



REPUBLIC OF SLOVENIA

SELECTED ISSUES PAPER

May 2016

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REPUBLIC OF SLOVENIA

SELECTED ISSUES

April 22, 2016

Approved By
European Department

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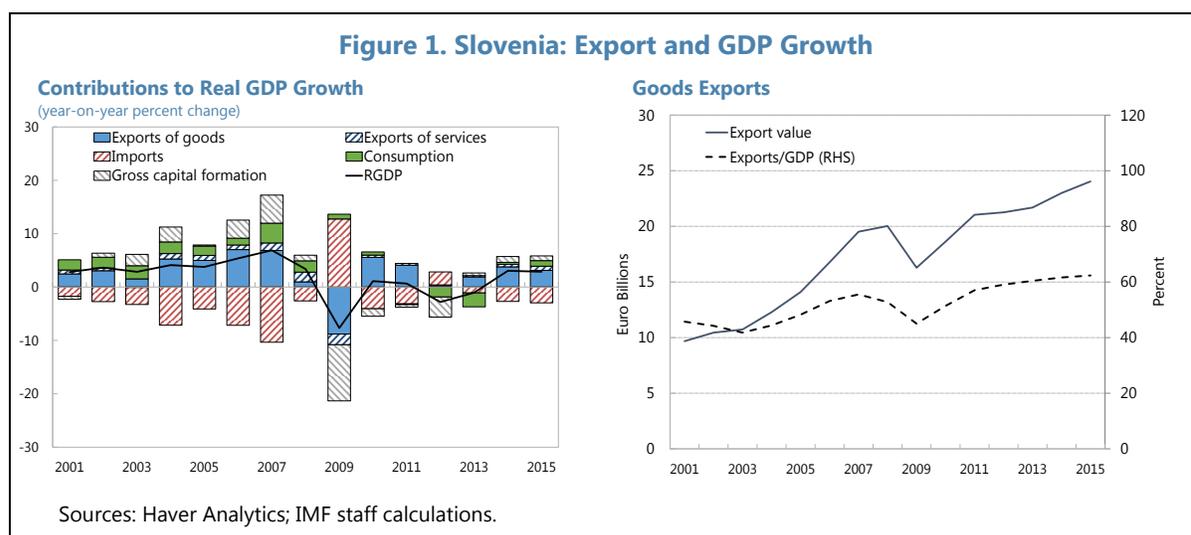
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EXPORT COMPETITIVENESS IN SLOVENIA¹

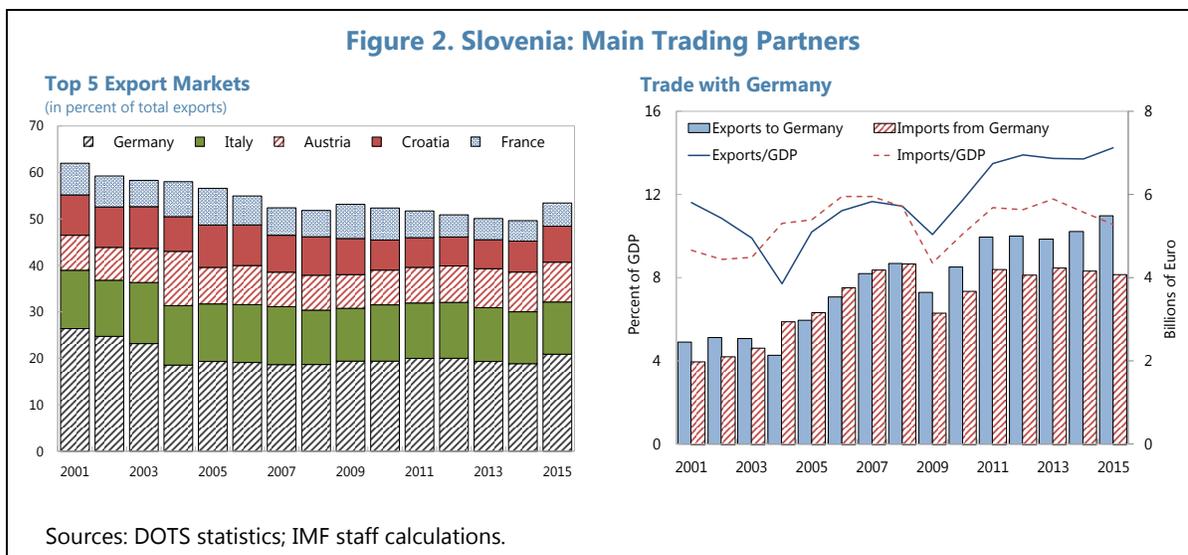
A. Introduction

1. **Slovenia's exports have been the main contributor to GDP growth in recent years.** In particular, by 2015 exports of goods and services had increased by 20 percentage points of GDP compared to their post-crisis low in 2009. This rapid increase in exports was due to an increase in the nominal value of exports as nominal GDP was relatively steady over this period (Figure 1). This strong export performance raises the question of how Slovenia's export sectors have remained resilient despite weak domestic conditions in the wake of the global economic and financial crisis. IMF (2013) finds that trade links between Germany and the four central European countries (CE4)--the Czech Republic, Hungary, Poland, and Slovakia--via supply chains contributed to rapid export and GDP growth in the CE4 countries. While Slovenia was not included in the IMF (2013) study, trade statistics show that Slovenia is also well integrated in European supply chains.

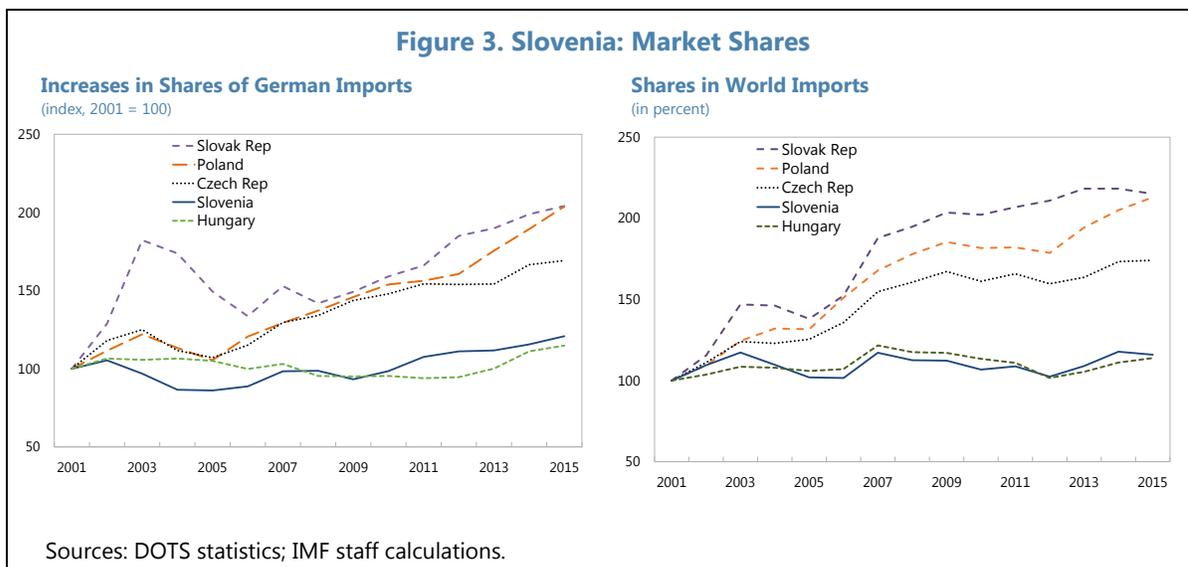


2. **Slovenia trades intensively with Europe, with more than 90 percent of Slovenia's goods sold to other European countries.** Germany is Slovenia's largest export market, followed by Italy and Austria. Slovenia's top five export markets bought about half of Slovenia's export products (Figure 2), with the other half going mainly to emerging European countries and countries in emerging Asia and the Middle East. Slovenia's exports to Germany have remained stable at about 20 percent of total exports over the past ten years, likely due to Germany's dominant position in European supply chains. While trade shares remained relatively constant, exports to Germany grew rapidly in value terms. Total exports in percent of GDP have also grown in recently years.

¹ Prepared by Ruo Chen and Lawrence Dwight (SPR)



3. **Slovenia has maintained its trade shares of both German and World imports, but unlike most of the CE4 countries it shares have not increased significantly** (Figure 3). Among the CE4 countries, Poland and the Slovak Republic have shown the largest gains in market shares.

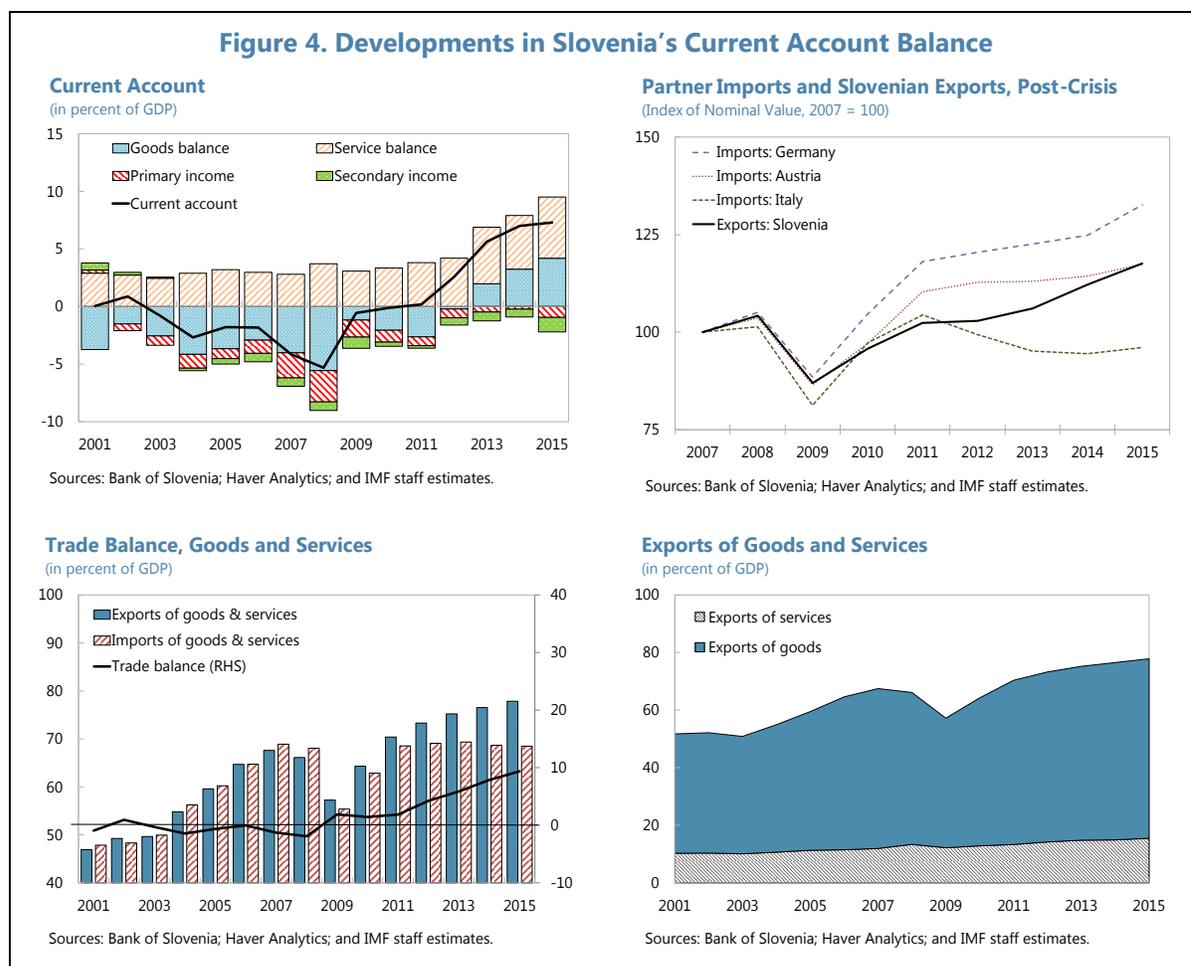


B. Explaining developments in Slovenia's external balances

4. **Strong growth in trading partners is one explanation for the considerable improvement in Slovenia's current account balance.** Slovenia's current account switched from a deficit of 5 percent of GDP in 2008 to a surplus of 7¼ percent of GDP in 2015 (Figure 4). This was largely the result of a surge in exports that paralleled an increase in imports of Slovenia's major export markets. For example, from 2008 to 2015, total German and Austrian imports rose by 23 and 13 percent, respectively, while Italian imports dropped by 5 percent. Not surprisingly,

Slovenia's exports of goods have increased by 13 percent since 2008, close to the weighted average of import growth in these three major trading partners.

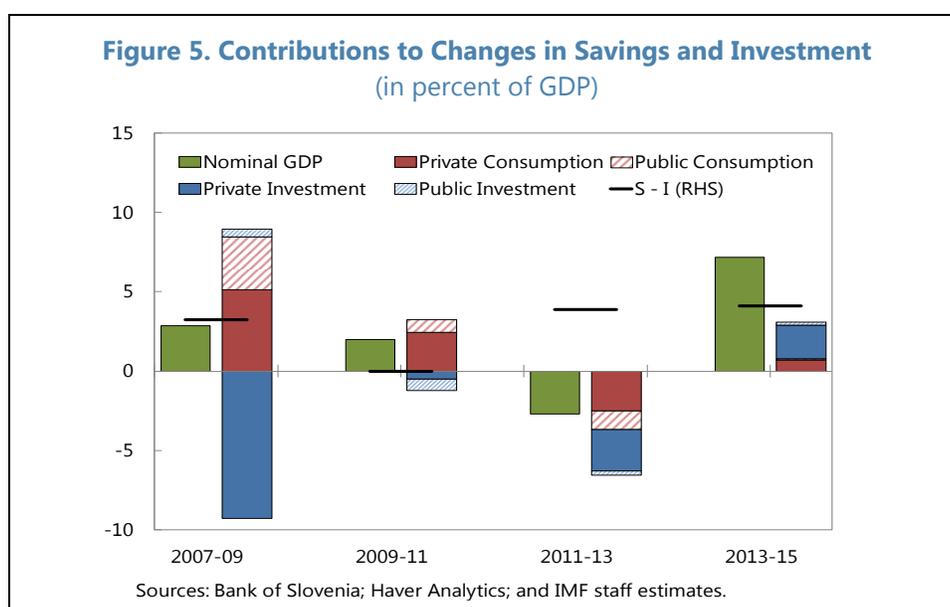
5. **During the same period, Slovenia's imports remained relatively flat in line with slow GDP growth.** For 2008–15, Slovenia's nominal GDP rose only by 1½ percent, with real demand for imports rising by only 2¼ percent. And while trading partners were recovering from the global crisis, Slovenia was hit by a banking crisis in 2012–13, resulting in a nominal decline in both GDP and imports during this period.



6. **From a savings-investment perspective, the improvement in the current account went through several phases, first primarily stemming from falling private investment and then due to rising income** (Figure 5). Immediately after the global financial crisis (2007–09), income growth remained positive with consumption growth even stronger, leading to a fall in savings. However, a sharp fall in private investment more than offset the fall in savings, leading to an improvement in the current account balance. In 2009–11, increases in income and consumption were small and offsetting and investment was slightly negative, leading to little change in the size of the current account. During Slovenia's banking crisis (2011–13), income and consumption fell commensurately so that there was little change in savings. However, a

moderate fall in private investment caused the current account to improve significantly. Finally, in recent years (2014–15), the improvement has been driven by significant income growth (led by exports) and hence savings. Investment growth turned positive for the first time since the start of the global crisis, but lagged growth in income. In sum, from 2007 to 2013 the 7 percent of GDP improvement in the current account balance resulted primarily from a fall in private investment (from 30 to 17 percent of GDP), while in the last two years the 4 percent of GDP improvement in the current account balance resulted primarily from export-led growth.

7. **So why hasn't private investment rebounded more strongly given strong exports, GDP growth, and a large current account surplus?** As discussed in the chapter on corporate financial health, many companies are still struggling with an overhang of corporate debt. This hinders their ability to invest. Exporters have been less affected than other firms because they are more likely to be large companies with substantial retained earnings, access to external financing, and/or easier access to domestic bank financing. In addition, exporters can post good collateral in the form of export earnings. In contrast, unreformed domestic firms (with relatively high debts and relatively low equity and profits) have suffered a deterioration in the quality of their collateral.

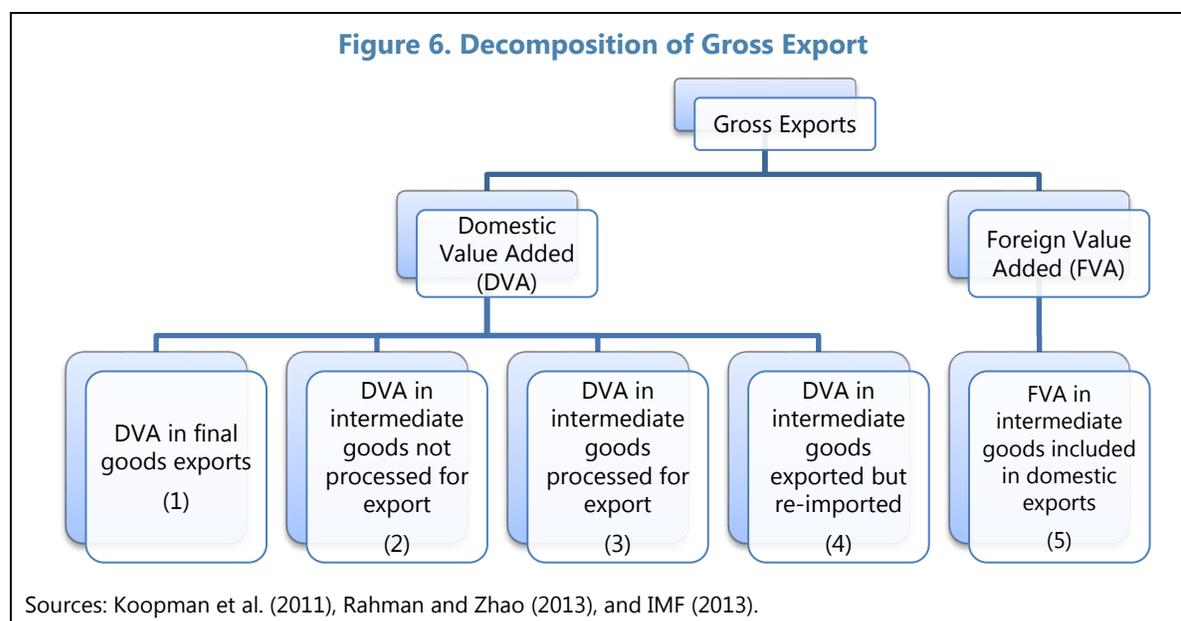


C. Review of export performance in value added terms

8. **Traditional trade statistics tend to overestimate domestic value added in exports due to the inclusion of imported intermediate goods, which represent foreign value added.**

We follow the framework for the decomposition of gross exports described in Koopman et al. (2011), Rahman and Zhao (2013), and IMF (2013). As shown in Figure 6, gross exports can be decomposed into five categories based on the origin of value added and the stage of production: (1) domestic value added in final goods, (2) domestic value added in intermediate goods not processed for further exports, (3) domestic value added in intermediate goods

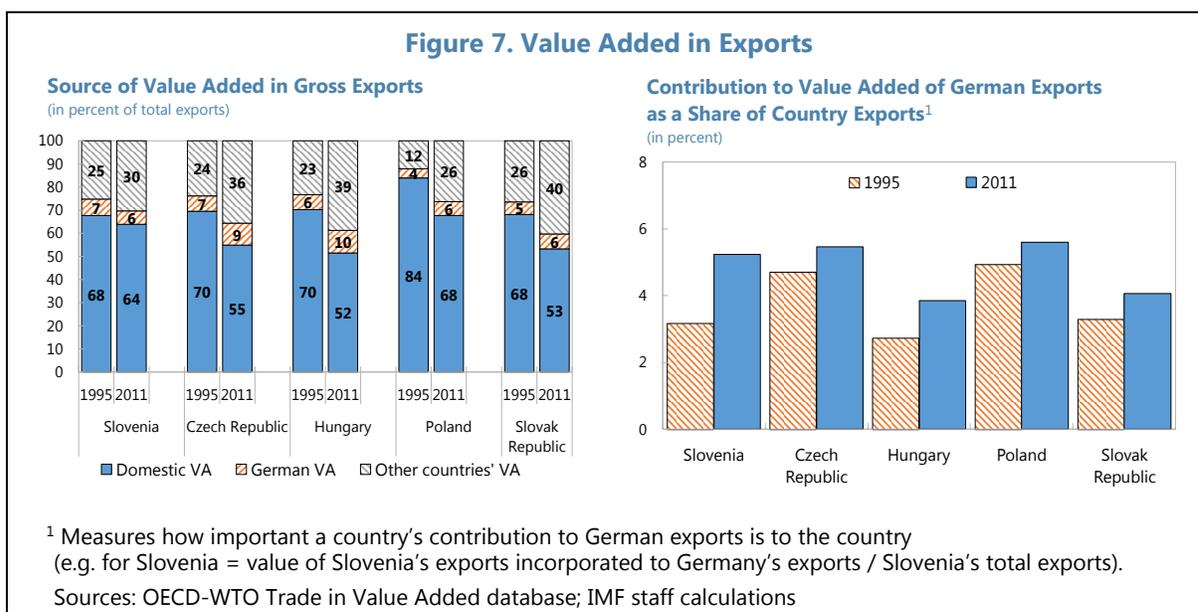
processed for export to third countries, (4) domestic value added in exports to other countries but later re-imported by the home country for export, and (5) imported value added used as inputs into domestic exports (also known as foreign value added). Components (1)-(4) represent domestic value added in gross exports, i.e. the real contribution of exports to the domestic economy in terms of income and employment. Components (3)-(5) represent domestic and foreign inputs into global and regional supply chains, with components (3)-(4) representing domestic value added into supply chains. Growth of supply chains would result in parallel increases in domestic and foreign value added in exports.



9. **On the import side, foreign value added in Slovenia's exports has increased over the last 20 years, but the increase has been smaller than for each of the CE4 countries, indicating less integration on imports** (Figure 7). All CE4 countries showed increases in the shares of foreign value added in exports by at least 12 percentage points, while the share of foreign value added in Slovenia's exports increased only five percentage points. Germany has the largest share of foreign value added in each country's gross exports (except for the Slovak Republic where Russia's value added is largest), indicating strong trade links through regional supply chains. In contrast with the CE4 countries where Germany's share of value added has increased, Germany's share of valued added in Slovenia's exports has dropped slightly. On the other hand, Slovenia also has strong trade links with Italy and intermediate goods from Italy make up the second largest share of foreign value added in Slovenia's exports.

10. **On the export side, shares of each country's value added in German exports have increased significantly, suggesting substantial increases in integration since 1995.** In fact, Slovenia's exports of intermediate goods to Germany have increased more (by 2 percentage points of total exports) than for the CE4 countries (by 1 percentage point). The share of intermediate goods exports to Germany (5 percent of total exports) is similar to the share for the

CE4 countries (4–6 percent of total exports). Thus, the contribution of Slovenia's integration in the German supply chain to its export performance is on a par with other countries in the region.



11. **The transportation, electrical equipment, machinery, and chemicals sectors are the most important for the CE4 countries and Slovenia in the German supply chain.** The IMF's 2013 Cluster Report on the German-Central European Supply Chain analyzes the German automobile industry, explains the factors driving integration of the CE4's automotive sectors, and evaluates the contribution of the automotive sector to their economies. In Slovenia, the transport equipment, machinery, and pharmaceutical sectors make up almost half of the total exports and have been the main contributors to export growth (Figure 8).

12. **The sectoral decomposition shows that foreign value added of transport equipment has increased as a share of Slovenia's total exports, but less than most of the CE4 countries.** In Slovenia, motor vehicles are the largest category of transport equipment exports accounting for almost 9 percent of total exports.² The share of foreign value added in Slovenia's transport equipment exports has increased by about 6 percentage points over the last 20 years, similar to the Czech Republic and Hungary but lower than in Poland and the Slovak Republic. The share of foreign value added in Hungary, Slovakia, and Slovenia were already relatively high in 1995, comprising more than half of the gross value of transport equipment exports. Although Slovenia's exports of transport equipment increased more rapidly than Slovenia's total exports, they still lagged behind the increase in transport equipment exports of the CE4 countries. In the largest category (automobiles), there is room for additional integration into the German supply chains.

² Transport equipment sector includes the manufacture of aircraft and other aerospace equipment, railroad equipment, motor vehicles and auto parts, motorcycles and bicycles, as well as the building, repairing and breaking of ships.

