



REPUBLIC OF LATVIA

SELECTED ISSUES

August 2019

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July 23, 2019

Approved By
European Department

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LATVIA'S PARTICIPATION IN GLOBAL VALUE CHAINS: IMPLICATIONS FOR COMPETITIVENESS AND EXPOSURE TO SHOCKS¹

Latvia, as many European countries, is open and relatively integrated into global value chains (GVCs) and hence competes over supplying value added in world markets. This paper analyzes the implications of GVC participation for Latvia's competitiveness and exposure to risks. Using a structural model, it assesses Latvia's competitiveness through different REER measures, and examines the main factors behind differences in the measures. Based on this analysis, the paper suggests policy options to strengthen Latvia's competitiveness. The paper also estimates the impact of an appreciation of the GVC related REER measure on value added export growth and real GDP growth, and finds sizable effects, suggesting that a rapid labor market tightening could lead to erosion in competitiveness and reduction in growth. Finally, trade tension induced tariff hikes may have significant cost for Latvia, especially in terms of value added produced in the country.

A. Background: Latvia's Participation in Global Value Chains

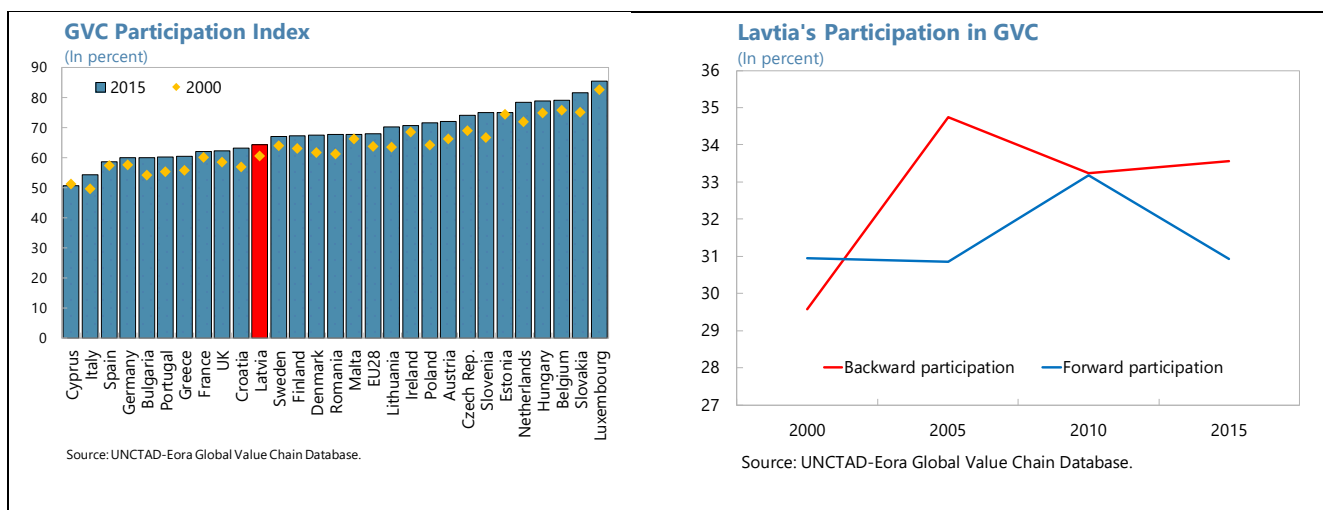
1. Countries' participation in global value chains has altered the nature of international competition. Global value chains (GVCs) refer to the fragmentation of production stages geographically and internationally, as countries increasingly compete over the supply of domestic value added to the production and sale of final goods and services in world markets. In this context, trade in value added, rather than the gross amount of traded goods and services with trading partners becomes a more relevant indicator of a country's competitiveness strength. Backward GVC participation refers to the amount of intermediate value added imported by a country to generate output for its own exports. Forward GVC participation captures the amount of a country's valued added exported as inputs in other countries' exports.

2. Latvia is relatively well integrated in GVCs. Its participation is lower compared to other Baltic countries but has increased over time.² The increase has been driven mainly by backward participation in industries such as manufacturing of basic metals, rubber and plastic products, transport equipment, and chemical products, as well as air transport. Latvia incorporates foreign value added mainly from Russia, Germany, Lithuania, Sweden and Finland. Forward participation is focused in industries such as manufacturing of wood and basic metals, land transport and transport via pipeline, wholesale trade (except of motor vehicles and motorcycles), and crop and animal production. Forward GVC participation is mainly with Estonia, Lithuania, Russia, and Belarus. This

¹ Prepared by Kodjovi Eklou.

² We assess Latvia's participation in GVC using the GVC index. The GVC participation index includes both backward and forward participation expressed as share of gross exports.

suggests that Latvia's competitiveness is likely to be sensitive to price changes in Russia and Germany and demand from Estonia and Lithuania for example. Compared to other EU countries, Latvia's GVC participation is lower and may reflect lower human capital and high unit labor costs than peers.³



3. This paper is closely related to recent research on GVC across countries and in Latvia.

Bems and Johnson (2017) derive demand for value added and a novel REER based on value added (VA). We use their structural model to construct a VA-based REER measure for Latvia, investigate the implication of its appreciation for value-added export and growth, and to quantify the impact of tariff shocks. The paper is also related to Benkovskis et al. (2017) which investigates determinants of GVC participation and its gains for Latvia using micro level data. We investigate the macroeconomic implication of GVC participation for competitiveness and exposure to external shocks and refer to Benkovskis et al. (2017) for appropriate ways to strengthen competitiveness.

B. Assessing Latvia's Competitiveness with Different REER Measures

Conventional REER Indexes versus Value-Added REER

4. The conventional framework features demand switching as the main channel through which changes in international relative prices affect both economic activity and the external balance. However, global supply chains challenge this conventional view because they link countries on the supply side. For instance, in the conventional framework, a depreciation of the euro, will make goods produced in Latvia more competitive, and consumers will switch their expenditure toward them, lowering demand for other EU trading partners outside of the euro area. This conventional view is not complete when one takes into account trade in inputs. If Latvia uses imported inputs from other non-euro area members in its production, then the expenditure

³ See Ignatenko et al. (2019) who show that high unit labor costs and low human capital reduce GVC participation in a sample of 189 countries. Regarding human capital, Benkovskis et al. (2017) highlight the importance of skilled workers as a determinant of GVC participation in Latvia.

switching in favor of goods produced in Latvia will also benefit its input suppliers. In addition, the depreciation of the euro will also benefit trade partners to which Latvia supplies input as the production cost of the latter will decrease and they will become more competitive. Overall, the VA-REER allows analyzing demand switching over value added, consistently with GVCs shaping the nature of competition toward the supply of domestic value-added and making therefore the product-focused approach of the conventional framework less relevant.

5. Using a structural model that accounts for supply chain linkages and trade in value added we assess Latvia's competitiveness in a world dominated by global value chains. We employ a structural framework developed by Bems and Johnson (2017) with the objective to compute a REER index replacing the weights of trading partners based on their gross trade flow shares with Latvia (conventional REER weights) with weights based on trade in value added.⁴ We use the 2016 vintage of the World Input-Output Database (WIOD, Timmer et al., 2015) to compute the value added REER of Latvia, taking into account bilateral trade in value added.⁵

6. The conventional REER is derived from a log-linearization of the standard Armington CES demand system as follows:⁶

$$\text{Conv REER}_i = \sum_{j \neq i} \left[\frac{1}{S_i} \sum_k \left(\frac{p_i D_{ik}}{p_i D_i} \right) \left(\frac{p_j D_{jk}}{P_k E_k} \right) \right] (\hat{p}_i - \hat{p}_j) \quad (1),$$

$$\text{where} \quad S_i = 1 - \sum_k \left(\frac{p_i D_{ik}}{p_i D_i} \right) \left(\frac{p_i D_{ik}}{P_k E_k} \right)$$

In this expression, D_{ik} denotes country k 's demand for output from i , P_k is the price index for real expenditure by country k on output from all countries (E_k), and D_i is the total demand for country i 's output. This conventional REER thus features the so-called double export weights for bilateral relative price changes, with a weighting scheme accounting for head-to-head competition between i and j in all destinations k (through $\frac{p_j D_{jk}}{P_k E_k}$) and the share of each destination in country i 's total sales (through $\frac{p_i D_{ik}}{p_i D_i}$).

7. The value-added REER (VA-REER) is derived from a theoretical framework that explicitly distinguishes between gross output and value-added, by modeling production and trade in final goods and inputs. The general expression of the VA-REER is given by:

⁴ This value-added REER is obtained as an aggregation of bilateral value-added price changes into an index that measures the average multilateral price of domestic relative to foreign value added. In this index, the weight attached to bilateral price changes depends on the cross-price elasticity of demand, that is the elasticity of demand for value added from a given country with respect to another country's value-added price. In addition, this cross-price elasticity depends on the interaction of the global input-output structure with relative elasticities in production versus consumption.

⁵ Given high persistency in the weights, we assume that they remain constant from 2014 through 2018.

⁶ See Bems and Johnson (2017) for details on the derivation. The terms \hat{x} represent a first difference in logarithm of x .

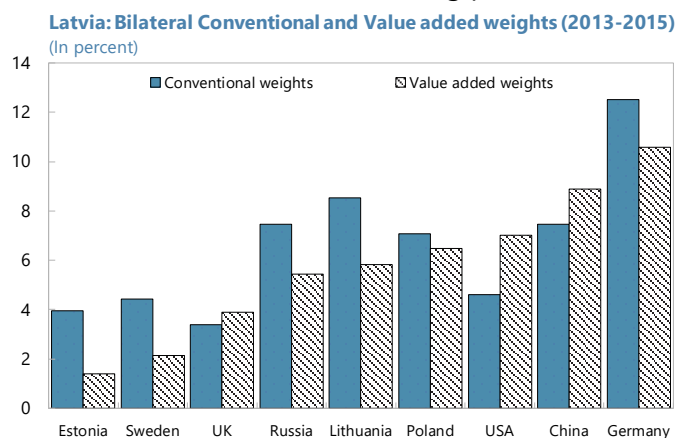
$$VAREER_i = \sum_{j \neq i} \left[\sum_k \left(\frac{-T^{ij}}{T^{ii}} \right) \right] (\hat{p}_i^v - \hat{p}_j^v) = \sum_{j \neq i} \left[\frac{1}{S_i} \sum_k \left(\frac{p_i^v V_{ik}}{p_i^v V_i} \right) \left(\frac{p_j^v V_{jk}}{p_k^f F_k} \right) \right] (\hat{p}_i^v - \hat{p}_j^v) (2),$$

$$\text{where } S_i = 1 - \sum_k \left(\frac{p_i^v V_{ik}}{p_i^v V_i} \right) \left(\frac{p_k^f F_k}{p_k^f F_k} \right)$$

In this general formula, the REER index features weights $\frac{-T^{ij}}{T^{ii}}$ attached to bilateral relative value-added price changes. The second part of the expression shows a version that assumes equal elasticities (elasticity of substitution across final goods, across inputs, and between inputs and value added in production). Here, V_{ij} denotes the value added produced by country i that is ultimately absorbed in country j , $p_i^v V_{ij}$ is the value-added exports from country i to country j . This second part of the expression is similar to the conventional REER index as it features a double-weighting scheme but focusing on value added (V_{ik} denotes country k 's demand for value added from i) and final goods ($p_k^f F_k$ refers to expenditure on final goods).

8. We use the VA-REER that accounts for the global input output linkages where weights are a complex function of trade flows and elasticities. In its version capturing the full global input-output linkages, it is assumed that the elasticity of substitution across inputs and the elasticity of substitution between input and value added in production are zero (Leontief production function). This property captures the well-known view of inflexible or rigid production chains, which implies that it is difficult for producers to substitute across suppliers in the short run (see for instance Boehm, Flaaen, and Nayar, 2019, Bayoumi et al., forthcoming). This measure of VA REER has also the property of putting more weight on final goods trade, and lower weights on country with strong bilateral input linkages as discussed further below.

9. Value added weights of Latvia's traditional trading partners are lower than conventional weights.⁷ A feature of the GVC-based model is that bilateral trading partners with stronger input linkages tend to have lower cross-price elasticities and hence lower value-added (VA) than conventional weights.⁸ Indeed, as supply chains are regional in the EU (See Bems and Johnson, 2017; Bayoumi et al., 2018, and Huidrom et al., 2019), bilateral VA weights tend to be lower than conventional weights for most EU countries. In this context, the value added embodied in each production step is often much lower than the gross trade flow. In particular, the VA weights of Lithuania and Estonia, Germany, Sweden,



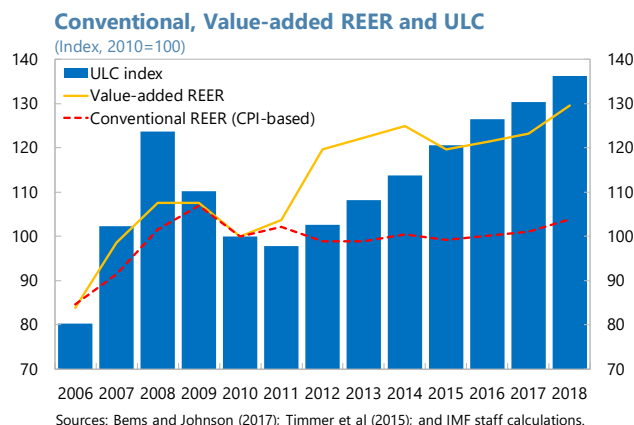
Sources: Bems and Johnson (2017); Timmer et al (2015); and IMF staff calculations.

⁷ See short appendix and Bayoumi et al. (2006) for details on the methodology for calculating conventional weights.

⁸ The conventional macro framework features weights based on gross trade flows and production as there is no distinction between gross output and value-added data nor between inputs and final goods.

and Russia are about 2.3 percentage points lower than their conventional rates, while USA and China's weight are 2 percentage points higher. It thus appears that the USA and China have somewhat greater importance for Latvia's competitiveness than Lithuania and Russia.

10. Latvia's VA REER index has appreciated more rapidly than the conventional REER. The conventional REER and VA REER have moved in the same direction, but the latter has appreciated more than the former since 2010. While a significant share of the current gap between the two indices built in 2012 (see below), it has continued to increase over time. In particular, the VA REER increase appears to be in line with the rise in unit labor cost and the correlation between the two is high (0.9). This suggests that Latvia's competitiveness in supplying its domestic value added is highly dependent on the increase of labor costs.



What drives the Gap Between the VA REER and the Conventional REER?

11. The gap between the VA REER and the conventional REER contains a price and a weight component as follows:

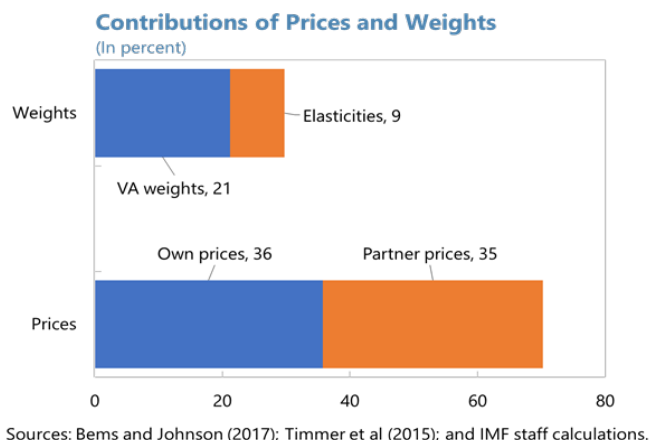
$VAREER_i - Conv REER_i$

$$= \sum_{j \neq i} (\omega_{ij}^v - w_{ij}^{Armington}) (\hat{p}_i^v - \hat{p}_j^v) + \sum_{j \neq i} w_{ij}^{Armington} [(\hat{p}_i^v - \widehat{CPI}_i) - (\hat{p}_j^v - \hat{E}_{i/j} - \widehat{CPI}_j)]$$

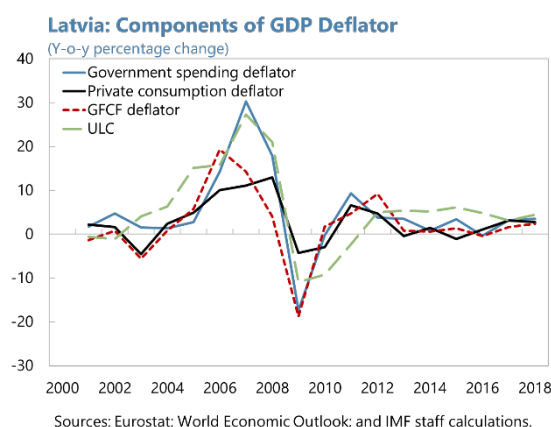
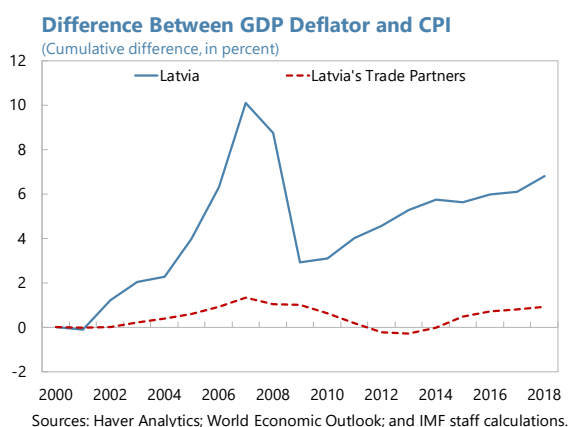
where the first part captures the role of differences in weights between the value-added and the conventional REER. The second term captures the differences in prices used in constructing the two REER indexes. This price component also has two subcomponents, which are the own-price component $(\hat{p}_i^v - \widehat{CPI}_i)$ showing the difference between the GDP deflator and the CPI, and the partner price component $(\hat{p}_j^v - \hat{E}_{i/j} - \widehat{CPI}_j)$. \widehat{CPI} and $\hat{E}_{i/j}$ are respectively the log changes in the CPI index and the nominal exchange rate, respectively.

12. The REER gap is largely explained by price differentials. About 70 percent of the REER gap is explained by the price component while the remaining part is explained by the weight component. Decomposing further shows that half of the price gap is due to the differential in

Latvia’s prices used in VA REER (the GDP deflator) relative to those used in the conventional REER (CPI) as opposed to the differential of partner prices. Value added weights account for 21 percent of the gap, with a smaller role (9 percent) for elasticities, that is the role of rigid production chains. Again, the VA-REER features mainly elasticities of substitution across final goods, which implies putting more weight on these final goods in determining cross-price elasticities of demand for value added.



13. Latvia’s price differential reveals large discrepancies between the GDP deflator and the CPI. Despite narrowing after crisis, the cumulative difference between the GDP deflator and the CPI has increased substantially since 2010. The GDP deflator has grown cumulatively by 23 percent since 2010, while the CPI has increased by 13.6 percent during the same period. A closer look at the rapid increase of the GDP deflator shows that a rise in prices of capital goods accounted for the opening of the gap early in the period. However, prices of capital goods have largely stabilized since 2012. Decomposing the GDP deflator using the income definition of GDP reveals that unit labor costs have remained a steady driver of final output prices, increasing by about 5 percent annually since 2012. The rapid growth in Latvia’s term of trade may also partly explain this dynamic. That is, a rapid growth of Latvia’s export price relative to import prices may have induced a sizeable increase in profit margins of Latvian companies, which is captured in the unit profits component of the GDP deflator.⁹ Furthermore, while some of Latvia’s euro area trading partners may have also experienced a more rapid increase in the GDP deflator in recent years, the gap between the GDP deflator and CPI appears to be particularly large in Latvia.



⁹ ECB (2016) contains an extensive discussion of the decoupling of the GDP deflator and HICP in the euro area after 2014, attributing it largely to the increase in profit margins due to an improvement in terms of trade (euro depreciation and decline in energy prices).

C. Latvia's Exposure to Shocks in a World of Global Value Chains

VA-REER Shocks, Value Added Export Performance, and Growth

14. The impact of VA-REER shocks on value added export growth can be estimated empirically. A local projection approaches a la Jordá (2005), could be used to estimate the dynamic effect of VA-REER shock on real value-added export growth. This methodology has the advantage of being robust to misspecification as the impulse responses can be defined without knowing the data generating process and even when its Wold decomposition does not exist (see for instance Koop et al., 1996; Potter, 2000 and Jordá, 2005).^{10,11}

15. The model specification is as follows:

$$\Delta Y_{c,t+h} = \delta_j \sum_{j=0}^h \Delta \ln(\text{VAREER})_{c,t-1+j} + \theta_h X_{ct-1} + \alpha_c + \tau_t + \varepsilon_{c,t+h} \quad (3)$$

Where the dependent variable ($\Delta Y_{c,t+h}$) is the change in the logarithm of real value added exports at horizon h ; δ_j are the coefficients of interest for each horizon $h=0,1,2,3$; α_c is a country fixed effect; τ_t is a time fixed effect; X is a set of control variables including (inflation, real GDP per capita, net foreign direct investment inflows and external demand).¹²

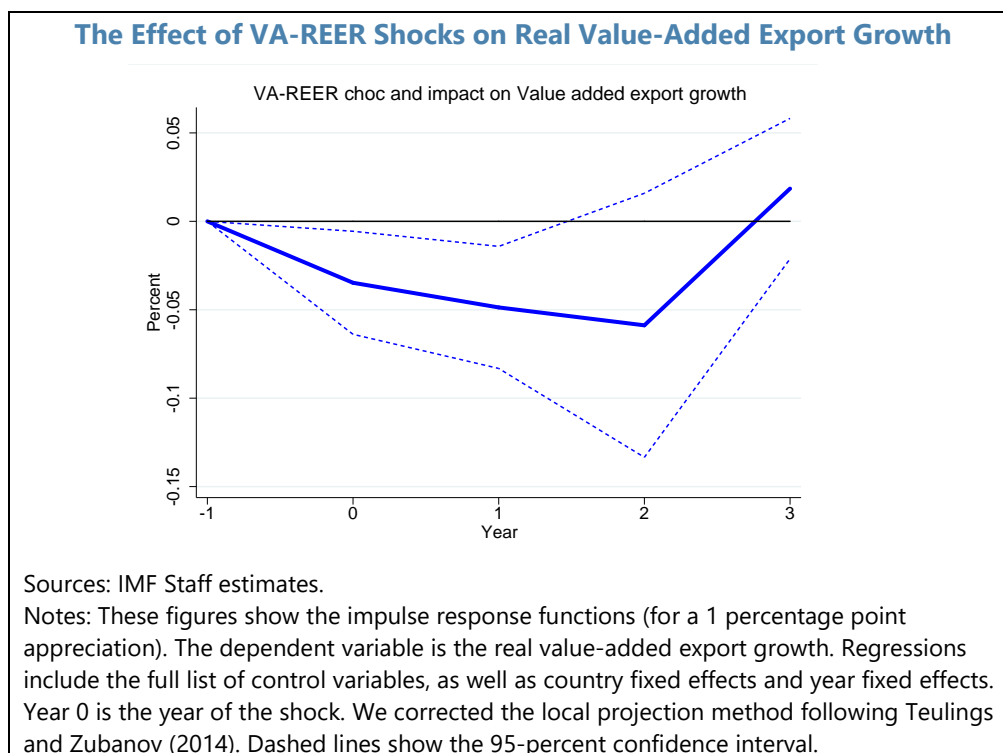
16. Appreciations in VA REER are estimated to have a negative and persistent effect on value added exports growth. Our estimates use panel data of 27 European countries over the 2003–13 period and the VA REER index constructed using the structural framework above. The regressions results suggest that a 10-percentage point appreciation (increase in the VA REER index) leads to a statistically significant reduction in value-added export growth by 0.4 percentage point the first year which cumulates to 0.5 percentage point the second year.¹³

¹⁰ See also Auerbach and Gorodnichenko, 2013; Owyang, Ramey and Zubairy, 2013; Jordá and Taylor, 2016

¹¹ To reduce potential bias, we implement the correction suggested by Teulings and Zubanov (2014) to control for innovations in the regressors between periods t and $t+h$ when estimating the impulse response at horizon h .

