



FORMER YUGOSLAV REPUBLIC OF MACEDONIA

SELECTED ISSUES PAPER

June 2013

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June 3, 2013

Approved By
European Department

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WILL STRUCTURAL TRANSFORMATION ALLOW LABOR MARKET CONVERGENCE?¹

The Macedonian labor market stands out for two reasons: it exhibits an extraordinarily high measured unemployment rate, yet, at the same time, does not demonstrate obvious and large enough constraints on the demand or supply side that could explain such an outlier position. While part of this high unemployment rate is a puzzle, the degree of unresponsiveness of employment to output changes indicates that structural factors are at play. Some of those factors are related to the late transition, an early outflow of a large pool of skilled workers, and the fact that recent structural reforms have not fully taken effect yet.

A. Introduction – Stylized Facts and Regional Comparison

1. The labor market in FYR Macedonia shows substantial weaknesses regardless of the measure of assessment used. While the Balkans as a region has a relatively poor track record when it comes to unemployment and activity rates, Macedonia stands out in that respect among comparable peers. Figure 1 shows how employment rates of working age population are below 50 percent, overall unemployment above 30 percent, and activity rates are among the lowest in Europe. It is also striking that when looking at dynamics in the period between 2006 and the third quarter of 2012—a period with an average real output growth above 3 percent—unemployment did not improve much. Of particular importance is the high proportion of long-term unemployed, which given a continuous degradation of skills are less employable and often more disengaged from active job search.

2. Unemployment is distributed unevenly. In addition to high rates of headline unemployment, the distribution of the burden is concentrated among specific sub-groups of the population, among them women, youth, older workers, ethnic minorities, and people in less developed regions (World Bank 2013). The labor force participation rate of working age population with low level of education (primary complete or less), for example, shows large inequalities—only 29 percent of women and more than 70 percent of men participate. When focusing on age, on an aggregated level those with 45 years and above have lower levels of skills and are therefore more vulnerable to being left out of the labor market in an environment of fast change.

¹ Prepared by Alexis Meyer Cirkel (EUR).

Figure 1. Labor Market Selected Indicators, 2006-2012Q3



Sources: Country authorities; OECD; Haver; Eurostat; CEA; and IMF staff calculations.
 1/ 2007 data used in place of 2006 data.
 2/ 2010 data used in place of 2012Q3 data.
 3/ 2011 data used in place of 2012Q3 data.
 4/ Registered unemployment used in place of labor force data.
 5/ 2007Q2 data used in place of 2006.

Sources: Eurostat; country authorities; and IMF staff calculations.
 1/ 2011 data used in place of 2012Q3 data.
 2/ 2010 data used in place of 2012Q3 data.
 3/ Youth unemployment rate ages 15-29.
 4/ 2007 data used in place of 2006 data; 2011 data used in place of 2012Q3 data.

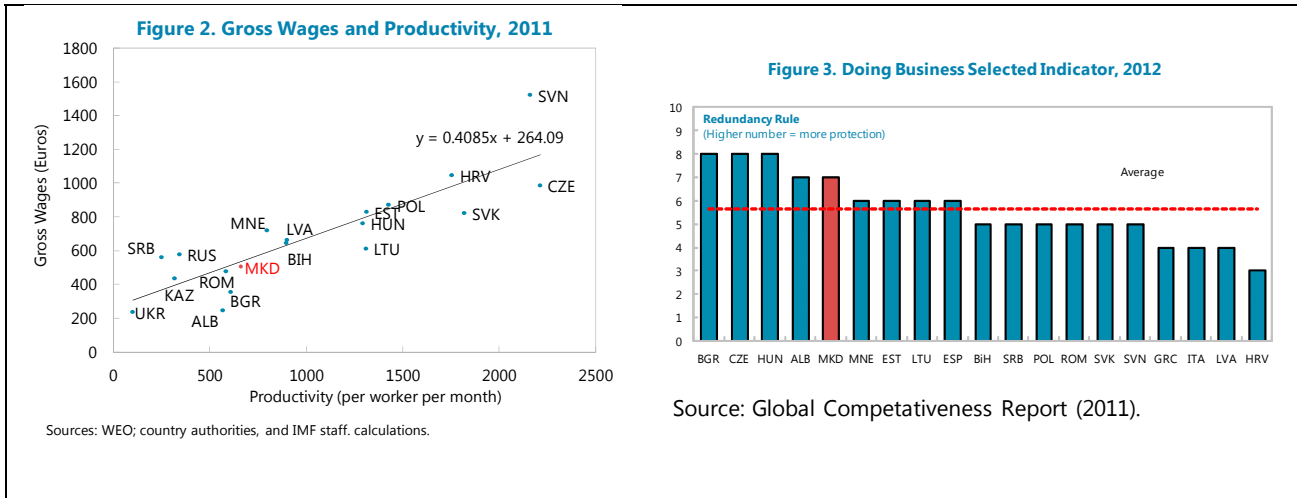
3. Yet, despite these outcomes, no striking feature of labor market institutions or policies stands out that could explain such high levels of unemployment.

As a first starting point it is helpful to investigate the characteristics that define a labor market’s supply and demand, and check if there is anything that hints to where the main problems could be. Applying such a diagnostic exercise for Macedonia reveals that the usual potential culprits are not obvious contributors to the observed problem: wages are aligned with productivity, institutional rigidities are not too strong, social assistance is likely not pushing reservation wages, the tax wedge is modest, and the overall business environment appears rather supportive of strong employment dynamics.

4. Gross wages are broadly in line with productivity levels.

When looking at the group comprised of Central and Eastern European countries, Macedonia can be found at the lower third of the distribution of average gross wages. While productivity of a worker per hour is also at the lower end, when plotting wages against productivity, as can be seen in Figure 2, Macedonia appears below the simple linear regression line. Although this indicates that wages are in line with what workers produce on average as output, the recent trend of increasing salaries accompanied by productivity decreases, points towards an unwelcome disconnect of the two variables. In addition, wage

dynamics have been driven particularly by increases in public sector wages. Given a negative potential crowding out of skills as well as an often associated “queuing”² effect, this trend should be monitored carefully over the near term.

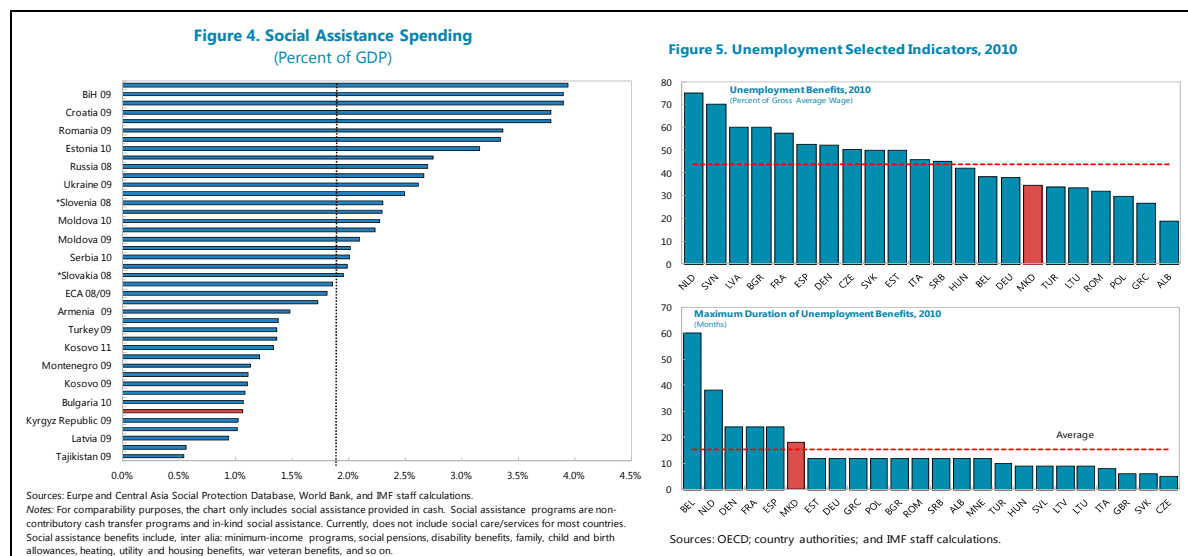


5. Employment protection legislation is comparable to peers, but caveats apply. From a macro perspective, Macedonia’s employment protection legislation (EPL) is either in line or more flexible than that of the reference peer group (Figure 3). Nevertheless, pockets of high regulation and low flexibility still exist, one example being the legislation on mandatory prior registration of overtime work. Of course, if in practice there also is a great deal of discretion in the application of labor regulation it de facto leaves potential gaps of uncertainty and might discourage demand. In addition, given that unemployment is distributed unevenly across society, it is likely that different segments are affected disproportionately by general work incentives and regulation issues.

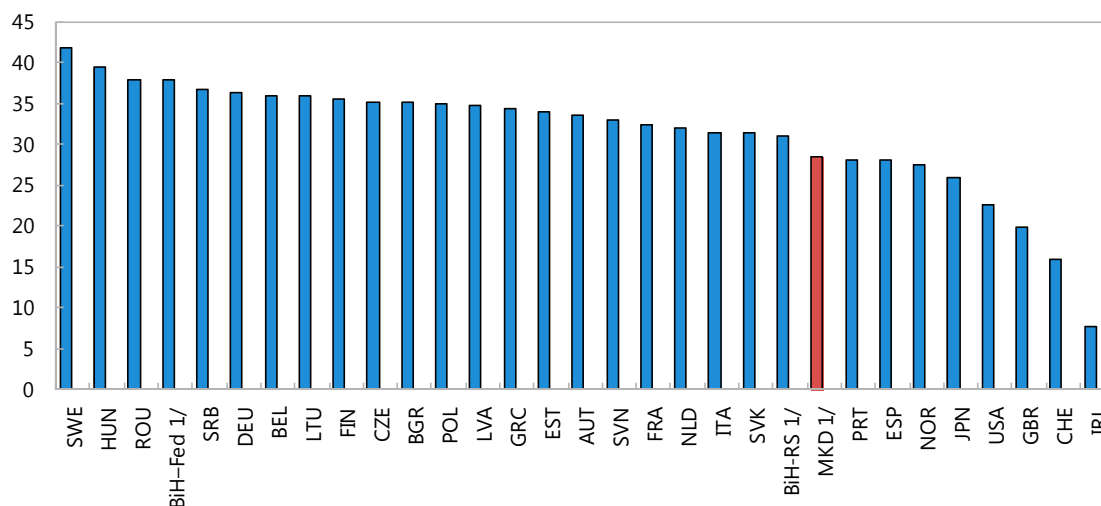
6. The role of reservation wages in explaining high unemployment in the case of Macedonia is unclear, but social assistance or unemployment benefits do not seem to play a major role. A wide set of variables, such as education, labor market status, and the different sources of household income play a role in determining reservation wages of family members. In advanced economies it can often be seen that overly generous social assistance and or high and lengthy unemployment benefits play a key role in explaining unemployment levels. In the case of Macedonia it neither seems to be the case that unemployment benefits are too generous (Figure 5) nor that overall social assistance (Figure 4) plays a role in providing large enough disincentives for individuals to abstain or disengage from the labor market. However, not only because remittances are high more research is needed in understanding and quantifying potential drivers of Macedonian

² The so called “queuing” for public sector jobs can have a considerable impact on reservation wages, since the expectations of potentially securing a highly paid and safe civil servant position biases job search incentives and salary demands.

reservation wages. Particularly for those issues not easily captured by regular surveys, such as living arrangements, public sector queuing, the role of agriculture as a backstop, among many others, the impacts are unclear.



