggregated business model (diversified, retail and specialised). This also facilitates comparison to the multivariate analysis, which uses the aggregated business model categorisation. This suffers from a similar problem to the simulation analysis run on the whole sample. Indeed, these less granular business model categories are less homogenous, which means the identifying assumption (that non-compliant banks migrate their balance sheet structure towards those of compliant banks) is weaker.

In terms of variations in balance sheet items, the conclusions are much in line with the ones already drawn previously. 0% ASF liabilities and long-term encumbrance are forecasted to decrease by an economically significant amount, which can reach close to EUR 700 billion for the short-term funding and EUR 200 billion for encumbrance.

Fully compatible with the conclusions per granular business model, specialised institutions are most affected, especially on the funding side. We estimate that they might have to decrease their interbank funding by about 24% of the total funding used by non-compliant specialised institutions in December 2014. This business model seems to also be the most heterogeneous, a fact that can be observed in the discontinuous shape of some of the distributions. Retail-oriented institutions appear to be the least impacted by the introduction of the NSFR.

Annexes 6 and 7 contain tables and charts by aggregated business models.

5.2.4 Size and relative domestic importance observations

Before presenting any considerations by size, we need to emphasise that running the simulation by size or relative size is less economically sound, because the identifying assumption is particularly weak. Indeed, we don't necessarily see strong reasons why non-compliant banks of a certain size would expect to emulate the balance sheet structure of compliant banks of a similar size when a stable funding requirement is introduced. They could belong to very different business models, undermining the logic behind the simulation exercise.

The general conclusion of the analysis by size is that we don't observe noteworthy differences between the way banks in various size buckets are impacted, regardless of whether we assess them by absolute size, relative to their domestic banking sector, or relative to their domestic GDP.

Other than that, we forecast the same decrease in short-term liabilities and long-term encumbrance.

Annexes 8, 9 and 10 contain tables by size, by size relative to the domestic banking sector, and by size relative to domestic GDP.

5.3 Adjustment to compliance and lending

5.3.1 Theoretical impact

Article 510 (1) of the CRR states that "EBA shall report […] whether and how it would be appropriate to ensure that institutions use stable source of funding, including an assessment of the impact on […] the economy and bank lending, with a particular focus on lending to SMEs and on trade financing […]. Following the requirement of Article 510(1) of the CRR, this section aims to present an assessment of the impact of a stable funding regulation on lending activity in the EU.

The effect of a stable funding regulation on lending activity appears unsettled. Depending on the adjustment strategy chosen by non-compliant banks, a stable funding standard might have negative effects on lending to the real sector. This adjustment strategy largely depends on the stable funding requirement calibration. We start by assessing whether the likelihood of the current Basel NSFR calibration is likely to incentivise banks to decrease lending.

The primary purpose of a stable funding requirement is to prevent financial instability. Banks that rely excessively on unstable funding might be forced to drastically reduce lending in times of liquidity stress. Such a funding regulation should support lending during liquidity stresses. Thus we also discuss the implications of introducing a stable funding requirement for lending through the economic cycle.

(i) Banks' adjustment strategies and lending

By definition, a stable funding regulation restricts the maturity transformation of banks. In such a regulatory framework, their amount of illiquid assets should be matched by a sufficient amount of stable funding. A non-compliant bank would have several strategies to meet the stable funding requirement, such as:

- increasing its balance sheet size by buying liquid assets with stable funding;
- changing its funding mix by increasing the relative share of long-term debt or retail deposits at the expense of short-term wholesale funding; and
- shifting its portfolio towards liquid assets by reducing either loans or other assets with a high RSF.

The first solution might not always be feasible in the context of meeting other prudential requirements such as the leverage and solvency ratios. The cost efficiency of the second solution depends on the relative cost of retail deposits and long-term debt compared to short-term market funding. This adjustment strategy will thus mainly depend on the ability of a non-compliant bank to shift its financing toward long-term debt or retail deposits. If the premium between these kind of debts remains sufficiently small, adjustment can occur only on the liability side and lending should be unaffected by the adjustment strategy.

The likelihood of the third strategy will depend on the relative return banks earn on lending compared to other activities and the calibration of the stable funding requirement. Banks are incentivized to decrease their holding of assets depending on their relative return to their RSF requirements. For example, if an asset A provides a return of 5% and a RSF of 85%, meanwhile an asset B gives the same return of 5% and a RSF of 50%. The bank faces as a strong incentive to shift its holding from asset A to asset B.

Depending on the relative return on loans and their calibration in the stable funding requirement, a non-compliant bank might thus prefer to shift its portfolio towards HQLAs in place of loans. In this particular case, the adjustment would come at the expense of lending to the real economy.

(ii) Calibration of the stable funding requirement for lending activities

The effect on lending depends strongly on the calibration of the stable funding requirement for lending activities. With an RSF calibration relatively more favourable to lending than other assets, the impact should be very limited as:

- banks with a business model of traditional lending to the real economy will only require minimum adjustments (or no adjustments at all) to comply with the regulation; and
- banks will have incentives to reduce activities other than lending and shift to funding sources traditionally used to finance lending, such as retail deposits.

The current calibration of the NSFR (as proposed by the BCBS in October 2014) arguably remains favourable to traditional lending activities. A bank funding a portfolio of unencumbered loans with long-term liabilities or retail deposits will benefit from a positive gap between its ASF (weighted between 0.9 and 1) and its RSF (weighted between 0.5 and 0.85). Encumbered loans for periods greater than one year will receive an RSF factor of 1. However, these loans often serve as collateral for the issuance of covered bonds or ABSs that also receive an ASF factor of 1 for maturities above one year. The calibration is thus favourable overall to traditional lending activities. It would mostly penalise a funding strategy based on short-term market funding, which is consistent with the prudential goal of avoiding financing a growing lending activity with unstable funding sources. Given the current calibration, we can reasonably expect that banks with traditional lending activities are less likely to have a stable funding shortfall. This in turn lessens the risk of a detrimental impact on lending, as banks with traditional lending business models should bear reduced adjustment costs. Moreover, short-term markets are usually used by banks to finance investment banking activities. An adjustment strategy based on a reduction of short-term wholesale funding should not significantly impact lending activities.

(iii) The impact of lending through the economic cycle

A lesson from the financial crisis of 2007-2008 is that banks' overreliance on unstable funding can cause a credit crunch when short-term wholesale funding dries up. The benefits for lending of a stable funding requirement during a liquidity stress period are important. Two reasons explain why an overreliance on unstable funding might result in a large decline of loan supply after a liquidity shock. First, the dry-up of these funding sources cannot be matched by an increase in other funding sources in a short time span: attracting new deposits or issuing long-term debt is not always feasible, especially when a liquidity stress occurs. Consequently, banks have to reduce their loan supply. Second, a liquidity shock creates incentives for banks to hoard liquidity in order to manage their rollover risk. This strategic behaviour results in liquidity being stocked, e.g. in central banks' accounts, rather than lent to the real sector.

By definition, a stable funding regulation limits the reliance on short-term and volatile funding. This increases banks' resilience to a liquidity shock by insulating them from the dry-up of unstable funding sources. This insulation from liquidity stress periods should allow them to continue their lending activity relatively more than other banks, thereby limiting the transmission of the liquidity shock to the real sector. Empirical evidence confirms that relying on unstable funding sources favours the transmission of liquidity shocks to the real economy. For example, Iyer et al. (2014) show that banks in Portugal heavily relying on interbank financing reduced their loan supply to non-financial firms during the period 2007-2009. Pessarossi and Vinas (2015) show that, over the same period, banks in France with a lower amount of stable funding (defined as long-term debt and retail deposits) reduced their supply of long-term lending, especially towards SMEs. In a cross-country study, Kapan and Minoiu (2014) show that overreliance on wholesale funding markets caused a decrease in banks' loan supply to non-financial firms.

By setting a stable funding requirement, it is likely that the transmission of liquidity shocks to the real economy would be more limited in the future. Insulating banks from liquidity shocks would thus bring important benefits in terms of lending during times of liquidity stress.

The current NSFR calibration is relatively favourable for lending activities to avoid the possibility of a credit crunch. Moreover, by insulating banks from liquidity shocks, the requirement could bring important benefits for lending during liquidity crises.

From this theoretical discussion, it emerges that a stable funding requirement should not have a significant impact on lending as long as a bank is not overly reliant on short-term wholesale funding to finance its activity. Moreover, the impact on lending should be limited when a liquidity crisis occurs, since banks will be more insulated from the shock.

The next sections empirically assess how the NSFR is related to lending activity by relying on two approaches. The first approach uses the simulation methodology to describe how non-compliant banks can adapt their balance sheet to the new regulation. The simulation notably quantifies the impact on lending assets in the balance sheet after banks' convergence to a satisfactory NSFR level (see section 5.1 for the detailed methodology). The second approach estimates whether an increase in compliance is associated with a decrease in lending activity in a multivariate regression analysis.

These two approaches complement each other. The first one is able to provide a full description of the possible adjustments on lending assets in banks' balance sheets. The second one estimates a direct relationship between compliance with the NSFR regulation and lending using historical data.

5.3.2 Simulation results on lending

In section 5.2 (simulation results) we have assessed the impact on lending based on the simulation methodology. We have separately addressed the potential impact of migrating towards compliance on the three types of lending recognised in the Basel standard, namely lending receiving 50% RSF—mostly short-term loans to corporates and governments, 65% RSF—represented mainly by mortgages and other loans receiving a risk weight of maximum 35% and 85% RSF—long-term performing loans of lower credit quality. We have observed that a zero potential impact was consistently placed between the 5th and 95th percentiles of the estimated distribution of impact on all three types of lending. This allowed us to conclude that, while we do not exclude that the impact on the lending activity of a single entity could be important, the impact on total lending at the EU level is likely to be insignificant. If anything, we observed that the amount of lending qualifying for the 65% RSF factor is in fact more likely to increase than decrease. This could be motivated by the fact that the 65% RSF loans are a good alternative to the assets requiring higher stable funding, while at the same time limiting the costs of compliance by forgoing a smaller yield difference. The results we observed have been consistent whether we

performed the simulation on the entire sample, per granular or aggregated business model, or per categories based on absolute or relative size.

5.3.3 Alternative assessment with a multivariate regression analysis

To dig deeper into the effect of introducing an NSFR on lending activity, we complement the simulation results with an econometrical analysis. Using QIS data, this subsection empirically assesses the link between the change in the NSFR shortfall and the change in lending. The half-yearly data cover one year from December 2013 to December 2014 (three time periods).

(i) Methodology

The NSFR not being implemented over the period of scrutiny, it is difficult to empirically estimate the causality between an increase in NSFR and lending. It is, however, possible to assess the relationship between the two. If implementing the NSFR has a structurally detrimental impact on lending, we should observe, on average, a negative relationship between banks' improvements in the NSFR and banks' lending. On the other hand, if NSFR improvements are not correlated with lending, one can argue that banks are able to increase their ratio without affecting lending (i.e. by adjusting other parts of their balance sheet).

The methodology assesses whether the evolution of banks' compliance is related to the change in their credit exposures. Evolution in banks' compliance is defined as the change in banks' shortfall normalised by ASF. Decreasing lending, either by deleveraging or switching from loans to securities with lower RSF weights, is a strategy that could increase the NSFR. However, banks might also improve their NSFR by increasing their level of stable funding or decreasing their holdings of other assets. We empirically assess whether the NSFR increases are related to the first strategy in our sample.

To control for the effects of other factors affecting lending at the same time, we rely on a multivariate regression analysis. We estimate a regression that relates the change in lending to the change in the NSFR shortfall. This approach allows us to determine if, on average, the NSFR regulation is related to lending. By using a first difference model (i.e. regressing the change in lending on the change in the NSFR shortfall), we control for other sources of heterogeneity between banks as they have different starting values of lending and the NSFR.

The analysis also takes into account potential differences between banks' business models. Due to the limited sample size, we consider the three largest business model classifications: retail, diversified, and specialised. We also perform subsample analyses on these business model classifications to determine whether the relationship between the NSFR and lending is different for banks in these different sub-groups. We also employ a similar approach with bank size. We run our estimations with each size category (small, medium, large and very large) to determine if the sensitivity of lending to a change in the NSFR depends on the size of the bank.

(ii) Sample of banks

The whole available sample consists of single legal entities (either parent companies or stand-alone entities) located in the EU and subsidiaries. Including European subsidiaries would result in counting twice the change in the NSFR and lending (if the parent company is also included in the sample). To avoid double counting, we only select banks that are either parent companies, stand-alone entities or subsidiaries whose parent company is not located in the EU.

For December 2013, 157 banks in the selected sample reported the NSFR template and data on their credit exposures in the leverage ratio timesheet of the QIS. For June 2014, 174 banks reported their NSFR and their credit exposures. Finally, 207 banks reported the required data for December 2014. For each period, we consider observations where the bank reported total exposures of 0 in the leverage ratio timesheet missing values.

For a bank to be available in the final sample, it needs to have reported information on lending for at least two consecutive dates in order to compute the change in lending and the change in the NSFR shortfall. This reduces the total sample size to 273 over the period. In the sample, only 103 banks (206 observations) reported the data consecutively for the three time periods. The rest of the sample only consecutively reported either for December 2013 and June 2014 or for June 2014 and December 2014.

(iii) Measuring the change in the NSFR shortfall

The shortfall in a time period is defined as the difference between RSF and ASF normalised by unweighted ASF. Negative values thus indicate a surplus of ASF for the bank. In the analysis, we then compute the change as the difference between two consecutive time periods. This definition of evolution in banks' compliance has the advantage of limiting the generation of extreme values in the dataset, which could generate biased estimates in the regressions.

To consistently compute the change in compliance, a key issue is to take into account methodological changes between templates. The QIS template for the NSFR remained consistent between December 2013 and June 2014, which allows carrying the analysis without making assumptions on one of these reporting dates. For December 2014, the standard has evolved to match the rules of the final BCBS standard of October 2014. In order to capture the change in the balance sheet between June and December 2014, we compute the change in compliance data by disentangling the effect of the NSFR standard reform in the total variation[19] between June and December 2014.

The NSFR standards between June and December 2014 differ in the treatment of bank and non-bank financial counterparties for short-term lending and the treatment of derivatives. Starting with June 2014 data, we correct the shortfall based on the rules of the final standard for short-term financial counterparties on the asset side, i.e. we compute the RSF banks would have

[19] Annex 13 describes in more detail how we consistently measure the change in the NSFR between June and December 2014.

obtained in June 2014 as if the final rule regarding banks and non-bank financial counterparties was prevailing at this date. To obtain the share of exposures collateralised by Level 1 HQLAs for each bank, we use the December 2014 ratio of exposures collateralised by Level 1 HQLAs. This is the only hypothesis required in the calculation of a consistent change in compliance between June and December 2014. Given the limited difference in RSF between exposures collateralised by Level 1 HQLAs and other exposures (10 and 15%), this hypothesis appears reasonable.

Next, to compute the consistent change in the NSFR shortfall, we correct the December 2014 value by subtracting RSF due to the new treatment of derivatives as these derivatives rules did not apply on June 2014; we subtract RSF due to the 20% add-on on gross derivative liabilities and take into account all types of margin in the netting of assets minus liabilities net derivatives. The variation in shortfall can thus be obtained with these corrected figures for June and December 2014. The change captured with this methodology is consistent as it only reflects changes driven by balance sheet evolution and not changes in the standard rules, e.g. a bank with the same balance sheet in June and December 2014 obtains a 0% change in shortfall between these two dates with our methodology. This is consistent with the fact that, in this theoretical example, lending has not evolved between the two periods. Note that, in practice, this adjusted change in shortfall and the raw change in shortfall are almost collinear in our sample (correlation of 99%). Thus, in our empirical setting, the results do not depend on this computation. For consistency, we keep the adjusted change in shortfall in the analysis.

(iv) Measuring the change in lending

We rely on the panel 'Business Model Categorisation' of the leverage ratio QIS timesheet to measure credit exposure. These exposures also include off-balance-sheet commitments. In order to capture lending activity, we define two variables for the change in lending. The first one is the total change in lending to non-financial counterparties between two periods. For each period, we compute the share of credit exposures in the total exposures of the bank. The change in lending is simply the difference between two consecutive periods. This variable thus captures possible asset substitution between credit to the real sector and other investments.

The second lending measure is the change in SME lending. SME lending is defined for each date as SME exposures in the corporate and retail portfolios. As for total lending, we measure the change in lending to SMEs between each consecutive time period.

We also test how lending to residential real estate (RRE) and PSEs evolves with the NSFR adjustments. These two asset categories are specifically identified in the leverage ratio exposure panel. As for other lending variables, we compute the difference in their share of total exposures for two consecutive dates.

Finally, as an alternative measure, we rely on the NSFR QIS timesheet to compute a third measure of change in lending. For each period, we measure lending as the sum of all loans to the real sector in the NSFR template. This includes residential mortgages with less than a 35% risk weight under the credit risk standardised approach, loans to retail and small business customers with a

maturity of less than one year, loans to non-financial corporate clients with a maturity of less than one year, loans to sovereign, PSEs, MDBs and national development banks (NDBs), other loans with a maturity of less than one year and with less than a 35% risk weight under the credit risk standardised approach, and performing loans with more than a 35% risk weight under the credit risk standardised approach. This variable is closely related to the NSFR reported, as credit definition is based on RSF categories (although these categories do not share the same weights). However, this alternative definition gives an indication of the robustness of our main estimations. In addition, as some banks do not report the panel 'Business Model Categorisation' of the leverage ratio QIS timesheet, it increases the sample size by including more banks in the analysis.

(v) Additional control variables

Finally, to account for effects potentially correlated with the change in the NSFR shortfall, we add control variables to the model in some specifications. On the one hand, control variables reduce the likelihood of an omitted variable bias. On the other hand, the model should remain parsimonious as the sample size does not allow the inclusion of a large set of controls. We consider several additional control variables: size of the bank, business model, change in non-performing exposures (NPEs), and change in leverage ratio.

Size of the bank refers to the classification retained in the report between small, medium, large and very large banks. We control for this effect by including dummy variables in the regressions. Moreover, we also account for potential interactions between size and shortfall on the relationship with lending by running the analysis by size subsamples. Business model classification is captured by three categories: retail, diversified, and specialised. As for size, we take into account this effect by including dummy variables in the model and consider possible interaction effects with the NSFR shortfall. NPE ratio is measured as defaulted securities and non-performing loans in the NSFR timesheet divided by unweighted ASF. The change in NPEs is simply the difference between two consecutive time periods. Finally, leverage ratio is taken from the QIS leverage ratio timesheet. Lending growth might be more constrained for banks with a decreasing leverage ratio.

The main model to be estimated is the following:

$$\text{Change in lending}_{b,t} = \alpha + \beta.\,\text{Change in NSFR shortfall}_{b,t} + X_{b,t}.\gamma + \varepsilon_{b,t} \qquad (1)$$

Where subscript *b* refers to a bank and subscript *t* refers to a time period. $Change\ in\ lending$ is the difference in lending share in the total exposures of the bank for either total lending or a particular lending asset category between two periods. $Change\ in\ NSFR\ shortfall$ is the change in shortfall between two periods. *X* is a set of additional control variables comprising either dummies for the size of the bank, dummies for business model classification, or change in NPEs and change in leverage ratio between two consecutive time periods. α, β and γ are parameters to be estimated using the ordinary least squares (OLS) method. ε is a disturbance term. Standard errors are robust to heteroskedasticity.

(vi) Sample descriptive statistics

Table 15 shows descriptive statistics of the sample of banks. The lending share to the real sector slightly decreased over the period, with an average decline of -0.74%. This decline is, however, not driven by SME exposures, whose share grew on average by 0.27% in banks' total exposures. The standard deviation for both lending variables is important compared to the average, at 5.67% and 5.7% respectively, indicating that the evolution of lending was very diverse between banks over the year.

The compliance of banks improved over the year with an average decline in shortfall of 0.70% of unweighted ASF. Again, the distribution of this variable is quite spread as the standard deviation equals 12.64%.

In terms of business models, diversified banks dominate the sample as they represent 45.05% of the observations. Retail business models account for 38.46% of the available observations in the sample; meanwhile, specialised banks only account for 16.48% of them.

Medium-sized banks appear to be the largest size group in the sample: they represent 41.03% of banks. They are followed by a large proportion of small banks representing 28.57% of observations in the sample. Very large banks represent 20.51% of observations; meanwhile, large banks only account for 9.89% of the sample size.

Table 15: Sample descriptive statistic

Variable	Definition	N	P50	Mean	STD
Change in total lending to the real sector	Difference in credit exposures to the retail and non-financial corporate sectors over total exposures for two consecutive periods	273	-0.27%	-0.74%	5.67%
Change in SME lending	Difference in credit exposures to SMEs over total exposures for two consecutive periods	273	0.00%	0.27%	5.70%
Change in trade finance lending	Difference in credit exposures to trade finance over total exposures for two consecutive periods	273	0.00%	0.11%	7.49%
Change in RRE lending	Difference in credit exposures to RRE over total exposures for two consecutive periods	273	0.00%	-0.05%	5.21%
Change in PSE lending	Difference in credit exposures to PSEs over total exposures for two consecutive periods	273	0.00%	-0.76%	5.90%
Change in the NSFR shortfall	Difference in shortfall over unweighted ASF for two consecutive periods	273	-0.04%	-0.70%	12.64%
Change in leverage ratio	Difference between Basel III leverage ratio for two consecutive periods	259	0.13%	0.28%	1.84%
Change in NPEs	Difference between the share of NPEs and defaulted securities over total unweighted ASF for two consecutive periods	273	0.00%	0.20%	2.65%
Retail business model	Dummy variable equal to 1 if a bank is classified as 'Retail'; 0 otherwise	273		38.46%	
Diversified business model	Dummy variable equal to 1 if a bank is classified as 'Diversified'; 0 otherwise	273		45.05%	
Specialised business model	Dummy variable equal to 1 if a bank is classified as 'Specialised'; 0 otherwise	273		16.48%	

Very large banks	Dummy variable equal to 1 if a bank is classified as 'Very large'; 0 otherwise	273	20.51%
Large banks	Dummy variable equal to 1 if a bank is classified as 'Large'; 0 otherwise	273	9.89%
Medium banks	Dummy variable equal to 1 if a bank is classified as 'Medium'; 0 otherwise	273	41.03%
Small banks	Dummy variable equal to 1 if a bank is classified as 'Small'; 0 otherwise	273	28.57%

(vii) Results

Table 16 presents the main regression results of the analysis. The first four columns show regression coefficients of the change in total lending to the real sector on the change in the NSFR shortfall with different control variables in the model. Columns 5 to 8 show regression coefficients with change in SME lending as the dependent variable.

The overall picture is clear as change in the NSFR shortfall is never significant in the estimations. This means that, on average, a decrease in the NSFR shortfall is not matched by a decrease in lending. This supports the view that banks are able to improve their NSFR by relying on strategies other than decreasing lending (e.g. decreasing other types of asset holding or increasing their ASF).

Controlling for the change in solvability (with the leverage ratio) or the change in NPEs does not affect the estimations. The change in leverage ratio has a negative impact on lending in the regression of change in SME lending. The variable change in the NSFR shortfall remains, however, non-significant.

The conclusion holds when we control for size groups or business model groups. These variables are almost never significant. This is not too surprising given that a first difference model already controls for most heterogeneity driven by banks' business model and size.

One can see that these models basically fail to explain the change in lending over the period. The R-square is close to 0, indicating that almost all variability in lending is unexplained by the change in NSFR compliance. Moreover, the F-test indicates that explanatory variables are jointly not significant (except for regression (6) at the 10% level). This is not too much of a concern as we are interested in assessing the relationship between lending and the NSFR, and not particularly to estimate the most relevant model for change in lending. In a nutshell, on average, we do not find that banks' shortfalls are related to lending.

Table 16: Main regressions of change in lending on change in the NSFR shortfall

This table shows regression coefficients of the change in lending to the real sector (columns 1 to 4) and the change in lending to SME (columns 5 to 8) on the change in the NSFR shortfall (the variable of interest) and a set of other control variables. Standard errors are reported in parentheses. '**' and '*' denote statistical significance at 5 and 10% respectively.

	Change in total lending to the real sector				Change in SME lending			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Change in the NSFR shortfall	-0.000	-0.019	-0.001	-0.000	0.030	0.010	0.031	0.030
	(0.029)	(0.027)	(0.030)	(0.029)	(0.023)	(0.024)	(0.023)	(0.022)
Change in leverage ratio		-0.124				-0.270**		
		(0.075)				(0.113)		
Change in NPEs		0.038				0.123		
		(0.085)				(0.118)		
Very large banks			-0.008				-0.007*	
			(0.006)				(0.004)	
Large banks			-0.011				0.003	
			(0.009)				(0.011)	
Medium banks			-0.004				0.003	
			(0.005)				(0.005)	
Small banks			-0.011				0.009	
			(0.008)				(0.008)	
Retail business model				-0.009				0.010
				(0.006)				(0.007)
Diversified business model				-0.007				-0.001
				(0.005)				(0.004)
Specialised business model				-0.005				-0.002
				(0.010)				(0.005)
Constant	-0.007**	-0.007**			0.003	0.001		
	(0.003)	(0.003)			(0.003)	(0.004)		
Observations	273	259	273	273	273	259	273	273
R-squared	0.000	0.005	0.020	0.017	0.004	0.019	0.016	0.017
Prob. > F	0.987	0.248	0.306	0.292	0.196	0.0734	0.200	0.450

(viii) Subsample results

Table 17 shows the regression results of our main model run by business models and size subsamples. These models test whether the relationship between lending and NSFR compliance differs between business models or size of banks. For example, retail-oriented banks might have fewer options to reach the required level of the NSFR than diversified banks. They could be more prone to substitute lending with more liquid assets.

Each column in Table 17 reports estimation with a different subsample. Overall, the relationship between the NSFR and lending does not, on average, differ for banks with different business models and sizes. We only observe one significant coefficient for large banks (column 5); for these banks, the regression indicates that an increase in the NSFR shortfall is positively correlated with an increase in lending. This correlation is, however, fragile for the following reasons. First, the regression is only based on 27 observations in this group: a too limited number of observations from which to draw conclusions. Secondly, removing only one observation (the one with the highest value for change in total lending) renders the coefficient non-significant in column (6). This suggests that this result is driven by outliers. Finally, when we run the same analysis on lending as defined in the NSFR template, the coefficient becomes negative and no longer significant as well.

Thus, there is overall no robust evidence that some group of banks are more likely to reduce lending in order to meet the NSFR requirements.

Table 17: Change in total lending to the real sector by business model (BM) and size subsamples

This table shows regression coefficients of the change in lending to the real sector for subsamples of banks on the change in the NSFR shortfall (the variable of interest). Standard errors are reported in parentheses. '*' denotes statistical significance at 10%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Retail BM subsample	Diversified BM subsample	Specialised BM subsample	Very large banks subsample	Large banks subsample	Large banks subsample (w/o outlier)	Medium banks subsample	Small banks subsample
Change in the NSFR shortfall	0.014	0.008	-0.096	0.092	0.190*	0.186	0.007	-0.006
	(0.035)	(0.069)	(0.070)	(0.174)	(0.103)	(0.115)	(0.088)	(0.032)
Constant	-0.009	-0.007	-0.006	-0.008	-0.012	-0.018**	-0.003	-0.011
	(0.006)	(0.004)	(0.010)	(0.006)	(0.009)	(0.007)	(0.005)	(0.008)
Observations	105	123	45	56	27	26	112	78
R-squared	0.002	0.000	0.023	0.003	0.042	0.065	0.000	0.000
Prob. > F	0.694	0.904	0.179	0.599	0.0761	0.121	0.932	0.841

(ix) Additional analyses

Change in lending for RRE exposures

We apply the same methodology to detect whether the NSFR shortfall adjustments are correlated with lending to RRE. This time, we thus regress the change in RRE on the change in shortfall and the same control variables as in the above specifications. We find again no evidence that a decrease in the NSFR shortfall is correlated with a decrease in RRE lending. On the whole sample, we find, on the contrary, that a decrease in the NSFR shortfall is significantly correlated with an *increase* in RRE lending. There is strong evidence, however, that this result is driven by outliers. First, graphical observation of the data clearly shows that this correlation depends on extreme values for the change in the NSFR shortfall. Second, when we run again the analysis on a trimmed sample (including 95% of the original sample), we find a non-significant effect of the NSFR shortfall on lending to RRE in all the specifications. The models R^2 and F-test also clearly indicate that no empirical relationship exists between the two variables. Table 18 reports the result of the regression for the trimmed sample.

Table 18: Change in RRE lending

This table shows regression coefficients of the change in lending to RRE on the change in the NSFR shortfall (the variable of interest) and a set of other control variables. Standard errors are reported in parentheses. The sample is trimmed by 5% to avoid the effect of outliers.

	(1)	(2)	(3)	(4)
Change in the NSFR shortfall	-0.021	-0.025	-0.018	-0.020
	(0.047)	(0.052)	(0.048)	(0.047)
Change in NPEs		0.210		
		(0.227)		
Change in leverage ratio		-0.002		
		(0.045)		
Very large banks			0.001	
			(0.003)	
Large banks			0.000	
			(0.003)	
Medium banks			0.001	
			(0.004)	
Small banks			-0.007	
			(0.010)	
Retail business model				0.001
				(0.006)
Diversified business model				-0.001
				(0.003)
Specialised business model				-0.005
				(0.009)
Constant	-0.001	-0.002		
	(0.003)	(0.003)		
Observations	258	248	258	258
R-squared	0.001	0.013	0.006	0.003
Prob. > F	0.652	0.728	0.973	0.928

Change in lending for PSEs

Next, we consider the change in lending to PSEs. We perform the same analysis using the change in PSE lending as our dependent variable in the model. As before, we do not observe any significant correlation between the change in lending to PSEs and the change in the NSFR shortfall. These results also hold in the trimmed sample, which deals with outliers' effects. Table 19 reports the regression of the change in PSE lending on the change in the NSFR shortfall.

Table 19: Change in PSE lending

This table shows regression coefficients of the change in lending to PSEs on the change in the NSFR shortfall (the variable of interest) and a set of other control variables. Standard errors are reported in parentheses. '**' and '*' denote statistical significance at 5% and 10% respectively.

	(1)	(2)	(3)	(4)
Change in the NSFR shortfall	0.007	0.020	0.006	0.008
	(0.020)	(0.023)	(0.019)	(0.020)
Change in NPEs		0.081*		
		(0.043)		
Change in leverage ratio		0.081		
		(0.132)		
Very large banks			-0.000	
			(0.010)	
Large banks			-0.012*	
			(0.007)	
Medium banks			-0.004	
			(0.004)	
Small banks			-0.016*	
			(0.008)	
Retail business model				-0.010**
				(0.004)
Diversified business model				-0.008
				(0.006)
Specialised business model				-0.001
				(0.007)
Constant	-0.008**	-0.007**		
	(0.004)	(0.004)		
Observations	273	259	273	273
R-squared	0.000	0.003	0.028	0.019
Prob. > F	0.715	0.209	0.165	0.176

Lending from the NSFR template

To check the robustness of our assessment, we perform several additional analyses. First, we redefine our lending variable by relying on information reported in the NSFR template. Although these aggregates are directly related to the computation of the ratio, this alternative definition has the advantage of providing more observations as some banks did not report their exposures in the leverage ratio timesheet. Table 20 reports the results of the regression of the change in lending from the NSFR template. The change in the NSFR shortfall has negative coefficients in all

regressions, and the effect is statistically significant in column 2. An increase in shortfall is thus correlated with a decrease in lending in the NSFR timesheet. This does not necessarily mean that global lending has increased for banks that improved their NSFR. Given that change in lending is measured as a share of total exposures, banks might have reduced their reliance on wholesale market funding and simultaneously decreased their share of non-lending activities. This could explain the correlation observed between the NSFR and lending items in the template. It also echoes the argument that the current calibration of the ratio is not detrimental to bank lending when the activity is funded by retail deposits or long-term funding.

The regressions also indicate that large banks had a relatively lower increase in their share of lending over the period compared to other banks. Retail and diversified banks also increased their share of lending more than specialised banks. Controlling for these characteristics, however, does not change the relationship between the NSFR shortfall and lending, which remains statistically non-significant.

Table 20: Change in lending (defined from the NSFR template)

This table shows regression coefficients of the change in lending as defined in the NSFR QIS template on the change in the NSFR shortfall (the variable of interest) and a set of other control variables. Standard errors are reported in parentheses. '***', '**' and '*' denote statistical significance at 1, 5 and 10% respectively.

	(1)	(2)	(3)	(4)
Change in the NSFR shortfall	-0.569	-1.006**	-0.568	-0.572
	(0.387)	(0.415)	(0.383)	(0.378)
Change in NPEs		0.079		
		(0.285)		
Change in leverage ratio		0.230		
		(0.240)		
Very large banks			0.021**	
			(0.009)	
Large banks			0.009	
			(0.016)	
Medium banks			0.043***	
			(0.013)	
Small banks			0.072***	
			(0.024)	
Retail business model				0.082***
				(0.021)
Diversified business model				0.028***
				(0.009)
Specialised business model				0.012
				(0.020)
Constant	0.046***	0.024***		
	(0.010)	(0.007)		
Observations	362	295	362	362
R-squared	0.112	0.300	0.170	0.180
Prob. > F	0.143	0.105	< 0.001	< 0.001

Trade finance

Panel G of the leverage ratio timesheet reports some information on banks' trade finance exposures. As an additional analysis, we thus estimate the correlation between trade finance and NSFR compliance to assess whether a negative correlation exists between the two. We thus compute the change in trade finance exposures in total exposures between each period. In some cases, trade finance exposures do not represent a large share of banks' total exposures (e.g. in the case of universal banks). As for other exposures, off-balance-sheet commitments are included. The mean trade finance exposure share in December 2014 is only 0.73% and more than half of banks do not report any trade finance exposure. Table 21 reports the results. The first column presents the results for the whole sample, i.e. banks that report zero to their exposures on all dates are also included. Given the high proportion of banks with no trade finance exposures, we also report in column 2 the same model for banks that report at least on one occasion a non-zero exposure. As for the overall result of the assessment, we find no significant correlation between the NSFR shortfall and trade finance exposures. The model fit is again very poor, indicating that change in the NSFR shortfall and trade finance exposures are not related.

Table 21: Change in trade finance exposures

This table shows regression coefficients of the change in trade finance exposures on the change in the NSFR shortfall. Standard errors are reported in parentheses.

	(1)	(2)
	Whole sample	Non-zero exposures
Change in the NSFR shortfall	0.000	-0.015
	(0.007)	(0.041)
Constant	0.001	0.003
	(0.005)	(0.011)
Observations	273	109
R-squared	0.000	0.000
Prob. > F	0.994	0.718

Outliers' effects

To control for potential bias arising from outlier observations in the sample, we run all the models again after truncating the dependent variable at 95%. The results remain qualitatively unchanged and confirm that, overall, we do not observe a significant correlation between lending and NSFR compliance.

(x) Discussion

Some important limitations arise from the methodology presented in this subsection. First, OLS estimates are obtained with a sample of limited size due to data availability constraints. Results should be interpreted qualitatively rather than quantitatively as coefficients cannot be estimated

precisely with a small sample size. Secondly, it is difficult to assess causality in the tested framework. The NSFR is not yet implemented and it cannot be considered exogenous. This creates potential problems of omitted variable bias and reverse causality. It is more appropriate to analyse the results in terms of relation (or correlation) between the variables rather than a causal relationship. Albeit less satisfactory than a clear measure of causality, this analysis still leads to interesting insights on the effects of the regulation. As we observe no particular correlation between the change in NSFR shortfall and the change in lending, it suggests that on average banks are able to improve their NSFR without affecting lending. If increasing the NSFR could only be achieved in a cost-efficiently manner by reducing lending, we would observe that decrease in the shortfall is correlated with a reduction in lending. There is no particular evidence of such a relationship in the QIS data.

Demand effects cannot be accounted for in the analysis. A change in the share of lending might also be driven by a decrease in loan demand. To the extent that this loan demand might be correlated with banks' NSFR level, this could bias the results. It is unclear why banks with a lower NSFR might face a different loan demand compared to other banks. It could be, for example, that a lower loan demand decreases banks' loan share and increases banks' NSFR at the same time. Note, however, that in this particular case we would then observe a significant negative relation between lending and the NSFR. This is not what we observe in the regressions.

Overall, the analysis does not show signs at this stage of a detrimental effect of the NSFR regulation on lending. In particular, lending to SMEs does not appear related to the change in the NSFR shortfall. There is no sign of asset substitution between lending and other types of exposures when the NSFR changes. However, the analysis was only conducted on one-year due to data limitations. It remains unclear how the relation between the NSFR and lending might evolve through an entire business cycle.

These results are in line with those obtained in the simulation exercise where, overall, lending activity did not seem to be significantly affected by the need to comply with the NSFR.

This conclusion has some implications regarding the potential effect of the NSFR on the development of shadow banking. As the NSFR imposes stable funding constraints on lending, we could expect that banks will rely on the shadow banking system to externalise some parts of their loan portfolio (e.g. via loan sale or securitisation). Our analysis shows that banks are able to increase their NSFR without decreasing lending on average. We thus do not expect that the NSFR will create a significant increase in the shadow banking sector.

5.4 Cost considerations

We attempt to give a perspective on the cost of implementing the NSFR for the banking sector if firms made the same adjustments as those predicted by the simulations. In order to do that, we make use of the results on impact in terms of absolute volume as presented in the simulation

section. By multiplying the volume of change for each item of the balance sheet with an associated interest rate assumption, we obtain an estimation of the impact on profitability. Summing up these changes in income and expenses, we determine the total impact on profitability. By dividing it by the amount of capital, we obtain a figure of the permanent loss of yearly RoE due to the implementation of the NSFR.

The results shown here are not expected to necessarily give a reliable cost estimate. Given the complexity of the balance sheet of a bank, we had to make simplifying assumptions about the cost associated with each category of elements of the balance sheet. We also tried to have an internally consistent set of assumptions; in any case, the cost results should be read jointly with the cost assumptions. Moreover, given the highly uncertain and subjective ways in which cost (and income) could be defined for each asset or funding category, we express our assumptions in terms of relative cost. We also believe that the cost results should be interpreted in terms of relative burden for various business models, rather than in terms of the actual costs of becoming compliant. The cost assumptions are presented below in terms of ranks. The higher the rank, the more expensive the category. A rank can appear twice, meaning that we assumed very similar associated interest rates.

	BS item	Interest rate rank within asset + off-BS/funding items
ASF	100% ASF capital and liabilities > 1Y	5
	95% ASF stable retail deposits	3
	90% ASF less stable retail deposits	4
	50% ASF non-retail liabilities	2
	0% ASF non-retail liabilities	1
RSF	0% RSF assets	1
	100% RSF assets	8
	100% RSF LT encumbered assets	9
	15% RSF assets	5
	50% RSF assets	7
	10% RSF assets	4
	5% RSF Level 1 assets	3
	15% RSF Level 2A assets	6
	50% RSF lending	8
	65% RSF lending	9
	85% RSF lending	10
	85% RSF assets	11
	100% RSF LT CB encumbered assets	9
	Off-BS items	2

We present conclusions per granular and aggregated business models. The relative cost estimations hold for various numerical assumptions, fitting the ranking described above.

The cost analysis is in line with the results presented before. Securities trading houses bear the largest adjustment costs, followed by other no retail deposits and savings banks. Under our assumptions, the savings banks face a relatively higher cost because, as explained before, their non-compliant members are the only ones that, in our forecasts, significantly increase both retail and capital/other long-term funding at the same time. Finally, we observe that some business models, such as mortgage and building societies, co-operatives and local universal, even improve their profitability and at the same time improve their NSFR.

Business model	# compliant banks	# non-compliant banks	Impact
Univ. cross-border	21	11	
Mrtg. & build. soc.	14	6	
Co-operatives	35	11	
Local univ.	63	17	
CCP	2	1	
Savings	26	14	
Custodian	1	0	
Other	20	0	
Other no retail dep.	7	5	
Auto & cons.	1	5	
Sec. trading	4	5	
Pass-through	1	6	
Div. no retail dep.	1	2	
Total	196	83	
Legend	Small sample, no conclusions		
	No impact		
	Low impact		
	Moderate impact		
	Severe impact		

Business model	# compliant banks	# non-compliant banks	Impact
Diversified	64	23	
Retail	74	33	
Specialised	31	10	
Total	169	66	
Legend	Small sample, no conclusions		
	No impact		
	Low impact		
	Moderate impact		
	Severe impact		

6. Consequences of the NSFR for trade finance

Given the small number of banks classified as mostly active in trade finance (one bank in December 2014), the assessment of the impact of the NSFR on trade finance could not be conducted by relying on the QIS data. This chapter describes the size of the market and its main characteristics in order to assess the impact of imposing the NSFR. The chapter assesses different types of instruments used in trade finance and considers their funding implications. Overall, the chapter foresees potentially high additional costs to be charged to final users if a high degree of stable funding is required for this kind of loan. This could reduce demand in this market. Apart from these reasons of general economic interest, the report assesses the specificities inherent to each of these transactions (namely letters of credit, bank guarantees, loans for exports/imports, and factoring) in order to give separate assessments.

For off-balance-sheet commitments in trade finance (letters of credit and bank guarantees), the report suggests applying graduated and low RSF factors for contingent trade finance products, reflecting the low funding risk and the secured nature of the activity; for example, a 5% RSF factor for transactions below six months, 10% up to one year, and 15% if above one year.

For on-balance-sheet exposures in trade finance, overall the report suggests that higher stable funding should be required than for off-balance-sheet exposures. Indeed, contrary to off-balance-sheet items, loans need to be funded by banks.

Import and export loans generally have maturities shorter than one year. The Basel NSFR treats these loans like other loans to non-financial corporates and imposes a 50% stable funding requirement if their residual maturity is less than one year, and an 85% requirement if it is longer. The report suggests applying the Basel NSFR factors for maturities longer than six months, while considering the use of lower requirements for shorter maturities (e.g. between 10-25%), balancing their short-term nature and the need for funding continuity of on-balance-sheet activities.

Factoring/forfaiting institutions receive a preferential treatment in the LCR DA, where they may be exempt from the inflow cap. The majority of these transactions appear to be below six months. The report suggests different potential alternatives for factoring institutions, ranging from a lower RSF factor when the maturity is below six months, similarly to import/export loans (10-25%), to a lower NSFR requirement, or even to a waiver on a solo basis (considering that most of the factoring institutions are banks' subsidiaries).

6.1 What is trade finance?

The term '**trade finance**' generally refers to finance that facilitates the trade of goods. Typically, trade finance is provided by banks and financial institutions, which intermediate between the buyer and the seller by providing financing to mitigate the risks involved in international as well as domestic trade. This is to be distinguished from **trade credit**, which involves no intermediation by financial firms. In a trade credit, the seller (exporter) of goods provides the buyer (importer) with a loan so that the buyer does not have to pay immediately at the point of purchase but within an agreed time period. At the same time, trade credit can also involve financial entities when either the exporter or the importer obtains credit insurance on their exposure. The implementation of the NSFR can thus be relevant for both trade finance and trade credit.

6.2 Types of trade finance

The risk involved in the trade of goods relates to the gap between the payment for and the delivery of the goods (referred to as the 'trade cycle' finance gap). Through trade finance, the seller of goods reduces the **payment risk** while the buyer aims to reduce the **delivery risk** from the seller. The duration between the shipping of the goods and the final delivery determines the term of the trade finance transaction, which is typically short term. Moreover, the term of trade financing transactions is directly related to the shipment of the goods, which means that there is no automatic rollover of the transactions. Trade finance can take different forms:

- trade credit insurance;
- letters of credit (documentary credits);
- bank guarantees;
- export/import loans; and
- factoring or forfaiting.

6.2.1 Trade credit insurance

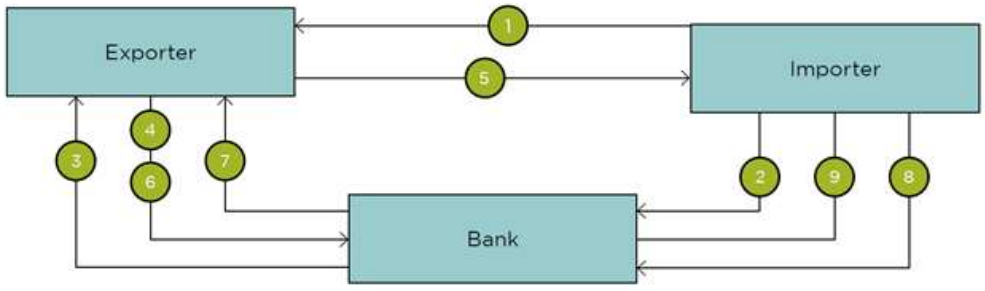
A seller providing trade credit is exposed to the credit risk of the buyer. Trade credit insurance provides the seller with protection against the risk of non-payment by the buyer. The non-payment may be due to the insolvency of the buyer or, in an international trade, due to political risks that prevent payment. Insurance against political risk is offered by private and government-sponsored entities such as Euler Hermes.[20]

[20] In 2003, guarantees granted by Euler Hermes amounted to EUR 103 billion. See Moser et al. (2008) for an overview and analysis of the role of export guarantees for trade.

6.2.2 Letter of credit

When goods are traded, the seller and the buyer need to agree on the process of how to pay for the goods. While the buyer may be reluctant to prepay for the traded goods, the seller may also be unwilling to ship the goods before payment is made. In this situation, a bank can intermediate between the trading partners by providing an import letter of credit (L/C) to the buyer of the goods, which guarantees payment to the seller. In order to protect against the risks in the delivery of the goods, the buyer requests that the seller provide documentation proving that the goods have been shipped. Once the bank receives the documentation confirming shipping has been made, the seller receives the payment from the bank while the bank receives payment from the buyer (or the buyer draws down a credit line).

Transaction process flow for an import letter of credit



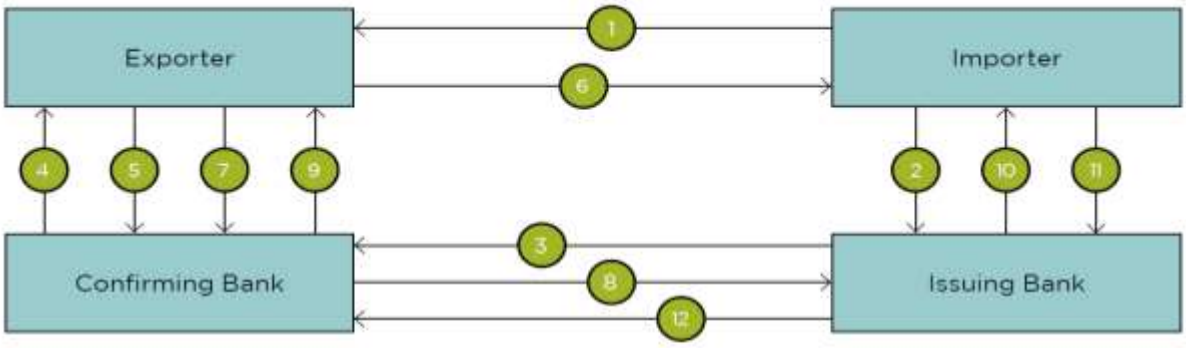
1. Exporter and importer agree contract of sale
2. Importer requests L/C
3. Bank issues L/C on behalf of the importer in favour of exporter
   - L/C will set out the terms and conditions for payment
   - Typically on the presentation of a compliant set of documents
4. Exporter checks and accepts the L/C
5. Exporter ships goods to importer
6. Exporter issues documents, such as bills of lading, as required by the terms and conditions of the L/C and sends them to the issuing bank
7. Issuing bank checks the documents and, if compliant, arranges payment to the exporter
   - Either "at sight", i.e. upon presentation of compliant documents
   - Or "usance", i.e. after a specified term, such as 30 or more days after sight or shipment date
8. In exchange, the importer pays the issuing bank (or provides a bill of acceptance, draws down on a credit facility, etc.)
9. Issuing bank releases documents to the importer

Source: ICC (2014)

In addition, the seller could also ask another bank for an export confirmed L/C to guarantee against non-payment from the bank issuing the import L/C. In this case, two banks intermediate the trade transaction between seller and buyer.

A L/C is a contingent liability and payment is only made by the bank to the seller from funds in the buyer's account when the documentation of shipping is presented.