Figure 8. Slovenia: Exports by Sector

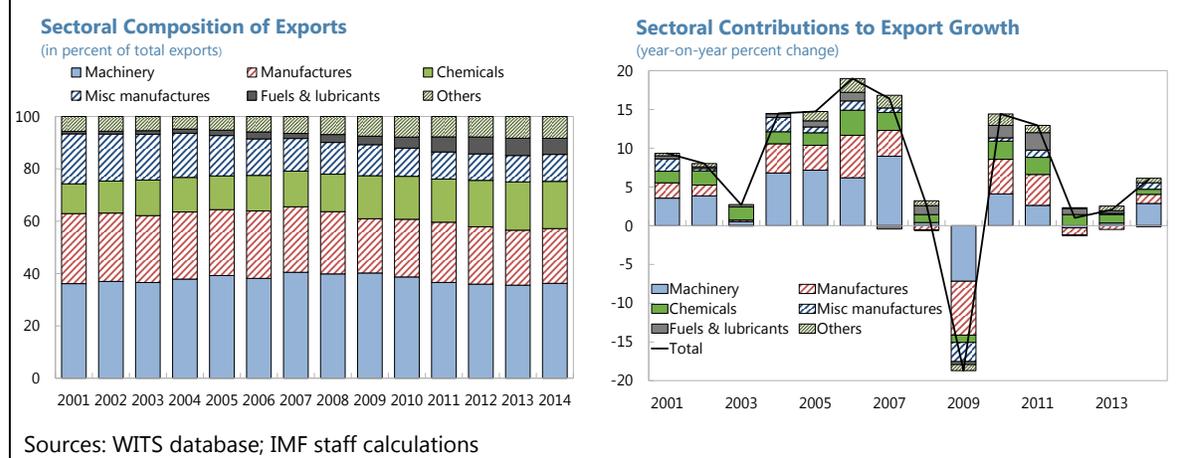
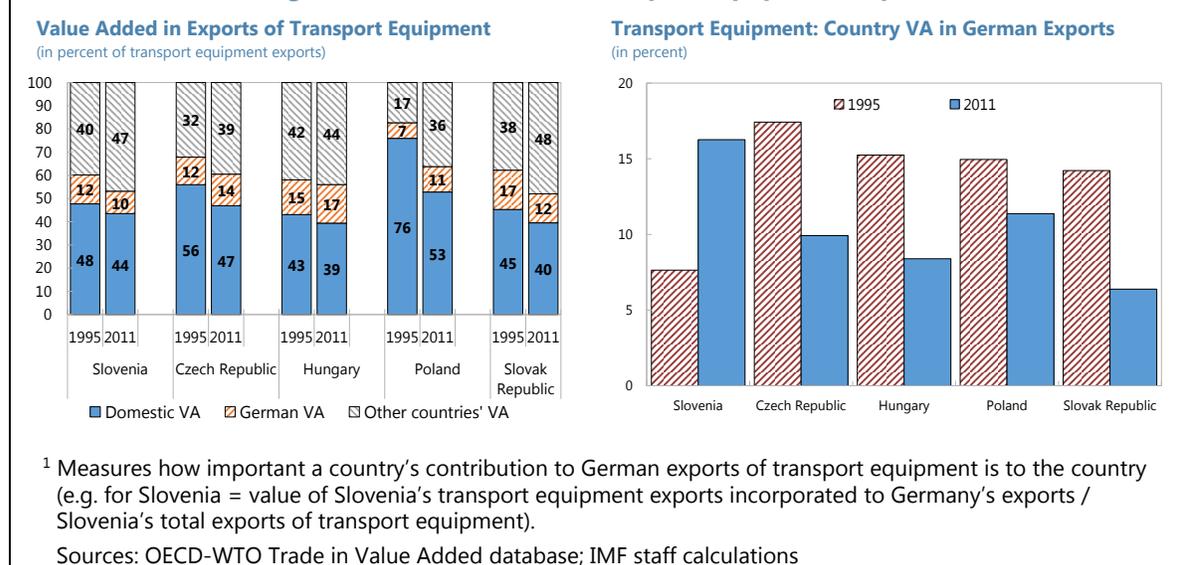


Figure 9. Value Added in Transport Equipment Exports

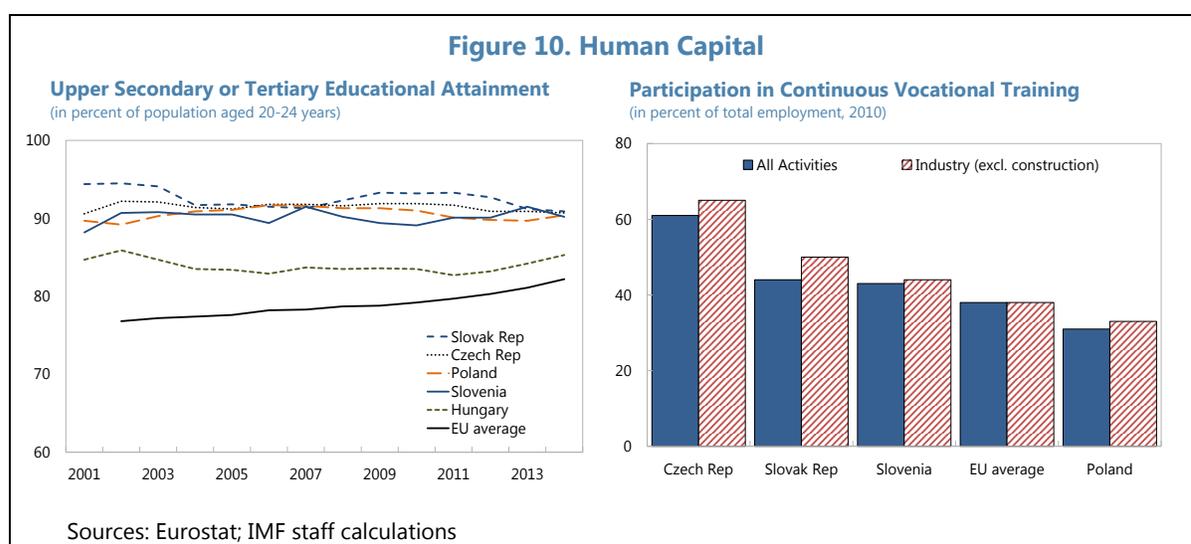


D. Structural factors contributing to export performance

13. **Improving labor markets, boosting foreign investment, and enhancing vocational training would improve Slovenia's competitiveness.** Empirical research has identified these three structural components as important for export performance. Rahman and Zhao (2013) show that a country's strong export performance globally and in Europe since the late 1990s has been associated with successful integration with supply chains. Rahman et al. (2015) further explore export performance in the European Union single market and find that export competitiveness depends on successful structural reforms in higher education, upgrading skills, wage incentives, and an environment that supports foreign investment. This section compares Slovenia's development in these areas with the CE4 countries.

Human capital

14. **Better human capital supports incorporation of new technology, integration into supply chains, and improvement in exports.** Rahman et al. (2015) find that two proxy indicators for human capital—higher education and the upgrading of vocational training and skills—explain close to 50 percent of export performance in the European Union. On measures of human capital, Slovenia compares favorably with the CE4 countries. The share of young people with secondary or higher education are similar to the levels in the Czech Republic, Poland, and Slovakia, and higher than the level in Hungary and the EU average (Figure 10). Slovenia has larger shares of employees participating in continuous vocational trainings than that in Hungary, Poland, and the EU averages. To utilize its skilled labor force, Slovenia also needs efficient labor market and supporting foreign investment environment.



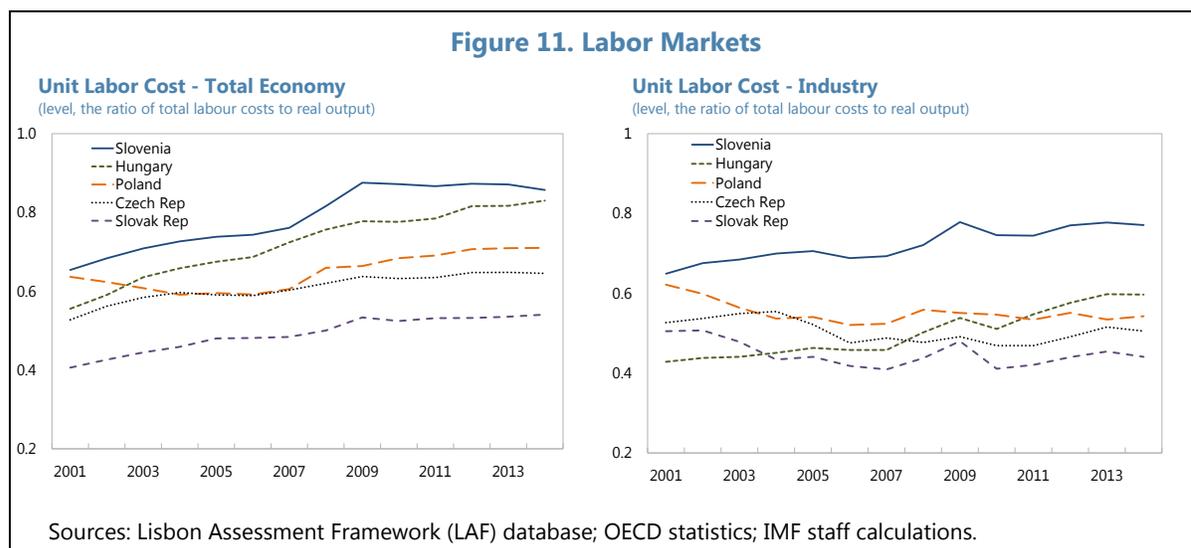
Labor markets

15. **The development of supply chains has been driven in part by firms outsourcing their production processes in order to seek efficiency gains through differences in wages.** It is critical for host countries to provide a competitive wage structure. Slovenia does not show a comparative advantage in unit labor costs relative to the CE4 countries. For example, Slovenia's unit labor costs remain higher than the CE4 countries in both the whole economy and in industry (Figure 11), although recent data suggest an improvement.

16. **Well-functioning labor markets are also critical to ensure efficient allocation of labor and provide incentives to work.** Rahman et al. (2015) uses two proxies, the inactivity trap and relative minimum wages, to measure labor market efficiency. The inactivity trap captures incentives to stay out of the work force due to either labor taxes or loss of social benefits.³ The inactivity trap indicator suggests that Slovenia provides weaker incentives to work relative to CE4

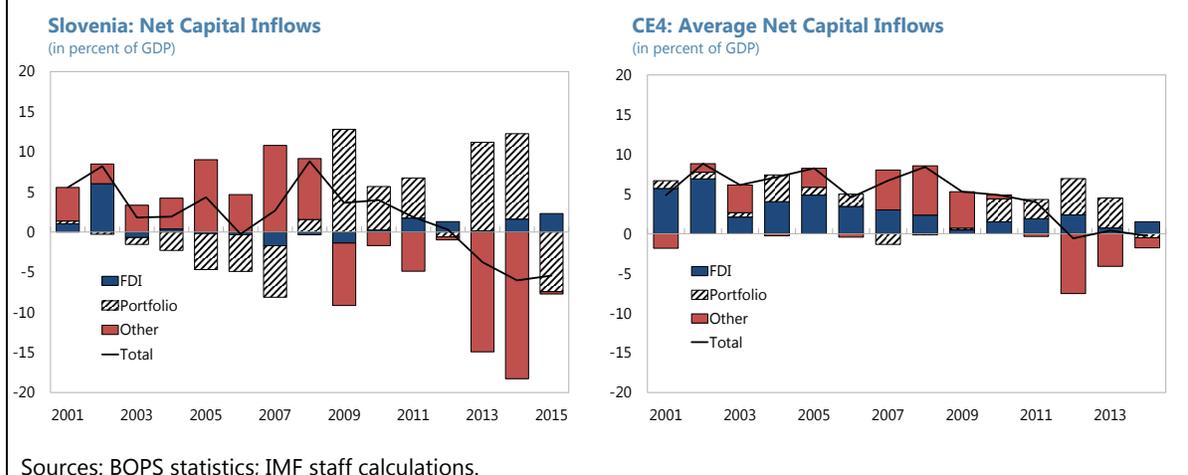
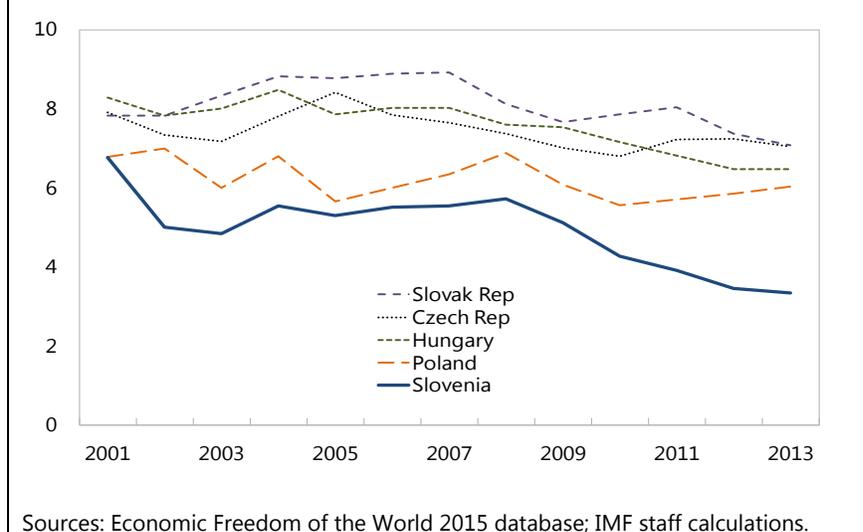
³ Inactivity trap = $1 - (\text{in-work net pay} - \text{out-of-work net pay}) / (\text{in-work gross pay} - \text{out-of-work gross pay})$.

countries. Countries with low minimum wages, a measure of the cost of employing low-skilled labor, tend to have a comparative advantage in labor-intensive exports in their trade with the EU (Rahman et al., 2015). Although Slovenia's minimum wage is low relative to that of the CE4 countries, relatively high unit labor costs offset a comparative advantage in labor-intensive exports. To provide an attractive labor market for multinational companies, Slovenia needs to reduce its unit labor costs (via increased productivity) and disincentives to work.



Foreign investment environment

17. **Foreign direct investment (FDI), particularly greenfield investment, has been a key channel to expand production in foreign countries.** For example, the evolution of the German supply chain has been supported by large inflows of FDI to the CE4 countries (IMF, 2013). FDI is usually a relatively stable source of external funding, holds up well during external crises, and is less prone to sudden stops. FDI inflows were the main component in net capital inflows to the CE4 countries before the financial crisis, averaging 4½ percent of GDP per year. In contrast, FDI inflows to Slovenia were less than one percent of GDP per year before the crisis (Figure 12). As a result, the stock of FDI in the CE4 countries has been around 40 to 50 percent of GDP. The comparable figure for Slovenia has been less than 15 percent of GDP over the last decade. Another index, from the Economic Freedom of the World (EFW) 2015 report, indicates that there is a perception that Slovenia has more restrictions on foreign ownership and investment than the CE4 countries and that these restrictions have increased since the global financial crisis (Figure 13). The EFW's index of foreign ownership and investment restrictions is based on two surveys from the World Economic Forum's *Global Competitiveness Report*: (i) the prevalence of foreign ownership and (ii) regulatory restrictions on international capital flows. In Slovenia's case, the perception of greater restrictions on foreign investment may have contributed to a lower level of foreign ownership. Rahman et al. (2015) conclude that Slovenia should make its foreign ownership regime more conducive for investors.

Figure 12. International Capital Flows and Investment Positions**Figure 13. Economic Freedom of the World: Foreign Ownership / Investment Restrictions Sub-Index**
(survey based, lower = greater restrictions)

E. Conclusion

18. **Slovenia's current account surplus reflects strong integration in European supply chains, maintained price competitiveness, and lackluster domestic demand.** Slovenia's current account balance has risen dramatically from a deficit of 5 percent of GDP in 2008 to over 7 percent of GDP in 2015. From a trade perspective, the increase was driven by a significant increase in exports (in line with the growth of imports of Slovenia's trading partners) while imports have remained relatively flat (in line with low GDP growth in Slovenia). From a savings-investment perspective, the 2008-2013 dynamics were driven by a large decline in private investment's share of GDP, while improvement in the last two years has been driven by a sharp

increase in private savings. The recovery in private investment has lagged due in part to the corporate debt overhang. In terms of integration, foreign imports have contributed very modestly to Slovenia's exports. However, on the export side Slovenian goods have seen a significant increase in their incorporation into the European supply chain, particularly for Germany.

19. **Nevertheless, additional steps could improve labor markets, boost foreign investment, and enhance training to increase Slovenia's competitiveness further.** Studies have shown that structural reforms are associated with strong export growth. In this regard, steps to address areas where Slovenia lags its peers could further improve competitiveness. These steps include further boosting human capital (e.g. by improving the quality of education to address demands of the marketplace), reforming labor markets (e.g. by reducing labor costs and disincentives to work), and increasing foreign direct investment (e.g. by reducing perceptions of a relatively restrictive investment environment).

References

Koopman, Robert, Zhi Wang, and Shang-Jin Wei, 2012, "[Tracing Value-Added and Double Counting in Gross Exports](#)", NBER Working Paper 18579.

International Monetary Fund, 2013. [German-Central European Supply Chains – Cluster Report](#), (Washington, DC).

International Monetary Fund, 2015. [Central and Eastern Europe: New Member States \(NMS\) Policy Forum, 2014, Staff Report on Cluster Consultations – Common Policy Frameworks and Challenges](#), (Washington, DC).

Rahman, Jesmin, Ara Stepanyan, Jessie Yang and Li Zeng, 2015, "[Exports in a Tariff-Free Environment: What Structural Reforms Matter? Evidence from the European Union Single Market](#)" IMF Working Papers Np. 15/187, (Washington, DC).

Rahman, Jesmin and Tianli Zhao, 2013, "[Export Performance in Europe: What Do We Know from Supply Chains?](#)" IMF Working Papers No. 13/62, (Washington, DC).

CORPORATE FINANCIAL HEALTH AND INVESTMENT¹

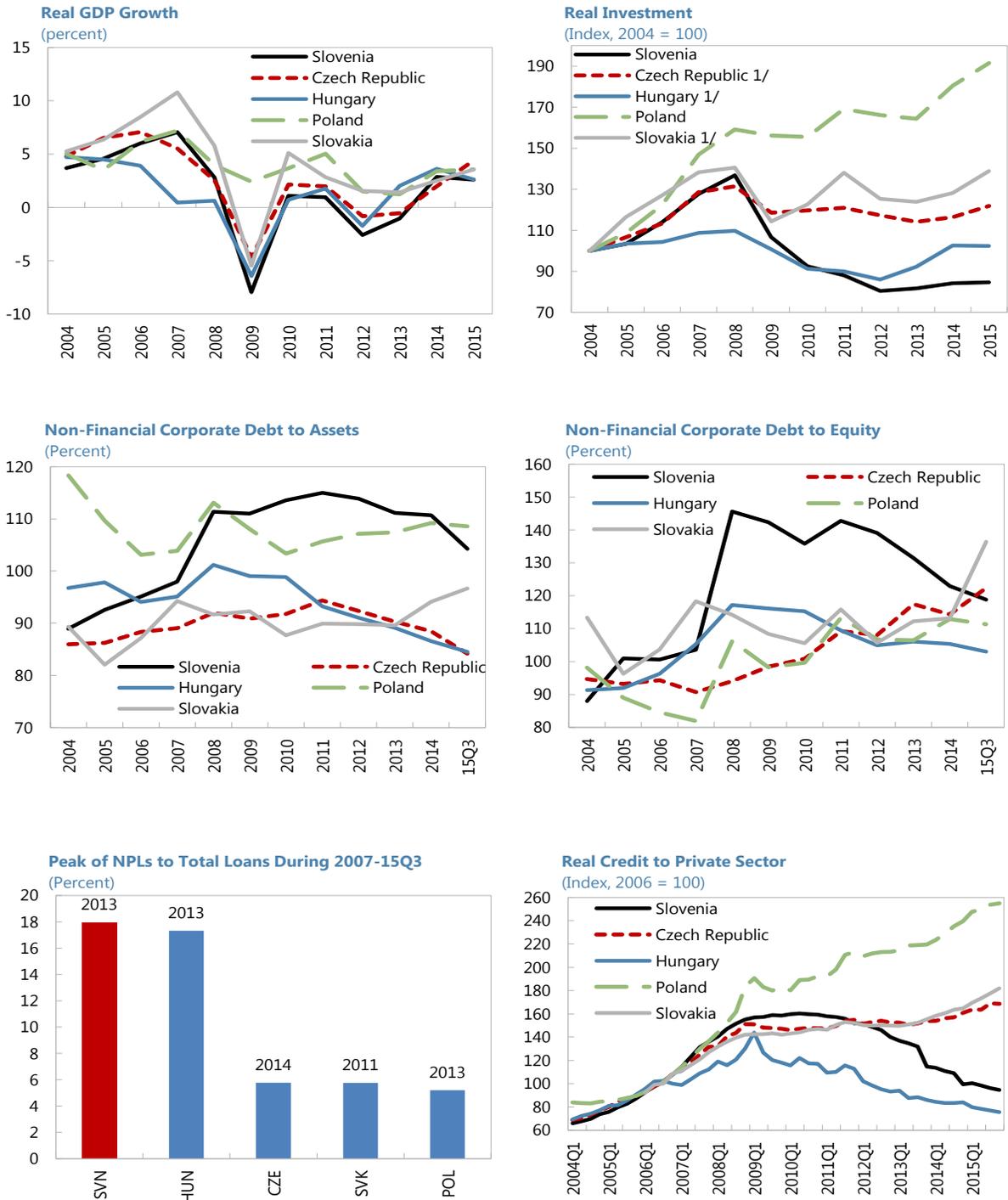
A. Introduction

- 1. When the global asset bubble burst in 2008, credit and investment collapsed in central Europe (Figure 1).** Preceding the crisis, bank credit in Slovenia and four central European countries (Czech Republic, Hungary, Poland, and Slovakia, collectively the CE-4) fueled corporate investment. When global credit markets froze in late 2008, bank financing dried up, precipitating credit- and investment-starved recessions in Slovenia and the CE-4, except Poland. Slovenia and Hungary, where non-financial corporates were the most indebted, were hit the hardest, with domestic banks in Slovenia requiring a public-sector bailout in 2013. Today, private investment remains well below pre-bubble levels in Slovenia, and investment in other countries have only returned to 2004 levels, despite a resumption of growth and historically low policy rates.
- 2. Today's low interest rates are supportive of corporate investment.** In theory, a firm's decision to investment depends on the risk-adjusted expected return of the investment. If the return exceeds a pre-determined hurdle rate (the discount rate applied to projected cash flows associated with the investment), it is assumed financing will be available for the project and it will be undertaken. The hurdle rate typically embodies a firm's weighted average cost of capital, managers' and owners' degree of risk aversion, and risks specific to the investment, including uncertainty surrounding cash flow projections. Changes in policy interest rates affect the cost of firm debt, and indirectly the cost of firm equity, thereby influencing a firm's hurdle rate. Specifically, lower policy interest rates can induce more investment spending as a greater number of potential investments become financially attractive to undertake.
- 3. However, poor corporate financial health can impair monetary policy transmission.** In the presence of financial frictions, a firm's financial health could play a larger role in determining its investment decisions and the availability of related financing (see Martinez-Carrascal and Ferrando, 2008 for a review of the literature). Indeed, studies have found that a firm's balance sheet strength, profitability, and the availability of liquid assets are significant determinants of investment (e.g., see Fazzari, Hubbard, and Perterson, 1988). In essence, high corporate debt burdens weigh on the capacity and desire of firms to finance an investment.² As a result, investment decisions and available financing for investment become less responsive to reductions in interest rates.

¹ Prepared by John Ralyea with assistance from Luisa Calixto and Tingyun Chen.

² References to a firm's capacity or ability to investment include the availability of internal financing such as retained earnings or fresh equity and external financing provided by bank and non-bank entities.

Figure 1. Economic trends and corporate financing



Sources: Eurostat, FSI, Haver Analytics, and IFS.
1/ 2015Q3 value is used instead.

4. **Against this background, this paper assesses corporate financial health in Slovenia and the CE-4, using firm-level data, and the potential effect on investment.** In particular, the paper addresses the following questions: i) How has the financial health of non-financial corporates fared over the last nine years, in terms of profitability, liquidity, and indebtedness, in Slovenia and the CE-4?; ii) Has a structural change occurred following the financial crisis in either a firm's willingness or ability to undertake investments given its financial health?; and iii) Is there a threshold of indebtedness that leads to lower corporate investment?

5. **The rest of the paper proceeds as follows:** Section B describes the firm level data and methodology used in the analysis; Section C reviews trends in the financial health of firms in the countries under study; Section D presents an econometric model linking a firm's investment to its financial health and broader economic and financial conditions; and Section E offers policy considerations.

B. Data and Methodology

6. **The analysis relies on a large dataset of harmonized financial data for firms in Slovenia and the CE-4.** The initial sample is the set of all non-financial firms (NFCs) for which financial and operating data are available on the *Orbis* database. The firm-year sample sizes average between 30,000–55,000 for Slovenia, the Czech Republic, Poland and Slovakia and around 130,000 for Hungary. The database includes a large portion of small- and micro-sized firms not readily available elsewhere, allowing for greater coverage of the non-financial sector. Only firm-year observations that contain positive values for tangible fixed assets are included in the analysis.

7. **The evolution of corporate financial health since 2006 is assessed based on indicators of profitability, debt, and debt service capability.** The following financial ratios are constructed from detailed financial statements: return on total assets, profit margin, cash-to-assets, debt-to-assets, debt-to-equity, debt-to-cash flow, and interest coverage. These indicators capture a firm's financial prospects and balance sheet strength, which, in turn, influence a firm's ability and willingness to use internal funds and external financing for investment. Specifically, return on assets and profit margins are proxies for the profitability of a firm and its growth prospects. Debt-to-assets reflects a firm's degree of leverage, while debt-to-cash flow and the interest coverage ratio are indicators of a firm's ability to service its debt. Firms are also classified based on size, sector of operation, and initial level of indebtedness (See Annex I for definitions of ratios and firm size). For the latter, firms with financial debt-to-asset ratios that exceed the median for firms in the same country are classified as high-leverage firms.