¹² External demand is measured as the weighted growth rate of Latvia's trading partners. In order to address potential multicollinearity between inflation and the VA REER, we also tested the robustness of our results by excluding inflation. The robustness test found similar results.

¹³ We also explored the link between VA REER appreciation and the degree of integration into GVCs. We ran the same regression on the subsample of countries with a GVC participation index higher than the sample median of 69.8 versus the subsample below this sample median. The results provide evidence that a 10-percentage point appreciation in the VA REER index leads to a reduction in VA export growth by 0.6 percentage point in the first year and cumulates up to 1 percentage point in the third year in countries that are above the sample median of GVC participation index.



17. VA REER appreciation thus has an impact on real GDP growth through trade channels.¹⁴ Using the Local projection specification, we estimate the impact of VA export growth on real GDP growth. The empirical results suggest that a 1 percentage point increase in real value-added export is associated with a 0.3 percentage point increase in real GDP growth cumulatively over the 4 years. These estimates are used to calculate the impact of a 10 percent appreciation in VA-REER on growth as follows:

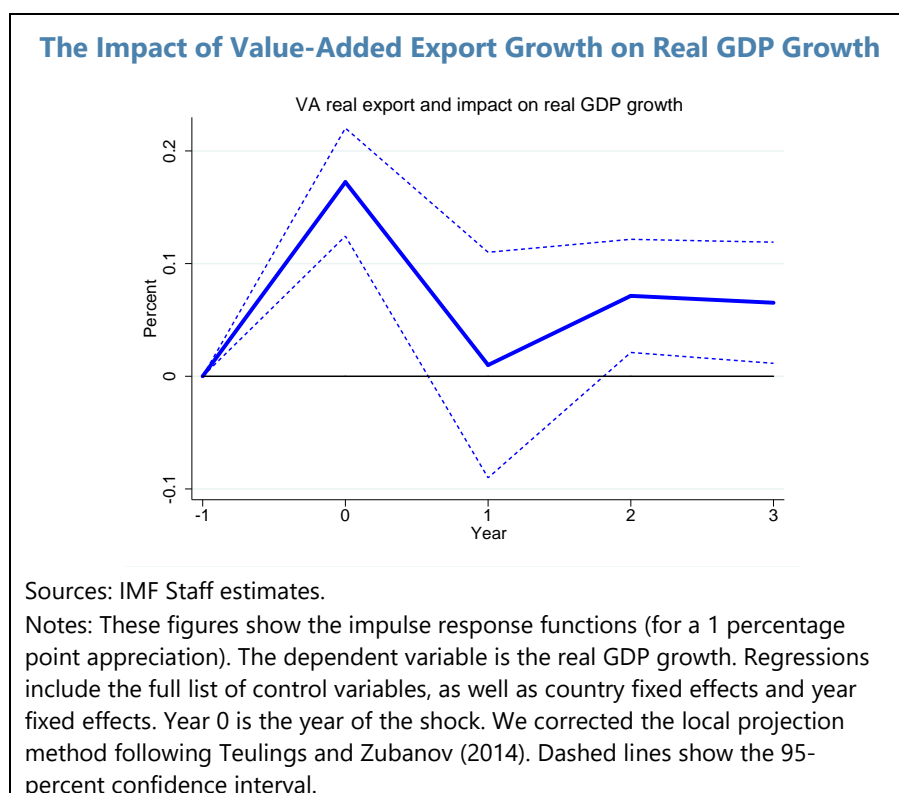
$$\frac{\Delta \text{Real GDP growth}}{\Delta(\text{VA-REER})} = \frac{\Delta \text{Real GDP growth}}{\Delta \text{VA export growth}} * \frac{\Delta \text{VA export growth}}{\Delta(\text{VA-REER})} \quad (2)$$

A 10 percent appreciation in the VA-REER could reduce growth rate by 0.2 percentage point.¹⁵ These findings suggest that VA-REER appreciation could be associated with a significant loss in competitiveness and growth.¹⁶

¹⁴ We also estimate the reduced form effect of VA-REER on real GDP growth and found no statistically significant effect. In addition, we do not find any statistically significant effect of conventional REER on value added export growth or real GDP growth.

¹⁵ Using the formula, we calculate the impact as $0.3 * (-0.5)$.

¹⁶ For countries above the sample median of the GVC participation index, the implied impact is larger and could reach 0.3 percentage point loss in growth.



18. The implied estimates of the impact of VA REER appreciation for Latvia are however modest. Since 2010, Latvia's VA REER has appreciated by roughly 5 percent. Using our estimates, this implies a reduction in value added export by 0.2 percent and a reduction in growth by 0.1 percentage point. Absent the appreciation in VA REER since 2010, and thus the rise in ULC owing to the strong pass-through previously discussed, growth could have been higher by 0.1 percentage point in Latvia. The modest effect of VA REER appreciation on growth in Latvia could be attributed to the relatively low GVC participation over the period in the sample.

Transmission of a Tariff Shock Through Global Value Chains

19. In a world dominated by global value chains, the imposition of a tariff would have far reaching consequences beyond the country and sector directly targeted. A tariff penalizes not only the assembler of the product, but also the suppliers, amplifying trade costs and potentially affecting the competitiveness of an entire value chain (Yi, 2003, and Miroudot et al., 2013). Moreover, as international trade in goods is increasingly integrated with services (OECD, 2013), tariffs on goods can also spillover to the service sector. Finally, escalating trade tensions could impact global economic growth through a combination of direct and indirect factors (IMF, *World Economic Outlook*, October 2018). The direct factors relate to higher trade costs while the indirect factors include lower business confidence, weaker private sector investment, and tighter financial conditions.

20. Europe's trade openness and deep integration into GVCs make the region vulnerable to escalating trade tensions. European countries have a larger exposure to US tariff shocks in

value-added terms than in gross trade terms (See Huidrom et al, 2019).¹⁷ Through rising uncertainties, trade tensions may lead to lower investment (See IMF, 2018b and Ebeke and Siminitz, 2018) and thus could have significant impact on competitiveness. For instance, countries using foreign value added in their exports—such as Latvia—may become less competitive as their cost increases due to a tariff hike in the US and China.

21. The structural model developed by Bems and Johnson (2017) can be used to estimate the short-run impact of changes in relative international prices induced by tariffs on demand for gross trade and value-added flows.¹⁸ We estimate the impact of trade tensions on both gross trade and value-added using scenarios in the October 2018 World Economic Outlook. To do so, we analyze the effect of a tariff imposed by the United States on its imports, with retaliation by all countries using the same tariff.¹⁹ As the structural model assumes a single price of output per country, we proceed sequentially. First, we calculate a tariff-induced price change for all goods (except for the US) and estimate how the US demand reacts. Second, we calculate the tariff-induced change in the prices of US goods and estimate how other countries' demand adjusts. We use the elasticities built in the structural model to estimate the tariff impact in both steps. Given that in the structural model, demands for value added are obtained holding countries' real expenditure levels constant, the impact of price changes on the reallocation of production across countries should be viewed as a short-run partial equilibrium effect. The model does not however account for potential realignment of supply chains in the long-run.

22. Latvia's exposure to trade shocks from China, USA, and the UK are significant. The bilateral weights implied by the VA REER are higher than conventional ones for China, USA and UK, suggesting a weaker input linkage. Thus, competition with these countries is mainly on final goods rather than on inputs. Because the value added embodied in each production step between countries with strong input linkages is often much lower than the gross trade flow, the VA weights are lower for these countries. Therefore, higher VA weights imply a weaker input linkage. Also, it follows that these three countries become more important to determine Latvia's competitiveness once we account for supply chain linkages as compared to gross trade.²⁰ Overall, accounting for trade in value-added, Latvia would be more exposed to external trade shocks originating in these countries than currently captured by gross trade. Our estimates show that a 5.9-percent tariff imposed by the US on its imports (Layer 1), with retaliation from all countries using the same tariff,

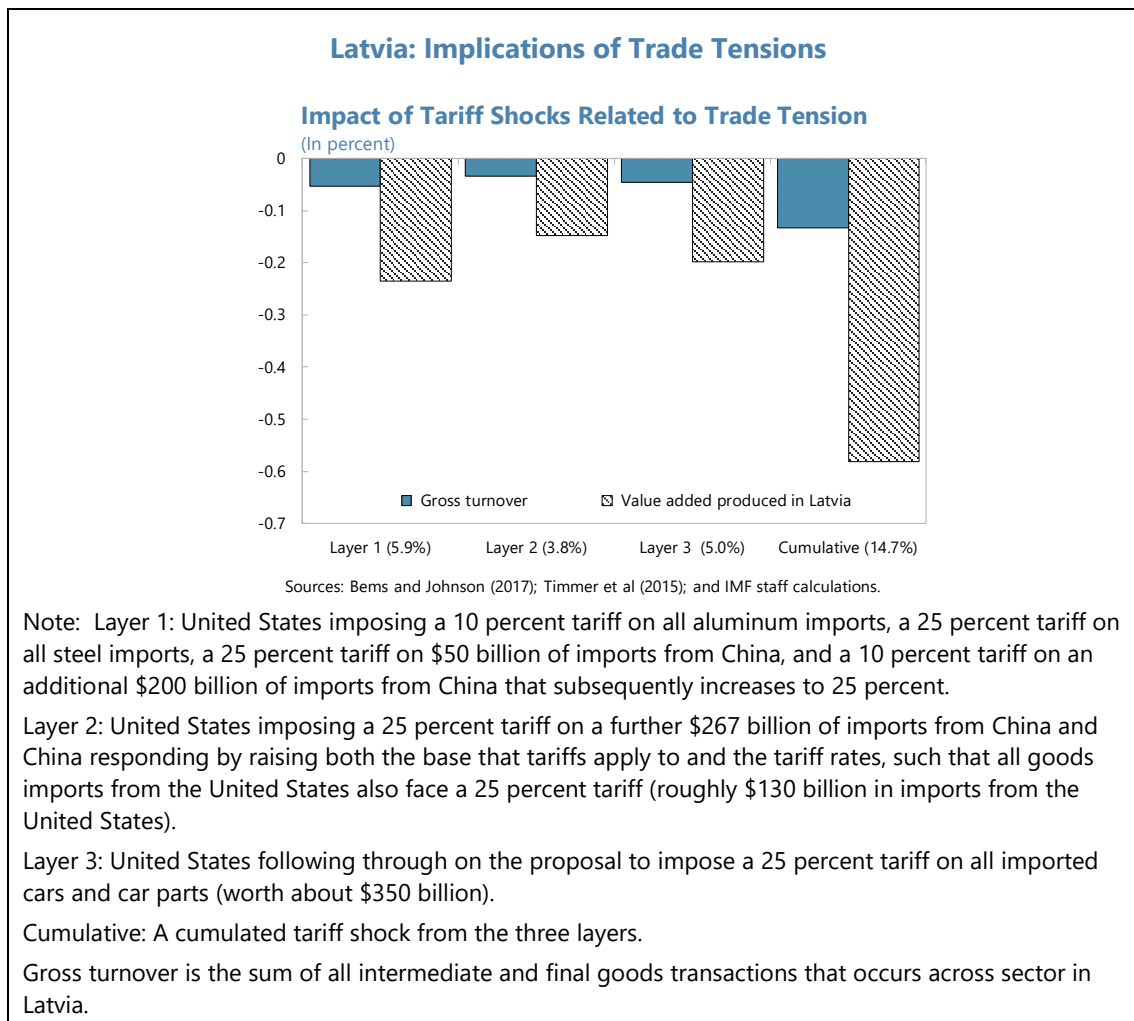
¹⁷ Huidrom et al. (2019) estimate the effect of a 5 percent tariff on all US' imports for Europe and find that it would lead to a decrease in total value added by 0.2 percent, while in gross output terms it would be only 0.1 percent. In addition, they also find that most European countries are less competitive in value-added terms than in gross trade flow terms.

¹⁸ We use the MATLAB code provided in the online Additional Materials of Bems and Johnson (2017) to calculate gross and value-added trade flows, partner weights, effective elasticities of substitution and demand spillovers (<https://www.aeaweb.org/articles?id=10.1257/mac.20150216>). We use the 2016 vintage of the World Input-Output Database (<http://www.wiod.org/database/wiots16>) to estimate the effect of tariffs for 43 countries, from 2000 to 2018. Bilateral exchange rates, CPI, and GDP deflator are taken from the World Economic Outlook.

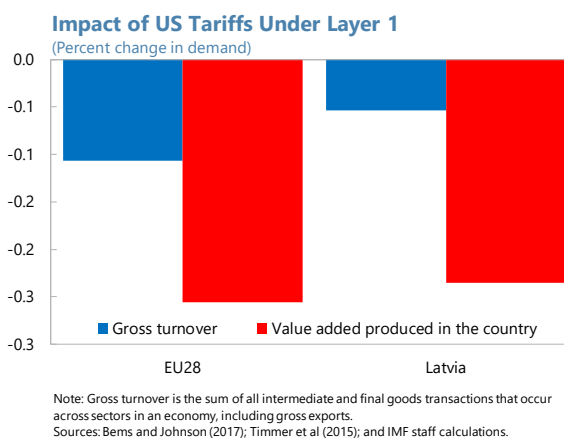
¹⁹ We use the equivalent of a tariff on all US imports implied by the tariffs in each layer. See chapter one of October 2018 WEO.

²⁰ Germany has the largest weight with both concepts, but the value-added weight is lower than the conventional one.

would lead to a reduction of 0.2 percent in Latvia’s value added (four times larger than the reduction in gross turnover flows).



23. Latvia’s exposure is relatively moderate compared to the European (EU28) average. We estimate the US tariff impact (under the Layer 1) and find similar effects for most European countries. Germany exhibits the largest exposure to trade tensions (owing to the vulnerability of the car industry), with a reduction in domestically produced value added about 50 percent higher than the average EU impact, while Latvia’s impact is slightly smaller than the EU average.



D. Conclusions and Policy Implications

24. The value-added REER (VA REER) index accounting for input-output linkages suggests that Latvia may be less competitive than indicated by a standard REER index based on gross trade. The recent rise in unit labor cost may have been a drag on Latvia's ability to supply its domestic value added on world markets, reflecting rising labor costs and wage growth. Preventing a long-term misalignment between wage growth and productivity would help preserve Latvia's competitiveness.

25. Trade tension induced tariff hikes are likely to have moderate costs for Latvia in terms of value added produced in the country. In this regard, policies aimed at enhancing product sophistication or quality and export market diversification could mitigate Latvia's exposure to trade shocks in GVCs.

26. There is significant scope to improve Latvia's competitiveness in the context of GVCs.

- *Backward GVC Participation.* Latvia's involvement in GVCs has mainly been toward backward participation, that is the country incorporates significant foreign value added into its own exports. Latvia's competitiveness could be enhanced by improving the degree of sophistication of Latvia's production, which would require greater use of imported intermediate goods with high-technological content. Yashiro et al. (2017) show that Latvia is not taking enough advantage from using imported inputs in producing its exports, as foreign value added in exports is lower than in peer countries. Indeed, using imported inputs allows countries to benefit from knowledge transfers, diversify their export, and improve product quality (Amiti and Konings, 2017).
- *Forward GVC Participation.* The participation in upstream activities, such as exporting intermediate goods, re-exports, and non-transport services, have been found to generate substantial productivity and employment gains in Latvia (Kowalski et al., 2015, and Benkovskis et al., 2017). Improving allocation and incentives for innovation—through better access to credit and skilled labor with knowledge of foreign markets—could yield significant productivity gains particularly for firms operating in upstream GVCs.

27. Attracting FDI inflows can also spur Latvia's GVC participation through an intra-firm trade flow channel. For instance, multinationals entering Latvia through FDI would likely increase trade with different countries in which they are present both in intermediate and final goods. Kowalski et al. (2015) find that inward FDI is an important determinant of backward participation. This empirical finding is confirmed in CEE countries by Buelens and Tirpák (2017), suggesting that policies to attract FDI would contribute to enhance Latvia's participation in GVCs. More specifically, given Latvia's backward participation, FDI inflows aiming at establishing export processing facilities could play an important role, including by improving Latvia's product diversity and sophistication.

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Annex I. Calculation of Conventional Weights

Conventional weights are calculated as described in Bayoumi et al. (2006). Under the assumption of perfect substitutability between individual commodities, the associated weights depend on the importance of other countries in the overall supply and demand for a commodity. However, manufactured goods are assumed to be differentiated and thus the weights in this case depend on bilateral flows across countries, augmented by the influence of third-market competition in export markets. Regarding services, only trade in tourism is included for countries for which tourism represent an important part of overall trade. Service weights are calculated using bilateral data on tourist arrivals. Based on the importance of different types of trade, these weights are combined as follows:

$$W_{ij} = \alpha_M W_{ij}(M) + \alpha_C W_{ij}(C) + \alpha_T W_{ij}(T)$$

where $W_{ij}(M)$, $W_{ij}(C)$ and $W_{ij}(T)$ denote weights calculated for manufactures, commodities, and tourism, respectively—between countries i and j —and α_M , α_C , and α_T represent the shares of these three types of trade in the overall trade of country i .

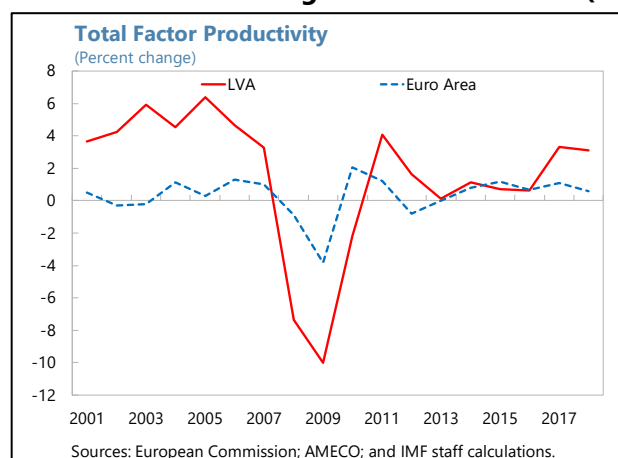
DRIVERS OF CORPORATE PRODUCTIVITY¹

This paper examines corporate productivity growth in Latvia using firm-level data. Firms with a higher share of innovative assets and better access to finance are estimated to have higher productivity growth. Financially distressed firms are found to negatively affect the productivity growth in the sector.

A. Introduction

1. Productivity growth in Latvia has slowed after the 2008–09 global financial crisis (GFC)

from its pre-crisis high levels. While the post-GFC slowdown of productivity growth is a global phenomenon (Adler et al., 2017) and Latvia's post-GFC productivity growth remains better than the euro area average, boosting productivity growth is the ultimate way to address long-term demographic challenges Latvia faces and achieve faster real convergence with the average income in western European countries. Understanding the factors affecting productivity growth would help in designing policies to raise it.



2. There have been a large number of studies on productivity growth in recent years inspired by the need to understand its post-GFC slowdown. Benkovskis et al. (2017) finds that export entry increases productivity and employment for Latvian and Estonian firms, in particular for firms in the upstream of global value chain (GVC). Benkovskis et al. (2018) finds that participation in EU co-funded projects raises firms' productivity with a lag. IMF (2016a) shows that during the GFC Latvian firms achieved higher productivity by using labor resources more efficiently and maintaining output with a smaller workforce, and that productivity gains during the post-crisis period were driven by "catch-up" of the relatively less productive firms. IMF (2016b) finds that the productivity gap between Central, Eastern, and Southeastern Europe countries and advanced Europe is largely due to structural and institutional obstacles that limit the efficient use of available technologies and allocative inefficiencies.

3. An increasing number of papers have looked into the role of financially distressed firms in the productivity growth slowdown after the GFC. Adalet McGowan et al. (2017a) finds that the prevalence of financially distressed firms ("zombie" firms) has risen since the GFC, and a higher share of industry capital sunk in zombie firms is associated with lower investment and employment growth of the typical non-zombie firm and less productivity-enhancing capital reallocation. IMF (2018b) finds that Asia's productivity growth slowdown has been driven by the rise

¹ Prepared by Yi Wu.

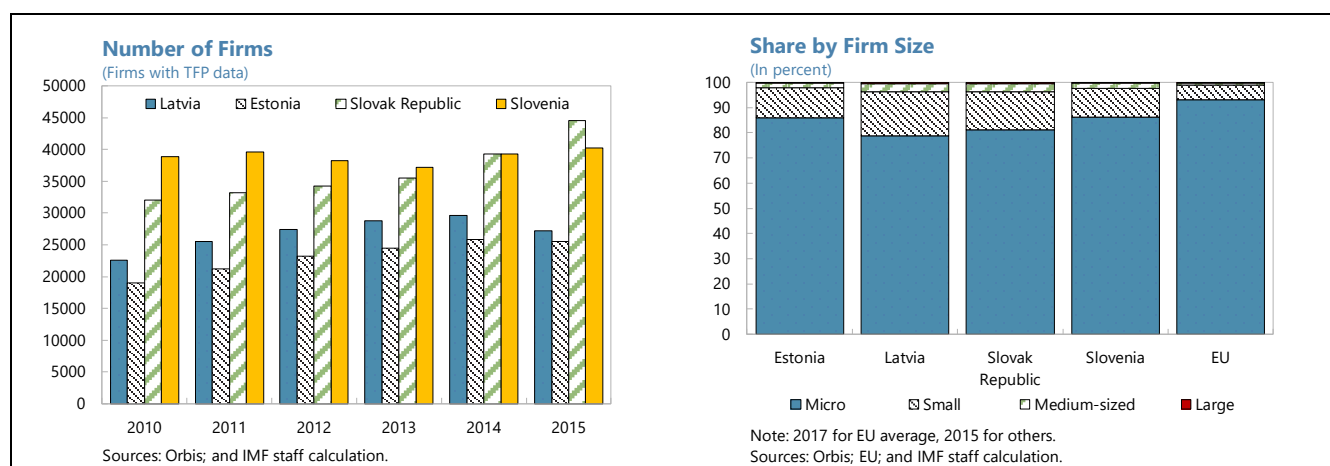
of zombie firms and resource misallocation that came with it. Zombie firms not only have lower productivity growth, but also hamper the efficient allocation of resources towards more productive firms. Azalet McGowan et al. (2017b) shows that reforms to insolvency regimes that lower barriers to corporate restructuring are associated with higher productivity growth of laggard firms and raise aggregate productivity, given evidence that stalling technological diffusion to laggard firms has contributed to the aggregate productivity slowdown.

4. This paper investigates some of the factors that are associated with corporate productivity growth. Our analysis shows that firms with a higher share of innovative assets in total assets and better access to finance have higher productivity growth. Smaller and younger firms also generally have faster productivity growth. The presence of zombie firms is associated with lower productivity growth of other firms in the same sector.

5. The paper is organized as follows: Section B describes the empirical framework and data. Section C presents the analysis. Section D concludes.

B. Analytical Framework and Basic Statistics

6. We use annual firm-level data of four small euro area countries. The data are obtained from the Orbis database, include non-financial corporates (NFCs) for Latvia, Estonia, Slovak Republic, and Slovenia,² and cover the 2010–15 period.³ Latvian firms constitute about 20 percent of the total number of firms. For all four countries, micro firms (firms with fewer than 10 employees) account for the vast majority of firms, which is also the case throughout the EU. While Latvia has a very large share of micro and small enterprises (96.2 percent of total), this share is slightly smaller compared to the other countries in the sample and the average EU share.⁴



² Lithuania is not included due to data availability.

³ Data coverage for these countries has significantly improved since 2009. Due to a structural break in the series, we do not use pre-2010 data.

⁴ Eurostat data show an even smaller difference compared to the EU average. EU (2018) shows that Latvia's share of micro, small, and medium-sized enterprises (SMEs) is smaller compared to the other countries in the sample and the EU average, though Latvia has slightly higher share of SMEs than Estonia and the EU average.