Transaction process flow for an export confirmed letter of credit



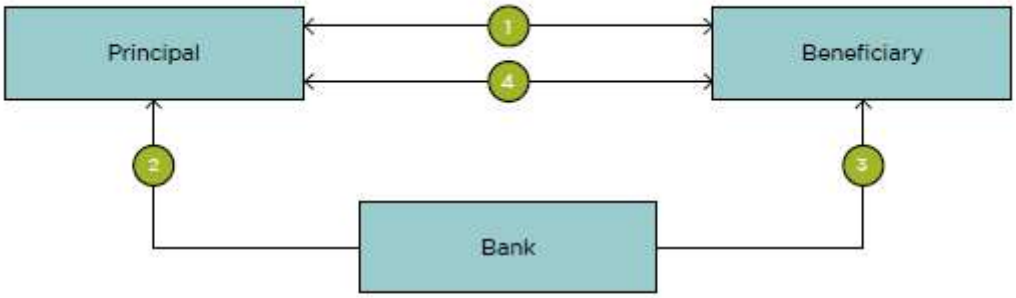
1. Exporter and importer agree contract of sale
2. Importer requests L/C
3. Issuing bank issues L/C on behalf of the importer in favour of exporter and sends it to the confirming bank
4. Confirming bank checks and accepts (confirms) the L/C before advising the exporter of the receipt of L/C documents
5. Exporter checks and accepts the L/C
6. Exporter ships goods to importer
7. Exporter presents documents, such as bills of lading, as required by the terms and conditions of the L/C and sends them to the confirming bank
8. Confirming bank checks the documents and, if compliant, releases documents to the issuing bank
9. Confirming bank arranges payment to the exporter (at sight or usance)
10. Issuing bank checks the documents and, if compliant, releases documents to the importer
11. In exchange for the documents, the importer pays the issuing bank (or provides a bill of acceptance, draws down on a credit facility, etc.)
12. Issuing bank arranges payment to the confirming bank

Source: ICC (2014)

6.2.3 Bank guarantee

Similar to a L/C, the bank intermediates between a buyer and seller of goods by providing a guarantee to one of them. For instance, the bank guarantees payment to the seller if the buyer fails to fulfil his contractual obligations. Guarantees typically have a medium to longer term and are used when the commercial relationship is of a longer nature.

Transaction process flow for a performance guarantee



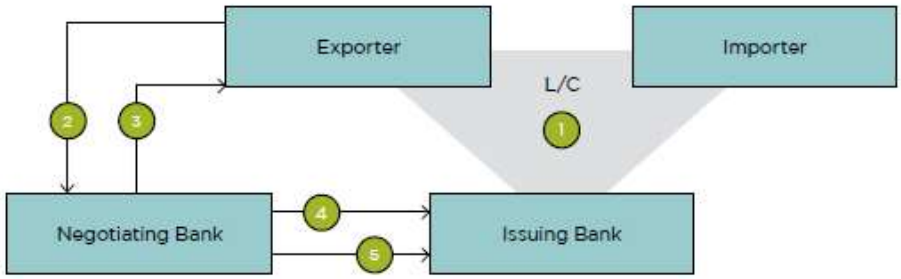
1. Principal and beneficiary agree contract of sale
2. Principal requests a performance guarantee
3. Bank issues performance guarantee on behalf of the principal in favour of beneficiary
   - Can also be structured as an L/C
   - Principal is exporter: guarantees the exporter's obligations to deliver and perform according to the contract
   - Principal is importer: guarantees the importer's payment for goods or services provided under the terms of the contract
   - Issued and delivered on behalf of principal at contract signing or before delivery
4. Exporter ships goods to importer; importer pays exporter

Source: ICC (2014)

6.2.4 Loans for export/import

With a loan for export, the seller uses a L/C as collateral to obtain a loan from another so-called negotiating bank. This allows the seller to cover costs, accessing funding until payment is made. Under this arrangement, the negotiating bank effectively buys the right to receive the payment from the buyer, i.e. from the L/C-issuing bank. Under this type of transaction, the negotiating bank effectively provides a loan to the buyer.

Transaction process flow for a negotiable L/C

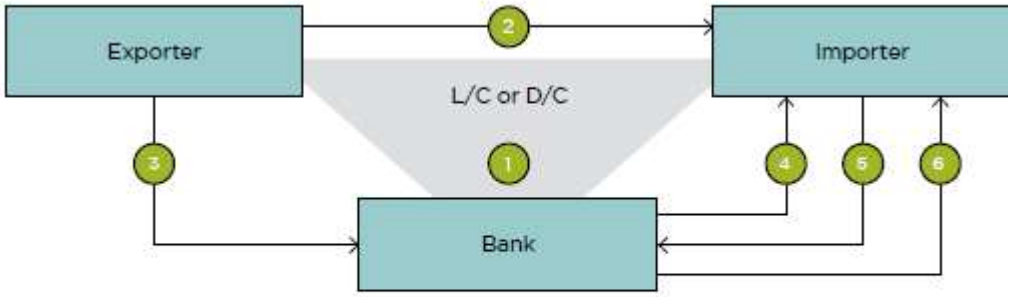


1. L/C structure set up as per import L/C
   - L/C needs to have a "negotiable" clause (i.e. an assurance from the issuing bank that it will reimburse anyone under the terms and conditions of the L/C who "negotiates" against conforming documents)
   - Hence, negotiating bank usually not named in the L/C
2. Exporter presents documents to the negotiating bank as per the terms and conditions of the L/C
3. Negotiating bank checks the documentation and, if compliant, advances cash to the exporter
   The "negotiation" is effectively the purchase of documents from the exporter at a discount
4. Negotiating bank presents the documents to the issuing bank
5. Issuing bank checks the documents and, if compliant, arranges payment to the negotiating bank

Source: ICC (2014)

Loans for imports present another form of trade finance, whereby the bank provides the buyer with a loan to pay for the goods. This allows the buyer to obtain funding during the period where the goods are obtained and sold. The loan is secured by the goods.

Transaction process flow for a loan against import



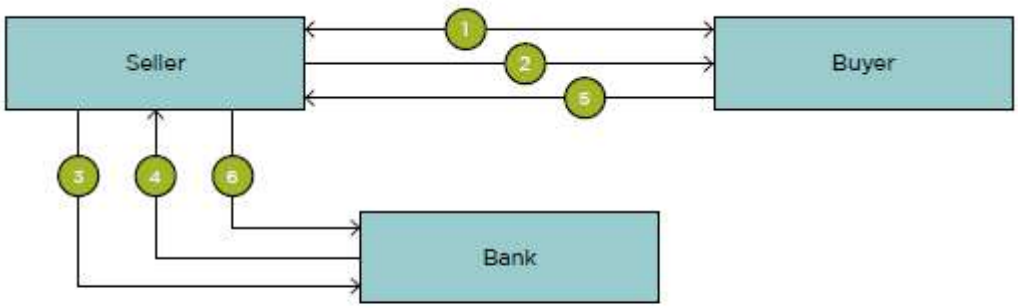
1. L/C or documentary collection structure set up
2. Exporter ships goods to importer
3. Exporter issues documents and sends them to the issuing bank
4. Issuing bank releases goods to the importer under trust receipts
5. Importer repays bank
6. Issuing bank transfer ownership of goods to the importer

Source: ICC (2014)

6.2.5 Factoring/forfaiting

In a factoring transaction, a bank buys the debt or invoice at a discount from the seller of the goods. Factoring thus relieves the seller from collecting the debt and provides immediate working capital to the seller. The bank subsequently collects the payment from the buyer. Similarly to factoring, under a forfaiting transaction the seller of the good sells the receivable from the sale to a company (the forfeiter), which is typically a specialised finance firm and not a bank. A direct purchase from the seller is called a primary purchase. The receivable then becomes a debt instrument, which can be traded on the secondary market as a bill of exchange or a promissory note.

Transaction process flow for invoice discounting



1. Seller and buyer agree contract of sale
2. Seller raises an invoice and sends it to the buyer
3. A copy is also sent to the bank
4. Bank approves the invoice and advances cash to the seller at a discount to the value of the invoice
5. Seller collects payment from the buyer
6. Seller repays the bank

Source: ICC (2014)

6.3 How big a market?

There is no unique and comprehensive source of data on trade finance. A Committee on the Global Financial System's (CGFS) study estimates that the **global flow of bank-intermediated trade finance in 2011** amounted to around USD 6.5 to 8 trillion, of which USD 2.8 trillion were letters of credit (CGFS (2014)).[21] Banks provide about one-quarter to a third of global trade finance. Moreover, trade finance is predominately US dollar denominated, making the provision of trade finance susceptible to banks' access to funding in US dollars.

As regards **factoring**, in 2014 the total factoring volume for Europe amounted to approximately EUR 1.46 trillion.[22] Europe accounts for 62% of the global factoring volume, whereas Asia is the second largest market, accounting for 26%. In Europe alone, over 90% of the factoring industry is made up of bank subsidiaries owned by commercial banks.[23]

6.4 Relevance of trade finance for non-financial firms

The importance of trade finance varies across firms, particularly in relation to their size. According to an (European Central Bank) ECB survey on the access to finance of enterprises in the Euro area (SAFE), trade credit is a more important source of funding for very small non-financial firms (NFCs) while factoring is more relevant for medium to large NFCs.[24] It should be noted that, due to the short-term nature of trade finance, the available evidence suggests that banks have been able to quickly reduce their exposures to trade finance in times of stress (see Chauffour and Farole (2009), CGFS (2014)).[25] While this is positive from a bank funding risk perspective, the finding also highlights a transmission mechanism of risks from the banking sector to the real economy and the importance of resilient bank balance sheets to facilitating trade in goods. A potential benefit of a stable funding requirement for trade finance could thus be that banks would be less in need of reducing their provision of trade finance during stressed times given that trade finance is backed up with more stable funding. While this may hold from an ex-post perspective, the added costs of a stable funding requirement may increase the cost and thus reduce the overall demand for trade finance. The net benefit of a stable funding requirement for trade finance is thus difficult to quantify. However, given the potentially low RSF factors to be assigned to most widely used trade finance products, i.e. letters of credit, the increase in cost can be expected to be largely muted. Letters of credit may, however, not be suitable for all kinds of trade transactions or customers

[21] See CGFS (2014), *Trade Finance: Developments and Issues, Working Paper No. 50*. There is no data for the EU or the Eurozone available. However, figures for individual EU countries are as follows: Italy USD 249-332 billion, Spain USD 76 to 101 billion, France USD 149-199 billion, and Germany USD 187 billion.

[22] See Factor Chain International 2015.

[23] See Factor Chain International Annual Review 2014.

[24] See ECB (2014) survey on access to the finances of enterprises in the Euro area, November 2014.

[25] See Chauffour and Farole (2009), *Trade Finance in Crisis Market Adjustment or Market Failure? World Bank Policy Research Working Paper 5003*.

and thus higher RSF factors for trade finance products other than letters of credit may have a more material impact on some forms of trade finance.

6.5 Maturity structure of trade finance

The various types of trade finance typically exhibit different maturities that can be broadly categorised in **short-term and medium- to long-term trade finance products**.[26] A further distinguishing characteristic is that some of the most widely used trade finance products are off-balance contingent liabilities. Table 22 below provides an overview classifying trade finance products in off- and on-balance-sheet products. The International Chamber of Commerce (ICC) defines short-term trade finance products as instruments with a maturity of less than one year with a clear link to a specific trade transaction. Specific transactions falling in this category are letters of credit, performance guarantees, and loans for import/export. Based on evidence found in the ICC trade register, Table 22 reports the average as well as the range of maturity across these short-term products.

Table 22: Short-term trade finance products

Product type	Average contractual maturity	Range of average maturity	On/off balance sheet
Export L/C	120	43-379	Off
Import L/C	110	48-158	Off
Performance guarantees	770	281-1105	Off
Loans for import/export	157	66-400	On

Source: ICC (2014)

Table 22 highlights that short-term trade finance products, with the exception of performance guarantees, have an average maturity of typically below one year. Moreover, letters of credit have the shortest term, with an average of 110 to 120 days. In contrast, performance guarantees on average exceed the one-year horizon of the NSFR and can even reach more than three years.

With regard to **long-term trade finance products**, the ICC identifies insurance cover and the provision of guarantees by export credit agencies (ECAs). The range of maturity varies from a few months up to 15 years, with an average tenor of 10 to 15 years.

[26] See ICC Trade Register Report 2014.

6.6 How is trade finance treated under the NSFR?

The Basel NSFR text allows national supervisors to specify the RSF factors for off-balance trade finance-related obligations on the basis of their national circumstances, and specifically mentions **guarantees and letters of credit**.[27]

Both **guarantees and letters of credit** are off-balance-sheet items. A low RSF requirement could be justified by the **low liquidity risk** given that inflows and outflows for trade finance are typically matched, small in value, short in duration, and have an identifiable source of repayment.[28] Moreover, Article 4 (3) of the CRR states that **trade finance is generally uncommitted** and requires satisfactory supporting transactional documentation for each drawdown request, enabling refusal of the finance in the event of any doubt about creditworthiness or the supporting transactional documentation. Repayment of trade finance exposures is usually independent of the borrower, with the funds instead coming from cash received from importers or resulting from proceeds from the sales of the underlying goods.

Based on the evidence provided in Table 22, letters of credit typically have a short maturity, providing justification for relatively low RSF factors for this product.

In contrast, performance guarantees show a significantly longer maturity, reflecting the longer commercial relationship between the trading firms, which may justify a different treatment than letters of credit. The EU Delegated Act for the LCR refers to Article 162 (3b) and Article 4 (80) of the CRR for trade finance products and includes guarantees. For a consistent treatment of trade finance and particular guarantees across the LCR and the NSFR, guarantees may thus need to be treated in line with letters of credit. At the same time, Article 4 (80) of the CRR explicitly defines trade finance products as financial products connected to the exchange of goods and services with a **fixed short-term maturity of less than one year and without an automatic rollover**. While guarantees are explicitly mentioned in Article 4 (80), guarantees may not exhibit a short maturity given that they are typically used for longer term commercial relationships. A possible way forward is to differentiate the treatment of guarantees under the NSFR, conditional on their maturity and using the maturity buckets of the NSFR, treating guarantees with a maturity of less than six months more favourably than longer term guarantees.

With regard to **loans for import and export**, these appear on the bank's balance sheet. In the NSFR, a 50% RSF factor applies to all loans to non-financial firms with a maturity of less than one year, while an 85% RSF is applicable for loans with a maturity of more than one year. While loans for export or import present an exposure of a bank to a non-financial corporate, they are typically backed by a L/C or the goods of the trade. This limits the term of the exposure to the period of the trade transaction, which is short (as confirmed by the evidence in Table 22). However,

[27] See paragraph 47 in BCBS (2014) Basel III: the net stable funding ratio, October 2014.

[28] See CRR paragraph 73. A low credit risk is also reflected in the preferential risk weight granted under the standardised approach under Article 121 (4) of the CRR.

contrary to off-balance-sheet items, loans for export or import need to be funded by banks, supporting the need for adequate backing with stable funding resources. In light of the relatively short maturity, a greater differentiation may be warranted by setting a distinct RSF factor for trade-related loans with a maturity of less than six months while maintaining a 50% RSF for loans above six months and below one year. Moreover, given that loans need to be funded, an RSF factor higher than 5% for off-balance-sheet items seems appropriate from a prudential perspective.

With regard to **factoring/forfaiting**, the purchase of the debt or invoice by a bank (export factor) creates an on-balance-sheet exposure, which needs to be funded. The treatment of the exposure depends on the bank's counterparty in the transaction. If the counterparty is a non-financial firm i.e. the importer, the RSF factors are 50% and 85% for maturities of less than one year and more than one year respectively. However, export factors frequently involve other banks in the importer's country as import factors. As a result, the counterparty in the factoring transaction is a financial institution where the loan is secured by the receivable. For transactions with a maturity of less than six months, six months to one year, and beyond one year, the corresponding RSF factors are 15%, 50% and 100% respectively. It should, however, be noted that subsidiaries of the export factor frequently act as import factors.

Trade finance product	Basel III NSFR requirement (RSF factor)
Letter of credit	National discretion
Bank guarantees	National discretion
Loans for export/import	50% less than 1 year; 85% more than 1 year.
Factoring or forfaiting	Exposures to non-financial firms: 50% for less than 1 year; 100% for more than 1 year. For exposures to financial institutions: 15% for less than 6 months' maturity; 50% for residual maturities between 6 months and 1 year; 100% for more than 1 year.

6.7 The LCR treatment of trade finance

The EU Delegated Act for the LCR provides for the competent authority to assign an outflow factor of up to 5% for off-balance-sheet trade finance-related products.[29] With regard to inflows,

[29] Trade finance products falling within the scope of this treatment are specified in CRR 429 and Annex I. Annex I specifies the trade finance off-balance-sheet items, classifying documentary credits and shipping guarantees as medium risk, and classifying documentary credits collateralised by the underlying shipment, warranties, guarantees without the character of credit substitutes, and irrevocable standby letters of credit as medium/low risk.

a 100% inflow factor is assigned to self-liquidating short-term trade financing transactions connected to the exchange of goods and services with a residual maturity **of less than 30 days**.[30] The Basel LCR further includes export and import bills under the contingent funding obligations, which are not explicitly referred to in the CRR Annex I.

6.8 A proposal for the treatment of trade finance under the NSFR

Based on the discussion, Table 23 below proposes RSF factors for trade finance products. The proposal is to apply graduated and low RSF factors for contingent trade finance products, reflecting the low funding risk and the secured nature of the activity. With regard to loans for export/import, the proposal is to apply the Basel NSFR factors for maturities for more than six months while considering the use of lower requirements of between 10-25%, balancing the short-term nature and the need for funding of on-balance-sheet activities.

A distinct treatment may also be necessary for factoring and forfaiting for the same reasons.[31] Given that factoring transactions have maturities reflecting the underlying trade of goods and services, a greater differentiation of RSF could be considered. This may be warranted given the short-term nature of these transactions, which are typically well below six months and are potentially not adequately captured by the broader maturity buckets of the NSFR. For specialised factoring institutions, the NSFR requirements may thus be difficult to meet, particularly when they have a limited deposit base and largely rely on short-term wholesale markets for their funding. At the same time, it should be noted that export factors typically have contracts with exporters, implying automatic rollover of exposures related to factoring, i.e. a longer term commitment to acquiring the receivables from the exporter. Moreover, factoring institutions also engage in maturity transformation in their activities, thus also warranting limits on their funding mismatch. The following options could be envisaged:

- a lower RSF factor for exposures with a residual maturity below six months, e.g. similar to loans for exports and imports;
- a lower NSFR requirement reflecting the insufficient granularity of the NSFR buckets; and
- waiving the NSFR requirement on a solo basis, reflecting that most factoring firms are subsidiaries of banks.

[30] Based on the notifications by NCAs to the EBA under Article 420 (2) of the CRR, most banks currently report using a 5% outflow factor for additional outflows for trade finance off-balance-sheet-related products.

[31] Delegated Regulation 2015/61 explicitly mentions factoring as a business model that may be exempt from the inflow cap, thus receiving preferential treatment.

Table 23: Proposed RSF factors for trade finance products

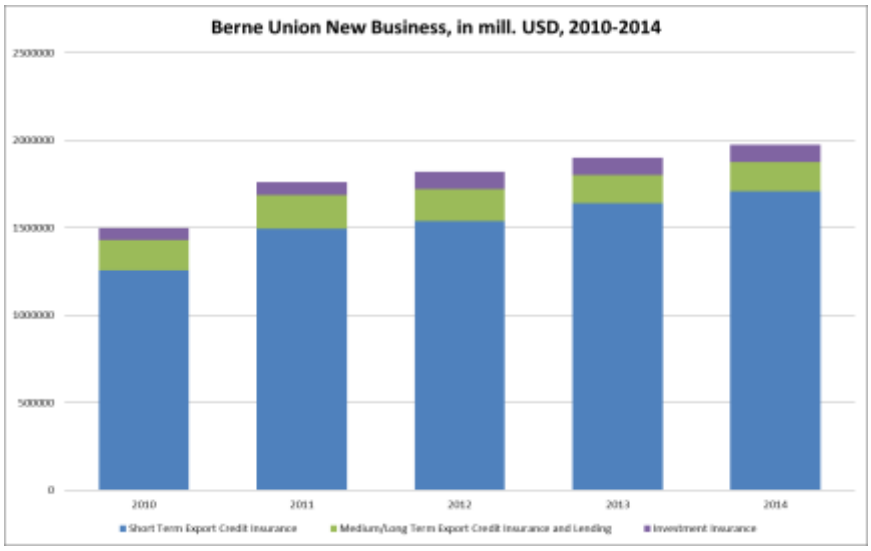
Trade finance product	< 6 months	Between 6 months & 1 year	More than 1 year
Letter of credit	5%	10%	15%
Bank guarantees	5%	10%	15%
Loans for export/import	*(10-25%)*	50%	85%
Factoring or forfaiting	Exposures to non-financial firms: *(10%-25%)* For exposures to financial institutions: 15%	50%	100%

6.9 Export credit agencies

Article 510 (1) of the CRR mandates the EBA to also assess the impact of a stable funding requirement inter alia on trade financing, including lending under official export credit insurance schemes. Article 4 (81) of the CRR defines officially supported export credits as loans or credits to finance the export of goods and services for which an official ECA provides guarantees, insurance, or direct financing.

Figure 17 shows the new business volume of Berne Union members over the period from 2010 to 2014, which has grown from USD 1.5 trillion to around USD 2 trillion.[32] Short-term export credit insurance accounts for 85% of ECA activities.

Figure 17: New business volume



[32] The Berne Union has 50 member companies from around the world. The membership may be private or state linked, small or large. They represent all aspects of the export credit and investment insurance industries worldwide.

The Organisation for Economic Co-operation and Development (OECD) lists ECAs on their webpage, showing that ECAs exist in most EU countries.[33] ECAs can offer a broad range of financing, including:

- the purchasing or insuring of trade receivables;
- discounting of bills of exchange;
- financing of banks' discounting of receivables;
- discounting of bills of exchange or receivables in individual transactions or portfolios; and
- providing bridge financing for a limited period until funds are paid out from an export credit finance transaction.

ECAs can offer their services both directly to exporters as well as to banks intermediating trade finance.[34] ECAs insure credit and political risks as well as the risk of a currency becoming non-convertible. Moreover, the insurance provided by ECAs varies in payment terms (covering several years) and coverage (typically, 5-15% of the risk exposure is not insured).

In terms of the **impact of a net stable funding requirement for banks** on trade financing, including lending under official export credit insurance schemes, a stable funding requirement could potentially increase the costs of the trade finance provided by banks. A decline in the demand for trade finance could also reduce the volume of services supplied by ECAs. However, ECAs can also directly provide their services to exporters and importers, thus potentially offsetting the effect of a reduced intermediation by banks. Consequently, **the overall effect on ECAs of the implementation of an NSFR is unclear and depends on the extent to which ECAs need to rely on the intermediation of banks. At the same time, the overall impact of the NSFR on banks' supply of trade finance can be expected to be largely muted** given the relatively low RSF factors to be assigned for the main trade finance products. Moreover, a more differentiated treatment of export and import loans for a maturity of up to six months may further reduce any impact on the demand for ECAs' services.

[33] See http://www.oecd.org/tad/xcred/eca.htm for details.

[34] See, for example, Euler Hermes at http://www.agaportal.de/en/aga/produkte/uebersicht.html

7. Pass-through financing models

This section describes the features of pass-through models, where payments on an asset or a pool of assets are passed on to investors in a security. A special case of the pass-through structure is match-funded mortgage lending, where the mortgage loan is matched directly to the specific bonds funding the loan.

In pass-through models where the assets (loans) and liabilities (bonds) have matched maturities, the funding risks are reduced as the assets are stably funded throughout their lifetime. Especially in the case of match-funded mortgage lending, when the loans are long-term and amortised throughout the term of the loan, the funding risks are absent, and Basel's §45 regarding interdependent assets and liabilities could be applied.

In pass-through models where the maturity of the pass-through bond is not matched with that of the loans, there exists a residual funding risk that results from this difference in maturities (a similar risk emerges in all funding structures that are imperfectly matched). In some cases, the existence of an extendable maturity trigger on the pass-through bond mitigates this funding risk.

The section further describes—both theoretically and empirically (from the QIS data sample)—that the NSFR of pass-through structures is maximum (and often below) 100% and that adjusting towards compliance would be very difficult and entail increasing the level of capital or long-term debt significantly, even in cases where such capital or long-term debt levels are not necessary in light of other risks and capital requirements.

7.1 Background

Article 510 (1) of the CRR notes that the EBA report on net stable funding requirements should include an assessment of the impact on the business and risk profile of institutions established in the Union or on financial markets or the economy and bank lending, with a particular focus on, among other things, pass-through financing models, including match-funded mortgage lending.

The following presents a description of the pass-through financing model in general, as well as a case study of match-funded mortgage lending.

7.1.1 Pass-through financing

A strict definition of the pass-through financing principle implies that payments on an asset or a pool of assets are passed directly on to investors in a security, the holders of which have the right to receive these payments. This could, for example, be in the form of a mortgage-backed security (MBS), where interest and principal payments from a pool of borrowers are passed through to the holders of the MBS, thereby making up the running payments from the security to the investor. Pass-through financing can also be in the form of a covered bond where the payments from the

cover pool are passed through to the covered bond investor. It must be emphasised, however, that not all covered bond funding is a pass-through structure. Regular banks use covered bond funding, where the assets in the cover pool typically change over time and the running payments are not necessarily passed through the bank from the cover pool to the investor. This type of arrangement is not a pass-through structure.[35]

Pass-through financing can be done in the form of both on- and off-balance-sheet structures for credit institutions. Off balance sheet, this can be in the form of a special purpose entity, which purchases loans from the credit institution and funds these purchases by issuing securities where the payment on these securities reflects the running interest and principal payment on the loans purchased by the entity. Pass-through financing can also be kept on the balance sheet of the credit institution, where the institution then issues securities whose running payments stem from the interest and principal payment on a pool of loans designated for this issuance. One key component here is whether the credit risk related to the assets is kept by the credit institution, or whether this is also passed on to the bondholders.

In relation to the definition of a stable funding requirement, the focus is on pass-through financing appearing on the balance sheet of the credit institution, as this is the type of assets and liabilities that directly features in the stable funding requirement. Some requirements may also be set for off-balance-sheet exposures, but this would be in the form of credit or liquidity facilities granted by the institution to off-balance-sheet entities, not in the form of pure funding of on-balance-sheet activities.

Looking at pass-through financing in relation to a stable funding requirement, we have two components to focus on:

- The asset side – Typically loans or leases, the payments on which are promised to the holders of the issued pass-through securities. Hence, these assets will be encumbered for the period in which the payments are promised to the security holders.

- The liability side – Typically issued bonds, the running payments on which stem directly from the payments made on the asset side.

The pass-through structure does not in itself guarantee a match in the term of the asset and liability side. For example, a 20-year loan may be funded by a five-year pass-through bond (for example, covered bonds). Once the bond expires, new financing must be established. The match in this case is thus for each sequential period. Similarly, a five-year bond may be used to finance a

[35] Also, conditional pass-through structures are not in the scope of the typical pass-through models described in this chapter. Conditional pass-through bonds are a special type of covered bonds, whereby the entire structure functions as a regular (non-pass-through) covered bond for as long as the issuer is going concern. As soon as the issuing institution becomes gone concern, the conditional pass-through covered bond becomes a pass-through structure in the conventional sense, simply transferring the loan repayment and interest proceeds to the investors. The institutions subject to the NSFR are going concern and in this respect the conditional pass-through covered bonds should be treated as regular covered bonds and should not be confused with the pass-through structures described in the rest of the chapter.

pool of loans with a typical term of six months. New loans will be added continually to the pool, the payments on which are then passed onto the bondholder.

Table 24 shows how the RSF and ASF factors of the Basel NSFR relate to pass-through structures with the main balance sheet components as described above and with various terms. It is assumed that the assets will always be considered encumbered for the term of the liability.

Table 24: RSF and ASF factors for pass-through structures

Liability\asset	Asset 0-6 months	Asset 6-12 months	Asset > 12 months
Liability 0-6 months	ASF: 0% RSF: 15%,[36] 50%	ASF: 0% RSF: 50%	ASF: 0% RSF: 65%, 85% or 100%
Liability 6-12 months	ASF: 50% RSF: 50%	ASF: 50% RSF: 50%	ASF: 50% RSF: 65%, 85% or 100%
Liability > 12 months	ASF: 100% RSF: 100%	ASF: 100% RSF: 100%	ASF: 100% RSF: 100%

For loans with a remaining term to a maturity above one year, the RSF factor depends on the counterparty to which the loan is given and the risk weighting. As is evident, for pass-through funding structures where the terms of assets and liabilities are matched the ASF and RSF factors match as long as the term is above six months. Below six months, the RSF factor exceeds the ASF factor. The general rationale in the Basel NSFR is that some stable funding is required to ensure the funding of a minimum rate of rollover of the loans (as explained in Chapter 2). However, in some pass-through structures, such as match-funded mortgage lending, there is no rollover needed, as described in section 7.1.2.

It can further be noted from Table 24 that the RSF factor will always equal or exceed the ASF factor for these pass-through structures. Where the term of the asset exceeds the term of the liability, the RSF factors exceed the ASF factors, reflecting the funding risk that materialises as the asset must be refinanced when the liability matures prior to the assets. However, in case there are supplementary requirements regarding the term of the liability—such as bonds with embedded options to extend maturity—the assessment of this funding risk can be somewhat different. Given that this type of option provides a possibility of increasing the maturity of the liability (funding source), it must generally be seen as a feature that reduces the funding risks, since longer term funding is considered more stable funding in the NSFR. However, the extent to which the existence of this kind of extendable maturity option mitigates the funding risks

[36] The 15% RSF factor is applicable for loans to financial institutions.

ultimately depends on the conditions of such an option. Two items are especially important in the assessment: (1) under what circumstances will the option to extend be triggered; and (2) the length of the extension period.

First, one must distinguish between the case where the option can be triggered at the discretion of a stakeholder (for example, the investor) and the case where it can be triggered by specifically defined events. If the option to extend the maturity is triggered exclusively at the discretion of a stakeholder, it is, to a large extent, a behavioural condition and it can be difficult to assess whether or not it will actually mitigate the funding risks. The assessment is clearer in the case of the option being triggered by predefined events. An example can be a refinancing failure trigger, where the bond is extended if it wouldn't be possible to get it refinanced in the market. In this case, the refinancing risk is specifically addressed and mitigated.

Secondly, if the option entails the possibility of extending the bond for as long as the term of the asset (loan) it is funding, it could under specific circumstances be considered stable funding since it could eliminate the residual maturity between the long-term asset and the shorter term bond, and thereby ensure funding of the asset for its entire term.

Overcollateralisation

To the extent that the pass-through financing structure is credit enhanced through overcollateralisation (OC), the institution will have to fund this OC through other sources of funding such as capital, deposits, or unsecured funding. This funding—as with any other—is assigned an ASF factor depending on its stability. Capital, deposits and long-term funding will provide the most stable funding in the NSFR. The required amount of stable funding for OC collateral depends on the quality of the collateral. If the OC collateral is of high credit and liquidity quality—such as Level 1 HQLAs—they will require less stable funding. However, the OC collateral will be encumbered for the term of the liability, similar to the cover assets.

OC exists for credit risk reasons and protects the bond holders in a bankruptcy event. The level of required OC is, therefore—among other things—dependent on the credit quality of the loans in the cover pool.

If OC assets are primarily funded by unsecured funding, it entails a funding risk when the degree of encumbrance in the balance sheet is high as there will be a smaller amount of unencumbered assets to pay unsecured creditors. For this reason, it can be difficult to roll over the unsecured funding in difficult times. This risk is reflected in the ASF factors of 0% and 50% for short-term funding. Further, the risk entailed in unsecured funding of OC assets depends on the credit risk of the assets—both the loans and OC assets—in the cover pool. If the assets are of high credit quality, there will be more assets left for unsecured creditors in the event of bankruptcy. Also, if the credit quality is high there is less risk of bankruptcy in the first place.

Figure 18 illustrates the balance sheet components for the pass-through structure as described above with issued bonds and loans as the main (and largest) components, as well as assets held

for OC and the funding hereof, typically representing only a small part of the balance sheet. The ASF and RSF factors for the main components—the pass-through bonds and loans—are as described in Table 24. The types of assets held for OC differ depending on national regulation and rating agencies' requirements, and thus the RSF factors for these assets also differ similarly. However, common for all assets is that if they are encumbered long term (more than one year) their RSF factor is 100%.

Figure 18: Balance sheet components and ASF/RSF factors for pass-through models

7.1.2 Match-funded mortgage lending

Match-funded mortgage lending can be seen as a special case of the general pass-through funding principle. The basic principle of match funding is still that there is a match between the cash flows of the asset being funded and the funding hereof, i.e. a loan and a bond issued to fund the loan. The payments on the loan match those payments made on the issued bond. This could be in the form of a 20-year loan with a 4% interest rate being funded by the issuance of a 20-year bond also with a 4% interest rate. If the loan is redeemed before the contractual maturity, then the bondholders will also get their money back at this time, rather than at the expected maturity date. In this example, it would be natural to describe the asset as being stably funded throughout its lifetime, as there is a clear match between the term of the asset and the liability, and one cannot be changed without changing the other. The Basel NSFR in general would also consider these assets as being fully stably funded until the terms of the asset and liability are below six months. Below this, there would be a higher RSF than ASF factor in the Basel NSFR.

For this type of match-funded mortgage lending structure, the loans are typically long term and amortised during their term; there will thus be no need or expectation to roll over the loan when it matures. The Basel NSFR principle of interdependent assets and liabilities could, therefore, be used for this type of structure, where national supervisors have discretion to adjust RSF and ASF factors to 0% where certain requirements are fulfilled.

Sequential match-funded mortgage lending

As for the general pass-through financing structure, it is not always the case that the term of the asset and the term of the liability in a match-funding structure are the same. For example, a 30-year loan could be financed by the issuance of a three-year bond. The loan will be match funded with respect to the running payments during the three years when the bond is issued, i.e. the cash flows on the asset and liability match during this three-year period. However, a new bond would have to be issued after the first three years, which may then again be under the match-funding principle—there will thus be a match for each sequential period. The principle of match funding in itself is not enough to ensure a perfect match of the term of assets and liabilities, and hence is not in itself a guarantee of a given asset being sufficiently stably funded. It must be supplemented by requirements regarding the term of the assets and liabilities.

7.2 The NSFR for pass-through financing models

As illustrated and explained above, the RSF factor always equals or exceeds the ASF factor for the pass-through structures described in this chapter, which means that the pass-through components of the balance sheet alone—issued bonds and loans—will result in a maximum NSFR level of 100%. However, if assuming a linear proportion of the liability continuously maturing, it would result in an NSFR lower than 100%, which is illustrated in a theoretical example in Annex 11. The example further illustrates that, in the case of a pass-through model where the term of the liability is shorter than the term of the asset, the NSFR will always be lower than 100%.

7.2.1 The QIS sample of pass-through banks

The QIS sample of pass-through banks consists of seven banks from France, Sweden and Denmark. See descriptions of the pass-through models in the respective countries in Chapter 8.4.

Table 25 shows the NSFR and shortfall of the pass-through sample as well as the non-compliant subset. For comparison, the table shows the NSFR and the shortfall for the aggregate sample rather than the one compliant pass-through bank. There is a relatively large shortfall for the pass-through banks, compared to both the aggregate sample and the shortfall within many of the other business model categories (see Table 6 in Chapter 3).

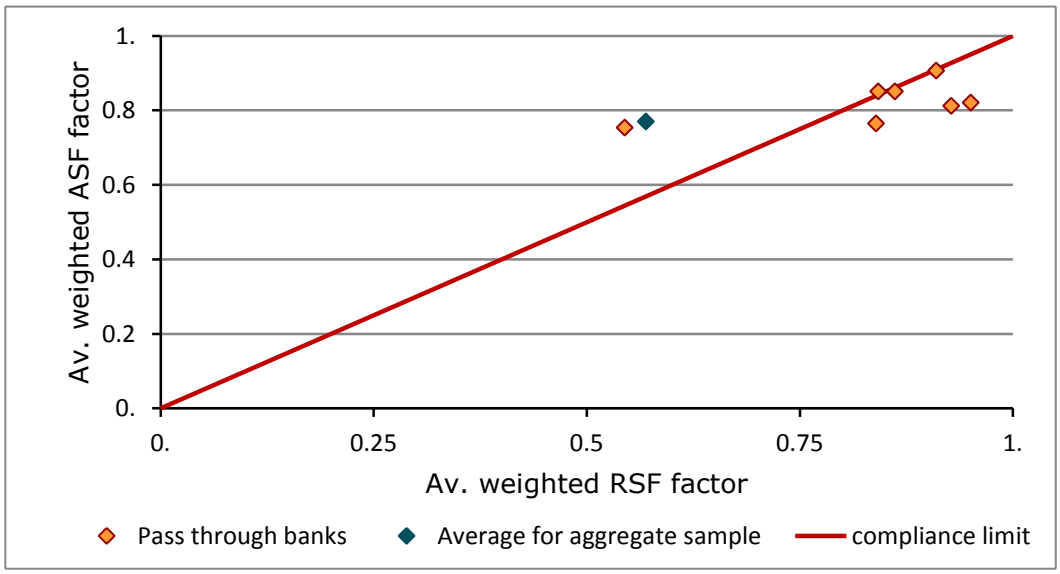
Table 25: The NSFR and the shortfall

		NSFR			NSFR shortfall			Compliance
	Num.	Avg.	Min.	Max.	Abs. shortfall (bn EUR)	Relative to total stable funding (%)	Relative to total assets (%)	Fraction of compliant banks (%)
Pass-through	7	93.7	86.3	142.1	33	8.6	7.2	14.3
Non-compliant	6	90.0	86.3	99.6	33	9.2	7.4	
Aggregate sample	279	103.6	18.5	435.5	595	3.5	1.9	

Only one bank in the pass-through sample is compliant with the Basel NSFR as of December 2014. The funding structure of this one compliant bank differs substantially from the rest of the pass-through sample, as its funding is primarily unsecured in contrast to the non-compliant banks, which are primarily funded by covered bonds. This difference is what distinguishes compliant and non-compliant pass-through banks.

Many of the non-compliant banks are not far from compliance, as their NSFR levels are in the range of 86.3% to 99.6%. This is further illustrated in Figure 19, where each bank is plotted by its average ASF and RSF factors.[37] If the average ASF factor is below the average RSF factor, the bank has an NSFR level below 100% and appears below the red line in the figure.

Figure 19: Pass-through banks (decomposed by ASF and RSF)



[37] The average ASF factor equals weighted ASF divided by unweighted ASF. Similarly, the average RSF factor equals weighted RSF divided by unweighted RSF.

For comparison, the average weighted ASF and RSF factors for the aggregate QIS sample are plotted in Figure 19 as well. The figure illustrates that the non-compliant pass-through banks have higher or identical average weighted ASF factors compared to both the average of the aggregate sample and the one compliant pass-through bank. Thus, when looking at the funding side, the Basel NSFR considers the funding profiles of these non-compliant banks to be at least as stable as the one compliant pass-through bank and the average of the aggregate sample. This is because the non-compliant pass-through banks have a large share of long-term funding, which is assigned a 100% ASF factor. On average, 80% (median 81%) of a non-compliant bank's funding is long-term (> 1 year), which is a large share compared to the aggregate QIS sample, where long-term funding on average constitutes 34% (median 28%) of the total funding.[38]

As illustrated in Figure 19, the non-compliant pass-through banks differ, particularly on the asset side as the levels of the average RSF factors for them are significantly higher than for the one compliant pass-through bank and for the average of the aggregate sample. This is mainly due to the large share of long-term encumbered assets (average 51%) assigned an RSF factor of 100% and occurs because of the large share of secured funding (average 77%), which is mainly formed of covered bond issuances.

7.3 Adjustment needs

Based on the QIS data and the above assessment of the NSFR for pass-through structures, it must be expected that banks with the pass-through funding structure must, to some extent, perform adjustments to their balance sheet in order to become compliant with the NSFR as defined by the Basel Committee.

The pass-through banks are typically limited in their use of funding sources. They are not permitted to take deposits and the typical pass-through business model (represented in the QIS sample) entails issuing covered bonds to provide financing (exclusively) for residential lending. In some countries, these limitations are enforced by national legislation (described in the country descriptions in Chapter 7.4). This funding structure entails that the majority of the assets are encumbered, which means that there are very narrow possibilities of adjusting the composition of the asset side to improve the NSFR. Further, a large part of their funding is already long term and thus considered stable in the Basel NSFR. For these reasons, it is expected that the pass-through banks would, to a large extent, obtain additional new funding or capital to cover the NSFR shortfall (and further ensure an adequate buffer above a 100% regulatory limit) in order to maintain their current business model. This could entail some institutions potentially being required to obtain more capital than required by solvency requirements or to obtain funding that they are by law not permitted to fund loans with.

[38] However, when looking at the aggregate sample, deposits are generally a significant funding source. The pass-through banks in this sample are not permitted to take deposits.

On average, each non-compliant pass-through bank in the QIS sample has an NSFR shortfall of EUR 5.5 billion, which is, on average, equivalent to 6%[39] of each bank's balance sheet. In comparison, the average share of capital among the non-compliant pass-through banks is 4% of each bank's balance sheet.

Given the limited strategies available for the non-compliant pass-through banks to cover their NSFR shortfall, it is expected that the funding costs for these banks will increase significantly. This could, in the end, affect the price of residential financing for the end costumers of these pass-through banks.

7.4 Case examples: country-specific descriptions of pass-through financing models

In addition to the general description of pass-through funding and the match-funding principle, some examples of pass-through structures in specific countries are given below.

7.4.1 The French pass-through model

Pass-through banks in France are vehicles used by banking groups to issue covered bonds. In 1985, Caisse de Refinancement de l'Habitat (CRH), a specialised vehicle for these refinancing operations, was created to fund home loans on the French credit market. The bank serves as an intermediary between bondholders and French credit institutions.

To be eligible for a CRH refinancing scheme, a credit institution must become a shareholder of CRH. Every shareholder commits to supplying regulatory capital if required and grants an off-balance-sheet back-up liquidity line to CRH. In 2015, the main shareholders of CRH are the five largest French banking groups.

CRH issues bonds guaranteed by residential home loans granted by banks. These loans are either mortgages or home loans guaranteed by a regulated third financial institution ('prêts cautionnés'). The amount borrowed by CRH is lent to the credit institution that provided the home loans as a guarantee. Each issued bond must be at least over-collateralised by 25%. In case of default of the borrowing credit institution, CRH becomes the full owner of the pool of loans without any formality.

One particularity of CRH is that it does not take any commission or margin in the deal with credit institutions. The loans granted to banks have the same characteristics, in terms of rate and maturity, as the issued bonds. The balance sheet of CRH thus does not create a maturity

[39] This is a simple average of each bank's shortfall.

mismatch between assets and liabilities and acts as a complete pass-through between investors and credit institutions. CRH only bears credit and operational risks.[40]

Home loans remain on the borrowing credit institution balance sheet and are only transferred to CRH in case of default. As a consequence, CRH assets are mainly constituted of loans to banks; meanwhile, CRH liabilities are mainly constituted of equity and issued covered bonds. The institution is not allowed to accept deposits as a funding source.

Apart from CRH, some French banking groups also tend to create their own subsidiaries to issue covered bonds. These bonds are mainly collateralised by residential home loans or, to a lesser extent, by claims issued or guaranteed by sovereigns.

As for the CRH case, these subsidiaries only serve as funding vehicles for their parents and do not create a maturity mismatch between their assets and liabilities. Most of the time, the pool of loans that serve as collateral remain on the parent's balance sheet. The subsidiary's balance sheet is thus mainly composed of loans to its parent bank on the asset side, covered bonds on the liability side, and off-balance-sheet guarantees received. Risk management and operational tasks performed by these subsidiaries remain mostly under the full control and responsibility of the parent bank.

Some regulatory restrictions apply on the quality of the pool of loans. In French regulation, the main constraints are related to the geographical location of real-estate exposures and the valuation methods used to calculate the value of the property. Recently, Article 129 of the CRR added a set of constraints on home loans guaranteed by a regulated third financial institution. CRR notably requires that retail borrowers respect a limit of 33% of loan-to-income ratio (i.e. payment of interest and principal cannot exceed 33% of borrowers' income). In practice, most subsidiaries go beyond regulatory requirements in terms of the quality of the pool of loans, since rating agencies require more stringent criteria to grant their highest rating notch to covered bond issuances.

7.4.2 Swedish institution classified as pass-through financing

One Swedish credit institution is classified with a pass-through financing business model. This credit institution can be seen as a financing vehicle for Swedish regional governments that are members of the institution.

The business model of the institution is to provide the regional governments with cheaper funding if they can coordinate their issuance through one actor, rather than going to the market one by one. Consequently, all lending provided by this institution is to its members or companies owned by its members. Because financing is raised to support the borrowing needs of the institution's members, it has been classified as a pass-through financing model.

[40] However, a default from a credit institution could create a maturity mismatch in CRH's balance sheet as it would become the owner of the pool of guaranteed loans.

The main finance source is short- and long-term senior debt. It does not take deposits or issue covered bonds. The financing strategy of the company says that it should try to match the term of its assets and liabilities, but this is not a requirement. In contrast to other pass-through financing business models, cash flows are not directly passed on to the borrowers.

As a consequence, it has a AAA-rating and in the market it is seen as belonging to the 'sovereign, supranational and agency' issuer segment.

One comparable actor is, for example, Kommunekredit in Denmark.

7.4.3 The Danish mortgage model

In Denmark, almost all covered bonds are issued through mortgage credit institutions, which, in terms of regulation, differ from Danish commercial banks in substantial respects (the latter are similar to the common European universal banking model). The following specifies selected features of the regulation of Danish mortgage credit institutions.

Danish mortgage credit institutions are specialised lenders restricted by regulation to conduct only narrowly defined mortgage credit activities. A special Mortgage Credit Act, which contains the special regulation of the mortgage credit product, applies to mortgage credit institutions supplementary to the regulation covering all Danish credit institutions according to the Financial Business Act and the CRR.

The scope of the business of mortgage credit institutions is limited to lending against mortgages, where the funding originates exclusively from the issuance of covered bonds. Thus, Danish mortgage credit institutions cannot fund their lending in any other way. It is stated in the Danish Financial Business Act[41] that credit institutions granting loans against mortgages funded by issuing covered bonds require a licence from the Danish Financial Supervisory Authority as a mortgage credit institution. Further, mortgage credit institutions can only perform narrowly defined mortgage-credit activities according to the Financial Business Act.[42]

The regulation of mortgage credit institutions has been drawn up with the prime consideration being the security of bond holders.

One of the most fundamental differences from other commercial banks is that the mortgage credit institutions are not authorised to accept deposits as a funding instrument. Being a non-deposit taking credit institution guards against some of the most obvious liquidity risks, as a deposit-driven 'run' on such an institution would be impossible.

The Danish mortgage credit system works under a so-called 'balance principle'. In Danish mortgage banks, the loans are matched directly to specific covered bonds in a way that means the bonds funding a given loan are perfectly known. This enables a borrower to buy the

[41] Section 8 of the Financial Business Act.

[42] Annex 3 of the Financial Business Act.

corresponding bonds (at market value or—if such an option exists—by buying back the covered bonds at par) behind the loan and deliver these to the mortgage bank and thus terminate or prepay the loan. Even though at a given point in time there is a direct link or match between a given loan and the corresponding bonds, this is not always the case in terms of maturity. A 30-year loan can, for example, be funded with one-year bonds where the corresponding bond is, after one year, refinanced and substituted with another bond directly connected or matched to the loan for the next year, and so on for up to 30 years. The refinancing risk in this case is addressed with a recent amendment in the Danish legislation, as explained below. For some types of loans though, a bond is issued matching the payment profile of the loan for the entire loan period, e.g. 30 years. Thus, a 30-year covered bond is issued, and the payments of the borrower are matched to the payments on the bond throughout the entire 30-year loan period. The 'balance principle', as explained above, results in a high degree of interest rate matching (the loan taker bears the interest rate risk), duration/liquidity matching, and currency matching.

In addition to the very narrow legal scope of activity for mortgage credit institutions, a detailed regulation that effectively limits their ability to take market risk exposures applies. Additionally, credit risk exposure is limited by LTV requirements (loan-to-value) and by detailed valuation principles for the different types of real estate.

Furthermore, the activity of the mortgage institution is performed through so-called capital centres within the institution. This secures the bankruptcy remoteness of the issued covered bonds, and the ratings by rating agencies apply for the different individual capital centres that are individually examined.

In 2014, new Danish covered bond legislation was implemented to address the refinancing risk for Danish mortgage banks when the term of the underlying loan is longer than the maturity of the bond used to fund it. The legislation introduces two types of trigger for Danish mortgage bonds. First, there is a refinancing trigger offset by a failed refinancing auction. Thus, if a mortgage bank is unable to sell bonds at refinancing, the maturity of the maturing bonds will be extended by 12 months. The bonds can be extended for 12 months at a time until the underlying loan matures or the mortgage bank is able to refinance in the market again. Second, there is an interest rate trigger offset by an expected increase in yield to maturity. Thus, if the issuing mortgage bank expects the yield-to-maturity (YTM) at refinancing to increase by more than 500 basis points compared with the previous refinancing, the maturity of the bond will be extended by 12 months.[43]

The new covered bond legislation has ensured clarity and transparency over what will happen in an extreme event where a mortgage bank is unable to complete the refinancing by sale of bonds on market terms, or if interest rates suddenly increase sharply. Further, with the introduction of

[43] In both cases, the yield of the maturity-extended bond will be as an equivalent bond traded 11-14 months earlier (or the yield of the bond at the previous succeeded refinancing auction for bonds with an initial maturity of one year) plus 5 percentage points in the first year it is extended. If the maturity of the bond is extended again, the yield remains unchanged. The increased yield on the bond is passed through to the loan taker and the mortgage bank does not experience an increase in funding costs.

the new covered bond legislation, funding of the underlying assets is, by law, ensured for the entire term, either by ordinary refinancing auctions or by maturity extension of the existing covered bonds. Under these legal safeguards, the bonds are behaviourally long term from a funding perspective as the legislation stipulates an automatic rollover during one year if the market does not refinance them.