7. The tax wedge is below median and has been decreasing in recent years. Even before the social contribution reform, Macedonia had a competitive position in regards to tax wedges (Figure 6), and that position has improved since 2009. The reduction in tax wedges has to be understood in the context of a general effort by the government to improve the attractiveness of Macedonia to foreign investors. Those government reforms have led to a marked reduction in social contribution rates to be paid by companies. Certainly those cuts are being felt on the budget side of social welfare providers, prominently the Health Fund, but nonetheless they have contributed to keeping the wage costs low for community. While the overall or average tax level on wages is not high, the taxation is very different across levels of wages (where low wage earners are penalized) and for second-earners (mostly women). This can matter, because these are the groups that are most likely to be outside the labor force or working informally, and will therefore be facing disincentives to join a formal labor condition.

Figure 6. Wage Income Taxed Away Across Countries, 2008

Source: World Bank (2011, "Social Safety Nets in the Western Balkans")/OECD Tax and Benefit model 1/ Values refer to 2009.

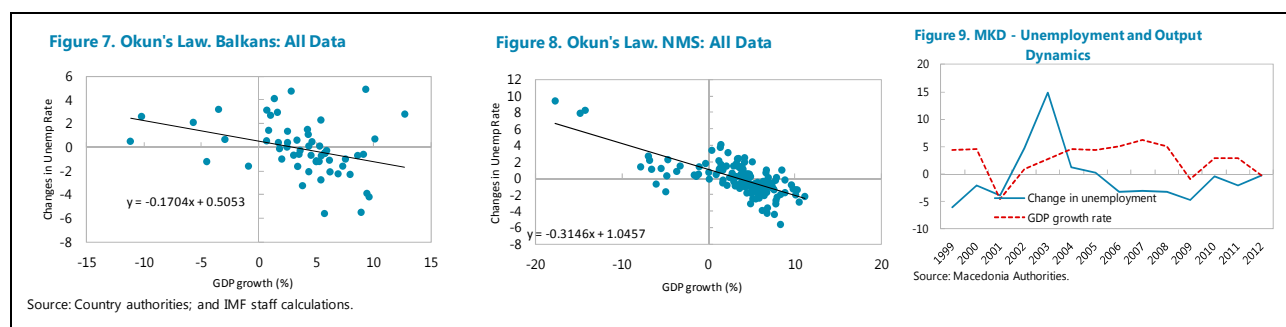
Notes: The tax wedge is defined as the share of income tax and social security contributions by employers and employees over total labor costs. The numbers presented in this table refer to a single earner with no children who receives average wage and works 33 or 50 percent part-time or full-time. Alternatively, in most, though but not all countries, this can also be interpreted as the tax wedge of a single earner with no children who works full-time but receives 33 percent, 50 percent, or 100 percent of the average wage. In the latter case, working full time for 33 percent of average wage might be below the legal minimum wage.

8. The business environment also does not appear to constrain job creation. In the course of the second part of last decade, the Macedonian authorities undertook considerable efforts to improve the local business environment in order to attract foreign direct investment. A sharp improvement of indicators across the board pushed Macedonia to number 23 out of the 185 countries ranked in the World Bank's Ease of Doing Business for 2013. Some measurable outcomes translate more readily into real business climate improvements; the table below shows very tangible outcomes of red tape reductions, which most certainly improve operating conditions of the private sector, the comparable attractiveness for foreign investors, and thereby their positive impact on labor.

| Indicator | Macedonia | Eastern Europe & | OECD |
|---|-----------|------------------|------|
| The total number of procedures required to register a firm. | 2 | 6 | 5 |
| The total number of days required to register a firm. | 2 | 14 | 12 |
| Cost incurred to open a business (% of income per capita) | 1.9 | 6.8 | 4.5 |
| Capital to be deposited before firm registration (% of income per capita) | 0 | 5 | 13.3 |

Source: World Bank -Doing Business Indicators 2013

9. As none of the more obvious impediments to labor market performance stand out, structural problems should be at play. Okun's law has widely been used as a reference to measure labor market flexibility. Hence, an interesting exercise is to compare this elasticity across different regions. Figure 6 plots GDP growth on the horizontal and changes to the unemployment rate on the vertical axis for the Balkan countries. At first sight it is clear that the dispersion is widespread, thereby indicating that the relationship is not clear cut. When compared to Figure 7, where the same data is plotted for the New Member States (NMS), two issues stand out: first, the plotted data is much more concentrated and therefore points to a narrower relationship; and second, the slope of the regression line is steeper, which indicates a greater elasticity. Hence, the labor market in the NMS seems to be much more reactive to shifts in the business cycle than it is the case for the Balkans. When zooming into this specific relationship for Macedonia over the past 15 years (Figure 8), it appears evident that the two series are rather de-linked³.



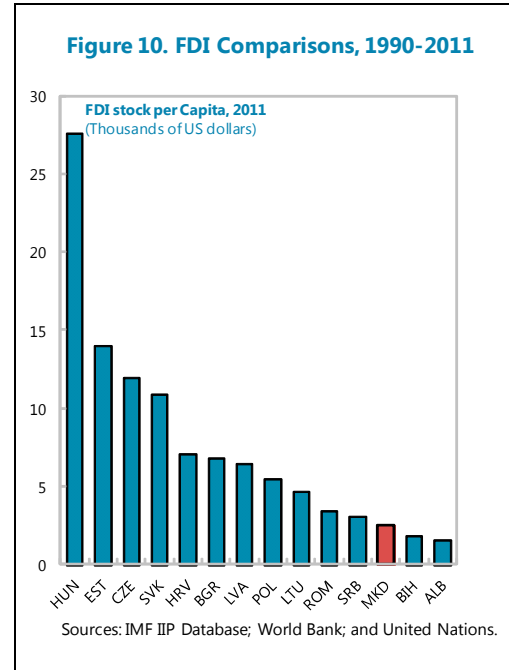
B. Unfinished Transition

10. Despite the proximity to the EU, the Balkan countries are latecomers in integration and convergence. When looking at integration through the neo-classical growth theory perspective, income convergence takes place through three channels: First, capital flows from richer countries to those with lower capital-labor ratios and higher expected rates of return. Second, cross border flow of labor takes place, as workers look abroad for better working conditions and higher pay. And third, fiscal transfers and or developmental aid aimed at reducing income differences also contribute to the speed of convergence.

11. The first channel of convergence, longer term capital inflows, has been relatively closed for Macedonia until recently. Theory would predict that entrepreneurs from more advanced economies should be good at scouting market gaps abroad, which they could then take advantage of by setting

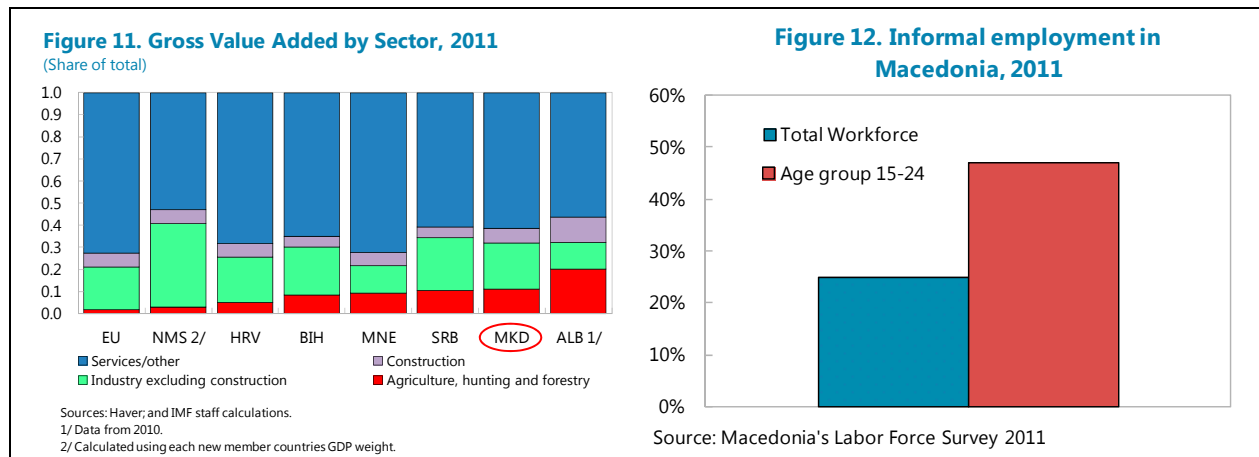
³ To make a more precise statement one would certainly have to analyze different lagged effect lengths. Nevertheless, given the subdued reaction of the Macedonian labor market to prolonged periods of growth in the past a weaker link between output and employment appears evident.

up local businesses and reaping the benefits of higher returns to investment, compared to opportunities at home. The successful transition during 1990s of Eastern Europe was associated with comprehensive structural reform, which attracted greenfield FDI. The Balkans remained on the sidelines of FDI inflows to the region for a long time. Figure 10 shows the low stock of FDI per capita accumulated by Macedonia in comparison to that of many of the New Member States. A number of factors have likely played a role here, among them the fact that many of the NMS were much faster in allowing structural transformation forces to be at play. For the Balkans, the largely disruptive consequences of the breakup of former Yugoslavia was a deterrent to both foreign and local investors, through uncertainty about the institutions in charge of safeguarding their investment⁴.

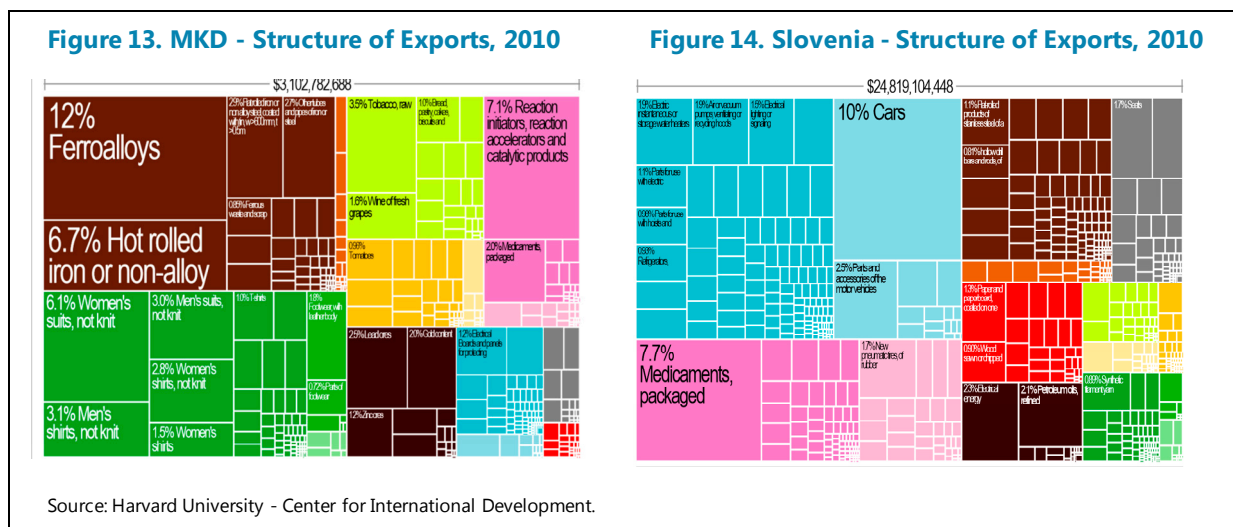


12. Structural transformation is underway in Macedonia, but the transition is still unfinished, partly due—until very recently—to the lack of FDI. In the course of economic development, a common pattern is the shift in weight of output components – usually a decrease in importance of agriculture is accompanied by a relative increase in manufacturing and particularly services. Figure 11 shows that Macedonia still has a relative large dependence on agricultural output, of which a considerable portion is achieved through very small scale or even subsistence type farming. At the same time the country faces substantial informality (Figure 12). About a quarter of the total workforce is employed in the grey economy, and among younger workers almost half of their employment is informal. This is proof of a need to strengthen institutional capacity and improve incentives for individuals and companies to move from the grey economy into the formal sector.