8. **A standard investment model is estimated to examine the relationship between a firm's financial health, its access to financing, and its investment outlays.** The variation over time and across firms in profitability, liquidity, and indebtedness is exploited to help explain the variation in firm investment. Of interest is whether the 2008 financial crisis induced a change in the sensitivity of a firm's investment spending to indicators of its financial health. Estimations are also run to determine if firm size influences the capacity or desire to invest. Moreover, the impact

of changes in bank lending conditions is modeled directly for Slovenia,³ where standards tightened considerably following the global and domestic bank crises, and only began to loosen in late 2015. Threshold levels (the ratio above which debt begins to influence investment negatively) for debt-to-assets and debt-to-cash flow were estimated for Slovenia as well.

C. Developments in firms' financial condition in Slovenia and the CE-4

9. **Corporates are slowly repairing their financial health** (Figure 2). The 2008 global financial crisis exposed the underlying vulnerabilities of corporate balance sheets in Slovenia and the CE-4 that grew fat on borrowing in the pre-crisis period. The liquidity shock and concomitant recession induced a deterioration in firm financial indicators across countries and firm sizes. Profitability fell and firms' debt burdens spiked. By the end of 2014, many financial ratios had returned close to pre-crisis levels, as highly indebted firms deleveraged and growth picked up in 2014.⁴ However, corporate investment remained subdued.

Profitability and liquidity

10. **Firm profitability and liquidity ratios are pointing upwards** (Figures 3–7). After falling significantly in 2008 and 2009, firm profitability stabilized before picking up in 2014. This was the case in all countries except Poland, where return on assets continued to fall gradually until 2013 though the overall profitability of Polish firms generally remained higher than in the other countries. Micro-sized firms were the least profitable throughout the post-crisis period, except in Slovenia, where the profitability of micro enterprises was higher and rebounded earlier than other firms. Turning to liquidity, Czech, Hungarian, and Slovakian firms are the most liquid with median aggregate cash-to-asset ratios greater than 10 percent. Slovenia firms are the least liquid, despite a general improvement in liquidity after the 2008 financial crisis, particularly in micro-sized firms.

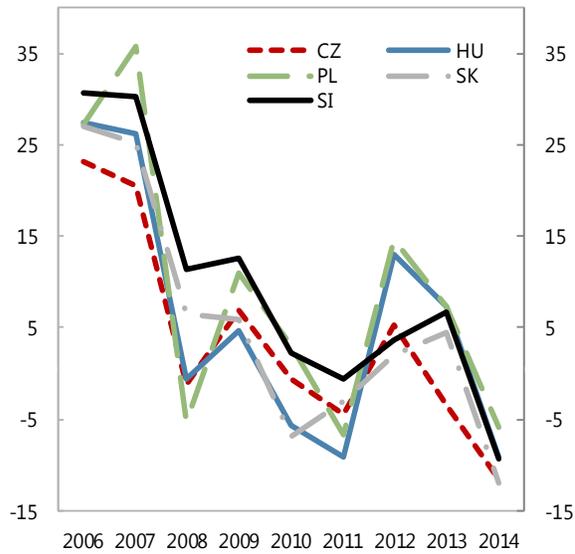
³ ECB bank lending survey data that covers the crisis period and afterwards is only available for Slovenia.

⁴ The reported summary statistics are based on firm-level observations excluding the top and bottom 5th percentile of values for each indicator to avoid distortions from extreme outliers. Eurostat data presented in Figure 1, suggests that these trends continued in 2015.

Figure 2. Summary: Firm-level data, 2006–14

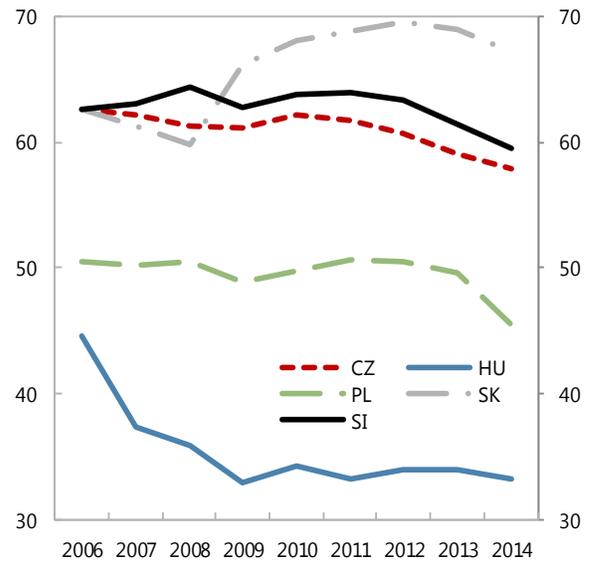
Investment

(Median, percent change in tangible fixed assets)



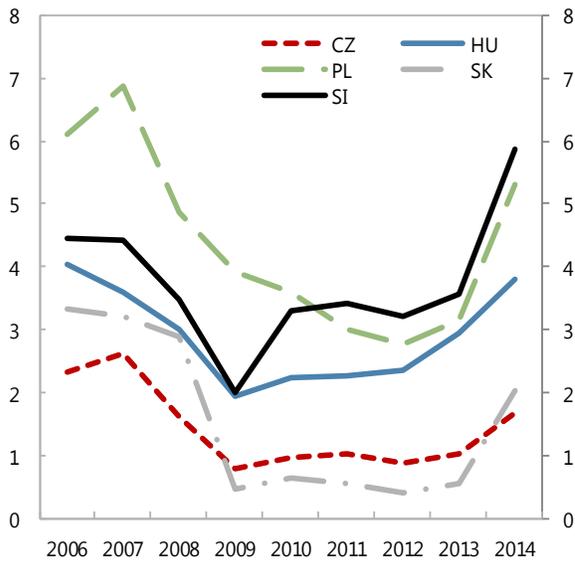
Debt-to-assets

(Median, percent)



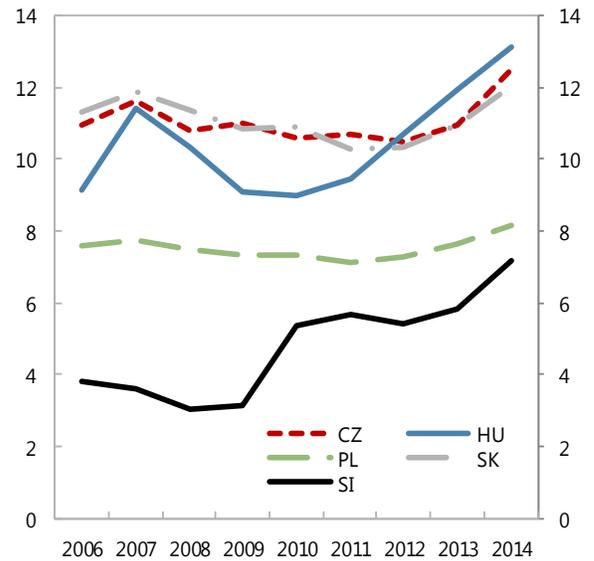
Return on assets

(Median, percent)



Cash-to-assets

(Median, percent)



Sources: Orbis; IMF staff calculations.

CZ= Czech Republic; HU=Hungary; SK=Slovakia; SI= Slovenia

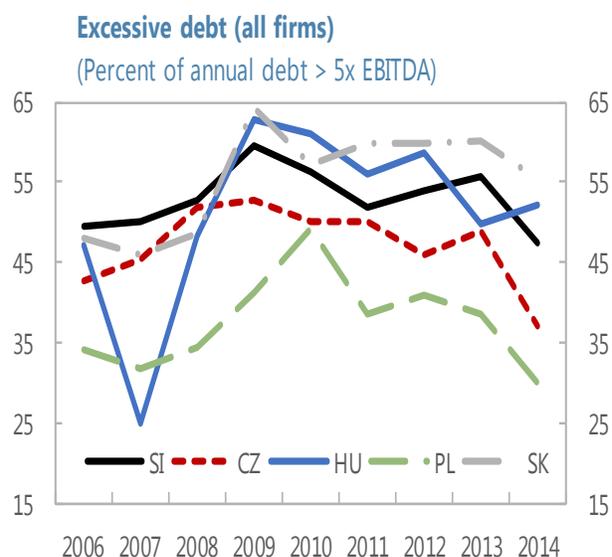
Leverage

Financial debt-to-assets

11. **Deleveraging has been gradual.** The median level of debt-to-assets in Slovenia, the Czech Republic, and Slovakia hovered around 60-70 percent throughout 2007–14, while the median ratio was closer to 50 percent and 35 percent in Poland and Hungary, respectively. The ratio for all firms decreased somewhat toward the end of the period in each country except Slovakia where it jumped in 2009 and stayed at the more elevated level through 2014. However, the aggregate figures mask significant differences among firms of different sizes. In all countries except Slovakia, micro-sized firms have considerably higher debt burdens than larger firms throughout most of the post-crisis period. The evolution of firm indebtedness also varies depending on the initial level of firm leverage. Highly leveraged firms shed more debt, while those with less debt maintained or increased their leverage.

Debt overhang (excessive debt)

12. **Micro-enterprises are still burdened with excessive debt.** In aggregate, firms in the Czech Republic, Poland, and Slovenia have reduced their debt overhang to pre-crisis levels, while Hungarian and Slovakian firms generally have the most excessive debt. It is worth noting, that developments in the measure of excessive debt (defined in this paper as financial debt greater than 5 times earnings before interest, taxes, depreciation, and amortization (EBITDA)) are sensitive to annual fluctuations in cash flow from operations.⁵ Thus, looking solely at micro enterprises Slovenia firms suffer the least from excessive debt and Polish ones join their Hungarian counterparts with the largest amounts of excessive debt since 2011. Nonetheless, 45 percent of all sampled Slovenian firms faced excessive debt levels in 2014.

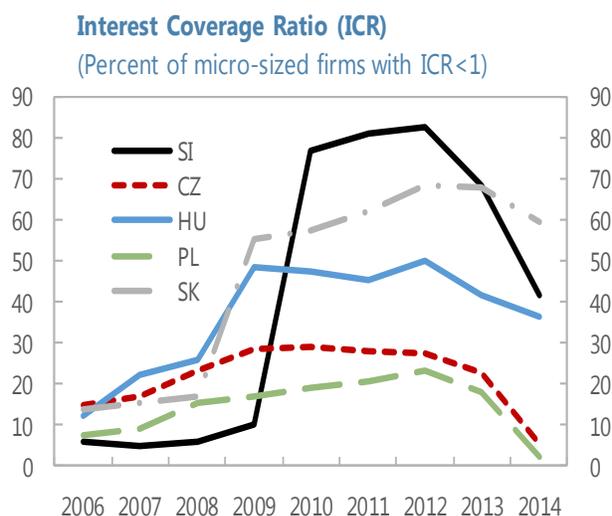


⁵ EBITDA is an approximate measure of operating cash flow. The measure of excessive debt is consistent with empirical results from a threshold analysis of debt-to-EBITDA on investment. The threshold level for debt-to-EBITDA at which the marginal return in terms of more investment begins to diminish is 4 for all firms in Slovenia. See Annex III.

Debt service capacity

13. **Corporate capacity to pay interest generally improved in 2013–14.**

However, a significant number of firms (10 to 30 percent of the sampled firms, depending on the country) have interest coverage ratios (EBITDA over financial expense) below one.⁶ In Slovenia and Slovakia, 2/5 of micro enterprises do not have the cash flow to cover annual interest payments. These firms have to rely on other sources of financing such as cash balances, asset sales, or credit lines to cover annual interest payments, suggesting that many firms still face significant financing constraints. However, with the exception of micro-sized firms, Slovenian firms in general can more easily cover interest payments out of cash flow from operations than their peers in comparator countries.



D. Firms' financial condition, investment and the effect of the crisis

14. **With the onset of the financial crisis, investment by companies in Slovenian and the CE-4 fell significantly and continued to contract through 2014.**⁷ The sharp decline across the board can be largely explained by the widespread fall in aggregate demand after the 2008 financial crisis as documented in Chapter 4 of the April 2015 World Economic Outlook (IMF, 2015c). However, the contraction in economic activity does not explain the entire fall in corporate investment nor the duration of the investment slump, suggesting that other factors also contributed to the decline.

15. **The financial crisis may have changed the sensitivity of firms' investment to its financial health.** Studies of Slovenian firms have found that weak balance sheets, as indicated by high debt burdens e.g., a debt-to-EBITDA ratio greater than 5, an interest coverage ratio less than 1.5 (Damijan, 2014), or a firm financing structure heavily reliant on debt are more susceptible to financing constraints. With the exception of micro-enterprises, indicators of financial health have broadly returned to their pre-crisis levels, yet investment has not recovered. This suggests the possibility of a more cautious approach by corporates in assessing their ability

⁶ With the potential for "sudden stops" during and after a financial crisis, it would be preferable to analyze cash flow to debt service, given the high probability that principal would not be rolled over. However, current data limitations regarding debt repayment profiles for firms prevent calculation of this statistic across countries.

⁷ Corporate investment is measured as the change in total tangible assets between t and t-1 plus depreciation and amortization over total tangible assets at t-1.

to undertake investments. For micro-enterprises, this dynamic would be compounded by their still weak financial positions.

16. **Empirical analysis supports the hypothesis that the financial crisis altered the relationship between firms' financial strength and investment spending.** A log-linear form of a standard firm investment model, as in (Budina et al., 2015; Kalemlı-Özcan et al., 2015; Damijan, 2014), is applied to annual observations on a sample of firms from each country. In addition, potential differences in investment rates related to firm size are also modeled, by running separate regressions with sub-samples based on firm size (large, medium, and small and micro). The econometric approach has the following specification:

$$\begin{aligned} \ln(I_{i,t}) = & \alpha + \beta_1 CAS_{i,t-1} + \beta_2 ROA_{i,t-1} + \beta_3 DA_{i,t-1} + \beta_4 DA(post)_{i,t-1} + \beta_5 OVER_{i,t-1} \\ & + \beta_6 OVER(post)_{i,t-1} + \beta_7 ASSETS_{i,t-1} + \alpha_i + \alpha_t + \varepsilon_{i,t} \\ post_{i,t-1} = & \begin{cases} 1 & \text{if } year_{i,t-1} \geq 2009 \\ 0 & \text{if } da_{i,t-1} < 2009 \end{cases} \end{aligned}$$

I	= Gross investment ⁸
CAS	= Cash and cash-equivalents to total assets
ROA	= Return on assets (EBITDA/total assets) ⁹
DA	= Financial debt to assets
OVER	= EBITDA/Financial debt
post	= Indicator that equals one if $year_{i,t-1}$ is 2009 or later; zero otherwise
ASSETS	= Total assets
α_i	= Firm (i) fixed effects
α_t	= Year (t) fixed effects
$\varepsilon_{i,t}$	= Error term

17. **The gross investment rate is modeled as a function of lagged variables that describe a firm's liquidity, profitability, and indebtedness.** Firm fixed effects absorb all time-invariant heterogeneity across firms and the year fixed effects control for factors that may affect investment equally across firms in a country, such as fluctuations in aggregate demand and interest rates. The debt-to-assets and EBITDA-to-debt variables are interacted with a post-2008 indicator to examine if the relationship between annual investment spending and firm indebtedness changed following the 2008 global financial crisis. Total assets are included in

⁸ Sum of the annual difference of tangible fixed assets and depreciation and amortization. Tangible fixed assets equals fixed assets less intangible fixed assets, e.g., goodwill.

⁹ Earnings before interest, depreciation, amortization, and taxes. As in Budina and others (2015) and Kalemlı-Ozcan and others (2015), the model uses the inverse of the indicator for a debt overhang, i.e., EBITDA over financial debt, as cash flow from operations may be zero or negative.

sample with all firms to control for differences arising from firm size. This variable is dropped in regressions on the sub-samples based on firm size. The samples include all firms that have been active throughout 2006–14.¹⁰

18. **For Slovenia, bank credit conditions are directly modeled as well.** A lagged explanatory variable (BLS) is added to the model for Slovenia to capture the potential role changes in bank credit conditions may have played in Slovenian firms' access to credit for investment.¹¹ The variable is the diffusion index calculated by the European Central Bank for Slovenia based on quarterly survey data that is designed to assess bank credit conditions.

19. **The repercussions of the global crisis altered the debt/investment relationship. (See Text Table and Annex II).** In periods of high growth and low corporate debt burdens, we would expect a positive relationship between the ratio of debt-to-assets and the investment rate, as firms are more likely and able to borrow and invest. We would also expect a negative relationship between the EBITDA-to-debt ratio and investment, as investment is mainly funded by borrowing rather than retained earnings. In contrast, with higher debt burdens and low growth, we would expect the relationship between the debt ratios and investment to reverse, i.e., higher corporate debt ratios in periods of depressed economic growth constrain investment. The regression results are in line with these expectations. Post crisis, firms' investment rates are more sensitive to their indebtedness and capacity to pay interest relative to the pre-crisis period. In addition, empirical results indicate that for Slovenian firms, thresholds exist for debt ratios, i.e., a turning-point level in the ratios' values above which debt begins to influence investment negatively.

Table 1. Point Estimates of Coefficients on Debt-Related Variables 1/

	Slovenia		Czech Republic		Hungary		Poland		Slovak Republic	
	(1) Pre 2/	(2) Post 2/	(3) Pre 2/	(4) Post 2/	(5) Pre 2/	(6) Post 2/	(7) Pre 2/	(8) Post 2/	(9) Pre 2/	(10) Post 2/
All firms										
Debt-to-assets	-0.123	-0.578***	-0.202***	-0.100*	-0.046	0.067***	-0.039	-0.557***	-0.192**	0.009
EBITDA-to-debt	-0.082***	-0.020	-0.098***	0.142***	-0.002	0.028***	-0.041*	-0.026	-0.109***	0.099***
Credit conditions		-0.623***								
Small and micro										
Debt-to-assets	-0.176	-0.668***	-0.246***	-0.131**	-0.045	0.065***	-0.156	-0.549***	-0.207**	-0.004
EBITDA-to-debt	-0.073**	-0.015	-0.111***	0.150***	-0.002	0.028***	-0.054**	-0.002	-0.111***	0.095***
Credit conditions		-0.620***								

Source: Orbis, IMF staff calculations
1/ Significance level: * p<0.10 **p<0.05 ***p<0.01
2/ "Pre" refers to observations in the period prior to 2009. "Post" is a linear combination of the coefficients on pre- and post-crisis observations.
Red = Change in coefficient value between pre- to post-crisis periods is consistent with economic theory.

¹⁰ This potentially introduces "survivor" bias in some results. In Slovenia's case, this may induce an under-estimation of the magnitude of the effects of leverage on investment, based on the findings of Vodopivec and Čede (2013). They found that the median leverage increased slightly between 2008 and 2012 for firms with 250+ employees that were still in existence in 2012, while if not accounting for changes in composition, median leverage decreased for these firms.

¹¹ The European Central Bank diffusion index is only available for Slovenia for the entire sample period.

- **More debt on top of already high debt levels leads to less investment.** A higher level of indebtedness reduces investment by Slovenian and Polish firms post crisis.¹² In the pre-crisis period, the coefficient on debt-to-assets (DA) is negative though insignificant. Post-crisis the coefficient becomes more negative and significant. In other words, as the indebtedness of firms in these countries increased, their investment rates fell. For firms in the other countries, some of which are less indebted, the coefficient on debt-to-assets turns positive post crisis and in some case is significant. A threshold analysis, described in Annex III, finds that in Slovenia large firms face a threshold debt-to-asset ratio of close to 76 percent, while the threshold for SME's is much lower at about 10 percent.
- **Earnings (and operational cash flow) matter more for investment.** The coefficient on EBITDA-to-debt becomes less negative or turns positive across all countries for the sample of all firms, and for the sub-sample containing only small and micro firms. This implies that a firm's ability or willingness to invest becomes more sensitive to operational cash flow relative to debt financing. The coefficient on EBITDA-to-debt for the pre-crisis period is more negative as firms took on more debt to finance investment. This possibly reflected overly optimistic assumptions by firms and their financiers about the ability of firms to service their debt burdens. The threshold analysis for Slovenian firms indicates the level for debt-to-EBITDA at which investment begins to decline is 8 for large firms and 1 for SMEs (See table).

Table 2. Optimal Debt Thresholds for Slovenia

Firm sample	Debt to assets (DA)	Debt overhang (OVER ¹)
	(Percent of assets)	(x EBITDA)
	Optimal	Optimal
Large	76	8
SME	10	1

Sources: Orbis; IMF staff calculations

- **Profits and cash matter.** As expected, more profitable and liquid firms invest more. The coefficients on cash-to-assets and return on assets are positive and statistically significant.

¹² Replacing the debt-to-assets ratio with an alternative measure of leverage, i.e., debt-to-equity, in the regression yields qualitatively similar results, though the coefficients are generally smaller. Also the direction of change on the coefficients for debt-to-equity from the pre- to post-crisis periods for the Czech and Slovak Republics is consistent with economic theory, whereas using debt-to-assets it is not.

Table 3. Point Estimates of Coefficients 1/

	Slovenia (1)	Czech (2)	Hungary (3)	Poland (4)	Slovakia (5)
All firms					
Return on assets	1.292***	1.060***	0.698***	2.143***	0.922***
Cash-to-assets	2.863***	3.534***	2.414***	3.519***	2.785***
Memorandum: R ²	0.230	0.228	0.312	0.306	0.277

Source: Orbis, IMF staff calculations
1/ Significance level: * p<0.10 **p<0.05 ***p<0.01

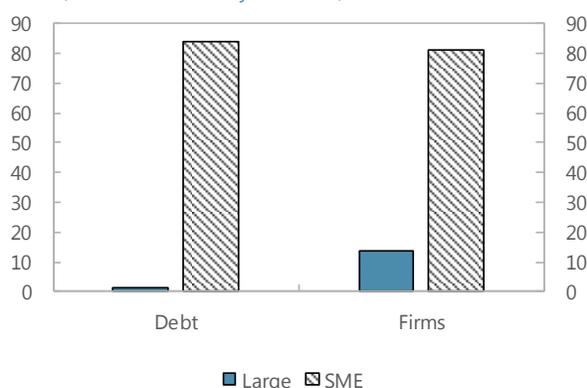
- **Tighter bank lending standards lower investment.** In all Slovenia-specific estimations, the coefficient on credit standards was negative, i.e., the investment rate was lower at higher bank credit standards (see chart), and highly significant. The magnitude of the impact was somewhat less for smaller firms. This result is consistent with the finding in Vodopivec and Čede (BoS, 2013) that the majority of firms with 1–15 employees do not rely on banks for financing.

20. **A “back of the envelope” calculation suggests that the aggregate debt of small- and micro-sized firms should be reduced by up to 30 percent of GDP from 2014 levels.**

The amount of further debt reduction depends on the amount of new equity financing obtained. With an average debt-to-asset ratio of 56 percent in 2014, medium-, small- and micro-size firms would need to reduce debt by about €12 billion, absent new equity, to lower the ratio to the threshold level of about 10 percent. New equity

would lower the needed amount of debt reduction. This matters for investment. Based on the firm-level data from Orbis, SMEs accounted for 60 percent of non-financial corporate investment over the period 2006–14. With a few exceptions, large firms’ debt-to-asset ratios are under the relevant threshold.

Debt Exceeding Debt/Assets Threshold, 2014
(Percent of total by firm size)



E. Policy options and conclusions

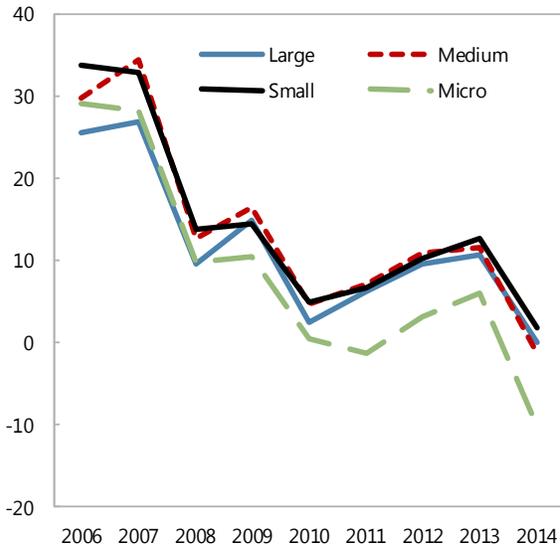
21. **This paper's findings indicate that corporate leverage, particularly for SMEs, needs to be reduced further to accelerate investment.** In addition, financial frictions are likely to remain elevated for some time in Slovenia and central European countries. International experience suggests possible further measures to restore corporate financial health and get

investment flowing. Below are examples of potential policy interventions, with a focus on Slovenia, that would be supportive of reducing corporate debt burdens and stimulating financing for corporate investment:

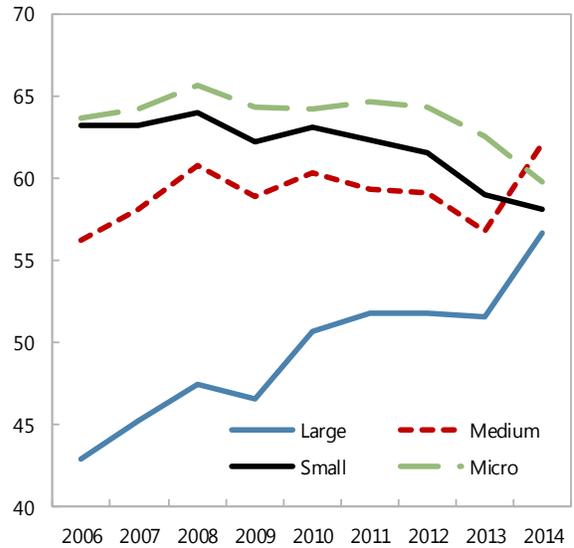
- Closely monitor bank implementation of the NPL guidelines provided by the Bank Association and the Bank of Slovenia, and adjust these guidelines if needed, based on the implementation experience.
- Consider again the benefits of a centralized privately funded entity (SPV) for SME NPL resolution. This would quickly reduce the lingering burden NPLs place on bank lending and stimulate greater economic activity by freeing up productive resources (e.g., blocked collateral).
- Further transfer assets to the Bank Asset Management Company (BAMC), especially claims on companies that are already part of its portfolio. This would facilitate speedier resolution of bad debts by mitigating creditor coordination issues.
- Explore ways to facilitate equity financing, including mezzanine financing, particularly for SMEs. Additional equity would provide resources for investment, and improve corporate leverage ratios enhancing the creditworthiness of corporate borrowers. Mezzanine financing, which may give the lender the right to convert to an ownership or equity interest in the company if the loan is not paid back, could help firms gain quicker access to financing for investment.
- Consider sponsoring or supporting regional efforts to develop a market in distressed debt (IMF, 2015d).