7.5 Conclusion

This chapter assesses the funding risks of pass-through models, including a special case: match-funded mortgage lending. An important factor in this assessment is whether or not there is a maturity match between assets and liabilities.

In pass-through models where the assets (loans) and liabilities (bonds) have matched maturities, the funding risks are reduced as the assets are stably funded throughout their lifetime. Especially in the case of match-funded mortgage lending where the bond and the loan have equal maturities, are typically long term and amortized throughout the term of the loan, the funding risks are deemed to be absent. In this case, the Basel principle on interdependent assets and liabilities (§45) could be applied.

In pass-through models where the maturity of the pass-through bond is not matched with that of the loans, there exists a residual funding risk that results from this difference in maturities (a similar risk emerges in all funding structures that are imperfectly matched). In some cases, the existence of an extendable maturity trigger on the pass-through bond may be deemed to mitigate this funding risk.

With the applicable ASF and RSF factors in the Basel NSFR, the pass-through financing models—with a balance sheet structure of mainly bonds and encumbered assets—will obtain an NSFR level of maximum (and often below) 100%. Adjusting towards compliance would be very difficult and entail increasing the level of capital significantly in order to meet the NSFR requirement even in cases where such capital levels are not necessary in light of other risks and capital requirements.

8. Proportionality in the context of the NSFR

The analysis of externalities reveals that the benefits of regulating banks' funding stability would be expected to differ for different types of banks, since the intensities of externalities vary from bank to bank. But absolute size (in EUR) is not the only relevant consideration when determining the severity of externalities. Furthermore, the aggregated impact of fragilities in the funding structures of smaller banks could have a very large magnitude and should not be underestimated.

Impact analysis reveals that the relative or absolute size of banks does not seem to be correlated with compliance in the sample. The report shows that there does not seem to be evidence that the impact on lending activity derived from the introduction of NSFR requirements would be different among different categories of banks and particularly among banks of different sizes.

Although, on average, the NSFR of smaller banks tends to have been more volatile during the period considered than in other banks, the volatility analysis conducted does not show a clear relationship between the size and the variation of the NSFR, possibly due to the small size of the consistent sample used and the absence of quarterly data.

8.1 Externalities analysis

The externalities motivating the introduction of the NSFR are explained in Chapter 1 of this report. These externalities—the costs from funding instability that banks do not take into account when choosing the structure of their funding—arise because of interconnectedness, because of the potential impact from fire sales of collateral, and because of expectations of public support (e.g. from central banks and governments). These expectations of public support are themselves driven by the consequences that the failure of parts of the financial system would have on other sectors of the economy. It is to avoid these consequences that public intervention would (justifiably) take place.

The intensity with which these externalities prevail is unlikely to be the same for all banks. Some types of banks are more likely to present high levels of interconnectedness, as defined in Chapter 1—both in a transactional and an informational sense. Banks using large amounts of collateral, if they fail, would have a large impact on prices in financial markets. Indeed, price impact increases with the amounts sold.

But this does not imply that absolute size, considered in isolation, would be the right criterion for measuring the intensity of these externalities. More refined metrics could be developed to capture the importance of banks in their economy (proxying expectations of public support), their level of interconnectedness (and thus their importance to their financial system), and the amounts of collateral and securities that they hold (to capture their impact on markets and the risk of fire sales).

For instance, size in absolute terms would not necessarily capture the importance of banks at the local level, if they have interconnections that are locally crucial or if they provide funding to other sectors locally, in a manner that would be severely disrupted should they fail. Hence, size considerations should be put into perspective and size should not be considered a perfect measure of importance.

Finally, there is merit to monitoring maturity transformation in a collection of small entities. Indeed, should they simultaneously encounter difficulties with refinancing their liabilities, they would pose challenges certainly no smaller in magnitude than a large, important and interconnected bank. This risk has been nicknamed 'too-many-to-fail' in the academic literature on banking regulation.[44]

Thus, the benefits of regulating banks' funding stability would be expected to differ, as the intensity of externalities varies from bank to bank.

8.2 Descriptive analysis

Three measures of size have been used to cluster banks by size in the models:

- The absolute size, measured by total assets.
- The relative size of the bank compared to the GDP of the country where it is based,[45] measured by the ratio of a bank's total assets over its domestic GDP. Because large banks report at the global consolidated level in our sample, the importance of some banks relative to domestic GDP could be overestimated.

[44] Cf. Farhi and Tirole (2012) 'Maturity Mismatch and Bailouts,' *American Economic Review*, Vol. 102, No 1, pp. 60-93, and Acharya and Yorulmazer (2007) 'Too Many to Fail—an analysis of time-inconsistency in bank closure policies,' *Journal of Financial Intermediation*, Vol. 16, No 1, pp. 1-31.

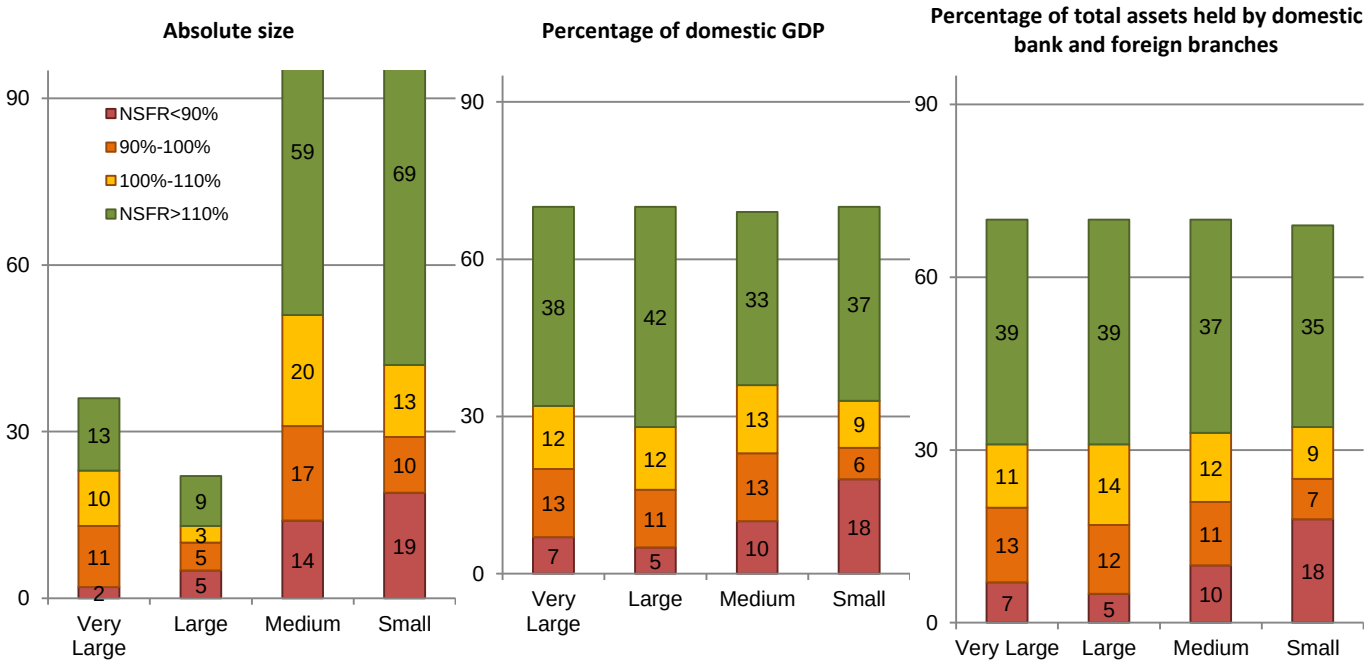
[45] Domestic GDP amounts have been taken from Eurostat: http://ec.europa.eu/eurostat/statistics-explained/index.php/File:GDP_at_current_market_prices,_2003%E2%80%9304_and_2012%E2%80%9314_YB15.png

- The relative size of the bank compared to the total domestic assets held by banks and foreign branches of the country where it is based.[46] Here, again, the relative size of some large banks could be overestimated.

The two relative size measures have been added to the analysis to reflect the relative heterogeneity of the European banking sector in the EU in terms of size. In smaller jurisdictions, some banks that would be classified as small in terms of absolute size are relatively significant as they represent a large share of the economy or hold a large share of domestic assets.

Figure 20 shows the results of the analysis. There does not seem to be a strong correlation in the sample between the size of the firm (absolute or relative) and compliance with the Basel NSFR ratio.

Figure 20: Range of compliance according to various measures of size



The absolute thresholds used to define the absolute size buckets are EUR 200 billion, EUR 100 billion, and EUR 10 billion. For the two measures of relative size, the threshold for defining the category has been set by calculating the ratio for each firm and dividing the sample into four equal segments.

[46] The calculation uses the consolidated data provided by the ECB on credit institutions: https://www.ecb.europa.eu/stats/money/consolidated/html/index.en.html

	Absolute size			% of domestic GDP			% of total assets held by domestic bank and foreign branches		
	Threshold (bn EUR)	*Number of banks*	*Average NSFR*	*Threshold (%)*	*Number of banks*	*Average NSFR*	*Threshold (%)*	*Number of banks*	*Average NSFR*
Small	10	111	103%	0.43	70	104%	0.19	70	104%
Medium	100	110	98%	2.85	70	112%	1.66	70	112%
Large	200	22	109%	13.7	69	101%	10.23	70	101%
Very large	-	36	116%	-	70	109%	-	69	106%

8.3 Adjustment to compliance by bank size: simulation results

In Chapter 5, we ran a simulation methodology to assess how non-compliant banks are likely to adjust their balance sheets following the introduction of an NSFR. In this section, we applied the same methodology to banks grouped according to either their absolute size or their relative size.

Before presenting the results of our analysis, we need to emphasise that the econometric assumptions for running the simulation by size or relative size may not be satisfied, given the heterogeneity of the sample of banks. Indeed, the simulation methodology described in Chapter 5 rests on a key identifying assumption, which is that non-compliant banks will migrate their balance sheet structure towards that of compliant banks. While this assumption is perhaps justified when looking at a set of banks with the same business model (provided they are sufficiently homogenous), it is less compelling when looking at a bucket of banks of a similar size. We do not necessarily see strong reasons why non-compliant banks of a certain size would try to emulate the balance sheet structure of compliant banks of a similar size. They could belong to very different business models, undermining the logic behind the simulation exercise.

The general conclusion of the analysis by size is that we do not observe noteworthy differences in our simulations between the ways in which banks in various size buckets may adjust. These results hold regardless of whether banks are bucketed by absolute size, by size relative to their domestic banking sector, or by size relative to their domestic GDP.

Other than that, we forecast the same decrease in short-term liabilities and long-term encumbrance.

Annexes 8, 9 and 10 contain the summary results of our simulations by size.

8.4 Bank size and impact on lending: regression analysis

In Chapter 5, we also assessed the impact of the NSFR on lending using a regression analysis. The analysis estimated the potential relation between the NSFR shortfall adjustment and lending. In

this section, we assess whether this relation might differ between banks depending on their size. Table 26 shows the regression results of our main model when applied to each size subsample separately. These models test whether the relationship between lending and NSFR compliance differs between banks of different sizes.

Each column in Table 26 reports estimation with a different subsample. Overall, the relationship between the NSFR and lending is not significant in most cases and does not differ between size groups. We only observe one significant coefficient for large banks (column 2); for these banks, the regression indicates that an increase in the NSFR shortfall is positively correlated with an increase in lending. This correlation is, however, fragile for the following reasons. First, the regression is only based on 27 observations in this group, too small a number of observations from which to draw conclusions. Secondly, after removing only one observation (the one with the highest value for change in total lending), the coefficient becomes non-significant in column (3). This suggests that this result is driven by outliers. Finally, when we run the same analysis on lending as defined in the NSFR template, the coefficient becomes negative and no longer significant as well.

Thus, there is overall no robust evidence that banks of different sizes are more or less likely to reduce lending in order to meet the NSFR requirements.

Table 26: **Change in total lending to the real sector by size subsamples**

This table shows regression coefficients of the change in lending to the real sector for subsamples of banks on the change in the NSFR shortfall (the variable of interest). Standard errors are reported in parentheses. '*' denotes statistical significance at 10%.

	(1)	(2)	(3)	(4)	(5)
	Very large banks subsample	Large banks subsample	Large banks subsample (w/o outlier)	Medium banks subsample	Small banks subsample
Change in the NSFR shortfall	0.092	0.190*	0.186	0.007	-0.006
	(0.174)	(0.103)	(0.115)	(0.088)	(0.032)
Constant	-0.008	-0.012	-0.018**	-0.003	-0.011
	(0.006)	(0.009)	(0.007)	(0.005)	(0.008)
Observations	56	27	26	112	78
R-squared	0.003	0.042	0.065	0.000	0.000
Prob. > F	0.599	0.0761	0.121	0.932	0.841

8.5 Volatility of the NSFR

8.5.1 Objective of the analysis

The reporting frequency should ideally be linked with the volatility of the monitored data. If the data requiring monitoring is more volatile, a higher reporting frequency may be appropriate to

capture significant changes that may impact a bank's compliance. Conversely, the reporting frequency of more stable data items can, in theory, be reduced. As more frequent reporting is expected to be more burdensome for small banks than for larger ones due to the existence of fixed costs, imposing lower reporting frequencies for them may be more proportionate.

Consequently, the analysis looks at the changes in the NSFR and tries to determine whether small banks tend to display higher or lower volatility compared to other banks. A lower volatility might argue for a relaxing of the NSFR frequency of the reporting for small banks.

However, the frequency of the reporting should also depend on the riskiness of a given data item. To examine this point, this analysis first looks at the overall semi-annual NSFR variations over the period December 2011-December 2014, before focusing on negative variations of the NSFR, which are of greater concern from a supervisory point of view.

8.5.2 Sample

Two different samples have been used in the analysis. The first sample includes only those institutions that have been reporting NSFR data consistently since June 2011. The second sample is broader. It includes all the institutions that reported in both June and December 2014.

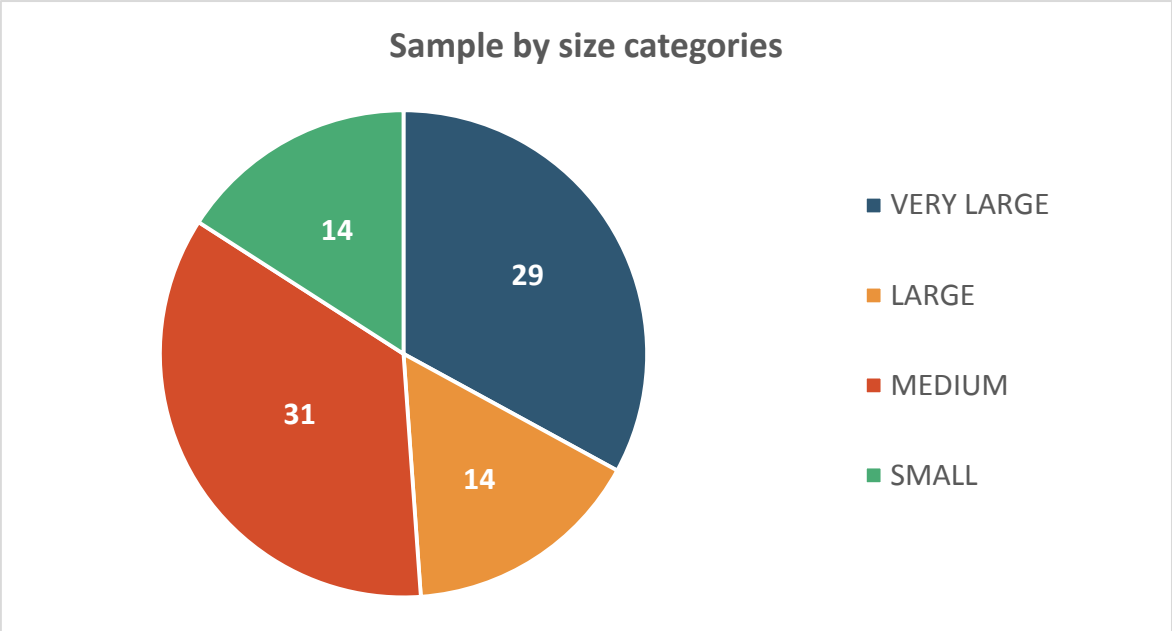
a. Consistent sample

The consistent sample includes the 88 EU institutions that have participated in all NSFR QIS exercises since June 2011.

For the purpose of the analysis, four groups have been identified based on their total assets as of June 2011. It has been assumed that 'Very large banks' are institutions with total assets above EUR 200 billion. 'Large banks' are the ones with total assets between EUR 100 and 200 billion. 'Medium banks' are institutions with total assets between EUR 10 and 100 billion. Other institutions (with total assets below EUR 10 billion) correspond to 'Small banks'. It should be noted that these thresholds are based on expert judgement and are the same as the ones used in other sections of the NSFR Impact Assessment report.

Based on the above-mentioned definitions, the consistent sample comprises 14 small banks, 31 medium banks, 14 large banks, and 14 very large banks (Figure 21).

Figure 21: Composition of the consistent sample

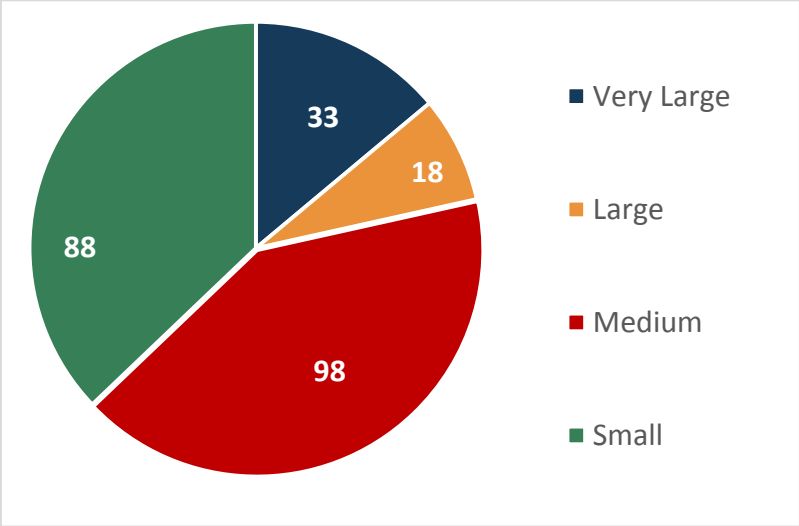


Source: EBA QIS (December 2014)

b. Broad sample

The broad sample includes all the institutions that reported data in June and December 2014. It comprises 237 institutions, including 88 small banks (Figure 22).

Figure 22: Composition of the broad sample



Source: EBA QIS (December 2014)

8.5.3 Methodology and caveats

- The methodology relies on descriptive statistics.
- The period covers June 2011 to December 2014. Significant changes to the calibration of the NSFR were made in December 2013. This change creates a significant shift in the data, and therefore the variation of the NSFR at this reporting date should be interpreted with care, as variations in this period are probably mostly driven by the calibration changes.
- The analysis examines the semi-annual changes in the NSFR ratio (i.e. the percentage point increase or decrease of the NSFR compared with the previous semester). In the absence of quarterly data, semi-annual data were used for assessing the variation of the NSFR over time. However, it should be noted that the current frequency of the NSFR reporting is quarterly.
- The analysis covers both the absolute and the negative variation of the NSFR:
    - The absolute variation takes into account the positive and negative variation of the NSFR and provides a view of the global volatility of the NSFR. It also permits offsetting the impact of negative numbers when calculating aggregated figures.
    - The negative variation analysis only looks at the changes that affect the NSFR negatively (decrease of the NSFR).

8.5.4 Key findings

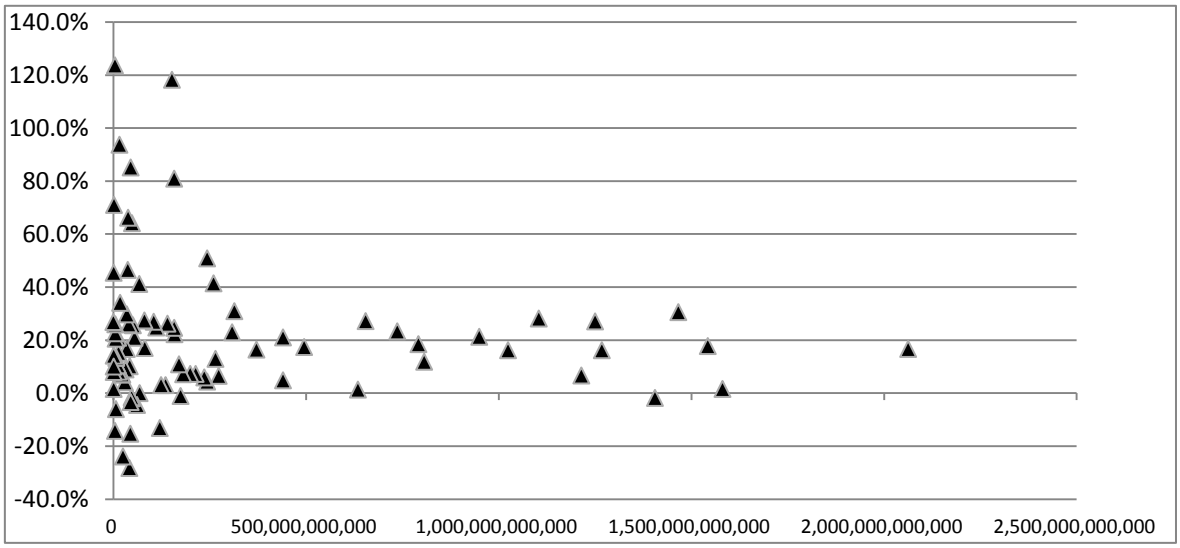
- The analysis does not show a clear relationship between the size and the variation of the NSFR when looking at both the consistent and the broad sample.
- On average, compared to other banks, the NSFR of small banks tends to have been more volatile during the period considered. In particular, in the last semester (December 2014) small banks appear to have been more prone to experiencing higher negative variation of the NSFR compared to the rest of the sample.
- However, these results should be interpreted with care given the small size of the consistent sample and in the absence of quarterly data.

8.5.5 Detailed results

c. Correlation between the size and variation of the NSFR

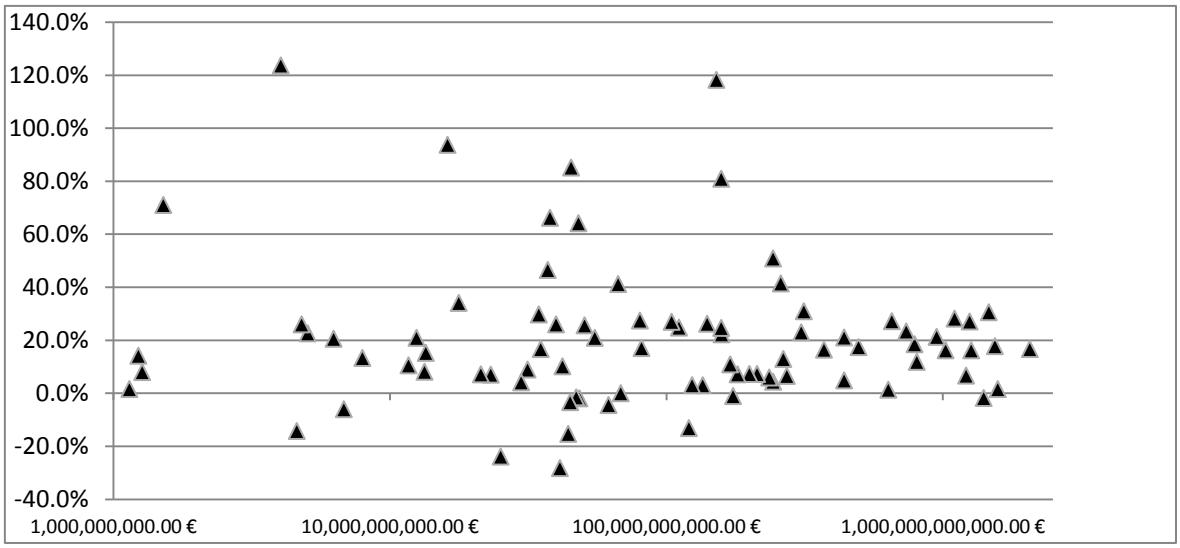
Figure 23 and Figure 24 show no significant correlation between the size of the institutions included in the sample and the change in the NSFR between June 2011 and December 2014. Regardless of size, for most of the institutions the variation of the NSFR ranges between -20% and 40%. Data also show that there are outliers (i.e. institutions with an NSFR variation above 60% and below -20%) in all the size categories considered.

Figure 23: Correlation between size and the change in the NSFR in December 2014 compared to June 2011 (arithmetic scale, consistent sample)



Source: EBA QIS (December 2014)

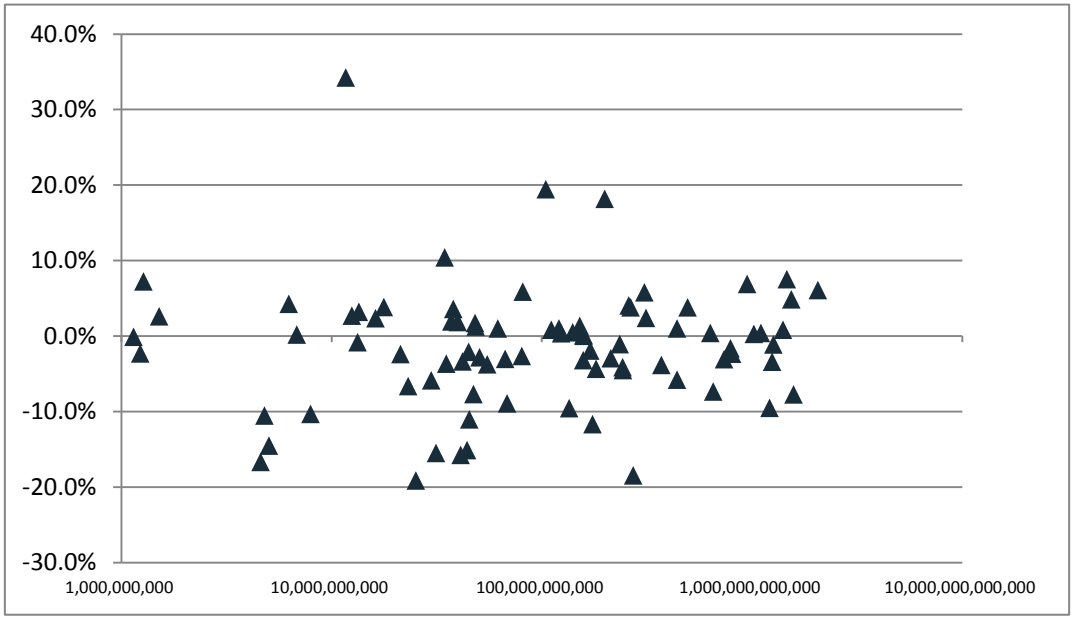
Figure 24: Correlation between size and the change in the NSFR in December 2014 compared to December 2012 (logarithmic scale, consistent sample)



Source: EBA QIS (December 2014)

Figure 25 also shows no significant correlation between size and the change in the NSFR between June 2014 and December 2014. Regardless of the size, for most of the institutions included in the sample the variation of the NSFR ranges between less than -10% and 10%. Similarly, there are outliers (i.e. institutions with an NSFR variation above 10% and below -10%) in all the size categories except the very large bank category.

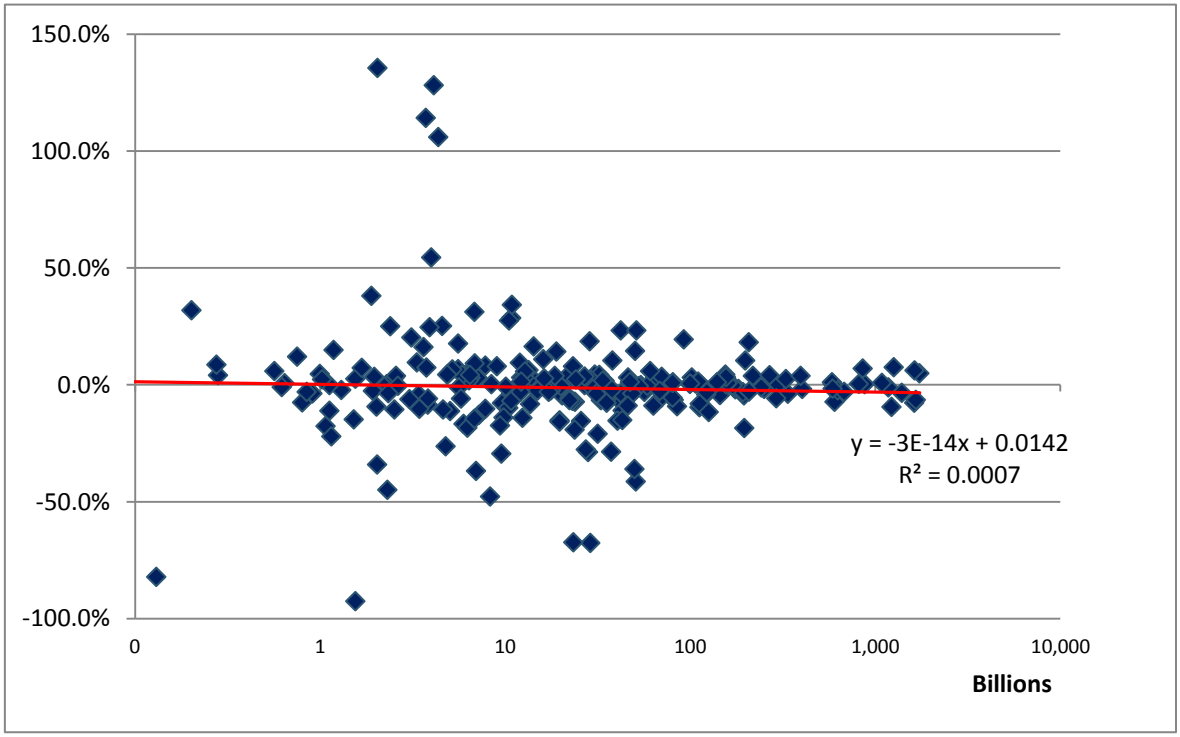
Figure 25: Correlation between size and the change in the NSFR in December 2014 compared to June 2014 (logarithmic scale, consistent sample)



Source: EBA QIS (December 2014)

Similar results are observed on the broad sample. There is no relationship between the size of the institutions and the change in the NSFR between June and December 2014. Data, however, show that all the big outliers (i.e. institutions with an NSFR variation above 50% and below -50%) are small banks (Figure 26).

Figure 26: Correlation between size and the change in the NSFR in December 2014 compared to June 2014 (logarithmic scale, broad sample)



Source: EBA QIS (December 2014)

d. Variation of the NSFR

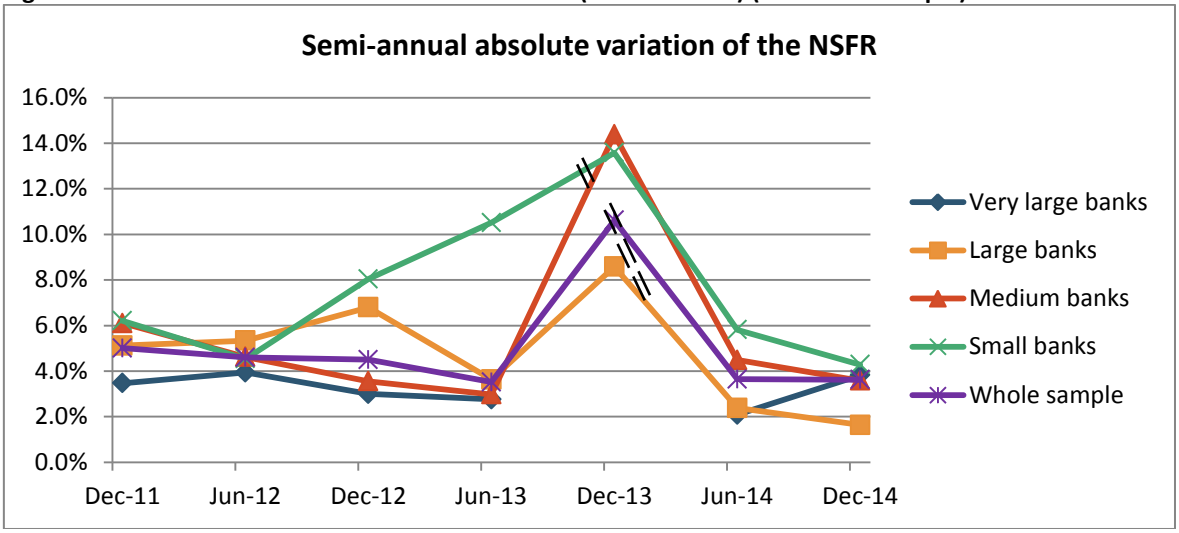
The present analysis looks at the median value of the variation of the NSFR for each group. Looking at the median value makes it possible to consider the variations in the NSFR without focusing on the outlier banks, with a smoothing of the variations over the period considered. For a more detailed presentation of the results within and across each size category, please refer to Annex 12.

ABSOLUTE VARIATION

As for the use of an absolute variation (regardless of its direction, positive or negative), it provides a view of the global volatility of the NSFR and makes it possible to offset the impact of negative numbers when calculating aggregated figures.

The median value shows that, considering the half-year variation, small banks tend to present the highest level of absolute variation for most of the considered observation date. However, the variation differential (the difference between the variation rate of the small banks and the variation rate of other groups) is quite low on average (Figure 27).

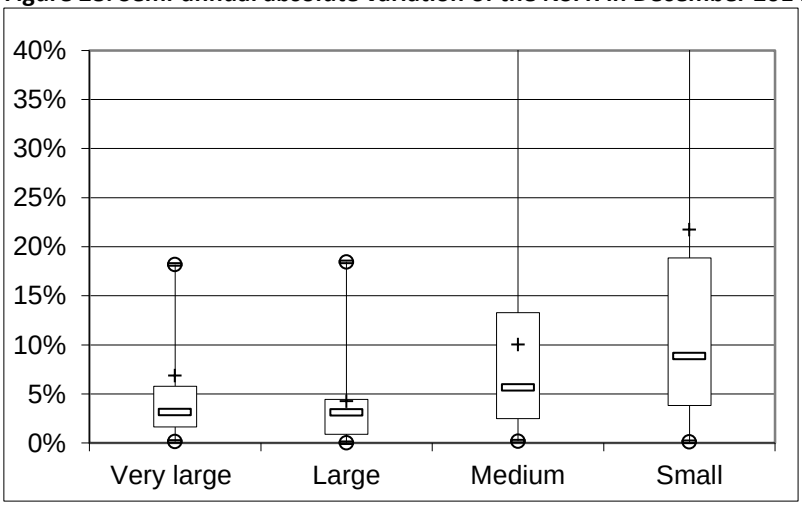
Figure 27: The NSFR semi-annual absolute variation (median value) (consistent sample)*



* Due to significant changes in the calculation of the NSFR in December 2013, the variation of the NSFR at this reporting date is probably driven entirely by changes in the calibration of the NSFR at this date. This date has been disregarded in the analysis.

The analysis of the broad sample also shows that the volatility of the NSFR (in December 2014 compared to June 2014) has been significantly higher for small banks. Indeed, the absolute variation of the NSFR was above 10% for half of the small banks included in the sample, while this figure (i.e. the median) is below 5% for the larger banks. In addition, the variation of the NSFR was above 20% for 25% of the small banks (i.e. third quartile), while none of the larger banks displayed an NSFR variation above 20% (Figure 28).

Figure 28: Semi-annual absolute variation of the NSFR in December 2014 (broad sample)



Source: EBA QIS (December 2014)

NEGATIVE VARIATION

From a supervisory perspective, positive changes in the NSFR do not raise the same possible concerns as negative changes. This section only focuses on negative variation of the NSFR (i.e. decrease in the NSFR in the period is considered).

OCCURRENCE OF THE NEGATIVE VARIATION

Table 27 shows that negative observations have been more common for small and medium banks over the period considered (December 2011 to December 2014). On average, more that 50% of the small and medium banks had experienced at least one decrease of their NSFR compared with the previous semester.

Table 27: Number of banks for which the NSFR decreased compared with the previous semester (consistent sample)

	Dec-11		Jun-12		Dec-12		Jun-13	
	Number	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
Very large banks	6	21%	10	34%	9	31%	13	45%
Large banks	5	36%	5	36%	5	36%	5	36%
Medium banks	13	42%	9	29%	18	58%	12	39%
Small banks	5	36%	9	64%	5	36%	8	57%
Whole sample	29	33%	33	38%	37	42%	38	43%

	Jun-14		Dec-14		**Average % (Dec-11 / Dec-14)**
	Number	**%**	**Number**	**%**	
Very large banks	11	38%	15	52%	34%
Large banks	8	57%	5	36%	38%
Medium banks	20	65%	18	58%	43%
Small banks	7	50%	7	50%	43%
Whole sample	46	52%	45	51%	39%

* Due to significant changes in the calculation of the NSFR in December 2013, the variations of the NSFR at this reporting date are not reported here. Indeed, between June and December 2013, variations in the NSFR are probably driven entirely by changes in the calibration of the NSFR.

Source: EBA QIS (December 2014)

However, when looking at the broad sample, the data does not show a higher occurrence of negative variation for small banks in December 2014 compared to June 2014 (Table 28).

Table 28: Number of banks for which the NSFR decreased in December 2014 compared with the previous semester (consistent sample)

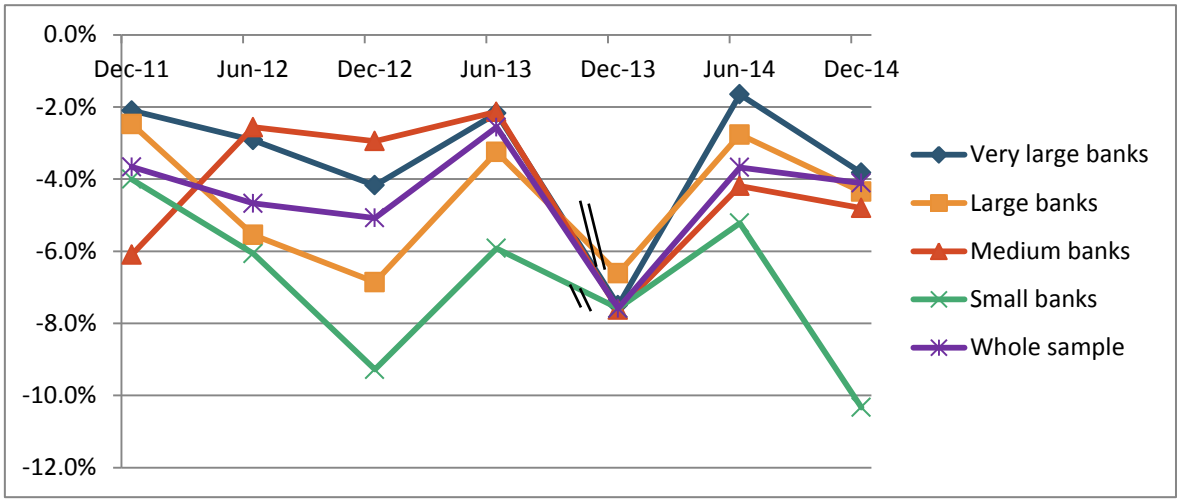
	Number of banks	% of banks
Very large	17	52%
Large	9	50%
Medium	55	56%
Small	42	48%
Whole	123	52%

Source: EBA QIS (December 2014)

Value of the negative variation

Looking at the median value of the negative variation of the NSFR compared to the previous semester, it appears that the negative variation of the NSFR is the highest compared with other groups. In particular, in December 2014, on average, the NSFR decreased more significantly for small banks (-10%) than for other groups (4%) (Figure 29).

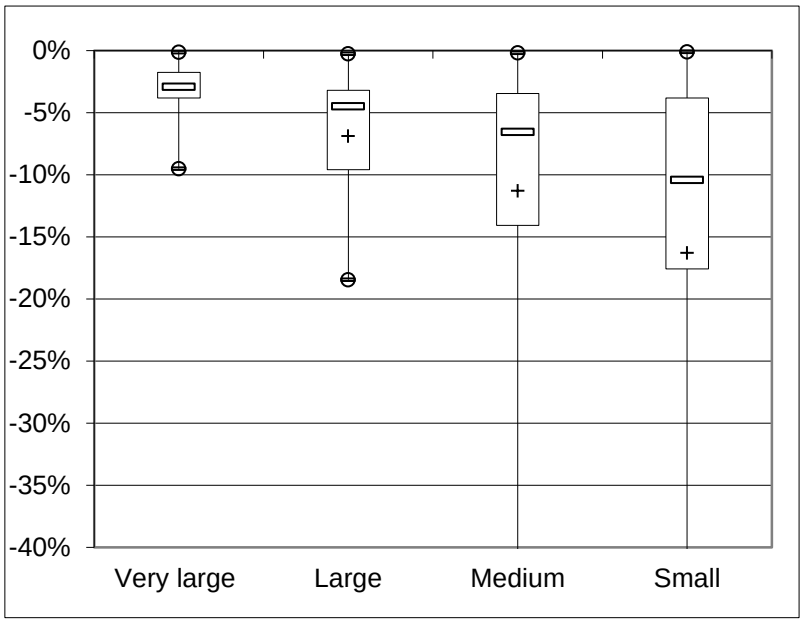
Figure 29: The NSFR half-year negative variation (consistent sample)*



Source: EBA QIS (December 2014)

This result is confirmed with the analysis of the broad sample, which shows that, similar to Figure 28, the negative variation of the NSFR affected smaller banks more significantly. Indeed, in December 2014, the semi-annual negative variation of the NSFR has been higher for smaller banks; the median, the average, and the first and third quartiles are all above the values observed for larger banks (Figure 30).

Figure 30: Semi-annual negative variation of the NSFR in December 2014 (broad sample)



Source: EBA QIS (December 2014)

8.5.6 Conclusions

On average, in the period considered, small banks showed higher variations of their NSFR ratios compared to larger banks. In addition, small banks appear to have been more prone to experience negative variation of the NSFR in the overall period considered (June 2011 to December 2014).

Based on the present analysis, it cannot be concluded whether or not small banks should be subject to lower reporting requirements. The analysis should be complemented by a more granular analysis of the fluctuations of the NSFR based on quarterly data and a bigger sample. More attention should also be given to the risk profile of small banks and to the volatility of the balance sheet items subject to reporting, which may drive fluctuations in the NSFR.

9. Impact on financial markets

This chapter describes the most relevant transactions in financial markets and the potential impact of introducing a stable funding requirement. These transactions include securities borrowing to cover clients' short sales, interrelated repo and reverse repo transactions, and swaps that provide customers with similar exposures in a synthetic form. The report describes the potential funding risk created by the maturity mismatch between the two sides of these transactions when, for franchise reasons, the providing bank would have an incentive to continue sourcing the security or the cash to its client, even when it is facing difficulties with the other counterparty (the counterparty from which the security or the cash is sourced).

Adjustments in prices could arise for the provision of prime brokerage transactions, and in market making. But overall, and in spite of important uncertainties around this assessment, the impact on financial markets is expected to be net beneficial, as the suggested calibration of the NSFR is expected to protect against existing funding risks and enable banks to provide them in a more stable manner.

This chapter finds no supporting evidence of a relation between trading book activities and the NSFR in the QIS data. This lack of an empirical relationship does not prove that the NSFR has no causal effect on these activities. But it does show that banks have been able, on average, to increase their NSFR without in parallel decreasing these trading activities over the year of analysis. Although the study is based on only one year when the NSFR was not actually yet in place, it might provide some comfort that implementing the NSFR need not result in downsizing of trading activities for banks.

The NSFR is not expected to result in significant distortions to financial assets markets. It is not expected to become, when introduced, a decisive element in the volume of specific financial markets. The current RSF factor for securities classes ranges from 5% to 85%. In some cases where the increasing funding cost due to the NSFR would exceed the expected return from holding these assets, it might disincentivise their holdings by banks. Assets like equities and other less liquid assets could be affected. According to the simulation exercise, banks are expected to reduce their non-HQLAs securities between EUR 0–94 billion. When put into perspective and compared with the size of the corresponding markets, this range does not appear to be a major cause of concern, as markets are expected to be able to absorb these amounts during a transition to NSFR compliance.

For these reasons, even though some adjustment in prices could arise, material consequences in financial markets as a direct result of introducing an NSFR requirement are not expected to happen. Rather, the suggested calibration of the NSFR is expected to protect against the existing funding risks entailed by these transactions.

This chapter contains a detailed description of the funding risks associated with derivatives

transactions and explains the rationale behind stable funding requirements on the total net derivative assets (and the variation margins considered for their calculation), on the total derivative liabilities, and on the initial margin posted.

The Basel Committee is reviewing two aspects of the treatment of derivatives: (i) the treatment of cash and securities posted as initial margin and as contributions to the default funds of CCPs; and (ii) the treatment of derivative transactions with counterparties exempt from the BCBS-IOSCO margin requirements. This review is expected to deliver its conclusions by mid-2016 and the EU implementation should take its conclusions into account.

This chapter is composed of relatively independent sections, each of which focuses on a particular aspect of relevance to the impact assessment. All of these sections are important, because financial markets perform many functions and thus the impact of a new regulation on their functioning cannot be assessed by looking at one aspect in isolation.

The chapter's first section tests whether a statistically significant correlation exists between NSFR adjustments recently undertaken by banks and the size of their trading book exposures. The second section describes the treatment of securities and derivatives, with some judgements on impact. The third section assesses the impact on various types of funding used by banks. Section 9.4 assesses the impact on prime brokerage and market making of the introduction of the NSFR.

9.1 Impact of the NSFR adjustment on trading book activities

In this section, we empirically assess the relation between the NSFR adjustment and the trading book activities of banks. We rely on the same methodology as for the multivariate analysis on lending in Chapter 5. We analyse whether the change in trading book activities in banks' total exposures is related to the change in their NSFR shortfall.

The premise of this analysis is that a shortfall adjustment should be reflected in the evolution of the trading book activities of banks, if (i) banks are already trying to adjust to the NSFR; and (ii) the NSFR structurally limits banks' ability to perform these kinds of activities.

To capture the evolution of trading activity, we compute the change in total trading book exposures in banks' total exposures using the data reported in the leverage ratio QIS template. We also decompose the change in the trading book total into its main two components: (i) the combined change in derivatives and secured financing transactions (SFTs) exposures[47], and (ii) the change in all other trading book activities.

Table 29 shows some descriptive statistics of the dependent variables considered in the analysis. We report descriptive statistics for the whole EU sample. We also report these statistics for the

[47] The leverage ratio exposures panel does not allow us to decompose between SFTs and derivatives. Our derivatives and SFTs exposures also include SFTs and derivatives from the banking book. Additionally, we also test the impact of shortfall adjustment on the change on derivatives and SFTs exposures from the trading book and the banking book separately.

subsample of banks with non-zero trading book exposures, as a significant share of the banks in our sample did not report any trading activities.

Table 29: Trading exposures' descriptive statistics

		Whole sample				Banks with trading activities			
Variable	**Definition**	**N**	**P50**	**MEAN**	**STD**	**N**	**P50**	**MEAN**	**STD**
Change in total trading book exposures	Difference in trading book exposures over total exposures for two consecutive periods	273	0.00%	0.17%	3.57%	170	0.06%	0.28%	4.52%
Change in derivatives and SFTs exposures	Difference in derivatives and SFTs exposures over total exposures for two consecutive periods	273	0.00%	-0.18%	4.80%	170	0.01	-0.01%	3.21%
Change in other trading book exposures	Difference in other (non-derivatives and non-SFTs) trading book exposures over total exposures for two consecutive periods	273	0.00%	0.16%	1.94%	170	0.00%	0.25%	2.46%

As for the regressions on lending, we include several control variables in our model: namely, the change in NPEs, the change in leverage ratio, the business model aggregated categories (retail, diversified, and specialised) and the size categories (small, medium, large, and very large).

Table 30 reports the results of the regressions for the whole sample. We see no evidence of a correlation between the change in total trading book exposure and the change in the NSFR shortfall. The coefficients are non-significant in all regressions and very close to zero. The conclusion is alike when we decompose the trading book activities into (i) derivatives and SFTs exposures; and (ii) all other trading book exposures. We observe no correlation between the change in shortfall and these activities. Derivatives and SFTs exposures also include exposures from the banking book. We also tested (but do not report for the sake of brevity) the change in derivatives and SFTs exposures from the trading book and the banking book separately. The results remain the same.

Table 30: Regressions of change in trading activities on change in the NSFR shortfall

This table shows regression coefficients of the change in total trading book exposures (columns 1 to 4), the change in derivatives and SFTs exposures (columns 5 to 8), and the change in other trading exposures (columns 9 to 12) on the change in the NSFR shortfall (the variable of interest) and a set of other control variables. Standard errors are reported in parentheses. '**' and '*' denote statistical significance at 5 and 10% respectively.