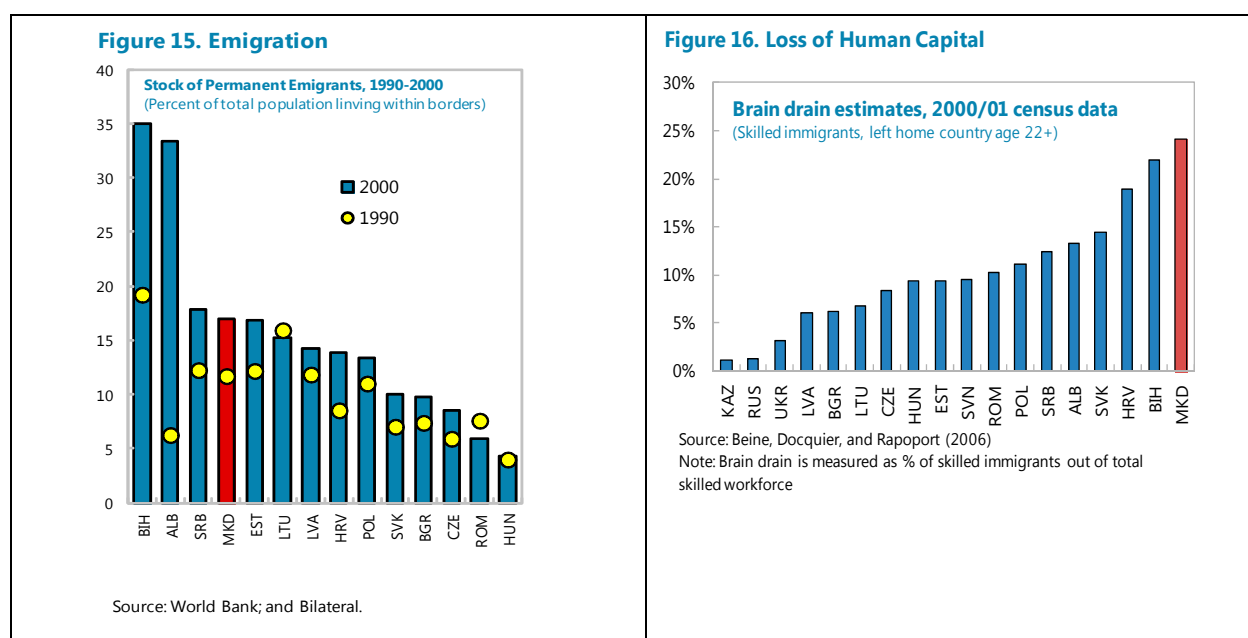
⁴ To a certain extent there is no clear directionality in the causal links at play: the right setting allowing structural transformation, such as stable institutions and expectations, openness, labor flexibility and mobility, among many others, attracts FDI. On the other hand, a rapid inflow of FDI will speed up the process of structural change, providing capital to those industries with the highest expected productivity gains, which will absorb excess labor capacity—and with overall output growth, an increasing importance of the non-tradable sector will set in.



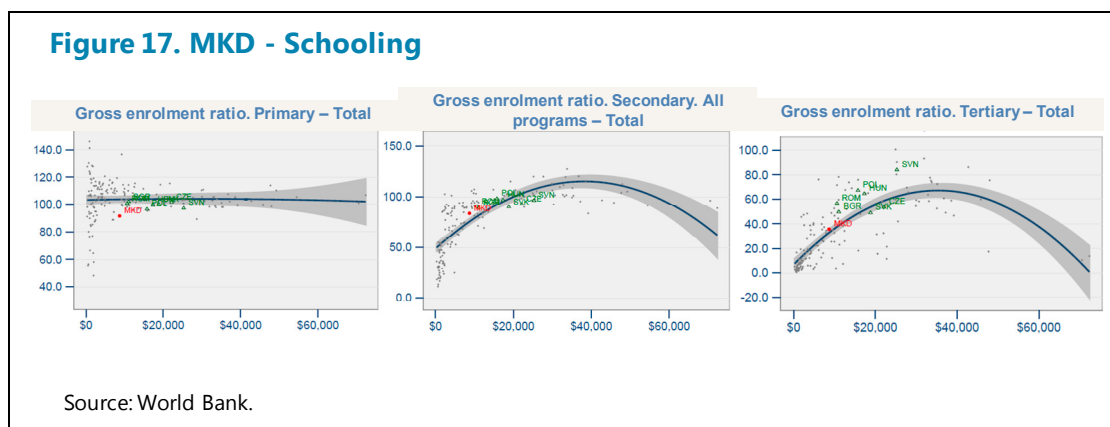
13. The structure of Macedonian exports also confirms the unfinished transition. In order to assess the degree of structural transformation and economic development, an alternative to looking at components of GDP output is to see what the main export products of a country are. Figure 13 shows a breakdown of the main export products of Macedonia by their sectoral composition in the year 2010, according to the database compiled by the Center for Economic Development of the Harvard University. The heavy reliance on primary products is noticeable: large contribution of “browns and blacks” (mining and metals), “yellows and oranges” (agriculture), while only some “greens” (chemicals), and very few “blues” (machinery, electrical components, cars). When comparing that export composition to the one presented by Slovenia in the same year (Figure 14), the contrast is stark. Slovenia achieved a more advanced level of export diversity and overall economic complexity. It relies on higher value added products, and therefore more “blues and pinks” can be seen making up their pallet of export products.



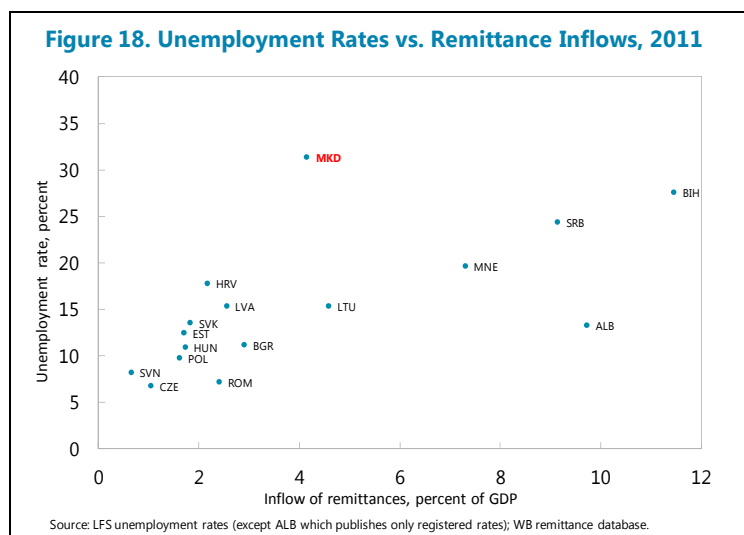
14. The second channel of conversion, labor mobility, has been more open, but led to a considerable loss of important human capital. Theory would predict that less skilled labor would move to more developed countries in search for higher pay, and generate a stream of remittance in the aftermath. For skilled labor the pulling forces are less clear: usually skill-scarcity and higher expected returns locally should keep business and salary developments buoyant, and thereby exert force for skilled labor to stay. The disintegration process of former Yugoslavia increased the immigration flow from the Balkans. Figure 15 shows the stock of permanent migrants in 1990 and 2000. Macedonia was not as severely impacted as other Balkan countries, such as Bosnia and Herzegovina or Albania, but it felt the exodus particularly on the highly skilled part of the population. Figure 16 plots brain drain estimates derived from bilateral census data from 2000/01 (Beine, Docquier, and Rapoport 2006). This rough estimate, as well as anecdotal evidence, suggests that Macedonia was particularly hard hit by skilled labor migrating abroad. A likely consequence of losing this important pool of qualified workers is that structural economic change is much harder or slower to achieve, particularly in high productivity growth sectors.



15. Primary education enrollment is below levels of peers, slowing down replenishment of lost skills and technology absorption. Given the extensive brain drain experienced by Macedonia, particularly in the course of the 1990s, it is important to assess at which rate the human capital is being rebuilt in the country. When taking gross enrollment ratios as proxies for skill replenishment efforts being undertaken, certain shortcomings are noticeable. Primary education enrollment is considerably below income peers as well as NMS. Secondary and tertiary enrollment is in line with income peers, but below competitors for FDI (Figure 17). In addition to shortcomings in the enrollment rates, there are gaps in the effectiveness of the schooling system, as can be measured by international assessments' of pupils' skills (Mojsoska-Blazevski, 2013). Taken together, education deficiencies will be affecting the skills-mismatch as well as the technology absorption capacity of the country.



16. The result of a large and skilled pool of émigrés is a considerable flow of remittances, which could be impacting reservation wages. The large Macedonian workforce abroad is contributing to sizeable remittance inflows into the country. While still lower than for a few of its Balkan peers (Figure 18), this might be due to BoP recording issues, given that private transfers stood above 15 percent in 2011. While the size of the effects of remittances on labor force participation is not clear from a few key empirical studies (e.g., Amuedo-Dorantes 2006), some degree of disincentives and or a more relaxed engagement on the part of jobseekers should be at play.



C. The Importance of Structural Change and the Role of FDI in Speeding Up the Process

17. The right speed and form of structural transformation are vital for securing resource allocation to higher productivity sectors. The debate on features and importance of structural transformation for economic development is old, but still en vogue. Quite recently the discussion has been revived, partly influenced by a publication by Rodrik and McMillan (2011). There the authors posit that countries managing to diversify away from agriculture and other traditional products will be the ones pulling out of poverty and moving up the income ladder. The speed at which this structural transformation takes place is key. More broadly, the idea behind fast and successful structural change is that capital and labor are going to shift towards those businesses and sectors of the economy that are experiencing the largest productivity improvements. Those sectors will then be driving output growth and an expansion of labor demand.

18. Fast structural change needs capital and labor mobility as well as a proper and stable institutional setting. Labor needs to move freely between regions and sectors, in search for highest expected pay and most promising outlook. At the same time, capital mobility should allow investments to flow into those projects with the greatest expected and risk-adjusted returns. Usually that is a function of a transparent, properly endowed and regulated financial sector. Both capital and labor will only flow efficiently to those sectors with the most promising outlook if the institutional set up is stable and consistent. The incentive structures for demand and supply should not be biased by inappropriate state intervention/taxation.

19. The case for FDI speeding up the process of growth is clear. While portfolio equity and bond flows should have a beneficial impact on financial and economic development, more recent empirical literature only finds a consistently significant impact of FDI on economic growth across different country groups and time spans (see Aizenman et al 2011). FDI has the advantage of being a more stable channel to tap foreign savings as well as foreign technology, know-how, and marketing channels. The key issue here is that investments are made having the medium to long term as a maturity horizon in mind, thereby insuring an appropriate incentive structure for projects to also import a larger set of foreign technology.

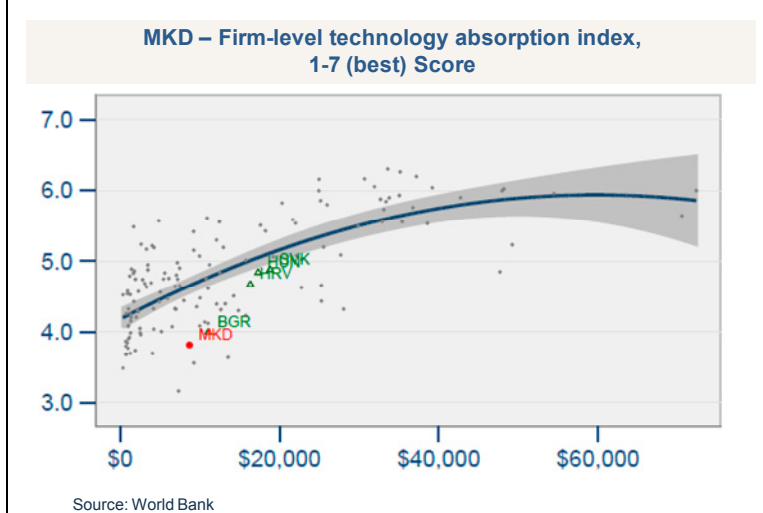
20. Clustering FDI and making sure spillover transmission channels exist is crucial for speeding up structural transformation.