Figure 3. Slovenia, 2006–14

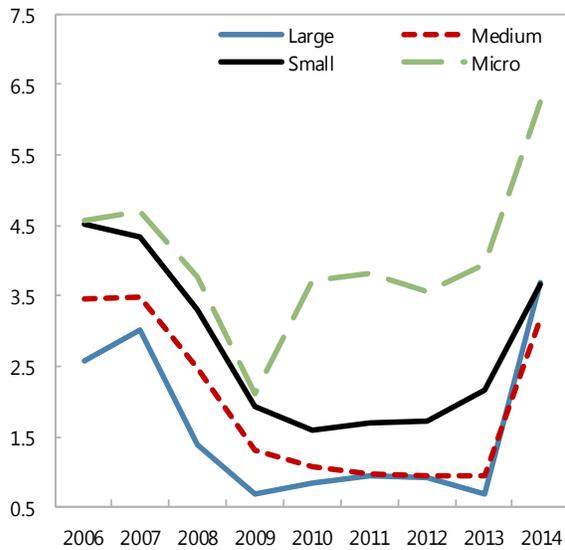
Investment
(Median, percent change in tangible fixed assets)



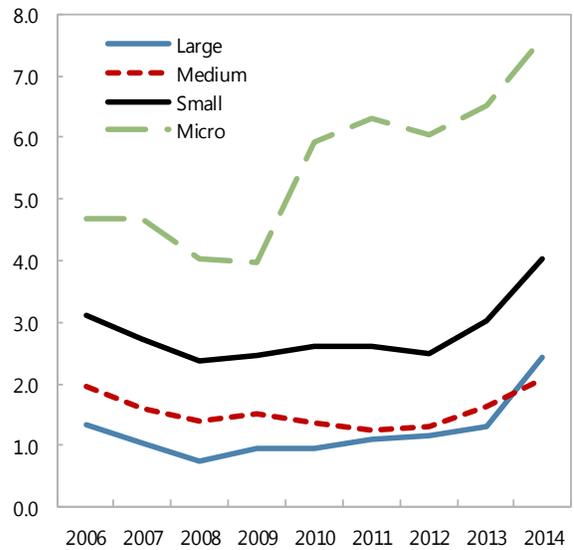
Debt-to-assets
(Median, percent)



Return on assets
(Median, percent)



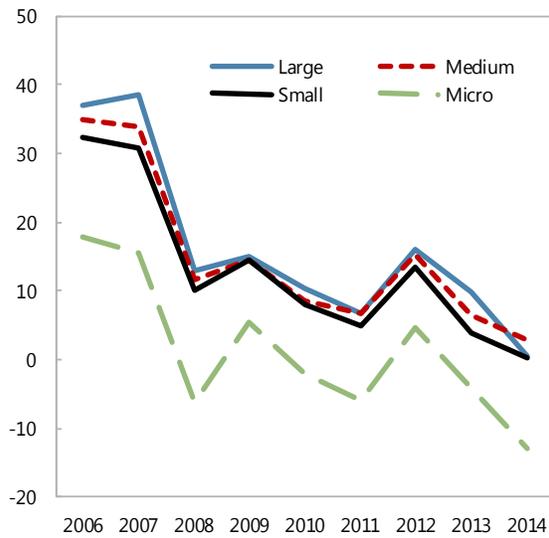
Cash-to-assets
(Percent, median)



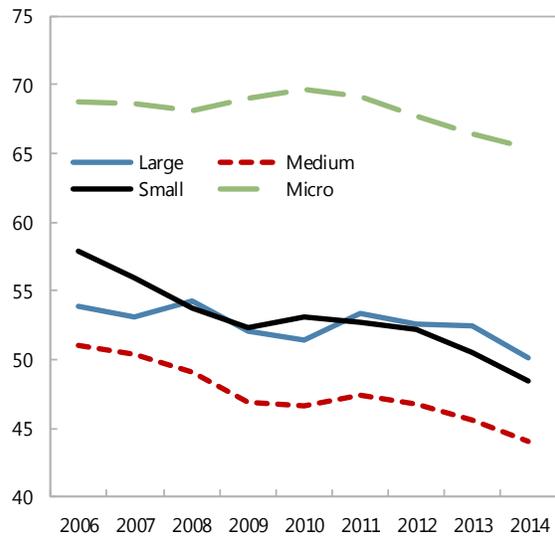
Sources: Orbis; IMF staff calculations.

Figure 4. Czech Republic, 2006–14

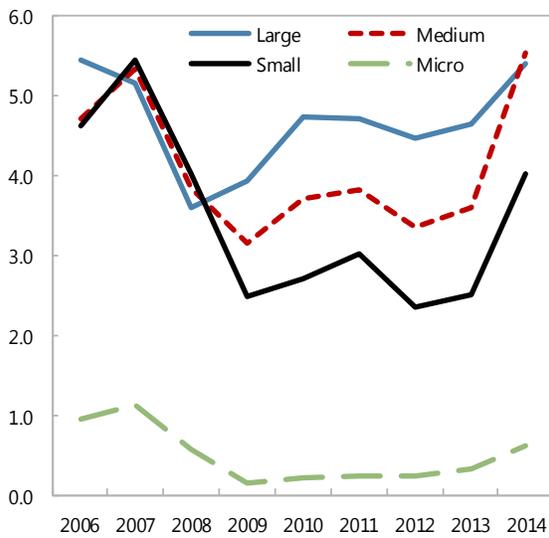
Investment
(Median, percent change in tangible fixed assets)



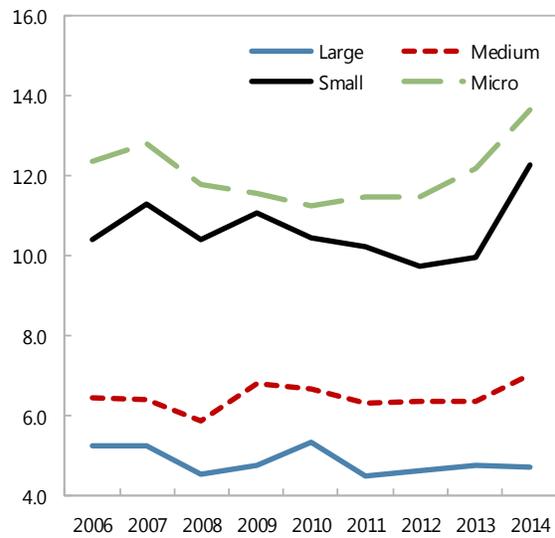
Debt-to-assets
(Median, percent)



Return on assets
(Median, percent)



Cash-to-assets
(Median, percent)

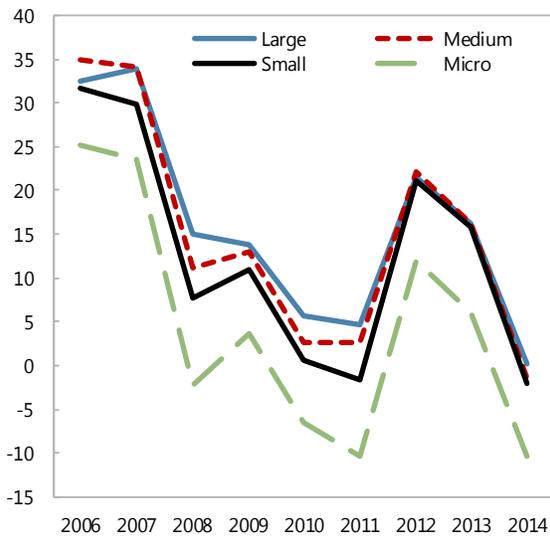


Sources: Orbis; IMF staff calculations.

Figure 5. Hungary, 2006–14

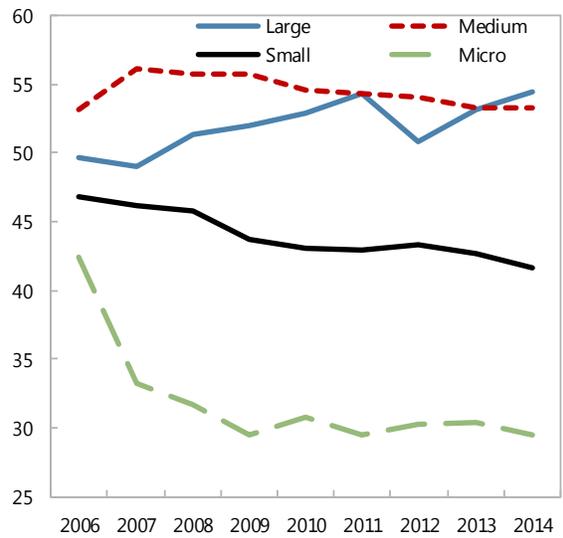
Investment

(Median, percent change in tangible fixed assets)



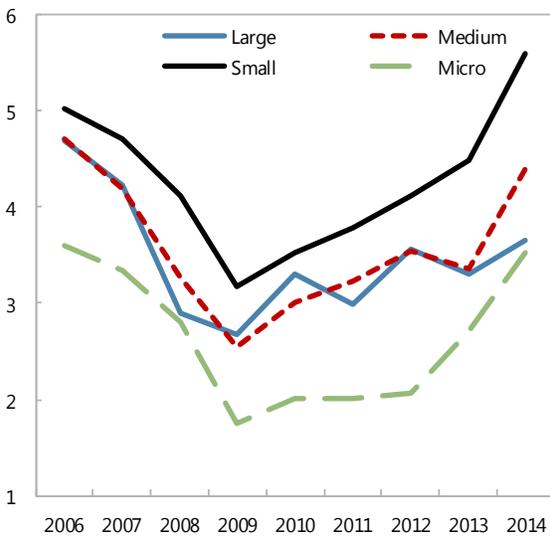
Debt-to-assets

(Median, percent)



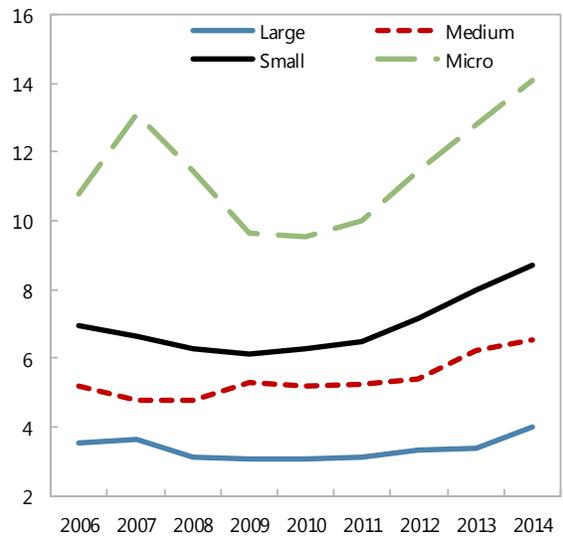
Return on assets

(Median, percent)



Cash-to-assets

(Median, percent)

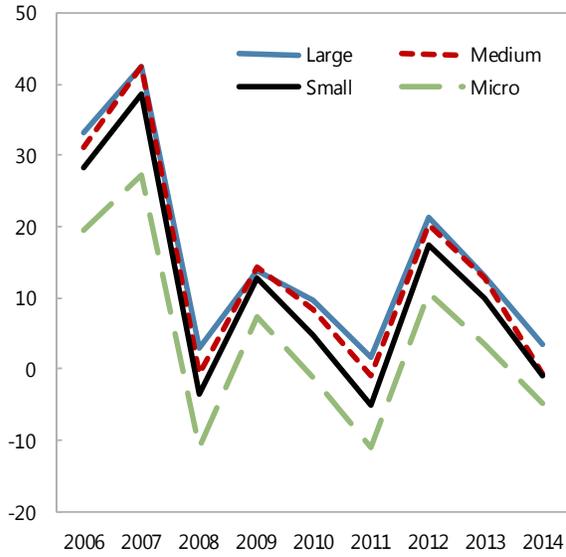


Sources: Orbis; IMF staff calculations.

Figure 6. Poland, 2006–14

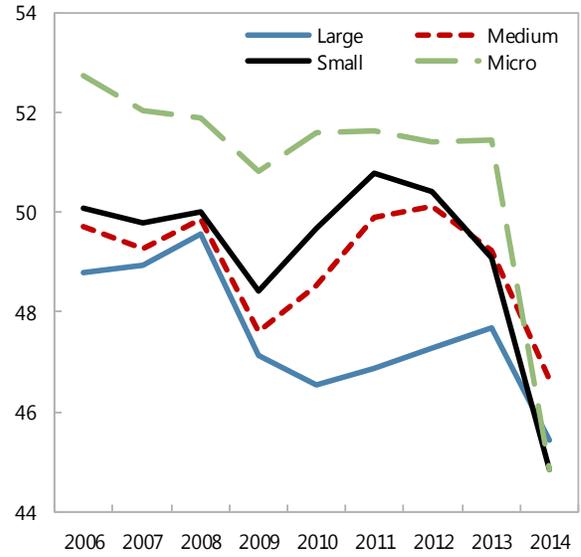
Investment

(Median, percent change in tangible fixed assets)



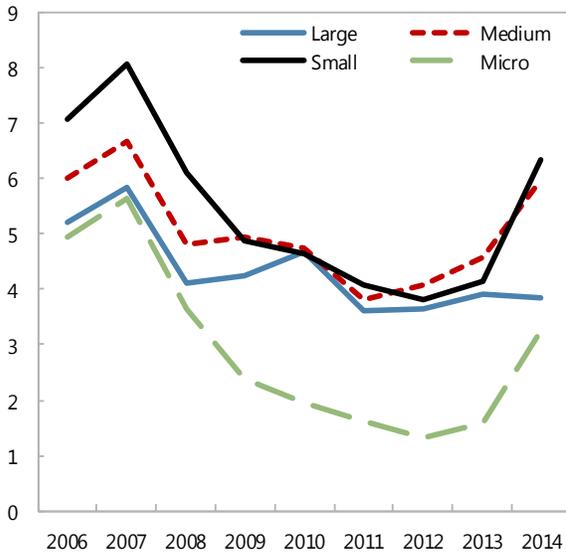
Debt-to-assets

(Median, percent)



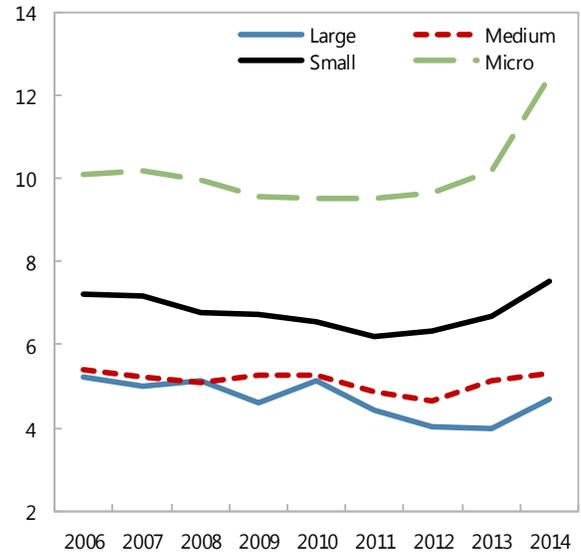
Return on assets

(Median, percent)



Cash-to-assets

(Median, percent)

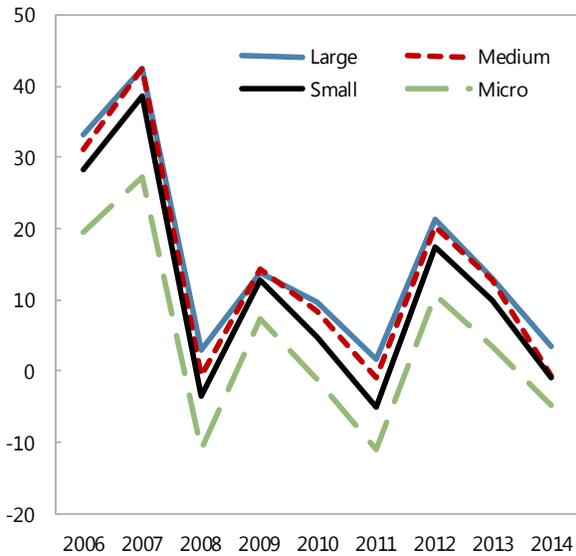


Sources: Orbis; IMF staff calculations.

Figure 7. Slovakia, 2006–14

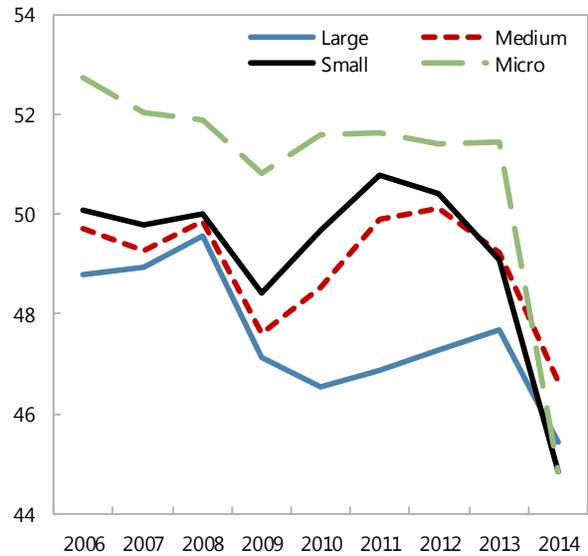
Investment

(Median, percent change in tangible fixed assets)



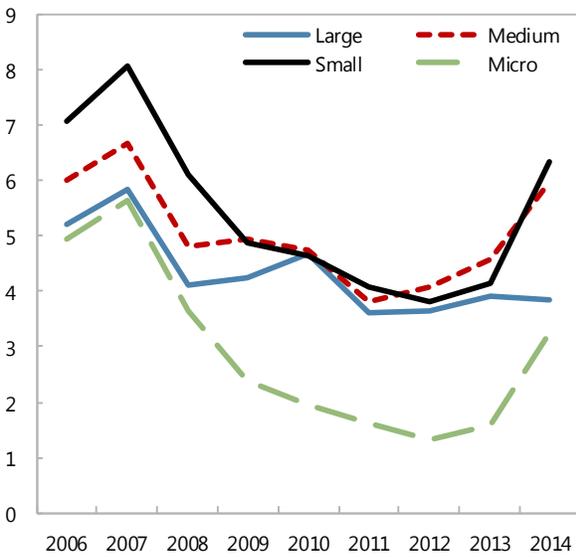
Debt-to-assets

(Median, percent)



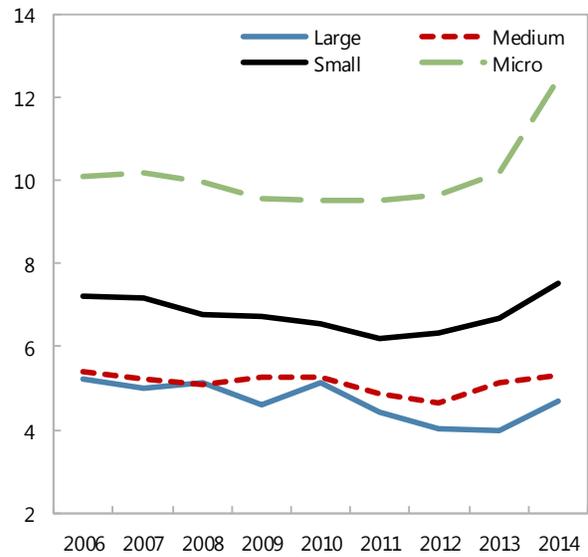
Return on assets

(Median, percent)



Cash-to-assets

(Median, percent)



Sources: Orbis; IMF staff calculations.

References

- Banka Slovenije, 2015, "Policy Strategy Paper for Slovenia, 2015," Ljubljana, Slovenia.
- Barkbu, Bergljot, S. Pelin Berkmen, Pavel Lukyantsau, Sergejs Saksonovs, and Hanni Schoelermann, 2015, "Investment in the Euro Area: Why Has it Been Weak," IMF Working Paper No. 15/32 (Washington: International Monetary Fund).
- Bending, Tim, Markus Berndt, Frank Betz, Philippe Brutscher, Oskar Nelvin, Debora Revoltella, Tomas Slacik and Marcin Wolski, 2014, "Unlocking Lending in Europe," Working paper, Economics Department (Luxembourg: European Investment Bank).
- Budina, Nina, Sergi Lanau and Petia Topalova, 2015, "The Italian and Spanish Corporate Sectors in the Aftermath of the Crisis," IMF Selected Issues Paper, IMF Country Report No. 15/167, pp. 22-48.
- Capriolo, Gonzalo, and Miha Trošt, 2015, "Deleveraging of Non-financial corporations: Taking stock," (*Forthcoming in Bancni Vestnik*)
- Christiansen, Lone, and Annette Kyobe, 2014, "Corporate Sector Vulnerabilities," Selected Issues Paper, IMF Country Report No. 14/174 (Washington, D.C.: International Monetary Fund).
- Damijan, Jože, 2014, "Corporate financial soundness and its impact on firm performance: Implications for corporate debt restructuring in Slovenia," EBRD, Working Paper No. 168.
- Fazzari, Steven, Glenn Hubbard and Bruce Peterson, 1988, "Financing Constraints and Corporate Investment," *Brookings Papers on Economic Activity*, Vol. 1. pp. 141-95.
- EBRD, 2014, *Strategy for Slovenia* (London: European Bank for Reconstruction and Development).
- EBRD, *Transition Report 2015-16*, 2015, "Rebalancing Finance," (London: European Bank for Reconstruction and Development) (*Draft*).
- European Central Bank, 2014, "Deleveraging Patterns in the Euro Area Corporate Sector," *ECB Monthly Bulletin* (February).
- Gabrijelčič, Mateja, Uroš Herman, and Andreja Lenarčič, 2015, "Debt Financing and Firm Performance before and during the Crisis: Micro-Financial Evidence from Slovenia," Ljubljana, Slovenia.

Annex I. Definitions of Financial Ratios, Variables, and Firm sizes

CAS	Liquidity (Cash and cash-equivalents/Total assets)
DA	Debt-to-assets (Financial debt ¹ /Total assets)
DE	Debt-to-equity (Total liabilities/Shareholders' equity)
EBITDA	Earnings before interest, taxes, depreciation, and amortization, i.e., total revenue less total expenses (excluding interest, taxes, depreciation, and amortization).
ICR	Interest coverage ratio (EBITDA/Financial expense)
PRMG	Profit margin (Earnings before taxes (EBT)/Operating revenue)
OVER	Debt overhang (Financial debt/EBITDA)
ROA	Return on assets (EBITDA/Total assets).

Firm Size Classification				
(in millions of euros, unless otherwise specified)				
	Large	Medium	Small	Micro
	>=	>=	>=	
Operating revenue	100	10	1	
Total assets	200	20	2	
Employees (number)	1000	150	15	
Other criteria	or listed	and not large	and not large or medium	All others

Source: Orbis by Bureau van Dijk
1/ Must match at least one of the conditions to be included in the size designation.

¹ Financial debt equals long-term debt plus current liabilities. Alternatively, it equals total liabilities less other non-current liabilities.