	Change in total trading book exposures				Change in derivatives and SFTs exposures				Change in other trading book activities			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Change in the NSFR shortfall	0.000	0.005	0.001	0.001	-0.005	-0.015	-0.004	-0.005	0.001	0.000	0.002	0.001
	(0.009)	(0.009)	(0.009)	(0.009)	(0.019)	(0.021)	(0.020)	(0.019)	(0.007)	(0.008)	(0.007)	(0.007)
Change in NPEs		-0.010				0.019				-0.007		
		(0.018)				(0.033)				(0.012)		
Change in leverage ratio		-0.055				-1.095**				-0.022		
		(0.062)				(0.514)				(0.036)		
Very large banks			-0.004				-0.005				0.005	
			(0.007)				(0.004)				(0.003)	
Large banks			0.001				-0.003				0.001	
			(0.003)				(0.004)				(0.002)	
Medium banks			0.003				-0.001				-0.000	
			(0.003)				(0.005)				(0.002)	
Small banks			0.005				-0.001				0.002	
			(0.004)				(0.007)				(0.002)	
Retail business model				-0.001				0.002				-0.001
				(0.002)				(0.002)				(0.001)
Diversified business model				0.000				-0.002				0.003
				(0.004)				(0.003)				(0.002)
Specialised business model				0.012*				-0.011				0.004
				(0.007)				(0.015)				(0.004)
Constant	0.002	0.001			-0.002	0.001			0.002	0.002		
	(0.002)	(0.002)			(0.003)	(0.003)			(0.001)	(0.001)		
Observations	273	259	273	273	273	259	273	273	273	259	273	273
R-squared	0.000	0.001	0.010	0.020	0.000	0.184	0.003	0.010	0.000	0.001	0.017	0.017
Prob. > F	0.987	0.713	0.630	0.430	0.807	0.140	0.810	0.723	0.846	0.884	0.537	0.385

A significant fraction of banks in the sample did not report any trading exposures. As these banks have no variation in their trading activities by definition, this might bias our analysis. To cope with this issue, Table 31 reports the same analysis but for the subsample of banks that have trading activities.

The regression results for this subsample show that the trading book exposures are not related to the change in the NSFR shortfall. As before, the coefficients are not significantly different from zero. For derivatives and SFTs exposures, we observe in one of the specifications (column 7) a weak correlation (significant at the 10% level) with the change in the NSFR shortfall. Graphical analysis of the scatterplots and analysis on a subsample where outliers have been removed strongly suggest that this result is the consequence of a few outliers in our sample. For the change in other trading book activities, we observe no correlation between the change in the NSFR shortfall and these activities.

Subsample analysis

We also run the analysis on subsamples by size and aggregated business model categories. We find no difference in trading book activity sensitivity to NSFR shortfall changes. In particular, specialised banks do not appear to be more sensitive to changes in the NSFR shortfall.

Conclusion

To summarise our findings, we find no supportive evidence of a relation between trading book activities and the NSFR in the QIS data. This lack of empirical relationship suggests that there is no causal effect of the NSFR on these activities. Banks seem to be able, on average, to increase their NSFR without in parallel decreasing these trading activities. This suggests that implementing the NSFR should not result in a drastic downsizing of trading activities for banks. This analysis was, however, only conducted over one year—2014—due to data limitations. It remains unclear how the conclusions would evolve if an entire business cycle could have been considered.

Table 31: Subsample of banks with trading activities

This table shows regression coefficients of the change in total trading book exposures (columns 1 to 4), the change in derivatives and SFTs exposures (columns 5 to 8), and the change in other trading exposures (columns 9 to 12) on the change in the NSFR shortfall (the variable of interest) and a set of other control variables. The sample only includes banks with non-zero trading exposures. Standard errors are reported in parentheses. '**' and '*' denote statistical significance at 5 and 10% respectively.

	Change in total trading book exposures				Change in derivatives and SFTs exposures				Change in other trading book activities			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Change in the NSFR shortfall	0.000	0.016	0.008	0.013	0.053	0.015	0.062*	0.052	0.004	-0.002	0.008	0.009
	(0.034)	(0.030)	(0.035)	(0.036)	(0.040)	(0.021)	(0.037)	(0.038)	(0.025)	(0.024)	(0.025)	(0.026)
Change in NPEs		-0.022				0.010				-0.009		
		(0.048)				(0.054)				(0.031)		
Change in leverage ratio		-0.241				-0.051				-0.092		
		(0.269)				(0.139)				(0.160)		
Very large banks			-0.004				-0.005				0.005	
			(0.008)				(0.004)				(0.003)	
Large banks			0.001				-0.003				0.001	
			(0.003)				(0.005)				(0.003)	
Medium banks			0.005				-0.001				-0.001	
			(0.004)				(0.004)				(0.003)	
Small banks			0.017				0.017**				0.008	
			(0.012)				(0.008)				(0.006)	
Retail business model				-0.003				0.005				-0.002
				(0.004)				(0.003)				(0.003)
Diversified business model				0.001				-0.002				0.003
				(0.004)				(0.003)				(0.002)
Specialised business model				0.029*				0.004				0.010
				(0.016)				(0.014)				(0.008)
Constant	0.003	0.002			0.000	0.000			0.003	0.003		
	(0.003)	(0.004)			(0.002)	(0.002)			(0.002)	(0.002)		
Observations	170	164	170	170	170	164	170	170	170	164	170	170
R-squared	0.000	0.004	0.025	0.048	0.019	0.002	0.063	0.029	0.000	0.002	0.028	0.030
Prob. > F	0.989	0.719	0.588	0.414	0.193	0.897	0.155	0.279	0.860	0.933	0.528	0.383

9.2 Potential consequences of introducing a stable funding requirement for investment in financial assets

9.2.1 Treatment of securities and derivatives in the NSFR standard

Financial securities and derivatives can be divided into five categories in the Basel NSFR standard: Level 1, Level 2A, and Level 2B securities (which form the HQLAs subset), non-HQLAs, and derivatives.

These categories receive different factors in the standard. Table 32 below summarises the rules that apply to different financial assets in the NSFR. Securities included in Level 1, Level 2A and Level 2B assets are broadly defined in the table. The HQLA definitions are the same as in the LCR standard. Table 32 also takes into account the European definition of HQLAs, as defined in the LCR DA,[48] which includes a broader set of financial securities in the Level 1 and Level 2B categories of HQLAs.

Table 32: Summary of applied RSF and ASF factors for securities and derivatives in the NSFR

Asset categories for securities and derivatives	RSF	ASF
Unencumbered Level 1 assets, including: • *sovereign claims from EU Member States (DA);* • sovereign claims from third parties with a sufficiently high credit quality; • *extremely high-quality covered bonds (DA).*	5%	
Unencumbered Level 2A assets, including: • sovereign claims from third parties with a lower credit quality compared to Level 1 assets; • corporate debt securities and covered bonds with a sufficiently high credit quality.	15%	
Unencumbered Level 2B assets, including: • Residential mortgage-backed securities (RMBS) with a sufficiently high credit quality; • *most senior tranches of other ABSs (e.g. SMEs, consumer loans, auto loans) with a sufficiently high credit quality (DA);* • corporate debt securities with a lower credit quality compared to Level 2A assets; • equity shares constituent of major stock indexes.	50%	
HQLAs encumbered between six months and one year	50%	
Other financial assets with a remaining maturity of less than one year	50%	

[48] Commission Delegated Regulation (EU) 2015/61 of 10 October 2014 to supplement Regulation (EU) No 575/2013 of the European Parliament and the Council with regard to liquidity coverage requirement for credit institutions available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2015.011.01.0001.01.ENG

Unencumbered securities (not HQLAs and not in default) with a remaining maturity over one year	85%	
Initial margin posted for derivative contracts (except on behalf of a customer)	85%	
NSFR derivative assets net of NSFR derivative liabilities (if positive)	100%	
NSFR derivative liabilities net of NSFR derivative assets (if positive)		0%
20% of gross derivative liabilities, i.e. derivative liabilities prior to deduction of the variation margin posted	100%	

Note: DA refers to the EU definition of HQLAs as in the Commission Delegated Regulation (EU) 2015/61 of 10 October 2014

a. Non-derivative securities

The NSFR applies factors depending on the liquidity of assets. Contrary to other assets in the standard, liquidity of securities is not assessed through their residual maturity but their market liquidity. Highly liquid financial assets can be converted into cash in a very short time span by selling them or pledging them as collateral. In consequence, a bank does not require much stable funding to hold them in its balance sheet. RSF factors are calibrated depending on the ability to convert a security into cash easily.

For example, unencumbered Level 1 assets are recognised as the most liquid claims, especially in times of financial distress where they can be traded or pledged as collateral without significant loss of value. They are given the lowest haircut as they only require 5% of stable funding. These financial assets are mostly constituted of sovereign exposures with the highest credit quality. On the other hand, non-HQLA securities with a remaining maturity of over one year require 85% of stable funding. It is expected that these securities cannot be sold or pledged as collateral easily if an unstable funding source is not rolled over. This assumption explains the relatively high stable funding requirement to hold these securities.

b. Derivatives

The treatment of derivative exposures in the Basel NSFR standard is slightly different from other types of exposures. The standard relies on several components that aim to capture funding risk arising from derivative exposures. Furthermore, because there is often a discrepancy between the behavioural and the contractual maturity of derivatives, the NSFR treatment of derivatives does not take contractual maturity into account.

Banks hold derivative exposures on both the asset and liability sides of their balance sheet. These exposures are measured at fair value, i.e. by the amount that it would cost to offset them by entering a new contract at current market prices (‘replacement cost’). In the NSFR, when a bilateral netting contract—which meets the Annex 8 and Annex 9 conditions of the Basel leverage ratio

standard[49]—exists between the bank and a counterparty, the bank reports the net value of all its derivative contracts with that counterparty (this net exposure is either an asset or a liability).

The first component of the derivative treatment in the NSFR takes as inputs: (i) the amount of derivative assets after deducting certain types of variation margin received; and (ii) the amount of derivative liabilities after deducting all types of variation margin posted. The eligibility criteria for offsetting the variation margin received are as follows:

- Only cash is eligible (securities received, as variation margin (VM) cannot be offset from the amounts of derivative assets for which they are received).
- For trades not cleared through a qualifying central clearing counterparty,[50] the cash received by the recipient counterparty is not segregated.
- Variation margin is calculated and exchanged on a daily basis based on mark-to-market valuations of derivative positions.
- Variation margin exchanged is the full amount that would be necessary to fully extinguish the mark-to-market exposure of the derivative subject to the threshold and minimum transfer amounts applicable to the counterparty.
- Derivative transactions and variation margins are covered by a single master netting agreement (MNA) between the legal entities that are the counterparties in the derivatives transaction. The MNA must explicitly stipulate that the counterparties agree to settle net any payment obligations covered by such a netting agreement, taking into account any variation margin received or provided if a credit event occurs involving either counterparty. The MNA must be legally enforceable and effective in all relevant jurisdictions, including in the event of default and bankruptcy or insolvency.

These criteria were taken directly from the Basel leverage ratio framework.[51] They set the bar high in terms of VM recognition, excluding securities and limiting the cases in which cash VM is recognised. In contrast, all variation margin posted in connection to derivative liabilities must be entirely offset from the amounts of derivative liabilities. The Basel Committee chose an asymmetric approach in order to avoid giving banks incentives to reduce the amounts of variation margin to be offset from derivative liabilities. Indeed, for a given amount of derivative liabilities gross of variation margin posted, the NSFR is decreasing in the amount of variation margin posted. In other words, banks have an incentive to report as large an amount of derivative liabilities net of VM as possible. Thus, if lower

[49] Essentially, the conditions to be met are that exposures should be of the same currency and value date and a legally enforceable offsetting agreement should exist between the counterparties. See the Basel III leverage ratio framework and disclosure requirements (January 2014) at http://www.bis.org/publ/bcbs270.pdf

[50] As defined in Annex 4, Section I, A of the Basel Committee document *International Convergence of Capital Measurement and Capital Standards: A Revised Framework.* Online at: http://www.bis.org/publ/bcbs128.pdf

[51] Basel Committee document: *Basel III leverage ratio framework and disclosure requirements*, January 2014. Online at: http://www.bis.org/publ/bcbs270.pdf

forms of VM (e.g. securities) were not offset from liabilities, banks might then have an incentive to post these lower forms of VM rather than cash.

With these inputs, the **first component** of the NSFR derivative treatment looks at the difference between net derivative assets and liabilities, i.e. the difference between derivative assets net of eligible VM and liabilities net of all VM at the level of the entire balance sheet. If, overall, the bank has a larger amount of net assets, then the difference receives a 100% RSF. If, overall, the bank has a larger amount of net liabilities, then the difference receives a 0% ASF factor. This first component of the NSFR derivatives treatment implies two things:

- To the extent that a bank has derivative liabilities corresponding to assets, the NSFR derivative assets can be funded with derivative liabilities (even when they do not belong to the same counterparty netting set). This approach seeks to recognise that, in some cases and under normal conditions, derivative liabilities may effectively act as a source of stable funding, even if derivative liabilities are not available to the bank to fund its activities as in traditional balance sheet liabilities. In reality, especially under stressed conditions, this may be a strong assumption. Netting all assets and liabilities implies that all derivatives are matched with respect to cash flows and no counterparty risk exists. In practice, this may not hold true. For example, a bank would have incentives to close out derivative contracts early to avoid a CVA loss. Also, the NSFR derivative liabilities correspond to losses where VM has not been called yet. But some of these margin amounts could be called, making it a potentially unreliable funding source for some derivative assets where VM cannot be called by the bank.

- The proportion of derivative assets in excess of derivative liabilities needs to be funded by stable funding. In the case where derivative assets are greater than derivative liabilities, the bank is in a position to receive a future stream of cash flows. As for other assets (e.g. loans), this residual position needs to be funded by stable funding. In the bank's balance sheet, the marked-to-market gain that the derivative asset represents is matched by an increase in equity, which provides a 100% ASF for the bank. The 100% RSF on net derivative assets seeks to prevent this equity gain from improving the NSFR until VM is exchanged (or the derivative asset matures and is settled). But as soon as VM is exchanged or the asset matures (and is settled), the improvement in the NSFR takes place.

Banks' exchanges of variation margin are recognised in the treatment described above. On the one hand, the variation margin received provides protection against funding risk for the bank. On the other hand, the variation margin posted needs to be funded. The NSFR considers that allowable cash received from a counterparty as a variation margin can be seen as a source of funding for the bank. It is, therefore, deducted from the gross derivative assets before netting. On the other hand, the variation margin posted can be seen as reducing the available funding for the bank (as when the bank reimburses any type of stable liability) and is therefore deducted from derivative liabilities.

The **second component** of the derivative treatment in the NSFR applies a direct RSF charge to gross derivative liabilities, i.e. derivative liabilities before the variation margin deduction. This add-on

equals 20% of gross derivative liabilities and is factored at 100% RSF. The add-on seeks to ensure that a bank with lower derivative assets (net of cash VM) than derivative liabilities (net of VM) will still need to back a fraction of its derivative exposures with stable funding. Without an add-on, a bank with a greater amount of derivative liabilities than assets would end up without funding requirements for derivatives even if its overall derivative exposures were to represent a substantial share of its balance sheet. The add-on covers, to some extent, future funding risks arising from negative mark-to-market movements that ultimately result in net requirements to post collateral. As derivative exposures tend to be more volatile than other bank exposures, a net negative position in derivative exposures might trigger future streams of cash flows to be paid by the bank. The add-on allows covering this potential unfavourable evolution over one year (be they due to losses on derivative contracts or increases in the proportion of derivative liabilities where the bank is asked to post VM). For these reasons, the 20% add-on reduces the bank's funding risk to the volatility of derivatives' market value.

Finally, the **third component** consists of a requirement on the initial margin posted (except on behalf of a customer). The inclusion of an RSF charge on initial margin seeks to reflect that, at least to some degree, the initial margin should remain relatively constant over the life of a portfolio of trades and may, therefore, need to be stably funded to some extent. Hence, the assets and cash posted as initial margin can be seen as encumbered assets, which justifies the requirement that they be partially stably funded (as they cannot be liquidated or re-pledged while encumbered). Initial margins receive an RSF factor of 85% in the NSFR standard. The Basel standard thus implicitly assumes that a proportion of 85% of these margins is renewed over one year or will remain encumbered for a period greater than one year.

The potential funding benefit of initial margin received is generally limited, except in cases where the banks post IM on behalf of their customers. When a bank posts IM on behalf of its customers, using customers' assets to pass them on to a CCP, the amount of IM posted to the CCP should not be captured in the requirement to stably fund initial margin (cf. footnote 18 of the Basel NSFR text). But outside these cases, initial margin received is not considered as providing stable funding, in particular because bilaterally exchanged initial margin should not be rehypothecated.

9.2.2 Incentives/disincentives for bank investment in financial securities and derivatives

Imposing RSF factors on financial market assets could create incentives for banks to change their investment policies. As stable funding should generally result in higher funding costs for banks, the factors might cause banks to shift from investing in one asset category to another, or even to reduce their overall investment in securities and derivatives, although the extent to which this will occur depends on the relative benefits that banks enjoy when holding these different types of securities.

The cost of holding securities should increase with the proportion of RSF associated with it. Thus, for a bank, the NSFR cost of holding (non-derivative) securities increases in the following order:

- unencumbered Level 1 assets;

- unencumbered Level 2A assets;
- unencumbered Level 2B assets, encumbered HQLAs between six months and one year, and other securities with a remaining maturity of less than one year; and
- unencumbered non-HQLA securities with a remaining maturity of over one year.

Banks hold financial securities such as bonds and equity instruments in order to invest in companies, realise arbitrage opportunities, provide market making services, and hedge other exposures such as derivative contracts. When assessing an investment strategy, the potential cost of holding financial securities should be compared with the expected return of the asset. Banks' objective is to maximise their expected return over their funding cost.

The expected profitability of financial assets depends on the level of riskiness borne by investors. HQLAs—and especially Level 1 HQLAs—are by definition liquid assets with a high credit quality. Consequently, they should have a lower expected return. Symmetrically, non-HQLAs should have a higher expected return. In that sense, the increasing risk weights reflect this economic rationale and should not create large distortions as long as the increase in funding cost is matched with the increase in expected return between asset categories. However, a miscalibration of the stable funding regulation might change the incentives of banks regarding their investment in financial securities.

a. Potential investment shifts towards securities with lower RSF

The regulation gives more incentives to invest in the safest and more liquid securities as they impose a smaller cost on banks. It is unclear to what extent the NSFR calibration between asset categories can quantitatively match the difference in the expected returns of each asset category. The difference in RSF factors goes from 5 to 85% depending on the financial securities. It implies that securities need to be funded by a proportion of long-term liabilities in this range, thus potentially increasing the cost of holding securities with a higher RSF. If the difference in expected returns between these asset categories is smaller than the increase in funding costs, the rule can make riskier assets relatively more expensive compared to HQLAs. It would create an incentive to shift bank investment towards the highest rated financial assets. This effect might be reinforced with other regulatory regimes—notably the LCR—which also incentivise banks to invest in HQLAs. From a liquidity risk standpoint, this incentive is desirable. However, it might lead banks to reduce their investment in less liquid bonds or equity instruments. This would limit financing sources for companies aiming to raise financing on capital markets. To overcome this funding cost increase, it is plausible that a stable funding regulation might prompt banks to reinforce their role as underwriters and diminish their participation in the secondary bond market.

b. Cost-efficiency of arbitrage activities under the NSFR

Arbitrage activities are also a driver of investments in financial securities and derivatives. An arbitrage can be defined as a financial operation destined to result in a positive gain without taking

any risk. An arbitrage exploits a temporary gap in pricing between related financial securities. This can be achieved by buying/selling a set of securities that replicate the payoffs of another financial security and by selling/buying this security. This financial operation is socially desirable as it eliminates a price distortion in financial markets.

The gain of an arbitrage operation does not depend on the intrinsic risk of securities (as the whole operation is riskless from the point of view of market risk) but on the deviation between the prices of securities. A bank might gain a certain profit in an arbitrage operation by holding a portfolio of low-risk securities. In that case, the funding cost would not increase much with the introduction of an NSFR: holding these securities does not imply funding them with a large share of long-term liabilities. However, a bank might also gain the same profit from another arbitrage operation by holding a portfolio of high-risk securities. Again, this is due to the fact that the gain from an arbitrage operation does not depend on the underlying risk of assets in the portfolio. In theory, both operations should be riskless if the arbitrage is constructed properly. However, the funding cost of the second arbitrage operation could be higher due to the necessity of funding assets with a higher share of long-term funding. It is thus possible that an increase in funding cost for certain securities caused by a stable funding requirement might prevent banks from entering into arbitrage operations.

However, this does not remove the rationale of a stable funding requirement for these operations. As stressed above, an arbitrage is only neutral from the point of view of market risk. It does not remove the funding risk of the operation for the bank. If the securities held in the transaction cannot be resold quickly or pledged as collateral without a significant haircut, a bank can suffer a funding problem. In consequence, despite the increasing cost such operations could entail, implementing a stable funding requirement on these operations still appears justified in order to properly control the funding risk of the bank. It is, moreover, likely that, if banks diminish their arbitrage activities, other financial institutions will step in to profit from such strategies.

c. Potential effect of the NSFR on derivative contracting

The incentives to enter into derivative contracts might also be reduced by the NSFR due to the different levels of requirements that apply to these exposures. Some derivative contracts can be the results of a proprietary trading activity of the bank. Other derivative contracts are used by a bank to hedge other investments. For example, when a bank invests in certain companies, it can reduce its exposure to credit risk by entering a credit default swap (CDS) contract. This derivative allows the bank to insure itself against a default of its counterparty. Finally, banks offer financial services and hedges to customers by entering into derivative contracts with them. For instance, pension funds use interest rate and inflation derivatives to hedge the discount rate on their liabilities.

Derivative markets are dominated by interest rate and currency products. In 2014, interest rate contracts, such as interest rate swaps and forward or future contracts, represented more than 80% of notional amounts of derivatives in over the counter (OTC) and exchange traded markets, according to the BIS. FX contracts represent almost 10% of notional amounts. These derivative contracts are useful tools for banks seeking to cover interest rate risk or currency mismatch risk. If

banks reduce their derivative exposures due to a stable funding requirement, it might either result in a decrease of hedging risks or a decrease in other investment activities, as they cannot be hedged at a reasonable cost. Where banks enter derivatives with clients to provide them with a hedge, the bank might charge a higher price because of the stable funding requirements associated with having a derivative portfolio. While frequent margining would reduce the impact of the first component of the derivatives treatment, the second component could still represent an increase in funding costs, as it is independent of margining.

Banks also hedge their exposition on derivative contracts towards their customers. Investors can enter into a derivative contract with a bank. In order to hedge the market risk, the bank will purchase the underlying asset of the derivative contract and hold it in its balance sheet. With stable funding requirements on both the derivative exposure (which will depend on its replacement cost) and the underlying security, the NSFR will increase the overall cost of the financial service. This could result in either a decrease of the activity or an increase in the cost of the financial service. Due to this impact on derivatives' positions on the one hand, and on the equities holding on the other hand, the business model of equity derivatives structuring would particularly see its funding costs significantly increase following the introduction of the NSFR. As stated above, the requirement's aim is to cover funding risk and not market risk. From this point of view, there is still a rationale to imposing a stable funding requirement for these linked transactions.

9.3 Potential consequences of introducing a stable funding requirement for different funding markets

9.3.1 Treatment of funding sources in the NSFR

The NSFR measures the stability of an institution's funding by assigning the different funding sources an ASF factor depending on their stability. ASF factors in the Basel NSFR are calibrated according to both the behavioural stability and the residual maturity of a liability. The maturity dimension is split into three time buckets, representing liabilities with a residual maturity of less than six months, between six months and one year, and greater than one year. However, some liabilities are assessed irrespective of their residual maturity but rather on the basis of their nature and their behavioural stability; for example, retail deposits that are contractually short term but tend to be behaviourally 'sticky'.

Regulatory capital instruments as well as all other liabilities with an effective residual maturity of one year or more are assigned an ASF factor of 100% in the Basel NSFR. Liabilities with an effective residual maturity of less than one year are assigned ASF factors of less than 100% depending on their stability and maturity. Table 33 illustrates the ASF factors for different funding sources in the Basel NSFR requirement.

Table 33: ASF factors for liabilities in the Basel NSFR

Funding sources	Residual maturity		
	< 6 months	6-12 Months	> 1 year
Capital			100%
Stable/less stable deposits from retail and SME	95%/90%	95%/90%	100%
Operational deposits	50%	50%	100%
Funding (secured and unsecured) from non-financial corporates, sovereigns, PSEs, and multilateral and national development banks	50%	50%	100%
All other liabilities not mentioned above	0%	50%	100%

Liabilities with an assigned ASF factor of 0% do not qualify as stable funding in the NSFR. This includes (among others) funding from central banks and financial institutions with a residual maturity of less than six months.

a. Incentives and disincentives for using different funding sources

The ASF factors are calibrated with the intent of incentivising institutions to adapt their funding profile towards more stable funding of their balance sheet, and ensuring a better match between the respective terms of assets and liabilities. The treatment of retail deposits differs from that of any other funding sources in the NSFR, making them highly incentivised given the 95% and 90% ASF factors applicable on them irrespective of the term. The below assessment is focused on funding sources other than retail deposits.

Incentives towards long-term funding

With a 100% ASF factor on any funding with a remaining maturity above one year compared to an ASF factor of maximum 50% on funding with a residual maturity of less than one year, the banks are incentivised to increase the maturity of their funding profile. Thus, an intended effect of the NSFR requirement is that banks will, to a greater extent, fund their assets with long-term liabilities. As a consequence, banks' funding costs are expected to increase due to several aspects.

First, it is generally assumed that—all other things being equal—long-term funding is more expensive for banks than short-term funding, because investors who purchase a bank's long-term bonds demand a higher yield as compensation for the relatively higher credit and liquidity risk a long-term bond possesses. However, this price differentiation between short- and long-term debt could in the future be narrowed as an NSFR requirement leads to banks' funding risks decreasing as they become more stably funded.

Second, the NSFR requirement will lead to an increase in the demand for long-term funding as it improves banks' NSFR level. Banks that are non-compliant with the NSFR requirement are, therefore, expected to obtain more long-term funding in order to comply with the NSFR. An increase

in the demand for long-term funding will—all other things being equal—also lead to an increase in the price.

However, in order for banks to increase long-term funding, the demand from investors for banks' long-term debt must increase simultaneously. Whether or not there will be sufficient demand from investors is difficult to assess, but in theory a price adjustment is expected to lead to an equilibrium between supply and demand for bank bonds.

The above-mentioned aspects lead to the expectation that the NSFR requirement will generally increase funding costs for some banks, as more long-term funding will be necessary in order to comply with the NSFR. These costs must be expected to be passed on to the bank's customers in the end. As alternatives to increasing the share of long-term funding, banks can reduce the size of their balance sheet, attract wholesale funding from non-financial corporates, or (in some cases) obtain further retail deposits to replace short-term funding in order to meet an NSFR requirement.

Secured funding vs unsecured funding

Common for all secured funding is that the funding is collateralised by an asset, either a loan or security. When assessing the treatment of secured funding in the Basel NSFR, one must look at both the liability side and the asset side of the balance sheet. On the liability side, there is no differentiation between secured and unsecured funding. The difference is, however, reflected on the asset side, where higher RSF factors are assigned for encumbered assets.

Below is a description of the treatment of two types of secured funding—repo/reverse repo agreements and covered bonds—in the Basel NSFR and an assessment of the expected consequences on the volume and liquidity of these funding markets.

Short-term repo/reverse repo

A repurchase agreement (repo) is a sale of a security combined with an agreement for the seller to buy back the given security at a later date. A reverse repurchase agreement is the same transaction but from the view of the buyer. A repo transaction is a secured loan and is used by banks—among other things—to obtain liquidity. Banks use reverse repo transactions to invest excess cash and cover short positions in securities. The assessment below is focused on the NSFR treatment of short-term (< 6 months) repo and reverse repo agreements.

Table 34 shows ASF and RSF factors for short-term repo and reverse repo transactions respectively for different counterparties.

Table 34: ASF and RSF factors for short-term repo and reverse repo agreements with different counterparties

Counterparty	ASF (repo)	RSF (reverse repo)
Financial institutions	0%	10%[52]/15%
Non-financial corporate clients, sovereigns, PSEs, and multilateral and national development banks	50%	50%

On the liability side, repo agreements are treated as secured funding in the NSFR and are assigned ASF factors of 0% or 50%, depending on the counterparty.

On the asset side, reverse repo agreements are treated as loans in the NSFR and are assigned an RSF factor depending on the counterparty. For short-term reverse repo agreements with financial institutions, there is a further differentiation in assigned RSF factors depending on the liquidity quality of the collateral received in the agreement and whether or not the collateral can be rehypothecated. In all other cases, there is no differentiation between secured and unsecured loans as they receive the same RSF factor.

In the case of matched book secured funding transactions where a bank does a short-term repo with another financial institution (ASF 0%) and similar reverse repo with any other counterparty (RSF 10%, 15% or 50%), the NSFR of the bank will be affected negatively. In this context, banks face higher costs of engaging in book matching with financial counterparties and might pass these costs on to their clients or reduce their provision of these types of services if they consider them to be not as profitable as they were in the past.

To the extent that the market participants will downscale the use of short-term repo/reverse repo transactions, it can have an effect on the liquidity of the underlying bond market. Financial institutions use repo transactions, among other things, to generate liquidity from their stock of bonds (typically government bonds and covered bonds). If there is a disincentive to engage in short-term repo and reverse repo transactions, the availability of this liquidity source could be narrowed. The simulation exercise described in Chapter 5 shows a significant result on the business models universal cross-border and securities trading houses to reduce the amount of 10% RSF category, which is the loans to financial institutions secured by Level 1 collateral and where the bank has the ability to freely rehypothecate the received collateral for the life of the loan, in order to comply with the NSFR.

The Basel NSFR recognises all short-term wholesale funding from non-financial corporates as relatively stable (50% ASF). This is in contrast to funding from financial corporates at similar

[52] Loans to financial institutions secured by Level 1 collateral and where the bank has the ability to freely rehypothecate the received collateral for the life of the loan.

maturities, which is considered unstable (0% ASF). This means that short-term wholesale funding secured by collateral (e.g. repo) is treated differently when it comes from a corporate's treasury function and when it comes from the repo desk of a financial firm. This could create an incentive for banks to turn to non-financial corporates to refinance reverse repos to financial clients (e.g. hedge funds). But it is very difficult to assess whether this type of financing would become very prevalent and it should be noted that it is not clear whether the 50% ASF and 10-15% RSF associated with this pair of transactions would be an inappropriate measure of the funding risk they entail.

Covered bond funding

Covered bonds are secured debt instruments issued by financial institutions and backed by a special pool of collateral (cover pool)—typically mortgage loans—on which the covered bond investor has a preferential claim in the case of a default. The specific features of the covered bond issuance are, to a high degree, dependent on the national legislative framework and can thus differ substantially across jurisdictions.

In the Basel NSFR, the issued covered bond on the liability side is assigned an ASF factor of 0%, 50% or 100% if the residual maturity is below six months, between six months and one year, or above one year, respectively.

On the asset side, the cover pool is considered encumbered for the term of the issued covered bond and is assigned an RSF factor of 100% if encumbered for more than one year. The rationale in Basel for the higher RSF factor for encumbered assets is that it reflects the amount of an asset that would have to be monetised through sale or used as collateral in a secured borrowing transaction over the course of one year. A funding risk typically arises if there is a maturity mismatch between the issued covered bond and the assets in the cover pool, because the assets must be refinanced during their term and there can be a risk of this not being completed at a reasonable price (see the further description of covered bond funding structures in Chapter 8).

Given the applicable ASF and RSF factors, the covered bond structure will obtain a maximum NSFR of 100% and in many cases below 100%. In comparison, if mortgage loans are funded by senior unsecured funding they are not encumbered and thus receive lower RSF factors (65% for residential mortgages), resulting in a higher NSFR level for the bank. In this context, one must assume that banks will, to some extent, be disincentivised to use covered bond funding.

9.4 Prime brokerage and market making: assessing the impact of the NSFR

This section explains the treatment of prime brokerage transactions in the NSFR. It is not easy to precisely measure the value added by prime brokerage to the overall economy. Thus, it is probably impossible to give reliable quantitative estimates of the costs of adopting the NSFR, which would arise via a reduction in the provision of prime brokerage services by certain broker dealers with

currently low NSFRs. It is not clear that these costs would be sufficiently substantial to be of concern. Indeed, prime brokerage entails important funding risks that were ignored in the years that led to the global financial crisis and were not reflected in the price of these services. The NSFR would lead broker dealers to devote more long-term funding to prime brokerage activities and ensure a better reflection of funding risks in their pricing. It is crucial to ensure broker dealers' funding stability, because they are central in the plumbing of the financial system and their failure can have devastating consequences.[53]

This section also assesses the potential for an increase in concentration in the market for providing prime brokerage and market making services. Higher concentrations may arise if many important broker dealers withdrew from these functions. But new entrants not currently regulated as banks could mitigate this tendency towards concentration and limit the increase in fees.

To guide policy making, the benefits from regulation (in terms of reduced subsidies and increased resilience of the banking system) have to be compared to the social costs, which are the macroeconomic impact on end borrowers' ability to borrow from end savers. There is considerable uncertainty surrounding these costs and benefits. But there is no clear evidence that an unintended increase in the costs imposed on borrowers' ability to borrow from end savers would arise because of the NSFR. Indeed, there is some evidence that the levels of liquidity and funding observed in the period leading to the financial crisis might have been unsustainable.

9.4.1 End savers and hedge funds: different approaches to investment

Markets for financial securities serve to allocate funds to end borrowers such as governments, large or medium firms, and even small firms and retail borrowers via securitisations. These markets function in two steps. Issuance takes place on the primary market. Securities issued are then placed on the secondary market. After that, secondary markets provide an additional service to end investors; they enable them to exit their positions and recoup their investment before maturity.[54] When secondary markets perform this additional task particularly well, end investors are willing to accept a lower return for a given amount of credit risk. This, in turn, improves the terms on which certain end borrowers are able to borrow in the primary market. While this effect is well documented, its exact magnitude is difficult to quantify in generalisable ways. In particular, as further sections of this document explain, it is hard to forecast precisely how the terms for end borrowers would vary in response to increased prime brokerage or market making costs.

Many end savers, such as high-net-worth individuals, pension funds, mutual funds, insurance companies,[55] corporations and sovereign wealth funds,[56] can be characterised as slow and/or

[53] To give a US-based example, the *Squam Lake Report* (2010) notes that: 'worried about the banks' financial condition, many [prime brokerage] clients withdrew their assets from brokerage accounts at Bear Stearns and Lehman Brothers in the weeks before these banks failed. Although Morgan Stanley did not fail, it also suffered from the withdrawal of prime brokerage assets'.

[54] To give a stark example, in the case of stocks, there is no contractual maturity. Stock markets perform a particularly important function for the issuance of equity. Indeed, buying non-traded equity is a strong commitment for investors.

[55] Pension funds, mutual funds and insurance companies invest on behalf of lower net worth households.

relatively risk averse. Indeed, they have strong preferences for non-levered strategies in which their savings are directly used to purchase financial instruments and are directly deposited into safe storages. They have long horizons for the riskier part of their portfolio. They devote a part of their portfolio to liquid investments such as treasuries or deposits. Their holdings of cash are in banks and money market funds (MMFs). Their holdings of securities are often managed by asset managers and custodians. Their investment strategies are slow; after buying, they tend to hold for a long time.

In contrast to these slow-moving investors with moderate risk appetites, hedge funds make profits from leveraged positions. Many hedge funds start with almost no cash and no securities.[57] They borrow cash to acquire long positions in financial securities and they borrow securities to take short positions.[58] Their strategies often focus on shorter or much shorter horizons than the end savers previously described (although some hedge funds do have long-term strategies). They research to guide their bets. For instance, if their research shows that a certain security is underpriced, they buy and hold it until the price increases. If their research shows that a security is overpriced, they take a short position (i.e. they borrow the security from a lender, to sell it in the market) in order to benefit from a future price decrease (buying it back at a lower price and returning it to the lender).

[56] These two types of players have been blamed for a so-called 'savings glut' in the period that led to the global financial crisis.

[57] Hedge funds have little equity relative to their risk exposures. Like all liabilities in the macroeconomy, their equity eventually belongs to end savers who hold it for diversification purposes and to achieve a higher degree of risk and return.

[58] A short position is taken by borrowing a security and selling it, hoping that the price will decrease. If it does, the hedge fund may buy back the same security to return it to the lender. That is: 'sell high, buy low'. Long positions bring profits when the hedge fund manages to 'buy low, sell high'.

Figure 31: End savers and hedge funds

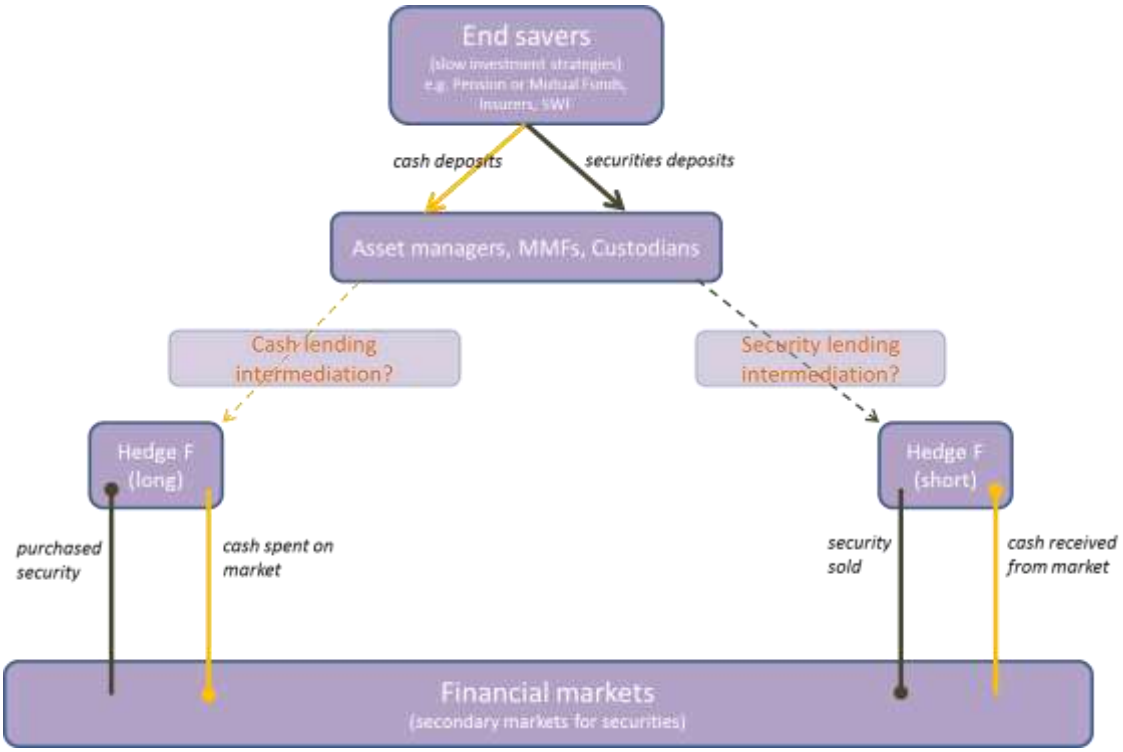
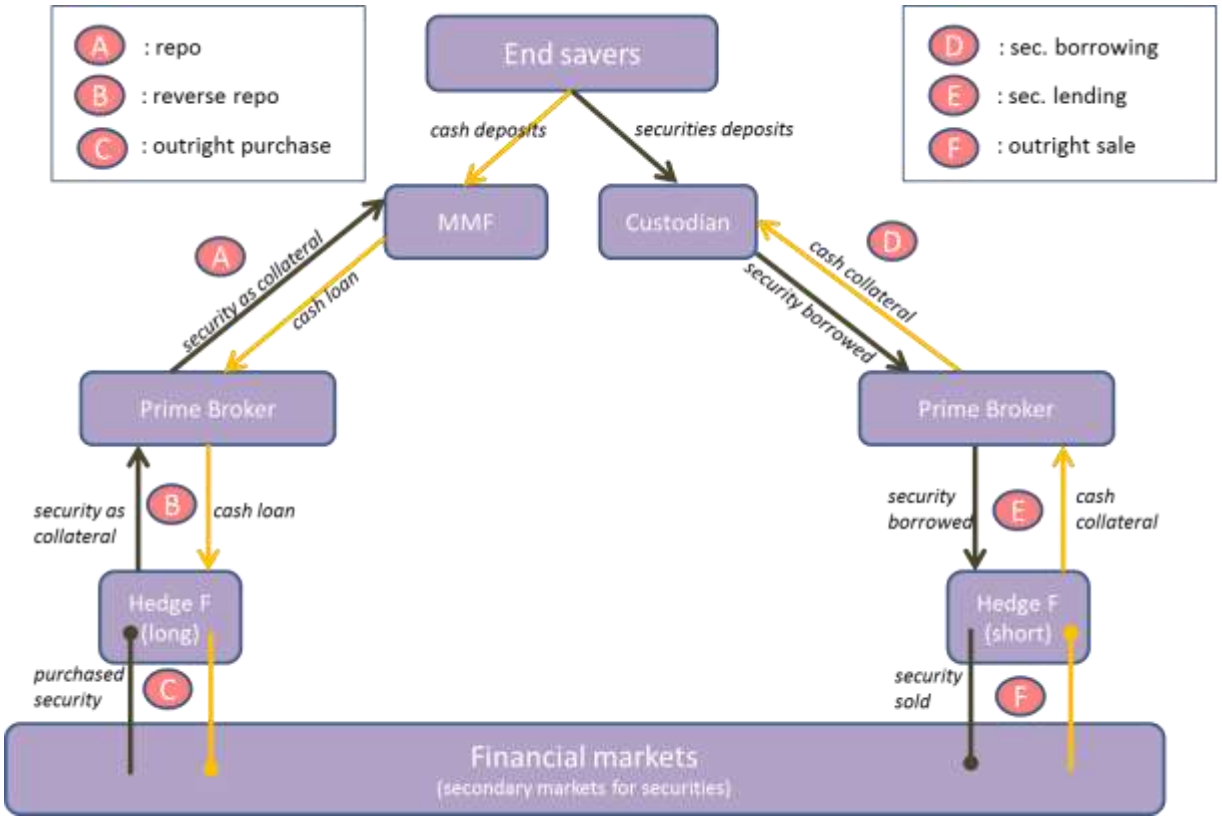


Figure 31 is a stylised representation of the interaction between 'slow' end savers and hedge funds. When a hedge fund takes a long position, it typically exchanges (borrowed) cash against a financial security in secondary financial markets (the cash is represented by a yellow dot and the security by a brown dot). When a fund takes a short position, it typically exchanges a (borrowed) security for cash. In both cases, the hedge fund borrows what it brings to the secondary market (cash or a security). Hedge funds borrow cash and securities through an infrastructure in which prime brokers play a key role. The next section describes this infrastructure.

9.4.2 Prime brokers: a link between hedge funds and end savers

In the simplest economic markets (e.g. some traditional farmers' markets), there are no intermediaries between suppliers and consumers, because they can interact face to face. In the markets for sourcing cash and sourcing securities, long intermediation chains are needed to avoid direct transactions, which would pose legal and operational challenges, or would entail excessive counterparty risk. Cash and securities flow through chains; each link limits such challenges while optimising fees. In a somewhat simplified fashion, Figure 32 depicts these chains. It shows how hedge funds borrow cash and securities in a secured manner from their prime broker. For the sake of expositional clarity, the picture has only one hedge fund, which takes a long position in (only) one security, and another hedge fund selling another security short, each of which deals with its own prime broker. In practice, a hedge fund might do both simultaneously (going short overvalued securities and long undervalued ones) but the same mechanisms are present.[59]

Figure 32: Prime brokers source cash and securities from end savers



[59] Even if one security is used as collateral for borrowing another, such security swaps can follow similar chains, and can sometimes be broken into two cash-for-security swaps.

In Figure 32, there are different types of financial firms, which differ in their holdings and ability or appetite to trade with one another. The figure focuses on the most economically meaningful aspects. Prime brokers intermediate between hedge funds and those who cannot take too much risk and do not know hedge funds' strategies and risks enough to be directly exposed to them (money market funds, custodians). Due to legal and operational requirements, the chain will often be longer than in Figure 32 in practice. Also, it could be that a prime broker sources cash or some securities from another prime broker, which in turn obtains it from an MMF or a custodian.

a. Repo and reverse repo

From the point of view of the prime broker (PB) on the right-hand side of Figure 32, transaction B is a reverse repo: the PB lends cash and the security partially[60] financed with the cash is used as collateral. The PB is generally allowed to enter a repo (transaction A) with a money market fund (or similar counterparty), using the same security as collateral.

The pair A and B is often referred to as a 'matched' pair of security financing transactions, and a book of such matched pairs is referred to as a 'matched book'. But 'matched' here is short-hand for 'approximately matched', as there is generally a mismatch between the contractual maturity of the repo (typically very short term) and that of the reverse repo (which can be several weeks). Prime brokerage services are offered for franchise value reasons, in addition to the income they may generate directly. To maintain franchise value, the PB may have incentives to roll over reverse repos, even in circumstances where the terms of the corresponding repos deteriorate. This means that the maturity mismatch is behaviourally greater than the contractual maturity mismatch. To reflect this, and the risk that not all reverse repo can be terminated if repos stop being rolled over, the Basel Committee decided to set a 15% stable funding requirement on transaction B. This stable funding requirement is lowered to 10% when the collateral is Level 1 HQLAs, because the terms of the repo are less likely to deteriorate with high-quality collateral.

b. Securities borrowing and lending

On the right-hand side of Figure 32, the prime broker enters a security-lending transaction with the 'short' hedge fund, and a security-borrowing transaction with the custodian (or other securities lender, e.g. an asset manager). A security-borrowing transaction is similar to a repo, because cash is received in exchange for a security. But, in contrast to a repo, the cash is meant to cover counterparty risk in this transaction (whereas the *security* covers this risk in a repo). There are some differences between the typical economic uses of these two types of contracts. Equities are commonly borrowed, only more rarely being used as collateral for repo since they are highly volatile. The haircut (difference between value borrowed and collateral) would typically function in the opposite way[61] (i.e. the amount of cash would exceed the value of the security). But the difference can be blurry in practice, making it difficult for a supervisor to ascertain whether a given contract is meant to be a reverse repo or was instead initiated to source a security. For instance,

[60] In repos, the value of the securities used as collateral generally exceeds the cash by an amount called the 'haircut'.

[61] Cf. ISLA documentation, for instance.

'repo specials' are repos where the security to be used as collateral is pre-specified. Often, repo specials are used by the cash provider as a means to borrow a specific security.

c. The NSFR treatment

Reverse repos require 10 to 15% stable funding in the NSFR (depending on collateral quality), while repos are not considered stable funding if they have less than six months of remaining maturity (as is typically the case in practice). Securities borrowing transactions (here with a custodian) also require 10-15% stable funding, while the cash leg of securities lending transactions does not count towards ASF in the NSFR.

There are important risks associated with prime brokerage. Many clients withdrew their assets and cash from brokerage accounts at some of the world's biggest broker dealers in 2008. Thus, there is a need for liquidity and funding stability. Another important step forward is to increase the segregation of client money to avoid the type of dynamic where clients exit their prime broker because they fear that they might not get their assets back immediately in the event of a failure.

In Figure 32, there is a symmetry between pairs A and B and D and E. In both cases, the broker might have difficulties continuing to provide its clients with cash/a security (because it cares about its franchise value) in times when the providers of cash/securities tighten their provision or withdraw it. The risks from A and B are probably strongest, as the collateral given to an MMF is a security, while that given to a custodian is cash. In practice, it would be difficult to distinguish B from D (and therefore the two pairs depicted in Figure 32), as the documentation for both types of contract is often exactly the same.

Some banking association studies have suggested treating client short covering facilitation (pair D and E) as a type of 'interdependent assets and liability' (in the sense of paragraph 45 of the Basel NSFR text). But paragraph 45 states that, in order for an asset-liability pair to qualify, it must be the case that 'the liability cannot fall due while the asset remains on the balance sheet'. In the case of transactions D and E, this condition does not appear to be met. Indeed, E *could* fall due while D remains on the balance sheet (similar to the matched pair of repo and reverse repo A and B).