The importance of spatial clustering and interlinkages to promote global production networks as well as technology dissemination and spillovers has been known for a while. But the success stories of the different development zones in China have propelled interest in analyzing those case studies. Kim (2011) looks in more detail at the Qingdao development zone, which epitomizes the importance of creating networks for information/technology spillovers.

The existence of knowledge flows between local companies, external and local research institutes, and various Chinese technology transfer and technology development centers is crucial to generate all the positive externality related to technological spillover. Hence, the impact of FDI is magnified by the amount of technology that is transferred from one company to the broader sector or even across sectors.

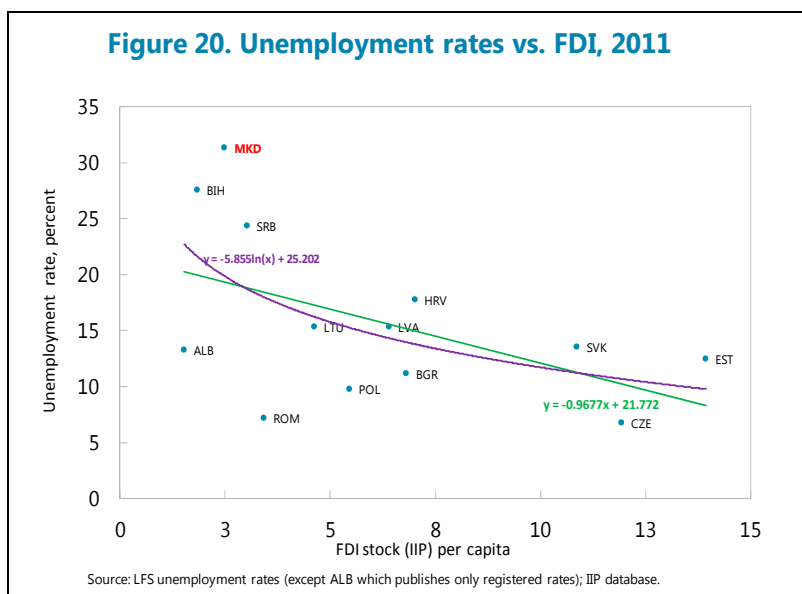
21. Macedonia has been able to generate a healthy pipeline of FDI, but without an appropriate technology absorption capacity the impact will be limited. Rapid and continuous improvements of the ease of doing business in Macedonia, paired with low labor costs and a relatively stable macroeconomic environment, has recently attracted many sizeable international

Figure 19. Technology Absorption Capacity



investors. A considerable FDI pipeline has been the result, and with it continuous improvements in the diversity of the export base are to be expected. While improving the range of products exported and potentially expanding the trade partner relationships are important, enabling technology to spread from the Technological-Industrial Development Zones (TIDZ) to the rest of the economy will be key. Only then the speed of structural transformation needed to push industrial development across more regions, as well as an increased output growth, and employment expansion can be achieved. One first proxy for the capacity of a country to absorb technology is computed by the World Bank (Figure 19). The index shows that Macedonia performs poorly in the capacity to absorb technology, not only when compared to the NMS but also when compared to a wider set of income peers.

22. While it is difficult to speak about causality there seems to be an empirical relationship between FDI and unemployment. This chapter so far has made the case for the importance of FDI in speeding up the process of structural change, and thereby boosting growth and employment demand. As a means of a simplified test, Figure 20 plots the FDI stock per capita versus the unemployment rate. Of course a bivariate plot only allows very limited inference into potential causal relationships, given that one would need to control for a large set of additional variables. Keeping that caveat in mind, the figure seems to show that some type of relationship should be at play.



D. Conclusions

23. Considerable achievements have been made allowing a faster pace of structural change, but challenges remain. Necessary improvements in the business environment, continuous infrastructure build up, and a remarkable FDI pipeline place Macedonia on an advantageous position to experience the fast structural change necessary for increased income convergence vis-à-vis the EU. The main challenges are threefold:

- **First**, maintenance of macroeconomic stability, and further improvements of institutional capacity and legal certainty is crucial. The confidence of the business community must be fostered by avoiding discretionary policy and making sure that macroeconomic and fiscal policy are geared towards supporting growth.
- **Second**, while attracting FDI is key, it is equally important to tie it to local production chains and to enable technology to spill over. For that purpose technology absorption capacity needs to be

fostered through increased linkages between industry, research institutes, capacity training centers, etc.

- **Third**, educational gaps need to be closed. The considerable emigration of highly educated citizens still holds back output potential. Replenishing this pool of lost skills by ensuring attendance and high standards of local schools and universities is very important. Particularly a primary and secondary education of quality for all income groups has proven to be crucial in allowing technology absorption and fast economic development.

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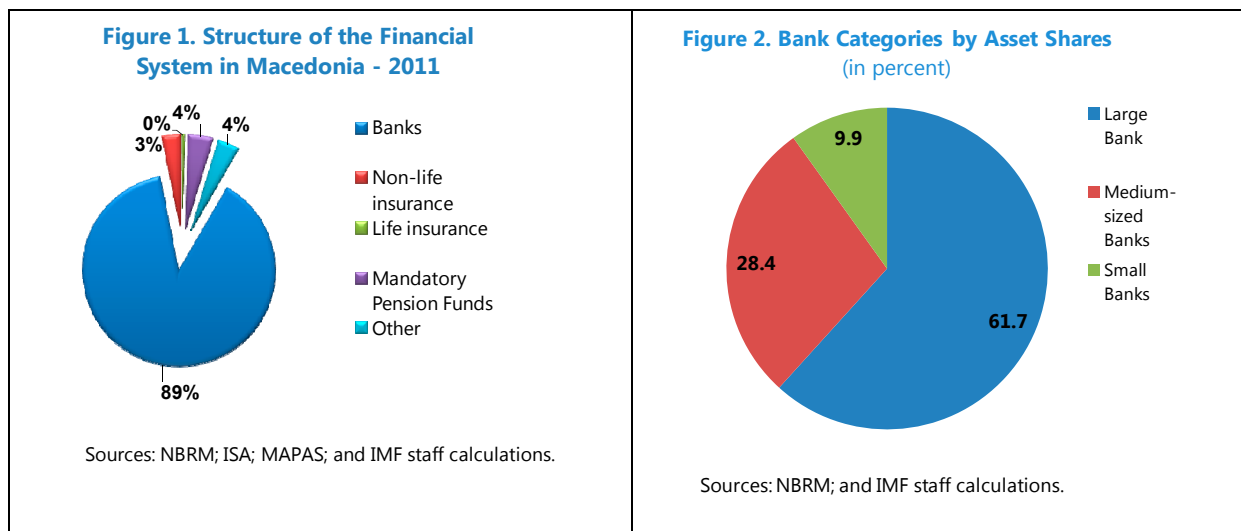
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FINANCING CONVERGENCE¹

This paper assesses ways in which the Macedonian financial sector could better contribute to growth and real convergence, taking stocks of where the sector stands and its recent developments. Drawing parallels with features of the financial systems in other European transition countries and using the results of a basic econometric model, it distills policy recommendations aimed at further easing the financing of economic catching-up. Streamlining bankruptcy procedures, improving collateral valuation by strengthening accounting practices in SMEs and starting the systematic collection and publication of real estate sales data, and revisiting the interest rate cap may serve to moderately boost credit supply.

A. Introduction

1. Financial intermediation is traditionally bank-based in Macedonia. Banks make up some 89 percent of the financial system (Figure 1). Second pillar (funded) pension funds, which have been introduced in 2006, comprise 4 percent of the system. Insurance companies represent a similar share, with assets mainly (87 percent) related to property and casualty insurance, and life insurance assets making up a small (13 percent), but rapidly growing category. Other parts of the financial sector, such as leasing and securities markets have been residual over the last few years.

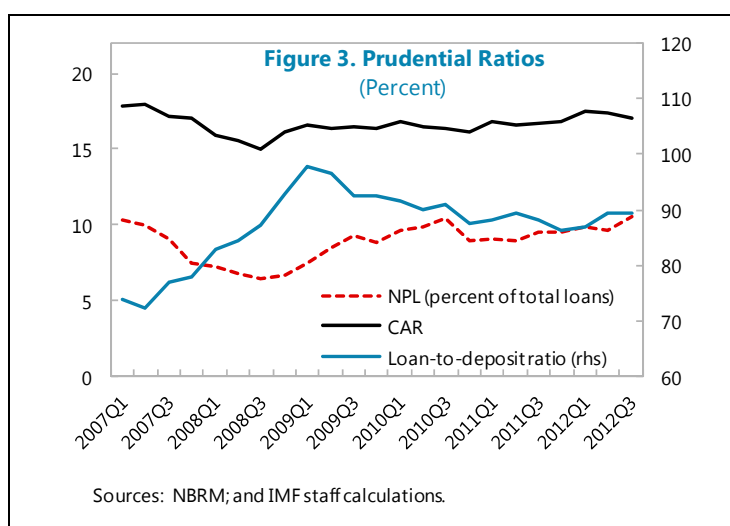


2. The banking system is concentrated. It is dominated by 3 large banks out of a total of 16, each with a balance sheet of €1 billion equivalent or more, together representing a 62 percent asset

¹ Prepared by Marc Gerard (EUR) and Alexander Tieman (Resident Representative to Macedonia, EUR). We are grateful to Robert Peterson for invaluable help and research assistance in compiling data and setting up most charts and tables, as well as to Gjorgji Nacevski for his kind and efficient work on Macedonian data sources.

market share (Figure 2). This segment is followed by 6 medium-sized banks, with balance sheets totaling between €182 and €440 million equivalent², for an asset market share of some 28 percent. The remainder segment of small banks consists of 7 institutions, together representing a market share of just under 10 percent. Ownership is largely in foreign hands, but all foreign-owned banks operate as standalone subsidiaries, under domestic regulation and supervision, and with their own balance sheets.

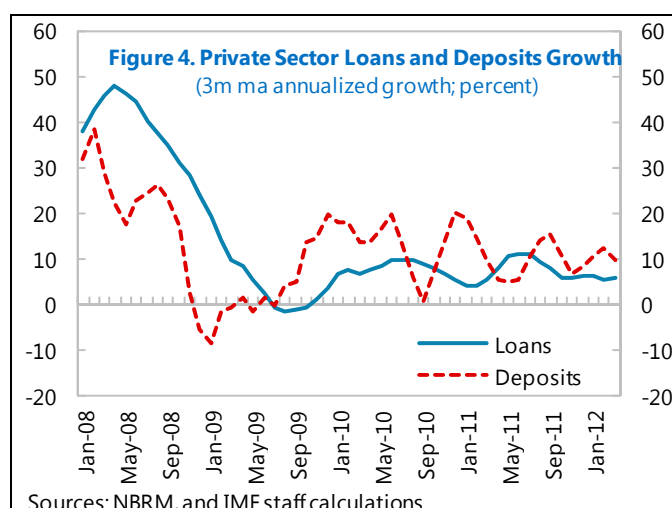
3. The banking system has exhibited considerable resilience throughout the recent economic crisis (Figure 3). One important factor underlying this stability has been the reliance on domestic deposits as the main financing instrument, as indicated by a loan-to-deposit ratio well below 1. Since banks do not rely on external (parent) wholesale financing, the crisis did not prompt deleveraging, as was the case in many other countries in the region. Another factor of resilience relates to the basic nature of banking: banks tend to know their customers well and do not deal in derivatives or exotic products. Prudent supervisory policies by the National Bank of the Republic of Macedonia (NBRM) likely also played a role in insulating banks from the ongoing turmoil.