Annex II. Regression Results by Country and by Firm Size

Dependent variable: Log-difference of tangible fixed assets												
	Slovenia				Czech Republic				Hungary			
	SI	SI_1	SI_2	SI_3	CZ	CZ_1	CZ_2	CZ_3	HU	HU_1	HU_2	HU_3
Cash-to-asset	2.863***	40.350***	0.455	2.911***	3.534***	2.877	3.197***	3.573***	2.414***	1.443	3.958***	2.399***
	0.000	0.000	0.735	0.000	0.000	0.134	0.000	0.000	0.000	0.594	0.000	0.000
Debt-to-assets	-0.123	-1.741	0.797	-0.176	-0.202***	-1.091	-0.289	-0.246***	-0.046	-1.176	-0.161	-0.045
	0.490	0.435	0.340	0.320	0.005	0.469	0.405	0.001	0.133	0.542	0.702	0.143
Return on assets	1.292***	18.675***	6.791***	1.131***	1.060***	5.290**	2.195***	0.907***	0.698***	1.848	1.757***	0.689***
	0.000	0.002	0.000	0.000	0.000	0.021	0.000	0.000	0.000	0.376	0.000	0.000
Debt overhang	-0.082***	-4.183**	-1.307***	-0.073**	-0.098***	-2.213**	-0.149	-0.111***	-0.002	-0.196	0.055	-0.002
	0.007	0.042	0.000	0.016	0.000	0.014	0.274	0.000	0.679	0.904	0.758	0.753
DA (post)	-0.455***	2.527	0.636	-0.492***	0.102*	0.578	1.151***	0.115**	0.113***	-0.889	0.567	0.110***
	0.003	0.400	0.373	0.002	0.067	0.674	0.000	0.041	0.000	0.613	0.154	0.000
Overhang (post)	0.062*	2.796*	1.143***	0.058*	0.240***	0.600	0.494***	0.262***	0.030***	-0.024	0.059	0.030***
	0.075	0.078	0.001	0.100	0.000	0.408	0.000	0.000	0.000	0.987	0.754	0.000
Bank survey	-0.623***	-0.717***	-0.781***	-0.620***								
	0.000	0.005	0.000	0.000								
r2	0.230	0.167	0.190	0.236	0.228	0.081	0.135	0.251	0.312	0.118	0.226	0.316
F	718.5	4.2	38.5	685.6	2590.5	7.1	192.9	2503.1	10301.3	4.2	150.4	10257.9
N	51,775	345	3,525	47,905	187,665	1,777	24,841	161,047	446,694	808	11,456	434,430

	Poland				Slovakia			
	PL	PL_1	PL_2	PL_3	SK	SK_1	SK_2	SK_3
Cash-to-asset	3.519***	3.699*	4.008***	3.463***	2.785***	-1.423	1.715**	2.815***
	0.000	0.052	0.000	0.000	0.000	0.748	0.031	0.000
Debt-to-assets	-0.039	0.313	0.389	-0.156	-0.192**	0.158	0.010	-0.207**
	0.757	0.759	0.251	0.243	0.030	0.949	0.986	0.021
Return on assets	2.143***	3.729**	3.479***	1.843***	0.922***	-1.916	1.898**	0.894***
	0.000	0.017	0.000	0.000	0.000	0.621	0.023	0.000
Debt overhang	-0.041*	-0.127	-0.055	-0.054**	-0.109***	0.858**	-0.321	-0.111***
	0.072	0.707	0.569	0.019	0.000	0.047	0.208	0.000
DA (post)	-0.519***	-0.612	-1.089***	-0.393***	0.202**	0.363	0.898	0.203**
	0.000	0.532	0.000	0.001	0.010	0.857	0.124	0.010
Overhang (post)	0.015	0.078	-0.057	0.052**	0.207***	0.493	0.787***	0.206***
	0.516	0.852	0.523	0.025	0.000	0.669	0.007	0.000
r2	0.306	0.149	0.265	0.328	0.277	0.341	0.222	0.281
F	2130.7	19.8	362.6	1812.5	1902.0	12.4	69.2	1850.0
N	110,090	2,226	22,040	85,824	95,647	388	5,429	89,830

Note: All regressions include firm and year fixed effects. Standard errors are clustered at the firm level.
p-values in parentheses: * p<0.10; ** p<0.05; *** p<0.01
1/ First country column is for sample with all firms in that country. Other country-columns: 1=large firms; 2=medium firms; 3=small and micro firms.

Annex III. Threshold Effects

We tested for the existence of a “turning point” threshold effect between the rate of investment and the debt-to-assets and debt-to-EBITDA ratios in Slovenia. The turning-point level is the ratio value above which debt begins to influence investment negatively. The base for the model is the same as equation (1) in the main text. The primary difference is that the pre- and post-designations for the variables that reflect a firm’s debt burden have been replaced with a variable that measures the degree to which a given debt burden varies relative to potential threshold value. The methodology follows that in Hansen (1999) and Khan and Senhadji (2000). Immediately below is the specification for the test for a debt-to-assets threshold:¹

$$d\ln(I_{i,t}) = \gamma_1 da_{i,t-1} + \gamma_2 dum_{i,t-1}^{DA^*} (da_{i,t-1} - DA^*) + X_{i,t-1}\beta + \alpha_i + \alpha_t + \varepsilon_{i,t}$$

$$dum_{i,t-1}^{DA^*} = \begin{cases} 1 & \text{if } da_{i,t-1} \geq DA^* \\ 0 & \text{if } da_{i,t-1} < DA^* \end{cases}$$

da	= Debt to assets
X	= Vector of control variables (CAS, ROA, OVER)
DA^*	= Threshold level for debt to assets
dum	= Dummy variable that equals one if $da_{i,t-1}$ is greater than threshold; zero otherwise
α_i	= Firm fixed effects
α_t	= Year fixed effects
$\varepsilon_{i,t}$	= Error term

The threshold level DA^* is chosen so as to minimize the residual sum of squares $S(da)$ with the threshold level fixed at da .

$$DA^* = \underset{da}{\operatorname{argmin}} \{S(da), da = \underline{da}, \dots, \overline{da}\}, \text{ where } \underline{da} = 1 \text{ percent and } \overline{da} = 100 \text{ percent.}$$

Regressions were run for a sub-sample of large firms and another one for a sub-sample of SMEs, i.e., all firms not classified as large. In the test for a debt-to-asset threshold, this amounted to one hundred regressions per sub-sample. The procedure was repeated to test for a threshold level of EBITDA-to-debt, substituting $over^{-1}$ for da , with a threshold range of 1 to 10 and an increment of one. The γ s are the coefficients of interest:

- γ_1 is an estimator of the effect of the debt burden on the change in investment for firms whose debt burden is less than the potential threshold;

¹ The specification for the test for a debt-to-EBITDA threshold replaces the regressor $da_{i,t-1}$ with $over_{i,t-1}^{-1}$ (i.e., debt-to-EBITDA) and threshold variable DA^* with $OVER^{-1}$.

- γ_2 is the coefficient on the difference between the observed debt burden and the threshold if the observed debt burden is higher than the potential threshold; and
- $\gamma_1 + \gamma_2$ is the impact of the debt burden variable on the change in investment when the variables value is higher than the potential threshold.

The “turning point” thresholds are identified on the ground of best fit (minimizing the RSS). For example, the thresholds reported in the table in the main text for debt-to-assets, are the threshold levels that correspond to the lowest residual sum of squares across the 100 regressions run for the specified sub-sample of firms. In practical terms, the turning-point threshold implies: the marginal debt accumulated after debt hits the threshold diminishes investment growth.

ECB QUANTITATIVE EASING: IMPLICATIONS FOR FISCAL POLICY¹

A. Introduction

1. **The past few years have witnessed substantial monetary easing by the ECB.** With inflation running well below target, the ECB has been pursuing unconventional monetary policy easing actions, as the zero lower bound (ZLB) is constraining the use of its short-term interest rate instruments. The latest round of quantitative easing (QE) implemented since mid-2015 constitutes the most significant easing episode in the EA to date. The ECB plans to keep this policy in place at least through March 2017, but has not ruled out extending it beyond that date, and/or broadening the range of eligible securities, depending on progress on reaching its inflation target.
2. **The latest round of QE focuses on the long end of the yield curve. QE is implemented primarily** via purchases of long-term paper of EA sovereigns in the secondary market. The aim is to bring down long-term interest rates, and thereby boost credit (which remains subdued since the global financial crisis) and aggregate demand. Other potential transmission channels include the exchange rate, wealth, and portfolio rebalancing channels.
3. **The planned size of QE is substantial, both for the EA as a whole and for Slovenia.** With total planned purchases of government paper in excess of €1 trillion (Table 1), the size of QE is very large when compared with earlier ECB easing episodes. By end 2015 roughly $\frac{1}{3}$ of the planned purchases had been implemented, with the rest still in the pipeline. Regarding Slovenia, the size of QE is also quite significant as measured against key debt market metrics: at €4 billion, planned purchases of Slovenian paper represent some 12 percent of end-2015 public debt and around $\frac{2}{3}$ of the medium- and long-term debt amortization in 2016–17. As with the rest of EA, the bulk of planned purchases of Slovenian paper remain to be implemented.
4. **This paper explores the appropriate response of fiscal policy to QE in the case of Slovenia.** While the monetary aspects of QE, including the relevant channels through which it can be expected to impact output and prices, have been researched extensively in the literature, the question of the appropriate fiscal policy response has received much less attention. This is surprising given that the impact of QE on public debt service costs is in many cases quite significant, and that fiscal policy can play a role if other transmission channels turn out to be less potent than expected- particularly in an environment of extensive private sector deleveraging. This paper explores this issue for the case of Slovenia.
5. **By way of preview of the paper's policy conclusions, empirical and analytical considerations would argue for a nontrivial fiscal response in Slovenia's case.** While the temporary nature of QE would argue against deviating from medium-term fiscal targets and the

¹ Prepared by Ioannis Halikias.

much-needed consolidation of current expenditure, some front-loading of public investment would appear justified. This temporary loosening of the primary balance (relative to a counterfactual without QE) should, however, less than fully offset the lower interest costs, so that the overall budget deficit and public debt should still decline. Importantly, the success of this strategy is critically contingent on putting in place a credible medium-term consolidation plan, underpinned by structural fiscal measures.

B. Fiscal “Windfall” of QE

6. **The launch of QE has had a substantial impact on Slovenia’s bond yields.** Slovenia’s bond yields had already been declining steadily since the bank recapitalization at end-2013, with spreads vis-à-vis core EA countries having narrowed by almost 400 basis points by early 2015; as a result, Slovenia’s yields had reached Spanish/Italian levels just prior to the launch of QE. Since QE launch, Slovenia’s yields have declined further, by almost 150 basis points, broadly in line with most other EA periphery countries (Figure 1). The contribution of lower spreads vis-à-vis the core to this more recent decline was relatively limited, suggesting that Slovenia’s post-QE trends have been part of the broader EA-wide picture.

7. **Slovenia’s public debt service costs have declined relatively more than those of most other EA countries.** Calculation of the impact of QE on debt service costs relative to a “non-QE” baseline takes into account sovereign gross financing needs over the QE period (2015-17), but also prefinancing at lower interest rates for future years, as well as debt buybacks and other debt management operations. Application of a consistent methodology across EA countries, which considers the maturity structure of the full range of government securities, suggests that Slovenia’s QE-related “fiscal windfall” is comparatively large (Figure 2): at 0.5 percent of GDP per year on average over 2016-17, it is somewhat lower compared to Italy and Ireland, but significantly larger compared to most other EA countries. These differences reflect less the magnitude of sovereign yield decline (as Slovenia is not an outlier in this regard), but mainly Slovenia’s comparatively large near-term rollover needs. In turn, this is a reflection of Slovenia’s market access difficulties since the global crisis and up to late 2013, which forced large (and expensive) short-term borrowing.

8. **The comparatively large QE-related “fiscal windfall” enjoyed by Slovenia renders the question of appropriate fiscal response policy relevant.** The policy question is to what extent these *temporarily* lower debt service costs provide room for some primary balance loosening, and to what extent they should be saved. The remainder of the paper takes up this issue.

C. Fiscal Reaction Functions – Empirical Analysis

9. **The question of how fiscal policy tends to respond to borrowing cost shocks has been the subject of limited recent empirical work.** The typical methodology of choice tends to employ vector autoregressions (VARs) on single-country or cross-country panels – de Groot et. al. (2015) being a recent reference, although single-equation estimation has also been pursued – see, for example, Cizkowicz et. al. (2015). A consensus result in the literature seems to be that, in response to lower borrowing costs, countries tend to loosen their primary fiscal balance, but not by the full

extent of the decrease in debt service costs; accordingly, the overall balance tends to improve and the public debt ratio ends up lower after the shock.

10. **As a starting point, we estimated a standard VAR to capture historical fiscal reaction functions to cost of borrowing shocks.** Specifically, a 5-variable VAR was employed, including as endogenous variables the effective interest rate **R** (defined as interest payments over last period's debt stock), the primary balance as a ratio to GDP **PB**, real GDP growth **g**, inflation **INF**, and the public debt ratio **DEBT** as a predetermined variable. The system was estimated with one lag (as indicated by the Akaike criterion), employing a Cholesky identification for the endogenous variables, on a panel consisting of all 12 EA countries over the full 1998-2015 EMU period. In line with the recent literature, this was an **unconstrained** VAR, whereby R is shocked by 1 percentage point, and is thereafter allowed to evolve endogenously.

11. **The empirical results of the unconstrained VAR are on the whole intuitive and in line with recent work.** The estimated impulse responses (Figure 3) suggest that, following a negative 100 basis point R shock, fiscal policy responds by easing, with PB dropping almost 0.3 percentage points below baseline four years after the shock. Nonetheless, the lower PB offsets the impact of the R shock on debt service costs only partially, and as a result DEBT falls, remaining some 2 percentage points below baseline by the end of the five-year horizon. These results are reasonably close to the literature – e.g. de Groot et. al. (2015). With regard to the other endogenous variables, the impulse responses confirm a positive impact on INF (after a very brief “price puzzle” period); on the other hand no significant impact on output growth could be documented (impulse response not shown).

12. **While the above results are suggestive, the unconstrained VAR specification may not adequately capture key design features of QE.** Letting R evolve endogenously following the initial shock yields a path that exhibits limited persistence, with about half the shock gone by year two. By contrast, QE is planned to remain in place for at least two years.

13. **To address these issues, we also estimated a class of constrained VARs, whereby R is restricted to remain at its initial post-shock level over a two-year period.** Beyond year two, the pace of unwinding QE (and hence the evolution of long-term rates) will presumably hinge on the response of EA inflation. For the present purposes, two alternative VAR specifications are employed to capture different possibilities regarding the pace of QE unwinding: A **“gradual unwinding”** specification (Constrained VAR I), whereby R is allowed to evolve endogenously after year two; and a **“rapid unwinding”** specification (Constrained VAR II), whereby R goes quickly back to baseline by year three and remains at that level for the remainder of the forecast horizon – this scenario could correspond to strong inflation response that leads the ECB to quickly reverse its securities purchases. Other than the constraints imposed on the path of R, the constrained VARs retain the unconstrained VAR specification.

14. **The estimated fiscal response under the “gradual unwinding” specification is qualitatively similar to the unconstrained VAR, but the size of the effects is somewhat larger.** The impulse responses corresponding to Constrained VAR I (Figure 4) suggest that the PB response to the R shock is more persistent, with PB falling by 0.35 percentage points below baseline by year

one, by 0.5 percentage points by year two, and by 0.6 percentage points below baseline by year three. Thereafter, fiscal policy starts tightening gradually, but PB remains at some ½ percentage point below baseline through year five. Despite this easier fiscal stance (in primary balance terms), lower average borrowing costs and (to a smaller extent) higher inflation keep DEBT somewhat lower relative to the unconstrained VAR throughout the five-year forecast horizon.

15. **The profile of the estimated fiscal response under the “rapid unwinding” specification shows intuitively compelling differences.** The impulse responses corresponding to Constrained VAR II (Figure 5) suggest a distinctly sharper tightening as QE is unwound. Specifically, like in the gradual unwinding scenario, PB falls by 0.3 percentage points below baseline by year one and by 0.5 percentage points by year two; after that point, however, a much sharper tightening sets in, with PB getting back to baseline by year four, and actually ending up above baseline by the end of the forecast horizon. These differences in fiscal response make intuitive sense: Faced with a rapid unwinding of QE, the fiscal authorities front-load spending to take advantage of low financing costs, but then tighten sharply to get back to their medium-term baseline as borrowing costs bounce back rapidly. Finally, the decline in DEBT is more moderate compared to the “gradual unwinding” case, ending up less than 1 percentage point below baseline by the end of the forecast horizon, as higher interest cost and lower inflation dominate the tighter PB.

16. **Overall, despite these differences, the estimation results under both QE-relevant specifications paint a qualitatively consistent picture.** The following results appear reasonably robust as regards the fiscal response to lower borrowing costs: the primary balance tends to loosen upfront while borrowing cost remain low; however, this primary easing does not fully offset the lower interest bill; as a result, the overall balance improves and the debt ratio falls.

D. Fiscal Reaction Functions – Analytical Considerations

17. **While the empirical results discussed above appear reasonably robust, the question remains whether they can be viewed as optimal policy response in models with optimizing household and government behavior.** Answering this question is important for the purposes of conducting welfare analysis that can form the basis for extracting plausible policy conclusions. It turns out that a fairly general class of micro-founded theoretical models, which emphasize consumption smoothing, can yield results consistent with the empirical patterns documented in the previous section. By way of illustration, a slightly modified version of the model employed by de Groot et al. (2015) can help clarify the intuition. The main building blocks of the model are as follows:

- Household intertemporal utility maximization, with households deriving utility both from private consumption and public good provision – the latter being treated as exogenous and subject to a stochastic shock;
- Household intertemporal budget constraint, with household income consisting of labor income taxed at an exogenous tax rate, subject to a stochastic shock;

- Interest rate faced by households is an increasing function of total household debt;
- Government intertemporal budget constraint, with changes in the expenditure and tax fiscal instruments subject to (convex) adjustment costs;
- Interest rate faced by the government is an increasing function of government debt.

18. **By imposing that fiscal authorities have the capacity to commit to a certain deficit path *ex ante*, this class of models can generate results consistent with the empirical findings of the previous section.** Commitment capacity allows a (benevolent) government to follow a time-invariant optimal policy by maximizing household utility subject to resource constraints and households' first-order equilibrium conditions. Without going into the details of the requirements for a closed-form solution, the setup of the model provides intuition with regard to the empirical findings of the previous section. Higher government expenditure in response to temporarily low interest rates is a direct implication of optimal household consumption smoothing that includes the utility provided by higher public spending. Moreover, a temporarily low interest rate today (implying that it will be higher in the future) leaves the household and government intertemporal budget constraints unaffected, implying that (noninterest) spending will have to be lower in the future to revert to their respective steady-state debt paths.

19. **The assumption of perfect commitment capacity, however, is in many cases a strong one.** The perfect commitment assumption rules out time inconsistency, which would lead the fiscal authority to re-optimize each period; in such an environment, it is clear that a time-invariant optimal policy cannot be supported. Yet there is strong evidence that time inconsistency problems are pervasive in policymaking, with present bias for public spending in the case of fiscal policy having received considerable attention in the literature. Wide concern about these issues is evidenced by the perceived need to adopt a variety of commitment mechanisms, such as fiscal rules in the case of fiscal policy.

20. **In the presence of time inconsistency suitable extensions of the model can restore the analytical basis of the empirical results.** To address these problems, the simple model described above can be extended to incorporate endogenous commitment mechanisms which can support an optimal tradeoff between the government's committing not to overspend against its desire for flexibility to respond to privately observed shocks to the social value of spending. Extending the model along these lines, as suggested by Halac and Yared (2014, 2015), which in turn builds on commitment mechanisms derived by Amador et al. (2006) in a more general context, would be a relatively straightforward option. Such an extension would add a history-dependent dimension to the optimal rule to support commitment, but would otherwise leave intact most of the key features of the simpler model.² While the extended model's additional complexity would typically not allow closed-form solutions, a wide range of calibrated parameter values validates the main empirical results of the previous section: a temporary increase in primary expenditure in response to a

² An extension along the lines of Halac and Yared (2015), in particular, also provides a welfare assessment of decentralized versus centralized (e.g. SGP-type) fiscal rules which is relevant for EA countries.

temporary decline in interest rates, which however does not fully offset the savings in debt service costs, with debt eventually returning to its original steady state level.

E. Policy Implications and Additional Constraints

21. **The empirical results and theoretical discussion of the previous sections provides a basis that can underpin policy recommendations on the appropriate fiscal response to QE in Slovenia's case.** Given the temporary nature of QE, there is little ground to deviate from a medium-term objective for the primary balance that safeguards public debt sustainability.³ At the same time, there appears to be scope for some flexibility in the near term that would allow for a transitory increase in public good provision. In terms of quantifying this extra room, the VAR results under the QE-relevant specifications suggest that roughly half of the QE-related interest savings could be spent over a two year horizon; in conjunction with the estimated "fiscal windfall" for Slovenia (Figure 2), this would imply room to raise primary spending by some ¼ percentage points of GDP each year during 2016-17.

22. **Public investment appears to be the best candidate to make use of this extra primary spending space.** Given the need to adhere to the medium-term fiscal targets, any up-front spending increase would need to be reversed in later years – this would seem to rule out spending categories such as the wage bill, transfers, and, possibly, spending on goods and services, as increases in these categories tend to be politically difficult to scale back. By contrast, public investment (either the EU-funded or the domestic component) is probably best suited to make use of the temporary spending room, given that it is typically part of a multi-year spending plan, and as such its reallocation across different periods should be easier. An additional argument for choosing public investment is that it could help offset any underperformance in private investment relative to the baseline in the near term, whose projected rebound is key for sustaining the recovery.

23. **In determining the scope for additional, front-loaded primary spending, a number of potential additional constraints also need to be taken into account.** These constraints could not be adequately incorporated in the empirical and analytical models considered above:

- **Consistency with the SGP:** Any near-term stimulus would need to be consistent with SGP requirements, notably the constraint of not breaching the 3 percent deficit limit. Assuming that Slovenia adheres to its 2016-17 budget targets, the temporary expansion suggested above would leave it comfortably below this threshold. While the precautionary arm of the EDP also prescribes a minimum annual structural fiscal adjustment, adequate safeguards that Slovenia will adhere to its medium-term fiscal targets, including importantly through structural fiscal reforms of current spending that strengthen credibility (see also below), should allow some flexibility in this regard.
- **Implementation capacity:** Availability of public investment projects with high rates of return and administrative capacity to adequately manage them could also be a potential

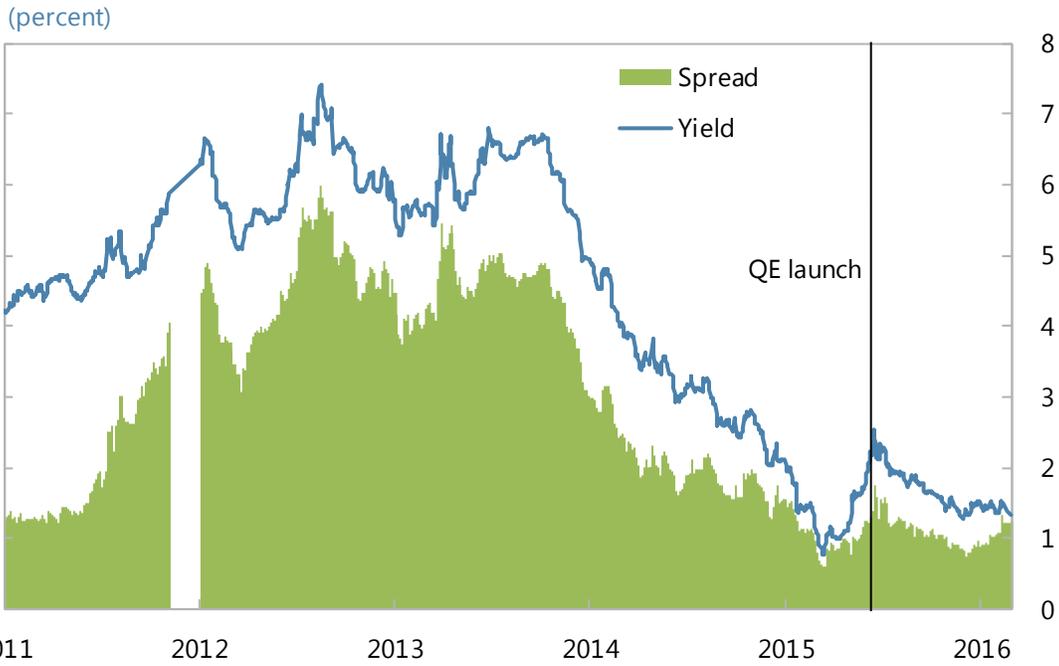
³ On Slovenia's medium-term fiscal strategy, see Government of the Republic of Slovenia (2015).

constraint. Calibrating this constraint at the average of the three highest levels of public investment (in terms of GDP) reached over the previous 10-year period suggests that the envisaged temporary public investment increase should be attainable.

- **Avoiding fiscal procyclicality:** The models discussed above do not adequately capture cyclical considerations, but it would arguably not be desirable to be providing extra stimulus if it threatens to move the economy significantly above potential. IMF staff estimates of a still negative output gap, together with absence of inflationary pressures and a large current account surplus provide assurance in this regard.

24. **It should be emphasized that the suggested strategy of a front-loaded primary spending expansion hinges crucially on a credible medium-term fiscal consolidation strategy.** Indeed, it is essential that higher primary spending in the near term not be perceived as signaling that Slovenia's medium-term fiscal targets could be compromised, as such credibility costs could more than offset any benefit deriving from the suggested near-term strategy. Accordingly, it is essential that any near-term stimulus should be pursued in the context of developing a credible consolidation strategy—underpinned by an adequate institutional framework—that provides strong assurances that fiscal sustainability will be maintained. In this sense, the envisaged near-term flexibility can be viewed as a benefit of medium-term credibility.