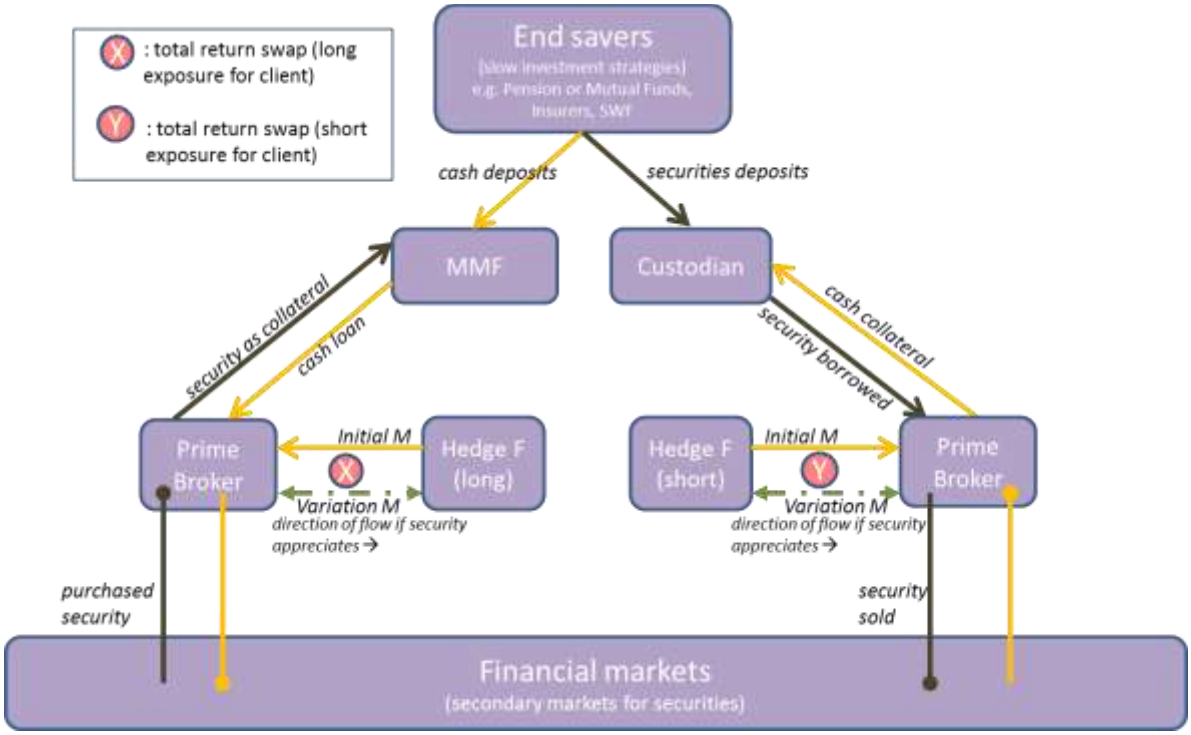
9.4.3 Synthetic long and short positions

In practice, hedge funds and other investors taking long and short positions will often not proceed as depicted in Figure 32. Indeed, they may face restrictions preventing them from holding or borrowing securities directly,[62] or it might not be economically viable for them to gain access to secondary markets (especially if their strategies would require membership to many different markets). When that is the case, hedge funds may ask their prime broker to construct for them a set of synthetic transactions that replicate all the economic consequences they would face if they were behaving as in Figure 31. This type of arrangement is described in Figure 33. As previously explained, hedge funds bet on the basis of the information they acquire. Instead of buying or selling directly, they

[62] In particular, this seems to be the case for UCITS.

have their PB do so for them, and pass on all gains and losses on these leveraged positions via a total return swap (TRS).

Figure 33: Synthetic prime brokerage



In a TRS, variation margin is exchanged frequently (e.g. twice a day). When the swap replicates a long position, the hedge fund receives margin when the security appreciates and posts margin when it depreciates. A swap replicating a short position functions in a symmetrical manner.

Before this transaction is agreed, the hedge fund posts initial margin to the prime broker. The role of initial margin is to cover the difference between variations in the true value of the underlying security and margins exchanged in the past. Indeed, the value of the security is tracked by frequent exchanges of variation margins—but with a delay. This creates a risk that the variation margin exchanged up to the current moment may not fully cover the market value of the underlying security. This is because there can be a delay before losses/gains are noticed on the underlying security. In addition, should the hedge fund fail, there could be a delay between a hedge fund's failure and the time when the swap is closed—time during which a value change might take place. Initial margining protects the PB against this risk. The amount of initial margin depends on the volatility of the underlying security, the hedge fund's credit, and the correlations between the two. Additional initial margin can be raised if these parameters change during the life of the TRS (or when it is rolled over).

If it can be re-pledged, the amount received as initial margin in transaction Y helps the PB provide a haircut, should the custodian require it for the security borrowing transaction. Similarly, re-pledging the initial margin received in transaction X can help the PB provide a haircut in the repo with the MMF or similar counterparty (thus, in that case, the initial margin received serves to fund part of the purchased security).

a. Economic risks and regulation

Since the aim is to replicate the previous hedge fund transactions, there are some similarities in funding risks. But from a regulatory perspective, synthetic brokerage transactions are treated differently (as derivatives plus on-balance-sheet cash or security). As this derivative contract is fully margined, the NSFR treatment of derivative exposures would not impose any stable funding requirement. But to the extent that the TRS is out of the money for the PB, the second step of the NSFR treatment of derivatives imposes a 20% stable funding requirement to the replacement cost gross of variation margin. In the case of transaction X, the replacement cost is equal to the total increase in the value of the underlying security since the TRS started.

In the case of transaction X, the prime broker holds the security on its balance sheet and thus faces a stable funding requirement for it (e.g. 50% or 85% if it is an equity). This implies that the stable funding requirement will typically be much higher for X (synthetic provision of a long exposure to a customer) than for the 'non-synthetic' provision of this service (pair A and B). Studies by banking associations claim that this requirement would make it unattractive for banks to offer a TRS at the current pricing. Thus, they expect increases in prices. Clients include pension funds and mutual funds.

One of the design principles of the Basel NSFR is simplicity. The number of different asset and liability classes and the number of weights used were kept relatively low. This is why the treatment of derivatives does not look at each different type of derivative transaction or prime brokerage transaction, but rather imposes an overall funding requirement for the entire portfolio of derivatives (or prime brokerage activities) instead of assessing the funding risk of each transaction separately. Similarly, the RSF weights on most loans are determined by reference to whether their risk-weight does or does not exceed 35% in the standardised approach, rather than a more detailed model of the funding requirements for each type of contract in various circumstances.

9.4.4 Market making

The previous charts do not give details on the functioning of secondary financial markets. Different structures are used on different markets. While some markets match sellers and buyers using an algorithm, other markets involve market makers who serve buyers and sellers sequentially. These market makers quote prices at which they are willing to serve buyers (ask or offer prices) and sellers (bid prices) up to a given amount. Their inventory increases after they serve a seller and decreases after they serve a buyer. They may choose to finance a long inventory via repo. If they are short,[63]

[63] This is less frequently the case than long positions on assets being traded.

they might borrow securities using reverse repo. They may choose to hedge the market risk associated with their long or short position by entering into a derivative contract.

The costs of repo, reverse repo, and derivatives enter the profit and loss (P&L) of market makers. Regulation may have an impact on these costs. If passed through, a cost increase could result in a higher spread between the ask and bid prices quoted by market makers.

9.4.5 Hedge funds and the macroeconomy

The contribution of hedge funds to society is not the object of a consensus. In part, this is due to the current state of knowledge on the allocative and informational efficiency of financial markets. Some of the ways hedge funds might add value to the economy is by improving price discovery, enabling a better allocation of funding to projects, and increasing the liquidity available for projects (e.g. by intermediating between safe MMF deposits and risky investments, as shown in Figure 34).

9.4.6 Costs and benefits of prime brokerage regulation to the macroeconomy

Figure 34 describes flows of funds from end savers to end borrowers. The objective of regulation is to ensure that private actors internalise the costs of their activities to society and do not excessively rely on guarantees of which they do not bear the full costs. For instance, capital requirements (risk weighted and non-risk weighted) are primarily motivated by the explicit deposit guarantee and implicit loss guarantees for important firms. The NSFR is motivated by externalities resulting from interconnectedness and expectations of public support to banks' funding (cf. Chapter 2 of this report).

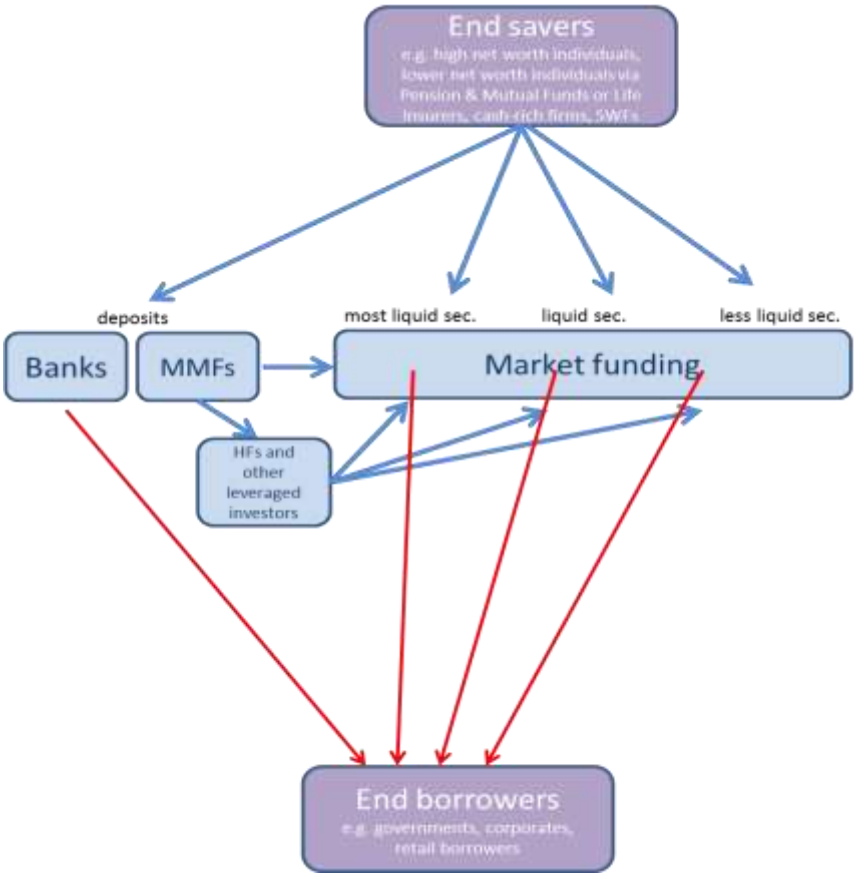


Figure 34: Some selected flows of funding

a. Market making and immediacy

If market making becomes more concentrated and bid-ask spreads increase, some savers may demand slightly[64] higher compensation for holding securities to cover the reduction in immediacy. This compensation would result in slightly higher funding costs for end borrowers. The marginal impact would be a slight increase in yields (all other things being equal) and a reduction in security issuance in primary markets.

According to a recent CGFS study,[65] robust growth in primary bond markets over the past years has pushed the amount of outstanding debt securities to record levels and funding conditions in the corporate bond market have improved considerably (although the outstanding debt of financial institutions has contracted amid efforts to deleverage balance sheets).

The CGFS study reports that asset managers are adapting their investment strategies to account for reduced market making capacity (e.g. they opt for less portfolio turnover). But the paper finds scant evidence that market participants facing fewer regulatory constraints are seeking to replace traditional market makers.

That being said, there was little indication of an overall increase in the cost of trading at the time when the CGFS study was published (November 2014). Although it is inherently difficult, if not impossible, to quantify the socially optimal level of market liquidity and immediacy, feedback received from market participants suggested that, in many markets, the compressed liquidity premia observed before the global financial crisis may not have been sustainable.

b. Fast investment strategies

If prime brokers reduce their provision of prime brokerage services or increase the fees they charge, this may reduce investments by fast investors such as hedge funds. This would also reduce returns for the entities that lend cash and securities to them via the intermediation of prime brokers.

The magnitude of these effects is unknown, because it depends on the steepness of the demand curve for these services (the willingness to pay for them). The impact is difficult to quantify in terms of:

- a potential reduction in funding available for end borrowers in the macroeconomy;
- a potential reduction in returns for savers; and
- A potential reduction in allocation efficiency of funds to projects.

[64] This increase would be moderate because liquidity premia generally form a small part of the overall yield of a financial security.
[65] CGFS paper 52: *Market-making and proprietary trading: industry trends, drivers and policy implications* (November 2014).

Thus, for market making and prime brokerage services, the macroeconomic costs depend on the demand for immediacy and facilitation respectively. The elasticity of these demands is not reliably quantifiable. It is, furthermore, difficult to predict the degree to which the entry of market participants facing fewer regulatory constraints would offset any impact.

But the macroeconomic costs—should any arise—would be similar to a productivity shock, which would slightly lower the natural interest rate. Indeed, these costs are likely to be only a small contributor to interest rates. This slight lowering of the natural interest rate would not be unintended if the pre-crisis period saw too much liquidity and too much funding relative to a sustainable growth objective, as many academic studies suggest. Thus overall, despite uncertainties, the net benefits in terms of long-term growth are expected to be positive, following a more prudent funding of the transactions studied in this section.

10. Interactions between the NSFR and other ratios

This section discusses the marginal impact of introducing a stable funding ratio. Indeed, in 2016 the Commission will face the decision of whether or not to suggest the adoption of a stable funding ratio in addition to existing EU regulatory requirements. This section also describes how different requirements relate to the NSFR, and what the marginal impact of adopting the NSFR would be.

10.1 Motivation

The previous sections of this report have considered the impact of introducing an NSFR, omitting the fact that the NSFR is part of the Basel III framework, which comprises further minimum requirements. Besides the NSFR, the Basel III framework includes three risk-based capital ratios, a leverage ratio, and the LCR. Often, the impact of introducing one minimum requirement is determined in an isolated view, neglecting the effects of the complex interactions of all six minimum requirements of the Basel III framework. Furthermore, by the time the Commission will have to decide whether and how an NSFR will be introduced, other parts of the Basel III framework will already have been put in place.

The impact of introducing the NSFR is usually quantified as a shortfall in terms of stable funding by considering the difference of available and required stable funding. For a clear distinction, this will be referred to as 'isolated shortfall' while the term 'combined shortfall' will be used for the shortfall that takes into account the interactions between the six quantitative minimum requirements of Basel III.

Considering the combined shortfall is of interest for various reasons:

1. Meeting the combined shortfall guarantees compliance with the Basel III ratios. This is not necessarily the case for the isolated approach. For example, covering the isolated capital shortfall allows fulfilling the corresponding capital ratios only if the capital is invested in assets with a zero risk weight.

2. Covering the isolated shortfall due to one ratio may increase or decrease the isolated shortfall due to another ratio. For example, a bank can meet the NSFR by an extension of its balance sheet (increase of ASF); however, this may lead to a violation of the leverage ratio. By taking into account the interactions, the combined shortfall may be larger or smaller than the sum of the isolated shortfalls.

3. The combined shortfall includes adjustments to the denominator of the Basel III ratios. In contrast, the isolated shortfall refers to strategies that increase the numerator of the Basel III ratios (capital, HQLAs, ASF).

10.2 Additive compliance portfolio

Each bank tries to meet all the CRD IV – CRR/Basel III requirements by determining its individual strategy so as to comply with the minimum requirements of the CRD IV – CRR/Basel III framework. Accordingly, it is difficult for analysts to predict banks' individual strategies. Therefore, to estimate the size of the interactions, each bank is assumed to follow a theoretical growth strategy. In order to meet all the quantitative CRD IV – CRR/Basel III requirements at the same time, it is assumed that each bank increases its balance sheet by the smallest possible amount. According to this strategy, each bank will use a selection of capital market instruments in order to reach due compliance (Table 35):[66]

1) Initial and subsequent capital requirements, due to the three risk-based capital ratios and the leverage ratio, are fulfilled by increasing capital. The capital is used to buy HQLAs.

2) The remaining stable funding requirements due to the NSFR are fulfilled using long-term funding from the capital market with a maturity above one year. The new funding is also used to buy HQLAs.

3) The remaining liquidity requirements, due to the LCR, are met using further HQLAs, which are financed by mid-term funding from the capital market.

Table 35: Additive capital market positions considered in the calculation of the combined shortfalls[67]

Δ Assets	**Δ Liabilities**
Δ HQLAs (risk weight and RSF weight zero)	Δ Capital market (mid-term, ASF weight zero, outflow weight zero)
	Δ Capital market (long-term, ASF weight one, outflow weight zero)
	Δ Tier 2
	Δ Additional Tier 1
	Δ CET1

[66] Inspired by Schmaltz, Christian and Heidorn, Thomas, *Distance to Compliance Portfolios: An Integrated Shortfall Measure for Basel III* (Social Science Research Network, March 10, 2014).

[67] Banks are assumed to reach compliance by extending their balance sheet using instruments from the capital market. The mid-term position refers to capital market funding with a maturity between 30 days and 6 months. The long-term position refers to funding with a maturity above one year. HQLAs with a risk weight and RSF weight of zero are considered.

The described scenario offers the advantage of requiring a minimum of information from each bank, namely the numerators and denominators of the Basel III ratios, which correspond to nine numbers per bank. The additive portfolio represents the smallest volume that needs to be added to the initial balance sheet to make the bank compliant. It is noteworthy that the described strategy, which the analysis has relied on, exhibits certain limitations. The calculation is based on a static consideration, i.e. effects that occur when the new instruments reach their maturity are not taken into account, e.g. outflows from the new stable funding will affect the liquidity buffer at some point in the future. Furthermore, institutions are not only using capital market instruments, such as adjusting their business activities, in their strategy to comply with CRD IV – CRR/Basel III. Since the positions related to their core business have different regulatory weights than the positions considered, the required changes in the volume are larger. Additionally, institutions could increase their buffers beyond the minimum requirements, e.g. to meet market expectations.

10.3 Results

Table 36 summarises the aggregation of the resulting capital market portfolios, which are determined for each individual institution in order to make it reach compliance with all the minimum requirements. The required relative extension of the balance sheet varies between 0.1% and 7.6% for the individual business models. In total, the balance sheet extension amounts to 1.6% of all total assets in the sample. It has to be noted that the sample contains fewer institutions than previous chapters since data regarding capital, leverage and liquidity requirements are necessary to perform the analysis. In the described additive scenario, the required long-term funding, which fully qualifies as stable funding in the sense of the NSFR, is determined to amount to EUR 378.5 billion.

Table 37 connects this number to the isolated NSFR shortfall. The isolated NSFR shortfall for the sample considered in the present analysis amounts to EUR 394.8 billion, which is EUR 16.3 billion above the value for the combined NSFR shortfall. In other words, the NSFR shortfall is overestimated by about 4% by omitting the interactions of liquidity and capital requirements. For the individual business models, the overestimation of the NSFR shortfall is found to vary strongly. For example, no effects are observed for the securities trading houses, savings, co-operative, diversified without retail deposits and other institutions that took part in the exercise. For these business models, the NSFR shortfall is identical in the combined and isolated approaches. On the other hand, the NSFR shortfall vanishes in the combined consideration for pass-through institutions. For CCPs, the NSFR shortfall is decreased by about one quarter. The combined NSFR shortfall relative to the total assets within each business model category amounts to up to 3%. Taking the current amount of ASF in each business model category as a reference value, it is found that the combined NSFR shortfall is up to 7%, except for CCPs, which need to increase their ASF by 77% in order to meet the NSFR minimum requirement.

The main driver of the observed decrease of the combined NSFR shortfall compared to the isolated NSFR shortfall is the fact that capital fully qualifies as stable funding. Therefore, the NSFR shortfall tends to be overestimated when ignoring the effects of capital requirements. Besides the interaction effects regarding the NSFR, it is found that the need for Tier 1 capital increases in the described combined approach. It increases, since, due to the leverage ratio requirement, an extension of the balance sheet needs to be backed by further Tier 1 capital. As a consequence of the increased need for Tier 1 capital in the combined approach, the shortfall in Tier 2 capital tends to be slightly overestimated in the isolated approach. Less Tier 2 capital is needed to fulfil the total capital ratio.

As described, the magnitude of the interactions of liquidity and capital requirements strongly depends on the balance sheet structure of each individual bank. Even though the effects of the interactions of capital and liquidity requirements are moderate for the aggregated sample, they can be significant for individual banks. Therefore, it is essential to study the complex effects of the interactions of the regulatory requirements in order to provide a more comprehensive view of the impact of the CRD IV – CRR/Basel III framework.

Table 36: Additive capital market positions[68]

	Numb	Assets	Liabilities					Balance
	er of	HQLAs	CM	CM	Tier 2	Add.	CET1	sheet

[68] The combined shortfalls are calculated across individual banks where a shortfall is observed. The shortfalls are calculated for fully phased-in Basel III standards and include the capital conservation buffer and the capital surcharges for G-SIBs as applicable. Only banks that provided data for capital, leverage and liquidity requirements are considered in the analysis. The HQLA shortfall is driven by the fact that banks only choose HQLAs to invest new capital and new stable funding in the described scenario. The sample considered in this analysis differs from the sample considered in previous chapters, since only institutions that provided all the sought data regarding capital, leverage and liquidity requirements are included.

	banks		mid-term	long-term		Tier 1		extension rel. to total assets in %
Auto & cons.	4	6.4	1.7	4.4	0.2	—	—	3.7
CCP	2	0.6	—	0.4	—	0.1	—	2.4
Co-operatives	37	14.1	1.8	11.5	0.3	0.5	—	0.8
Div. no retail dep.	2	1.8	0.7	1.1	—	—	—	7.6
Local univ.	46	117.8	21.4	88.1	1.6	4.0	2.8	2.5
Mrtg. & build. soc.	17	12.5	0.0	11.6	0.0	0.7	0.2	1.7
Other	13	0.3	0.3	—	—	0.0	—	0.1
Other no retail dep.	9	9.1	0.3	5.9	0.1	2.5	0.3	2.1
Pass-through	2	1.9	—	—	—	1.9	0.0	2.2
Savings	32	10.5	3.4	6.3	0.2	0.5	0.1	1.6
Sec. trading	4	0.1	—	0.1	—	—	—	0.3
Univ. cross-border	28	263.5	0.1	249.1	11.7	1.8	0.9	1.4
Total	**196**	**438.6**	**29.7**	**378.5**	**14.2**	**12.1**	**4.2**	**1.6**

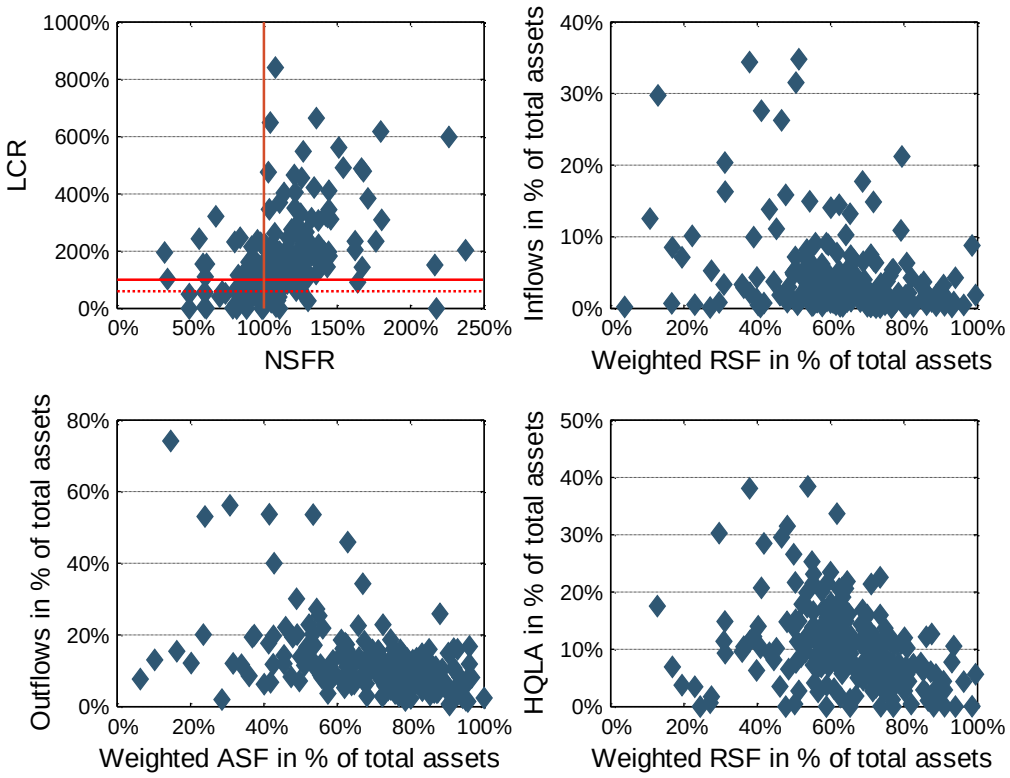
Table 37: Comparison of the combined and isolated NSFR shortfall

		NSFR shortfall in bn EUR			NSFR shortfall in %		
	Number of banks	Isolated	Combined	Combined – isolated	(Combined – isolated) relative to isolated	Combined relative to ASF	Combined relative to total assets
Auto & cons.	4	4.6	4.4	-0.2	-4	4	3
CCP	2	0.6	0.4	-0.1	-26	77	2
Co-operatives	37	11.5	11.5	-0.0	-0	1	1
Div. no retail dep.	2	1.1	1.1	—	—	7	5
Local univ.	46	93.8	88.1	-5.7	-6	3	2
Mrtg. & build. soc.	17	12.4	11.6	-0.8	-6	2	2
Other	13	—	—	—	—	—	—
Other no retail dep.	9	6.3	5.9	-0.4	-6	2	1
Pass-through	2	0.5	—	-0.5	-100	—	—
Savings	32	6.3	6.3	—	—	1	1
Sec. trading	4	0.1	0.1	—	—	1	0
Univ. cross-border	28	257.7	249.1	-8.6	-3	3	1
Total	**196**	**394.8**	**378.5**	**-16.3**	**-4**	**3**	**1**

10.4 The NSFR and the LCR

In order to estimate whether the two liquidity ratios, the LCR and the NSFR, are complementary or substitutable, the relationship between the two liquidity requirements is examined. Figure 35 (top left) illustrated that institutes with a high LCR tend to also report a high NSFR. This is partially expected since the NSFR and the LCR treat certain deposits, especially retail deposits and deposits from small business customers, in a preferential way. Within the LCR they have low outflow rates and in the NSFR they are regarded as stable funding with high ASF weights. Therefore, a negative correlation between outflows and ASF relative to the total assets is expected, which is supported by Figure 35 (bottom left). Also, the expected negative correlation between the risk buffer of the LCR, namely the amount of HQLAs, and RSF, is observed. This can be explained by the low RSF weights for HQLAs (see Figure 35 (bottom right)).

Figure 35: The LCR vs the NSFR



11. Other EU specificities

This section discusses other specific EU transactions that merit a separate analysis.

In a specific framework of centralised regulated savings where banks are required to transfer a determined part of regulated savings accounts' outstandings to a dedicated state-controlled fund that provides loans for public interest operations, where inflows and outflows on the corresponding savings accounts are transferred at least monthly, and where the public fund is legally bound to reimburse the bank in the event of a decrease of the amount of regulated savings due to observed withdrawals, a funding risk does not arise. The part of regulated savings account deposits subject to centralisation in the public fund and the corresponding assets held by the bank are interdependent.

CCPs do not generally rely on maturity transformation and are not expected to rely on short-term funding in order to fund long-term assets and off-balance-sheet activities as captured in the NSFR. Therefore, in these cases, without prejudging the other risks they might run in their activity (which are beyond the scope of this report), CCPs are probably not subject to the type of risk that banking regulation intends to mitigate through the NSFR requirement.

Residential housing retail loans guaranteed by a bank or insurer where, in the event of default of a borrower, the corresponding loan is transferred by the originating credit institution to the guarantor, which then takes over the recovery process. In exchange, the guarantor swiftly reimburses all funds claimed by the credit institution on the loan. If the guarantor cannot be reimbursed by the borrower, it can benefit from a mortgage on the real estate. Indeed, the guarantee is only provided under the initial contractual agreement that the guarantor can benefit from a mortgage on the real estate in case of default. As a consequence, residential guaranteed loans can become mortgage loans at the end of the process. These loans can be analysed as having the same potential liquidity as mortgages as they are commonly securitised or used as underlying assets of covered bond issuances. The RSF factor applicable to mortgages should, therefore, also be granted to residential guaranteed loans.

Not-for-profit financial co-operatives, otherwise known as credit unions, have a significant presence in some EU jurisdictions. Their lending activity and their funding are concentrated on their members. Generally, they are limited (mainly for legal reasons) to investing their excess liquidity in specific items, namely government bonds and bank deposits. Their liquidity risk profile (stability factors) is considered in the LCR DA to be the same as that of non-financial institutions.

The report highlights potential unintended consequences if the same approach (i.e. if credit unions are not treated as non-financial customers when acting as bank depositors) is not followed in the NSFR for the bank deposits they make below six months

This section also contains discussions on the treatment of gold and on the main concerns raised by main market participants.

11.1 An example of interdependent assets and liabilities: regulated savings

Paragraph 45 of the Basel III NSFR sets out the possibility for a specific treatment of interdependent assets and liabilities. This possibility is to permit national discretion in limited circumstances when the liability can solely fund the corresponding assets, the principal payments from the asset flows can only serve to repay the liability, and the liability cannot be repaid while the asset remains on the balance sheet.

Further criteria are:

- the individual interdependent asset and liability items must be clearly identifiable;
- the maturity and principal amount of both the liability and its interdependent asset should be the same;
- the bank is acting solely as a pass-through unit to channel the funding received (the interdependent liability) into the corresponding interdependent asset; and
- the counterparties for each pair of interdependent liabilities and assets should not be the same.

Centralised regulated savings, a feature existent in one EU jurisdiction, fulfil the criteria of paragraph 45 and could, therefore, be recognised as interdependent assets and liabilities. Given the importance of deposits in the NSFR standard, this specificity deserves to be analysed in detail. Regulated savings may represent a significant amount of banks' liabilities referring to retail deposits. These regulated deposits often share common features: full liquidity of the accounts, a state deposit guarantee, a tax benefit (the interest earned by depositors is exempted from income tax and social charges), an interest rate partially set by the state, and a ceiling set by regulation imposing a maximum balance.

Specific national regulations impose credit institutions to transfer a significant part of the regulated savings raised in their balance sheet to a state-owned institution performing public interest financing operations, such as social housing and urban policy investment. The corresponding centralised amount of deposits is managed by the public institution in a dedicated, ad-hoc fund. The latter is bound by national law to reimburse credit institutions in case of a decrease of the amount of regulated savings due to observed withdrawals (less than 10 days between the withdrawal and the reimbursement by the public institution), thus incurring liquidity risk on the behalf of the credit institution if the regulation implementing the NSFR does not explicitly exempt them.

In terms of balance sheet accounting, this centralisation mechanism leads to the recognition of a liability towards the retail customer and a claim towards the state-owned institution centralising regulated savings.

Referring to the criteria set by paragraph 45, centralised regulated savings appear to fulfil the requirement of interdependent assets and liabilities. More precisely:

- the liability (deposit from a retail customer in a regulated savings account) and the asset (financing of a central state-owned institution) are clearly identifiable and are not the same;
- the maturity and principal of both assets and liabilities are the same since any withdrawal of funds by a retail client implies automatically for the centralising public institution to refund the bank; and
- the bank only acts as a pass-through and automatically transfers centralised regulated savings to the public institution.

The NSFR treatment currently used in the QIS templates submitted by credit institutions aims to reflect the neutral impact of the centralisation mechanism on the long-term financing of credit institutions. It also aims to reflect the fact that the centralised part of regulated deposits doesn't constitute stable funding available to cover assets other than the corresponding loan to the centralising public institution. Furthermore, the treatment received by these operations must be consistent with that applied for LCR calculation, as provided for by Article 26 of the Delegated Act. Credit institutions were requested to report the centralised amounts as interdependent assets (claim to the institution centralising regulated saving) and liabilities (regulated retail deposits). In the December 2014 QIS data used for the analysis carried out in this report, centralised regulated savings amount to EUR 229 billion.

11.2 Central counterparties

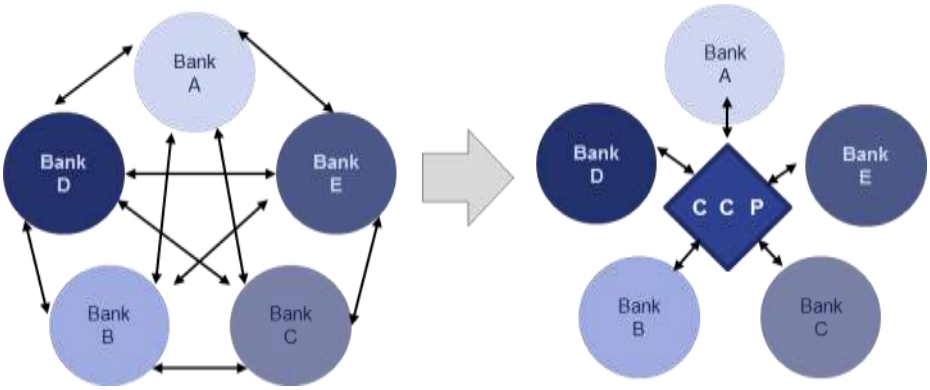
Central counterparties (CCP) act by novation, as requested by Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories, (European Market Infrastructure Regulation –EMIR–), towards market participants, becoming the only buyer for the sellers and the only seller for the buyers. Some CCPs in the EU operate with a banking licence, as EMIR does not prevent Member States from adopting an authorisation as a credit institution for CCPs established in their jurisdiction (Article 14 (5) of EMIR). As such, CCPs may be subject to the upcoming NSFR requirement in a similar way compared to credit institutions.

CCPs are market infrastructures that reduce and manage counterparty risks in financial markets

The core purpose of CCPs is the management and mitigation of risk. Acting by novation reduces counterparty risk for market participants, absorbs shocks and helps to prevent the build-up of excessive risk in the financial system. In addition, CCPs bring efficiencies to market participants by reducing counterparty exposure through the multilateral netting of positions and, in some cases, offering services such as portfolio compression. CCPs are, by design, crisis management

infrastructures that cover the counterparty risk between counterparties during the life of a trade. They perform this function through robust risk management tools, clearly defined under EMIR.

Therefore, all the exposures resulting from CCPs' activity consist of trade exposures against clearing members following the novation act and financial guarantees collected following the application of Article 41 to Article 43 of EMIR to limit their counterparty exposure towards their members.



CCPs acting by novation

The NSFR treatment for clearing activities

A CCP acting by novation holds symmetrical exposures to an initial buyer and seller, to which it becomes the unique counterparty. Clearing house accounts represent a significant part of the asset and liability sides of the balance sheet through, respectively, loans for which securities were received and loans for which securities were delivered under repurchase agreements. CCPs also face relatively large off-balance-sheet exposures related to clearing house commitments received and commitments given to market counterparties.

Often collateralised by Level 1 assets pursuant to Commission-Delegated Regulation 2015/61, repurchase agreements are subject to the NSFR treatment for collateralised loans to financial institutions with a residual maturity lower than six months, and fall under the asymmetrical treatment introduced in the Basel standard (0% ASF versus 10% RSF for similar trades with the initial buyer and the initial seller).

Compensation of derivatives' positions, such as a CDS, may, under a similar mechanism, also create an important NSFR shortfall following the treatment set out in the Basel standard, with the CCP holding collateralised exposures on the asset and liability sides of its balance sheet.

Funding risk profile of CCPs and EMIR requirements

Under EMIR, CCPs cannot carry out usual banking activities, even when granted a banking licence. Their activity only consists of those set out in the novation act, standing between market counterparties and ensuring proper settlement of cleared transactions.

In this context, CCPs do not rely on maturity transformation and have no reliance on short-term funding in order to fund long-term assets and off-balance-sheet activities as captured in the NSFR. It follows that CCPs' activities and their very specific risk profile are not the ones for which the NSFR was developed as a requirement. The NSFR was developed to capture funding risks associated with banking activities, where maturity transformation plays a key role. In contrast, CCPs are indeed payment systems, concentrating a specific counterparty risk and acting for the efficiency of financial operations' settlement; as such, they would need their business model to be captured adequately. Moreover, for those CCPs authorised as credit institutions, direct access to central bank facilities allows for thorough liquidity and funding risk management, especially when dealing with clearing members' default.

EMIR provides the framework for the mitigation of specific CCPs' liquidity and funding risk. The main liquidity risk faced by CCPs, driven by the potential member default, is fully covered by EMIR requirements through the holding of pre-financed financial guarantees collected from clearing members. In the event of default, CCPs will activate their default management process to liquidate in a predefined period the portfolio of the defaulter using the liquidity resources (initial margins, contributions to default fund and own resource—skin in the game[69]—following a waterfall approach) held within EMIR requirements.

In this context, the relevance of liquidity requirements other than the NSFR for CCPs (even those operating with a credit institution licence) should be taken into account because of the specificities of those institutions, for which tailored prudential requirements have been incorporated in other pieces of European legislation.

11.3 EU specificities compared to the NSFR standard: the case of residential guaranteed loans

The NSFR standard recognises specific treatment for unencumbered mortgage loans with a maturity greater than one year and a credit risk weight under the standardised approach of less than 35%; it requires a reduced RSF of 65%. However, the structure and functioning of the financing of domestic residential loans, which can account for a large part of banks' balance sheets depending on their business model, may differ significantly across EU Member States. Notably, the standard does not

[69] The skin in the game is the part of a CCP's capital dedicated to loss absorbency in case initial margins and the contributions of a defaulted entity might not be sufficient. It is defined as a percentage of the own funds requirement (typically 25%) applicable through EMIR.

acknowledge the existence of residential guaranteed loans, which are alternatives to mortgages and constitute underlying assets commonly used for covered bonds issuances or securitisation.

Residential guaranteed loans are residential housing loans, underwritten by the retail part of credit institutions that are insured by a recognised guarantor. These guarantors are regulated financial entities operating under banking or insurance licences, and they can be in-house or external. Residential guaranteed loans form a large part of the housing loans in some jurisdictions in which they are widely refinanced through the issuing of covered bonds.

To accept to grant its guarantee, the guarantor undertakes its own assessment of the credit quality of the borrower (after the one performed by the credit institution itself). Each borrower who is granted a residential guaranteed loan must pay either a deposit or a premium to the guarantor, which mutualises the collected funds to build up reserves[70] for non-performing loans. In the event of default of a borrower, the corresponding loan is transferred by the originating credit institution to the guarantor, which then takes over the recovery process. In exchange, the guarantor swiftly reimburses all funds claimed by the credit institution on the loan. If the guarantor cannot be reimbursed by the borrower, it can benefit from a mortgage on the real estate. Indeed, the guarantee is only provided under the initial contractual agreement that the guarantor can benefit from a mortgage on the real estate in case of default. As a consequence, residential guaranteed loans can become mortgage loans at the end of the process. From the credit institution's point of view, the recovery procedure is immediate as it recovers its investment in the case of non-performance of the loan (from the guarantor through the mutual guarantee fund).

Credit institutions use guarantors for several reasons, including i) to externalise the recovery process (for efficiency as well as commercial reasons); ii) to speed up and secure the recovery of residual claims; and iii) to benefit from a second underwriting assessment on the credit quality of the borrower.

Possible treatment of residential guaranteed loans in a European NSFR framework

The Basel NSFR standard officially recognises that mortgage loans of high quality are more liquid than other assets. However, it remains silent on the RSF to be applied to these residential guaranteed loans, although they can similarly serve as collateral for funding purposes. Not allowing residential guaranteed loans to receive the same RSF as mortgage loans could result in a higher RSF being applied to this category of residential loans. These loans could then be subject to a 100% RSF were they to be assimilated to loans to financial institutions. On the other hand, mortgage loans benefit from a 65% RSF when they receive a 35% or lower risk weight under the standardised approach for credit risk. Given the large market of residential guaranteed loans in some EU countries, this difference in treatment would increase the overall shortfall in specific jurisdictions relying on this guarantee scheme for residential loans.

[70] Mutual guarantee funds (in the case of credit institutions, considered as own funds under certain criteria) or accounting reserves (in the case of insurance companies).

A European NSFR could then assimilate residential guaranteed loans to mortgage loans in order for them to be given equal treatment. Being guaranteed by a guarantor licensed as a financial institution, residential guaranteed loans possess, in terms of long-term funding, a similar credit quality to residential mortgage loans.[71] They also ultimately convert to mortgage loans if no other repayment option has been agreed on between the debtor and the guarantor. Moreover, like mortgage loans, residential guaranteed loans can be used as collateral for covered bonds, in application of Article 129 (1) (e) of the CRR, and for securitisation. Residential guaranteed loans can then be monetised to receive funding. This ability to monetise mortgage loans is the reason why mortgages can benefit from a preferential 65% RSF in the NSFR.

As a conclusion given the strong similarity in terms of liquidity between residential guaranteed loans and mortgage loans in Europe, the definition of long-term residential loans eligible to receive a 65% RSF factor could then also be recognised for residential guaranteed loans.

Following this reasoning, institutions have reported residential guaranteed loans in the same category as mortgage loans in the December 2014 QIS reporting.

11.4 Credit unions and the NSFR

European credit unions are not-for-profit financial co-operatives with a significant presence in some EU jurisdictions (mainly the UK and Ireland). Their investment is mainly limited (to a great extent for legal reasons) to loans to members, government-guaranteed bonds, bank bonds, and bank deposits. Their funding is basically via savings deposits from members. These limited activities reduce their risk profile but also their income sources to maintain the credit union as an economically sustainable enterprise.

Even though they are classified as financial customers in accordance with Article 411 (1) of the CRR, their liquidity risk profile has been assimilated in the LCR DA with that of non-financial institutions, since their deposits placed with banks have the same outflow rate as the one envisaged for deposits from non-financial customers.

Irish credit unions are not subject to the LCR in accordance with Article 2 (5) of the CRD and would consequently not be subject to the NSFR.

The risk credit unions face in the context of the Basel NSFR definition is the treatment that their bank deposits may receive in the NSFR of the bank receiving them and how it could impact the yield these deposits may earn and consequently the general sustainability of credit unions. At present, since they are formally considered financial customers, the ASF factor to be applied following the Basel NSFR definition would be 0% if the deposits mature within 6 months, 50% if the maturity is between 6 and 12 months, and 100% if the maturity is above 12 months. In the case of non-financial

[71] See the EBA report on *EU covered bond frameworks and capital treatment*, published in July 2014.

depositors, the factors are the same except for the below six months bucket, in which case the applicable factor is 50%.

Consideration should be given to the possibility of extending the treatment envisaged for non-financial bank depositors in the NSFR to credit unions when acting as bank depositors (as in the LCR treatment), due to the potential unintended consequences that could be triggered if they were considered financials in this context.

11.5 Gold

The report does not contain an additional quantitative analysis of gold apart from the general approach followed for all categories under the Basel QIS data in the context of the NSFR for reasons of data constraints.

Concerns have been raised by some professional associations (in particular London Bullion Market Association –LBMA–, World Gold Council –WGC–) with respect to the treatment of gold in the Basel standard, where an RSF factor of 85% is required for all commodities held on balance sheet. These associations voice the need to consider an important quality of gold, in their view, which is its total depth of liquidity on a global basis. They are also of the view that an 85% RSF factor will raise funding costs for banks funding bullion trades, and that such an increase in funding costs could ultimately lead these banks to exit the gold business or increase prices for their customers. These customers of desks funding gold and other precious metals include refiners, some clients of which are companies that produce catalysts made of precious metals.

The banks active in the bullion trade in the EU are generally large banks for which this activity would represent a small part of their balance sheet and NSFR calculation. Thus, the potential incentives or disincentives to carry out gold-related transactions in the future would come from transfer pricing or funding cost allocation within these large banks, if the activities are not deemed sufficiently profitable overall relative to other activities that would result in lower stable funding requirements. The QIS NSFR template does not give information specifically on gold.

As explained in different chapters of this report, the market liquidity of an asset is a key feature in determining how much of it should be stably funded. The more an asset is able to be liquidated without loss, the lower the funding risk of this asset. Thus, assets would necessitate stable funding to the extent that they are not able to be certainly liquidated. For many assets, this is expressed by means of the haircut that is applied for the liquidity coverage requirement. The Basel standard does not include gold as a liquid asset for this purpose and considers it a commodity; investments in it should be stably funded with 85% of their value. In Europe, the LCR DA does not consider gold a liquid asset either, consistent with the Basel approach.

Specifically, the industry has raised concerns on the impact of the Basel NSFR treatment on the following transactions, mainly:

- Banking loans secured with gold with a maturity of roughly two months (as an average in market) are funded with match funding. The industry's concern is that the cost of the loans will grow significantly if stable funding is required for them.

  The EBA understands that there is a funding risk inherent in these transactions. Some rollover of these loans might need to be assumed to take place in all circumstances, for franchise reasons. As a result, some positive amount of stable funding would appear necessary to ensure an appropriate stable funding structure.

- Spot purchases of gold with one counterparty linked to forward sales of gold with a different counterparty. Gold will be reflected as a stock in the balance sheet and the forward sale as a derivative. Both transactions cannot be netted and gold would be subject to an RSF factor of 85%.

  The EBA understands that the NSFR is a metric computed on the basis of on-balance-sheet positions. Derivative liabilities can only be considered stable funding for derivative assets, but not for any other kind of assets, as explained in Chapter 9.

- Spot purchases of gold where the bank sells it through the futures market on the date of purchase. Here, the gold is held on the bank's balance sheet and can be delivered to the counterparty on close-out of the future because a gold future is a deliverable contract.

  The EBA understands here that, in all those cases where the bank funds the gold used by a client, the funding risk is related to the need to maintain the client's funding. And although gold is not a HQLA, this funding need could possibly not need to be directly related to the fact that the funding is for a commodity, as the counterparty is the client for which the funding is done.

It should be noted that the EBA's views are purely based on an assessment from an EU banks' perspective, which is the aim of this report. The EBA does not disregard that there could be other angles to consider, like the potential implications on final users or the impacts on third countries. Also, the possibility that the cited data constraints, particularly on OTC transactions, have made the analysis difficult to approach from other perspectives or angles should not be disregarded.