4. As a counterpart to this stability, credit growth has remained low. While the slowdown may appear especially pronounced since the start of the crisis, Macedonia actually has a long history of modest credit growth. In the late 1990s and early 2000s, weak credit to the private sector (partly related to the civil conflict of 2001), led to Macedonia being labelled a “sleeping beauty” among CESEE peers (Cottarelli et al, 2003). Over the last decade, credit growth first picked up to grow quite strongly in the mid-2000s—reaching 44 percent y-o-y in May 2008—then underwent a sharp downturn during the crisis and remained very weak since then (Figure 4). In the years leading up to 2008, these developments reflected broader, moderate to strong economic performances; but even

² In the central bank’s classification, Ohridska Bank, with €440 million equivalent in assets, is classified as a large bank. As its balance sheet still represents less than half that of any of the largest three banks however, we group it within the medium-sized banks category.

over this period of expansion, cumulative credit growth to the private sector did not exceed the average growth rate among peer countries (Dell’Ariccia et al., 2012, Table A5). In late 2008 and the first half of 2009, the deceleration in credit growth coincided with severe current account pressures, resulting in rapid macroeconomic adjustment and a shallow recession. As economic growth somewhat recovered in 2010–11 before coming again to a standstill in 2012, credit growth remained relatively subdued.



5. These observations raise the issue of the relationship between financial deepening and real convergence in Macedonia. At current, the level of banking sector intermediation may be deemed insufficient to finance economic convergence to European wealth standards. However, it is not easy to gauge what underpins the observed modest credit growth. While both credit supply by banks and credit demand from the real economy are likely to play a role, determining which factor is dominant is an empirical question. On the one hand, credit supply may have been curtailed by banks’ strong risk aversion and preference for staying liquid in the aftermath of the crisis. On the other, the quality of credit demand is likely to have been undermined by the deteriorated financial health of corporates and households due to worsening economic environment.

6. This paper aims at analyzing the interplay between financial and real economic factors driving credit developments. First, we benchmark recent trends against the experience of other European transition countries. Second, we try to empirically disentangle the influence of credit supply and economic demand factors on weak credit performance, using a simple cointegration model. Third, we attempt to come up with recommendations aimed at enabling the banking sector to play an enhanced role in financing convergence.

B. Peer Comparison Before and Through the Crisis

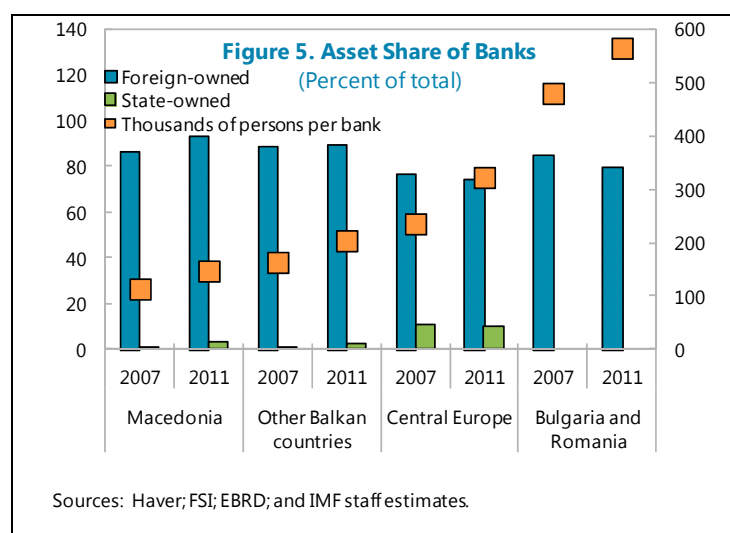
Compared to peer countries, Macedonian banks stand out for their pronounced risk aversion, resulting in greater stability but also limited credit intermediation and financial deepening.

Structural Features

7. Structural features of banking systems may affect credit intermediation. Generally speaking, private sector banks are considered more efficient than state-owned banks, as state ownership can be associated with directed lending. The size of banks is also believed to affect efficiency, with small banks often exhibiting higher cost-to-income ratios than larger ones. In addition, the significant presence of foreign-owned banks on the domestic market is often associated with the development of modern intermediation practices and technologies, boosting credit intermediation.

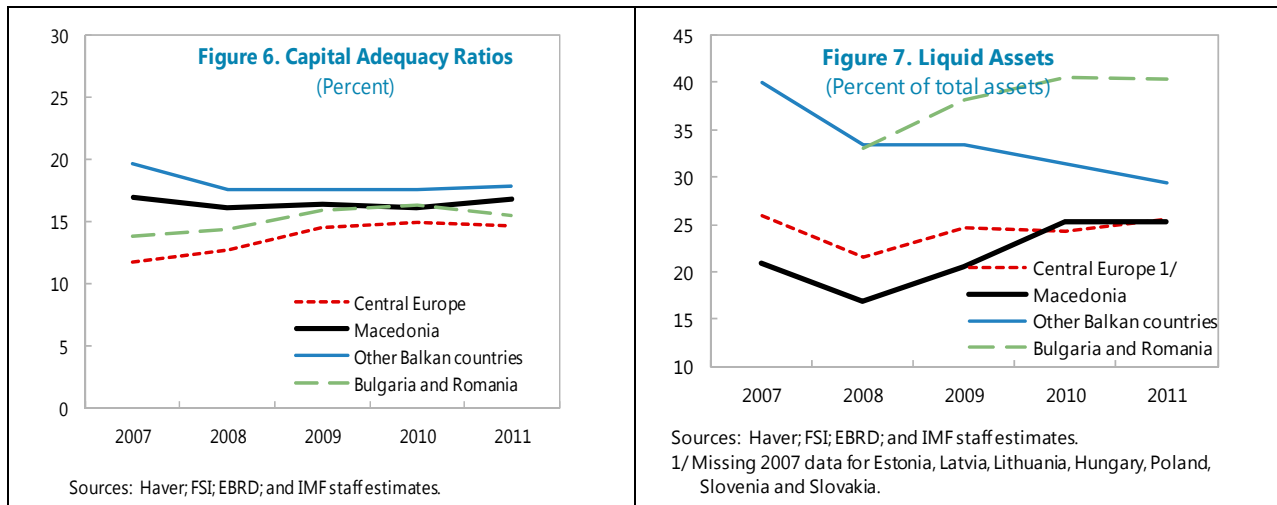
8. In Macedonia, low state ownership and high foreign penetration suggest that the banking system could be efficient at intermediating credit (Figure 5). The banking sector in Macedonia is completely in private hands, with the exception of the Macedonian Bank for Development Promotion (MBDP), reflecting a decision early on to transfer ownership, partly forced upon the authorities in the wake of banking crises in the late 1990s. While in line with other Balkan peers, the level of state ownership is significantly below the average in Central European economies. Moreover, banks are largely free from state-directed lending, although they do benefit from subsidized credit lines and regulatory incentives to lend to specific sectors. A consequence of early privatizations, foreign ownership is high, in line with or even above peers. Taken together, these features suggest that banks should be in a good position to intermediate credit in Macedonia.

9. Yet other structural features hint at possible limitations to credit intermediation. While the number of banks is high, so is the level of concentration among the largest institutions. When benchmarked against the population and the size of the economy, Macedonia features a relatively large number of banks (Figure 5). This is due, however, to a long tail of 7 small banks totaling a 10 percent market share, many of which are loss-making or barely profitable, as evidenced by negative ROE and ROA, and inefficient, as evidenced by relatively high cost-to-income ratios. This suggests that small banks might not be in a position to intermediate credit very effectively. As a result, market concentration, as measured by the market share by assets of the top-3 banks, appears somewhat higher than in peers, which has the potential to limit competition in the sector as a whole (Table 1).

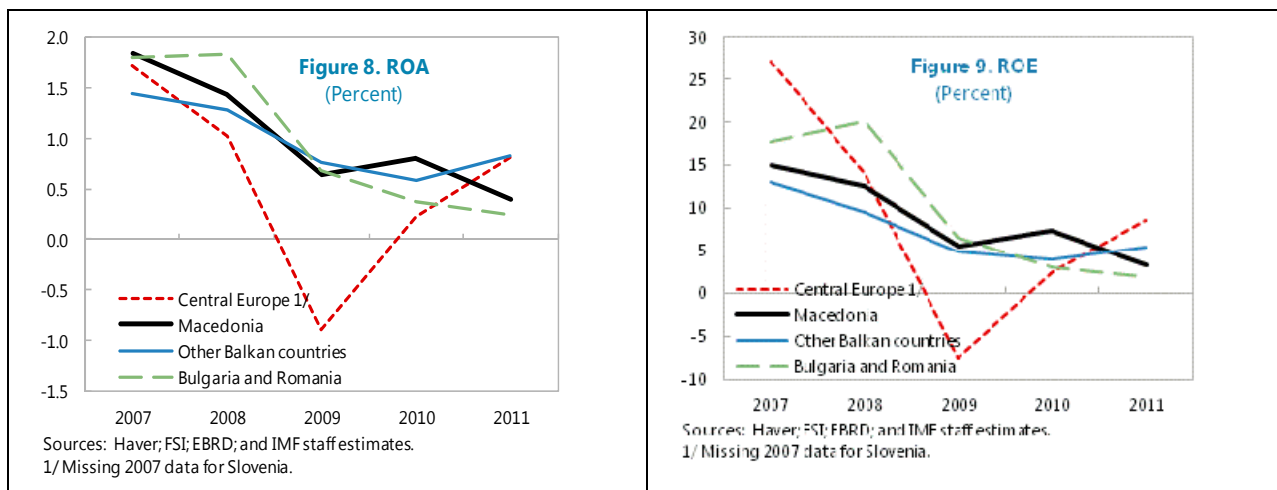


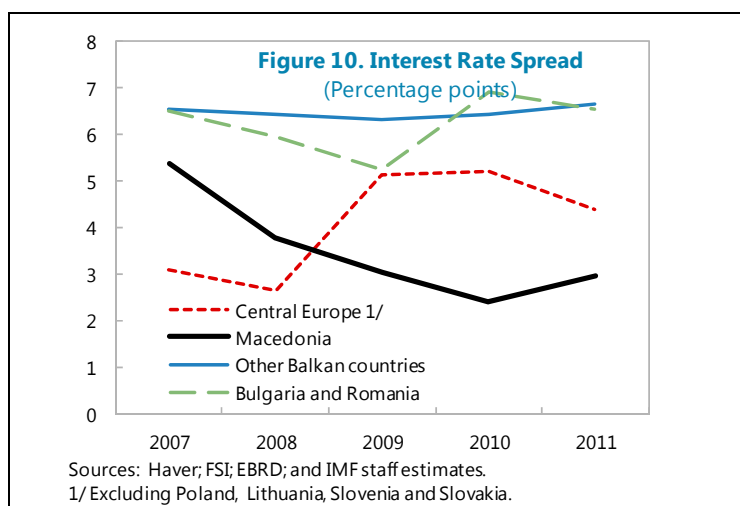
Prudential Indicators and Performance

10. The prudential indicators of Macedonian banks are generally in line with peers. Capital adequacy ratios are high, below those in other Balkan countries but slightly above those in more developed Central European banking systems (Figure 6). Likewise, with 29.4 percent of liquid assets on their balance sheets at the end of 2012, Macedonian banks are about as liquid as their Central European counterparts, but somewhat less liquid than banks in other Balkan countries (Figure 7).



11. Profitability has been deteriorating since the onset of the crisis. The pace of decline has been comparable to that in other Balkan countries, but more gradual than in Romania and Bulgaria, let alone Central Europe (Figures 8 and 9). Some of the reduction in profits has been driven by particularly low interest margins (Figure 10), which decreased more than in peers and continue to hover significantly below the levels observed in comparable banking systems. In addition, increased NPL provisioning seems to have contributed very significantly to the deterioration of profitability.