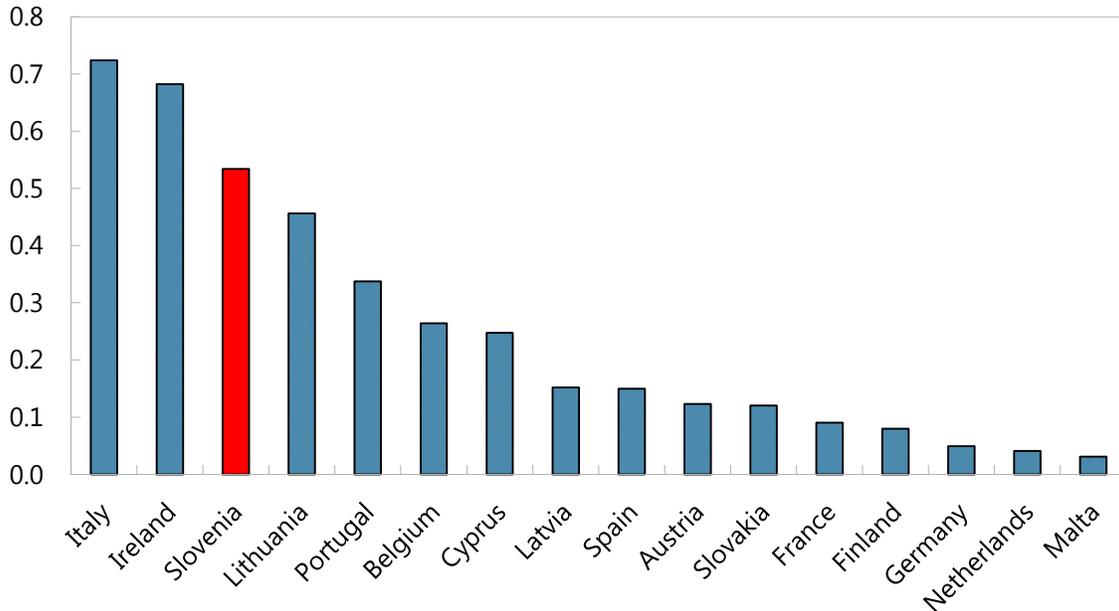
Figure 1. 10-Year Government Bond Yield and Spread vs. Germany



Source: Bloomberg.

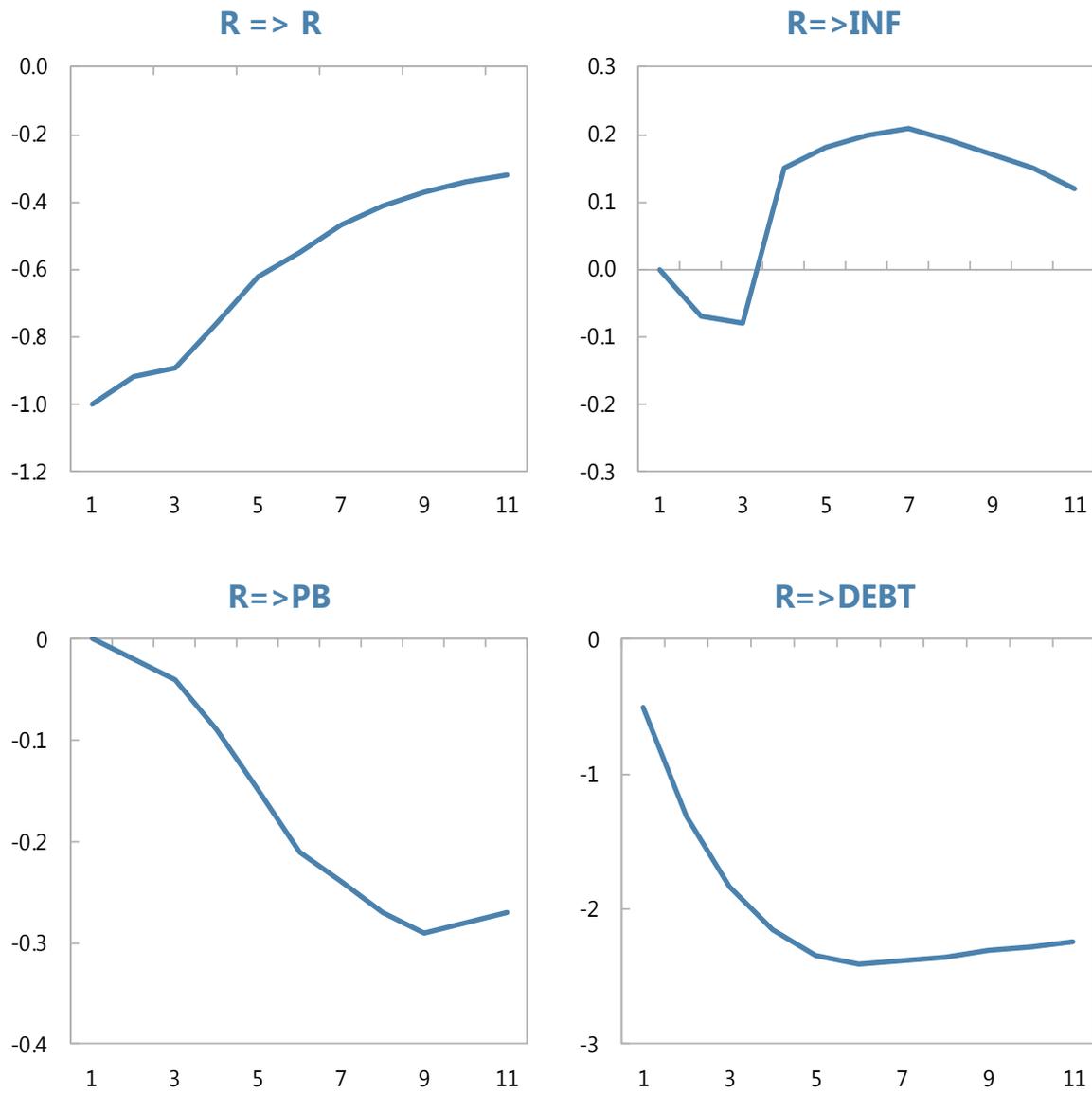
Figure 2. Selected Euro Area Countries: Estimates of Funding Cost Savings From QE, 2016–17

(Annual average, percent of GDP)



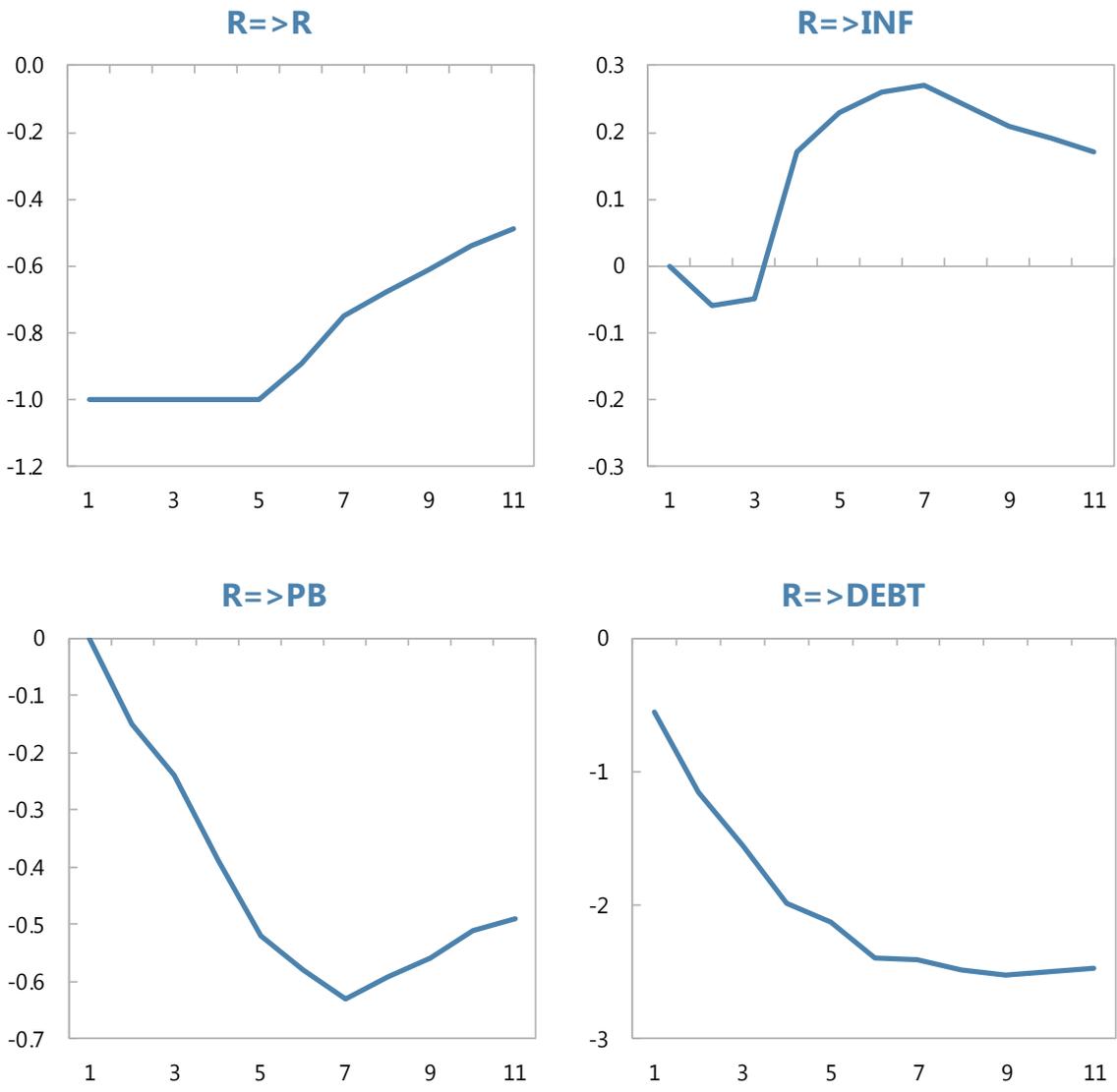
Sources: Bloomberg, ECB, and IMF staff calculations.

Figure 3. Impulse Responses-Unconstrained VAR



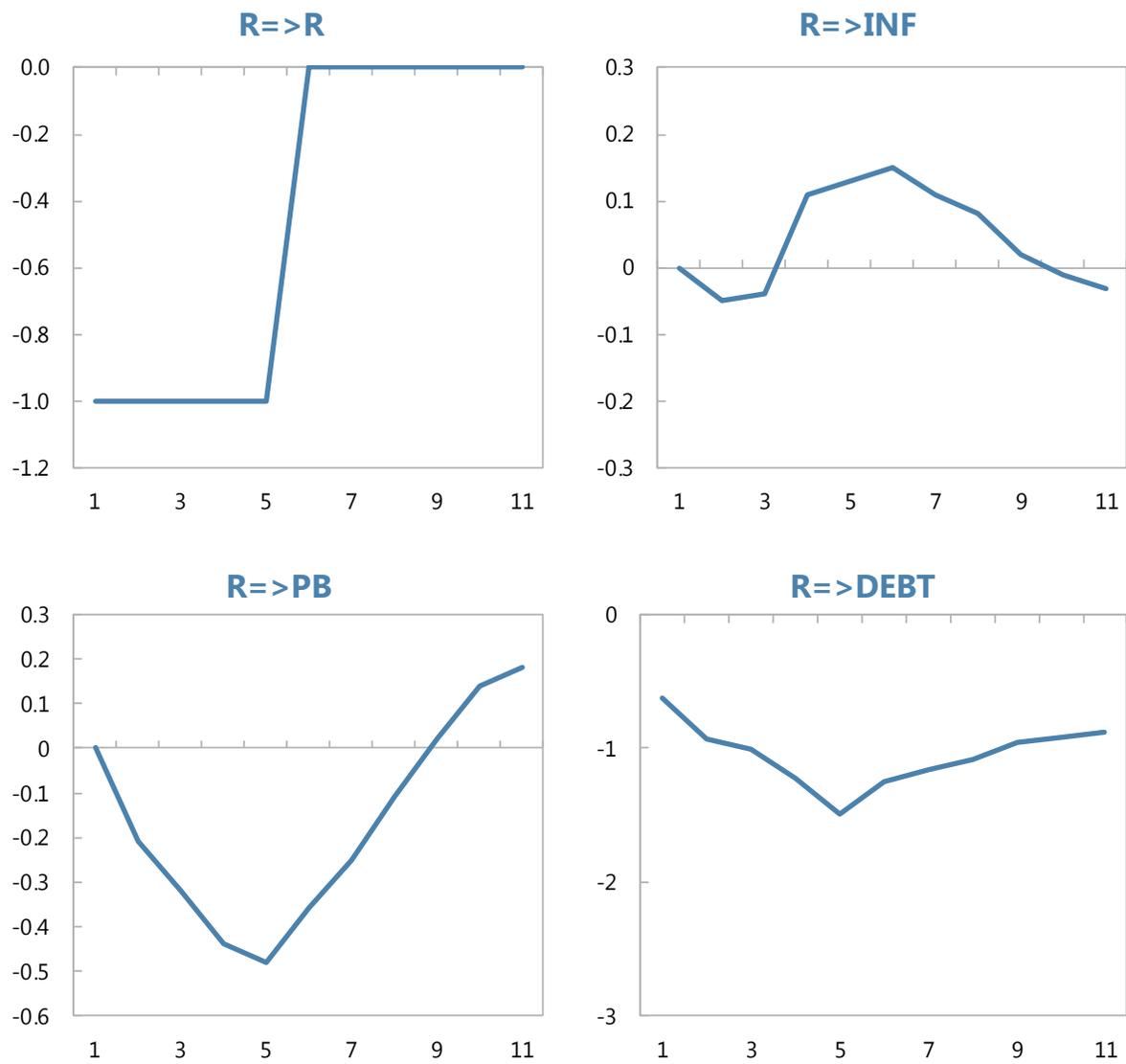
Source: IMF staff calculations.

Figure 4. Impulse Responses-Constrained VAR



Source: IMF staff calculations.

Figure 5. Impulse Responses-Constrained VAR II



Source: IMF staff calculations.

Table 1. Eurosystem Sovereign Debt Purchases under PSPP, ex Supranational Debt
(as of Nov. 30, 2015)

	Overall eligible market (s.t. limits, nominal) 1/	Overall eligible market (s.t. limits, market) 1/	Planned purchases (EUR billion)*		Actual purchases (EUR billion, market)		In percent of target (market)	In percent of PSPP 4/	ECB capital key 3/	Dev. from capital key	Avg. maturity (years)
			Target (nominal)	Target (market)	42369	Cum.					
ITA	414.3467	515.0072	155.692	193.5154	8.876	72.03	37.2208068	16.2846	15.7074	0.57715	9.28
FRA	393.9825	503.9139	174.262	222.8851	10.221	83.5	37.4632499	18.8782	18.0913	0.78692	7.81
DEU	326.2329	407.5836	226.437	282.9024	12.903	105.2	37.179605	23.7803	22.9629	0.81739	7.02
ESP	206.8117	260.5141	110.324	138.9715	6.334	51.68	37.1874783	11.6842	11.2802	0.40401	9.74
NLD	87.06892	108.2291	50.6277	62.93165	2.883	23.42	37.2165665	5.29518	5.10809	0.18709	6.59
BEL	91.11958	120.2224	29.5204	38.94893	1.764	14.45	37.0998626	3.26695	3.16144	0.10551	9.62
AUT	52.29325	66.7427	24.1776	30.85828	1.411	11.49	37.221776	2.59683	2.50473	0.0921	8.25
PRT	30.04083	36.60148	22.4926	27.40478	1.248	10.2	37.2270807	2.30654	2.22441	0.08212	10.57
IRL	35.62075	45.84849	15.3439	19.74955	0.84	6.899	34.9324398	1.55977	1.60305	-0.0433	9.34
FIN	24.75067	28.93388	15.6074	18.24523	0.909	7.352	40.2954692	1.66219	1.48094	0.18125	7.61
SVK	9.9	12.6	7.4699	9.507143	0.533	4.345	45.7024793	0.98235	0.98214	0.0002	8.54
SVN	3.3	3.85	4.04082	4.714286	0.248	2.031	43.0818182	0.45918	0.44643	0.01275	8.13
Others 5/	25.38015	31.95856	7.45911	9.392468	0.167	2.342	24.9348722	0.5295	1.25375	-0.7243	6.03
Euro Area	1700.848	2142.005	843.454	1060.027	48.337	394.9	37.2554747	89.2857	86.8067		8.06

Sources: Bloomberg L.P., ECB, and IMF staff calculations. Note: *assuming monthly purchase volume of EUR44 bln.; 1/ including estimated net issuance until end-2016 and current SMP holdings (where applicable) and inclusion of eligible sub-national debt, after application of security issue and issuer limits; 2/ excluding 12% of supranational debt purchases; 3/ partially consistent refers to the maximum amount determined as the lesser of the capital key-based allocation and the still available stock of eligible government debt (e.g., for Germany the latter is binding); 4/ excluding Greece and Cyprus, adjusted for supranational purchases; 5/ "Others" includes Estonia, Latvia, Lithuania, Luxembourg, Malta, Slovenia, and the Slovak Republic.

References

Amador, M., I. Werning, and G.-M. Angeletos, 2006, "Commitment vs. Flexibility," *Econometrica*, Vol. 74, No. 2, March.

Cizkowicz, P., A. Rzonca, and R. Trzeciakowski, 2015, "Windfall of Low Interest Payments and Fiscal Sustainability in the Euro Area: Analysis through Panel Fiscal Reaction Functions," *Kyklos*, Vol. 68, No. 4, November.

de Groot, O., F. Holm-Hadulla, and N. Leiner-Killinger, 2015, "Cost of Borrowing Shocks and Fiscal Adjustment," *Journal of International Money and Finance*, Vol. 59.

Government of the Republic of Slovenia, 2015, "Stability Programme – Amendments 2015," April.

Halac, M. and P. Yared, 2014, "Fiscal Rules and Discretion Under Persistent Shocks," *Econometrica*, Vol. 82, No. 5, September.

Halac, M. and P. Yared, 2015, "Fiscal Rules and Discretion in a World Economy," *Columbia Business School Working Paper No. 15-72*, September.

FINANCIAL SECTOR DEVELOPMENT ISSUES AND PROSPECTS¹

A. Introduction

1. **The global financial crisis has raised legitimate questions about the possibility that stability and growth could be hurt by too much finance.** Recent research on financial development has advanced the discussion, including analyses by the International Monetary Fund (IMF), the Bank for International Settlements (BIS), and the Organization for Economic Cooperation and Development (EOCD), and in academia.
2. **In Slovenia, the global crisis and the more recent domestic banking crisis exposed weaknesses in the banking sector.** The ongoing balance sheet deleveraging process that followed the remarkable boom-bust cycle since the country's EU accession (2004), and the nonperforming asset overhang has led to a sustained contraction in credit to the economy, and in particular to SMEs, since the third quarter of 2011. To this can be added the reduced demand for credit by corporates reflecting impaired balance sheets and the economic contraction. Despite the considerable deleveraging process, Slovenia still compares relatively well to other peer countries in terms of credit-to-GDP ratio, the main traditional indicator of financial development. However, the latter is only one metric to assess financial development.
3. **Using a new broad measure of financial development developed by IMF staff, this note assesses the implications of Slovenia's financial development for economic activity and financial stability.**² The analysis suggests potential ways the financial sector could advance while minimizing the negative effects that financial deepening had in Slovenia. That is, the lower quality of financing led to a build-up of risks and resulted in high NPLs and a misallocation of resources. Key elements to reduce financial sector vulnerabilities would include better regulation and supervision (including ensuring adequate governance), further development of financial markets, and improved efficiency of financial institutions.
4. **This note is structured as follows.** Section II discusses the structure of the financial system and the developments since the 2012–13 banking crisis. Section III presents some features of the regulatory and supervisory framework. Section IV introduces a broad indicator of financial development that take into account the depth, access, and efficiency of financial institutions and markets. On this basis, it assesses Slovenia's standing in a cross-country context. Finally, section V concludes with some potential avenues for future financial sector development.

¹ Prepared by Claudio Visconti (MCM).

² Sahay, Ratna and others, 2015, "Rethinking Financial Deepening: Stability and Growth in Emerging Markets," IMF, Staff Discussion Note No. 15/8.

B. Financial System Structure and Recent Developments

System Structure

5. **Slovenia's financial system has assets of about 150 percent of GDP and is bank centered.** Banks account for about 70 percent of assets with the remaining roughly equally split between insurers and a group comprising pension companies and funds, investment funds, and leasing companies. Bank ownership is concentrated in the state (63 percent of the total sector's equity) while other domestic entities control about 7 percent of the sector, and non-residents about 30 percent. Market share is also concentrated with the largest domestic banks controlling about 57 percent of the sector's assets, small domestic banks 8 percent, and banks under majority foreign ownership 35 percent.³

Developments in Recent Years

6. **The global financial crisis brought a sudden stop of capital inflows and associated credit boom.** Reflecting lost access to external funding, the foreign to total liabilities ratio of Slovenian banks fell to 13 percent by September 2015 down from a 40 percent peak in June 2008. The squeeze in funding sources forced banks into a pronounced deleveraging with a dramatic cut in lending that reinforced the recession. As a result, NPLs (mainly from corporates) increased sharply peaking at 14.4 percent in 2012 from 3.8 percent in 2008, impairing the balance sheets of banks and corporates in a protracted process. The difficulties faced by corporates led to a rapid deterioration in the quality of banks' portfolios imposing operating losses that reduced banks' capital and increased solvency risks. In 2013 a comprehensive asset quality review of eight banks determined that foreign banks had a capital shortfall of 78 percent relative to the capital levels reported in September 2013 while banks under domestic ownership showed a shortfall of 244 percent.⁴

7. **State banks were recapitalized at a total cost of 10 percent of GDP.** As part of the measures to stabilize the banking sector, six banks received capital injections in 2013–14. In addition, the establishment of the Bank Asset Management Company (BAMC) in late 2012 allowed the transfer of 53 percent of the EUR 9.4 billion in NPLs from five of the recapitalized government banks by end-2014, primarily involving loans to large state-owned corporates.⁵ The remaining NPLs are concentrated (over 70 percent) at small and medium-sized enterprises (SMEs). The crisis exposed inadequate bank governance and risk management practices that allowed endemic connected lending and lax risk controls, especially for state-owned banks. Likewise, significant weaknesses in corporate management and governance (including through state ownership) were also exposed.

³ The sale of NKBM to a U.S. equity fund was announced in June 2015. It is the second largest bank with a 12 percent share in total bank assets and deposits and a 9 percent share in total loans. In comparison, NLB, the largest bank, has shares of 32, 34 and 30 percent, respectively.

⁴ *Report of the Bank of Slovenia on the Causes of the Capital Shortfalls of Banks*, March 2015.

⁵ Over 70 percent of claims against large corporates were transferred to BAMC. Some claims less than 90 days in arrears were also transferred.

8. **In addition, other measures were adopted to support the effort of stabilizing the banking sector.** Besides the recapitalization and transfers of NPLs to BAMC, the authorities implemented: (i) Corporate Insolvency Framework: the 2013 reform opened more options to help address corporate debt overhang, including voluntary multilateral restructuring agreements (MRAs). Besides banks, BAMC also implements MRAs. (ii) Supervisory Actions: to monitor and support restructuring of NPLs the BOS established reporting requirements, including 3-year management plan and restructuring strategy, asset reclassification, release of impairment provisions. Despite all these actions, most MRAs involve debt re-profiling, but not debt reduction, new financing, nor recapitalization.

9. **Balance sheets of both banks and corporates remain impaired with the repair process proceeding very slowly.** System wide NPLs were at 10.3 percent (EUR 3.7 billion, of which corporates represent 60 percent) in November 2015 and overall capital ratios were at 20.5 percent (CAR) and 19.8 percent (core tier 1) by September 2015. However, credit to the private sector is still contracting by 5.7 percent total and 10.2 percent to nonfinancial corporates (yoy) in December 2015 and the income generation capacity of banks is limited. Bank profitability is still low, with ROE at 6.1 percent in September, after highly negative readings since 2010 and net interest margin of 2.2 percent. It is thus important to accelerate the process of balance sheet repair and NPL resolution.

C. Regulatory and Supervisory Framework

10. **The last assessment of Slovenia's regulatory and supervisory frameworks was in 2012.** It was conducted by the IMF and the World Bank in the context of the Financial Sector Assessment Program (FSAP).⁶ The assessment noted that state-controlled banks should be privatized, which “would help address the long-standing governance weaknesses of these banks, which were put into the spotlight by the crisis. Reducing government influence on the day-to-day operations and lending decisions of banks will help improve the risk management practices and the efficiency and stability of the banking system over the longer term.”

11. **In addition, the assessment of the Basel Core Principles for Effective Banking Supervision noted weaknesses in banking supervision.** In particular, it found that the BOS powers should be strengthened in several areas, including: (i) the licensing or removal of bank supervisory board members; (ii) the requirement for banks to obtain authorization for acquiring non-bank financial companies; (iii) the power to direct banks to increase capital (without shareholders' discretion to impede BOS's requirement); (iv) the lack of granularity in the reporting of problem assets; and (v) the relatively low provisioning of NPLs.

12. **The BOS legal framework was strengthened with the approval of amendments to the Banking Law, in line with the FSAP recommendations.** The most significant changes in the 2012 amendment provided the BOS with: (i) increased powers in relation to banks' supervisory board members; (ii) broader powers towards effective implementation of financial stability measures over

⁶ Republic of Slovenia: Financial System Stability Assessment, IMF Country Report No. 12/325.

banks and the banking system (extraordinary measures include the appointment of extraordinary administration, compulsory disposal of shares of existing shareholders, capital increase, and transfer of assets and liabilities of the bank); (iii) power to authorize qualifying investment of banks in other financial undertakings; (iv) increased powers over the execution of the supervisory measures, especially in relation to requirements for recapitalization of banks; and (v) legal protection of supervisors.