ANNEX 1: AGGREGATED LEVEL TABLES

Table 38: Nominal impact for the entire sample – constant BS – two-sided migration

	Nominal impact (bn EUR)	Mean	Median	5th percentile	95th percentile
ASF	100% ASF capital and liabilities > 1Y	12	-114.19	-697.42	1203.47
	95% ASF stable retail deposits	422.33	400.20	-464.35	1486.64
	90% ASF less stable retail deposits	191.57	169.45	-261.21	810.18
	50% ASF non-retail liabilities	-41.56	-106.25	-527.96	883.54
	0% ASF non-retail liabilities	-585.94	-670.02	-1204.41	241.33
	85% ASF coop statutory (retail) deposits	1.91	0.00	0.00	0.00
RSF	0% RSF assets	-66.53	-127.57	-313.32	362.51
	100% RSF assets	102.56	-69.37	-586.01	1291.61
	100% RSF LT encumbered assets	-235.65	-263.67	-631.53	251.49
	15% RSF assets	-50.39	-157.12	-332.01	659.67
	50% RSF assets	-53.09	-92.11	-263.96	267.55
	10% RSF assets	-72.36	-157.85	-302.76	204.45
	5% RSF Level 1 assets	141.59	68.81	-244.11	768.10
	15% RSF Level 2A assets	-25.75	-49.27	-126.61	143.92
	50% RSF lending	9.92	-50.05	-364.95	576.23
	65% RSF lending	325.46	244.38	-381.08	1233.75
	85% RSF lending	18.27	-57.82	-587.68	760.76
	85% RSF assets	-94.15	-119.84	-294.45	189.17
	100% RSF 20% deriv. payables	-30.14	-31.18	-64.48	5.40
	100% RSF LT CB encumbered assets	0.12	0.00	0.00	0.00
	Off-BS items	-82.93	-147.16	-608.68	571.83

Table 39: Impact for the entire sample as a percentage of the aggregated BS of the compliant and non-compliant banks – constant BS – two-sided migration

	% of BS of the entire industry	Mean	Median	5th percentile	95th percentile
ASF	100% ASF capital and liabilities > 1Y	0.05%	-0.45%	-2.77%	4.78%
	95% ASF stable retail deposits	1.68%	1.59%	-1.84%	5.90%
	90% ASF less stable retail deposits	0.76%	0.67%	-1.04%	3.22%
	50% ASF non-retail liabilities	-0.16%	-0.42%	-2.10%	3.51%
	0% ASF non-retail liabilities	-2.33%	-2.66%	-4.78%	0.96%
	85% ASF coop statutory (retail) deposits	0.01%	0.00%	0.00%	0.00%
RSF	0% RSF assets	-0.26%	-0.51%	-1.24%	1.44%
	100% RSF assets	0.41%	-0.28%	-2.33%	5.13%
	100% RSF LT encumbered Assets	-0.94%	-1.05%	-2.51%	1.00%
	15% RSF assets	-0.20%	-0.62%	-1.32%	2.62%
	50% RSF assets	-0.21%	-0.37%	-1.05%	1.06%
	10% RSF assets	-0.29%	-0.63%	-1.20%	0.81%
	5% RSF Level 1 assets	0.56%	0.27%	-0.97%	3.05%

	15% RSF Level 2A assets	-0.10%	-0.20%	-0.50%	0.57%
	50% RSF lending	0.04%	-0.20%	-1.45%	2.29%
	65% RSF lending	1.29%	0.97%	-1.51%	4.90%
	85% RSF lending	0.07%	-0.23%	-2.33%	3.02%
	85% RSF assets	-0.37%	-0.48%	-1.17%	0.75%
	100% RSF 20% deriv. payables	-0.12%	-0.12%	-0.26%	0.02%
	100% RSF LT CB encumbered assets	0.00%	0.00%	0.00%	0.00%
	Off-BS items	-0.33%	-0.58%	-2.42%	2.27%

Table 40: Impact for the entire sample as a percentage of the aggregated BS of the non-compliant institutions – constant BS – two-sided migration

	% of BS of the non-compliant institutions	Mean	Median	5th percentile	95th percentile
ASF	100% ASF capital and liabilities > 1Y	0.12%	-1.22%	-7.43%	12.82%
	95% ASF stable retail deposits	4.50%	4.26%	-4.95%	15.83%
	90% ASF less stable retail deposits	2.04%	1.80%	-2.78%	8.63%
	50% ASF non-retail liabilities	-0.44%	-1.13%	-5.62%	9.41%
	0% ASF non-retail liabilities	-6.24%	-7.14%	-12.83%	2.57%
	85% ASF coop statutory (retail) deposits	0.02%	0.00%	0.00%	0.00%
RSF	0% RSF assets	-0.71%	-1.36%	-3.34%	3.86%
	100% RSF assets	1.09%	-0.74%	-6.24%	13.76%
	100% RSF LT encumbered assets	-2.51%	-2.81%	-6.73%	2.68%
	15% RSF assets	-0.54%	-1.67%	-3.54%	7.03%
	50% RSF assets	-0.57%	-0.98%	-2.81%	2.85%
	10% RSF assets	-0.77%	-1.68%	-3.22%	2.18%
	5% RSF Level 1 assets	1.51%	0.73%	-2.60%	8.18%
	15% RSF Level 2A assets	-0.27%	-0.52%	-1.35%	1.53%
	50% RSF lending	0.11%	-0.53%	-3.89%	6.14%
	65% RSF lending	3.47%	2.60%	-4.06%	13.14%
	85% RSF lending	0.19%	-0.62%	-6.26%	8.10%
	85% RSF assets	-1.00%	-1.28%	-3.14%	2.01%
	100% RSF 20% deriv. payables	-0.32%	-0.33%	-0.69%	0.06%
	100% RSF LT CB encumbered assets	0.00%	0.00%	0.00%	0.00%
	Off-BS items	-0.88%	-1.57%	-6.48%	6.09%

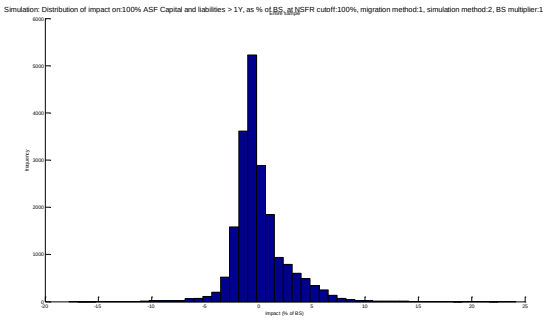
Table 41: Impact for the entire sample as a percentage of initial amounts reported by non-compliant institutions – constant BS – two-sided migration

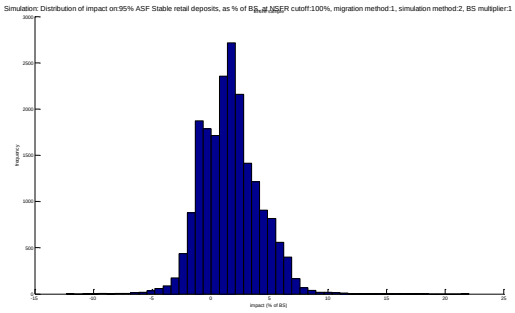
	% of initial values - non-compliant institutions	Mean	Median	5th percentile	95th percentile
ASF	100% ASF capital and liabilities > 1Y	0.41%	-4.00%	-24.41%	42.13%
	95% ASF stable retail deposits	40.68%	38.55%	-44.73%	143.20%
	90% ASF less stable retail deposits	31.15%	27.55%	-42.47%	131.74%
	50% ASF non-retail liabilities	-2.48%	-6.33%	-31.48%	52.68%
	0% ASF non-retail liabilities	-18.30%	-20.92%	-37.61%	7.54%

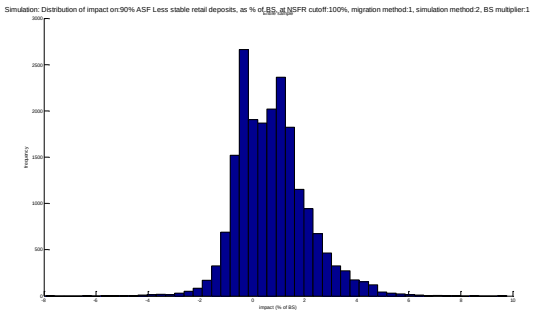
RSF	0% RSF assets	-8.94%	-17.15%	-42.12%	48.73%
	100% RSF assets	7.81%	-5.28%	-44.63%	98.36%
	100% RSF LT encumbered assets	-18.56%	-20.77%	-49.74%	19.81%
	15% RSF assets	-8.31%	-25.92%	-54.76%	108.81%
	50% RSF assets	-10.49%	-18.19%	-52.13%	52.84%
	10% RSF assets	-12.99%	-28.35%	-54.37%	36.71%
	5% RSF Level 1 assets	19.88%	9.66%	-34.27%	107.84%
	15% RSF Level 2A assets	-11.00%	-21.04%	-54.07%	61.46%
	50% RSF lending	1.04%	-5.25%	-38.27%	60.42%
	65% RSF lending	40.67%	30.54%	-47.62%	154.16%
	85% RSF lending	1.42%	-4.50%	-45.78%	59.27%
	85% RSF assets	-17.59%	-22.38%	-55.00%	35.34%
	100% RSF 20% deriv. payables	-26.30%	-27.20%	-56.26%	4.71%
	Off-BS items	-5.37%	-9.53%	-39.41%	37.03%

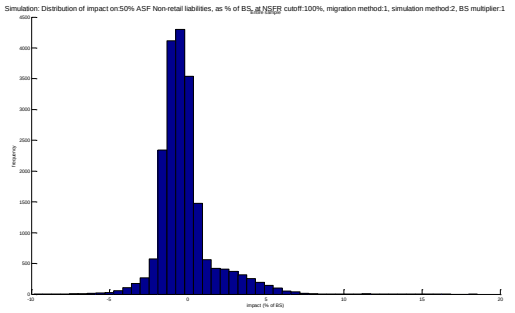
ANNEX 2 – ADJUSTMENT TO COMPLIANCE WITH THE NSFR – AGGREGATED LEVEL CHARTS

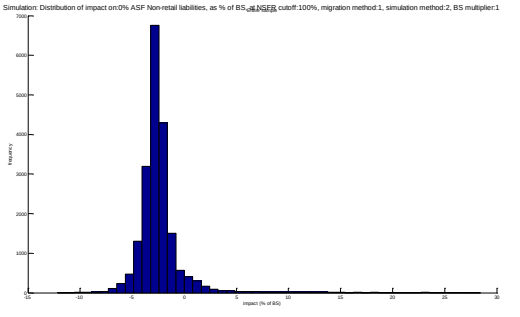
Note that the graphs are presented in terms of a percentage of the aggregated balance sheet for the entire industry, being composed of both compliant and non-compliant institutions. They shows the distribution of results we got from each of our simulations.

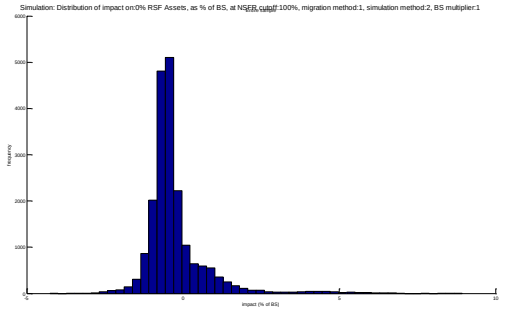


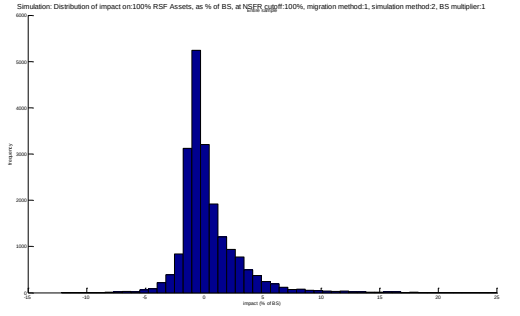


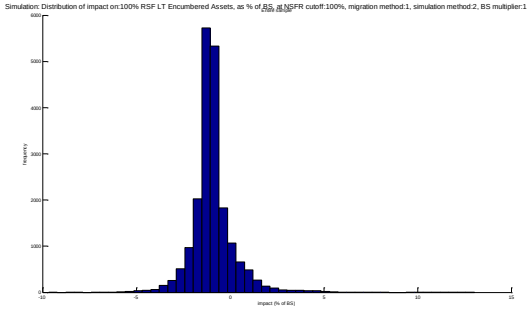


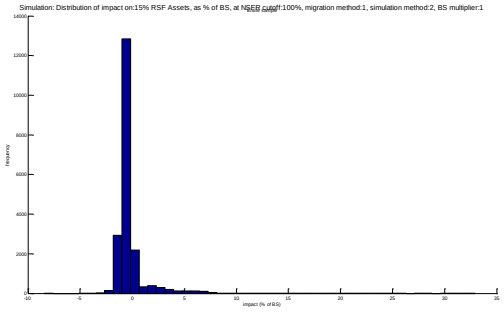








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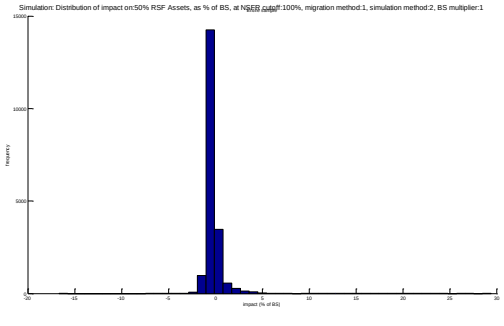
Frequency
Impact (% of BS)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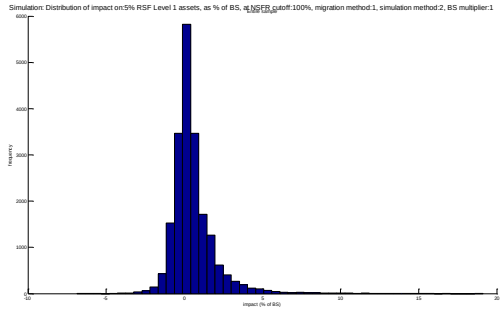
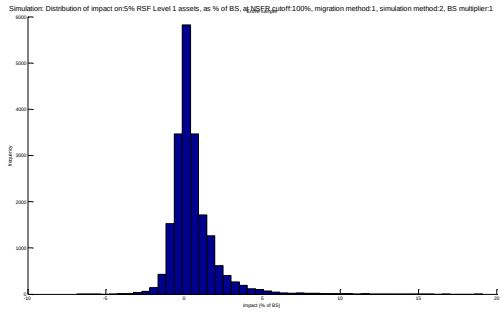
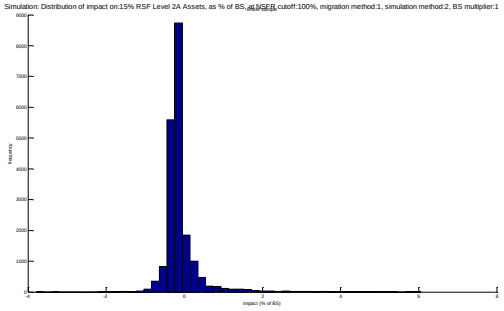
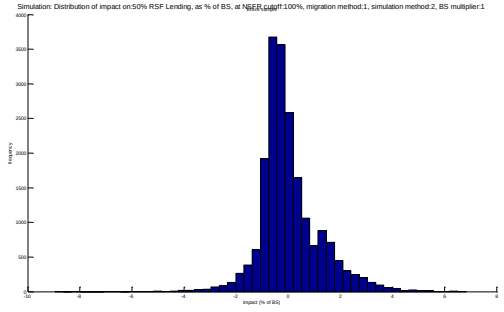
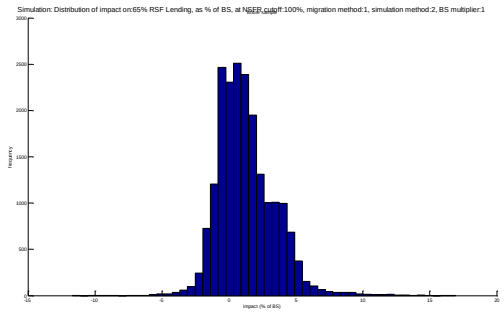
Frequency
Impact (% of BS)

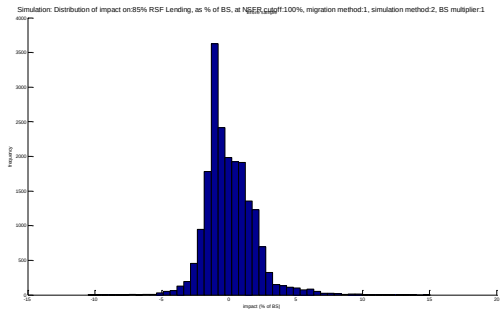

Simulation: Distribution of impact on:5% RSF Level 1 assets, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Frequency
Impact (% of BS)

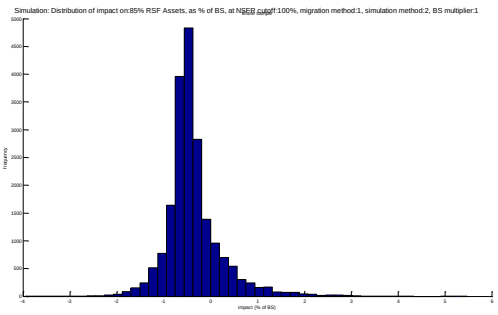

Simulation: Distribution of impact on:5% RSF Level 1 assets, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Frequency
Impact (% of BS)

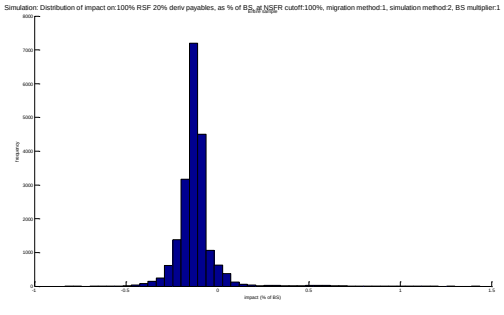

Simulation: Distribution of impact on:15% RSF Level 2A Assets, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Frequency
Impact (% of BS)

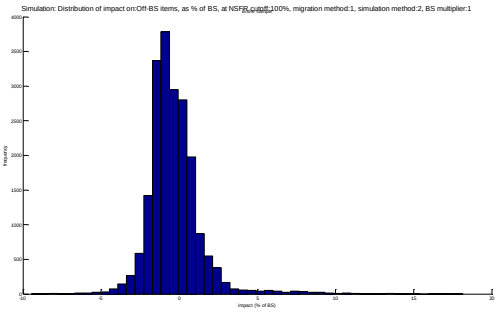

Simulation: Distribution of impact on:50% RSF Lending, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Frequency
Impact (% of BS)

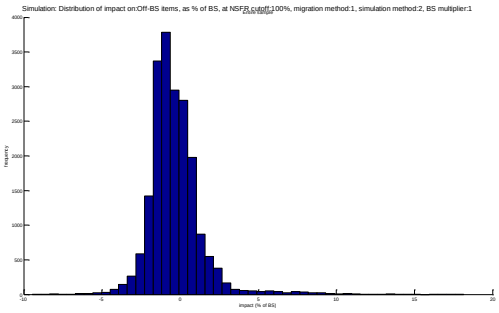

Simulation: Distribution of impact on:65% RSF Lending, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Frequency
Impact (% of BS)


Simulation: Distribution of impact on:85% RSF Lending, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Frequency
Impact (% of BS)


Simulation: Distribution of impact on:85% RSF Assets, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Frequency
Impact (% of BS)


Simulation: Distribution of impact on:100% RSF 20% deriv payables, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Frequency
Impact (% of BS)


Simulation: Distribution of impact on:Off-BS items, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Frequency
Impact (% of BS)


Simulation: Distribution of impact on:Off-BS items, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Frequency
Impact (% of BS)

ANNEX 3 GRANULAR BUSINESS MODEL TABLES

	Mean nominal impact (bn EUR)	Univ. cross-border	Mrtg. & build.soc.	Co-operatives	Local univ.	CCP	Savings	Other no retail dep.	Auto & cons.	Sec. trading	Pass-through	Div. no retail dep.	Total
	# compliant banks	21	14	35	63	2	26	7	1	4	1	1	175
	# non-compliant banks	11	6	11	17	1	14	5	5	5	6	2	83
ASF	100% ASF capital and liabilities > 1Y	55.94	-4.65	-63.93	-40.72	1.03	2.84	7.81	0.66	74.06	-10.72	7.55	29.86
ASF	95% ASF stable retail deposits	177.76	18.29	54.39	73.60	0.00	4.80	0.00	-5.58	23.38	0.00	0.00	346.64
ASF	90% ASF less stable retail deposits	181.83	-0.16	16.93	56.96	0.00	1.21	0.00	10.15	16.21	0.00	0.00	283.12
ASF	50% ASF non-retail liabilities	72.57	-3.82	16.98	-17.68	1.09	-4.11	0.21	-0.10	55.60	10.80	-0.30	131.24
ASF	0% ASF non-retail liabilities	-488.10	-9.66	-24.37	-72.76	-2.12	-4.73	-8.01	-5.13	-169.25	-0.08	-7.26	-791.48
ASF	85% ASF coop statutory (retail) deposits	0.00	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61
RSF	0% RSF assets	-86.12	0.52	2.68	16.85	-6.75	-0.09	-6.51	0.02	0.84	1.66	0.01	-76.88
RSF	100% RSF assets	68.86	2.12	-3.63	-18.08	0.07	-3.46	-2.64	0.98	71.84	-23.62	-0.87	91.56
RSF	100% RSF LT encumbered assets	-60.87	-11.02	-38.94	-77.24	0.00	2.45	-15.87	-2.30	-7.92	-71.42	0.00	-283.13
RSF	15% RSF assets	-58.01	-0.44	-1.86	-7.78	4.36	0.09	5.30	2.18	-13.60	-2.56	1.53	-70.77
RSF	50% RSF assets	65.00	1.37	-2.27	-19.39	0.01	-0.52	0.80	-0.08	19.49	-2.31	-0.01	62.09
RSF	10% RSF assets	-131.01	-0.18	4.33	-4.27	0.83	-0.06	-1.56	-0.83	-50.23	0.00	0.00	-182.97
RSF	5% RSF Level 1 assets	41.20	0.14	18.22	21.61	0.92	4.81	0.30	-0.52	-2.24	12.88	-4.52	92.80
RSF	15% RSF Level 2A assets	-41.04	0.53	-8.83	3.84	0.55	-0.17	-0.08	0.00	0.76	0.86	0.00	-43.58
RSF	50% RSF lending	76.13	0.50	3.02	11.57	0.00	1.95	-3.70	1.88	15.01	29.04	4.97	140.37
RSF	65% RSF lending	184.11	7.81	15.81	42.53	0.00	-6.63	16.77	0.00	0.00	56.92	-2.27	315.06
RSF	85% RSF lending	23.01	-1.61	17.38	32.61	0.00	2.59	6.11	-0.57	-0.57	0.00	2.51	81.,46
RSF	85% RSF assets	-82.38	0.26	-5.93	-2.26	0.01	-0.95	1.09	-0.77	-33.38	-1.45	-1.36	-127.12
RSF	100% RSF 20% deriv. payables	-14.20	-0.08	-0.56	-4.20	0.00	-0.04	0.06	-0.03	-12.13	0.07	-0.33	-31.44
RSF	100% RSF LT CB encumbered assets	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12
	Off-BS items	126.56	-1.06	-0.10	-11.00	2.99	0.33	-5.10	-1.76	13.53	1.30	1.90	127.60

	Mean impact as % of BS of entire business model	Univ. cross-border	Mrtg. & build.soc.	Co-operatives	Local univ.	CCP	Savings	Other no retail dep.	Auto & cons.	Sec. trading	Pass-through	Div. no retail dep.	Total
	# compliant banks	21	14	35	63	2	26	7	1	4	1	1	175
	# non-compliant banks	11	6	11	17	1	14	5	5	5	6	2	83
ASF	100% ASF capital and liabilities > 1Y	0.35%	-0.59%	-3.26%	-0.79%	2.16%	0.35%	1.69%	0.41%	18.22%	-2.26%	13.66%	0.11%
ASF	95% ASF stable retail deposits	1.12%	2.32%	2.77%	1.43%	0.00%	0.59%	0.00%	-3.52%	5.75%	0.00%	0.00%	1.30%
ASF	90% ASF less stable retail deposits	1.15%	-0.02%	0.86%	1.11%	0.00%	0.15%	0.00%	6.41%	3.99%	0.00%	0.00%	1.06%
ASF	50% ASF non-retail liabilities	0.46%	-0.48%	0.87%	-0.34%	2.27%	-0.51%	0.05%	-0.06%	13.68%	2.27%	-0.53%	0.49%
ASF	0% ASF non-retail liabilities	-3.08%	-1.23%	-1.24%	-1.42%	-4.43%	-0.58%	-1.74%	-3.24%	-41.64%	-0.02%	-13.13%	-2.97%
ASF	85% ASF coop statutory (retail) deposits	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
RSF	0% RSF assets	-0.54%	0.07%	0.14%	0.33%	-14.13%	-0.01%	-1.41%	0.02%	0.21%	0.35%	0.03%	-0.29%
RSF	100% RSF assets	0.43%	0.27%	-0.19%	-0.35%	0.14%	-0.43%	-0.57%	0.62%	17.68%	-4.97%	-1.57%	0.34%
RSF	100% RSF LT encumbered assets	-0.38%	-1.40%	-1.99%	-1.50%	0.00%	0.30%	-3.44%	-1.45%	-1.95%	-15.02%	0.00%	-1.06%
RSF	15% RSF assets	-0.37%	-0.06%	-0.09%	-0.15%	9.14%	0.01%	1.15%	1.38%	-3.35%	-0.54%	2.77%	-0.27%
RSF	50% RSF assets	0.41%	0.17%	-0.12%	-0.38%	0.02%	-0.06%	0.17%	-0.05%	4.80%	-0.49%	-0.02%	0.23%
RSF	10% RSF assets	-0.83%	-0.02%	0.22%	-0.08%	1.73%	-0.01%	-0.34%	-0.52%	-12.36%	0.00%	0.00%	-0.69%
RSF	5% RSF Level 1 assets	0.26%	0.02%	0.93%	0.42%	1.93%	0.59%	0.06%	-0.33%	-0.55%	2.71%	-8.18%	0.35%
RSF	15% RSF Level 2A assets	-0.26%	0.07%	-0.45%	0.07%	1.15%	-0.02%	-0.02%	0.00%	0.19%	0.18%	0.00%	-0.16%
RSF	50% RSF lending	0.48%	0.06%	0.15%	0.23%	0.00%	0.24%	-0.80%	1.19%	3.69%	6.11%	8.99%	0.53%
RSF	65% RSF lending	1.16%	0.99%	0.81%	0.83%	0.00%	-0.82%	3.63%	0.00%	0.00%	11.97%	-4.10%	1.18%
RSF	85% RSF lending	0.15%	-0.20%	0.89%	0.63%	0.00%	0.32%	1.32%	-0.36%	-0.14%	0.00%	4.54%	0.31%
RSF	85% RSF assets	-0.52%	0.03%	-0.30%	-0.04%	0.02%	-0.12%	0.24%	-0.48%	-8.21%	-0.30%	-2.46%	-0.48%
RSF	100% RSF 20% deriv. payables	-0.09%	-0.01%	-0.03%	-0.08%	0.00%	0.00%	0.01%	-0.02%	-2.98%	0.01%	-0.59%	-0.12%
RSF	100% RSF LT CB encumbered assets	0.01%	0.00%	0.00%	0.00%	0.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Off-BS items	0.80%	-0.13%	0.00%	-0.21%	6.27%	0.04%	-1.11%	-1.11%	3.33%	0.27%	3.43%	0.48%
	Legend:	Δ>1%	Δ>5%	Δ>10%									

	Mean impact as % of BS of the non-compliant institutions	Univ. cross-border	Mrtg. & build.soc.	Co-operatives	Local univ.	CCP	Savings	Other no retail dep.	Auto & cons.	Sec. trading	Pass-through	Div. no retail dep.	Total
	# compliant banks	21	14	35	63	2	26	7	1	4	1	1	175
	# non-compliant banks	11	6	11	17	1	14	5	5	5	6	2	83
ASF	100% ASF capital and liabilities > 1Y	0.86%	-2.46%	-9.00%	-2.85%	4.66%	3.30%	6.79%	0.48%	22.00%	-2.42%	17.57%	0.30%
ASF	95% ASF stable retail deposits	2.74%	9.68%	7.66%	5.15%	0.00%	5.59%	0.00%	-4.12%	6.95%	0.00%	0.00%	3.47%
ASF	90% ASF less stable retail deposits	2.81%	-0.08%	2.38%	3.98%	0.00%	1.40%	0.00%	7.50%	4.81%	0.00%	0.00%	2.83%
ASF	50% ASF non-retail liabilities	1.12%	-2.02%	2.39%	-1.24%	4.91%	-4.79%	0.18%	-0.07%	16.52%	2.43%	-0.69%	1.31%
ASF	0% ASF non-retail liabilities	-7.53%	-5.11%	-3.43%	-5.09%	-9.58%	-5.51%	-6.97%	-3.79%	-50.28%	-0.02%	-16.88%	-7.92%
ASF	85% ASF coop statutory (retail) deposits	0.00%	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
RSF	0% RSF assets	-1.33%	0.28%	0.38%	1.18%	-30.54%	-0.11%	-5.67%	0.02%	0.25%	0.37%	0.03%	-0.77%
RSF	100% RSF assets	1.06%	1.12%	-0.51%	-1.26%	0.31%	-4.03%	-2.30%	0.72%	21.34%	-5.32%	-2.01%	0.92%
RSF	100% RSF LT encumbered assets	-0.94%	-5.83%	-5.48%	-5.40%	0.00%	2.86%	-13.80%	-1.70%	-2.35%	-16.09%	0.00%	-2.83%
RSF	15% RSF assets	-0.90%	-0.23%	-0.26%	-0.54%	19.75%	0.11%	4.61%	1.61%	-4.04%	-0.58%	3.57%	-0.71%
RSF	50% RSF assets	1.00%	0.72%	-0.32%	-1.36%	0.04%	-0.61%	0.69%	-0.06%	5.79%	-0.52%	-0.03%	0.62%
RSF	10% RSF assets	-2.02%	-0.10%	0.61%	-0.30%	3.74%	-0.08%	-1.36%	-0.61%	-14.92%	0.00%	0.00%	-1.83%
RSF	5% RSF Level 1 assets	0.64%	0.08%	2.57%	1.51%	4.18%	5.60%	0.26%	-0.38%	-0.66%	2.90%	-10.52%	0.93%
RSF	15% RSF Level 2A assets	-0.63%	0.28%	-1.24%	0.27%	2.48%	-0.20%	-0.07%	0.00%	0.22%	0.19%	0.00%	-0.44%
RSF	50% RSF lending	1.17%	0.27%	0.43%	0.81%	0.01%	2.27%	-3.22%	1.39%	4.46%	6.54%	11.56%	1.40%
RSF	65% RSF lending	2.84%	4.13%	2.23%	2.97%	0.00%	-7.72%	14.59%	0.00%	0.00%	12.83%	-5.28%	3.15%
RSF	85% RSF lending	0.36%	-0.85%	2.45%	2.28%	0.00%	3.01%	5.32%	-0.42%	-0.17%	0.00%	5.84%	0.82%
RSF	85% RSF assets	-1.27%	0.14%	-0.84%	-0.16%	0.04%	-1.11%	0.95%	-0.57%	-9.92%	-0.33%	-3.17%	-1.27%
RSF	100% RSF 20% deriv. payables	-0.22%	-0.04%	-0.08%	-0.29%	0.00%	-0.04%	0.05%	-0.02%	-3.60%	0.02%	-0.76%	-0.31%
RSF	100% RSF LT CB encumbered assets	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
	Off-BS items	1.95%	-0.56%	-0.01%	-0.77%	13.54%	0.39%	-4.44%	-1.30%	4.02%	0.29%	4.41%	1.28%
	Legend:	Δ>5%	Δ>10%	Δ>20%									

ANNEX 4 GRANULAR BUSINESS MODELS - STATISTICALLY SIGNIFICANT IMPACT

Nominal impact (bn EUR)				
Business model	BS category	Median	5th percentile	95th percentile
CCP	100% ASF capital and liabilities > 1Y	1.02	0.67	1.39
CCP	50% ASF non-retail liabilities	0.96	0.09	2.19
CCP	0% ASF non-retail liabilities	-1.93	-2.86	-1.48
CCP	0% RSF assets	-6.69	-7.34	-6.22
CCP	100% RSF assets	0.06	0.04	0.10
CCP	15% RSF assets	3.86	0.40	8.78
CCP	50% RSF assets	0.01	0.00	0.02
CCP	5% RSF Level 1 assets	0.82	0.08	1.86
CCP	15% RSF Level 2A assets	0.53	0.06	1.01
CCP	50% RSF lending	0.00	0.00	0.00
CCP	85% RSF assets	0.01	0.00	0.02
CCP	Off-BS items	2.65	0.26	6.03
Co-operatives	100% ASF capital and liabilities > 1Y	-59.10	-119.01	-29.65
Co-operatives	100% RSF LT encumbered assets	-35.64	-83.14	-11.64
Co-operatives	15% RSF Level 2A assets	-8.52	-18.85	-0.81
Mrtg. & build.soc.	0% ASF non-retail liabilities	-9.37	-15.49	-4.79
Mrtg. & build.soc.	10% RSF assets	-0.18	-0.31	-0.09
Other no retail dep.	0% ASF non-retail liabilities	-8.41	-11.61	-3.79
Other no retail dep.	0% RSF assets	-6.72	-7.84	-4.27
Other no retail dep.	100% RSF assets	-2.37	-6.49	0.00
Other no retail dep.	100% RSF LT encumbered assets	-17.98	-18.08	-11.92
Other no retail dep.	10% RSF assets	-1.55	-1.80	-1.03
Other no retail dep.	50% RSF lending	-3.67	-4.64	-2.92
Savings	50% ASF non-retail liabilities	-4.20	-6.46	-1.43
Savings	0% ASF non-retail liabilities	-4.97	-7.93	-0.05
Sec. trading	95% ASF stable retail deposits	15.89	1.01	62.68
Sec. trading	90% ASF less stable retail deposits	12.51	4.68	34.28
Sec. trading	0% ASF non-retail liabilities	-162.21	-200.09	-139.96
Sec. trading	100% RSF LT encumbered assets	-7.51	-10.55	-5.76
Sec. trading	10% RSF assets	-48.41	-64.64	-39.84
Sec. trading	65% RSF lending	0.00	0.00	0.00
Sec. trading	85% RSF lending	-0.51	-1.03	-0.13
Sec. trading	85% RSF assets	-28.06	-58.50	-16.56
Sec. trading	100% RSF 20% deriv. payables	-11.45	-17.23	-7.83
Univ. cross-border	0% ASF Non-retail liabilities	-470.20	-717.60	-321.87
Univ. cross-border	10% RSF Assets	-125.44	-238.50	-9.63

	Nominal impact (bn EUR)				
	BS category	Business model	Median	5th percentile	95th percentile
ASF	100% ASF capital and liabilities > 1Y	Co-operatives	-59.10	-119.01	-29.65
	100% ASF capital and liabilities > 1Y	CCP	1.02	0.67	1.39
	95% ASF stable retail deposits	Sec. trading	15.89	1.01	62.68
	90% ASF less stable retail deposits	Sec. trading	12.51	4.68	34.28
	50% ASF non-retail liabilities	CCP	0.96	0.09	2.19
	50% ASF non-retail liabilities	Savings	-4.20	-6.46	-1.43
	0% ASF non-retail liabilities	Univ. cross-border	-470.20	-717.60	-321.87
	0% ASF non-retail liabilities	Mrtg. & build.soc.	-9.37	-15.49	-4.79
	0% ASF non-retail liabilities	CCP	-1.93	-2.86	-1.48
	0% ASF non-retail liabilities	Savings	-4.97	-7.93	-0.05
	0% ASF non-retail liabilities	Other no retail dep.	-8.41	-11.61	-3.79
	0% ASF non-retail liabilities	Sec. trading	-162.21	-200.09	-139.96
RSF	0% RSF assets	CCP	-6.69	-7.34	-6.22
	0% RSF assets	Other no retail dep.	-6.72	-7.84	-4.27
	100% RSF assets	CCP	0.06	0.04	0.10
	100% RSF assets	Other no retail dep.	-2.37	-6.49	0.00
	100% RSF LT encumbered assets	Co-operatives	-35.64	-83.14	-11.64
	100% RSF LT encumbered assets	Other no retail dep.	-17.98	-18.08	-11.92
	100% RSF LT encumbered assets	Sec. trading	-7.51	-10.55	-5.76
	15% RSF assets	CCP	3.86	0.40	8.78
	50% RSF assets	CCP	0.01	0.00	0.02
	10% RSF assets	Univ. cross-border	-125.44	-238.50	-9.63
	10% RSF assets	Mrtg. & build.soc.	-0.18	-0.31	-0.09
	10% RSF assets	Other no retail dep.	-1.55	-1.80	-1.03
	10% RSF assets	Sec. trading	-48.41	-64.64	-39.84
	5% RSF Level 1 assets	CCP	0.82	0.08	1.86
	15% RSF Level 2A assets	Co-operatives	-8.52	-18.85	-0.81
	15% RSF Level 2A assets	CCP	0.53	0.06	1.01
	50% RSF lending	CCP	0.00	0.00	0.00
	50% RSF lending	Other no retail dep.	-3.67	-4.64	-2.92
	65% RSF lending	Sec. trading	0.00	0.00	0.00
	85% RSF lending	Sec. trading	-0.51	-1.03	-0.13
	85% RSF assets	CCP	0.01	0.00	0.02
	85% RSF assets	Sec. trading	-28.06	-58.50	-16.56
	100% RSF 20% deriv. payables	Sec. trading	-11.45	-17.23	-7.83
	Off-BS items	CCP	2.65	0.26	6.03

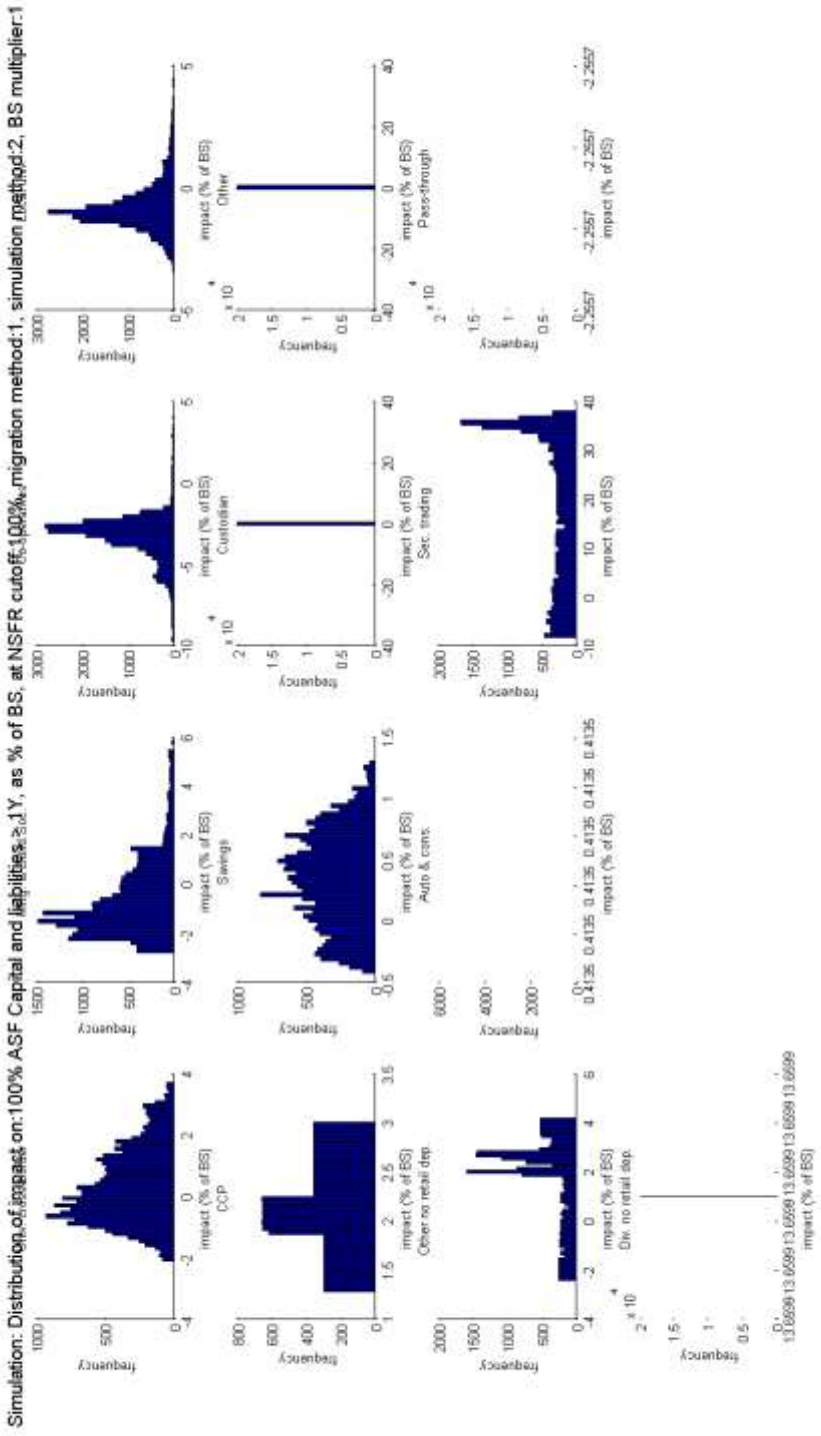
Impact as % of BS for the entire business model				
Business model	BS category	Median	5th percentile	95th percentile
CCP	100% ASF capital and liabilities > 1Y	2.13%	1.40%	2.91%
CCP	50% ASF non-retail liabilities	2.01%	0.20%	4.59%
CCP	0% ASF non-retail liabilities	-4.05%	-5.99%	-3.10%
CCP	0% RSF assets	-14.00%	-15.36%	-13.02%
CCP	100% RSF assets	0.13%	0.07%	0.22%
CCP	15% RSF assets	8.07%	0.83%	18.38%
CCP	50% RSF assets	0.02%	0.00%	0.04%
CCP	5% RSF Level 1 assets	1.71%	0.17%	3.90%
CCP	15% RSF Level 2A assets	1.11%	0.13%	2.11%
CCP	50% RSF lending	0.00%	0.00%	0.00%
CCP	85% RSF assets	0.02%	0.00%	0.04%
CCP	Off-BS items	5.54%	0.55%	12.63%
Co-operatives	100% ASF capital and liabilities > 1Y	-3.01%	-6.07%	-1.51%
Co-operatives	100% RSF LT encumbered assets	-1.82%	-4.24%	-0.59%
Co-operatives	15% RSF Level 2A assets	-0.43%	-0.96%	-0.04%
Mrtg. & build.soc.	0% ASF non-retail liabilities	-1.19%	-1.96%	-0.61%
Mrtg. & build.soc.	10% RSF assets	-0.02%	-0.04%	-0.01%
Other no retail dep.	0% ASF non-retail liabilities	-1.82%	-2.52%	-0.82%
Other no retail dep.	0% RSF assets	-1.46%	-1.70%	-0.92%
Other no retail dep.	100% RSF assets	-0.51%	-1.41%	0.00%
Other no retail dep.	100% RSF LT encumbered assets	-3.90%	-3.92%	-2.58%
Other no retail dep.	10% RSF assets	-0.33%	-0.39%	-0.22%
Other no retail dep.	50% RSF lending	-0.79%	-1.01%	-0.63%
Savings	50% ASF non-retail liabilities	-0.52%	-0.80%	-0.18%
Savings	0% ASF non-retail liabilities	-0.61%	-0.98%	-0.01%
Sec. trading	95% ASF stable retail deposits	3.91%	0.25%	15.42%
Sec. trading	90% ASF less stable retail deposits	3.08%	1.15%	8.43%
Sec. trading	0% ASF non-retail liabilities	-39.91%	-49.23%	-34.44%
Sec. trading	100% RSF LT encumbered assets	-1.85%	-2.59%	-1.42%
Sec. trading	10% RSF assets	-11.91%	-15.90%	-9.80%
Sec. trading	65% RSF lending	0.00%	0.00%	0.00%
Sec. trading	85% RSF lending	-0.13%	-0.25%	-0.03%
Sec. trading	85% RSF assets	-6.90%	-14.39%	-4.07%
Sec. trading	100% RSF 20% deriv. payables	-2.82%	-4.24%	-1.93%
Univ. cross-border	0% ASF non-retail liabilities	-2.97%	-4.53%	-2.03%
Univ. cross-border	10% RSF assets	-0.79%	-1.50%	-0.06%

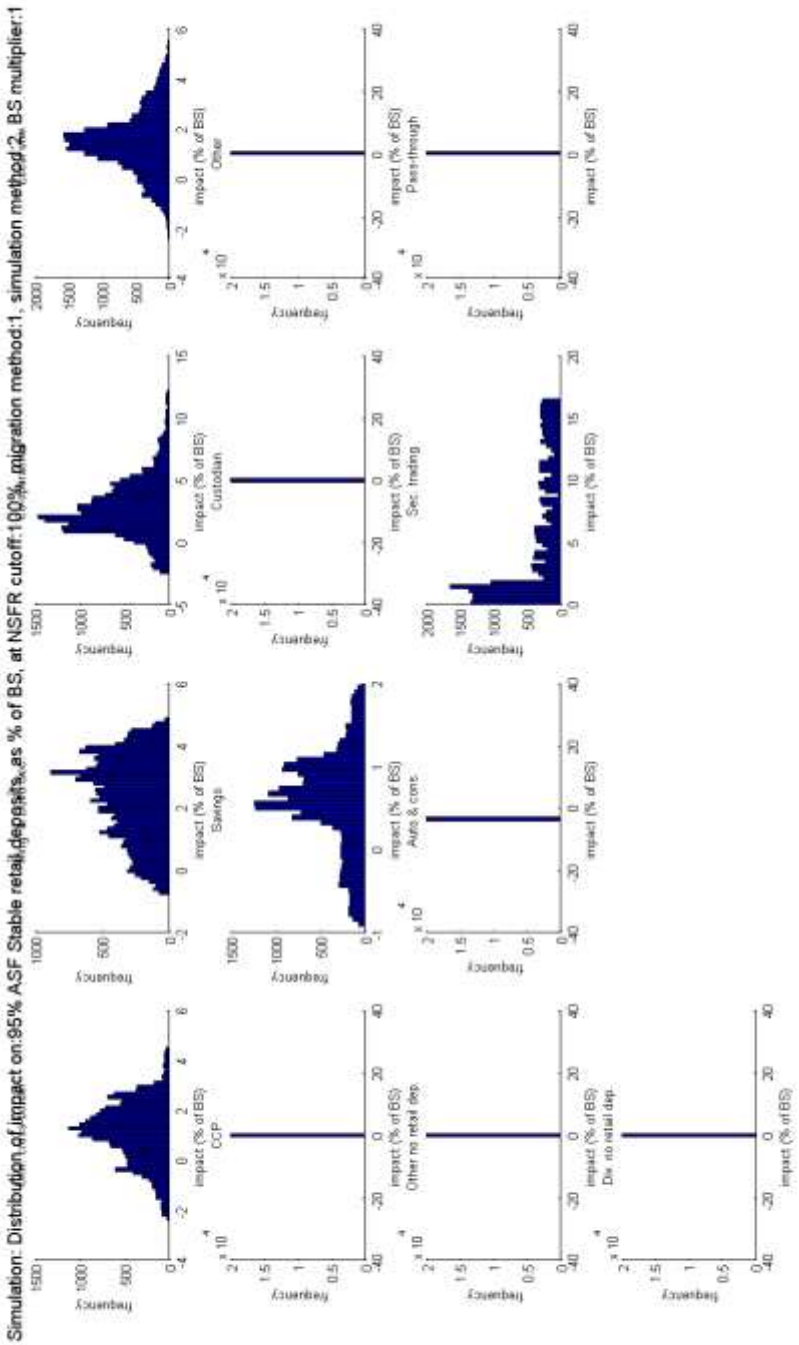
	Impact as % of BS for the entire business model				
	BS category	Business model	median	5th percentile	95th percentile
ASF	100% ASF capital and liabilities > 1Y	Co-operatives	-3.01%	-6.07%	-1.51%
	100% ASF capital and liabilities > 1Y	CCP	2.13%	1.40%	2.91%
	95% ASF stable retail deposits	Sec. trading	3.91%	0.25%	15.42%
	90% ASF less stable retail deposits	Sec. trading	3.08%	1.15%	8.43%
	50% ASF non-retail liabilities	CCP	2.01%	0.20%	4.59%
	50% ASF non-retail liabilities	Savings	-0.52%	-0.80%	-0.18%
	0% ASF non-retail liabilities	Univ. cross-border	-2.97%	-4.53%	-2.03%
	0% ASF non-retail liabilities	Mrtg. & build.soc.	-1.19%	-1.96%	-0.61%
	0% ASF non-retail liabilities	CCP	-4.05%	-5.99%	-3.10%
	0% ASF non-retail liabilities	Savings	-0.61%	-0.98%	-0.01%
	0% ASF non-retail liabilities	Other no retail dep.	-1.82%	-2.52%	-0.82%
	0% ASF non-retail liabilities	Sec. trading	-39.91%	-49.23%	-34.44%
RSF	0% RSF assets	CCP	-14.00%	-15.36%	-13.02%
	0% RSF assets	Other no retail dep.	-1.46%	-1.70%	-0.92%
	100% RSF assets	CCP	0.13%	0.07%	0.22%
	100% RSF assets	Other no retail dep.	-0.51%	-1.41%	0.00%
	100% RSF LT encumbered assets	Co-operatives	-1.82%	-4.24%	-0.59%
	100% RSF LT encumbered assets	Other no retail dep.	-3.90%	-3.92%	-2.58%
	100% RSF LT encumbered assets	Sec. trading	-1.85%	-2.59%	-1.42%
	15% RSF assets	CCP	8.07%	0.83%	18.38%
	50% RSF assets	CCP	0.02%	0.00%	0.04%
	10% RSF assets	Univ. cross-border	-0.79%	-1.50%	-0.06%
	10% RSF assets	Mrtg. & build.soc.	-0.02%	-0.04%	-0.01%
	10% RSF assets	Other no retail dep.	-0.33%	-0.39%	-0.22%
	10% RSF assets	Sec. trading	-11.91%	-15.90%	-9.80%
	5% RSF Level 1 assets	CCP	1.71%	0.17%	3.90%
	15% RSF Level 2A assets	Co-operatives	-0.43%	-0.96%	-0.04%
	15% RSF Level 2A assets	CCP	1.11%	0.13%	2.11%
	50% RSF lending	CCP	0.00%	0.00%	0.00%
	50% RSF lending	Other no retail dep.	-0.79%	-1.01%	-0.63%
	65% RSF lending	Sec. trading	0.00%	0.00%	0.00%
	85% RSF lending	Sec. trading	-0.13%	-0.25%	-0.03%
	85% RSF assets	CCP	0.02%	0.00%	0.04%
	85% RSF assets	Sec. trading	-6.90%	-14.39%	-4.07%
	100% RSF 20% deriv. payables	Sec. trading	-2.82%	-4.24%	-1.93%
	Off-BS items	CCP	5.54%	0.55%	12.63%