7. The sectoral composition of companies reveals some difference and common features across the four countries. The wholesale and retail trade sector have the highest share in all countries, but while its total factor productivity (TFP) growth is relatively high in Latvia, it is fairly low in other countries (Table 1). Information and communication services is a small but rapidly growing sector. The agricultural sector has a negative productivity growth both in Latvia and across all other countries. Manufacturing generally has higher-than-average productivity growth across all countries.⁵

Table 1. Latvia: Sectoral Composition of Companies						
Sector	All Countries			Latvia		
	Number of Firms	Share	TFP Growth	Number of Firms	Share	TFP Growth
Agriculture and mining	6352	4.6	-0.1	2874	10.6	-1.6
Manufacturing	16054	11.7	0.7	804	3.0	0.9
Construction and real estate	21263	15.5	0.2	4571	16.8	0.4
Wholesale and retail trade	31431	22.9	0.3	6873	25.2	1.4
Transportation and storage	10267	7.5	0.2	2361	8.7	0.6
Information and communication	6454	4.7	1.1	1495	5.5	1.7
Professional, scientific, and technical services	19686	14.3	0.5	3836	14.1	0.3
Other services	25908	18.9	0.6	4407	16.2	1.6
Total	137415	100	0.4	27221	100.0	0.7

Sources: Orbis and IMF staff calculations.
Notes: Number of firms is for 2015 (only firms with TFP data). TFP growth is the average of 2010–15.

8. A Cobb-Douglas production function is used to derive TFP:

$$\ln Y_{it} = \alpha + \beta \ln K_{it} + (1 - \beta) \ln L_{it} + u_{it}, \quad (1)$$

where i represents firm and t represents year. Y_{it} is value added, K_{it} and L_{it} are capital and labor inputs, respectively. The residual, u_{it} , is the log of TFP. The estimation is done by the 2-digit NACE industry level, for which the production function is assumed to be the same. The estimation follows De Loecker and Warzynski (2012) and Akerberg, Caves, and Frazer (2015), and uses value added on the left-hand side. For Latvia, due to data availability, TFP is estimated using turnover revenue on the left-hand side and the cost of goods sold on the right-hand side as in De Loecker and Eeckhout (2017). Firm-level data (median or general distribution) also confirm a post-GFC slowdown in productivity growth.

9. Further, we estimate the following specification of TFP growth in relation to a set of factors:⁶

$$\Delta \text{TFP}_{it} = \alpha + \beta \text{S}_{it-1} + \delta \text{Non-zombie}_{it-1} + \theta \text{Non-zombie}_{it-1} * \text{Zombie share}_{it-1} + \gamma \text{Recovery}_{it-1} + u_i + v_{it}, \quad (2)$$

⁵ The table shows a much smaller share of manufacturing firms in Latvia than in other countries. This mainly reflects a higher share of missing TFP data for Latvian manufacturing firms.

⁶ To help control for potential endogeneity, all explanatory variables are lagged.

where ΔTFP_{it} measures the TFP growth for firm i from year $t-1$ to year t . Firm fixed effects and year dummy variables capture omitted explanatory variables that are firm or year specific (such as overall macroeconomic environment). S_{it} represents a set of firm characteristics commonly used in the literature (Table 2, summary statistics reported in Tables 3a and 3b):⁷

- *Debt-to-asset ratio.* Debt is constructed as the sum of long-term and short-term financial debt.⁸ The average debt-to-asset ratio is 17 percent. A quadratic term of debt is included to control for nonlinearity. Previous studies suggest that while an increase in leverage could be associated with higher productivity growth during normal times, excessive debt buildup could negatively affect productivity growth (see, e.g., IMF 2016c; IMF 2018b; Anderson and Raissi, 2018; Duval et al., 2017). Except for the IT sector, Latvian companies generally tend to be more leveraged than companies in other countries in the sample.
- *Ratio of intangible to total fixed assets.* Intangible fixed assets include a company's proprietary technology (e.g. computer software), patents, copyrights, licensing agreements, and goodwill. Previous studies identified a positive correlation between the share of intangible assets and productivity growth (e.g., IMF, 2018c; Budina et al., 2018). A high share of intangible assets to total assets may indicate higher investment in research and innovation, which could lead to higher productivity growth. Eighty two percent of firms in our dataset have zero intangible assets, while the average ratio is 1 percent.⁹ Companies in the IT sector tend to have higher share of intangible assets, both in Latvia and in other countries, but Latvian companies have a lower share of intangible assets than other countries in the sample.
- *Productivity gap to industry leaders.* Measured at NACE2 two-digit levels, a higher number represents a larger gap of the top 1 percent of firms in the sector from each firm's productivity level. This variable explores how fast firms' productivity tends to converge towards the frontier firms (a measure of efficiency in technology diffusion).
- *Firm size.* This variable is measured by the log of number of employees, and its quadratic form. About one quarter of firms included in the regressions report only one employee, while the average number of employees is 17.

⁷ Data processing follows standard practice in the literature. Variables are converted from dollar to euro, and then converted into real variables using deflators at the 2-digit NACE industry level, if available. Clear cases of data misreporting and outliers are excluded. In particular, we drop duplicate firm data and firms that have negative total assets, employment, sales or tangible fixed assets in any year. We also drop firm-year observations with missing, zero, or negative values for costs of materials, operating revenue, and total assets, and firms without a NACE sector code. Furthermore, we calculate the ratio of assets, revenue, and revenue/assets per employee and filter out the top and bottom 0.1 percent of the sample based on the ratios. Further data quality checks are reported in Diez et al. (2018).

⁸ About 40 percent of the firms have zero debt, which may be due to misreporting.

⁹ A direct measure of R&D expenditure is not available.

- *Firm age.* This is to see whether there is a difference in productivity growth as firms get older. Usually firms less than 5 years old are considered young firms. Young firms are less experienced but are often more receptive to new technologies and innovations.

Table 2. Latvia: TFP Growth and Firm Characteristics, 2010–15

Sector 1/	TFP Growth	Debt to Assets	Intangible Assets to Total Assets		Number of Employees	Firm Age	Share of Zombie Firms
			TFP Gap	TFP Gap			
All Countries							
1	-0.1	21.7	0.2	88.2	10.9	13.6	0.8
2	0.7	18.9	0.8	97.1	25.1	13.2	1.3
3	0.2	18.8	0.3	96.8	7.8	10.8	1.0
4	0.3	17.5	0.5	108.7	9.5	12.1	1.2
5	0.2	22.4	0.3	84.5	16.0	10.9	1.0
6	1.1	11.0	3.0	107.2	8.2	10.0	0.6
7	0.5	12.9	1.3	92.4	4.4	10.2	0.5
8	0.6	16.5	0.9	102.3	11.5	10.2	1.0
Latvian Companies							
1	-1.6	21.9	0.1	73.7	7.3	14.1	0.9
2	0.9	19.7	0.4	81.7	22.5	11.1	1.8
3	0.4	20.9	0.3	96.9	10.2	9.7	2.0
4	1.4	21.0	0.4	63.4	11.1	10.7	1.8
5	0.6	22.5	0.2	83.5	18.9	9.8	1.5
6	1.7	9.5	2.1	154.3	9.2	7.8	0.9
7	0.3	11.9	1.3	130.2	4.4	7.7	0.5
8	1.6	16.8	0.6	108.9	18.2	9.5	1.7

Source: Orbis, and IMF staff calculations.

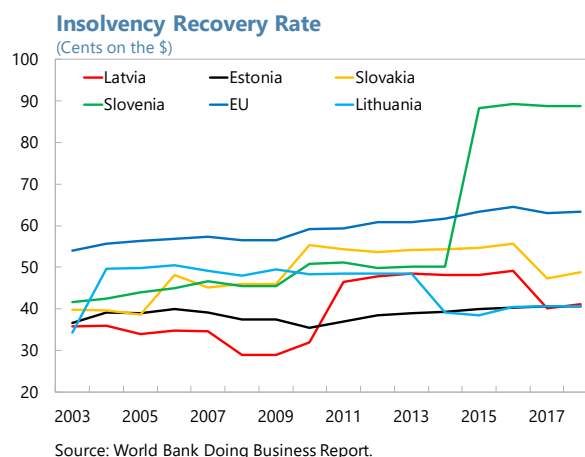
1/ 1=Agriculture and mining; 2= Manufacturing; 3=Construction and real estate; 4= Wholesale and retail trade; 5= Transporting and storage; 6=Information and communication; 7= Professional, scientific, and technical services; 8= Other

10. An important factor in the analysis is the role of firms in distress. Zombie firms refer to firms whose financial conditions are chronically distressed. Following Adalet McGowan et al. (2017a), a firm is defined as a zombie firm if it is aged 10 years or older and has an interest coverage ratio (ICR) of less than one for three consecutive years. As noted in Adalet McGowan et al. (2017a), the age restriction is placed in order to address the fact that it may be difficult to distinguish real zombie firms from young start-ups who are at the beginning of their lifecycle, which can take a while to start making profits. All firms younger than 10 years are thus treated as non-zombies. The ICR is defined as the ratio of earnings before interest and taxes (EBIT) to interest paid.

11. The specification also controls for the prevalence of zombie firms and the insolvency recovery rate:

- Non-zombie_{it-1} is a dummy variable that equals 1 if the firm is not a zombie firm.

- $Zombie\ share_{it-1}$ is the share of zombie firms in the sector (at two-digit NACE level). $Non-zombie_{it-1} * Zombie\ share_{it-1}$ is an interaction term capturing any impact of zombie firm congestion on other firms in the sector. Latvia has a higher share of zombie firms than other countries in the sample, and the share of zombie firms is particularly high in the construction sector.¹⁰ Non-zombie firms have a higher median TFP growth than zombie firms (by 0.3 percent for Latvian firms).
- $Recovery_{it-1}$ is the recovery rate (cents on the dollar) in insolvency resolution, with data obtained from the World Bank's Doing Business Report. The recovery rate stands at 41 percent for Latvia in 2018, which is significantly lower than other countries in the sample and the average for EU countries of 63.4 percent.¹¹ Furthermore, Latvia's recovery rate has shown a deterioration in recent years.¹²



C. Empirical Results

12. Better access to finance is associated with higher productivity growth (Table 4). Higher debt-to-asset ratio, a measure of access to finance, is positively associated with TFP growth and statistically significant at the 1 percent level. An increase in debt financing of firm assets by 10 percentage points is associated with higher productivity growth by about 0.5 percentage points.¹³ One possible channel of this relationship is that better access to finance allows firms to make larger capital and R&D investment, which could lead to higher productivity growth. However, the quadratic term is negative— though only statistically significant in Table 4, Column (1) and showing a very large debt threshold—which suggests that excessively high debt would be associated with lower productivity growth.

13. Firms with a higher share of intangible assets tend to have higher labor productivity growth. The share of intangible fixed assets in total fixed assets is positive and statistically significant. This suggests that policies that increase intangible assets, e.g., supporting R&D and innovation, could potentially help raise productivity growth. In particular, raising Latvia's intangible assets from an average of 0.4 percent to Slovenia's 1.4 percent of total assets would increase

¹⁰ There are no ICR data for Estonian firms due to missing interest payment data after 2008. As a result, no Estonian firms are assigned to be zombies in our sample period.

¹¹ For Slovenia, firm bankruptcies surged during the 2013–14 banking crisis. The authorities implemented several measures including (1) setting up a bank asset management company with professional asset disposal; (2) facilitating out-of-court settlement; and (3) issuing guidelines on resolving non-performing loans (NPLs). Subsequently, the NPL ratio dropped from 13 percent in 2013 to 5 percent in 2016.

¹² The World Bank's Doing Business Report, which we use for consistency across the country sample, shows the recovery rate at 48.2 percent in 2016. IMF (2019) finds that the recovery rate was only 23 percent in 2016.

¹³ This is at the level of the average debt-to-asset ratio of 17 percent with respect to the quadratic term.

productivity growth by 0.1 percentage point. Latvia's R&D expenditure (0.5 percent of GDP) is only a quarter of the EU average, indicating there is significant scope to increase intangible assets. Specific tax incentives to replace the R&D tax allowance that expired in 2018 could encourage R&D investment, given the considerable risks associated with such investment and its positive externalities (OECD 2018). However, such incentives need to be carefully designed to ensure that they benefit genuine R&D activities, e.g., through an appropriate system for validating R&D tax credit (the World Bank, 2017). Acemoglu et al. (2013) also find that R&D tax subsidies are only effective when policy settings can encourage the exit or downsizing of weak firms, as this frees up resources.

14. The evidence also points to technological convergence to industry leaders. The coefficient is statistically significant at the 1 percent level. The average TFP gap to industry leaders is about 100 percent (90 percent for Latvian firms). The results in Table 4, Column (2) suggest that the TFP gap would close by 18 percent per year.¹⁴ For example, for a firm whose TFP is only 52.6 percent of that of the industrial leader (corresponding to a TFP gap of 90 percent), its TFP growth would be 0.16 percentage points higher than the leading firms.

15. Firm size and age are found to be significant factors. The results suggest that for micro firms, firms with larger number of employees have higher productivity growth. However, once the firm size goes beyond micro firms, larger firms generally have lower productivity growth. This is after controlling for all other factors—in terms of simple average, larger firms actually have higher TFP growth. The average number of employees is 16 for Latvian firms, but micro firms dominate with 75 percent of Latvian firms having 8 or fewer employees.¹⁵ There is also some evidence suggesting that younger firms have higher productivity growth (Table 4, Column (3)).¹⁶

16. Financially sound firms in sectors with higher share of zombie firms have lower productivity growth. The non-zombie firm dummy variable is statistically insignificant. But the interaction of the non-zombie firm dummy with the share of zombie firms in the sector is negative and statistically significant at the 1 percent level, suggesting that the prevalence of zombie firms lowers productivity growth of other firms in the sector. A possible channel is that the zombie firms would occupy productive resources, thus lowering the productivity growth of other firms in the sector. More generally, zombie firms could congest the sector, distorting prices and profits, thereby discouraging new firm entry and investment (Caballero et al. 2008) and raising the risk premium for companies in the sector. To test these channels, we estimate a probit regression, in which the dependent variable is 1 in year t if in year $t-1$ the firm's (a non-zombie firm) debt is 0 and in year t debt is positive (i.e., the firm gains access to financing), and 0 if in both year $t-1$ and t debt is 0 (Table 5). The results suggest that it is more difficult for non-zombie firms to gain access to

¹⁴ Estimates of convergence vary by studies. For example, Adalet McGowan (2017b) found a convergence coefficient ranging from 8 to 22 percent depending on productivity measures for firms in OECD countries.

¹⁵ The World Bank (2017) points to some evidence that across sectors, higher taxes on labor and profit (measured as a share of turnover) seem to be associated with higher share of micro enterprises.

¹⁶ This is consistent with findings of other studies (e.g., IMF 2018c). Contradicting results include IMF (2018a), which found that younger Czech firms usually had lower productivity growth.

financing in sectors with higher share of zombie firms. In particular, the result in Table 5, Column (2) suggests that when the explanatory variables are at average values, a 1 percentage point increase in the share of zombie firms in the sector would lower the probability of new borrowing for non-zombie firms by 1.04 percentage points.

17. Furthermore, productivity growth is higher in country/year with higher insolvency recovery rate. An increase in the recovery rate by one standard deviation, or 9 percentage points, is associated with an increase of TFP growth by 0.4 percentage points.

18. Additional robustness checks do not change the main results. The Wooldridge test for autocorrelation (Wooldridge 2002) does not reject the null hypothesis of no first-order autocorrelation for TFP growth, suggesting that there is no need to include lagged TFP growth in the right-hand side of the regression (dynamic panel).¹⁷ We are therefore of the view that fixed effects (equation 2) is a better specification than dynamic panel. Nevertheless, we estimate dynamic panel using the Blundell and Bond (1998) two-step system GMM. The estimator results are broadly similar to the baseline results. However, under some dynamic panel specifications, the intangible asset ratio and firm age are statistically insignificant, and the insolvency recovery rate becomes negative. Note that, if there is endogeneity caused by omitted variables or reverse causality, the GMM will not correct it (as lagged variables in level and differences are used as instruments). Various additional robustness checks yield broadly similar results.¹⁸ These include using debt-to-equity ratio instead of debt-to-asset ratio, using (log) assets as the measure of firm size, and dropping Slovenia from the sample (whose insolvency recovery rate increased significantly in 2015).

D. Concluding Remarks and Policy Implications

19. This paper identified several firm characteristics that are associated with higher productivity growth. The evidence suggests that firms with better access to finance and higher share of innovative assets had higher productivity growth. Younger firms generally had faster productivity growth and, productivity growth seems to slow as firms become larger (beyond micro firm). The evidence also points to productivity catch-up for firms that are far from the technological frontier. Zombie firms are found to negatively affect the productivity growth of other firms in the same sector, possibly by holding up productive resources and reducing other firms' ability to borrow, and preventing the entry of new firms. Lower insolvency recovery rate is also associated with lower productivity growth.

20. Policies that support access to financing and R&D and innovation and improve the insolvency regime could potentially help raise productivity growth.

- Latvia's R&D spending lags behind other EU countries and there is ample room for improvement. Better tax incentives that benefit genuine R&D activities could help support R&D spending. The design of R&D incentives needs to guard against the risk of foregoing tax

¹⁷ The correlation between TFP growth and its lag is -0.16.

¹⁸ These results are available upon request.

revenue without a commensurate rise in innovation. Important aspects include the scope for eligible R&D, the eligibility requirements, and carry-back and carry-forward provisions. The bulk of R&D spending usually occurs in large corporations, as young firms often do not generate enough profit to benefit from non-refundable tax incentives. Cash refunds, carry forwards, or payroll withholding tax credits for R&D related wages could be more helpful to young firms. Better access to seed financing and well-designed direct support, such as grants and contracts, may also stimulate R&D for such firms. Furthermore, well-functioning product, labor, and risk capital markets are essential to support R&D and other knowledge-based capital (OECD, 2013).

- There is room to improve Latvia's insolvency regime. Under an efficient insolvency regime with low barriers to restructuring, zombie firms could be liquidated more quickly, allowing better allocation of resources among healthy firms and easier entry of new firms. Faster restructuring or liquidation of financially distressed firms and better recovery rates for creditors would help reduce borrowing risk premiums and improve firms' incentives to invest. Bankruptcy laws that do not overly penalize business failure could encourage greater investment in knowledge-based assets. Prevention tools (early warning mechanisms and pre-insolvency regimes) are also desirable.

Table 3a. Summary Statistics					
Variables	Mean	Std. Dev.	Min	Max	Measurement units
TFP growth	0.004	0.17	-7.50	6.38	ratio
Debt-to-asset ratio	0.17	0.23	0	1.0	ratio
Intangible assets/total assets	0.01	0.05	0	1.0	ratio
TFP gap to frontier firms	1.02	0.44	-6.09	6.05	ratio
Number of employees	17.24	114.40	1	15000	unit
Firm age	12.37	6.99	1	118	year
Insolvency recovery rate	0.51	0.09	0.32	0.88	ratio
Share of zombie firms in the sector	0.01	0.01	0.00	0.30	ratio

Sources: Orbis and IMF staff calculations.

Table 3b. Latvia: Summary Statistics (Latvia)

Variables	Mean	Std. Dev.	Min	Max
TFP growth	0.01	0.18	-7.50	6.38
Debt-to-asset ratio	0.18	0.24	0.00	1.00
Intangible assets/total assets	0.00	0.03	0.00	0.99
TFP gap to frontier firms	0.90	0.49	-6.09	5.62
Number of employees	16.09	104.40	1	8537
Firm age	11.56	6.74	2	25
Insolvency recovery rate	0.47	0.02	0.32	0.48
Share of zombie firms in the sector	0.02	0.02	0.00	0.24

Sources: Orbis and IMF staff calculations.

Table 4. Latvia: TFP Growth, 2010–15

	(1)	(2)	(3)
Debt-to-asset ratio	0.057*** (0.007)	0.042*** (0.007)	0.040*** (0.008)
Debt-to-asset ratio ²	-0.023** (0.010)	-0.006 (0.010)	-0.010 (0.012)
Intangible assets/total assets	0.052*** (0.018)	0.046*** (0.018)	0.053*** (0.020)
TFP gap to frontier firms		0.183*** (0.001)	0.196*** (0.001)
Log number of employees		0.026*** (0.002)	0.024*** (0.002)
Log number of employees squared		-0.006*** (0.000)	-0.006*** (0.001)
Firm age		0.001 (0.001)	-0.002** (0.001)
Insolvency recovery rate			0.045*** (0.012)
Non-zombie dummy			-0.004 (0.004)
Non-zombie dummy*share of zombies in the sector			-0.388*** (0.047)
Firm fixed effects	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
No. of firms	125287	119745	102663
No. of obs.	387030	368070	294972
R-squared	0.01	0.09	0.10
Note: All explanatory variables in lag. ***, **, * indicate significance at 1, 5, and 10% level.			

Table 5. Latvia: Probability of New Borrowing for Non-Zombie Firms, 2010–15		
Share of zombie in the sector (in lag)	-5.386*** (0.426)	-4.776*** (0.495)
TFP gap to frontier firms		-0.123*** (0.010)
Log number of employees		0.032*** (0.004)
Firm age		-0.014*** (0.001)
Sector dummies (Nace2 two digits)	Yes	Yes
Year dummies	Yes	Yes
No. of obs.	170,862	143,947
Note: All explanatory variables in lag. ***, **, * indicate significance at 1, 5, and 10% level.		

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REFOCUSING THE BANKING SECTOR: FINANCIAL INTEGRITY AND STABILITY IMPLICATIONS¹

Monitoring the de-risking process of Latvia's banking system requires effective prudential and conduct regulation to support the re-orientation of banks servicing foreign clients (BSFCs) and mitigate remaining and emerging risks associated with their new business models and changing liquidity risk profiles. To support this effort, we review current progress in strengthening the anti-money laundering/counter-terrorism financing (AML/CFT) regime and analyze whether AML/CFT breaches can result in funding vulnerabilities via a system-wide liquidity stress test. We find that there is a need for a deeper understanding of ML/TF risks, more effective risk-based supervision accompanied by proportionate and dissuasive sanctions, as well as greater use of financial intelligence in ML/TF investigations. The liquidity stress test exercise, which was performed independent of the forthcoming Financial Sector Assessment Program (FSAP) for Latvia, confirms a sufficient degree of resilience of the sector, as banks enter the exercise from a position of relative strength, which reduces their fundamental vulnerability to funding shocks if ML/TF concerns were to flare up again. Going forward, alongside building a more effective AML/CFT regime, the supervisory assessment of liquidity risk should expand the current indicator-based framework to integrate ML/CF risks and their impact on banks' viability in the development of stress test scenarios to enhance macroprudential surveillance.

Motivation and Objective

- 1. De-risking efforts have become a critical element of Latvia' financial sector reform agenda.**² A significant part of Latvia's banking activities has historically been oriented toward non-resident clients. Since 2016, following a spate of AML/CFT breaches and associated pressure from the international community, the authorities have pressed banks servicing foreign clients (BSFCs) to change their business models with a greater focus on domestic activities. Nonetheless, recent allegations of systematic money laundering resulted in the self-liquidation of Latvia's third largest bank, suggesting persistent ML/TF risks. Subsequently, MONEYVAL's *Fifth Round Mutual Evaluation Report* (Council of Europe, 2018) identified weaknesses in the effectiveness of the AML/CFT regime, which if insufficiently addressed, could result in Latvia being listed by the Financial Action Task Force (FATF) as a jurisdiction with strategic AML/CFT deficiencies in early 2020.
- 2. Effective monitoring the de-risking process has required reforms of prudential and conduct regulation.** Since 2018, the authorities have accelerated their efforts and have passed several legal amendments and updated regulations aimed at reducing banks' exposures to high-risk

¹ Prepared by Andreas Jobst (European Department) and Kathleen Kao (Legal Department).

² "De-risking" refers to the process by which Latvian financial institutions are terminating customers and accounts perceived as being high-risk and reduce transactions susceptible to ML/TF. The term is not used in reference to any actions on the part of foreign correspondent banks towards their Latvian counterparts.

clients (e.g., shell companies) and enhancing the AML/CFT regime.³ The success of these reforms depends on whether they can support the sustainable re-orientation of business models and ensure that banks' new activities and business plans mitigate ML/TF risks and avoid raising new financial stability risks or creating contingent liabilities for the government.