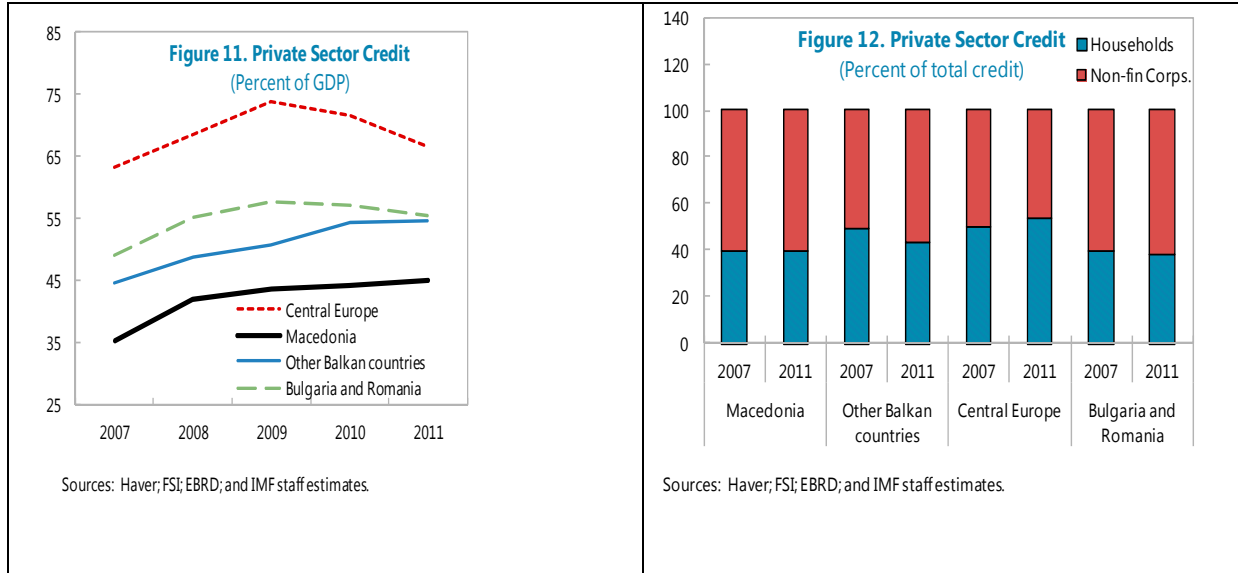




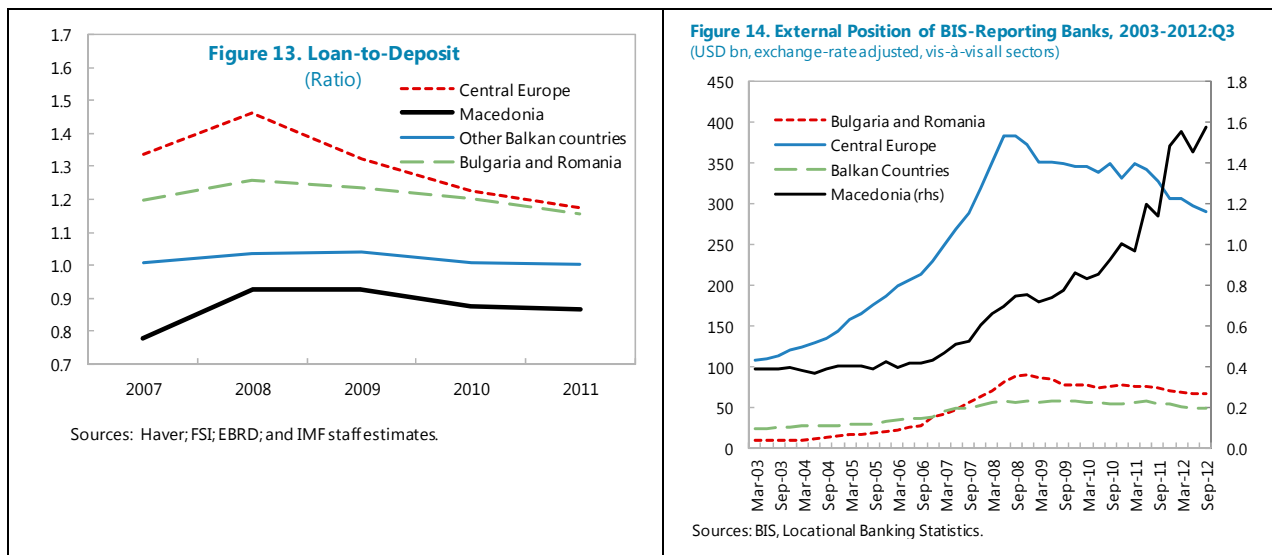
12. The high level of NPL provisioning stands out among peers. Since 2007, NPLs almost doubled, to reach 11.7 percent of total loans in February 2013. However, alone among peer countries, loan loss provisions by banks remain larger than the stock of NPLs in Macedonia, due to high provision charges taken by banks when loans become non-performing, as well as (modest) provisions held against performing loans. While depressing profitability, these provisioning charges have increased buffers against shocks. Moreover, to the extent that some recovery from NPLs can be expected, such full provisioning may actually increase future profits at the expense of current profitability.

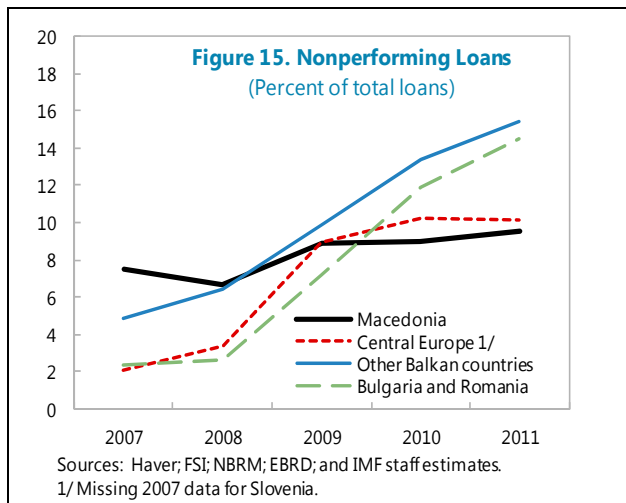
Credit Developments

13. Compared to peer countries, financial convergence has been low in Macedonia, partly due to the belated development of the banking sector. Credit growth and the concomitant increase in credit-to-GDP ratios only really took off in 2005, whereas these started several years earlier (in some cases even by a decade) in most peer countries. As a result, notwithstanding an increase by some 10 percentage points between 2007 and 2011, the stock of private sector credit to GDP remains among the lowest in the region, at 45 percent in 2011 (47.5 percent in 2012), compared to 55 percent in other Balkan countries, Romania and Bulgaria, and 67 percent in Central Europe (Figure 11). While the literature on financial deepening in transition economies, either focusing on equilibrium credit levels (e.g. Cottarelli and al. (2003)) or growth rates (e.g. Backe et al. (2006)), assessed in relation to fundamental determinants, generally points to considerable cross-country variation in the appropriate pace of financial development, such a low stock points to a much weaker cumulative increase than in peer countries over the last decade. The composition of credit has also been different, with a relatively low share of credit to households, notably due to a lower proportion of mortgage credits in the portfolio (Figure 12 and Table 1).



14. Slow credit developments helped maintain a resilient financing structure, thereby limiting negative spillovers from the global financial crisis. Strong deposit growth and conservative lending practices kept the loan-to-deposit ratio well below 1 since the onset of the crisis (Figure 13). In contrast to peers, domestic banks were not relying on wholesale (external) parent financing beforehand. Thus, the banking system has proven resilient to stress in parent groups and no deleveraging has taken place (Figure 14). Furthermore, slower development of the mortgage market than in peers has been associated with more moderate price hikes in the real estate market, which may have contributed to a more modest increase in NPLs during the crisis (Figure 15).

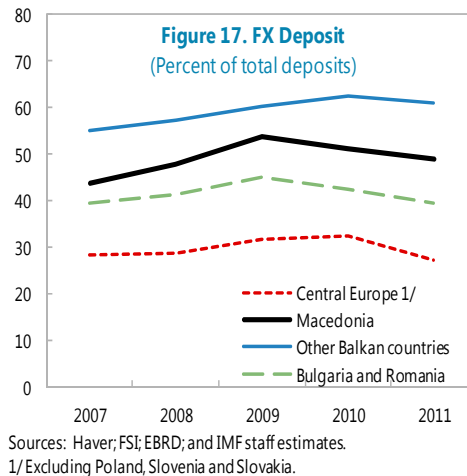
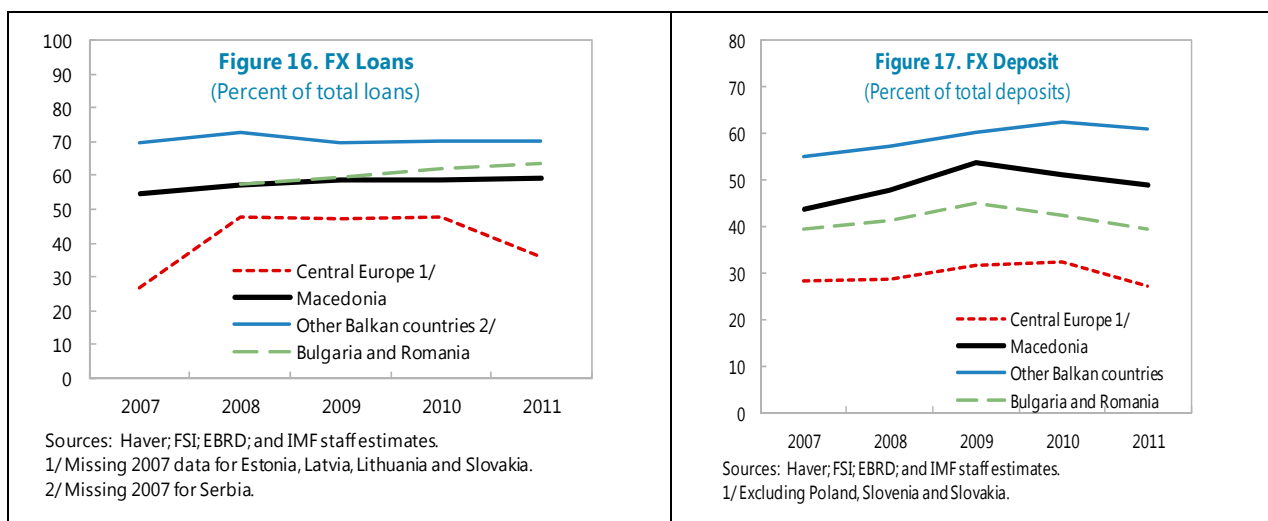




15. Compared to peer countries operating fixed exchange rate regimes, the extent of the euroisation process has been kept in check. The absence of competitive pressures on the credit market is likely to have slowed down the extent of balance sheet euroisation in recent years, both for non-financial economic agents and for banks (Figures 16 and 17).

C. The Way Forward: Financing Economic Catching-Up

16. Financial deepening has some way to go in Macedonia. The experience of sustained convergence in more advanced Central and Eastern Europe transition economies suggests significant increases in the credit-to-GDP ratio in Macedonia going forward. In these countries, a higher level of credit intermediation has typically been instrumental in financing investment, hence ultimately fostering economic catching-up and real convergence.