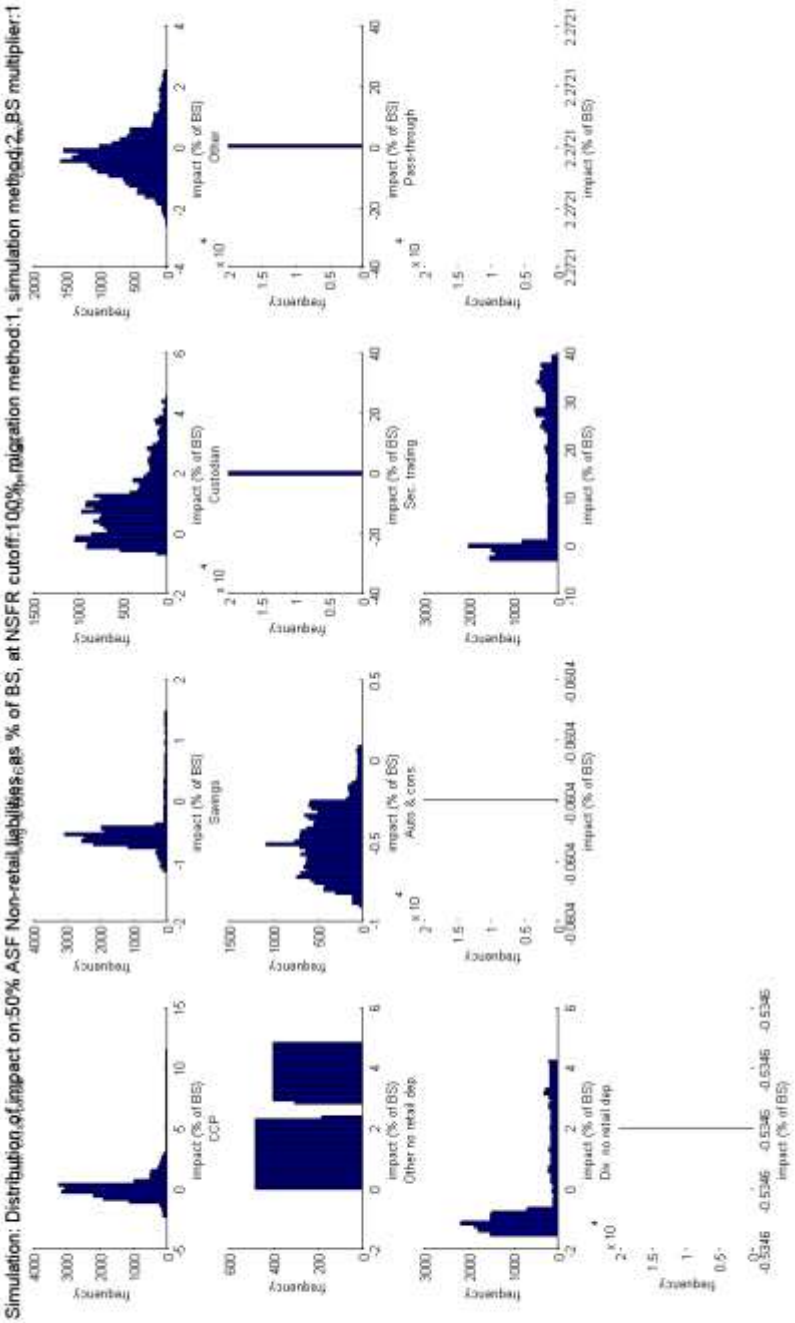
Impact as % of BS of the non-compliant firms per business model				
Business model	BS category	Median	5th percentile	95th percentile
CCP	100% ASF capital and liabilities > 1Y	4.61%	3.03%	6.28%
CCP	50% ASF non-retail liabilities	4.34%	0.43%	9.91%
CCP	0% ASF non-retail liabilities	-8.74%	-12.94%	-6.71%
CCP	0% RSF assets	-30.27%	-33.20%	-28.14%
CCP	100% RSF assets	0.28%	0.16%	0.47%
CCP	15% RSF assets	17.45%	1.79%	39.74%
CCP	50% RSF assets	0.04%	0.00%	0.08%
CCP	5% RSF Level 1 assets	3.69%	0.37%	8.42%
CCP	15% RSF Level 2A assets	2.40%	0.29%	4.56%
CCP	50% RSF lending	0.01%	0.00%	0.01%
CCP	85% RSF assets	0.04%	0.00%	0.08%
CCP	Off-BS items	11.97%	1.19%	27.30%
Co-operatives	100% ASF capital and liabilities > 1Y	-8.32%	-16.76%	-4.17%
Co-operatives	100% RSF LT encumbered assets	-5.02%	-11.71%	-1.64%
Co-operatives	15% RSF Level 2A assets	-1.20%	-2.65%	-0.11%
Mrtg. & build.soc.	0% ASF non-retail liabilities	-4.96%	-8.20%	-2.54%
Mrtg. & build.soc.	10% RSF assets	-0.09%	-0.16%	-0.05%
Other no retail dep.	0% ASF non-retail liabilities	-7.31%	-10.10%	-3.30%
Other no retail dep.	0% RSF assets	-5.84%	-6.82%	-3.71%
Other no retail dep.	100% RSF assets	-2.07%	-5.65%	0.00%
Other no retail dep.	100% RSF LT encumbered assets	-15.64%	-15.73%	-10.37%
Other no retail dep.	10% RSF assets	-1.34%	-1.57%	-0.90%
Other no retail dep.	50% RSF lending	-3.19%	-4.04%	-2.54%
Savings	50% ASF non-retail liabilities	-4.89%	-7.52%	-1.67%
Savings	0% ASF non-retail liabilities	-5.79%	-9.23%	-0.05%
Sec. trading	95% ASF stable retail deposits	4.72%	0.30%	18.62%
Sec. trading	90% ASF less stable retail deposits	3.72%	1.39%	10.18%
Sec. trading	0% ASF non-retail liabilities	-48.18%	-59.44%	-41.58%
Sec. trading	100% RSF LT encumbered assets	-2.23%	-3.13%	-1.71%
Sec. trading	10% RSF assets	-14.38%	-19.20%	-11.83%
Sec. trading	65% RSF lending	0.00%	0.00%	0.00%
Sec. trading	85% RSF lending	-0.15%	-0.30%	-0.04%
Sec. trading	85% RSF assets	-8.34%	-17.38%	-4.92%
Sec. trading	100% RSF 20% deriv. payables	-3.40%	-5.12%	-2.33%
Univ. cross-border	0% ASF non-retail liabilities	-7.25%	-11.07%	-4.97%
Univ. cross-border	10% RSF assets	-1.94%	-3.68%	-0.15%

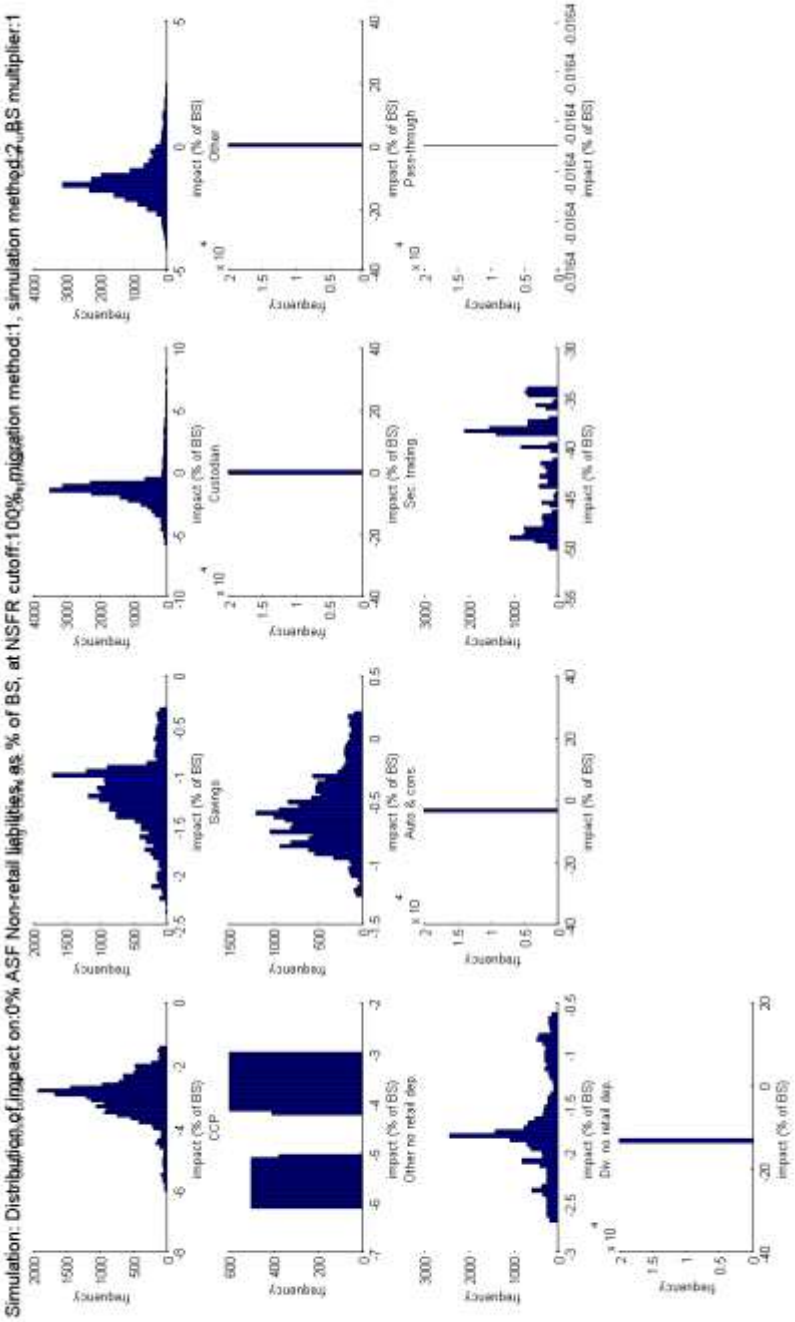
	Impact as % of BS of the non-compliant firms per business model				
	BS category	Business model	Median	5th percentile	95th percentile
ASF	100% ASF capital and liabilities > 1Y	Co-operatives	-8.32%	-16.76%	-4.17%
	100% ASF capital and liabilities > 1Y	CCP	4.61%	3.03%	6.28%
	95% ASF stable retail deposits	Sec. trading	4.72%	0.30%	18.62%
	90% ASF less stable retail deposits	Sec. trading	3.72%	1.39%	10.18%
	50% ASF non-retail liabilities	CCP	4.34%	0.43%	9.91%
	50% ASF non-retail liabilities	Savings	-4.89%	-7.52%	-1.67%
	0% ASF non-retail liabilities	Univ. cross-border	-7.25%	-11.07%	-4.97%
	0% ASF non-retail liabilities	Mrtg. & build.soc.	-4.96%	-8.20%	-2.54%
	0% ASF non-retail liabilities	CCP	-8.74%	-12.94%	-6.71%
	0% ASF non-retail liabilities	Savings	-5.79%	-9.23%	-0.05%
	0% ASF non-retail liabilities	Other no retail dep.	-7.31%	-10.10%	-3.30%
	0% ASF non-retail liabilities	Sec. trading	-48.18%	-59.44%	-41.58%
RSF	0% RSF assets	CCP	-30.27%	-33.20%	-28.14%
	0% RSF assets	Other no retail dep.	-5.84%	-6.82%	-3.71%
	100% RSF assets	CCP	0.28%	0.16%	0.47%
	100% RSF assets	Other no retail dep.	-2.07%	-5.65%	0.00%
	100% RSF LT encumbered assets	Co-operatives	-5.02%	-11.71%	-1.64%
	100% RSF LT encumbered assets	Other no retail dep.	-15.64%	-15.73%	-10.37%
	100% RSF LT encumbered assets	Sec. trading	-2.23%	-3.13%	-1.71%
	15% RSF assets	CCP	17.45%	1.79%	39.74%
	50% RSF assets	CCP	0.04%	0.00%	0.08%
	10% RSF assets	Univ. cross-border	-1.94%	-3.68%	-0.15%
	10% RSF assets	Mrtg. & build.soc.	-0.09%	-0.16%	-0.05%
	10% RSF assets	Other no retail dep.	-1.34%	-1.57%	-0.90%
	10% RSF assets	Sec. trading	-14.38%	-19.20%	-11.83%
	5% RSF Level 1 assets	CCP	3.69%	0.37%	8.42%
	15% RSF Level 2A assets	Co-operatives	-1.20%	-2.65%	-0.11%
	15% RSF Level 2A assets	CCP	2.40%	0.29%	4.56%
	50% RSF lending	CCP	0.01%	0.00%	0.01%
	50% RSF lending	Other no retail dep.	-3.19%	-4.04%	-2.54%
	65% RSF lending	Sec. trading	0.00%	0.00%	0.00%
	85% RSF lending	Sec. trading	-0.15%	-0.30%	-0.04%
	85% RSF assets	CCP	0.04%	0.00%	0.08%
	85% RSF assets	Sec. trading	-8.34%	-17.38%	-4.92%
	100% RSF 20% deriv. payables	Sec. trading	-3.40%	-5.12%	-2.33%
	Off-BS items	CCP	11.97%	1.19%	27.30%

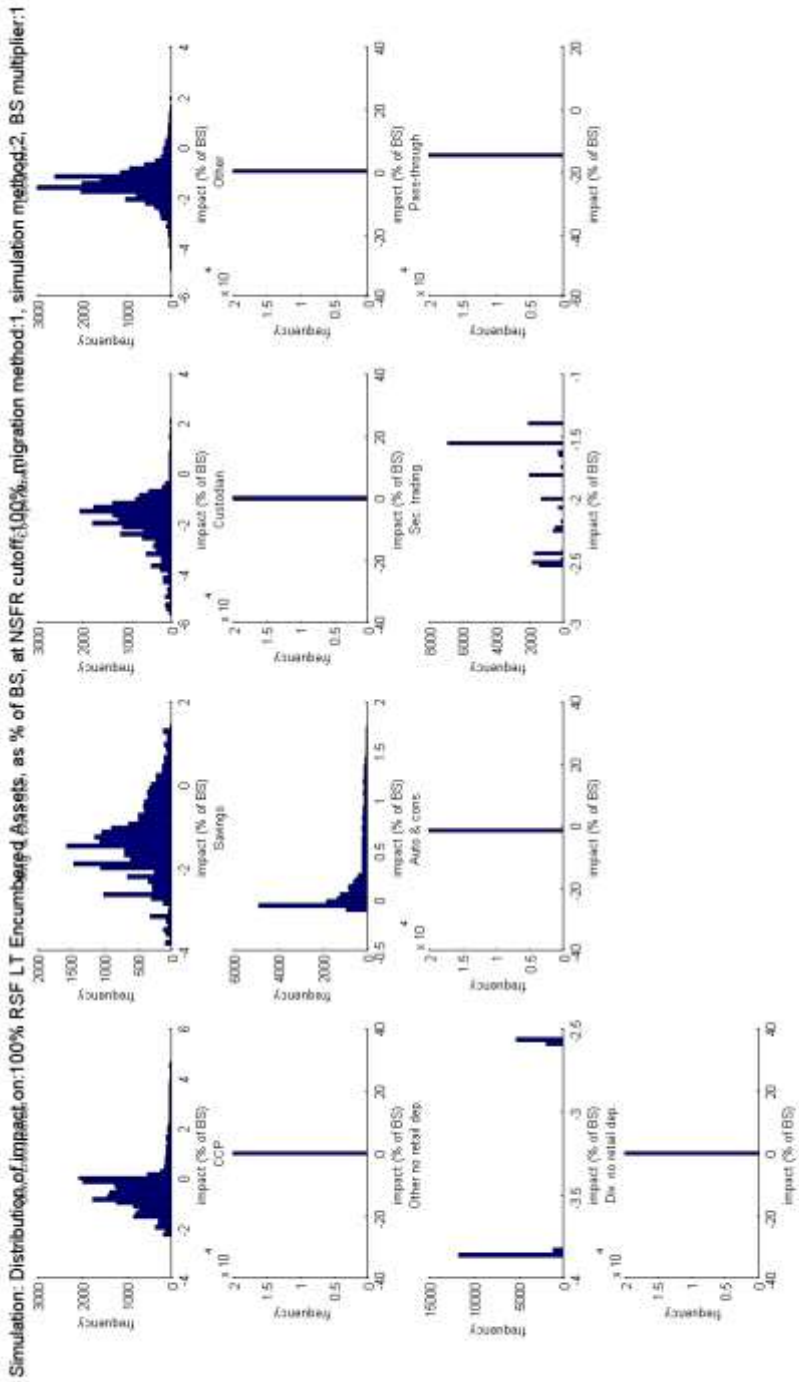
ANNEX 5. GRANULAR BUSINESS MODELS – DISTRIBUTION CHARTS

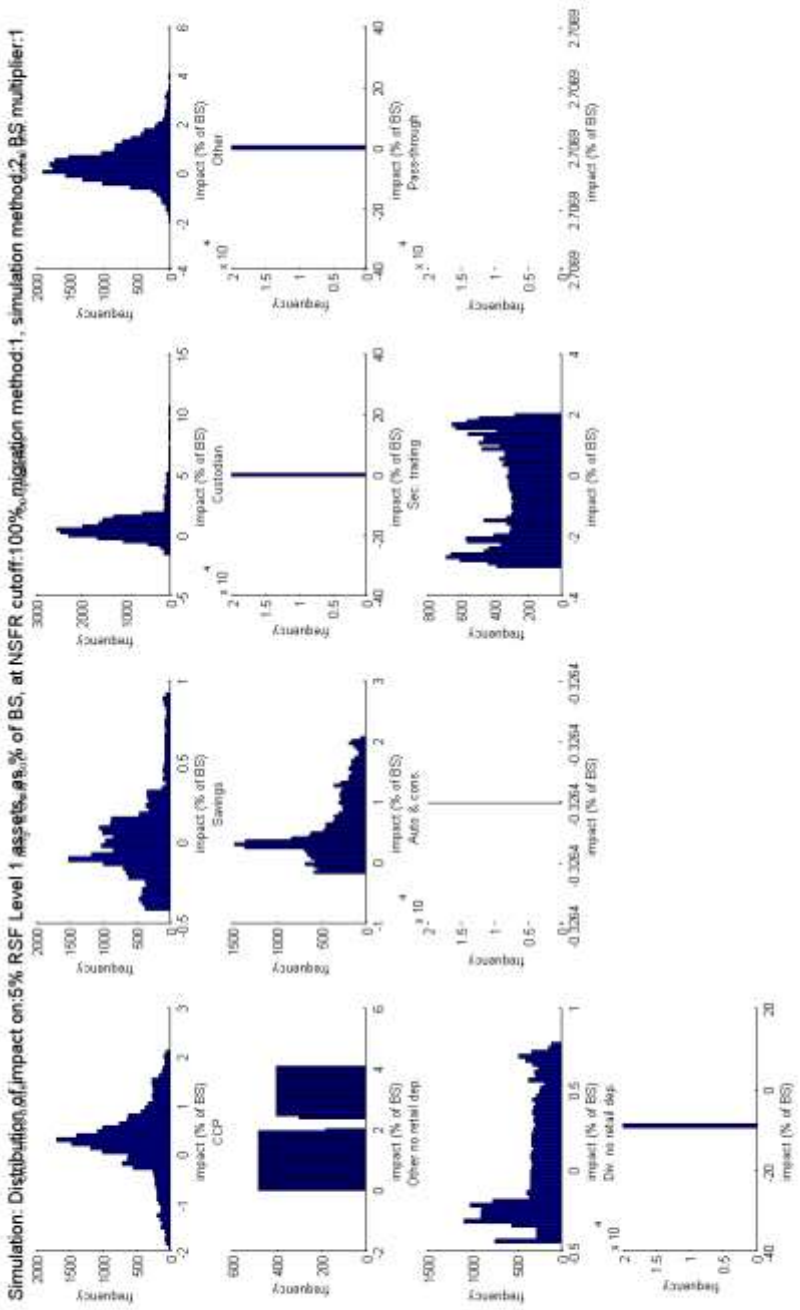


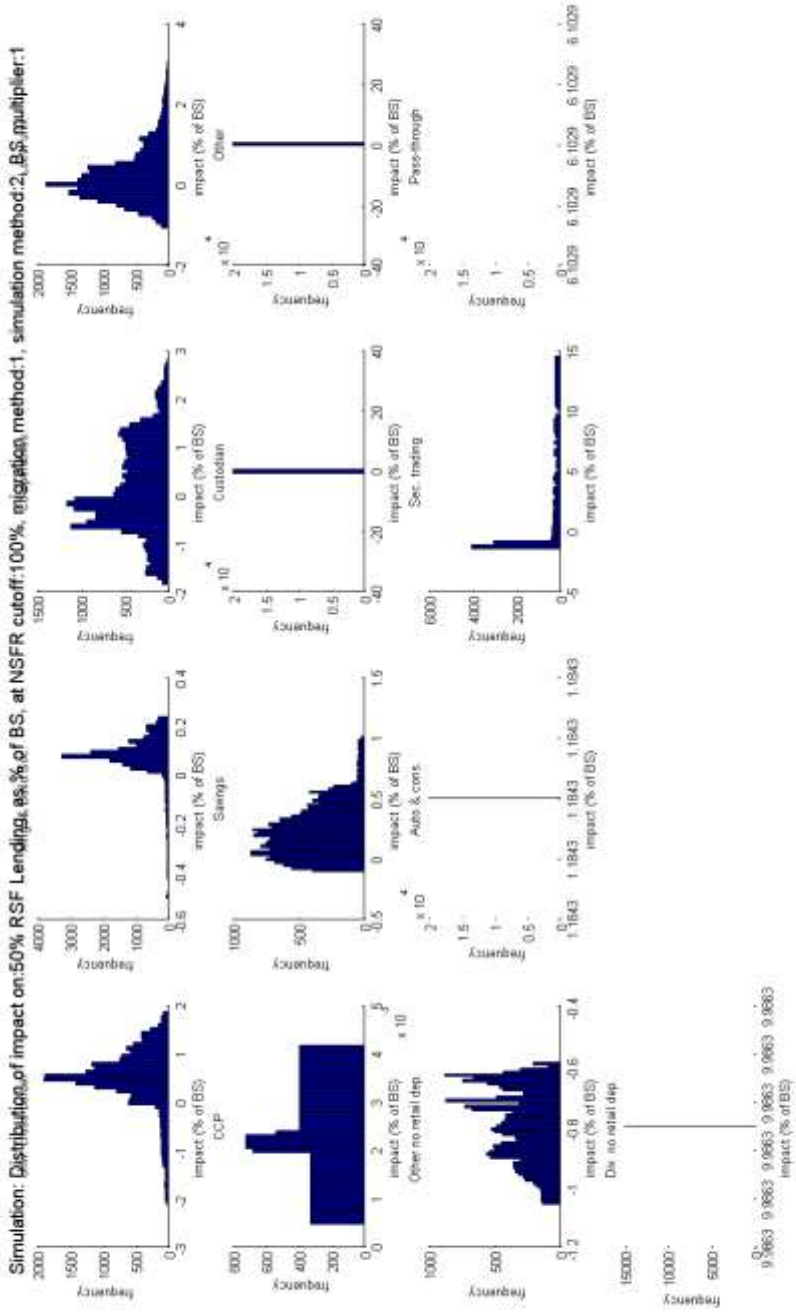

Simulation: Distribution of impact on:95% ASF Stable retail deposits, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Frequency
impact (% of BS)
Other
Pass-through
Custodian
Sec. trading
Savings
Aux. & corp
CCP
Other no retail dep
Dv. no retail dep.

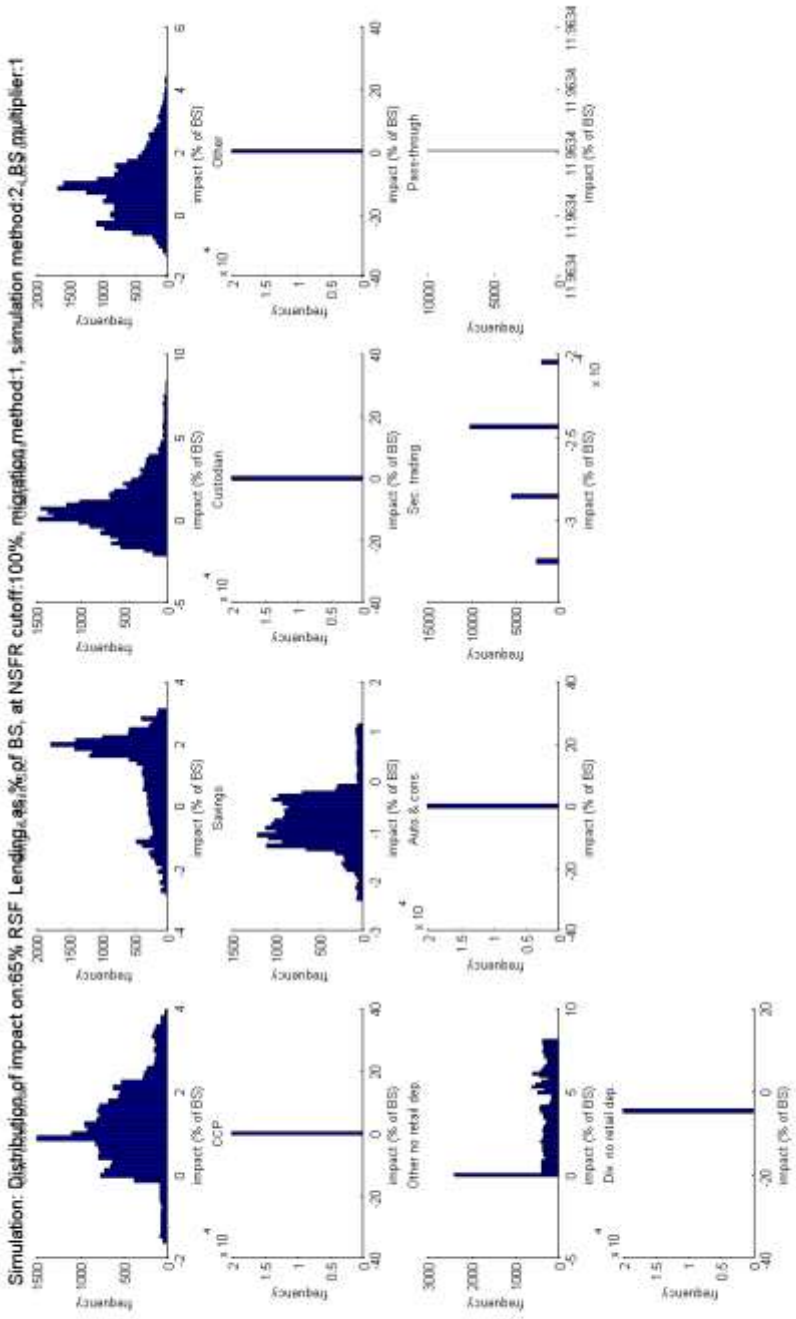

Simulation: Distribution of impact on:50% ASF Non-retail liabilities as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Frequency
impact (% of BS)
CCP
Other no retail dep
Dis. no retail dep
Savings
Aucs & cons
Custodian
Sec. trading
Other
Pass-through

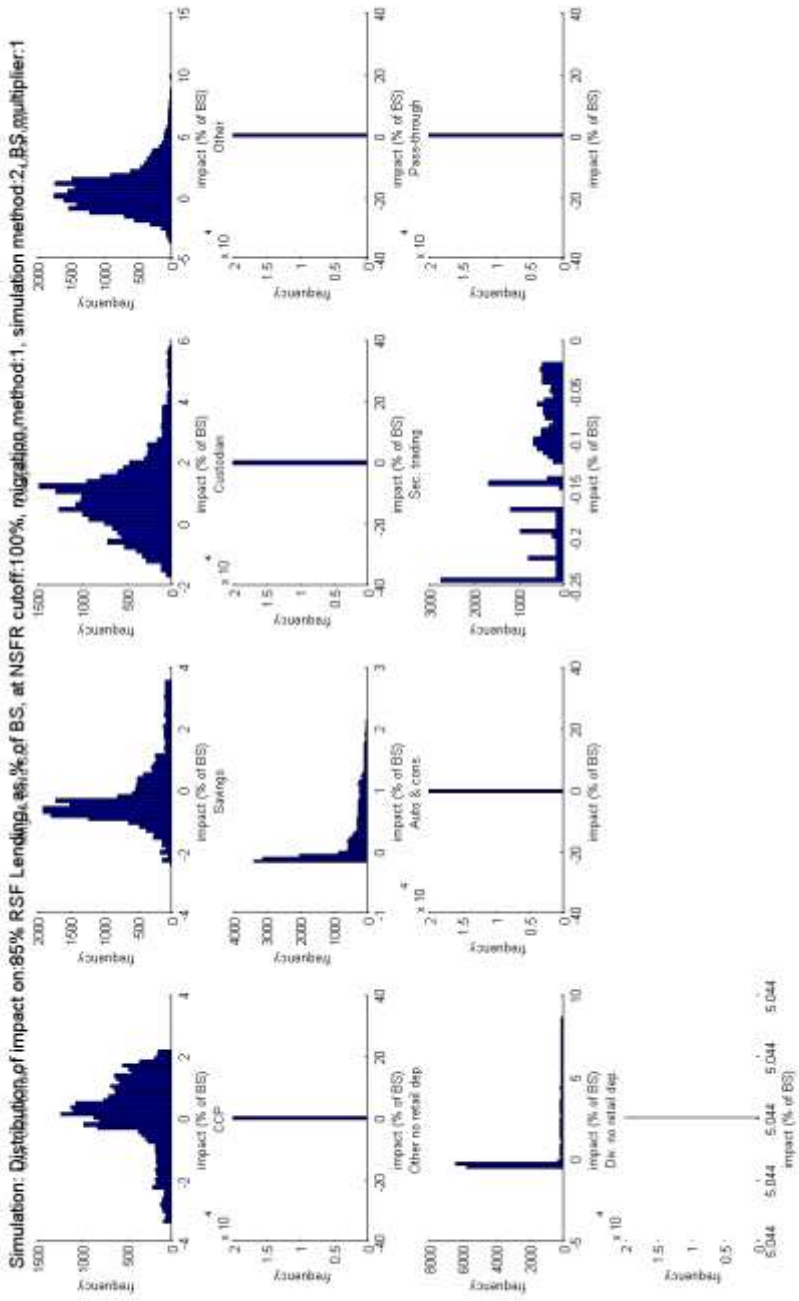

Simulation: Distribution of impact on:0% ASF Non-retail liabilities, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Other
Pass-through
Custodian
Sec. trading
Savings
Corp
Auto & cons
CCP
Other no retail dep
Dw no retail dep
Asuenbeq
impact (% of BS)

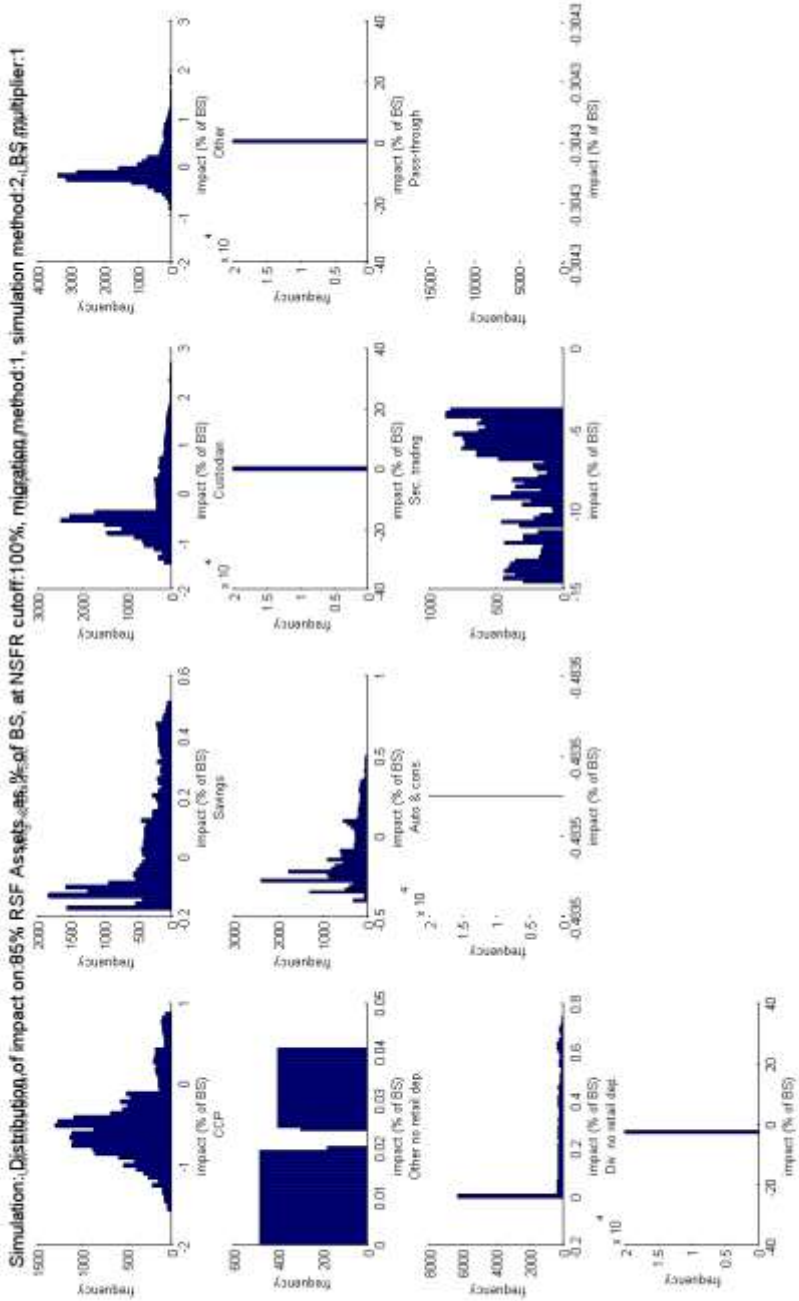

Simulation: Distribution of impact on:100% RSF LT Encumbered Assets, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Other
Pass-through
Custodian
Sec. lending
Savings
Auto & cons
CCP
Other no retail dep
Dv. no retail dep
#counterp
impact (% of BS)

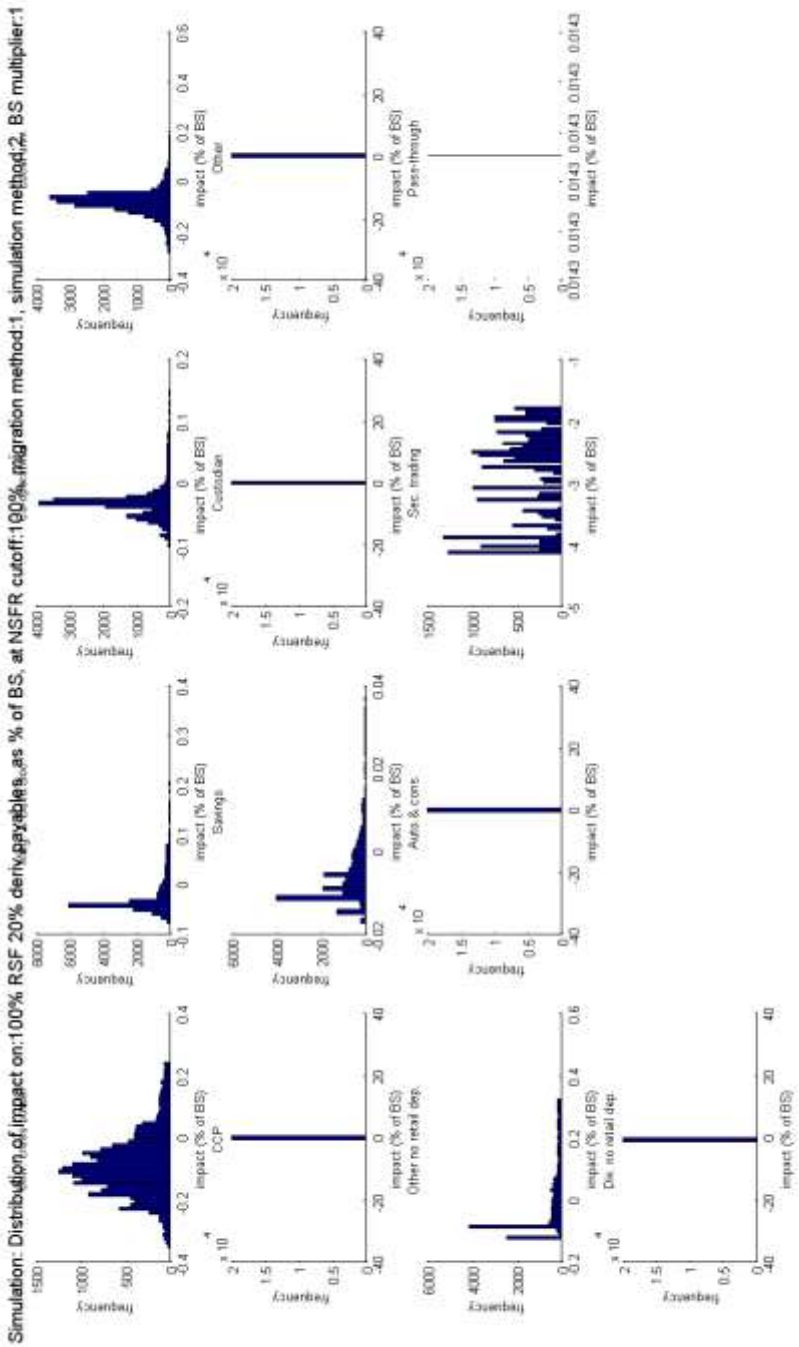

Simulation: Distribution of impact on:5% RSF Level 1 assets as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Frequency
impact (% of BS)
Other
Pass-through
Custodian
Sec. lending
Savings
Auto & conv.
CCP
Other no retail dep
Div. no retail dep

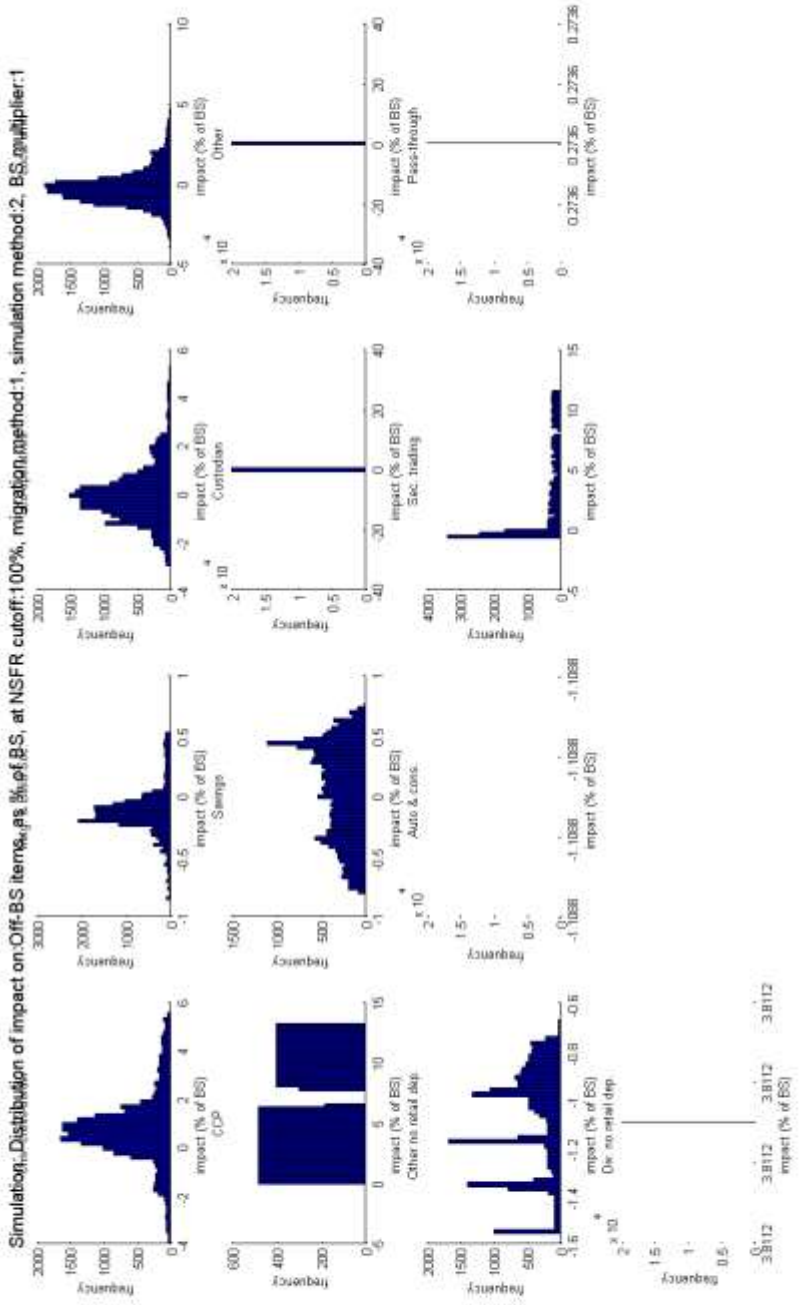

Simulation: Distribution of impact on:50% RSF Lending as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Frequency
impact (% of BS)
Other
Pass-through
Custodian
Sec. trading
Savings
Auto & cons.
CCP
Other no retail dep
Dis. no retail dep


Simulation: Distribution of impact on:65% RSF Lending as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Frequency
impact (% of BS)
Other
Pass-through
Custodian
Sec. trading
Savings
Auto & cons.
CCP
Other no retail dep.
Dw no retail dep.


Simulation: Distribution of impact on:85% RSF Lending, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Other
Pass-through
Custodian
Sec. trading
Savings
Auto & cons.
CCP
Other no retail dep
Dir. no retail dep
impact (% of BS)
#cases


Simulation: Distribution of impact on 85% RSF Assets as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
frequency
impact (% of BS)
CCP
Other no retail dep.
Dw. no retail dep.
Savings
Custodian
Auto & cons.
Sec. trading
Other
Pass-through


Simulation: Distribution of impact on:100% RSF 20% deriv.payables as % of BS, at NSFR cutoff:100% migration method:1, simulation method:2, BS multiplier:1
Frequency
impact (% of BS)
Other
Pass-through
Custodian
Sec. trading
Savings
Ass & conc
CCP
Other no retail dep.
Ins. no retail dep.


Simulation: Distribution of impact on:Off-BS items as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1
Frequency
impact (% of BS)
Other
Custodian
Sec. trading
Pass-through
Savings
Auto & cons.
CCP
Other no retail dep
Ow. no retail dep

ANNEX 6 TABLES BY AGGREGATED BUSINESS MODELS

	Mean nominal impact (bn EUR)	Diversified	Retail	Specialised	Total
	# compliant banks	64	74	31	169
	# non-compliant banks	23	33	10	66
ASF	100% ASF capital and liabilities > 1Y	60.07	-66.32	50.41	44.15
ASF	95% ASF stable retail deposits	268,83	111.37	14.32	394.52
ASF	90% ASF less stable retail deposits	169.20	37.52	24.24	230.96
ASF	50% ASF non-retail liabilities	-44.43	1.64	39.71	-3.08
ASF	0% ASF non-retail liabilities	-455.97	-84.20	-128.68	-668.86
RSF	0% RSF assets	-27.03	-15.51	-5.84	-48.38
RSF	100% RSF assets	60.04	22.12	11.12	93.28
RSF	100% RSF LT encumbered assets	-109.53	-41.81	-34.91	-186.25
RSF	15% RSF assets	-70.02	-3.94	-33.65	-107.61
RSF	50% RSF assets	-30.03	-2.04	-8.28	-40.35
RSF	10% RSF assets	-110.56	-7.42	-30.38	-148.36
RSF	5% RSF Level 1 assets	79.48	27.50	28.42	135.40
RSF	15% RSF Level 2A assets	-33.28	-6.09	7.20	-32.16
RSF	50% RSF lending	52.54	-8.11	19.19	63.62
RSF	65% RSF lending	187.44	47.67	45.07	280.18
RSF	85% RSF lending	64.67	-1.58	35.02	98.11
RSF	85% RSF assets	-64.11	-10.77	-32.97	-107.85
RSF	100% RSF 20% deriv. payables	-19.14	-1.26	-9.77	-30.17
	Off-BS items	-46.92	5.61	25.70	-15.61

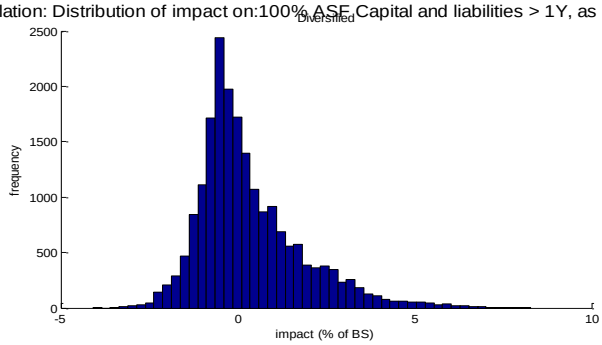
	Mean impact as % of BS of entire business model	Diversified	Retail	Specialised	Total
	# compliant banks	64	74	31	169
	# non-compliant banks	23	33	10	66
ASF	100% ASF capital and liabilities > 1Y	0.33%	-1.25%	3.35%	0.18%
ASF	95% ASF stable retail deposits	1.46%	2.10%	0.95%	1.57%
ASF	90% ASF less stable retail deposits	0.92%	0.71%	1.61%	0.92%
ASF	50% ASF non-retail liabilities	-0.24%	0.03%	2.64%	-0.01%
ASF	0% ASF non-retail liabilities	-2.48%	-1.58%	-8.55%	-2.66%
RSF	0% RSF assets	-0.15%	-0.29%	-0.39%	-0.19%
RSF	100% RSF assets	0.33%	0.42%	0.74%	0.37%
RSF	100% RSF LT encumbered assets	-0.60%	-0.79%	-2.32%	-0.74%
RSF	15% RSF assets	-0.38%	-0.07%	-2.24%	-0.43%
RSF	50% RSF assets	-0.16%	-0.04%	-0.55%	-0.16%
RSF	10% RSF assets	-0.60%	-0.14%	-2.02%	-0.59%
RSF	5% RSF Level 1 assets	0.43%	0.52%	1.89%	0.54%
RSF	15% RSF Level 2A assets	-0.18%	-0.11%	0.48%	-0.13%

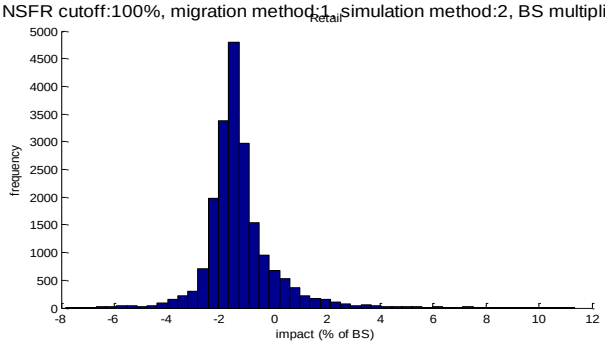
	50% RSF lending	0.29%	-0.15%	1.28%	0.25%
	65% RSF lending	1.02%	0.90%	3.00%	1.11%
	85% RSF lending	0.35%	-0.03%	2.33%	0.39%
	85% RSF assets	-0.35%	-0.20%	-2.19%	-0.43%
	100% RSF 20% deriv. payables	-0.10%	-0.02%	-0.65%	-0.12%
	Off-BS items	-0.26%	0.11%	1.71%	-0.06%
	Legend:	Δ>1%	Δ>5%	Δ>10%	

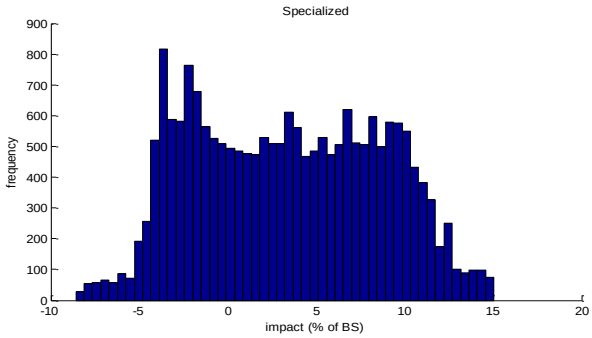
	Mean impact as % of BS of the non-compliant institutions	Diversified	Retail	Specialised	Total
	# compliant banks	64	74	31	169
	# non-compliant banks	23	33	10	66
ASF	100% ASF capital and liabilities > 1Y	0.90%	-3.04%	9.40%	0.47%
ASF	95% ASF stable retail deposits	4.03%	5.11%	2.67%	4.20%
ASF	90% ASF less stable retail deposits	2.54%	1.72%	4.52%	2.46%
ASF	50% ASF non-retail liabilities	-0.67%	0.08%	7.40%	-0.03%
ASF	0% ASF non-retail liabilities	-6.83%	-3.87%	-23.99%	-7.12%
RSF	0% RSF assets	-0.40%	-0.71%	-1.09%	-0.52%
RSF	100% RSF assets	0.90%	1.02%	2.07%	0.99%
RSF	100% RSF LT encumbered assets	-1.64%	-1.92%	-6.51%	-1.98%
RSF	15% RSF assets	-1.05%	-0.18%	-6.27%	-1.15%
RSF	50% RSF assets	-0.45%	-0.09%	-1.54%	-0.43%
RSF	10% RSF assets	-1.66%	-0.34%	-5.66%	-1.58%
RSF	5% RSF Level 1 assets	1.19%	1.26%	5.30%	1.44%
RSF	15% RSF Level 2A assets	-0.50%	-0.28%	1.34%	-0.34%
RSF	50% RSF lending	0.79%	-0.37%	3.58%	0.68%
RSF	65% RSF lending	2.81%	2.19%	8.40%	2.98%
RSF	85% RSF lending	0.97%	-0.07%	6.53%	1.04%
RSF	85% RSF assets	-0.96%	-0.49%	-6.15%	-1.15%
RSF	100% RSF 20% deriv. payables	-0.29%	-0.06%	-1.82%	-0.32%
RSF	Off-BS items	-0.70%	0.26%	4.79%	-0.17%
RSF	Legend:	Δ>5%	Δ>10%	Δ>20%	

ANNEX 7 CHARTS BY AGGREGATED BUSINESS MODELS

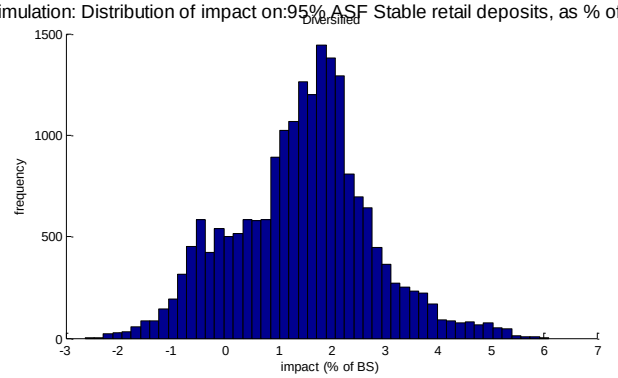
Simulation: Distribution of impact on:100% ASF Capital and liabilities > 1Y, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1