3. This paper examines financial integrity and stability aspects of recent developments in the Latvian banking sector through a combination of qualitative and quantitative analyses. A review of the evolving AML/CFT regime generates important findings about the risk context and the scope for potential risk mitigation. AML/CFT breaches also have significant reputational implications, which can severely damage banks' liquidity risk profiles (as demonstrated by the rapid demise of ABLV Bank after allegations of institutionalized money laundering). This prudential impact is reflected in a liquidity stress test of banks' capacity to control and mitigate vulnerabilities from large cash outflows and restricted market access under an adverse AML/CFT scenario.⁴ Insights from the stress test help inform supervisory expectations of adequate liquidity risk management required by existing and emerging ML/TF risks.

Evolution of the Non-Resident Banking Sector

4. Historically, Latvia's banking sector has been characterized by a dual nature. Four dominant, mostly foreign-owned banks cater predominantly to the domestic clients (BSDCs), and 11 smaller, local banks provide transactional services to foreign clients (BSFCs). BSDCs—Swedbank, Luminor Bank, SEB banka, and Citadele banka (in order of size)—account for more than three-quarters of total sector assets, which stood at €21.0 billion at end-2018 (Table 1). BSFCs have limited participation in the domestic economy and have traditionally acquired most of their funding via non-resident deposits.

5. As a regional financial center, Latvia has been a major gateway between the European Union and Commonwealth of Independent States (CIS) countries. Historically, most BSFCs focused on servicing high-risk clients and clients from former or current CIS member countries and offshore financial centers (OFCs), which accounted for about 40 percent of all transactional flows of foreign clients at their peak in early 2016. BSFCs would service CIS clients' transactions in and out of the region predominantly through shell companies (both resident and non-resident) holding accounts at BSFCs (Stack, 2015).⁵ In early 2016, 50 percent of total banking sector deposits were

³ In February 2019, the Prime Minister of Latvia ordered an overhaul of financial sector regulation with the goal to strengthen the capacity of competent authorities to combat ML/TF more effectively. The government is committed to completing this overhaul by the end of 2019. See https://www.mk.gov.lv/sites/default/files/editor/Finansu_sektors/financial_sector_update_no_15.pdf.

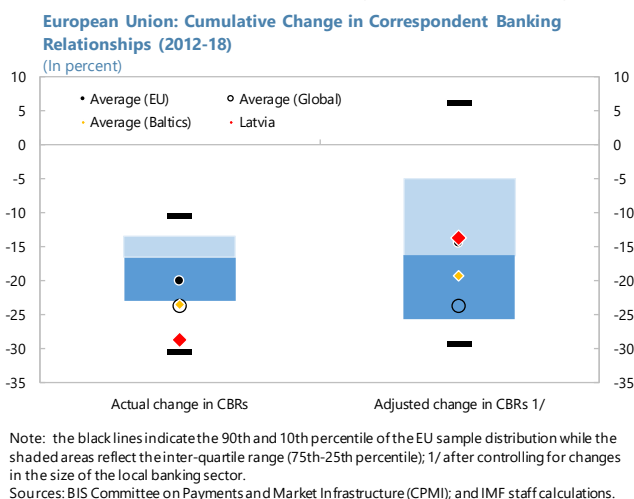
⁴ The liquidity stress test was completed independently and outside of the forthcoming IMF Financial Sector Assessment Program (FSAP) for Latvia.

⁵ Schemes involving shell companies and mis-invoicing (trade-based money laundering) have been well-documented. See also U.S. Treasury Department (2018).

held in BSFCs, of which over 80 percent were estimated to originate from Russia and other CIS countries (IMF, 2016b).

6. Money laundering and terrorism finance (ML/TF) concerns have weighed on Latvia's financial sector for many years. Significant gaps in the implementation of the AML/CFT framework have hampered its effectiveness. In 2015, the OECD's Working Group on Bribery (OECD, 2015)⁶ drew attention to ML/TF vulnerabilities, which triggered efforts to improve Latvia's AML/CFT regime. For example, in 2016, BSFCs were required to undertake independent audits of their internal AML/CFT controls every 18 months and address identified shortcomings, and additional resources were dedicated to AML/CFT supervision.

7. Correspondent banking relationships (CBRs) have come under pressure. In 2015–16, eroding confidence in the financial system's integrity caused correspondent banks to temporarily sever ties with their Latvian counterparts, effectively shutting them out from direct access to clearing transactions in U.S. dollars (IMF, 2017 and 2018b).⁷ By 2018, the largest banks had fully restored their CBRs with major U.S. banks, and banks have been communicating with their correspondents to reassure them that their internal AML/CFT policies and procedures are satisfactory; however, most BSFCs remain without correspondent banks, and all BSFCs are considered high-risk according to the Financial and Capital Market Commission (FCMC)'s risk assessment methodology. Recent data from the BIS' Committee on Payments and Market Infrastructures (CPMI)⁸ suggest that Latvia's cumulative decline of CBRs has been consistent with the general impact of the termination of relationships by foreign correspondents on the availability of foreign-currency clearing in other countries over the past seven years. In fact, Latvia's -13.7 percent-decline (after adjusting for the shrinking banking sector) compares rather favorably to that of the other Baltic countries (-19.2 percent) and the EU average (-14.4 percent).



⁶ The report recommended that Latvia strengthen its AML/CFT measures to support enforcement efforts against bribery of foreign public officials by Latvian companies.

⁷ In the context of cross-border payments, a correspondent bank provides local account and payment services for banks based abroad; this access to foreign-currency clearing transactions allows local banks to process cross-border payments for their clients. Clearing in USD was important for BSFCs until 2018 when a large share of non-resident deposits and transactional flows were denominated in USD. However, as BSFCs now transact primarily in EUR, the importance of CBRs with US banks has significantly diminished.

⁸ The CPMI, the global standard setter for payment, clearing and settlement services, tracks the size and scope of the network of relationships on an annual basis based on annual SWIFT data. The recent *Quantitative Review of Correspondent Banking Data* (CPMI, 2019) shows a broad-based and global reduction in CBRs as their geographical focus narrows. The number of CBRs has shrunk by more than 20 percent since 2012.

8. ABLV Bank's closure in early 2018 amplified pressures on BSFCs to reform their business models and de-risk their client base. The proposal by the U.S. Treasury Department's Financial Crimes Enforcement Network (FinCEN) of special measures against ABLV Bank as a financial institution of primary money laundering concern (U.S. Treasury Department, 2018) prompted the FCMC to call for a fundamental re-orientation of BSFCs away from a transaction-based business model towards other financial services supporting the real economy. More stringent AML/CFT requirements (affecting mostly high-risk clients and non-resident depositors) forced BSFCs to (i) roll off most of their foreign customers and terminate activities with certain shell companies, which were no longer permissible (Figure 2); (ii) change their funding structure by replacing non-residential funding with deposits from customers possessing less ML/TF risks, and (iii) adopt new business lines and services, such as specialized lending, asset/wealth management, and e-commerce in lieu of transactional business. As part of last year's *Supervisory Review and Evaluation Process* (SREP), all BSFCs had submitted their new business plans, had them approved by the FCMC, and are now in the process of implementing these plans. Banks are assessed for the effectiveness of their ML/TF risk management systems within the SREP.⁹

9. The amount and share of both non-residential deposits as well as the volume of transaction flows have decreased significantly. Since end-2017, non-resident deposits declined by more than 60 percent (€4.8 billion), and their share decreased to about 20 percent of total deposits, of which three-quarters (mostly USD from offshore jurisdictions) seemed to have left the banking sector altogether (Figures 1 and 3–4).¹⁰ Incoming and outgoing interbank payments of foreign clients have declined by a factor of four across all banks due to the steep reduction in USD transactions. Since 2016, the total volume of incoming and outgoing payments (gross values) transacted by BSFCs declined from 49.7 to 10.9 percent of GDP by end-March 2019, which is slightly higher than the transactional business in BSDCs (7.5 percent of GDP).¹¹

A. AML/CFT Considerations

10. The Latvian authorities have signaled strong commitment to reforming and rehabilitating the financial sector in the wake of recent external assessments of the AMF/CFT regime (Box 1). Several important legislative initiatives have been completed:

- *Amendments to the Law on the Prevention of Money Laundering and Terrorism and Proliferation Financing (AML/CFT Law) limiting the engagement of Latvian financial institutions with certain types of shell entities.* Shell arrangements are defined by Latvian law as any legal person possessing one or several of the following characteristics: (i) having no affiliation with an actual

⁹ The ML/TF risk assessment has been as quantitative component of the SREP since 2009. A qualitative component was added in 2018.

¹⁰ The remaining (mostly EUR-denominated) local deposits in the BSFC sector seemed to have migrated to the BSDC sector (net of new EUR deposits from the euro area (about €400 million)).

¹¹ According to FCMC data, the number of shell entity customers across the banking sector has decreased by about 90 percent (from 19,590 at the end of 2017 to 1,971 in May 2018), whose deposit volume declined by 86 percent (from €2.7 billion to €379 million) over the same time.

economic activity and operations that are of limited or no economic value; (ii) not being subject to an obligation to prepare and submit financial statements in the state of incorporation; or (iii) having no physical place of business in the state of incorporation.¹² Pursuant to new provisions, financial institutions are prohibited from engaging with shell companies bearing characteristics of (i) and (ii).

- *Amendments to the AML/CFT Law to extend its application to proliferation financing*, including the introduction of the offence of proliferation financing (PF) and the addition of counter proliferation financing measures to the existing AML/CFT obligations of reporting entities (e.g., suspicious transaction reporting, customer due diligence, and transaction monitoring).
- *Amendments to the AML/CFT Law clarifying reporting requirements by replacing the concept of unusual transaction reports (UTRs) with threshold reporting requirements for transactions conducted through financial institutions.*
- *Amendments to the Law on Sanctions* providing a mechanism to implement UN designations without having to wait for an EU regulation to be issued entered into force on July 4, 2019. The FCMC also issued a set of Regulations of Enhanced Due Diligence and “Recommendations to credit institutions and licensed payment and electronic money institutions to reduce the risks associated with the failure to comply with sanctions” providing more detailed guidance on obligations under the Law on Sanctions.
- *Updates relating to beneficial ownership*, namely the full transposition of the Fifth EU Anti-Money Laundering Directive, opting for public disclosure of beneficial ownership information as of 1 March, 2018, and amendments to the AML/CFT law providing for exclusion from the Enterprise Registry for failure to submit beneficial ownership information.
- *Amendments of the FCMC Act and the Credit Institutions Law* broadening the FCMC’s operations and responsibilities to include the prevention of money laundering and combatting terrorism financing and proliferation financing in the supervision and liquidation of banks (including the license withdrawal of banks whose actions are deemed to be in breach of the AML/CFT Law), revising the procedure for appointing the Board, and introducing new provisions for the removal of the Chairperson and Board members. A procedure for the selection of the FCMC Board on the basis of an open recruitment and approval of Parliament has been introduced, along with provisions allowing for Parliament and the Ministry of Finance (jointly with the Bank of Latvia) to remove the Chairman.¹³

11. Institutional and operational reforms are also under way. The Financial Intelligence Unit (FIU) has significantly expanded its operational resources, and inter-agency coordination has been

¹² Law on the Prevention of Money Laundering and Terrorism and Proliferation Financing, Art. 15.

¹³ As of July 4, 2019, the current Chairman and his Deputy have both tendered their resignations, effective as of July 15, 2019.

organized under the national AML/CFT strategy. New staff recruitment¹⁴ has allowed the FIU to staff its strategic analyst positions (all of which were vacant at the time of the MER) and undertake new activities, such as developing new typologies (e.g., one on virtual currencies in 2018) and updating the NRA (including risk assessments of the financial sector and related professionals and on legal entities). The FCMC has also been progressively intensifying its activities. It conducted 9 on-site inspections during the first half of 2019 and 14 on-site inspections in 2018 (compared to six on-site inspections in 2017).

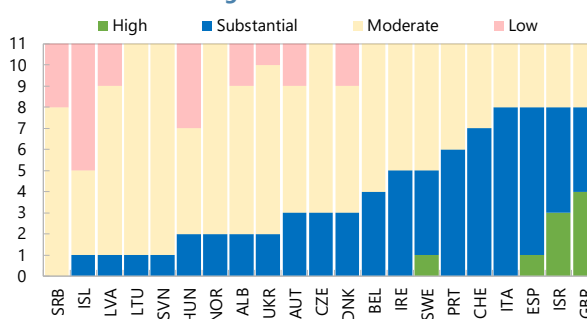
Box 1. MONEYVAL's Assessment of Latvia's AML/CFT Regime

The recent assessment by MONEYVAL (Council of Europe, 2018) raised concerns about Latvia's anti-money laundering and combating the financing of terrorism (AML/CFT) regime. Although Latvia's AML/CFT regime was deemed effective in some areas, such as cooperating with foreign counterparts, significant deficiencies were identified, putting the country at risk of being designated (grey-listed) as a jurisdiction with strategic AML/CFT

deficiencies. In its *Mutual Evaluation Report* (MER), MONEYVAL acknowledged a general understanding of ML/TF risks but found an uneven appreciation of the specific ML/TF threats posed by large cross-border banking flows. It also identified weaknesses in (i) AML/CFT supervision and the analytical abilities of the Financial Intelligence Unit (FIU), (ii) the application of internal controls by financial institutions, and (iii) the prioritization of ML/TF offences by law enforcement and prosecution authorities. Overall, Latvia was found to lack targeted measures to address ML/TF threats arising from the high concentration of non-resident deposits and transactional flows in BSFCs.

The insufficient implementation of AML/CFT controls in the banking sector have amplified concerns about the current supervisory regime. At the time of the MER, most banks had not incorporated ML/TF risks into their enterprise risk management systems (i.e., banks could assess the risk of their customers, but could not speak to their own risk exposure), and no banks characterized their ML/TF risks exposure as being high. This incongruous risk assessment was reflected in the level and quality of suspicious transaction reporting, which demonstrated a poor risk understanding or weak implementation of AML/CFT control on the part of BSFCs. Reported figures from past years suggest defensive reporting by Latvian banks (given the high number of reports received relative to the number of disseminations by the FIU to law enforcement), although limitations in the FIU's operational analysis may have also played a contributing factor. The MER also expressed doubts as to the adequacy of customer due diligence being carried out by BSFC banks, citing poor quality of beneficial ownership information (BOI) (often taken at face value by banks when on-boarding new customers) as a significant vulnerability for ML/TF as well as proliferation financing (PF).

Assessment Ratings of Effectiveness



Note: Includes only European countries for which assessments under the 2013 FATF Methodology are available. Based on MONEYVAL assessments for ALB, CZE, HUN, LVA, LTU, SRB, SVN, and UKR; FATF assessments for AUT, BEL, CHE, DNK, ESP, GBR, IRE, ISL, NOR, PRT, and SWE; and IMF/FATF assessment for ITA. Ratings reflect the extent to which a country's measures are effective. The assessments are conducted on the basis of 11 immediate outcomes, which represent key goals that an effective AML/CFT system should achieve.
Source: Financial Action Task Force (FATF), *Consolidated Assessment Ratings*, April 17, 2019.

¹⁴ At present, the FIU has 8 strategic analysts and 16 operational analysts.

Box 1. MONEYVAL's Assessment of Latvia's AML/CFT Regime (concluded)**FIU: Received STRs and Disseminations**

	STRs received	Transactions involved	Disseminations	STRs included in dissemination
2015	7,267	17,525	340	584
2016	5,008	18,712	231	439
2017	7,722	25,517	225	393

Source: Latvia Financial Intelligence Unit.
Note: STR=Suspicious Transaction Report.

Latvia's legal framework was deemed not sufficiently precise to ensure implementation of targeted financial sanctions (TFS). The risk of PF is rated "medium high," and the risk of TF is rated "low." At the time of the MER, obligations imposed by EU Regulations, the AML/CFT Law and the Law on Sanctions were not fully consistent, including on the scope of the freezing obligation and persons obligated to comply with the freezing obligation, and on the ability of the FIU to order freezing of assets indefinitely without a court order. Furthermore, MER found instances of banks repeating breaches in the context of administrative agreements. After the MER, penalties for contravention of sanctions against the Democratic People's Republic of North Korea were significantly lower than sanctions imposed for other AML/CFT compliance breaches; in 2017, the FCMC fined three banks a total of €641,000 for systematic failures to detect payments to the DPRK (although these were the first penalties of this kind).

The analytical quality of financial intelligence hampered enforcement efforts. At the time of the MER, FIU disseminations were of insufficient quality, with incomplete reports and inaccurate identification of beneficial owners. Given these challenges, law enforcement reported a preference to independently collect financial intelligence. The FIU was also noted as over-relying on BOI submitted by reporting entities and failing to classify predicate offences based on its own analysis (as reporting entities are not required to report on the underlying criminal activity). Accordingly, convictions obtained in proceedings initiated based disseminations were of a significantly smaller percentage than in those initiated on other sources of information (e.g., three times as many prosecutions were initiated based on FIU disseminations than other sources in 2016, yet the same number of convictions were obtained for each category of proceedings). In addition to the deficiencies related to the quality of the FIU's financial intelligence, legal practitioners noted that a lack of training among police may result in evidentiary challenges ultimately posing an impediment to money laundering enforcement actions.

Findings

12. Overall ML/TF awareness has been improving. Authorities and industry are broadly aware of the main risks faced by Latvian banks (as was the case at the time of the MER). The authorities have been taking steps to better understand and identify new and emerging risks, such as those that may arise from the changes in the banking sector and new products and services. Nonetheless, agencies vary in the degree and granularity to which they appreciate and analyze risks, and not all stakeholders appear to be as cognizant of the specific modalities and channels potentially employed to move illicit funds through the financial sector.

13. Banks have sought to enhance their AML/CFT compliance systems. Banks report moving to fully automated systems for customer due diligence (CDD) and risk assessment, including related to TF and PF, and taking actions to update compliance procedures and protocols. As part of the re-

structuring of their business models, banks have also begun incorporating ML/TF risks into their risk management systems on a strategic level. However, the metric for the scale and scope of de-risking appears relatively coarse (e.g., on the level of resident vs. non-resident), which, in some cases, has resulted in closing of accounts of companies with genuine economic activity. In the absence of specific guidance from the FCMC on how to re-orient their business models, some banks have taken a more measured approach to risk reduction while searching for a market niche (development of capital markets, trade financing for SMEs), while others have maintained existing business models but significantly scaled back their relationships with high-risk customers.

14. Controls for terrorism and proliferation financing (TF/PF) have risen in priority. Prior to 2018, banks differed in the extent to which they had internal controls in place to comply with requirements to implement targeted financial sanctions. Now they are obliged to have specific policies on sanctions and a dedicated sanctions compliance officer. Some banks have adapted internal controls to include TF/PF risks on the client facing level as well as updated their system triggers to catch both hits on a sanctions list and indicators/red flags (such as a specific country or mode of delivery). New developments appear to be moving the financial sector in a positive direction in terms of awareness of TF; in 2018, the FIU received 142 STRs related to TF (compared with 31 in 2017).

15. However, risks associated with remaining non-resident accounts have become more concentrated. With the significant decline in non-resident deposits,¹⁵ ML/TF risk may have also declined. However, BSFCs still have a considerable share of high-risk clients in their remaining gross payment flows, which is also reflected in FCMC's classification of all BSFCs as high-risk banks as of end-March 2019 (Figure 5). Patterns of payments to and from foreign customers also remain the same—albeit at lower volume—and potential roundtripping of income using Latvia as a transit country may still be taking place. In addition, significant differences in reported trade flows between Latvia and CIS countries (i.e., overreported exports and underreported imports) provide circumstantial evidence of potential mis-pricing due to illicit transactional flows (Figure 6).¹⁶

16. Underlying risks associated with shell companies and other high-risk entities could reemerge. The 2018 amendments to the AML/CFT law carve out a category of shell entities with which financial institutions are precluded from doing business. However, the entities covered by this prohibition represent a very small share of all entities falling within the definition of a shell company (Figure 2), and the definition of banned companies is subject to some interpretation.¹⁷ A very large number of shell companies whose accounts have been closed do not fall under the prohibition. The law has thus far had a strong “signaling effect,” but its long-term effectiveness is questionable, especially as banks may recalibrate their procedures to further narrow the banned company

¹⁵ Determined based on legal, not beneficial, ownership.

¹⁶ While some statistical discrepancy might be explained by methodological differences, the persistent (and large) gap for CIS countries (as opposed to EU countries) requires further investigation.

¹⁷ Due to the subjective criteria to determine economic value, a small, but not insignificant, percentage of shell companies cannot be categorized under the current legislation.

definition. Further, in cases of corporate accounts, the classification of residency for purposes of financial reporting to the Bank of Latvia is based on legal ownership. As such, the decline in non-resident deposits is more accurately categorized as a reduction of accounts held by companies established abroad and does not reflect a significant reduction of accounts held by Latvian companies with foreign owners.

17. Uncertainty about the implementation of recent supervisory reforms has led to excessive risk aversion. In the face of much greater scrutiny of Latvia's AML/CFT regime both by the international community and domestic stakeholders, the FCMC has, at times, resorted to a more rules-based approach. For fear of indiscriminate regulatory crackdown on higher risk customers, many banks have discontinued operations with non-resident clients, including those with business or links abroad (especially Russia and the CIS region). Thus, insufficient differentiation might have contributed to a very timid credit activity in Latvia.

18. Supervisory actions are missing critical aspects of a risk-based approach. The FCMC's risk-based approach to AML/CFT supervision has evolved over the last several years but needs further improvement in several important areas. The risk categorization of banks—critical, high, medium, or low risk—does not appear to be the main determinant of the FCMC's inspection plan. The critical risk category, defining banks as unable to correct severe AML/CFT deficiencies or with already restricted activities—does not result in binding and pre-defined supervisory actions. The only two banks classified in this category were identified as critical risk only after their licenses had been withdrawn. Due to resource constraints, supervision has focused on targeted/thematic inspections, and the FCMC has not conducted a full-scope inspection of all high-risk banks in the last three years (two banks have not been subject to a full-scope inspection during the period of 2016–19). Of the 9 on-site inspections conducted in the first half of 2019, only one was a full-scope inspection. Further, none of the high-risk banks have been subject to more than one full-scope inspection in the last three years, despite the FCMC's stated policy of conducting full-scope exams of high-risk banks every 18 months.

19. Sanctions may not be sufficiently effective, dissuasive, proportionate. Although the number of sanctions imposed has markedly increased in 2018, questions remain as to whether penalties are commensurate with the types of violations being identified. The regulator has broad discretion to enter into an administrative agreement for the reduction of a pecuniary penalty. Penalties have varied widely—for weaknesses in customer due diligence resulting in the circumvention of sanctions, five banks were fined between €35,000 and €1.3 million in 2017; deficiencies in CDD resulted in fines ranging from €9,825 to €2.2 million in 2018. Breaches that do not result in an administrative agreement must always proceed as an administrative case, which can be lengthy and costly. Procedures for imposing administrative sanctions can take up to a year to be completed, due partly to delays in obtaining responses and information from supervised entities and in part to limited resources.

20. ML/TF risks outside of the banking sector remain poorly monitored. The 2018 updates to the existing NRA (the sectoral risk assessments carried out by the FIU and the FCMC) point to weak or non-existent supervision of certain subjects of the financial sector (cash collection service

providers, financial leasing service providers, non-bank lenders, and other payment service providers not supervised by the FCMC). Among the factors cited by the NRA as causing the most significant vulnerability of the non-financial sector is insufficient supervision capacity of the non-financial sector's supervision and control authorities. The tax administration has recently begun inspections of the real estate sector but is still building its capacity in this area and sanctions imposed thus far (generally around €1,800 with a maximum penalty of €10,000) have not been effective, proportionate, or dissuasive.

21. The FIU's operational and strategic analysis may still need improvement to better support enforcement actions.

The FIU has progressively strengthened its systems to identify predicate offences and improve analytical abilities, including with the help of an external consultant. Once its new IT systems are in place, enhanced operational capacity should also contribute to the FIU's strategic activities. The percentage of FIU disseminations to law enforcement resulting in the initiation of criminal proceedings over the last few years has remained roughly constant (Table).

Latvia: Criminal Proceedings Based on FIU Disseminations			
	FIU Disseminated Reports	Criminal Proceedings Started	
		No.	Ratio
2017	225	83	36.9%
2018	171	59	34.5%
2019*	99	36	36.4%

Source: Latvia Financial Intelligence Unit.
Note: */ until July 1, 2019.