17. The cause behind limited financial depth in Macedonia seems to lie in long-standing structural impediments, both on the financial and real sides of the economy. In this respect, it is not *a priori* clear whether supply-side obstacles in the financial sector prevent credit to grow more vigorously, in turn hampering domestic demand, or, instead, whether weak economic activity results in less crediting. In addition, important changes in the economic environment over the recent crisis may have negatively affected both the real economy and the financial system in different ways. In what follows, we try to empirically assess the link between credit availability and private consumption, notably focusing on their dynamic adjustment following a shock. We subsequently discuss a number of possible barriers to credit growth on both the demand and supply sides of the market.

What is the Problem: Consumption or Credit?

18. Credit demand is likely to have been significantly affected by real economic developments. During the mid-2000s era of substantial economic growth, financial reserves of households and corporates increased, while the rise in the value of possible collateral enabled them to borrow more easily. Since the onset of the crisis, these effects have likely played in the opposite direction. Economic agents have had to use substantial parts of their financial reserves. This negatively affected their creditworthiness and credit histories, also leaving them with less and less-valuable unpledged collateral, still an essential asset for most business loans. In addition, accounting practices have weakened or underlying weaknesses that remained out of sight before the crisis may have come to light. Thus, both the increase in credit demand during the boom years and its subsequent stagnation suggest a positive causal effect from real economic developments to credit growth.

19. Conversely, credit may have been instrumental in bolstering private demand and economic growth. Increased credit availability may have (partly) driven the mid-2000s boom. Financial development has been characterized by the use of a wider set of collateral and the introduction of entire new forms of lending, such as credit card loans. Thus, better access to cash may have spurred growth in the form of consumption and investment. Since the beginning of the crisis, reverse effects may have been at play. Factors not stemming directly from real economic developments that may have also affected credit availability include the monetary policy stance, changes to the financing model of the banking sector, a varying degree of risk aversion, and various longer-standing structural impediments in the financial sector. These considerations suggest that there may be a positive causal effect running from credit availability to economic growth.

20. Assessing whether credit has been driving economic growth or whether economic growth has been driving credit ultimately boils down to an empirical question. In order to evaluate the relative importance of supply-side and demand-related factors in shaping the path of financial convergence, we proceed to a cointegration analysis of the dynamic interactions between nominal private consumption and total loans to households, using quarterly data over the years 2003–12. First, we test for the existence of a stable, long-term relationship between both series. Second, provided that such a relation can be identified, we estimate an error-correction model describing the adjustment process in case of deviation from the dynamic equilibrium.

21. The model outcome suggests that consumption developments, hence the growth in aggregate demand, may have been constrained by limited credit availability. Both the nominal private consumption and outstanding credit to households series are found to be non-stationary and linked by a cointegration relationship. Moreover, in case of short-run deviations from the long-run equilibrium, the relative signs and magnitudes of ‘speed-of-adjustment’ coefficients suggest that the adjustment process primarily falls on nominal private consumption. Taken together, these results indicate that credit to households and private consumption have, indeed, co-moved over the business cycle, and that following common shocks, private consumption has been adapting to the new level of available credit, whereas the opposite does not hold true.

22. These findings support the hypothesis that there may be some unsatisfied demand for credit in the economy. Yet these results do not identify the causes behind such insufficient credit supply. In the following section, we review candidate impediments that may be part of the observed bottleneck in credit developments. Removing or relaxing some of these constraints may thus contribute to foster financial deepening in Macedonia.

Analyzing Credit Constraints

23. Credit constraints can be found on both the demand (real) and supply (financing) sides of the economy. With demand factors being consubstantial to economic growth, however, policy prescriptions geared towards increasing credit demand would come down to general growth-promoting policies. Supply-side constraints, on the other hand, appear somewhat exogenous to general economic developments, hence may be alleviated by specific policies. We analyze the main factors one-by-one below.

Monetary Policy and Regulation

24. Monetary policy does not seem to have constituted an obstacle to bank lending. Over the crisis, policy rates have been decreased from a peak of 9 percent in 2009 to 3.5 percent currently, and lending rates slowly and partially followed this movement. Starting from a situation where outstanding deposits were already exceeding loans in 2009, the growth of deposits in the banking system has outpaced lending developments. This has resulted in excess liquidity, conducive to substantial increases in the outstanding volume of central bank securities. More recently, the government also tapped the domestic bond market for increasing amounts, with substantial bank participation, primarily at the short end of the curve. In all, excess liquidity suggests that monetary policy has not been too tight and therefore cannot be deemed a factor constraining credit.

25. Prudential regulation has remained appropriately conservative, contributing to stability without inhibiting credit growth. In line with peer countries (Lim et al., 2011), macroprudential policies were tightened at the onset of the crisis. Reserve requirements were raised to curb credit growth and later also to incentivize saving in domestic currency, while liquidity requirements were set at full coverage of 30 and 180- day liquidity, after a transition period. Both regulations remain in place, but were loosened only modestly over the last few years. The NBRM has recently reviewed and is in the process of revising policies on reserve requirements, collateral in

possession, and provisioning. Further down the road, these gradual policy changes may free up modest funds and hence encourage bank to lend, but probably only at the margin.

26. The level of non-performing loans is unlikely to have represented a drag on credit growth. While NPLs represent close to 12 percent of total loans, they are on average fully provisioned. This, in effect, removes the drag from NPLs on credit growth that has been observed in other countries (Vienna Initiative, 2012; Klein, 2013; and IMF, 2013a and b).

Deleveraging and Banks' Financing Model

27. In the absence of deleveraging, the withdrawal of foreign funding sources has not been a factor curtailing credit growth. Because of the traditional financing model of banks through deposits, the general retrenchment of the wholesale financing option did not affect the banking system much (Figure 14), nor did one observe substantial changes in their lending practices.

Risk Aversion

28. Risk aversion may have contributed to lower lending. Risk aversion among banks does seem to have increased during the crisis and remained high ever since. Many international banking groups operating in Macedonia have first-hand experience of funding strain or even recapitalization at the group level, which has led to increased caution, as evidenced by banks giving up some growth and profits in order to stay more liquid (Figure 7). Yet devising practical measures to mitigate such increased risk aversion are not straightforward, although policies aimed at maintaining macroeconomic stability surely constitute a necessary factor in this regard.

Characteristics of the Banking System

29. The substantial number of small banks may have affected credit on the margin. Given their low profitability, takeovers or mergers in the segment of small banks would likely enhance efficiency at the global level, therefore adding to credit availability. However, as the total market share of those banks amounts to under 10 percent, the overall impact of such efficiency-enhancing developments would be insignificant.

30. There may be some room for further competition in the banking sector. In spite of the relatively high number of banks, the banking sector has been characterized by a high level of concentration. Several medium-sized banks that have recently been competing more aggressively for market shares have seen their portfolios grow rapidly. This could be a sign of hitherto limited banking competition, the development of which could boost credit provision.

Structural Factors

31. Structural impediments to credit supply appear to stem from an unfinished transition agenda. These include a cap on interest rates, inefficient bankruptcy procedures, weak accounting practices in small and medium-sized enterprises, and deficiencies in collateral valuation.

32. The interest rate cap may lead to direct constraints on lending. Interest rates are capped at 8 and 10 percentage points above the policy rate for household and corporate loans, respectively. This may be typically conducive to the bunching of rates close to the cap, hence undermining rate differentiation based on credit worthiness and access to finance for riskier borrowers and projects. In addition, as the cap is reset every 6 months, it might affect monetary policy transmission should a tightening cycle be warranted, and temporarily squeeze interest rate margins.

33. By increasing credit risk, inefficient bankruptcy procedure may indirectly affect available financing. The bankruptcy framework is characterized by lengthy procedures, often dragging for years. Furthermore, the resolution process itself is unpredictable, partly due to inefficient court and bankruptcy administration system. These issues increase the uncertainty of future cash-flows to be expected from corporate loans, which is likely to translate into lower credit supply at any given rate.

34. Weak corporate accounting practices in parts of the SMEs sector are also likely to reduce credit supply. While large firms generally follow international accounting practices, many small and medium-sized firms apply local accounting rules and practices, which tend to fall short of standards. In the absence of sets of accounts providing a proper insight into the financial situation of companies, banks do not have a solid basis for lending decisions, which may result in increased risk perception and lower supply of credit.

35. Poor valuation practices represent another structural factor likely to inhibit lending. Banks mostly lend against collateral, the valuation of which therefore becomes crucial. However, no reliable time series data on prices exist even for liquid market segments, complicating proper collateral valuation by banks.

D. Policy Recommendations and Conclusions

Steps could be taken to alleviate some of the constraints identified above:

- **The streamlining of bankruptcy procedures is already on the agenda.** The authorities are currently in the process of reviewing the bankruptcy legislation, notably with a view to shorten the procedures and introduce a framework for speedy restructuring of bankrupt enterprises. Training for bankruptcy administrators is also planned to be scaled up, while efficiencies in the court system are starting to be addressed. In this regard, the judiciary could also usefully benefit from training to increase its understanding of economic issues;
- **The interest rate cap legislation is perhaps the easiest structural factor to tackle.** Abolishing or amending the legislation would allow for proper credit risk differentiation among riskier borrowers, enabling banks with good credit assessment mechanisms to better price risk in this segment, hence broadening access to finance. To safeguard borrowers, the law could be complemented by better targeted consumer protection, in line with regulation in European peers;

- **Further improvements of corporate accounting practices in SMEs and collateral valuation methods could also contribute to enhance credit availability.** Presented with better sets of books, banks could consider lending against business plans rather than just against collateral, while more realistic valuations of collateral would lower credit risk. Yet improvements in accounting practices would require training, primarily for small and medium-sized entrepreneurs, but also for their domestic auditors. To improve valuation methods, data collection could be improved. A good start would be to have the cadastre record and publish real estate sales transactions. Over time, this would allow for the built-up of time series data and proper modeling of real estate prices in liquid market segments.
- **Recent changes to the NBRM policies aimed at relaxing provisioning rules may have additional, albeit modest positive effects.** The NBRM has made changes to provisioning rules for collateral-in-possession and reserve requirements, and adopted comprehensive amendments to the rules governing NPL provisioning, with the dual objectives of forcing banks to progressively release collateral and giving them more leeway in provisioning new loans. These changes, which will become effective in 2014, are likely to only have marginal positive effects on credit.

36. Within a context of weak credit growth and low level of financial deepening, this paper has argued that a few structural policy measures could enhance credit supply. Given the close interplay between credit demand and perceived lending opportunities by banks, some low-cost steps may be taken here and now to unlock a few structural (albeit, arguably, marginal) impediments to credit supply—either due to excess risk aversion by banks or to institutional or capacity constraints. In turn, increased credit could contribute to growth by better financing both consumption and investment needs.