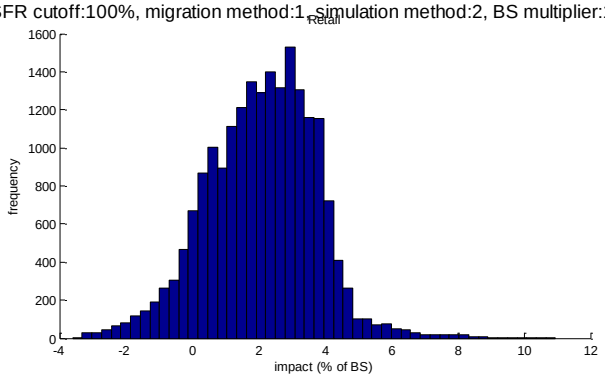


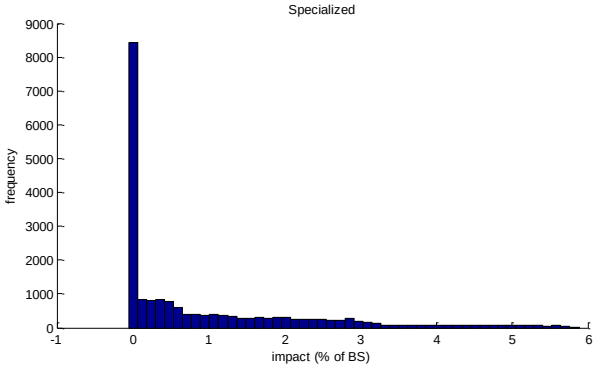




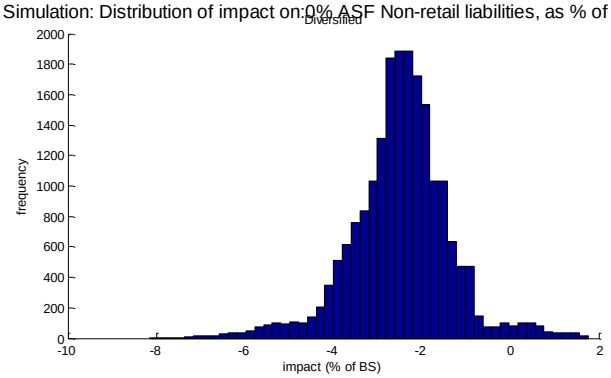
Simulation: Distribution of impact on:95% ASF Stable retail deposits, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1

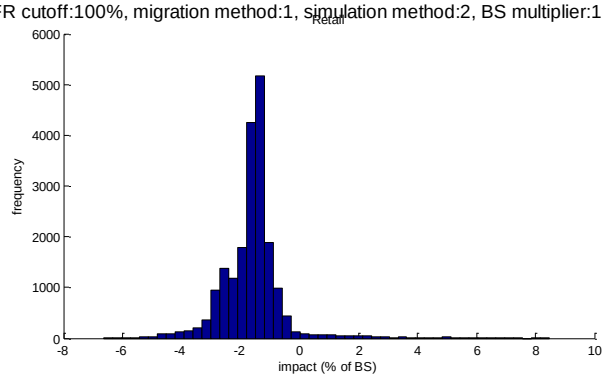


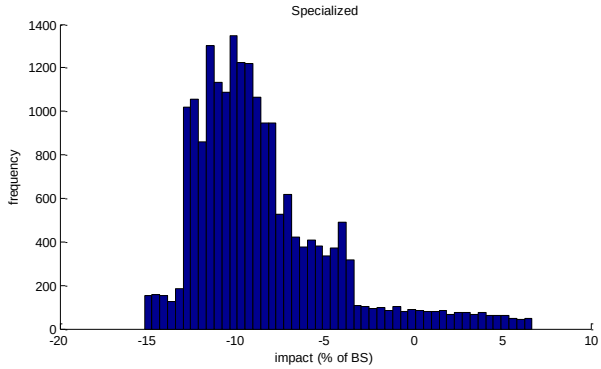




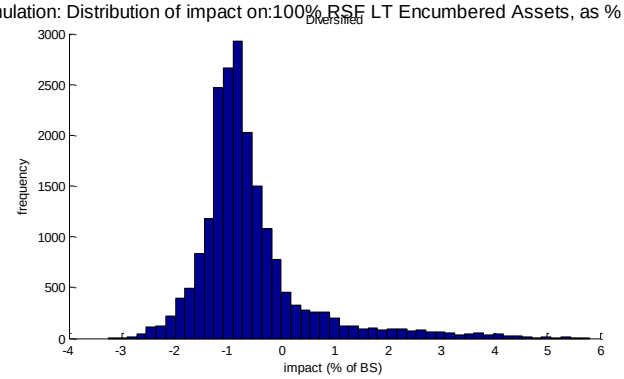
Simulation: Distribution of impact on:0% ASF Non-retail liabilities, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1

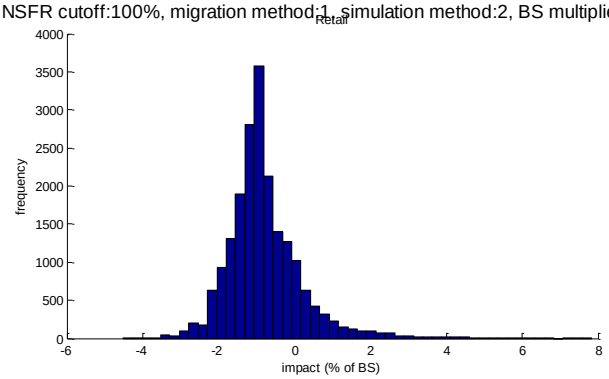


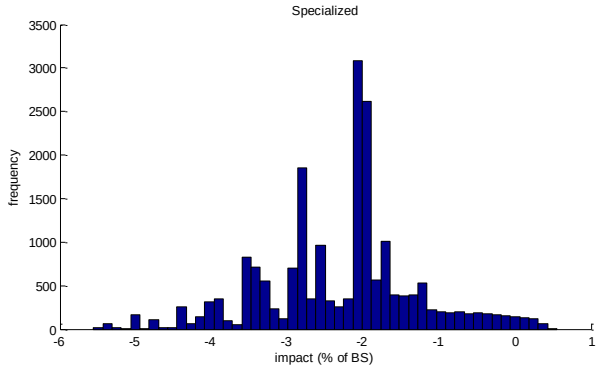




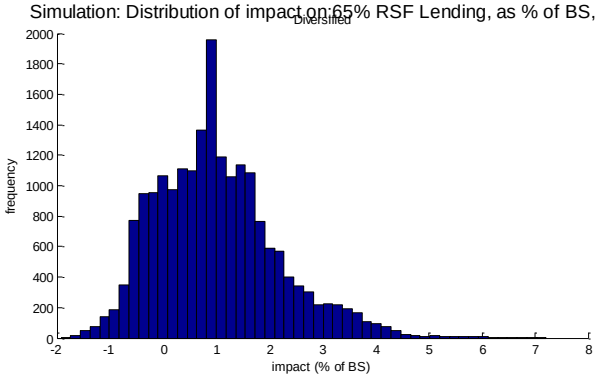
Simulation: Distribution of impact on:100% RSF LT Encumbered Assets, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1

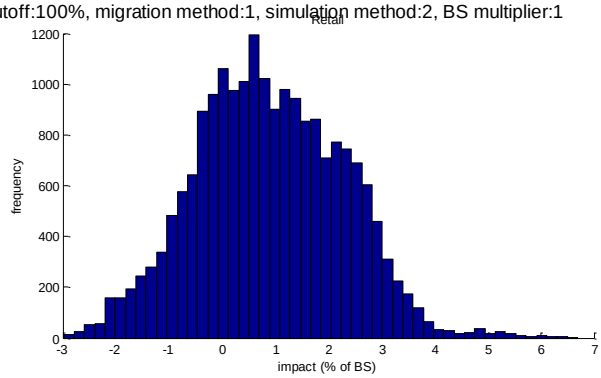


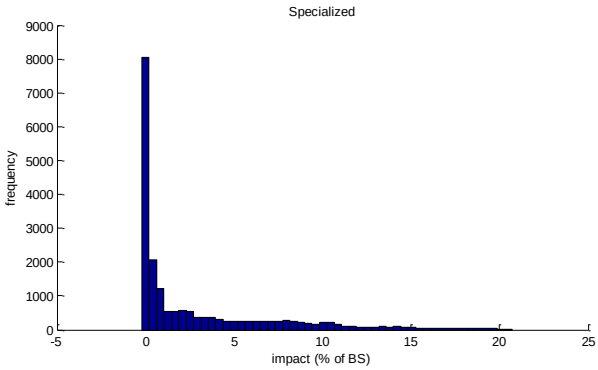




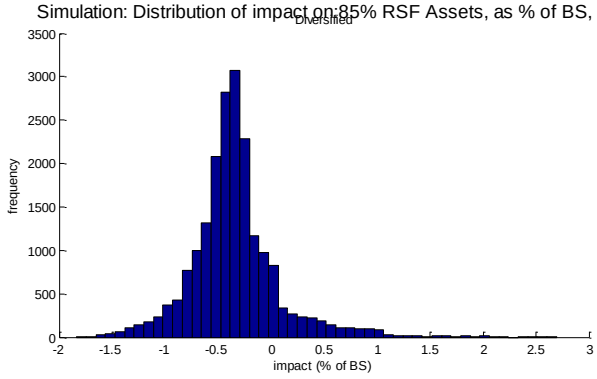
Simulation: Distribution of impact on:65% RSF Lending, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1

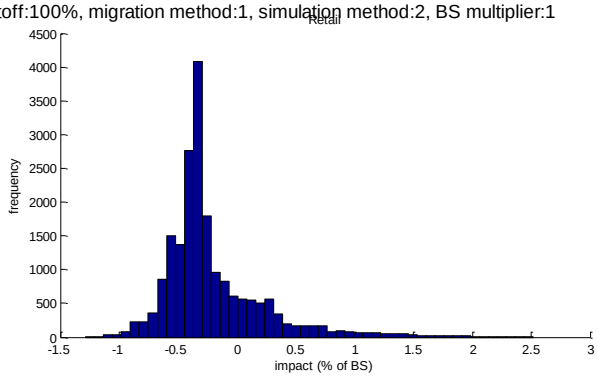


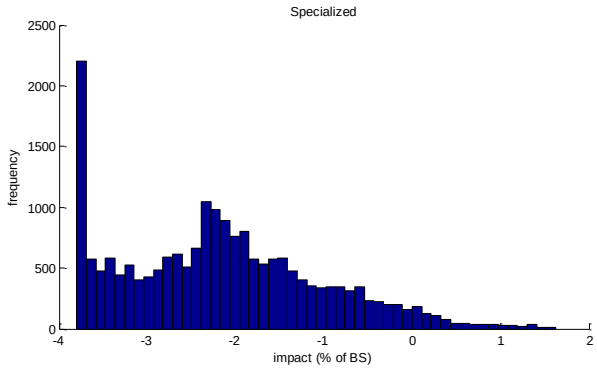




Simulation: Distribution of impact on:85% RSF Assets, as % of BS, at NSFR cutoff:100%, migration method:1, simulation method:2, BS multiplier:1







ANNEX 8 TABLES BY SIZE

	Mean nominal impact (bn EUR)	Huge	Large	Medium	Small	Total
	# compliant banks	23	12	79	82	196
	# non-compliant banks	13	10	31	29	83
ASF	100% ASF capital and liabilities > 1Y	-75.89	36.68	-16.34	-1.52	-57.06
ASF	95% ASF stable retail deposits	345.06	71.77	46.46	3.06	466.35
ASF	90% ASF less stable retail deposits	208.05	65.41	29.19	2.80	305.45
ASF	50% ASF non-retail liabilities	-38.94	45.01	3.40	-1.40	8.07
ASF	0% ASF non-retail liabilities	-438.28	-218.87	-62.72	-2.99	-722.87
RSF	0% RSF assets	-43.06	5.69	-0.57	3.24	-34.70
RSF	100% RSF assets	42.86	3.34	-17.01	-13.27	15.91
RSF	100% RSF LT encumbered assets	-51.06	-102.13	-56.05	-0.39	-209.63
RSF	15% RSF assets	-81.36	-76.00	0.66	1.60	-155.11
RSF	50% RSF assets	-83.30	-41.21	-2.26	2.42	-124.35
RSF	10% RSF assets	-120.66	-61.83	-7.91	2.59	-187.81
RSF	5% RSF Level 1 assets	130.63	52.64	24.94	2.87	211.08
RSF	15% RSF Level 2A assets	-66.71	3.65	1.27	0.79	-60.99
RSF	50% RSF lending	57.95	39.81	3.87	-1.76	99.87
RSF	65% RSF lending	285.40	117.41	39.75	-4.15	438.41
RSF	85% RSF lending	8.20	97.55	21.13	5.78	132.66
RSF	85% RSF assets	-80.08	-38.92	-7.82	0.28	-126.54
RSF	100% RSF 20% deriv. payables	-15.23	-13.29	-3.40	0.02	-31.90
RSF	100% RSF LT CB encumbered assets	1.21	0.00	0.00	0.00	1.21
	Off-BS items	177.00	55.13	17.90	-4.87	245.15

	Mean impact as % of BS of entire business model	Huge	Large	Medium	Small	Total
	# compliant banks	23	12	79	82	196
	# non-compliant banks	13	10	31	29	83
ASF	100% ASF capital and liabilities > 1Y	-0.39%	1.24%	-0.43%	-0.37%	-0.21%
ASF	95% ASF stable retail deposits	1.77%	2.42%	1.22%	0.74%	1.75%
ASF	90% ASF less stable retail deposits	1.07%	2.21%	0.77%	0.67%	1.14%
ASF	50% ASF non-retail liabilities	-0.20%	1.52%	0.09%	-0.34%	0.03%
ASF	0% ASF non-retail liabilities	-2.25%	-7.38%	-1.65%	-0.72%	-2.71%
RSF	0% RSF assets	-0.22%	0.19%	-0.01%	0.78%	-0.13%
RSF	100% RSF assets	0.22%	0.11%	-0.45%	-3.19%	0.06%
RSF	100% RSF LT encumbered assets	-0.26%	-3.44%	-1.48%	-0.09%	-0.79%
RSF	15% RSF assets	-0.42%	-2.56%	0.02%	0.38%	-0.58%
RSF	50% RSF assets	-0.43%	-1.39%	-0.06%	0.58%	-0.47%
RSF	10% RSF assets	-0.62%	-2.08%	-0.21%	0.62%	-0.70%
RSF	5% RSF Level 1 assets	0.67%	1.77%	0.66%	0.69%	0.79%
RSF	15% RSF Level 2A assets	-0.34%	0.12%	0.03%	0.19%	-0.23%

	50% RSF lending	0.30%	1.34%	0.10%	-0.42%	0.37%
	65% RSF lending	1.46%	3.96%	1.05%	-1.00%	1.64%
	85% RSF lending	0.04%	3.29%	0.56%	1.39%	0.50%
	85% RSF assets	-0.41%	-1.31%	-0.21%	0.07%	-0.47%
	100% RSF 20% deriv. payables	-0.08%	-0.45%	-0.09%	0.00%	-0.12%
	100% RSF LT CB encumbered assets	0.01%	0.00%	0.00%	0.00%	0.00%
	Off-BS items	0.91%	1.86%	0.47%	-1.17%	0.92%
	Legend:	Δ>1%	Δ>5%	Δ>10%		

	Mean impact as % of BS of the non-compliant institutions	Huge	Large	Medium	Small	Total
	# compliant banks	23	12	79	82	196
	# non-compliant banks	13	10	31	29	83
ASF	100% ASF capital and liabilities > 1Y	-1.03%	2.51%	-1.58%	-1.42%	-0.57%
ASF	95% ASF stable retail deposits	4.67%	4.91%	4.51%	2.85%	4.67%
ASF	90% ASF less stable retail deposits	2.81%	4.48%	2.83%	2.61%	3.06%
ASF	50% ASF non-retail liabilities	-0.53%	3.08%	0.33%	-1.31%	0.08%
ASF	0% ASF non-retail liabilities	-5.93%	-14.99%	-6.08%	-2.79%	-7.23%
RSF	0% RSF assets	-0.58%	0.39%	-0.06%	3.02%	-0.35%
RSF	100% RSF assets	0.58%	0.23%	-1.65%	-12.35%	0.16%
RSF	100% RSF LT encumbered assets	-0.69%	-6.99%	-5.43%	-0.37%	-2.10%
RSF	15% RSF assets	-1.10%	-5.20%	0.06%	1.49%	-1.55%
RSF	50% RSF assets	-1.13%	-2.82%	-0.22%	2.25%	-1.24%
RSF	10% RSF assets	-1.63%	-4.23%	-0.77%	2.42%	-1.88%
RSF	5% RSF Level 1 assets	1.77%	3.61%	2.42%	2.68%	2.11%
RSF	15% RSF Level 2A assets	-0.90%	0.25%	0.12%	0.74%	-0.61%
RSF	50% RSF lending	0.78%	2.73%	0.38%	-1.64%	1.00%
RSF	65% RSF lending	3.86%	8.04%	3.85%	-3.86%	4.39%
RSF	85% RSF lending	0.11%	6.68%	2.05%	5.38%	1.33%
RSF	85% RSF assets	-1.08%	-2.67%	-0.76%	0.26%	-1.27%
RSF	100% RSF 20% deriv. payables	-0.21%	-0.91%	-0.33%	0.02%	-0.32%
RSF	100% RSF LT CB Encumbered assets	0.02%	0.00%	0.00%	0.00%	0.01%
	Off-BS items	2.39%	3.78%	1.74%	-4.54%	2.45%
	Legend:	Δ>5%	Δ>10%	Δ>20%		

ANNEX 9 TABLES BY SIZE RELATIVE TO DOMESTIC BANKING SECTOR

	Mean nominal impact (bn EUR)	4thquartile-largest	3rdquartile	2ndquartile	1stquartile-smallest	Total
	# compliant banks	52	49	51	44	196
	# non-compliant banks	18	20	19	26	83
ASF	100% ASF capital and liabilities > 1Y	-121.21	17.70	-17.59	-0.92	-122.03
ASF	95% ASF stable retail deposits	258.30	90.01	38.79	7.30	394.40
ASF	90% ASF less stable retail deposits	253.12	66.19	27.55	1.53	348.39
ASF	50% ASF non-retail liabilities	78.09	-1.61	-2.91	-3.67	69.91
ASF	0% ASF non-retail liabilities	-468.30	-173.51	-45.85	-4.24	-691.90
RSF	0% RSF assets	-20.51	22.63	-7.47	0.43	-4.92
RSF	100% RSF assets	92.09	-36.21	-4.69	-3.79	47.40
RSF	100% RSF LT encumbered assets	-182.89	-79.82	-36.25	-0.64	-299.60
RSF	15% RSF assets	-53.39	-42.85	-3.79	0.13	-99.91
RSF	50% RSF assets	-60.54	-35.86	5.37	1.90	-89.13
RSF	10% RSF assets	-78.33	-65.25	-5.50	2.41	-146.66
RSF	5% RSF Level 1 assets	106.46	81.48	5.36	2.75	196.04
RSF	15% RSF Level 2A assets	-40.20	15.99	-3.41	1.08	-26.53
RSF	50% RSF lending	52.51	27.79	0.74	-1.42	79.62
RSF	65% RSF lending	139.44	135.74	28.14	-4.52	298.79
RSF	85% RSF lending	107.46	18.25	24.98	1.25	151.94
RSF	85% RSF assets	-62.57	-41.90	-3.48	0.43	-107.51
RSF	100% RSF 20% deriv. payables	-15.84	-12.12	-4.08	-0.01	-32.06
RSF	100% RSF LT CB Encumbered assets	0.47	0.00	0.00	0.00	0.47
	Off-BS items	64.02	5.02	-1.99	-0.77	66.27

	Mean impact as % of BS of entire business model	4thquartile-largest	3rdquartile	2ndquartile	1stquartile-smallest	Total
	# compliant banks	52	49	51	44	196
	# non-compliant banks	18	20	19	26	83
ASF	100% ASF capital and liabilities > 1Y	-0.68%	0.27%	-0.82%	-0.37%	-0.46%
ASF	95% ASF stable retail deposits	1.45%	1.40%	1.81%	2.90%	1.48%
ASF	90% ASF less stable retail deposits	1.42%	1.03%	1.29%	0.61%	1.31%
ASF	50% ASF non-retail liabilities	0.44%	-0.02%	-0.14%	-1.45%	0.26%
ASF	0% ASF non-retail liabilities	-2.63%	-2.69%	-2.14%	-1.68%	-2.59%
RSF	0% RSF assets	-0.12%	0.35%	-0.35%	0.17%	-0.02%
RSF	100% RSF assets	0.52%	-0.56%	-0.22%	-1.50%	0.18%

	100% RSF LT encumbered assets	-1.03%	-1.24%	-1.69%	-0.26%	-1.12%
	15% RSF assets	-0.30%	-0.66%	-0.18%	0.05%	-0.37%
	50% RSF assets	-0.34%	-0.56%	0.25%	0.75%	-0.33%
	10% RSF assets	-0.44%	-1.01%	-0.26%	0.96%	-0.55%
	5% RSF Level 1 assets	0.60%	1.26%	0.25%	1.09%	0.73%
	15% RSF Level 2A assets	-0.23%	0.25%	-0.16%	0.43%	-0.10%
	50% RSF lending	0.29%	0.43%	0.03%	-0.57%	0.30%
	65% RSF lending	0.78%	2.10%	1.31%	-1.79%	1.12%
	85% RSF lending	0.60%	0.28%	1.17%	0.50%	0.57%
	85% RSF assets	-0.35%	-0.65%	-0.16%	0.17%	-0.40%
	100% RSF 20% deriv. payables	-0.09%	-0.19%	-0.19%	-0.01%	-0.12%
	100% RSF LT CB encumbered assets	0.00%	0.00%	0.00%	0.00%	0.00%
	Off-BS items	0.36%	0.08%	-0.09%	-0.31%	0.25%
	Legend:	Δ>1%	Δ>5%	Δ>10%		

	Mean impact as % of BS of the non-compliant institutions	4thquartile-largest	3rdquartile	2ndquartile	1stquartile-smallest	Total
	# compliant banks	52	49	51	44	196
	# non-compliant banks	18	20	19	26	83
ASF	100% ASF capital and liabilities > 1Y	-1.79%	0.75%	-2.35%	-1.01%	-1.22%
ASF	95% ASF stable retail deposits	3.81%	3.80%	5.18%	7.99%	3.95%
ASF	90% ASF less stable retail deposits	3.73%	2.80%	3.68%	1.67%	3.49%
ASF	50% ASF non-retail liabilities	1.15%	-0.07%	-0.39%	-4.01%	0.70%
ASF	0% ASF non-retail liabilities	-6.90%	-7.33%	-6.12%	-4.64%	-6.92%
RSF	0% RSF assets	-0.30%	0.96%	-1.00%	0.47%	-0.05%
RSF	100% RSF assets	1.36%	-1.53%	-0.63%	-4.15%	0.47%
RSF	100% RSF LT encumbered assets	-2.70%	-3.37%	-4.84%	-0.71%	-3.00%
RSF	15% RSF assets	-0.79%	-1.81%	-0.51%	0.14%	-1.00%
RSF	50% RSF assets	-0.89%	-1.51%	0.72%	2.08%	-0.89%
RSF	10% RSF assets	-1.15%	-2.76%	-0.73%	2.64%	-1.47%
RSF	5% RSF Level 1 assets	1.57%	3.44%	0.71%	3.01%	1.96%
RSF	15% RSF Level 2A assets	-0.59%	0.68%	-0.45%	1.19%	-0.27%
RSF	50% RSF lending	0.77%	1.17%	0.10%	-1.56%	0.80%
RSF	65% RSF lending	2.06%	5.73%	3.75%	-4.95%	2.99%
RSF	85% RSF lending	1.58%	0.77%	3.33%	1.37%	1.52%
RSF	85% RSF assets	-0.92%	-1.77%	-0.46%	0.47%	-1.08%
RSF	100% RSF 20% deriv. payables	-0.23%	-0.51%	-0.54%	-0.01%	-0.32%
RSF	100% RSF LT CB encumbered assets	0.01%	0.00%	0.00%	0.00%	0.00%
RSF	Off-BS items	0.94%	0.21%	-0.27%	-0.85%	0.66%
RSF	Legend:	Δ>5%	Δ>10%	Δ>20%		

ANNEX 10 TABLES BY SIZE RELATIVE TO DOMESTIC GDP

	Mean nominal impact (bn EUR)	4thGDP quartile-largest	3rdGDP quartile	2ndGDP quartile	1stGDP quartile-smallest	Total
	# compliant banks	50	46	54	46	196
	# non-compliant banks	20	23	16	24	83
ASF	100% ASF capital and liabilities > 1Y	-83.60	2.87	-5.38	-1.10	-87.21
ASF	95% ASF stable retail deposits	304.18	89.77	19.99	6.18	420.12
ASF	90% ASF less stable retail deposits	238.91	73.13	15.86	1.60	329.49
ASF	50% ASF non-retail liabilities	15.24	18.76	7.07	-3.53	37.54
ASF	0% ASF non-retail liabilities	-474.73	-184.53	-37.69	-3.15	-700.09
RSF	0% RSF assets	-29.81	1.17	-4.47	0.48	-32.63
RSF	100% RSF assets	78.72	-31.14	-0.60	-4.60	42.39
RSF	100% RSF LT encumbered assets	-179.58	-77.80	-15.13	-0.54	-273.04
RSF	15% RSF assets	-70.51	-33.55	-4.97	0.56	-108.48
RSF	50% RSF assets	-73.80	-33.65	4.04	1.81	-101.61
RSF	10% RSF assets	-127.42	-35.54	-8.10	1.97	-169.10
RSF	5% RSF Level 1 assets	143.99	51.29	4.39	2.67	202.33
RSF	15% RSF Level 2A assets	-37.48	15.04	0.24	0.90	-21.29
RSF	50% RSF lending	59.68	15.59	2.20	-0.71	76.76
RSF	65% RSF lending	215.99	143.47	6.51	-4.13	361.84
RSF	85% RSF lending	95.36	18.97	17.29	1.44	133.07
RSF	85% RSF assets	-75.66	-33.86	-1.41	0.18	-110.75
RSF	100% RSF 20% deriv. payables	-14.27	-12.20	-3.29	-0.01	-29.78
RSF	100% RSF LT CB encumbered assets	0.53	0.00	0.00	0.00	0.53
	Off-BS items	53.37	8.06	-4.23	-0.21	56.99

	Mean impact as % of BS of entire business model	4thGDP quartile-largest	3rdGDP quartile	2ndGDP quartile	1stGDP quartile-smallest	Total
	# compliant banks	50	46	54	46	196
	# non-compliant banks	20	23	16	24	83
ASF	100% ASF capital and liabilities > 1Y	-0.41%	0.06%	-0.37%	-0.48%	-0.33%
ASF	95% ASF stable retail deposits	1.49%	1.98%	1.36%	2.67%	1.57%
ASF	90% ASF less stable retail deposits	1.17%	1.61%	1.08%	0.69%	1.23%
ASF	50% ASF non-retail liabilities	0.07%	0.41%	0.48%	-1.52%	0.14%
ASF	0% ASF non-retail liabilities	-2.32%	-4.07%	-2.57%	-1.36%	-2.62%
RSF	0% RSF assets	-0.15%	0.03%	-0.30%	0.21%	-0.12%
RSF	100% RSF assets	0.39%	-0.69%	-0.04%	-1.99%	0.16%

	100% RSF LT encumbered assets	-0.88%	-1.71%	-1.03%	-0.23%	-1.02%
	15% RSF assets	-0.34%	-0.74%	-0.34%	0.24%	-0.41%
	50% RSF assets	-0.36%	-0.74%	0.27%	0.78%	-0.38%
	10% RSF assets	-0.62%	-0.78%	-0.55%	0.85%	-0.63%
	5% RSF Level 1 assets	0.70%	1.13%	0.30%	1.15%	0.76%
	15% RSF Level 2A assets	-0.18%	0.33%	0.02%	0.39%	-0.08%
	50% RSF lending	0.29%	0.34%	0.15%	-0.31%	0.29%
	65% RSF lending	1.06%	3.16%	0.44%	-1.79%	1.36%
	85% RSF lending	0.47%	0.42%	1.18%	0.62%	0.50%
	85% RSF assets	-0.37%	-0.75%	-0.10%	0.08%	-0.42%
	100% RSF 20% deriv. payables	-0.07%	-0.27%	-0.22%	-0.01%	-0,11%
	100% RSF LT CB encumbered assets	0.00%	0.00%	0.00%	0.00%	0.00%
	Off-BS items	0.26%	0.18%	-0.29%	-0.09%	0.21%
	Legend:	Δ>1%	Δ>5%	Δ>10%		

	Mean impact as % of BS of the non-compliant institutions	4thGDP quartile-largest	3rdGDP quartile	2ndGDP quartile	1stGDP quartile-smallest	Total
	# compliant banks	50	46	54	46	196
	# non-compliant banks	20	23	16	24	83
ASF	100% ASF capital and liabilities > 1Y	-1.13%	0.14%	-1.35%	-1.59%	-0.87%
ASF	95% ASF stable retail deposits	4.09%	4.29%	5.02%	8.91%	4.20%
ASF	90% ASF less stable retail deposits	3.21%	3.49%	3.98%	2.30%	3.30%
ASF	50% ASF non-retail liabilities	0.21%	0.90%	1.77%	-5.08%	0.38%
ASF	0% ASF non-retail liabilities	-6.39%	-8.81%	-9.46%	-4.54%	-7.01%
RSF	0% RSF assets	-0.40%	0.06%	-1.12%	0.69%	-0.33%
RSF	100% RSF assets	1.06%	-1.49%	-0.15%	-6.63%	0.42%
RSF	100% RSF LT encumbered assets	-2.42%	-3.72%	-3.80%	-0.77%	-2.73%
RSF	15% RSF assets	-0.95%	-1.60%	-1.25%	0.80%	-1.09%
RSF	50% RSF assets	-0.99%	-1.61%	1.01%	2.60%	-1.02%
RSF	10% RSF assets	-1.71%	-1.70%	-2.03%	2.83%	-1.69%
RSF	5% RSF Level 1 assets	1.94%	2.45%	1.10%	3.84%	2.02%
RSF	15% RSF Level 2A assets	-0.50%	0.72%	0.06%	1.29%	-0.21%
RSF	50% RSF lending	0.80%	0.74%	0.55%	-1.03%	0.77%
RSF	65% RSF lending	2.91%	6.85%	1.63%	-5.95%	3.62%
RSF	85% RSF lending	1.28%	0.91%	4.34%	2.07%	1.33%
RSF	85% RSF assets	-1.02%	-1.62%	-0.35%	0.26%	-1.11%
RSF	100% RSF 20% deriv. payables	-0.19%	-0.58%	-0.83%	-0.02%	-0.30%
RSF	100% RSF LT CB encumbered assets	0.01%	0.00%	0.00%	0.00%	0.01%
	Off-BS items	0.72%	0.38%	-1.06%	-0.31%	0.57%
	Legend:	Δ>5%	Δ>10%	Δ>20%		

ANNEX 11 THEORETICAL EXAMPLES – NSFR OF SIMPLIFIED PASS THROUGH FINANCING MODELS

In order to illustrate the NSFR for the typical balance sheet structures of pass through financing models, a theoretical example is applied below.

Table A describes the simplified balance sheets of four theoretically constructed pass-through banks funding residential mortgage loans via issuance of covered bonds with terms of 3 years, 5 years, 10 years and 30 years, respectively. For illustrative purposes, these examples are constructed in a simplified way, with only one type of funding and one type of asset for each bank. In practice, pass-through financing banks could also have a mix of bonds with different terms financing loans to different counterparties.

Table A: Theoretical pass through banks

	Funding	**Assets**
Bank A	3 year covered bonds	30 year residential mortgages
Bank B	5 year covered bonds	30 year residential mortgages
Bank C	10 year covered bonds	30 year residential mortgages
Bank D	30 year covered bonds	30 year residential mortgages

The maturity profiles of these theoretically constructed banks are shown in Table B. It is assumed that the funding is issued continuously, and each year an equal part of the funding matures. Thus, for example, for Bank A which is funded with three-year covered bonds, one third of the funding matures each year.

Table B: Maturity profile of theoretical pass through banks

	Maturity of funding		
	< 6m	6m-12m	>12m
Bank A	16.5%	16.5%	67%
Bank B	10%	10%	80%
Bank C	5%	5%	90%
Bank D	1.7%	1.7%	96.7%

Given the maturity profiles in Table B and the applicable ASF and RSF factors the theoretical pass-through banks A-D with a balance sheet size of 100 would obtain ASF, RSF and NSFR levels as

illustrated in Tables C, D and E respectively. The loans are considered encumbered for the term of the liability.

Table C: Available stable funding for theoretical pass-through banks

Maturity of funding	< 6m	6m-12m	>12m	**Total ASF**
ASF factor	0%	50%	100%	
Bank A	-	8.3	67.0	**75.3**
Bank B	-	5.0	80.0	**85.0**
Bank C	-	2.5	90.0	**92.5**
Bank D	-	0.9	96.7	**97.6**

Table D: Required stable funding for theoretical pass-through banks

Maturity of funding	< 6m	6m-12m	>12m	**Total RSF**
RSF factor	65% (50%)[72]	65% (50%)[73]	100%	
Bank A	10.7	10.7	67.0	**88.5**
Bank B	6.5	6.5	80.0	**93.0**
Bank C	3.3	3.3	90.0	**96.5**
Bank D	0.9	0.9	96.7	**98.4**

Table E: Total ASF, RSF and NSFR for theoretical pass-through banks

	ASF	RSF	**NSFR**
Bank A	753	88.5	**85%**
Bank B	85.0	93.0	**91%**
Bank C	92.5	96.5	**96%**
Bank D	97.6	98.4	**99%**

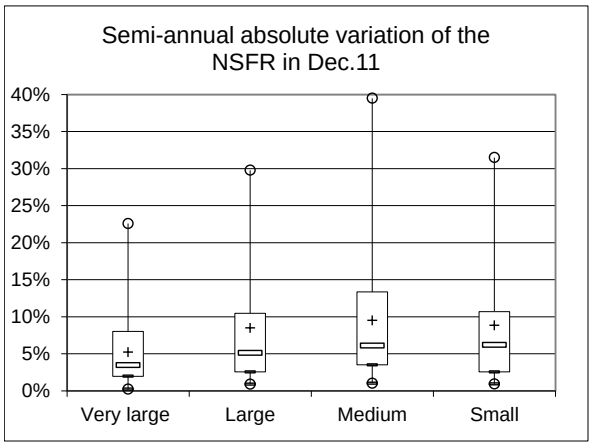
[72] Only Bank D will have an RSF factor of 50% when below six months because this bank's assets and liabilities have the same term and, therefore, mature simultaneously.

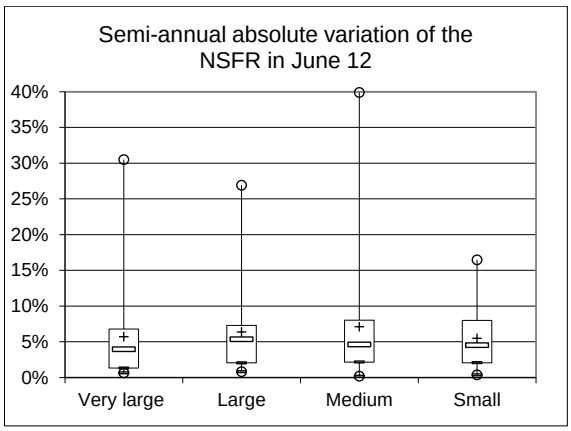
[73] Only Bank D will have an RSF factor of 50% when below one year because this bank's assets and liabilities have the same term and, therefore, mature simultaneously.

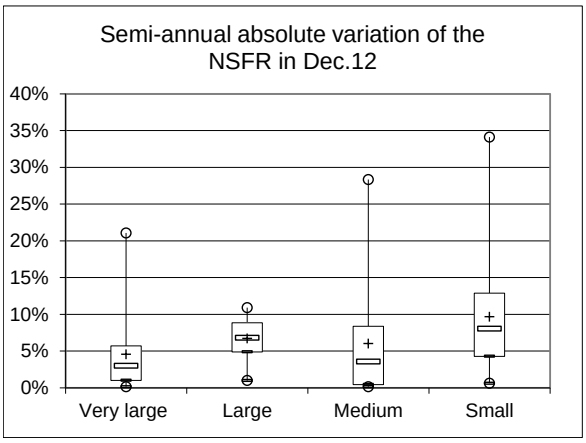
Table E shows the NSFR levels of the four simplified pass-through banks. A pass-through bank having a mix of funding from covered bonds with different terms between 3 and 30 years would, in this example, obtain an NSFR level in the range of 85-99%.

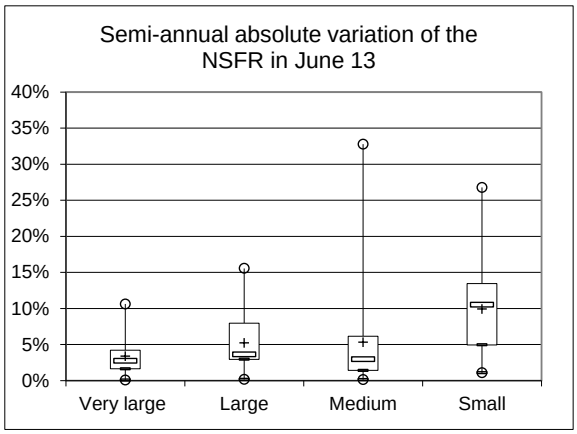
ANNEX 12 VOLATILITY OF THE NSFR

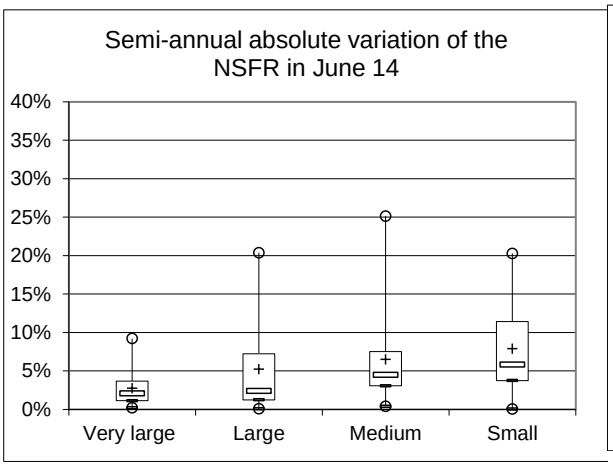
1) Semi-annual absolute variation of the NSFR

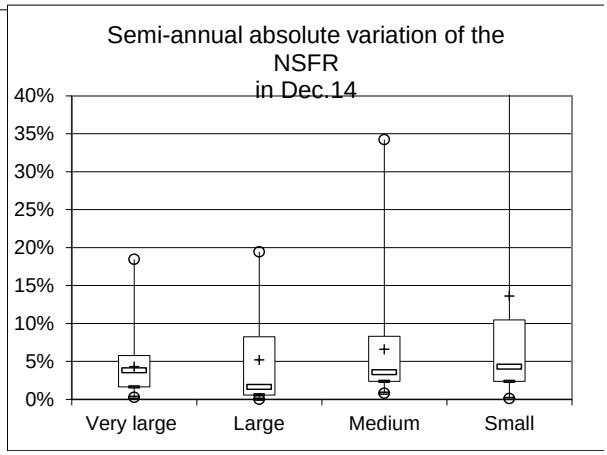






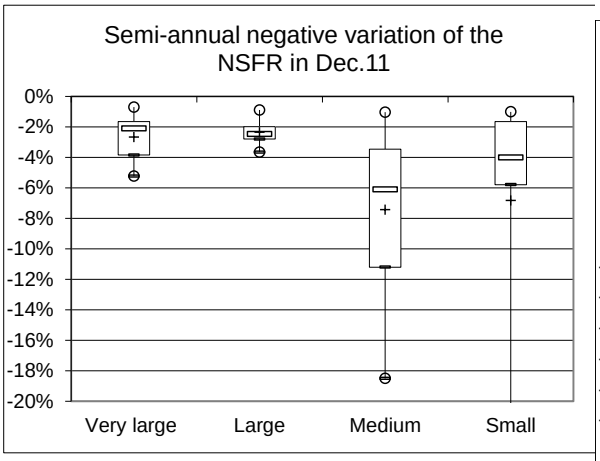


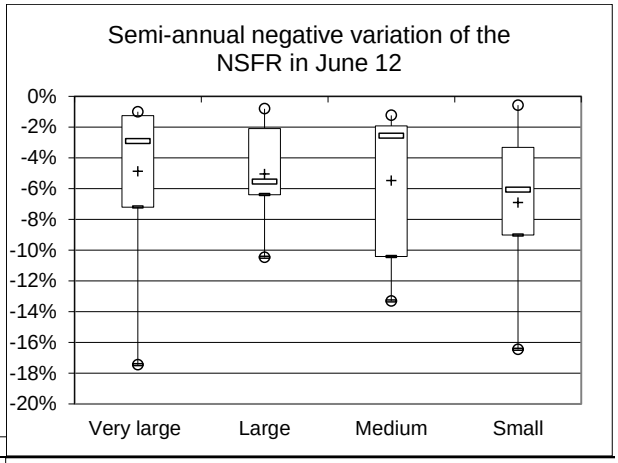


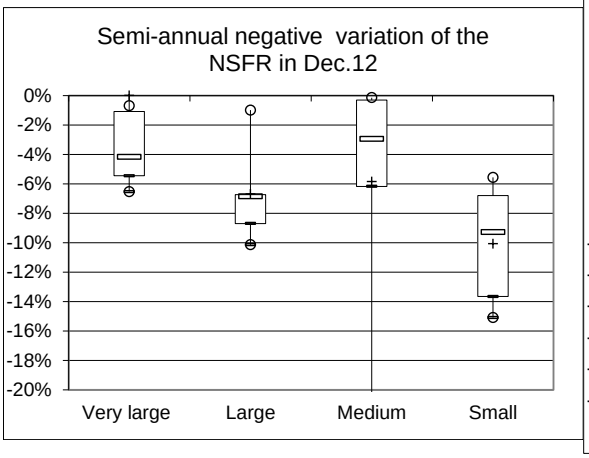


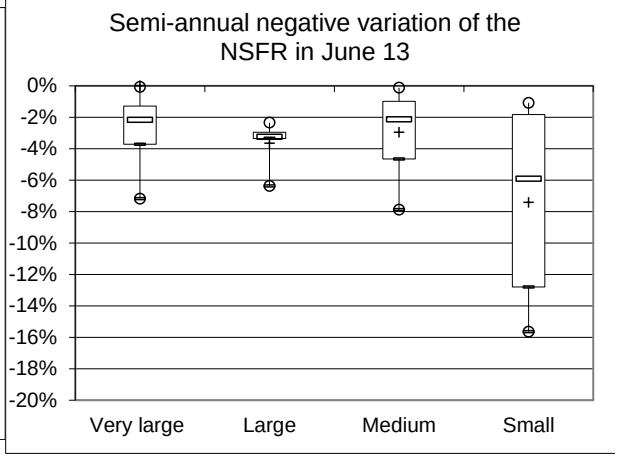
Source: EBA QIS (December 2014)

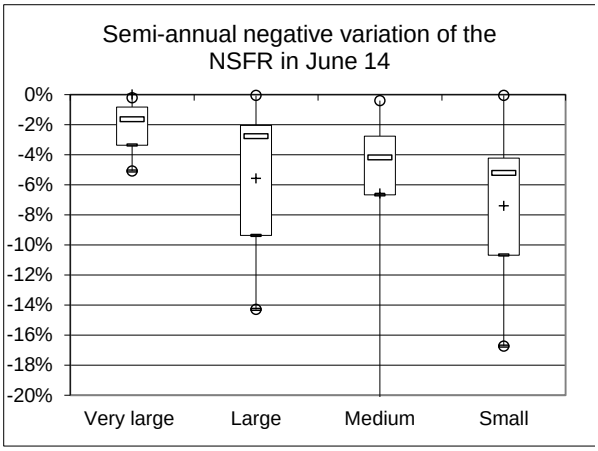
2) Semi-annual negative variation of the NSFR

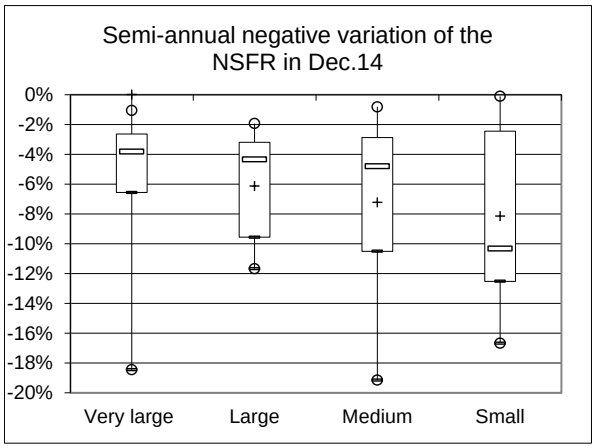












Source: EBA QIS (December 2014)

ANNEX 13. MATCHING NSFR QIS TEMPLATES BETWEEN JUNE AND DECEMBER 2014

The December 2014 QIS template is based on the final NSFR standard of October 2014. As a consequence, a direct comparison with the June 2014 NSFR is inconsistent. This note describes an approach to isolating the variation in the NSFR due to balance sheet changes from changes due to the new standard.

The approach aims to minimise the number of hypotheses to be done in order to make a consistent calculation of the shortfall variation between the two periods. In the proposal below, only one hypothesis is required to compute this consistent change in the NSFR between June and December 2014.

ASF

There are no methodological changes regarding the calculation of the ASF in the final NSFR standard. The figures can be reported as in the QIS templates for both dates.

RSF

The final NSFR standard modifies the treatment of derivatives. Compared to the previous standard:

- RSF increases by 85% * initial margins for derivatives contracts and contribution to the default fund of a CCP;
- RSF increases by 20% * gross derivative liabilities; and
- only the cash variation margin can be deducted from derivative assets, which increase RSF by the amount of other variation margins whether the difference between derivative assets and liabilities is positive or not.

In the final standard, the treatment of loans to financial institutions with a remaining maturity of less than six months (and which are unencumbered or encumbered for less than six months) is also modified:

- the asymmetric treatment between regulated banks and non-bank financial institutions disappears;
- exposures secured by Level 1 assets (which can be re-hypothecated) receive a 10% RSF;
- all other exposures receive a 15% RSF;
- compared to the previous standard:
    - RSF increases by 10% to 15% for exposures towards regulated banks;

- RSF decreases by 35% to 40% for exposures towards non-bank financial institutions.

Consistently measuring the change in the NSFR between June and December 2014:

1. Treatment of loans to bank and non-bank financial institutions in the June 2014 template

- In the December 2014 template, we compute the proportion **α** of loans to banks and financial institutions of less than six months' maturity secured by Level 1 assets over the total amount of loans:
  - we hypothesise that this proportion is the same in June 2014, as we cannot directly infer it from the June data;[74] and
  - this hypothesis appears to be acceptable given the narrow difference in RSF weights for the two types of exposures (5%).
- In the June 2014 template, we compute the adjusted RSF:
  - we compute the increase in RSF as + [(0.10 * α) + (0.15 * (1 – α))] * loans to banks with a maturity of less than six months; and
  - we compute the decrease in RSF as – [(0.40 * α) + (0.35 * (1 – α))] * loans to non-bank financial institutions with a maturity of less than six months.

2. Treatment of derivatives

- In order to limit the number of assumptions to be made, we adapt RSF in the December 2014 template for a consistent treatment of derivatives:
- Regarding margining rules:
  - other variation margins are deducted from the derivative assets, which leads to a decrease in RSF equal to max (0, calculated RSF on derivatives – other variation margin); and
  - RSF decreases by 85% of the initial margin posted and contribution to the default funds of a CCP.
- Regarding the 20% RSF add-on:

[74] We also make the assumption that the same proportions **α** of bank and non-bank exposures are collateralised by Level 1 assets.

- RSF is decreased by 20% * gross derivative liabilities

The adjusted RSF for June and December 2014 can then serve as a basis to compute the consistent change in NSFR (or change in shortfall) between the two time periods. The remaining change between the actual June and December 2014 NSFR is due to the methodological changes in the final standard.

The diagram below summarizes the steps to compute the consistent change in NSFR:

$$NSFR_{JUNE14} = \frac{ASF_{JUNE14}}{RSF_{JUNE14}}$$

Step 1

$$Adjusted\ NSFR_{JUNE14} = \frac{ASF_{JUNE14}}{Adjusted\ RSF_{JUNE14}}$$

$$Adjusted\ RSF_{JUNE14} = RSF_{JUNE14} + [0.10 \times \alpha + 0.15 \times (1 - \alpha)] \times \text{loans to banks mat. inf. 6 m} - [0.40 \times \alpha + 0.35 \times (1 - \alpha)] \times \text{loans to nonbank financial institutions mat. inf. 6m}$$

$$NSFR_{DEC14} = \frac{ASF_{DEC14}}{RSF_{DEC14}}$$

Step 2

$$Adjusted\ NSFR_{DEC14} = \frac{ASF_{DEC14}}{Adjusted\ RSF_{DEC14}}$$

$$Adjusted\ RSF_{DEC14} = RSF_{DEC14} - Max(0, calculated\ RSF\ on\ derivatives - Other\ variation\ margin) - 85\% \times initial\ margin - 20\% \times Gross\ derivative\ liabilities$$

Step 3

$$Consistent\ \Delta NSFR = Adjusted\ NSFR_{DEC14} - Adjusted\ NSFR_{JUNE14}$$

ANNEX 14. REFERENCES

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