Policy Implications

22. The task ahead is challenging due to the need to demonstrate effectiveness of the enhanced AML/CFT regime over the near term. The absorptive capacity of both regulatory authorities and the private sector needs to be considered. The fast pace of legislative and regulatory changes and the high rate of recruitment necessitate proper sequencing of activities. This will ease uncertainty and the sense of regulatory crackdown in the financial system. It will also allow for staff to be properly trained and educated as well as for meaningful assessment of effectiveness to be carried out. Efforts need to focus on several key areas:¹⁸

- *Understanding AML/CFT risks.* The authorities should continue improving their understanding and analysis of ML/TF threats and vulnerabilities to ensure effective de-risking. The new banking landscape requires a new approach to understanding residual and emerging ML/TF risks, including potential spillovers from bank to nonbank activities. A deeper analysis of available data (both present and historical) would enhance the assessment of potential sources of vulnerabilities and their evolving nature over time and guide the authorities in developing a more forward-looking NRA and targeted risk mitigation strategy. This also involves further increasing FIU's operational capabilities to strengthen the analytical products used in

¹⁸ These areas should not prejudice the implementation of any action plan developed with the FATF or MONEYVAL and should be harmonized with any such action plan to the extent possible.

understanding ML/TF risks. The FIU should continue efforts to improve its operational analysis and its systems in place to maintain detailed statistics.

- *Strengthening AML/CFT supervision.* A more refined risk-based model should guide the FCMC's supervisory activities. For instance, a broader set of risk factors should help identify critical risks and underpin a new categorization for banks exhibiting serious AML/CFT concerns. Linking supervisory actions to the risk categorization of banks and shifting focus toward full-scope inspections (on a risk-based approach) would make these actions more effective. The authorities may also need to provide more aid to both bank and non-bank financial institutions in developing their own risk assessments, mitigation measures, and internal controls.
- *Strengthening the sanctions regime.* The FCMC should evaluate the use of administrative agreements, particularly for the reduction of penalties; this could be complemented by a more streamlined procedure for the imposition of administrative sanctions.
- *Ensuring accurate beneficial ownership information.* The effective implementation of recent updates to the AML/CFT framework intended to improve the availability of companies' BOI should be a specific area of focus of AML/CFT supervision. The effectiveness of updates to the regulatory and institutional framework for the collection, registration, and verification of BOI under company law also should be carefully monitored.
- *Improving AML/CFT preventive measures and reporting.* The FIU and supervisory authorities should continue to work on ensuring an appropriate quality and amount of reporting of suspicious transactions. Special focus should be on ensuring effective implementation of preventive measures by higher risk entities, such as BSFCs, including with respect to TFS. In place of an outright ban of certain types of customers, guiding financial institutions toward applying a more nuanced risk-based approach based on various risk attributes of customers could help prevent further misuse of shell entities. Such an exercise would need to be accompanied by a more thorough understanding of risk factors, stronger application of internal controls, and more proactive guidance from regulatory authorities.
- *Improving the quality and use of financial intelligence.* The FIU should continue to improve its analytical capabilities and ensure that financial intelligence generated by its operational analysis is useful to law enforcement in ML/TF investigations. Continued recruitment and training of additional staff, and the application of adequate IT solutions would improve analytical capabilities and support enforcement efforts. The FIU should also continue collaborative efforts with law enforcement, prosecutors, and judges to increase the overall knowledge and prioritization of ML/TF across the jurisdiction.
- *Enhancing ML/TF enforcement.* The FIU should continue its efforts to work with law enforcement and prosecutors to improve the overall ability of the jurisdiction to combat financial crime. Strengthening investigative and prosecutorial bodies would improve their ability to more effectively lay charges and secure convictions, and the imposition of criminal sanctions. The

development of sentencing guidelines would help ensure that criminal sanctions imposed are more effective, proportionate, and dissuasive.

- *Ensure the independence of regulatory authorities.* Measures to strengthen the governance and accountability of the FCMC have the potential to improve the agency's overall functioning if accompanied by the necessary safeguards; however, new provisions may need further clarification to ensure procedures for removal of Board members or the FCMC Chairperson do not undermine the independence of the regulator.
- *Encouraging greater strategic coordination and cooperation.* Regulatory authorities need to work together towards a common national vision. National AML/CFT policies are generally discussed through the Financial Sector Development Board, which has been the main forum for developing the action plan to address MONEYVAL recommendations. While cooperation between the FCMC and the FIU has strengthened, particularly during ABLV Bank's self-liquidation process, the agencies should further share mutual accountability in setting strategic goals as well as finalize the process of formalizing their cooperation through a Memorandum of Understanding initiated in June 2019.¹⁹ Notably, the FIU needs to become a key participant in the re-orientation of the BSFCs, given its unique function in strategic analysis. Cooperation across supervisory, financial intelligence, tax administration, and law enforcement authorities will improve the effectiveness of AML/CFT measures and reforms.

B. Liquidity Stress Test

23. The de-risking of Latvia's banking sector has important implications for the prudential assessment of how existing and emerging vulnerabilities to ML/TF affect liquidity conditions under stress. Such liquidity risks are difficult to assess comprehensively as part of the regular oversight through quantitative analysis outside thematic inspections and have yet to be fully and routinely incorporated in stress testing exercises.²⁰ While the FCMC's SREP includes specific liquidity requirements for funding channels susceptible to ML/TF risks using an indicator-based approach (Annex II), it does not identify the transmission channels and their impact on the prudential assessment of overall liquidity risk. For instance, the ECB's "failing or likely to fail" (FOLF) decision on ABLV Bank in February 2018 was not based on the bank's failure to meet authorization requirements (including the compliance with relevant provisions under the national AML/CFT regime) but triggered the high probability of failure after money laundering allegations had caused significant cash outflows. In addition, the lack of quantitative metrics for a system-wide but differentiated assessment of liquidity risk from AML/CFT breaches makes it difficult for supervisors to direct banks' risk mitigation efforts and assess their effectiveness.

¹⁹ The FIU has conducted a separate assessment of the business plans of BSFCs in parallel with the re-structuring exercise conducted by the FCMC. It is unclear whether the conclusions of two agencies share a common set of priorities and focus areas.

²⁰ The FCMC has periodically included plausible stress test scenarios for BSFCs, such as the escalation of geopolitical risks and the complete closure of USD accounts.

24. The ongoing structural changes in Latvia's banking sector call for an interim assessment of financial stability implications from banks' evolving liquidity risk profiles. The liquidity stress test determines how the de-risking process (and its impact on the balance sheet composition of banks) affects their capacity to absorb shocks to the stability of funding.²¹ It aims at examining the system-wide resilience to shocks, uncovering vulnerabilities to any rapid deterioration in the macroeconomic environment and, more generally, identifying threats to overall financial stability, potentially triggered by an escalation of ML/TF risks. Over the last year, the accelerated de-risking process resulted in considerable cash demands on BSFCs to satisfy payments to a wide but quickly diminishing deposit base of non-residents; however, most banks still hold large liquidity buffers with significant carrying costs as the transition to new business models might raise new funding demands. Thus, the stress test provides a quantitative assessment of how the downside risk associated with a lack of progress in strengthening Latvia's AML/CFT regime could change current funding conditions.²² The stress test is also motivated by important results from the Nordic-Baltic Stability Group's recent crisis simulation exercise in January 2019, which involved a liquidity shortfall scenario at subsidiary level in Baltics, and generated important findings on how deteriorating liquidity conditions have implications for local ring-fencing of collateral and the FOLF decision at the parent level (SRB, 2019).²³

25. The recent reforms of the AML/CFT regime also offer an opportunity to introduce a more detailed and comprehensive quantitative analysis of ML/TF risks in a regular liquidity stress test to support potential FOLF decisions triggered by an escalation of liquidity risk. The new amendments to *the Law on the FCMC* and the *Credit Institutions Law* grant the FCMC legislative powers to determine criteria for significant AML/CFT breaches and require the FCMC to revoke the license of a bank that it deems to be in violation of these criteria. Given that the FCMC will also be responsible for monitoring the compliance with AML/CFT regulations during liquidation, these criteria would ideally be aligned with existing indicators of ML/TF risks and the way they influence the assessment of funding vulnerabilities (and their impact on the viability of banks).

26. However, the results of the stress testing exercise have no immediate supervisory implications. This exercise is different from the routine supervisory reviews undertaken by the FCMC, which support the capital planning process under Pillar II and are aimed at identifying potential liquidity shortfalls from severe but plausible funding shocks in the near term, and for which management actions may be required. The results have no immediate prudential implications but rather inform relevant policy discussions on (i) system-wide vulnerabilities in the banking sector

²¹ Liquidity stress tests inform a comprehensive assessment of whether banks' own internal resources (i.e., liquidity buffers) are sufficient to withstand adverse shocks. They also shed light on the potential need for emergency liquidity assistance to viable banks.

²² The stress test is based on economic and market conditions as of end-2018, the cut-off date of the exercise, and does not incorporate most recent developments.

²³ The exercise was held between January 22 and 23, 2019, and involved 31 authorities from Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway and Sweden as well as relevant EU authorities. The exercise followed a hypothetical crisis scenario involving fictitious financial institutions in the Nordic and Baltic countries and tested the respective authorities' crisis management capabilities and regional cooperation.

from the ongoing de-risking process and (ii) the potential impact of continued ML/TF risks on liquidity conditions (and the supervisory assessment of banks' viability under stress) if the current implementation of recent legal amendments and regulatory updates is protracted and/or fails to achieve its desired effects.

27. This section presents the results of an examination of liquidity risk using public data. It reflects a top-down (TD) assessment of a large variety of possible vulnerabilities to funding shocks that can affect the individual viability of institutions and system-wide risks in the sector. The test focuses on sudden, sizable withdrawals of funding and the sufficiency of existing assets to withstand those shocks under stressed conditions using an established IMF methodology to determine the short- and medium-term resilience of individual banks and the overall system. Different scenarios are combined into a comprehensive analysis of the sector's vulnerability using cumulative and non-cumulative implied cash flow (ICF) tests over different risk horizons. The stress testing exercise captures 94 percent of the total banking sector (including foreign subsidiaries/branches but excluding banks that have exited Latvia by the end of 2018).

Stress Test Design and Methodology

28. The liquidity stress test assesses the short-term resilience of the banking sector with respect to sudden, sizable withdrawals of funding, which might also be influenced by AML/CFT concerns impacting banks' risk profile. The analysis was completed using publicly available data from banks' statutory financial filings in 2018. Due to the stringency of assumptions that were applied across different scenarios, the findings are informative regarding the dynamics of aggregate funding positions under very severe system-wide distress. The specification of the scenarios also acknowledges structural vulnerabilities from the residual reliance on funding sources more exposed to ML/TF risks, such as non-resident deposits, which BSFCs have been displacing in their efforts to re-orient their business models towards the domestic economy.

29. The liquidity stress tests aim to capture the risk that a bank fails to generate sufficient funding to satisfy short-term payment obligations due to one or more of the following channels affecting cash flows: (i) cash inflows related to maturing assets and assets that are either repo-able or saleable at stressed market values ("market liquidity risk"); (ii) cash outflows due to the restricted ability to access funding markets ("funding liquidity risk"); and (iii) unscheduled cash flows due to available but unused credit lines from/to related and third parties; and (iv) net derivatives flows.²⁴ In this regard, assumptions about the decline in asset values, amortization/renewal rates, drawdown rates on contingent claims/liabilities, intragroup funding, and the extent to which assets were subject to haircuts when used as collateral for wholesale funding influence the severity of cash

²⁴ The ability to survive funding constraints due to the rollover risk stemming from maturity mismatches was not examined due to data constraints.

flow calculations.²⁵ In the context of the current situation of Latvian banks, the assumptions for contractual and behavioral cash flows also reflect the ability to keep meeting payment obligations in the event of suspension of access to settlement services due to ML/TF sanctions.²⁶

30. The exercise focused on so-called *implied cash flow (ICF) tests to assess whether banks can continue to operate using available cash and collateral without access to additional funding sources under stress (including central bank liquidity support)*. Consistent with common practice in FSAPs, we apply a cumulative five-day test and a non-cumulative 30-day test based on the methodology in Jobst, Ong, and Schmieder (2017 and forthcoming), which has been informed by FSAP liquidity stress testing by IMF teams in jurisdictions with systemically important financial systems between September 2010 and December 2016.²⁷ Under the Basel III framework, banks are expected to maintain a stable funding structure, reduce maturity transformation, and hold a sufficient stock of assets that should be available to meet their funding needs in times of stress (BCBS, 2017). Due to the limited scope and data access, the stress test only indirectly considers one of the Basel III standard measures of liquidity risk, the *Liquidity Coverage Ratio (LCR)*, by mapping its definition of valuation haircuts and discount rates to the risk factor specification in both ICF tests.²⁸ The two ICF tests simulate a gradual outflow of funding over five consecutive days on a cumulative basis and over a 30-day period on a non-cumulative basis. Both tests define liquidity ratios as the liquidity position after dividing cash inflows (including proceeds from asset sales, securities lending, and repos) by cash outflows. Thus, a stress test ratio higher than 100 percent implies a liquidity surplus in the stress scenario—implied by the application of suitable funding and market liquidity risks to liquid assets and cash flows. Conversely, a liquidity ratio below 100 percent indicates a deficient liquidity position under the respective scenario. The tests are applied to all 4 BSDCs and 7 (out of total of 11) BSFCs²⁹ on a solo basis, representing 95.0 percent of the banking sector's total assets (Table 1).

²⁵ Considerations for calibration of these risk factors include, among others, (i) the importance of deposits relative to wholesale-based funding, (ii) the role of off-balance sheet funding/lending, (iii) the nature of counterparty risk (e.g., market-based transmission channels), and (iv) contingent intragroup/related party claims and obligations.

²⁶ Note that the transactional payment volume and the share of U.S. dollar-denominated deposits has declined significantly, so foreign exchange risks have not been examined separately.

²⁷ The methodology was implemented in an MS Excel tool, which is available at <https://www.imf.org/~media/Files/Publications/WP/2017/datasets/wp17102.ashx>.

²⁸ Banks are required to satisfy two quantitative liquidity standards that aim to strengthen liquidity risk management practices. The LCR is intended to promote short-term resilience to potential liquidity disruptions by requiring banks to hold sufficient high-quality liquid assets (HQLA) to withstand the run-off of liabilities over a stressed 30-day scenario specified by supervisors. LCR requires that banks hold enough stock of unencumbered, HQLA to cover cash outflows less cash inflows (subject to a cap at 75 percent of total cash inflows) that are expected to occur during in times of stress. LCR of less than 100 percent indicates a liquidity shortfall. The other Basel III standard measures of liquidity risk, the Net Stable Funding Ratio (NSFR), was not included in the stress test.

²⁹ The strict categorization between BSDC and BSFC is due to the historical distinction of the two business models, which is increasingly being blurred. We retain this distinction consistent with the current use by the FCMC.

31. We specify a historical macro-financial scenario (“main scenario”), which is complemented by additional background scenarios for robustness check and cross-validation:

- *Main Scenario*—The availability of the counterbalancing capacity of liquid assets and outflow assumptions for the “historical scenario”³⁰ were calibrated to (i) the actual deposit run-off experienced by the BSFCs, (ii) the valuation change of Latvian government debt securities, and (iii) the rise in the external finance premium for corporate borrowers in the wake of the ECB’s decision on ABLV Bank as “failing or likely to fail” (FOLF) credit institution in February 2018 (Table 2).³¹
- *Background Scenarios*—Aside from mapping the LCR to the ICF tests (“Regulatory Scenario”) (BCBS, 2013), we also consider several alternative scenarios consistent with current and upcoming micro- and macroprudential surveillance efforts involving the Latvian banking sector (Annex I Tables 1-4): (i) the ECB’s *Sensitivity Analysis of Liquidity Risk—Stress Test* (LiST) (ECB, 2019a and 2019b), which has been completed for two Latvian banks under direct ECB supervision (Swedbank Latvia and SEB Banka)³² during the first half of this year to inform additional capital and liquidity requirements as part of the SREP, and (ii) the forthcoming IMF FSAP for Latvia. The ECB’s LiST 2019 exercise is structured similar to the ICF tests and defines three different scenarios (baseline, adverse, and extreme), which are mapped to our stress testing format (“Quasi-ECB”) after accounting for the detailed risk control measures of the Eurosystem’s collateral framework (ECB, 2014; Bindseil and others, 2017).³³ While our exercise does not pre-empt the liquidity stress test component of the upcoming FSAP, it provides an interim assessment of potential financial stability implications arising from the changing liquidity risk profile due to the ongoing transformation of the banking sector and changing business models of BSFCs. Thus, we apply a conventional specification of a standard scenario consistent

³⁰ The valuation haircuts for liquid assets have been calibrated to the interest rate shocks experienced during the ABLV episode and scaled to the average duration of the residual maturity of current holdings in the banking sector (between 3–5 years). Thus, for government bonds as well as other public sector securities (Levels 1 and 2), we apply a haircut of -5.2 percent (consistent with a shock of +107 bps to the basis spread of Latvian government bonds over German Bunds); for other debt securities and marketable loans/loans collateralize secured funding for up to 3 months, the valuation haircut was -12.9 percent (consistent with a shock of +151 bps to the credit spread of small corporate loans). For the deposit run-off rate (up to 30 days), we apply the actual weekly run-off of 5.5 percent of non-resident deposits (implied compounded rate) during the four weeks after FOLF decision on ABLV Bank as daily run-off rate in the 5-day ICF (which is consistent with a run-off rate of 27.7 percent over a 30-day period) (Figure 8).

³¹ These shocks were also implemented in the GIMF model (Kumhof and others, 2010), which provides the possibility of examining the interlinkages of liquidity and solvency conditions under stress with feedback effects to the real economy.

³² Luminor Bank is a branch and was not tested separately but included in the results for the Estonian parent bank (at the group level). PNB Banka did not participate in the ECB’s LiST.

³³ LiST has been carried out as the ECB’s annual supervisory stress test for 2019 to assess the ability of the banks it directly supervises to handle idiosyncratic liquidity shocks. The outcome of the stress test supports the ongoing supervisory assessment of banks’ liquidity risk management frameworks but will not affect supervisory capital and liquidity requirements in a mechanical way. Liquidity risk is part of the ECB’s supervisory priorities for 2019 due to individual cases of constrained liquidity in recent years. For Latvia, the ECB included only the four banks under direct ECB supervision (Swedbank, Luminor, SEB, and PNB Banka) (Table 1).

with the one used in recent FSAPs for European countries (“IMF-Standard Scenario”) (IMF, 2016a and 2018a).

Findings

32. Based on ICF tests over different risk horizons, we find that liquidity risk for most banks is low. Banks exceed—and in most cases by a large margin—minimum statutory liquidity ratios (defined by Basel III standard liquidity measures) and hold large stocks of liquid assets at low encumbrance levels, which help mitigate potential vulnerabilities to funding shocks. Overall, excess liquidity amounts to 20 percent of total assets, which is the highest level in any euro area member country. However, the aggregate numbers disguise significant differences across banks. While the capital adequacy is almost the same for BSDCs and BSFCs (20.3 percent vs. 20.4 percent CET1 capital ratio), the latter report a much higher weighted-average LCR of 375.0 percent (vs. 247.0 percent) at the end of 2018 due to rising cash balances from significant asset sales triggered by the substantial decline of the non-residential deposit base since 2016 (which accelerated after the collapse of ABLV Bank). For the stress testing sample, the partial coverage of BSFCs raises the average sample LCR from 269.0 to 271.3 percent (Figure 3 and 4).

33. The stress test results for our liquidity risk measures show that almost all banks can withstand short-lived shocks to cash flows (Tables 3 and 4; Figure 8). The results are largely robust to a variation of the type and magnitude of funding shocks under different scenarios, and are not materially affected by higher encumbrance despite varying “quality” of counterbalancing capacity across banks:³⁴

- *Five-day implied cash flow (ICF) test*—Despite a large contraction of unsecured funding by up to 21 percent, most banks have sufficient liquidity buffers to compensate for negative net cash outflows over a 5-day horizon and have an implied ICF liquidity ratio of at least 100 percent or higher. The average net cash shortfall of banks with a deficient liquidity position amounts to a maximum of 4.0 percent and 12.5 percent of liquid assets and total assets, respectively (under the “historical scenario,” which generates the worst aggregate outcomes under stress).
- *30-day implied cash flow (ICF) test*—Extending the risk horizon to one month generates no overall liquidity shortage under all but the most extreme scenarios (which implies a loss of unsecured funding by up to 49 percent under the adverse and extreme ECB scenarios); the average net cash shortfall declines to 2.1 percent and 6.5 percent of liquid assets and total

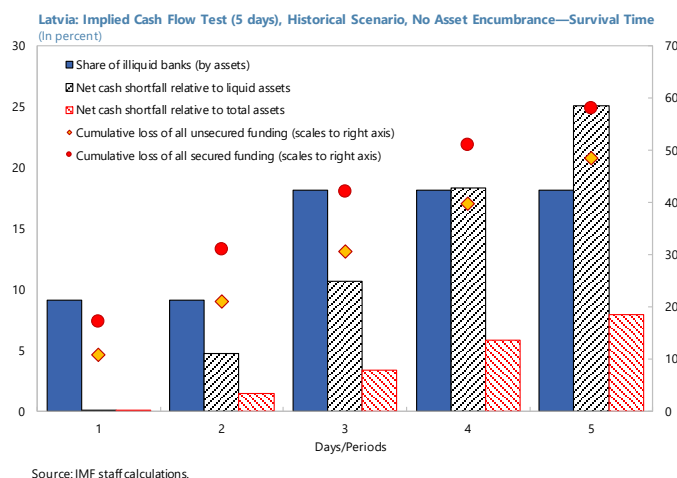
³⁴ The differences in the impact of the main scenario relative to the alternative scenarios (ECB, Basel III) reflects (i) higher (lower) valuation haircuts for public (private) sector liquid assets and (ii) lower callback and drawdown rates of the former.

assets, respectively, due to a larger number of marginally failing banks.³⁵ However, there is no bank with a deficient liquidity position under the main scenario (“historical scenario”).³⁶

34. However, banks remain generally vulnerable to large outflow shocks due to limited alternative funding sources that can augment their deposit base at longer maturity tenors (and thereby reducing potential re-pricing risks). Although banks are not reliant on wholesale funding and have reduced non-resident deposits, they lack sufficient term funding; some of them have become dependent on retail deposits from other euro area countries and local corporate deposits, which are more market-sensitive.

Especially for banks with large mortgage and consumer loan books and high maturity mismatches, the liquid asset buffer might not be enough to absorb a sizable decline in deposits in times of stress (Chart). In the absence of greater diversity of funding sources with longer maturity tenors, high carrying cost of substantial cash balances will require BSFCs to make difficult choices regarding their liquidity risk management.³⁷ As lending to both households and non-financial corporations (NFCs) remains timid,³⁸ and the domestic capital market is still shallow, banks might shift demand to foreign investment securities as liquidity buffers, which exposes their funding profile to changes in market liquidity risk. In addition, BSFCs are vulnerable to greater competitive pressures in the domestic lending market and regulatory changes affecting funding markets. These smaller institutions would be likely to experience a decline in net profitability, which might also result in deteriorating capital conditions over the medium term and raise consolidation pressures.

35. The results also highlight relative vulnerabilities of banks’ funding structures. While the different business models of BSDCs and BSFCs explain level difference in liquidity ratios, the liquidity impacts under stress seem more diverse, reflecting heterogeneous funding and liquid asset structures. Although the composition of liabilities has become increasingly similar, their difference



³⁵ Note that data limitations prevent a granular treatment of maturities less than three months, and, thus, extend the amount of potential liabilities run-off to maturity terms exceeding the stress period of one week or one month, which inflates the net cash shortfall.

³⁶ While some banks show a deficient liquidity position under the most adverse scenarios, they would still meet the threshold of a LCR ratio of 100 percent (if shocks to market and funding liquidity risk were calibrated to standard valuation haircuts and discount rates implied by the prudential definition of the ratio).

³⁷ The re-orientation of towards the domestic economy will involve more long-term lending, which would ideally be funded by more stable but limited residential deposit funding.