13. **The revised Banking law transposes to national legislation the European directives on capital requirements (CRD IV).** It was approved in March 2015 and includes the frameworks for capital buffers and for early intervention, besides the recovery of credit institutions and investment firms (part of BRRD).⁷ The Single Supervisory Mechanism (SSM) framework will strengthen supervision, aligning standards with European best practices. In particular, it seeks to ensure equal supervisory quality and treatment between the group of “important banks” (direct ECB supervision) and that of “less important banks” (indirect ECB supervision, direct supervision by national competent authorities), including by applying common rules and procedures from the single supervision manual. Improved supervision should also address weak bank risk management and governance, and monitor connected lending. Other European initiatives, such as the establishment of a macroprudential framework and of a credit register, once fully operational will reinforce Slovenia’s regulatory and supervisory frameworks.

D. Indicators of Financial Development

14. **The most traditional indicator of financial development is size.** It is traditionally measured by the ratio of non-financial private sector credit (usually from banks) to GDP. However, in light of its simplicity, it does not capture other important aspects of financial development. These include the liquidity of markets, other sources of credit (from nonbanks), access to financial services, and efficiency in the delivery of such services.

15. **A new and broad measure (Financial Development Index or FD index) was developed by IMF staff.** To better capture the different characteristics of financial development the FD index covers both institutions and markets and includes metrics for depth (size and liquidity of markets), access (access to financial services by individuals and companies), and efficiency (provision of financial services at low cost and sustainable revenues, and the level of activity of capital markets) (Box 1).

16. **The IMF analysis confirms a number of important financial development features.** Based on data for 176 countries, not only does it demonstrate the non-monotonic effect (marginal return) of financial development on growth and stability, but it also shows that, as economies evolve and the process of financial development advances, the relative benefits from institutions decline and those from markets increase. The intuition behind this result is that too much finance (larger financial systems) and/or fast financial deepening tend to contribute to real output losses through

⁷ The remaining BRRD provisions are planned to be transposed into national legislation by April 2016, in the context of the Law on Banking Resolution.

more frequent booms and busts and greater financial instability. These potential trade-offs, with costs outweighing benefits at some stage, are the underlying factors behind the bell-shaped relationship between financial development and growth (Box 2).

17. **The cross-country evidence highlights the importance of strong regulatory and supervisory frameworks in promoting financial stability and financial development.** It shows that the same subset of regulatory principles is critical for both, and that there are concrete regulatory actions that would promote financial development and stability simultaneously.⁸ That said, good regulation must be complemented by adequate and efficient supervision and oversight so as to produce the expected results. Relatedly, it also suggests that the faster the pace of financial development the higher the risks to economic and financial instability, likely due to the fact that regulation and, particularly, supervision would only follow with a lag.

Financial development in Slovenia compared to the international experience

18. **Credit in Slovenia grew at a rapid pace doubling in 2004–10.** So, based on the private sector credit-to-GDP metric, Slovenia was ahead of most CEE countries and some other emerging market economies (EMEs) in 2013 (Figure 1).⁹

19. **A more complete picture, however, emerges through the use of the broad FD index.**

- The annual evolution of the financial development index in the period 2004–2013 (since Slovenia's EU entry), shows Slovenia below the average for the EA, but above CEE and EME (Figure 2). It also shows that the narrowing gap between Slovenia and the EA was reversed from 2009. This pattern also coincides with the index for Slovenia moving towards the average for the CEE and EME.
- However, the sub-indices, financial institutions (FI) and financial markets (FM), point to a stronger position of institutions, comparable to that of the average EA, and a weaker position in markets (Figure 2). The latter puts Slovenia closer to the average CEE and EME. More developed institutions than markets is a feature shared by the three comparator groups.
- The components of the sub-indices, depth, access, and efficiency for each institutions and markets suggest that Slovenia's position is driven by relatively strong access levels of both institutions and markets, and weaker depth and efficiency (Figure 3). And the latter is much lower for markets than for institutions.
- The variables underlying the sub-indices, particularly those related to market depth (FMD) and efficiency (FME), reveal that the deficiencies are driven by very low relative levels of nonbank

⁸ These principles capture: (1) the ability of regulators to set and demand adjustments to capital, loan loss provisioning, and employee compensation; (2) regulatory definitions, such as definitions of capital, nonperforming loans, and loan losses; and (3) financial reporting and disclosures.

⁹ CEE countries comprise, besides Slovenia: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, and Slovak Republic.

market development, such as stock market capitalization and trading volumes (both measured as shares to GDP), number of debt securities issuers, and stock market turnover ratio (Figure 4). Regarding institutions, the components of depth, such as assets of pension and mutual funds, for Slovenia lag behind those for the EA (for both) and EME/CEE (for pension fund assets), while mutual fund assets are well below the EA and similar to the average in EME/CEE.

- The evolution of Slovenia’s financial development in 1995–2013 has been skewed towards increased relevance of financial institutions along with a decrease in the role of markets. This contrasts with a more balanced process in the EA and even for EME, with the importance of both markets and institutions increasing over time, albeit relatively more for the latter (Figure 5).
- Based on the estimations presented in the Sahay and others (2015), Slovenia would lie close to the turning point at which the positive effects of financial development on growth and on growth volatility begin to decline (Figure 6; see next paragraph for specifics on Slovenia).¹⁰ And past the point at which the effect of continued financial deepening of institutions on financial stability is increasingly more negative.¹¹

E. Future Prospects

20. **The results suggest some potential ways the financial sector could advance in Slovenia while minimizing the negative effects of too much finance.** The analysis indicates that financial deepening has led to low-quality financing, with the build-up of risks, vulnerabilities, and declining efficiency of investment. As a consequence, the current bank assets are not productive enough, with significant misallocation of loans and high NPLs. Expanded credit would only help support higher sustainable growth if applied efficiently to productive activities by viable corporates. Conversely, and as the recent experience in Slovenia demonstrates, higher/faster credit could lead to increased vulnerabilities, a boom and bust cycle, and ultimately lower output.

Better regulation and supervision

21. **Adequate regulation and supervision are key elements in a balanced process of financial development preserving economic and financial stability.** As demonstrated by Slovenia’s own recent experience, when institutional deepening advances too fast it tends to lead to economic and financial instability. Reasons often associated with this result are incentives towards

¹⁰ This result has to be taken with caution since, as explained in IMF 2015, “there is no one particular point of “too much finance” that holds for all countries at all times. The shape and the location of the bell may differ across countries depending on country characteristics including income levels, institutions, and regulatory and supervisory quality”. The estimated turning point for which the positive effects of financial development on growth begin to decline is on average in the 0.4 and 0.7 range with a confidence level of 95 percent. This wide band around the turning point reflects differences in fundamentals and institutional settings for the countries in the sample. As such, a country to the right of the range may still be at its optimum if it has above average quality of regulations and supervision while a country to the left of the range with weak institutions may have reached its maximum already.

¹¹ Financial stability is measured here by distance to distress, which in turn is defined as the sum of the capital-to-assets ratio and the return-on-assets (ROA) ratio, divided by the standard deviation of the ROA.

risk-taking and over-leveraging, particularly when institutional governance is lagging and regulation and supervision are not adequately developed and/or enforced. Importantly, the empirical results suggest that effective implementation of key regulatory principles could help shift the turning point region for which the positive effects of financial development on growth, and growth and financial volatility begin to decline. The experience in Slovenia, and elsewhere, points to the large output loss stemming from less-than-desirable financial regulation and/or supervision. The excessive credit growth before the crisis is now reflected in impaired sectoral balance sheets and high NPLs with consequent low credit provision to the economy. This is fully in line with the argument that too much finance increases the frequency of booms and busts and leaves countries ultimately worse off and with lower real GDP growth.

Further financial market development

22. **Relative to the international experience, Slovenia is in the middle range in terms of the financial development.** It fares particularly well in terms of financial institutions while market development lags behind, showing much room for improvement. This suggests that a process more geared towards markets than institutions and focusing on increased access and efficiency could allow greater benefits from further financial development in terms of economic and financial stability.

23. **Given the size of Slovenia's domestic market and its increasing integration with the European market, developing a vibrant local capital market is likely to be difficult.** However, corporates, and in particular SMEs, would benefit from more options for equity financing rather than just bank debt funding. In this context, further development of local nonbank financial institutions and/or the capital market could facilitate new investments by the sector. A shift in the structure of corporate financing towards a higher proportion of equity would also increase corporate resilience to shocks. For instance, incentives towards equity could be supported by easier foreign investment and ownership and a more dynamic privatization process.

More efficient financial institutions

24. **Although Slovenia's financial system is bank centered, it could benefit from stronger and efficient nonbank institutions, such as pension and mutual funds.** These could be an additional source of corporate finance as they currently play a very small role in the financial sector. However, challenges to this end remain, given: (i) the small size and low turnover ratio of the domestic stock market; (ii) the apparent lack of interest to create new mutual funds with focus on domestic investments; (iii) the trend in last few years towards consolidation of mutual funds with a wider global/regional investment strategy; and (iv) the strategy of pension funds to invest abroad.

Potential Implications for the Banking Sector

25. **Banks face limitations to the traditional role of credit providers.** The process of balance sheet repair is still unfolding while high NPLs reduce profitability and keep lending standards tight (not necessarily a bad outcome). From the asset side, credit to the private sector continues to

contract and the loan-to-deposit ratio to fall. On the liability side funding is restricted, including the fall on deposits with agreed maturity since early 2013 (by over 25 percent). Moreover, as deleveraging continues, the share of foreign in total liabilities have been reduced to below 13 percent from the 40 percent peak in mid-2008 without an offsetting increase in other sources of funds.

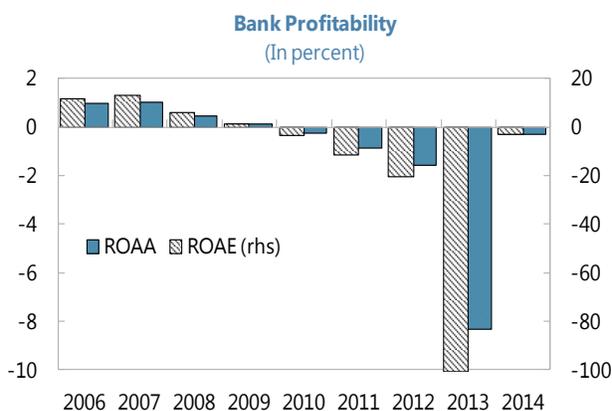
26. **Given these factors and the relatively undeveloped capital market, a migration of the demand for credit to nonbanks would be a possibility.** The higher competition, in turn, would tend to reduce the space for bank activities and profits. For instance, the net value of commercial paper by companies (a short-term funding instrument) issued in the domestic market has been increasing continuously since 2011, albeit from a very low level, to EUR 230 million in 2014 from EUR 9 million in 2011. In the same period the net value of outstanding corporate bonds increased to EUR 140 million from EUR 65 million, recovering from a sharp decline in 2012–13. Despite these increases, commercial paper and bonds represented 1.0 percent and 14 percent, respectively, of the Ljubljana Stock Exchange market turnover in 2015 (chart). This suggests the potential for the expansion of these financial instruments in the local market.



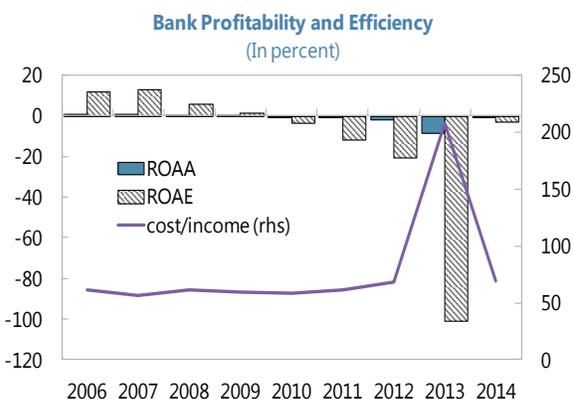
27. **Banks need to improve efficiency and reduce costs.** Banks' low efficiency and profitability suggest that some consolidation in the sector could be beneficial. Of the 16 commercial banks operating in Slovenia, the top five control close to 70 percent of the assets while the assets of the 10 smallest banks represent 25 percent of the total.¹² Privatization of public banks could also generate efficiency gains if followed by active supervision and regulation. To resume their lending function banks need to accelerate the process of balance sheet repair and NPL resolution. Without higher efficiency and with it competitive lending rates, banks will tend to lose share in credit provision, particularly to corporates. And small banks, with less opportunity for economies of scale and diversification, are more likely to be vulnerable to various shocks.¹³

¹² These numbers reflect the merger of Abanka Vipava and Banka Celje.

¹³ On the other hand, the authorities should be careful not to create too big to fail institutions.



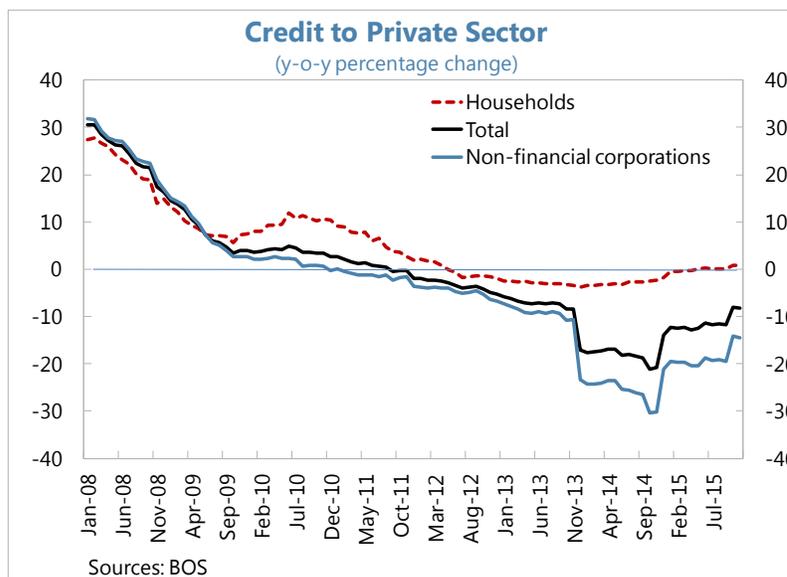
Source: Bankscope



Source: Bankscope

28. Banks need to offer flexible conditions to borrowers with access to external funding.

A process of market segmentation could result with the best corporate credits potentially moving to borrow from abroad or even from nonbanks, while banks would tend to keep the lower-tier credit risks. In fact, there is evidence that some process of disintermediation of banks is underway. For instance, domestic loans to corporates continued to shrink in 2015 (yoy), albeit at a



Sources: BOS

lower rate.¹⁴ In contrast, the international net financial position of corporates doubled to 28 percent of GDP in the period 2008–14 and increased by 10 percentage points in 2011–14.¹⁵ Cross-border financing to corporates increased in 2014 with the issuance of equity and debt securities, mostly to the EU. Moreover, nonbank financing to corporates, including SMEs, is on the rise in Europe, although from a relatively low level. Initiatives to improve funding to SMEs have taken various forms such as publicly tradable debt (mini bonds), equity, private-debt funds, private placements (placing securities privately with institutional investors), and direct borrowing from nonbanks.

¹⁴ The yoy growth rate has been negative since early 2011.

¹⁵ Nominal GDP is estimated as flat in 2008–14 and to have grown by 1 percent in 2011–14.

29. **Banks also face some limits to expand credit from the asset side.** State-aid rules in the context of the bank recapitalization process impose some limitations on sectoral lending and on minimum required rates of return (return on equity) for project lending.¹⁶ In addition, the higher European regulatory capital requirement with additional capital buffers to mitigate cyclical or structural systemic risks represent an increase to banks' cost of funding, as more and better quality equity is required.

¹⁶ The bank restructuring plans of the major state-owned banks approved by the European Commission determined a minimum return on equity of 7-10 percent.

Box 1. Financial Development Index

The financial development index (FD index) is constructed to capture indicators of financial institutions (FI) and financial markets (FM) across three dimensions: access, depth, and efficiency (see table). The FI and FM are based on six sub-indices: financial institutions access (FIA), financial institutions depth (FID), financial institutions efficiency (FIE); the financial markets access (FMA), financial markets depth (FMD), and financial markets efficiency (FME). These sub-indices in turn are based on the indicators listed in the table.

The dataset comprises annual data for the period 1980-2013 for 176 countries (25 advanced, 85 emerging, and 66 low-income developing countries).^{1/}

The data for the indicators are winsorized at the 5th and 95th percentiles to avoid extreme values driving the results. Each indicator is normalized between zero and one, using a global mini-max procedure that relates country performance to global minima and maxima across all countries and years. For all indicators higher values mean greater financial development.

Sub-indices are constructed as weighted averages of the underlying indicators, where the weights are obtained from principal component analysis, reflecting the contribution of each underlying indicator to the variation in the specific sub-index. Sub-indices are combined into higher indices also using principal component analysis.

The result is a relative ranking of countries on depth, access, and efficiency of financial institutions and financial markets, on the development of financial institutions and markets, and on the overall level of financial development. The minimum and maximum values of all indices are zero and one, respectively. More details can be found in "Rethinking Financial Deepening: Stability and Growth in Emerging Markets".

	FINANCIAL INSTITUTIONS	FINANCIAL MARKETS
DEPTH	<ol style="list-style-type: none"> 1. Private-sector credit (% of GDP) 2. Pension fund assets (% of GDP) 3. Mutual fund assets (% of GDP) 4. Insurance premiums, life and non-life (% of GDP) 	<ol style="list-style-type: none"> 1. Stock market capitalization to GDP 2. Stocks traded to GDP 3. International debt securities of governments (% of GDP) 4. Total debt securities of nonfinancial corporations (% of GDP) 5. Total debt securities of financial corporations (% of GDP)
ACCESS	<ol style="list-style-type: none"> 1. Branches (commercial banks) per 100,000 adults 2. ATMs per 100,000 adults 	<ol style="list-style-type: none"> 1. Percent of market capitalization outside of top 10 largest companies 2. Total number of issuers of debt (domestic and external, nonfinancial corporations, and financial corporations)
EFFICIENCY	<ol style="list-style-type: none"> 1. Net interest margin 2. Lending-deposits spread 3. Non-interest income to total income 4. Overhead costs to total assets 5. Return on assets 6. Return on equity 	<ol style="list-style-type: none"> 1. Stock market turnover ratio (stocks traded/capitalization)

Source: Rethinking Financial Deepening: Stability and Growth in Emerging Markets

1/ A large portion of the empirical work is based on the World Bank's Global Financial Development database, which requires a long lag to update with end 2013 figures released in late September 2015.

Box 2. Financial Development, Growth and Stability

The analysis in the IMF paper suggests that financial development increases growth and stability, but the effects weaken at higher levels of financial development, and eventually become negative. And that financial deepening drives the weakening effect. Fast deepening of financial institutions can lead to economic and financial instability, as it encourages greater risk-taking and high leverage (including through reduced capital buffers in banks), if not countered by adequate regulation and supervision.

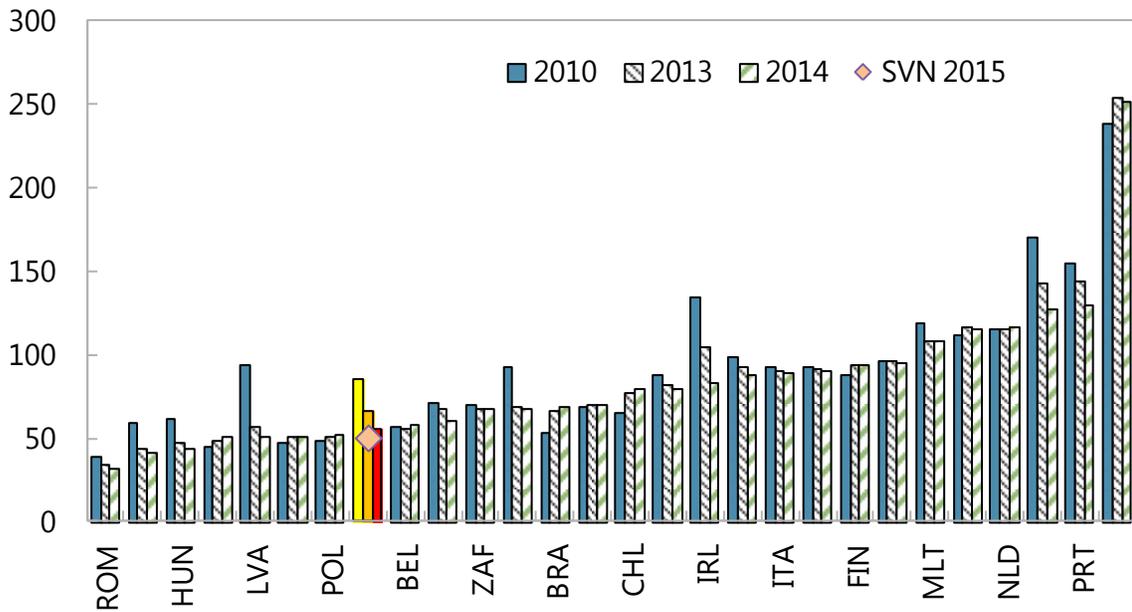
The relation between finance and economic growth (as well as economic volatility and financial stability) is estimated using the form

$$\dot{y}_{it} = \alpha + \beta_0 FD_{it} + \beta_1 FD_{it}^2 + \beta_2 (FD_{it} \cdot Interact_i) + \beta_3 X_{it} ,$$

where y is the per capita real GDP growth, FD is the financial development index (or sub-component), and its square, $Interact$ accounts for additional interactions, and X for a set of controls variables (initial income per capita, education (secondary school enrollment), trade-to-GDP, consumer price index inflation, government consumption-to-GDP ratio (as proxy for macroeconomic stance), and foreign direct investment-to-GDP ratio). Using a dynamic system generalized method of moments (GMM) estimator the equation is estimated over non-overlapping five-year periods in the 1980-2010 range, based on a 128-country sample.

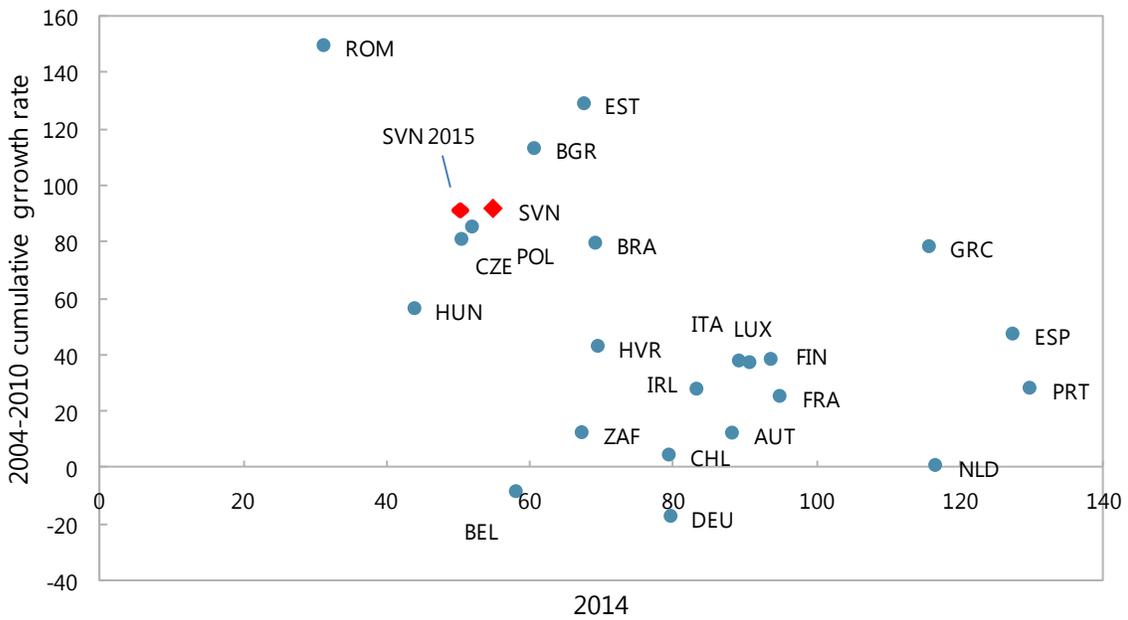
The same method is applied for economic volatility and financial stability as dependent variables, rather than economic growth. In that case, economic volatility was measured by the rolling five-year standard deviation of growth, and financial stability was approximated by distance to distress, defined as [capital to assets + return on assets / standard deviation of return on assets].