Appendix 1: The Banking Sector in Macedonia and Peer Countries

Table 1. Structural features and characteristics of the banking sector in Macedonia, other Balkan countries and Central and Eastern European countries

| | Macedonia | | Other Balkan countries | | Central Europe | | Bulgaria and Romania | |
|---|--|--------|------------------------|--------|----------------|---------|----------------------|---------|
| | 2007 | 2011 | 2007 | 2011 | 2007 | 2011 | 2007 | 2011 |
| Structural features and asset composition | | | | | | | | |
| Number of banks | 18 | 17 | 23 | 25 | 22 | 22 | 24 | 25 |
| of which: foreign-owned | 11 | 13 | 20 | 21 | 16 | 15 | 15 | 17 |
| of which: state-owned | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 0 |
| Thousands of persons per bank | 113.6 | 147.3 | 163.4 | 203.9 | 235.4 | 322.2 | 479.3 | 563.9 |
| Asset share of foreign-owned banks (percent of total) | 85.9 | 92.9 | 88.5 | 89.2 | 76.4 | 73.9 | 84.8 | 79.2 |
| Asset share of state-owned banks (Percent of total) | 1.4 | 3.1 | 1.4 | 2.5 | 10.7 | 10.3 | 0.0 | 0.0 |
| Asset share of major 3 banks (percent) | 68.0 | 65.7 | 51.1 | 50.3 | 63.3 | 60.7 | 47.6 | 41.8 |
| Credit and deposit developments | | | | | | | | |
| | (Percent of GDP, unless otherwise indicated) | | | | | | | |
| Domestic credit to private sector | 35.3 | 44.9 | 44.5 | 54.6 | 63.2 | 66.5 | 49.1 | 55.3 |
| Domestic credit to households | 13.9 | 17.7 | 21.4 | 23.2 | 25.6 | 30.9 | 19.4 | 21.4 |
| Of which mortgage lending | 1.5 | 3.8 | 8.6 | 12.0 | 17.5 | 22.5 | 6.6 | 9.1 |
| Mortgage Lending (percent of household lending) | 11.2 | 21.7 | 40.4 | 51.6 | 68.5 | 73.0 | 34.0 | 42.6 |
| Domestic credit to non-financial corporations 1/ | 21.1 | 27.1 | 21.9 | 30.2 | 26.0 | 26.5 | 29.6 | 35.1 |
| Share of FX-loans to total loans (Percent) 2/ | 54.7 | 59.2 | 69.4 | 70.2 | 26.9 | 36.1 | ... | 63.6 |
| Deposit euroisation: share of FX-deposits to total deposits | 43.8 | 48.7 | 55.1 | 61.0 | 28.3 | 27.1 | 39.6 | 39.5 |
| Loan-to-deposit ratio (percent) | 0.8 | 0.9 | 1.0 | 1.0 | 1.3 | 1.2 | 1.2 | 1.2 |
| Profitability and prudential indicators | | | | | | | | |
| | (Percent, unless otherwise indicated) | | | | | | | |
| CAR | 17.0 | 16.8 | 19.6 | 17.9 | 11.7 | 14.6 | 13.8 | 15.5 |
| Tier 1 capital (percent of Risk Weighted Assets) 3/ | 15.7 | 14.1 | ... | 15.8 | ... | 12.8 | ... | 13.9 |
| ROA 4/ | 1.8 | 0.4 | 1.4 | 0.8 | 1.7 | 0.8 | 1.8 | 0.2 |
| ROE 5/ | 15.0 | 3.4 | 13.1 | 5.5 | 27.1 | 8.6 | 17.6 | 1.9 |
| Loan-to-deposit interest rate spread (percent) 6/ | 5.4 | 3.0 | 6.5 | 6.7 | 3.1 | 4.4 | 6.5 | 6.5 |
| Non-performing loans (percent of total loans) 7/ | 7.5 | 9.5 | 4.9 | 15.4 | 2.1 | 10.1 | 2.3 | 14.5 |
| Liquid assets to total assets (percent) 8/ | 20.9 | 25.3 | 40.0 | 29.5 | 26.0 | 25.5 | ... | 40.4 |
| Memo items | | | | | | | | |
| GDP (Billions of euros) | 6.0 | 7.6 | 22.7 | 24.6 | 87.0 | 99.7 | 77.6 | 87.4 |
| Y/Y GDP growth rate, average over last 5 years | 4.6 | 2.2 | 5.2 | 1.2 | 6.5 | -0.2 | 6.4 | 0.5 |
| GDP per capita (euros, PPP) | 7631.5 | 8784.1 | 8765.9 | 9310.5 | 17575.7 | 18386.0 | 10045.0 | 11025.6 |
| GDP per capita (euros) | 2916.8 | 3055.3 | 6042.3 | 4872.1 | 16807.1 | 13904.7 | 6891.3 | 6202.5 |

Sources: EBRD; FSI; IFS; WEO; Haver; Country Authorities; BankScope; and Raiffeisen Research.

Central and Eastern European countries: Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia.

Other Balkan countries: Albania, Bosnia & Herzegovina, Croatia and Serbia.

1/ Central and Eastern Europe: missing 2007 data for Estonia, Latvia, Lithuania and Slovakia. Other Balkan countries: Serbia missing in 2007.

2/ Central and Eastern Europe: excl. Poland Slovakia, and Slovenia.

3/ Central and Eastern Europe: missing 2007 data for Estonia, Latvia, Lithuania, Hungary, Poland, Slovenia and Slovakia.

4/ Central and Eastern Europe: missing 2007 data for Slovenia.

5/ Central and Eastern Europe: missing 2007 data for Slovenia.

6/ Central and Eastern Europe: missing data for Lithuania [last obs. 2010], Poland [last obs. 2006], Slovakia [last obs. 2008] and Slovenia [last obs. 2009]).

7/ Central and Eastern Europe: missing 2007 data for Slovenia.

8/ Central and Eastern Europe: missing 2007 data for Estonia, Latvia, Lithuania, Hungary, Poland, Slovenia and Slovakia.

Appendix 2: Cointegration Analysis of Credit to Households and Nominal Private Consumption Developments Over the Period 2003–12

We investigate the dynamic interactions between total loans to households (henceforth CRHH) and nominal private consumption (NCON) by testing for the existence of a cointegration relationship and estimating a bivariate error-correction model linking both series, using quarterly data over the period 2003Q1 to 2012Q4. While quarterly data on the various component of GDP in nominal terms are readily available from the State Statistical Office (SSO), we construct quarterlies for the credit to household variable using monthly data on various categories of loans released by the National Bank of the Republic of Macedonia (NBRM). We primarily follow the Johansen (1995) VECM procedure, also implementing the two-step Engle-Granger (1987) methodology as a robustness check. Results indicate that credit to household and private consumption are linked by a long-term, dynamic equilibrium relationship, with private consumption bearing the bulk of the adjustment to credit constraints following short-run common shocks.

Methodology

Following the Johansen procedure, we proceed in three steps. First, we perform unit root tests on each series to assess the existence of a stochastic trend, selecting lag lengths by means of information criteria. The CRHH and NCON series have to be integrated of order one for the analysis to proceed. Under the (provisional) assumption of cointegration between the series (i.e. assuming that residuals are covariance stationary), we also perform Granger-causality tests to provide preliminary insights into possible ‘causal’ links between them, as well as to select the less ‘weakly exogenous’ variable (i.e. the variable which developments are likely to be influenced to a greater extent by the other one than it is found to influence the latter) for subsequent normalization purposes.

Second, we proceed to initial estimations of various specifications of the following functional form:

$$\Delta X_t = \alpha\beta' Z_{1,t} + \Psi Z_{2,t} + \varepsilon_t \quad (1)$$

$$\text{with: } Z_{1,t} = (X_{t-1}, D_t)' \text{ and } Z_{2,t} = \left(\sum_{j=1}^n \Delta X_{2,t-j}, C_t \right)'$$

where X is a bivariate vector containing the CRHH and NCON series, D is a vector of deterministic elements which can alternatively include a time trend or a constant restricted to the cointegrating

vector, and C is a general deterministic term in the error-correction term. In equation (1), the number of lags is determined by a step-down procedure for model selection using likelihood ratio tests and information criteria (relying on the exclusion tests in case of conflicting outcomes) applied to models estimated by cointegrated least squares, so as to ensure that the residuals are Gaussian white noises. We then perform trace tests to determine the rank of the coefficient matrix and to verify the existence of a cointegrating relationship between both series.

Third, we re-estimate those specifications of equation (1) for which we were able to exhibit a long-term relationship after normalization of the cointegrating vector using the variable found to be less 'weakly exogenous'. We select the final model based on log-likelihood maximization tests.

With regards to the two-step Engle-Granger procedure, after testing for the stationarity of the residuals of the long-term relationship between both series, we estimate a functional form written in difference akin to equation (1) above, directly plugging the estimated long-run equilibrium lagged one period in the right-hand side of the equation.

Principles of Interpretation

In equation (1), the slope coefficient β measures the magnitude of the long-term co-movement between CRHH and NCON, with a higher coefficient indicating a stronger relationship over the time period under consideration, taking into account the presence of possible deterministic trends in the data and/or the cointegrating vector.

The 'speed-of-adjustment' vector α captures the way in which each series adjusts to correct short-term deviations from the cointegration relationship following a common shock. Following common practice, we interpret the absence of any adjustment by a variable as signaling that this variable is actually 'leading' in the adjustment process (i.e. is the most 'weakly exogenous'), since the bulk of the subsequent adjustment has then to fall on the other variable. In this respect, the speed-of-adjustment coefficient entering into the equation for the variable used to normalize the cointegrating vector needs to be significant and negative, and/or the coefficient entering the equation for the other variable needs to be significant and positive, for an error-correction mechanism to be detected.

Results

The main results, which are reported in table 2, can be summarized as follows:

- Both the credit to households (CRHH) and nominal private consumption (NCON) series appear to be non-stationary over the period 2003Q1–2012Q4, as the null hypothesis of a unit root cannot be rejected in either case. Furthermore, Granger-causality tests (not reported here) indicate that the null hypothesis that one series does not Granger cause the other can be rejected for both of them at the 1 percent significant level, but at an even lower significance level in the case of CRHH—which pleads for using NCON as the provisional dependent variable as well as for normalization purposes in subsequent regressions. The variance analysis further suggests that CRHH explains a large and increasing share of NCON variance following a shock;
- There appears to exist a cointegrating vector linking CRHH and NCON, based on a trace statistics for the coefficient matrix significant at the 1 percent level (while the null of a unit root in the residuals of the long-term relationship is rejected at the 5 percent level in the Engle-Granger methodology). However, the detection of a restricted trend in the data indicates that this long-run equilibrium relationship needs to be interpreted for ‘de-trended’ series, once cleared from their common stochastic trend;
- In this regard, the slope coefficient that measures the extent of the long-term interplay between both series is found to be about 0.45 (0.5 in the two-step methodology), which points to the importance of other, complementary factors for explaining the series dynamics;
- When using NCON to normalize the cointegrating vector, the speed-of-adjustment coefficient entering the equation describing the short-term behavior of NCON is found to be strongly significant and negative while the speed-of-adjustment coefficient entering the equation describing the short-term behavior of CRHH does not turn out to be significant. These results indicate that in the case of a departure from the long-run equilibrium, nominal private consumption bears the whole of the adjustment process, alternatively decreasing or increasing to match changes affecting the dynamics of credit, while the reverse does not hold true;
- Yet rather counter-intuitively, the rather high value of this speed-of-adjustment coefficient, estimated at -2.64 (-2.39 in the Engle-Granger methodology), suggests that corrections of short-term deviations tend to ‘overshoot’ the path of return to equilibrium, implying an imperfect error-correction process. This outcome is likely to be chiefly attributable to the use of quarterly data in the model, whereas a significant part of the adjustment is bound to take place

within a higher frequency timeframe in reality, given the micro-economic nature of credit transactions.

Table 2. ECM Estimation Results for NCON and CRHH Series

| Methodology | Trace test (Johansen) / ADF test (Engle-Granger) statistics | Number of lags in VAR | Slope coefficient of the cointegrating vector | Deterministic term | Speed of adjustment coefficients | |
|------------------------------------|---|-----------------------|---|-------------------------|----------------------------------|-----------------|
| | | | | | α_{NCON} | α_{CRHH} |
| Johansen (VECM) | 38.154*** | 3 | 0.452*** | Restricted linear trend | -2.637*** | -0.025 |
| Engle-Granger (two-step procedure) | -2.514** | 3 | 0.505*** | - | -2.388*** | -0.062 |

Reading: *, **, *** indicate significance at the 10%, 5% and 1% thresholds, respectively. In the trace test, the null hypothesis is that there is no cointegrating vector against the alternative that there is one. In the ADF tests, the null hypothesis is that the residuals of the long-term relationship have a unit root.

Overall, notwithstanding the small-size distortions associated with the use of 40 point time series, these results point to the prevalence of credit supply constraints, as opposed to insufficient aggregate demand, in curtailing financial deepening in Macedonia over the period 2003–2012.

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