³⁸ Tightening lending standards and declining loan-to-deposit ratios also signal that banks’ lending policies remain cautious due to concerns about the effectiveness of the insolvency regime and widespread informality. Also, some lending headroom of larger banks is being displaced by the absorption of legacy portfolios of banks exiting the Latvian market (e.g., Danske Bank).

on the asset side and the varying “stickiness” of deposits has resulted in varying resilience to liquidity shocks. The main risk driver for many cash-rich BSFCs with considerable amounts of liquid assets is a shrinking deposit base; their liquidity positions improve substantially if customer deposits remain stable. In contrast, BSDCs have a wide, retail-dominated (and thus, more stable) deposit base but remain highly dependent on the collateral value of less liquid assets and show greater susceptibility to outflows from related party lending and contingent claims. Contingent claims for BSDCs are an important distinguishing feature in the characterization of projected cash outflows under stress. The withdrawal of scheduled and contingent intragroup funding and moderate increases in valuation haircuts appear to also limit the generation of cash inflows.

36. The FCMC has already strengthened liquidity risk monitoring with a view to enhancing AML/CFT considerations in the supervisory process. In 2018, stricter liquidity regulations have been introduced for the Pillar II capital requirement of banks with significant non-resident deposits and foreign lending under SREP, which have encouraged greater focus on liquidity risk management as banks continue to reduce their exposure to high-risk clients (Annex II). These requirements coincided with the implementation of the general liquidity coverage ratio (LCR) according to EU Regulation No. 575/2013, which replaced FCMC’s liquidity ratio on January 1, 2018. The stricter liquidity regulations encouraged BSFC’s to hold high liquidity buffers that can absorb significant adverse funding shocks. The FCMC has also assessed the new business models of BSFCs banks—considering future business strategies and risk impact—but their sustainability is yet to be proven (with uncertain outcomes for their liquidity risk profile).³⁹

37. Overall, the liquidity stress test results need to be put into context given the static nature of risk factors, empirical constraints, and the assumption that all banks face escalating liquidity risk at the same time. Given the assumptions and modeling technique, identified liquidity risk should be interpreted in terms of a general vulnerability to the specific assumptions, rather than being representative of an actual liquidity need in a general stress situation. Ideally, the results would be qualified based on mitigating considerations, such as (i) the availability of potential refinancing via central bank as lender of last resort (with lower valuation haircuts) and (ii) the likely reallocation of deposits within the banking sector in a situation when not all banks experience funding shocks simultaneously [and assuming that (at least retail) deposits largely remain in the banking system)]. In addition, the general mapping of different exposures based public data with broad “maturity buckets” (i) excludes the exact modeling of cash flows under stress and separate testing of FX liquidity risks, and (ii) complicates a more detailed analysis of interconnectedness with other financial institutions, the interaction with solvency risk, and/or feedback effects with the real economy.

Summary and Policy Implications

38. The stress test exercise confirms a sufficient degree of resilience of the sector. After more than two years of continuous de-risking, banks are still profitable and hold high levels of

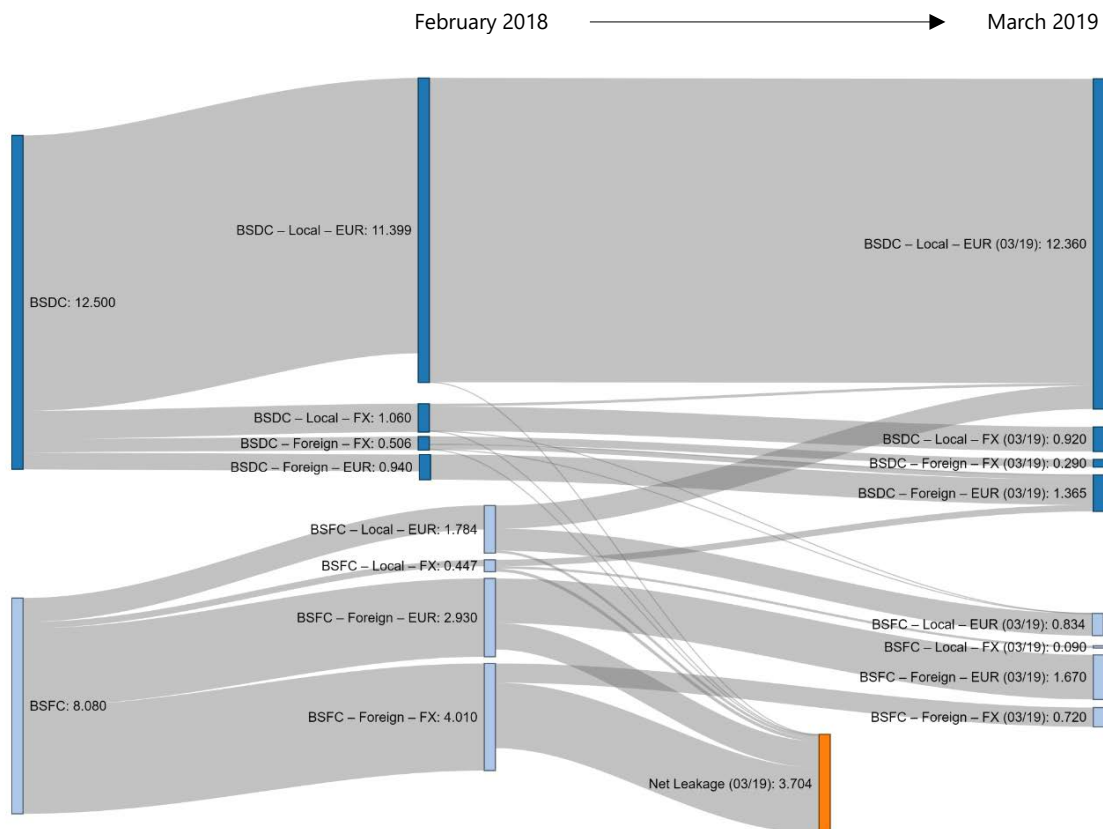
³⁹ This would not include extreme situations when AML/CFT concerns cause counterparty banks to discontinue transactions irrespective of its solvency and liquidity position, such as in the case of ABLV Bank.

capital and liquidity. Asset encumbrance is relatively low, with large available liquidity buffers relative to the amount of short-term liabilities to depositors and creditors. Analyses based on public data suggests that only a very severe deterioration of market and funding liquidity risk would result in material aggregate net cash outflows over a risk horizon of up to 30 days. While most banks have sufficient liquidity buffers to withstand deteriorating funding conditions, some banks are vulnerable to large outflow shocks, which could be triggered by renewed AML/CFT concerns. In the absence of greater diversity of funding sources with longer maturity tenors and high carrying cost of substantial cash balances will make some smaller banks vulnerable to greater competitive pressures in the domestic lending market. Supplementary, longer term sources of funding could help reduce rising cash flow mismatches, especially for BSFCs whose re-orientation towards the real economy suggests the need for more stable funding to support more consumer and wholesale lending. Some larger banks also have significant intragroup funding obligations and hold contingent claims, which could amplify the impact of liquidity risks on solvency conditions under stress.

39. Going forward, the authorities are encouraged to refine their qualitative and quantitative treatment of liquidity risk in the SREP and integrate AML/CFT considerations in the development of stress test scenarios. The current review of banks' business models, governance, and risk management in the Pillar II review process already includes a separate, indicator-based AML/CFT component; however, the specification of associated liquidity risks would ideally be widened to a comprehensive, system-wide approach beyond the current indicators of funding risk to support effective risk-based supervision and macroprudential surveillance. For instance, greater nuance might be required regarding (i) the varying asset quality of banks' counterbalancing capacity (and the eligibility of liquid assets as collateral for central bank money), (ii) any adverse composition effects of deposits on behavioral cash outflows (given that the de-risking process seems to have removed almost all dormant accounts and concentrated remaining high-risk clients), and (iii) the interlinkages between liquidity and solvency risks, which tend to be influenced by the interconnectedness and network effects within the banking sector (including the characteristics of remaining transactional banking services).⁴⁰ Even though current stress tests have been designed to cover the most salient risk drivers, ML/TF risks represent a strategic source of vulnerability, which could be incorporated within the current framework based on granular prudential information, e.g., contingent claims and intragroup transactions under severe stress conditions and/or the concentration of high-risk clients in lending and payment services.

⁴⁰ A limited set of existing stress testing models developed by the IMF staff incorporate feedback effects between solvency conditions and liquidity risk (Schmieder and others, 2012; Babihuga and Spaltro, 2014; Jobst, 2014; Schmitz and others, 2017).

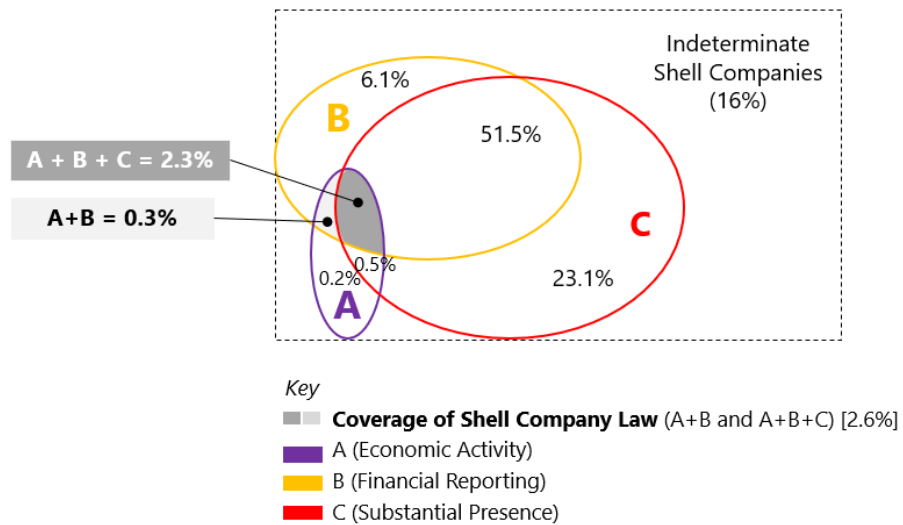
Figure 1. Latvia: Migration of Deposit Base, February 2018–March 2019
(In EUR billions)



Sources: Bank of Latvia; FCMC; and IMF staff calculations.

Note: BSDC=banks servicing domestic clients, BSFC=banks servicing foreign clients, FX= foreign-currency denominated, local=resident depositors, foreign=non-resident depositors. Given that the classification of residence does not identify the ultimate beneficial owner (UBO) as per FCMC reporting, it is possible that some non-resident deposits were converted into resident deposits with foreign UBOs.

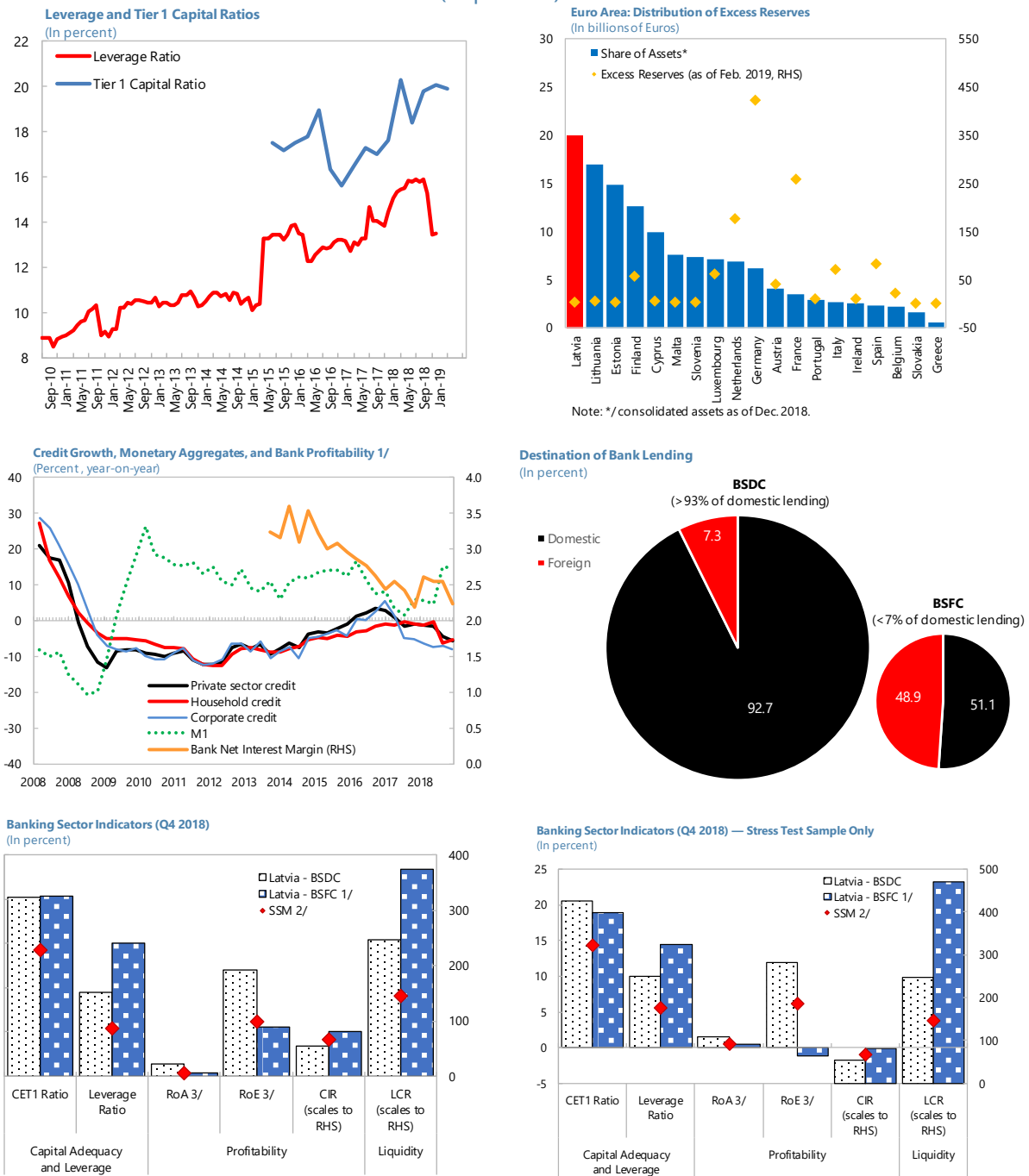
Figure 2. Latvia: Shell Companies—Account Balances, May 2018
(In percent)



Source: FCMC; and IMF staff calculations.

Note: (A) Economic Activity: has no affiliation of a legal person to an actual economic activity and the operation of a legal person forms a minor economic value or no economic value at all, and the subject of the Law has no documentary information at its disposal that would prove the opposite. (B) Financial Reporting: laws and regulations of the country where the legal person is registered do not provide for an obligation to prepare and submit financial statements for its activities to the supervisory institutions of the relevant state, including the annual financial statements. (C) Substantive Presence: the legal person has no place (premises) for the performance of economic activity in the country where the relevant legal person is registered.

Figure 3. Latvia: Banking Sector Conditions
(In percent)



Sources: Bank of Latvia; FCMC; and IMF staff calculations.

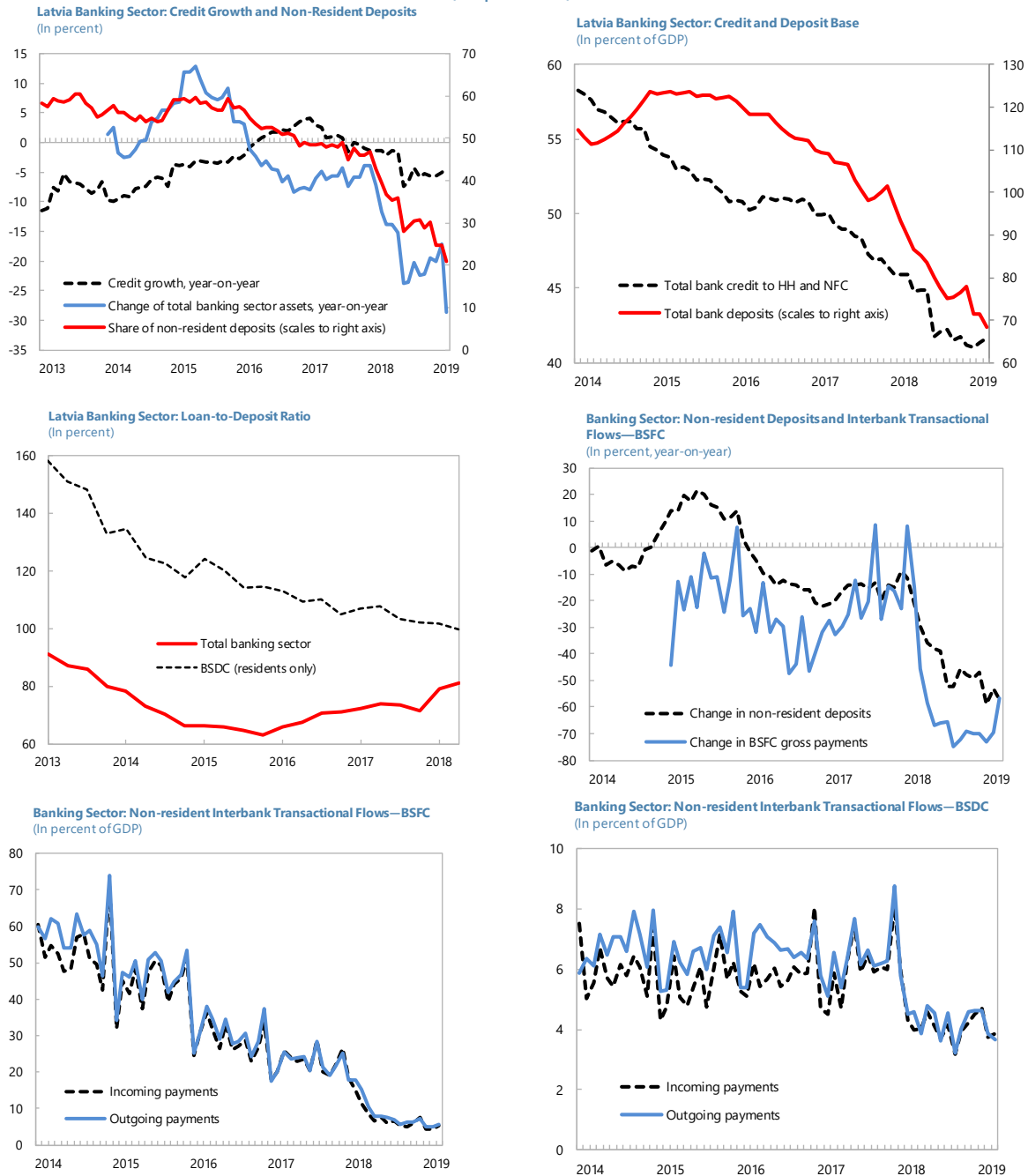
Note: BSDC=banks servicing domestic clients, BSFC=banks servicing foreign clients, CET1 = Common Equity Tier 1, CIR = cost-to-income ratio, LCR = liquidity coverage ratio, RHS = right hand side.

1/ Data based on consolidated (solo) reporting from 8 (3) banks [left chart] and solo reporting of 7 banks [right chart].

2/ All significant banks (110) directly supervised by the ECB at the highest level of consolidation for which common reporting (COREP) and financial reporting (FINREP).

3/ For SSM: RoE and RoA are computed by dividing "net profit/loss" by, respectively, "equity" and "total assets" at the end of the corresponding reference period.

Figure 4. Latvia: Impact of De-risking BSFCs
(In percent)

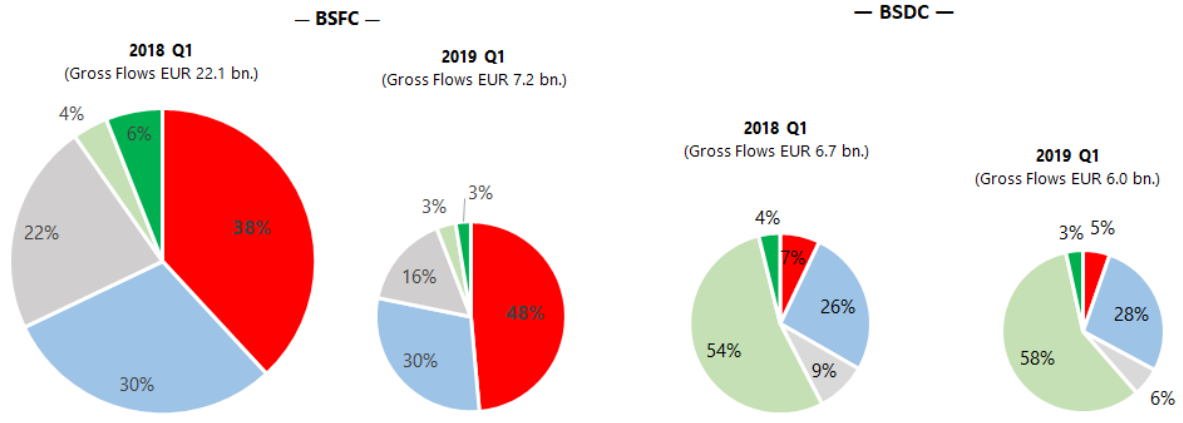


Sources: Bank of Latvia; European Central Bank; FCMC; and IMF staff calculations.

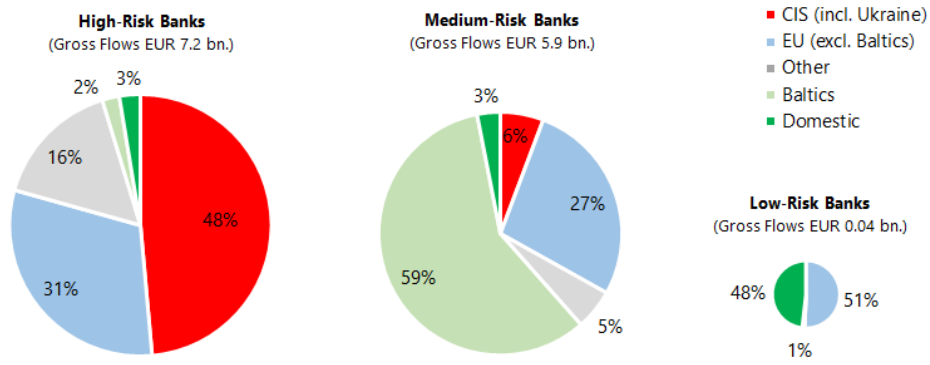
Note: BSDC=banks servicing domestic clients, BSFC=banks servicing foreign clients.

Figure 5. Latvia: Overview of Interbank Foreign Client Payment Flows by Bank Business Model and Risk Categorization
(In percent)

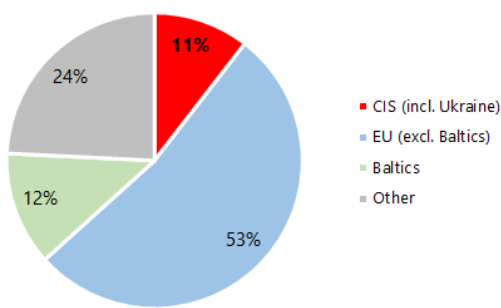
Latvia: Foreign Client Payments—Transaction In- and Outflows (Gross)
(In percent, by source and destination group of countries)



Latvia: Foreign Client Payments—Transaction In- and Outflows (Gross), 2019 Q1
(In percent, by source and destination group of countries)



Latvia: Trade Weights (2013-15)
(In percent)



Sources: FCMC; and IMF staff calculations.