Figure 1. Slovenia: Private Sector Credit
(In percent)



Sources: IFS and WEO

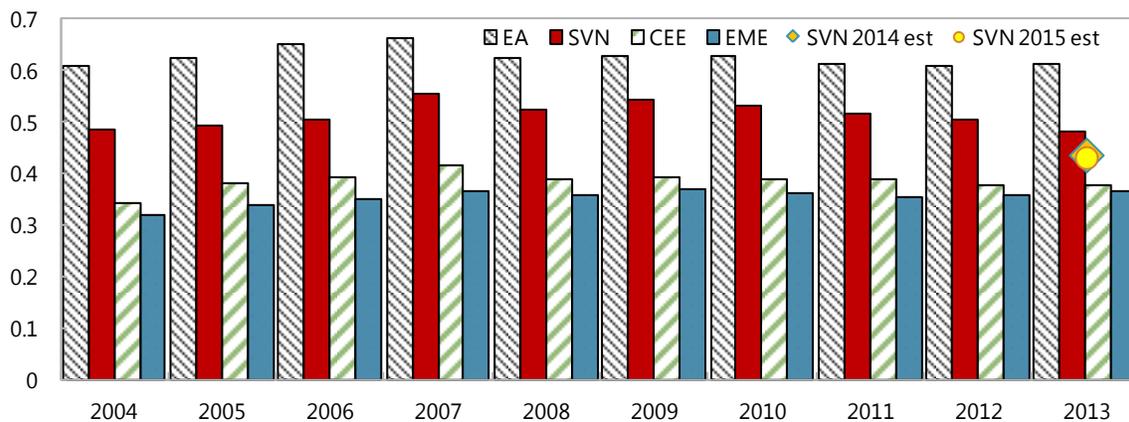
Private Credit to GDP
(In percent)



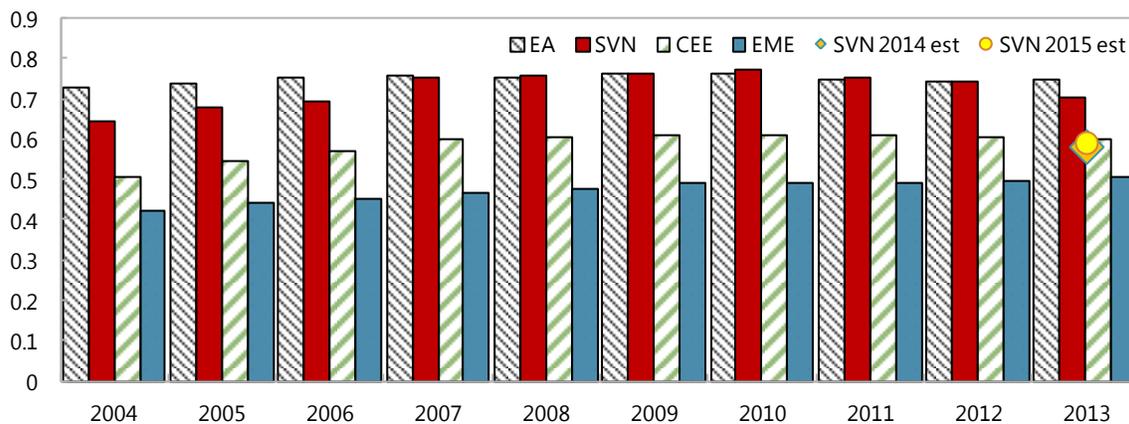
Sources: IFS and WEO

Figure 2. Slovenia: Financial Development Index, Sub-Indices

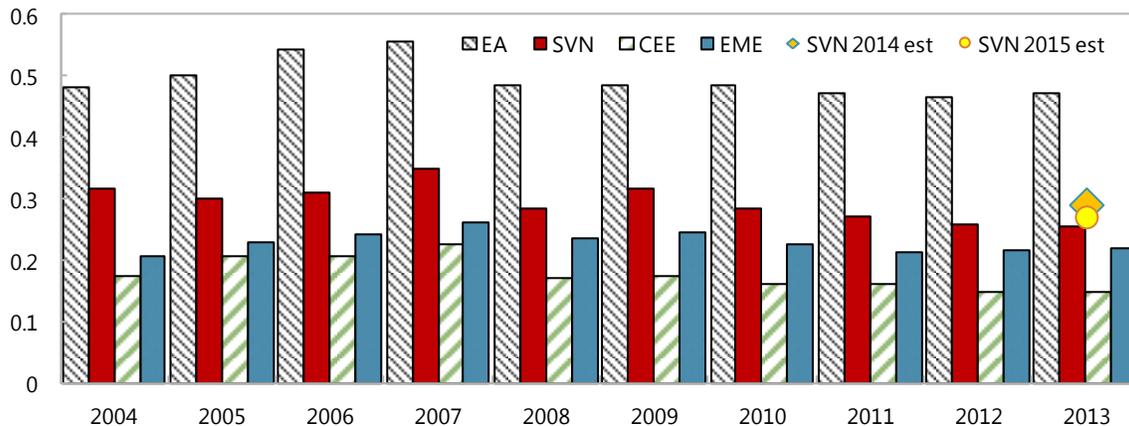
Financial Development Index



Financial Institutions Development Index



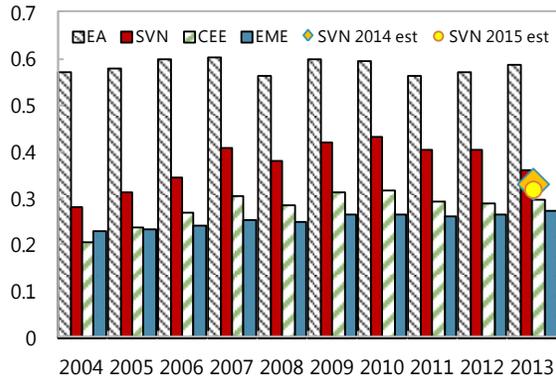
Financial Markets Development Index



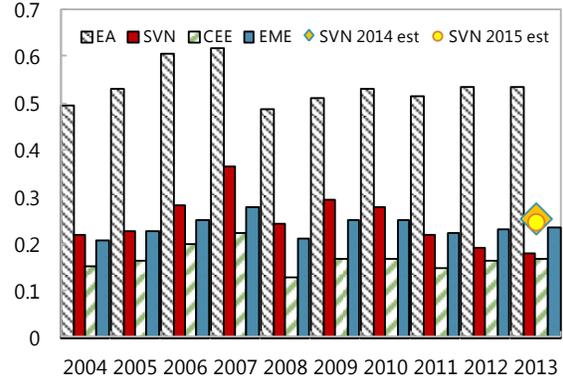
Source: IMF staff

Figure 3. Slovenia: Financial Development Sub-Indices Components

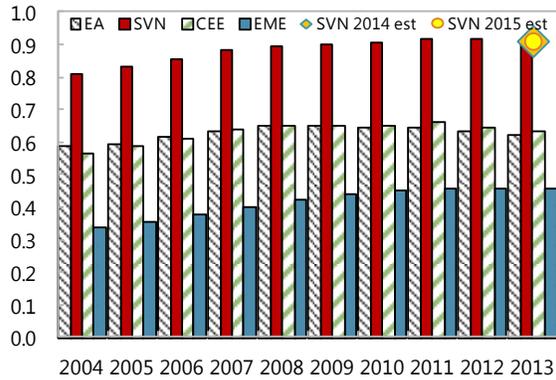
Financial Institutions Depth Index



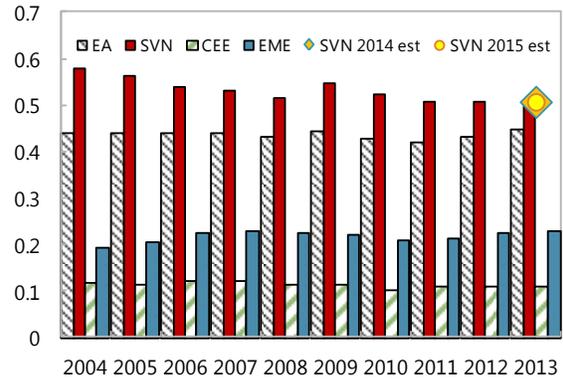
Financial Markets Depth Index



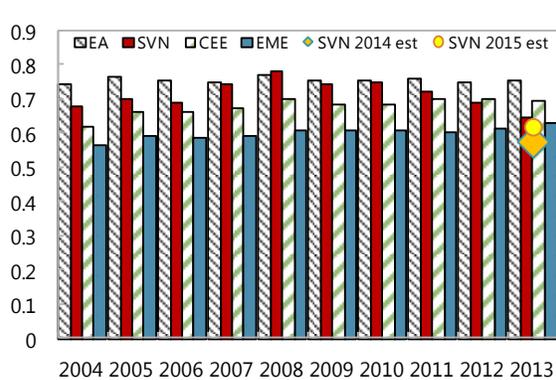
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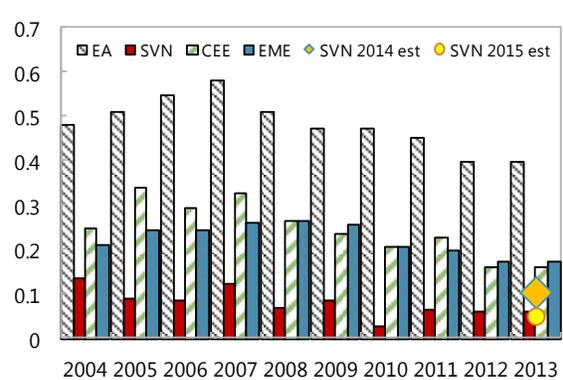
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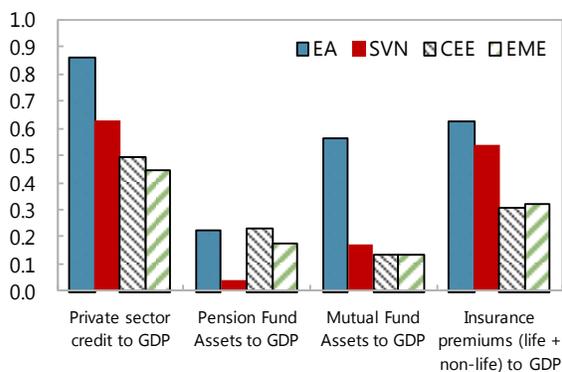
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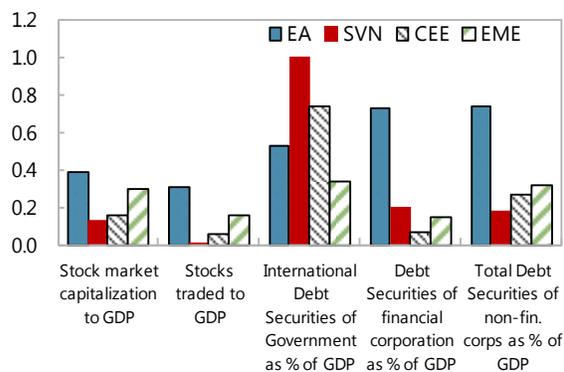
Source: IMF staff

Figure 4. Slovenia: Components of Financial Development Index, 2013
Normalized Variables

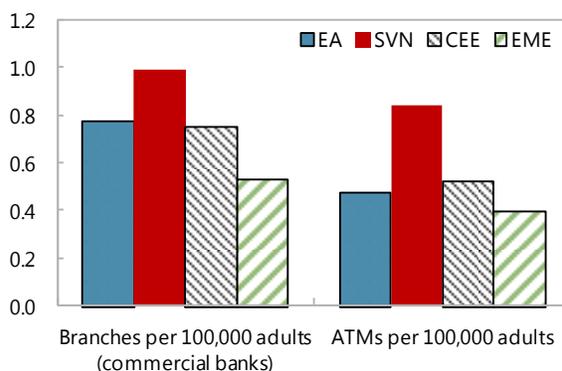
Financial Institutions - Depth



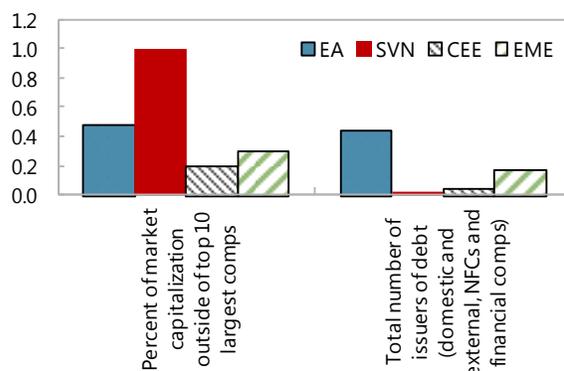
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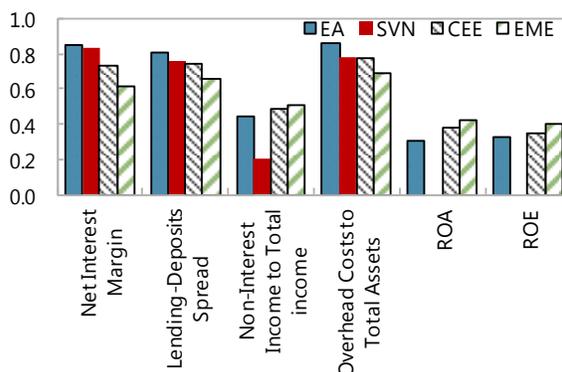
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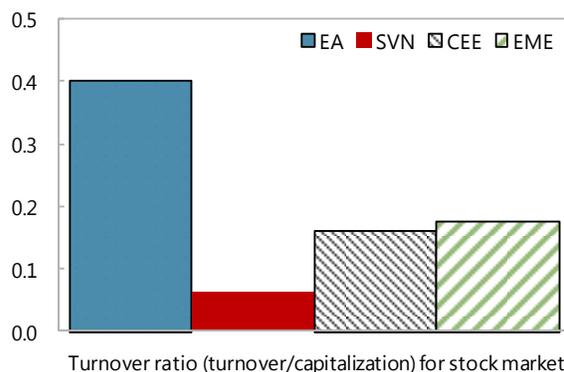
Financial Markets - Access



Financial Institutions - Efficiency



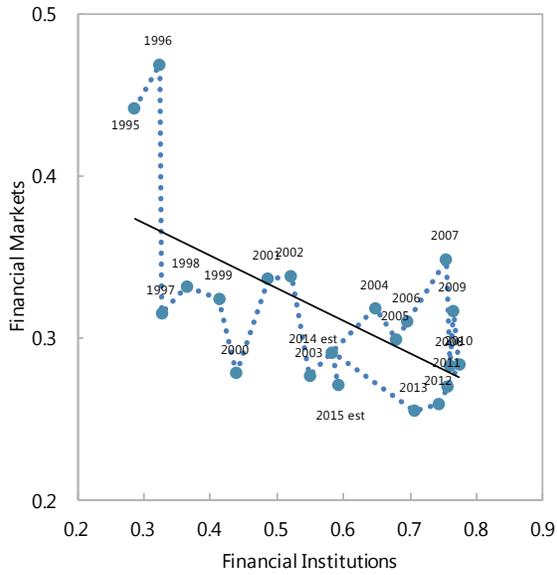
Financial Markets - Efficiency



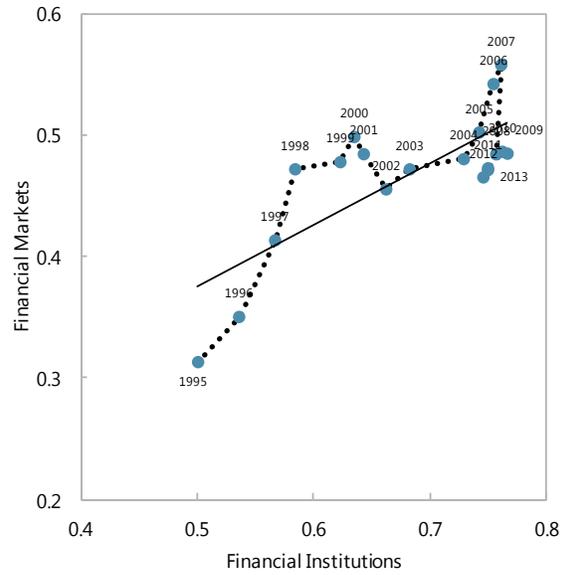
Source: IMF staff

Figure 5. Slovenia: Comparative Evolution of Institutions and Markets

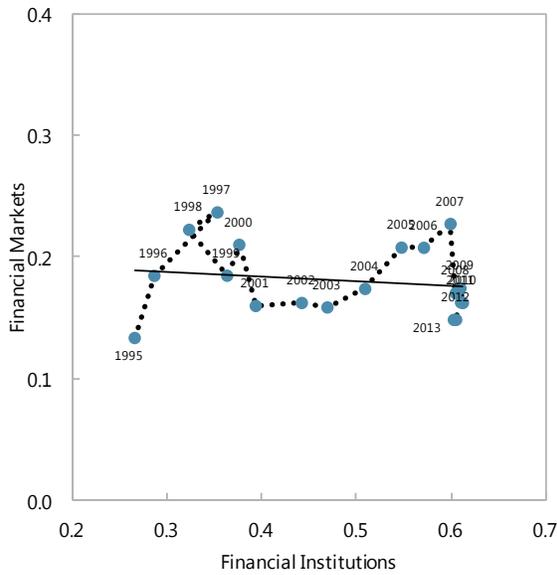
Slovenia - Institutions and Markets Indices (1995-2015)



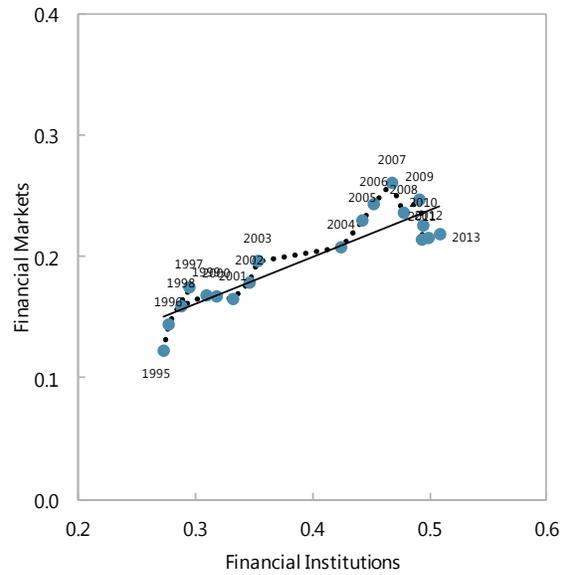
EA - Institutions and Markets Indices (1995-2013)



CEE - Institutions and Markets Indices (1995-2013)

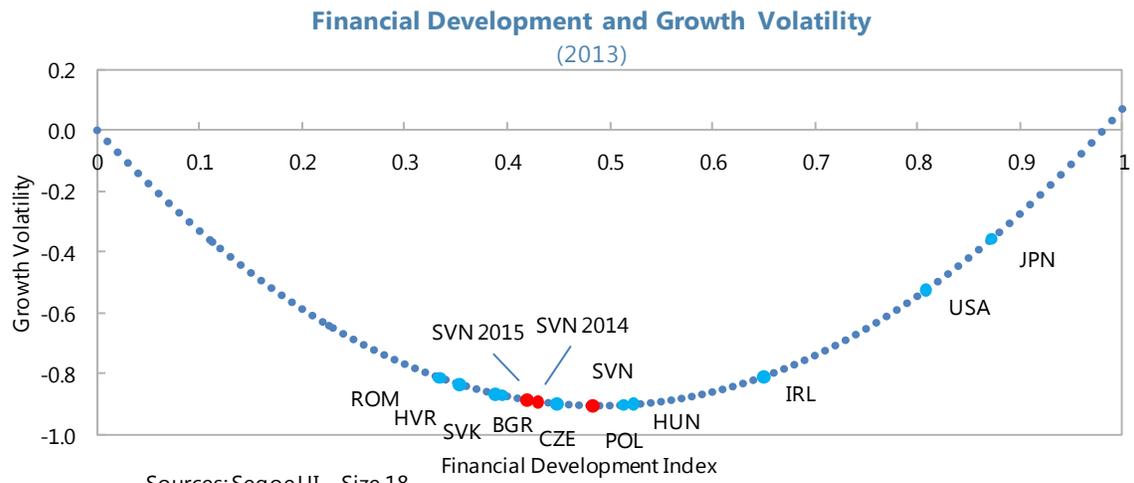
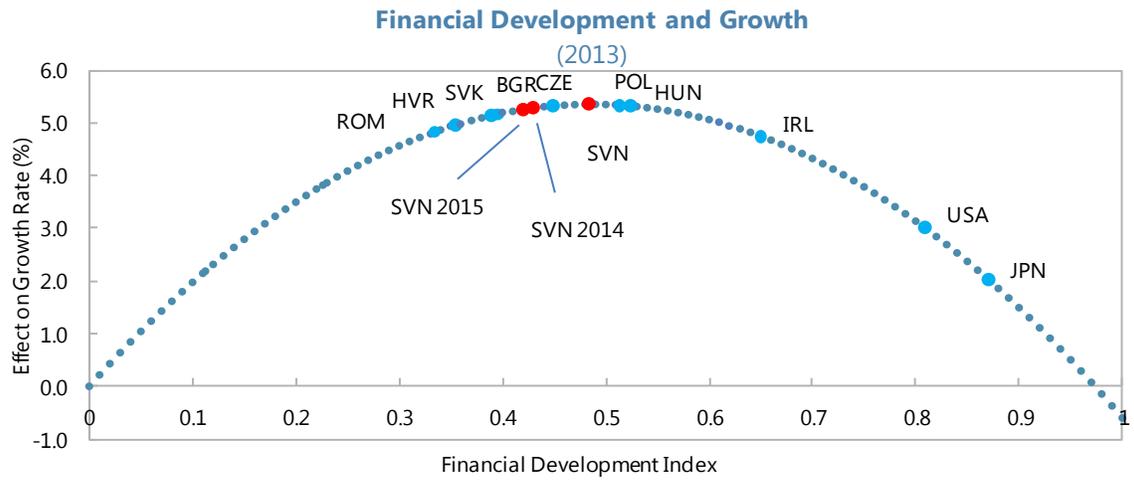


EME - Institutions and Markets Indices (1995-2013)

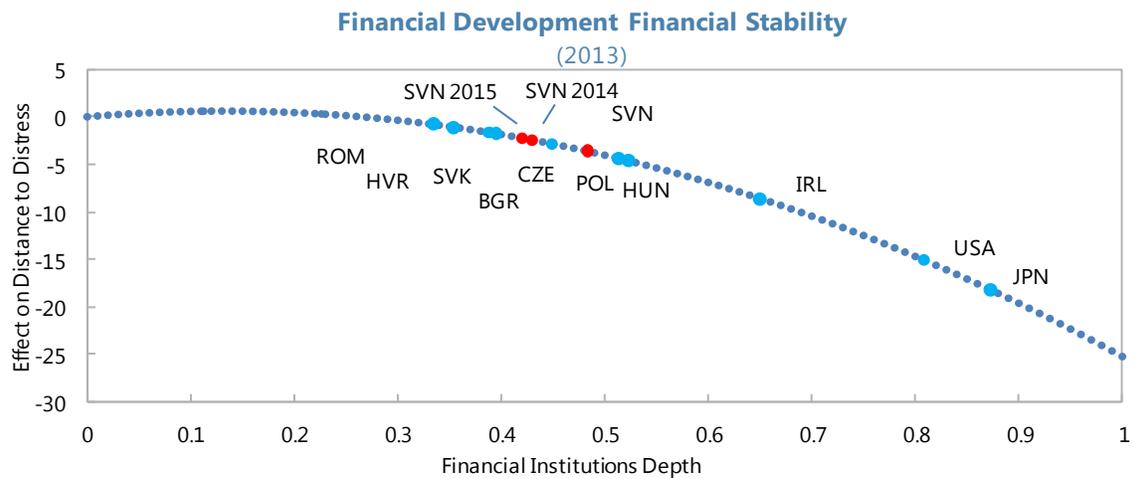


Source: IMF staff

Figure 6. Slovenia: Financial Development Impact



Sources: SegoeUI - Size 18



Source: IMF staff

References

- Bank of Slovenia, 2015, "Report on the Causes of the Capital Shortfalls of Banks", March.
- Cecchetti, Stephen G and Enisse Kharroubi, 2015, "Why does financial sector growth crowd out real economic growth?", Bank for International Settlements, Working Paper No. 490.
- Čihák, Martin, Asli Demirgüç-Kunt, Erik Feyen, Ross Levine, 2012, "Benchmarking Financial Systems around the World", World Bank, Policy Research Working Paper No. 6175.
- Cournède, Boris, Oliver Denk, Peter Hoeller, 2015, "Finance and Inclusive Growth", OECD, Economic Policy Paper No. 14.
- Impavido, Gregorio, Heinz Rudolph, and Luigi Ruggione, 2013, "Bank Funding in Central, Eastern and South Eastern Europe Post Lehman: a "New Normal"?" IMF, Working Paper No. 13/148.
- International Monetary Fund, 2015, "Advancing Financial Development in Latin America and the Caribbean", Regional Economic Outlook: Western Hemisphere.
- International Monetary Fund, 2015, "Vulnerabilities, Legacies, and Policy Challenges", Global Financial Stability Report.
- International Monetary Fund, 2013, "Financing Future Growth: the Evolving Role of Banking Systems in CESEE", Central, Eastern and Southeastern Europe, Regional Economic Issues.
- International Monetary Fund, 2012, "Republic of Slovenia: Financial System Stability Assessment, IMF Country Report No. 12/325.
- Luigi Zingales, "Does Finance Benefit Society?", 2015, Harvard University.
- Sahay, Ratna, Martin Čihák, Papa N'Diaye, Adolfo Barajas, Ran Bi, Diana Ayala, Yuan Gao, Annette Kyobe, Lam Nguyen, Christian Saborowski, Katsiaryna Svirydzenka, and Seyed Reza Yousefi, 2015, "Rethinking Financial Deepening: Stability and Growth in Emerging Markets," IMF, Staff Discussion Note No. 15/8.
- The Journal for Money and Banking, 2015, "Banking Sector at the Crossroads: Challenges for the Future", The Bank Association of Slovenia, No. 11.
- The Journal for Money and Banking, 2010, "Corporate Governance of Banks", The Bank Association of Slovenia, No. 11.