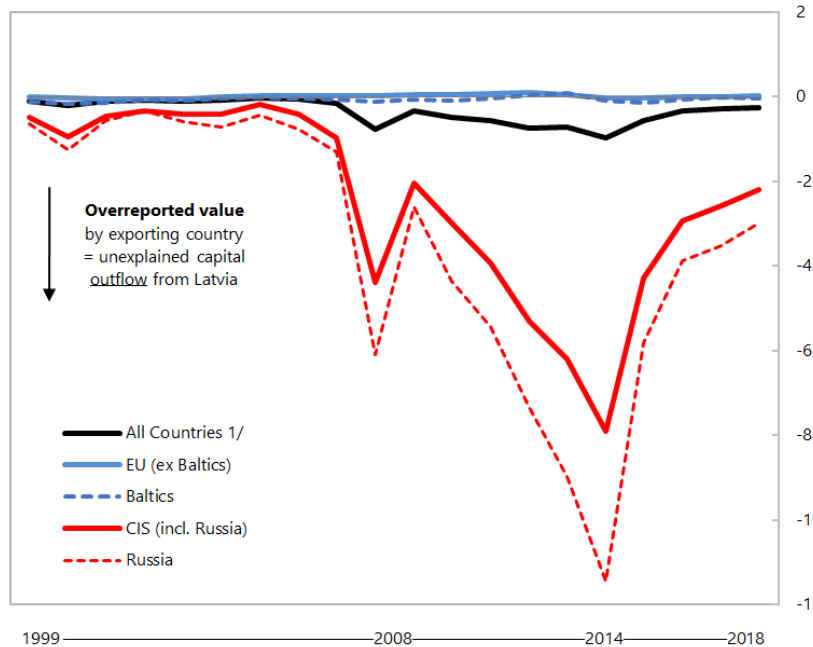
Note: BSDC=banks servicing domestic clients, BSFC=banks servicing foreign clients.

Figure 6. Latvia: Directional Trade Statistics

(In EUR billions)

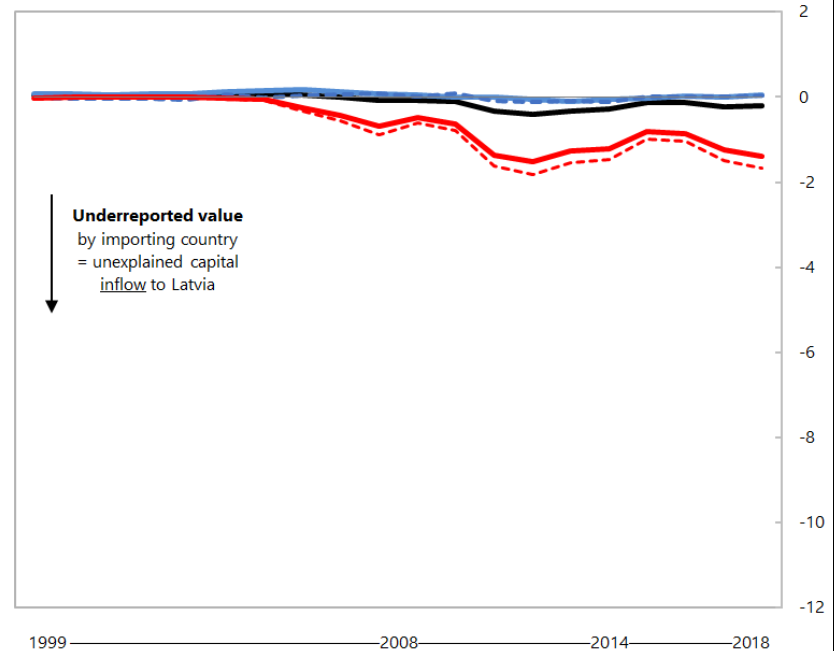
Latvia: Imports—Difference* in Reported Value of Goods

(EUR billions)



Latvia: Exports—Difference* in Reported Value of Goods

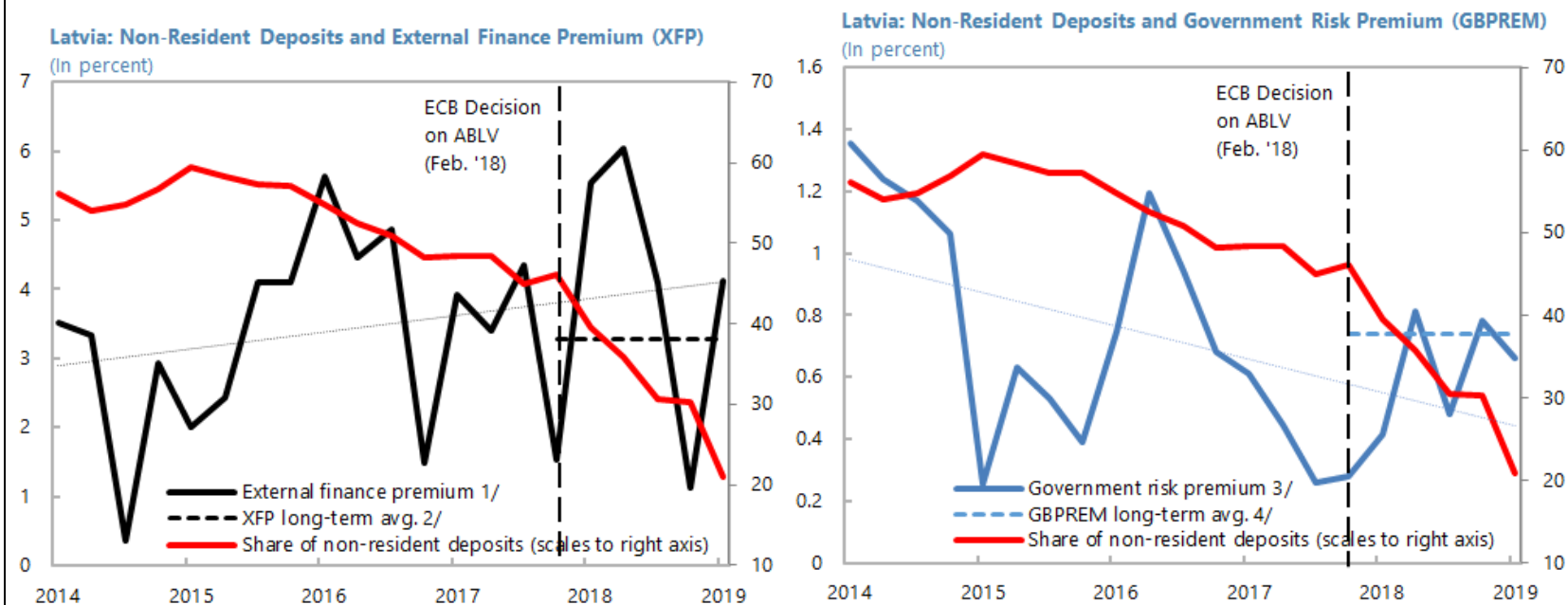
(EUR billions)



Source: IMF staff calculations.

Note: The difference is calculated between the value of goods reported by Latvia and the corresponding counterparty country; export and imports in the IMF Directional Trade Statistics (DOTS) have different valuations, consistent with the practice in most countries. Following the IMTS 2010 methodology, exports are recorded on free-on-board (FOB) basis and imports are recorded on cost, insurance, and freight (CIF) basis. Imports include shipping and insurance costs up to the border of the importing country, while exports exclude these costs. By construction, imports CIF reported by partner countries are expected to be larger than exports FOB. In addition to difference in insurance and freight costs, there are several complications that can cause inconsistencies between exports to a partner and the partner's recorded imports FOB, or between imports FOB from a partner and the partner's recorded exports. The main reasons for inconsistent statistics on destination and origin for a given shipment are differences in classification, time of recording, exchange rates movements, shipment and reexport through intermediate points, coverage, and processing errors. These asymmetries are not reconciled in the DOTS dataset. */ Trade-weighted within each group for each year. 1/ Largest 39 trade partners as of end-2018.

Figure 7. Latvia: Calibration of Shocks to Government Debt Securities and Corporate Debt
(In percent)



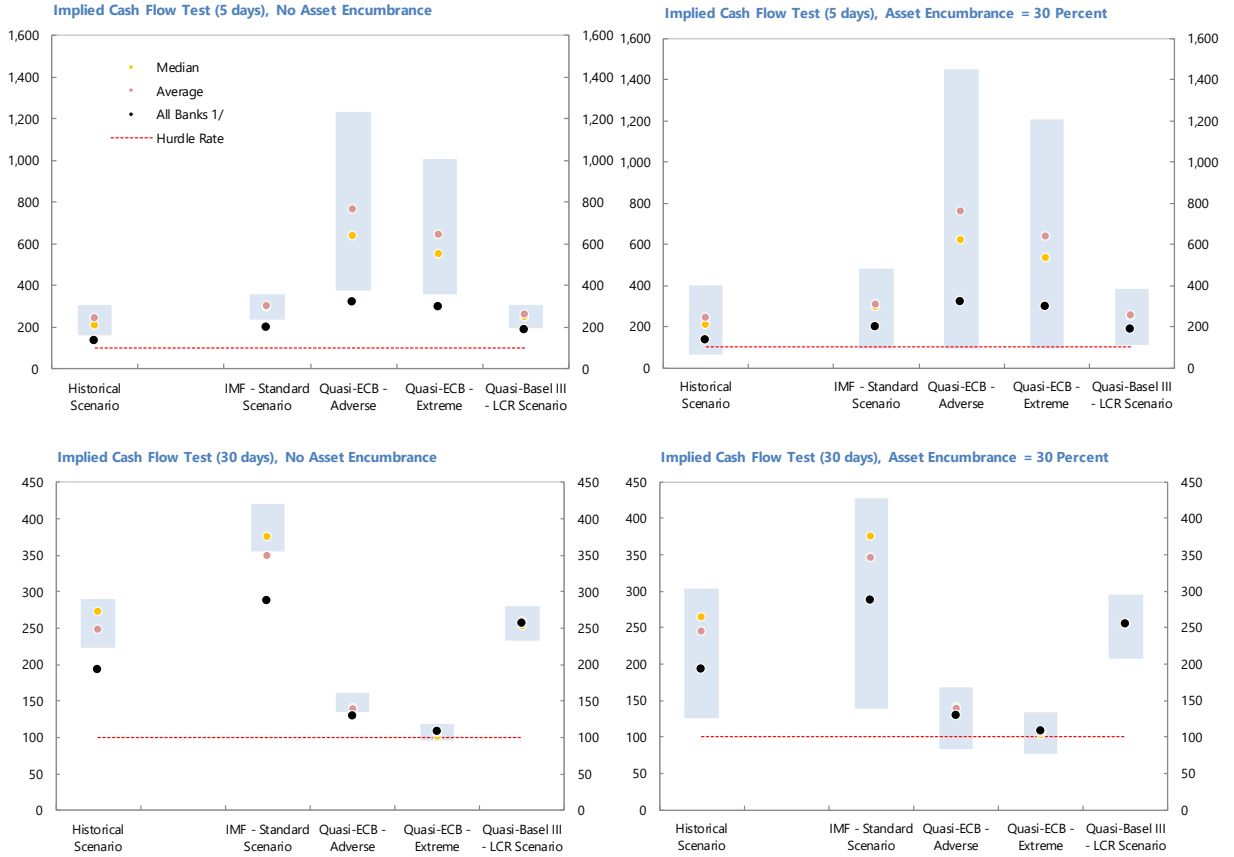
Sources: Bank of Latvia; Bloomberg L.P.; Haver Analytics; and IMF staff calculations.

1/ The external finance premium (XFP) is calculated as the difference between the corporate lending rate for loans of €1 million or less and the 10-year sovereign yield for Latvian government bonds.

2/ the long-term average (3.28 percent) is calculated from January 2014 to February 2018.

3/ The government risk premium (GBPREM) is calculated as the difference between the 10-year sovereign yields for Latvian and German government bonds; 4/ The long-term average (0.74 percent) is calculated from January 2014 to February 2018.

Figure 8. Latvia: Implied Cash Flow Test, All Scenarios—Sample Distribution of Liquidity Ratio (In percent)



Sources: FCMC; and IMF staff calculations.

Note: The blue bar indicates the inter-quartile range (25th to 75th percentile). */ The implied liquidity ratio is defined as the sum of contractual and behavioral cash flows from existing and contingent funding plus cash flows from the asset sale of liquid assets divided by contractual and behavioral cash flows under stress according to each scenario.

Table 1. Latvia: Overview of Liquidity Stress Test Sample
(In millions of EUR, end-2018)

Bank Name	Total Assets*	included in Liquidity ST?	Banking Model	Direct Supervisor	Legal Status
<i>Group 1 (BSDC) – 4 banks</i>					
Swedbank Latvia AS	5,834.9	x	BSDC	ECB	Foreign bank (subsidiary) - SWE
Luminor Bank AS (Latvijas Filiāle)	4,692.0	x	BSDC	ECB**	Foreign bank (branch) - EST
SEB Banka AS	3,705.8	x	BSDC	ECB	Foreign bank (subsidiary) - SWE
Citadele Banka AS	2,330.0	x	BSDC	FCCM	Local bank
<i>Group 2 (BSFC) – 11 banks</i>					
Rietumu Banka Group	1,546.4	x	BSFC	FCCM	Local bank
PNB Banka AS 1/	576.8	x	BSFC	ECB	Local bank
AS BlueOrange Bank	479.3	–	BSFC	FCCM	Local bank
Rigensis Bank AS	455.6	–	BSFC	FCCM	Local bank
Baltic International Bank AS	287.3	x	BSFC	FCCM	Local bank
Reģionālā Investīciju Banka AS 2/	283.2	x	BSFC	FCCM	Local bank
PrivatBank AS	201.0	x	BSFC	FCCM	Foreign bank (subsidiary) - UKR
LPB Bank AS	196.7	–	BSFC	FCCM	Local bank
Meridian Trade Bank AS	184.5	x	BSFC	FCCM	Local bank
Signet Bank AS	139.1	x	BSFC	FCCM	Local bank
Expobank AS	82.3	–	BSFC	FCCM	Local bank
<i>Memo items (other banks)</i>					
ABLV Banka (in self-liquidation)***	2,891.5	–	BSFC	FCCM	Local bank
OP Corporate Bank Plc (Latvijas Filiāle)	610.1	–	BSDC	FCCM	Foreign bank (branch) - FIN
Danske Bank AS (Latvijas Filiāle) 3/	591.1	–	BSDC	FCCM	Foreign bank (branch) - DEN
Svenska Handelsbanken AB (Latvijas Filiāle) 3/	46.1	–	BSDC	FCCM	Foreign bank (branch) - SWE
Scania Finans Aktiebolag (Latvijas Filiāle)	n.a.	–	BSDC	FCCM	Foreign bank (branch) - SWE
Other banks					
Total (BSDC)	16,562.6				
Total (BSFC)	4,432.0				
Total (all banks) 4/	20,994.7				
of which: included in stress test	19,780.9	94%			

Sources: Bloomberg Finance L.P.; FCCM; FitchConnect/Bankscope; Latvia Finance Association; and IMF staff calculations.

Note: AS=Akciju Sabiedrība; */ As of end-2018 (solo basis); **/ Directly supervised by the ECB via the parent bank in Estonia; ***/ As of end-June 2018

1/ fmr. AS Norvik Banka (directly supervised by the ECB as of March 2019 based on Article 6(5)(b) of Regulation (EU) No. 1024/2013)

2/ Regional Investment Bank.

3/ As of end-December 2017.

4/ Excluding banks under memo items.

Table 2. Latvia: General Assumptions for Implied Cash Flow Tests Under the Historical Scenario

Test	Definition	Basic Assumptions		Other Assumptions
		Assets	Liabilities	
5-day implied cash flow (ICF) test	Cumulative inflow and outflow over 5 consecutive days	<p><u>Liquid financial assets:</u> (i) cash and cash balances with central banks [haircut: 0 percent], (ii) securities and bank loans eligible at major central banks [0-15], (iii) securities and bank loans which can be mobilized in repo transactions (or another type of lending against financial collateral) [5-30], and (iv) marketable securities [10-35];</p> <p><u>Cumulative cash inflows:</u> (i) expected cash inflows related to credit extension to financial institutions/other borrowers without liquid financial assets as collateral [call-back rate: 20/0 percent per day], (ii) expected inflows of cash and liquid assets related to maturing transactions with liquid securities and bank loans (e.g., reverse repo and securities borrowing transactions) [20], and (iii) potential inflows from committed/uncommitted credit lines to related and third parties [drawdown rate: 3/5 percent per day].</p> <p><u>Cumulative net cash flows:</u> expected and potential net cash flows related to derivatives (excl. credit derivatives) – net contractual cash flows [20] 1/</p>	<p><u>Cumulative cash outflows:</u> (i) maturing and non-maturity funding without liquid financial assets as collateral [run-off rate: 5 percent per day] (i.e., all deposits and funding from financial and non-financial corporates as well as private households and SME clients) with the exception of sovereign and other public sector and central bank clients [0], (ii) expected outflows of cash and liquid assets related to transactions with liquid securities and bank loans (e.g., repo and securities lending transactions) [20], and (iii) committed/uncommitted contingent claims to related and third parties [drawdown rate: 10/20 percent per day].</p>	A ratio lower than 100 percent implies a liquidity shortage if the stress scenario would materialize at the reporting date (i.e., potentially required liquidity > potentially available liquidity); only <u>unencumbered</u> liquid assets (generating cash inflows), i.e., assets used as a collateral to receive funding (with the exception of cash/cash-equivalents) are included in the test ("liquidity scope"); new unsecured financing and securitization impossible within the time horizon; no renewal of unsecured lending to financial institutions but full renewal of (secured) wholesale and retail lending (e.g., secured lending with illiquid collateral (residential mortgages)); central bank eligible collateral can be monetized at appropriate haircuts; repo markets are open at appropriate haircuts; fire-sale of assets possible at appropriate haircuts; no consideration of funding via potentially re-usable securities received as collateral ("rehypothecation"); limited potential unsecured support in convertible currencies from related and third parties (e.g., in the form of committed lines); no renewal of term retail and wholesale deposits; and full convertibility between currencies (within one week).
30-day implied cash flow (ICF) test	Non-cumulative	<p><u>Liquid financial assets:</u> (i) cash and cash balances with central banks [haircut: 0 percent], (ii) securities and bank loans eligible at major central banks [0-20], (iii) securities and bank loans which can be mobilized in repo transactions (or another type of lending against financial collateral) [10-60], and (iv) marketable securities [20-70];</p> <p><u>Non-cumulative cash inflows:</u> (i) expected cash inflows related to credit extension financial institutions/other borrowers without liquid financial assets as collateral [call-back rate: 100/0 percent], (ii) expected inflows of cash and liquid assets related to maturing transactions with liquid securities and bank loans (e.g., reverse repo and securities borrowing transactions) [100], (iii) expected and potential net cash flows related to derivatives (excl. credit derivatives) – net contractual cash flows [100], and (iv) potential inflows from committed/uncommitted credit lines to related and third parties [drawdown rate: 12/23 percent].</p> <p><u>Non-cumulative net cash flows:</u> expected and potential net cash flows related to derivatives (excl. credit derivatives) – net contractual cash flows [100] 1/</p>	<p><u>Non-cumulative cash outflows:</u> (i) maturing and non-maturity funding without liquid financial assets as collateral [run-off rate: 10-75 percent] (i.e., all deposits and funding from financial and non-financial corporates as well as private households and SME clients) with the exception of sovereign and other public sector and central bank clients [0], (ii) expected outflows of cash and liquid assets related to transactions with liquid securities and bank loans (e.g., repo and securities lending transactions) [100], and (iii) committed/uncommitted contingent claims to related and third parties [drawdown rate: 41/67 percent].</p>	

Source: Adapted from Jobst and others (2017).

1/ Many derivatives positions might be non-deliverable (typically, FX and interest rate swaps and forwards), and their valuation tends to be highly variable based on prevailing market conditions and expectations. For these positions, the valuation based on the firm's chosen accounting treatment should be considered, and potential net cash flows (variation margin/cash settlement cost) checked for consistency with the calibration of market risk under the Basel framework.

Table 3. Latvia: Liquidity Stress Test—Implied Cash Flow Analysis

Encumbrance Level = 0 percent, (In percent, solo basis)

	Share of Banks with Shortfall	Net Cash Shortfall				Loss of Unsecured Funding 1/	CET1 Capital Ratio 2/
		relative to liquid assets	avg. per bank	relative to total assets	avg. per bank		
5-Day Test							
All Sample Banks (11)							
Historical Scenario (calibrated to ABLV case)	18.2	-25.0	-12.5	-7.9	-4.0	20.8	18.7
<i>Other Scenarios</i>							
IMF - Standard Scenario	18.2	-9.6	-4.8	-3.1	-1.5	13.2	18.7
Quasi-ECB - Baseline	18.2	-6.5	-3.2	-2.0	-1.0	5.8	18.7
Quasi-ECB - Adverse	18.2	-7.5	-3.7	-2.4	-1.2	7.1	18.7
Quasi-ECB - Extreme	18.2	-7.8	-3.9	-2.5	-1.2	7.5	18.7
Quasi-Basel III - LCR Scenario	9.1	-0.1	-0.1	0.0	0.0	11.1	19.8
30-Day Test							
All Sample Banks (11)							
Historical Scenario (calibrated to ABLV case)	–	–	–	–	–	23.7	–
<i>Other Scenarios</i>							
IMF - Standard Scenario	–	–	–	–	–	18.5	–
Quasi-ECB - Baseline	–	–	–	–	–	10.2	–
Quasi-ECB - Adverse	18.2	-5.5	-2.8	-17.4	-8.7	38.7	18.7
Quasi-ECB - Extreme	36.4	-8.2	-2.1	-25.9	-6.5	49.1	17.8
Quasi-Basel III - LCR Scenario	–	–	–	–	–	15.1	–

Sources: FitchConnect; and IMF staff calculations.

Note: LCR=liquidity coverage ratio, ECB LIST=ECB Liquidity Stress Test 2019; FSAP=Financial Sector Assessment Program.

1/ The cumulative outflow assumption represents the weighted-average across the different types of unsecured funding sources, whose relative magnitude differs across banks.

2/ Weighted average common equity Tier 1 ratio of banks with net cash shortfall.

Table 4. Latvia: Liquidity Stress Test—Implied Cash Flow Analysis

Encumbrance Level = 30 percent, (In percent, solo basis)

	Share of Banks with Shortfall	Net Cash Shortfall				Loss of Unsecured Funding 1/	CET1 Capital Ratio 2/
		relative to liquid assets	avg. per bank	relative to total assets	avg. per bank		
5-Day Test							
All Sample Banks (11)							
Historical Scenario (calibrated to ABLV case)	18.2	-25.3	-12.7	-8.0	-4.0	20.8	18.7
<i>Other Scenarios</i>							
IMF - Standard Scenario	18.2	-9.9	-4.9	-3.1	-1.6	13.2	18.7
Quasi-ECB - Baseline	18.2	-6.8	-3.4	-2.1	-1.1	5.8	18.7
Quasi-ECB - Adverse	18.2	-7.8	-3.9	-2.5	-1.2	7.1	18.7
Quasi-ECB - Extreme	18.2	-8.1	-4.1	-2.6	-1.3	7.5	18.7
Quasi-Basel III - LCR Scenario	9.1	-0.5	-0.5	-0.1	-0.1	11.1	19.8
30-Day Test							
All Sample Banks (11)							
Historical Scenario (calibrated to ABLV case)	–	–	–	–	–	23.7	–
<i>Other Scenarios</i>							
IMF - Standard Scenario	–	–	–	–	–	18.5	–
Quasi-ECB - Baseline	–	–	–	–	–	10.2	–
Quasi-ECB - Adverse	18.2	-5.6	-2.8	-17.8	-8.9	38.7	18.7
Quasi-ECB - Extreme	45.5	-8.4	-1.7	-26.4	-5.3	49.1	18.0
Quasi-Basel III - LCR Scenario	–	–	–	–	–	15.1	–

Sources: FitchConnect; and IMF staff calculations.

Note: LCR=liquidity coverage ratio, ECB LIST=ECB Liquidity Stress Test 2019; FSAP=Financial Sector Assessment Program.

1/ The cumulative outflow assumption represents the weighted-average across the different types of unsecured funding sources, whose relative magnitude differs across banks. 2/ Weighted average common equity Tier 1 ratio of banks with net cash shortfall.

Annex I. Table 1. Latvia: Detailed Assumptions for Implied Cash Flow Tests—Liquid Assets (Valuation Haircuts)

Type of Liquid Asset	5-Day Test (Cumulative Cash Flow)						30-Day Test (Non-Cumulative Cash Flow)					
	LCR Scenario	ECB			IMF		LCR Scenario	ECB			IMF	
		Baseline	Adverse	Extreme	Historical*	Standard**		Baseline	Adverse	Extreme	Historical*	Standard**
Cash, cash balances with central banks and gold 1/	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Securities and bank loans eligible for collateralized central bank borrowing												
Securities												
Public sector (assets qualifying for 0% risk-weighting)	0.0%	0.0%	0.0%	0.0%	2.6%	0.0%	0.0%	1.5%	1.5%	1.5%	5.2%	0.0%
Public sector (assets qualifying for 20% risk-weighting)	2.3%	0.4%	0.4%	0.4%	2.6%	0.0%	15.0%	6.5%	6.5%	6.5%	5.2%	0.0%
Financial (bank/non-bank) institutions	25.0%	13.8%	13.8%	13.8%	6.5%	5.0%	50.0%	27.5%	27.5%	27.5%	12.9%	10.0%
Private sector - wholesale (non-financial) corporate	25.0%	14.0%	14.0%	14.0%	6.5%	5.0%	50.0%	28.0%	28.0%	28.0%	12.9%	10.0%
Other eligible securities (investment grade)	33.3%	25.7%	25.7%	25.7%	9.7%	10.0%	50.0%	38.5%	38.5%	38.5%	19.4%	15.0%
Bank loans	37.5%	14.3%	14.3%	14.3%	12.9%	15.0%	50.0%	19.0%	19.0%	19.0%	25.8%	20.0%
Securities and loans that can be mobilized for secured funding/lending 2/												
Bonds												
Public sector entities (all)												
Investment grade	7.5%	3.3%	3.3%	3.3%	6.5%	5.0%	15.0%	6.5%	6.5%	6.5%	12.9%	10.0%
Non-investment grade	7.5%	7.5%	7.5%	7.5%	12.9%	10.0%	15.0%	15.0%	15.0%	15.0%	25.8%	20.0%
Financial (bank/non-bank) institutions												
Investment grade	25.0%	13.8%	13.8%	13.8%	25.8%	20.0%	50.0%	27.5%	27.5%	27.5%	51.7%	40.0%
Non-investment grade	50.0%	50.0%	50.0%	50.0%	38.8%	30.0%	100.0%	100.0%	100.0%	100.0%	77.5%	60.0%
Private sector - wholesale (non-financial) corporate												
Investment grade	25.0%	13.8%	13.8%	13.8%	6.5%	5.0%	50.0%	27.5%	27.5%	27.5%	12.9%	10.0%
Non-investment grade	50.0%	50.0%	50.0%	50.0%	12.9%	10.0%	100.0%	100.0%	100.0%	100.0%	25.8%	20.0%
Other securities												
Main index equities	25.0%	25.0%	25.0%	25.0%	25.8%	20.0%	50.0%	50.0%	50.0%	50.0%	51.7%	40.0%
Other equities listed on regulated stock exchanges	25.0%	25.0%	25.0%	25.0%	25.8%	20.0%	50.0%	50.0%	50.0%	50.0%	51.7%	40.0%
Other securities	25.0%	25.0%	25.0%	25.0%	25.8%	20.0%	50.0%	50.0%	50.0%	50.0%	51.7%	40.0%
Bank loans	50.0%	50.0%	50.0%	50.0%	25.8%	20.0%	100.0%	100.0%	100.0%	100.0%	51.7%	40.0%
Marketable securities												
Bonds												
Public sector entities (all)												
Investment grade	7.5%	3.3%	3.3%	3.3%	12.9%	10.0%	15.0%	6.5%	6.5%	6.5%	25.8%	20.0%
Non-investment grade	7.5%	7.5%	7.5%	7.5%	19.4%	15.0%	15.0%	15.0%	15.0%	15.0%	38.8%	30.0%
Financial (bank/non-bank) institutions												
Investment grade	25.0%	13.8%	13.8%	13.8%	32.3%	25.0%	50.0%	27.5%	27.5%	27.5%	64.6%	50.0%
Non-investment grade	50.0%	50.0%	50.0%	50.0%	45.2%	35.0%	100.0%	100.0%	100.0%	100.0%	90.4%	70.0%
Private sector - wholesale (non-financial) corporate												
Investment grade	25.0%	13.8%	13.8%	13.8%	12.9%	10.0%	50.0%	27.5%	27.5%	27.5%	25.8%	20.0%
Non-investment grade	50.0%	50.0%	50.0%	50.0%	19.4%	15.0%	100.0%	100.0%	100.0%	100.0%	38.8%	30.0%
Other securities												
Main index equities	25.0%	15.0%	15.0%	15.0%	32.3%	25.0%	50.0%	30.0%	30.0%	30.0%	64.6%	50.0%
Other equities listed on regulated stock exchanges	25.0%	25.0%	25.0%	25.0%	32.3%	25.0%	50.0%	50.0%	50.0%	50.0%	64.6%	50.0%
Other securities	25.0%	25.0%	25.0%	25.0%	32.3%	25.0%	50.0%	50.0%	50.0%	50.0%	64.6%	50.0%
Potentially re-usable securities received as collateral	25.0%	25.0%	25.0%	25.0%	50.0%	40.0%	50.0%	50.0%	50.0%	50.0%	100.0%	80.0%

Sources: BCBS; ECB; Jobst and others (2017); and IMF staff calculations.

Note: LCR=liquidity coverage ratio. The following (additional) assumptions were made regarding the calibration of the parameters for the various scenarios — for the LCR scenario: all non-public assets are rated AA or below (otherwise, haircut would be 15 percent only); for the ECB scenarios: (i) all securities have a residual maturity of 5-10 years (for the 30-day test), (ii) public sector assets with a credit RWA of 20 percent are assumed to be rated "BBB" (CQS=3), and (iii) all equities qualify as high-quality liquid asset (HQLA). */ Calibrated to historical experience during ABLV Bank episode (and applied to all banks); **/ Common calibration used in the liquidity stress test of the IMF Financial Sector Assessment Program (FSAP). 1/ In excess of minimum reserve requirements. 2/ E.g., repo/reverse repo.

Annex I. Table 2. Latvia: Detailed Assumptions for Implied Cash Flow Tests—Cash Inflows (Callback and Drawdown Rates)

Type of Contractual and Behavioral Cash Inflows (Assets and Liabilities)	Five-Day Test (Cumulative Cash Flow)						30-Day Test (Non-Cumulative Cash Flow)											
	maturity < 1 week or no maturity						maturity < 1 week or no maturity					maturity > 1 week and < 1 month						
	Scenario	ECB			IMF		LCR	ECB			IMF		LCR	ECB			IMF	
1/	Baseline	Adverse	Extreme	Historical*	Standard**	Scenario	Baseline	Adverse	Extreme	Historical*	Standard**	Scenario	Baseline	Adverse	Extreme	Historical*	Standard**	
Unsecured lending: cash inflows related to lending without liquid financial assets as collateral																		
Public sector (assets qualifying for 0% risk-weighting)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Public sector (assets qualifying for 20% risk-weighting)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Financial (bank/non-bank) institutions	20.0%	50.0%	50.0%	50.0%	20.0%	20.0%	67.2%	96.9%	96.9%	96.9%	67.2%	67.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Private sector - wholesale (non-financial) corporate	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	41.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Private sector - retail (incl. SMEs)	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	41.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Secured lending: expected inflows related to lending with liquid financial assets as collateral 2/																		
Cash	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	67.2%	67.2%	67.2%	67.2%	67.2%	67.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Liquid securities and bank loans																		
Securities and bank loans eligible for collateralized borrowing from relevant central banks	18.5%	20.0%	20.0%	20.0%	20.0%	20.0%	64.0%	67.2%	67.2%	67.2%	67.2%	67.2%	92.5%	100.0%	100.0%	100.0%	100.0%	100.0%
Securities and loans that can be mobilized for secured lending (e.g., reverse repo)	16.0%	20.0%	20.0%	20.0%	20.0%	20.0%	58.2%	67.2%	67.2%	67.2%	67.2%	67.2%	80.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Marketable securities	10.0%	20.0%	20.0%	20.0%	20.0%	20.0%	41.0%	67.2%	67.2%	67.2%	67.2%	67.2%	50.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Potentially re-usable securities received as collateral	10.0%	20.0%	20.0%	20.0%	20.0%	20.0%	41.0%	67.2%	67.2%	67.2%	67.2%	67.2%	50.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Intragroup funding: expected inflows from related parties																		
Cash	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	67.2%	67.2%	67.2%	67.2%	67.2%	67.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Funding with liquid financial assets as collateral (i.e., transactions with liquid securities and bank loans)																		
Securities and bank loans eligible for collateralized borrowing from relevant central banks	18.5%	20.0%	20.0%	20.0%	20.0%	20.0%	64.0%	67.2%	67.2%	67.2%	67.2%	67.2%	92.5%	100.0%	100.0%	100.0%	100.0%	100.0%
Securities and loans that can be mobilized for secured funding (e.g., repo)	16.0%	20.0%	20.0%	20.0%	20.0%	20.0%	58.2%	67.2%	67.2%	67.2%	67.2%	67.2%	80.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Marketable securities	10.0%	20.0%	20.0%	20.0%	20.0%	20.0%	41.0%	67.2%	67.2%	67.2%	67.2%	67.2%	50.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Potentially re-usable securities received as collateral	10.0%	20.0%	20.0%	20.0%	20.0%	20.0%	41.0%	67.2%	67.2%	67.2%	67.2%	67.2%	50.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Contingent liabilities: potential inflows from related parties and third parties (situation on reporting)																		
Related parties																		
Committed credit lines	20.0%	20.0%	20.0%	20.0%	5.0%	5.0%	67.2%	67.2%	67.2%	67.2%	22.6%	22.6%	--	--	--	--	--	--
Uncommitted credit lines	0.0%	20.0%	20.0%	20.0%	2.5%	2.5%	0.0%	67.2%	67.2%	67.2%	11.9%	11.9%	--	--	--	--	--	--
Potential transfer of liquid securities and bank loans	20.0%	20.0%	20.0%	20.0%	5.0%	5.0%	67.2%	67.2%	67.2%	67.2%	22.6%	22.6%	--	--	--	--	--	--
Unlimited blanket guarantee received	20.0%	20.0%	20.0%	20.0%	5.0%	5.0%	67.2%	67.2%	67.2%	67.2%	22.6%	22.6%	--	--	--	--	--	--
Third parties																		
Committed credit lines	20.0%	20.0%	20.0%	20.0%	5.0%	5.0%	67.2%	67.2%	67.2%	67.2%	22.6%	22.6%	--	--	--	--	--	--
Uncommitted credit lines	0.0%	20.0%	20.0%	20.0%	2.5%	2.5%	0.0%	67.2%	67.2%	67.2%	11.9%	11.9%	--	--	--	--	--	--

Sources: BCBS; ECB; Jobst and others (2017); and IMF staff calculations.

Note: LCR=liquidity coverage ratio. The following (additional) assumptions were made regarding the calibration of the parameters for the ECB scenario: (i) unsecured lending to the public and non-financial private sector (households, SMEs, retail, and wholesale) received call-back rates according to the category “monies due not reported above resulting from sight and non-maturing loans and advances” while unsecured lending to credit institutions and other financial customers as treated as monies due not reported as “monies due from secured lending,” (ii) intragroup funding was assigned the call-back rates for “other cash inflows,” and (iii) all secured lending is classified as “monies due from secured lending and capital market transactions collateralized.” */ Calibrated to historical experience during ABLV Bank episode (and applied to all banks); **/ Common calibration used in the liquidity stress test of the IMF Financial Sector Assessment Program (FSAP).

1/ For the 5-day test under the LCR scenario, the run-off and drawdown rates are scaled consistent with the ratio of the parameter values for the 5-day and 30-day tests under the standard IMF scenario.

2/ Transactions with liquid securities and bank loans (e.g., reverse repo and securities borrowing transactions).

Annex I. Table 3. Latvia: Detailed Assumptions for Implied Cash Flow Tests—Cash Outflows (Runoff and Drawdown Rates)

Type of Contractual and Behavioral Cash Outflows (Assets and Liabilities)	5-Day Test (Cumulative Cash Flow)						30-Day Test (Non-Cumulative Cash Flow)											
	maturity < 1 week or no maturity						maturity < 1 week or no maturity					maturity > 1 week and < 1 month						
	LCR Scenario 1/	ECB Baseline	ECB Adverse	ECB Extreme	IMF Historical*	IMF Standard**	LCR Scenario	ECB Baseline	ECB Adverse	ECB Extreme	IMF Historical*	IMF Standard**	LCR Scenario	ECB Baseline	ECB Adverse	ECB Extreme	IMF Historical*	IMF Standard**
Unsecured funding: cash outflows related to funding without liquid financial assets as collateral																		
Deposits and customer savings certificates																		
Public sector (assets qualifying for 0% risk-weighting)	1.5%	0.0%	0.2%	0.3%	5.5%	0.0%	7.5%	0.0%	28.5%	37.5%	24.8%	0.0%	7.5%	0.0%	28.5%	37.5%	27.7%	0.0%
Public sector (assets qualifying for 20% risk-weighting)	1.5%	0.0%	0.2%	0.3%	5.5%	0.0%	7.5%	0.0%	28.5%	37.5%	24.8%	0.0%	7.5%	0.0%	28.5%	37.5%	27.7%	0.0%
Financial (bank/non-bank) institutions	5.0%	20.0%	20.0%	20.0%	5.5%	5.0%	25.0%	100.0%	100.0%	100.0%	24.8%	75.0%	25.0%	100.0%	100.0%	100.0%	27.7%	30.0%
Private sector – wholesale (non-financial) corporate	6.0%	0.0%	0.7%	1.1%	5.5%	5.0%	30.0%	0.0%	52.0%	76.0%	24.8%	22.6%	30.0%	0.0%	52.0%	76.0%	27.7%	10.0%
Private sector – retail (incl. SMEs)																		
Sight/demand deposits	1.5%	0.0%	0.2%	0.3%	5.5%	3.0%	7.5%	0.0%	28.5%	37.5%	24.8%	14.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Savings/term deposits	1.5%	0.0%	0.2%	0.3%	5.5%	3.0%	7.5%	0.0%	28.5%	37.5%	24.8%	14.1%	7.5%	0.0%	28.5%	37.5%	27.7%	10.0%
Other deposits	5.0%	0.0%	0.5%	0.8%	5.5%	5.0%	25.0%	0.0%	37.0%	50.0%	24.8%	22.6%	25.0%	0.0%	37.0%	50.0%	27.7%	10.0%
Certificates of deposit	5.0%	0.0%	0.5%	0.8%	5.5%	3.0%	25.0%	0.0%	37.0%	50.0%	24.8%	14.1%	25.0%	0.0%	37.0%	50.0%	27.7%	10.0%
Other short-term funding – maturing bonds (issued by the institution) and other sources	20.0%	20.0%	20.0%	20.0%	5.5%	3.0%	100.0%	100.0%	100.0%	100.0%	24.8%	14.1%	100.0%	100.0%	100.0%	100.0%	27.7%	10.0%
Secured funding: expected outflows related to funding with liquid financial assets as collateral 2/																		
Cash	0.0%	20.0%	20.0%	20.0%	20.0%	20.0%	0.0%	100.0%	100.0%	100.0%	67.2%	67.2%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Liquid securities and bank loans																		
Securities and bank loans eligible for collateralized borrowing from relevant central banks	0.0%	20.0%	20.0%	20.0%	20.0%	20.0%	0.0%	100.0%	100.0%	100.0%	67.2%	67.2%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Securities and loans that can be mobilized for secured funding (e.g. repo)	4.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	100.0%	100.0%	100.0%	67.2%	67.2%	20.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Marketable securities	7.5%	20.0%	20.0%	20.0%	20.0%	20.0%	37.5%	100.0%	100.0%	100.0%	67.2%	67.2%	37.5%	100.0%	100.0%	100.0%	100.0%	100.0%
Potentially re-usable securities received as collateral	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	100.0%	100.0%	100.0%	100.0%	67.2%	67.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Intragroup lending: expected outflows to related parties																		
Cash	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	100.0%	100.0%	100.0%	100.0%	67.2%	67.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Lending with liquid financial assets as collateral (i.e. transactions with liquid securities and bank loans)																		
Securities and bank loans eligible for collateralized borrowing from relevant central banks	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	100.0%	100.0%	100.0%	100.0%	67.2%	67.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Securities and loans that can be mobilized for secured lending (e.g. reverse repo)	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	100.0%	100.0%	100.0%	100.0%	67.2%	67.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Marketable securities	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	100.0%	100.0%	100.0%	100.0%	67.2%	67.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Potentially re-usable securities received as collateral	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	100.0%	100.0%	100.0%	100.0%	67.2%	67.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Contingent claims: potential outflows to related parties and third parties (situation on reporting)																		
Related parties																		
Committed credit lines	20.0%	20.0%	20.0%	20.0%	20.0%	10.0%	100.0%	100.0%	100.0%	100.0%	67.2%	41.0%	–	–	–	–	–	–
Uncommitted credit lines	20.0%	20.0%	20.0%	20.0%	10.0%	5.0%	100.0%	100.0%	100.0%	100.0%	41.0%	22.6%	–	–	–	–	–	–
Potential transfer of liquid securities and bank loans	20.0%	20.0%	20.0%	20.0%	10.0%	5.0%	100.0%	100.0%	100.0%	100.0%	41.0%	22.6%	–	–	–	–	–	–
Other contingent claims (guarantees provided, credit derivatives etc.)	20.0%	20.0%	20.0%	20.0%	10.0%	5.0%	100.0%	100.0%	100.0%	100.0%	41.0%	22.6%	–	–	–	–	–	–
Unlimited blanket guarantee(s) provided	20.0%	20.0%	20.0%	20.0%	10.0%	5.0%	100.0%	100.0%	100.0%	100.0%	41.0%	22.6%	–	–	–	–	–	–
Third parties																		
Committed credit lines	20.0%	20.0%	20.0%	20.0%	20.0%	10.0%	100.0%	100.0%	100.0%	100.0%	67.2%	41.0%	–	–	–	–	–	–
Uncommitted credit lines	20.0%	20.0%	20.0%	20.0%	10.0%	5.0%	100.0%	100.0%	100.0%	100.0%	41.0%	22.6%	–	–	–	–	–	–
Other contingent claims (guarantees provided, credit derivatives etc.)	20.0%	20.0%	20.0%	20.0%	10.0%	5.0%	100.0%	100.0%	100.0%	100.0%	41.0%	22.6%	–	–	–	–	–	–

Sources: BCBS; ECB; Jobst and others (2017); and IMF staff calculations.

Note: LCR=liquidity coverage ratio. The following (additional) assumptions were made regarding the calibration of the parameters under various scenarios — for the LCR scenario: (i) 50/50 split between stable and less stable retail deposits; (ii) 50/50 split between covered/uncovered deposits, (iii) no non-retail operational deposits (so only “non-operational” parameters applied to non-retail categories, (iv) secured funding with securities and loans that can be mobilized for secured funding /marketable securities are subject to an average run-off rate of “Level 2A assets” and “non-Level 2A assets”/“RMBS eligible for Level 2B” and “Other Level 2B assets”/“Other funding transactions,” and (v) secured funding with potentially re-usable securities received as collateral are considered “other funding transactions”; for the ECB scenarios: (i) operational deposits are defined as in the LCR scenario, (ii) all retail (incl. SME) deposits are treated as operational sight deposits, (iii) other short-term funding through maturing bonds (issued by the institution) and other sources is mapped to the run-off rate of “other transactions,” and (iv) all secured funding is mapped to “liabilities from secured borrowing and capital markets driven transactions, collateralized.” */ Calibrated to historical experience during ABLV Bank episode (and applied to all banks); **/ Common calibration used in the liquidity stress test of the IMF Financial Sector Assessment Program (FSAP).

1/ For the 5-day test under the LCR scenario, the call-back and drawdown rates are scaled consistent with the ratio of the parameter values for the 5-day and 30-day tests under the standard IMF scenario.

2/ Transactions with liquid securities and bank loans (e.g., reverse repo and securities borrowing transactions).

Annex I. Table 4. Latvia: Detailed Assumptions for Implied Cash Flow Tests—Net Derivative Flows (Discount Rates)

Type of Contractual and Behavioral Net Cash Flows	Five-Day Test (Cumulative Cash Flow) <i>maturity < 1 week or no maturity</i>						30-Day Test (Non-Cumulative Cash Flow) <i>maturity < 1 week or no maturity</i> / <i>maturity > 1 week and < 1 month</i>											
	LCR Scenario 1/	ECB			IMF		LCR Scenario	ECB			IMF		LCR Scenario	ECB			IMF	
		Baseline	Adverse	Extreme	Historical*	Standard**		Baseline	Adverse	Extreme	Historical*	Standard**		Baseline	Adverse	Extreme	Historical*	Standard**
Expected and potential net cash flows 2/																		
<i>Net contractual cash flows</i>																		
Currency derivatives	20.0%	100.0%	100.0%	100.0%	20.0%	20.0%	100.0%	100.0%	100.0%	100.0%	67.2%	67.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Interest rate derivatives	20.0%	100.0%	100.0%	100.0%	20.0%	20.0%	100.0%	100.0%	100.0%	100.0%	67.2%	67.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Other derivatives	20.0%	100.0%	100.0%	100.0%	20.0%	20.0%	100.0%	100.0%	100.0%	100.0%	67.2%	67.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<i>Maximal additional net cash flows</i>																		
Currency derivatives	20.0%	100.0%	100.0%	100.0%	5.0%	5.0%	100.0%	100.0%	100.0%	100.0%	22.6%	22.6%	100.0%	100.0%	100.0%	100.0%	25.0%	25.0%
Interest rate derivatives	20.0%	100.0%	100.0%	100.0%	5.0%	5.0%	100.0%	100.0%	100.0%	100.0%	22.6%	22.6%	100.0%	100.0%	100.0%	100.0%	25.0%	25.0%
Other derivatives	20.0%	100.0%	100.0%	100.0%	5.0%	5.0%	100.0%	100.0%	100.0%	100.0%	22.6%	22.6%	100.0%	100.0%	100.0%	100.0%	25.0%	25.0%

Sources: BCBS; ECB; Jobst and others (2017); and IMF staff calculations.

Note: LCR=liquidity coverage ratio. The following (additional) assumptions were made for the ECB scenarios: net contractual cash flows from derivatives are assessed at current market values of derivatives amount payables/receivables and mapped to “FX swaps maturing” (for currency derivatives) and “other transactions (for interest rate and other derivatives).” */ Calibrated to historical experience during ABLV Bank episode (and applied to all banks); **/ Common calibration used in the liquidity stress test of the IMF Financial Sector Assessment Program (FSAP).

1/ For the 5-day test under the LCR scenario, the run-off and drawdown rates are scaled consistent with the ratio of the parameter values for the 5-day and 30-day test under the standard IMF scenario.

2/ Excluding credit derivatives.

Annex II. AML/CFT Considerations in FCMC's Supervisory Review and Evaluation Process (SREP)

1. Since 2012, the FCMC has set specific Pillar II capital requirements for banks servicing foreign clients (BSFCs) to ensure prudent risk management. In 2018, additional provisions were introduced under the Pillar II capital review to reflect a risk-based assessment of continued ML/TF risks. More specifically, the following aspects are considered in SREP:

- Business model: (i) business strategy and drivers of profitability (geographies, products, clients), and (ii) use of legal entities/channels to do business (particularly in jurisdictions with high ML/TF risks);
- Internal governance and controls: (i) level of managerial awareness for ML/TF risks and degree of [strategic/operational] engagement in mitigating actions, and (ii) effectiveness of internal controls/reporting system;
- Operational risk: (i) understanding/addressing sources of events leading to ML/TF-related sanctions/measures, and (ii) adequacy of provisions and economic capital for known litigation risk (including sanctioning/investigations procedures);
- Liquidity risk: (i) bank reliance on funding sources more exposed to ML/TF risk, and (ii) capacity of servicing payment obligations if access to settlement services (e.g., in USD) through correspondent banking relationships were suspended due to ML/TF sanctions; and
- Credit risk: (i) relevant indicators assessed under the review of business model as well as internal governance and control (see above), (ii) secured lending collateralized with cash, and (iii) implementing KYC approach in loan underwriting process.

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