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SELECTED ISSUES

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REPUBLIC OF SLOVENIA

SELECTED ISSUES

April 25, 2017

Approved By
European Department

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ANNEX

CREDIT GROWTH AND ECONOMIC RECOVERY IN EUROPE: THE CASE OF SLOVENIA[1]

Economic activity in Europe has yet to fully recover nearly eight years after the global financial crisis (GFC). Bank credit expansion also remains tepid despite historically low lending interest rates. Trying to identify the key factors underpinning such developments, this study uncovers that: (i) Emerging Europe's post-GFC recovery is slower than what one can expect after a crisis; (ii) Slovenia's post-GFC recovery path, on the other hand, is generally explained by the global nature of the 2008 financial crisis and Slovenia's 2012–13 banking crisis; (iii) loan quality, customer deposits, and bank capital, as well as the macroeconomic environment are key factors influencing bank credit developments in Europe and Slovenia; and (iii) bank credit to the private sector has a positive, but modest impact on economic activity in European countries, working mainly through the investment channel.

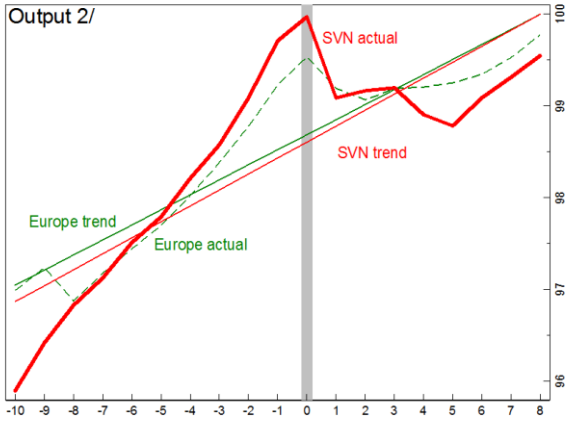
A. Introduction

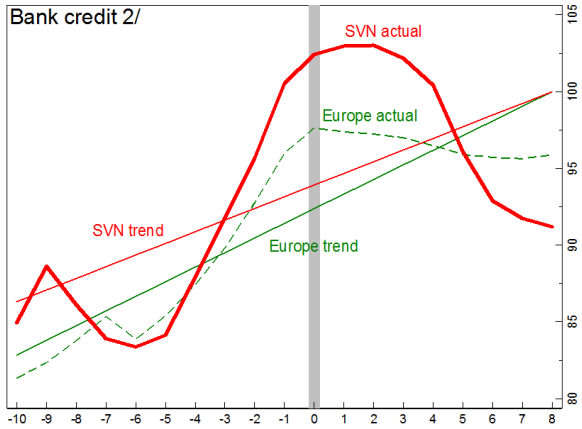
1. The 2008 global financial crisis (GFC) had a seemly large and permanent effect on output and bank credit growth in European countries, including Slovenia (see panel). Prior to the crisis, European countries experienced significant GDP and credit growth. Amid buoyant global financial market conditions, both GDP and bank credit accelerated sharply in the three years preceding the crisis, pushing both measures well above their trend levels. The 2008 economic and financial crisis led to a significant tightening in global financial conditions. European countries were not immune. In the immediate period following the onset of the GFC, output and bank credit contracted severely. GDP growth took three years to return to Europe as a whole, while European bank credit extension stabilized but has yet to decidedly turn the corner toward sustained growth, despite aggressive monetary policy easing by European central banks. Slovenia's GDP and bank credit dynamics followed a similar pattern but were more volatile.

2. Slovenia experienced a double-dip recession following the 2008 global financial crisis (see Box 1 in accompanying staff report). Output contracted nearly 8 percent in 2009 as the external demand shock, co-incident with the end of the domestic investment cycle, and sudden stop of capital inflows caused by the global financial crisis triggered an adverse feedback loop between the over-leveraged corporate and banking sectors and the sovereign. Despite a feeble recovery in 2010-11, the highly leveraged corporate sector was unable to service its debts, driving the mostly state-owned banking system towards insolvency. These dynamics precipitated a two-year recession in 2012-13 with a cumulative output loss of nearly 4 percent.

[1] Prepared by John Ralyea with assistance from Luisa Calixto and Dustin Smith. The paper draws on an ongoing cross-country analysis of credit growth and economic recovery in Europe after the global financial crisis performed by an EUR team including Sergei Antoshin, Marco Arena, Tonny Lybek, John Ralyea, and Etienne Yehoue under the supervision of Nikolay Gueorguiev. The paper also benefitted from insightful comments and questions posed by Slovenian authorities at seminars held at the Bank of Slovenia in November 2016 and March 2017.

Europe and Slovenia: GDP Growth and Bank Credit to the Private Sector[1]

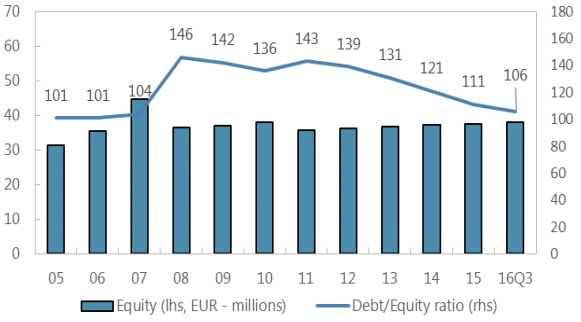




Sources: BIS total credit statistics; IFS; and IMF staff calculations
The pre-crisis (peak) trend is estimated up to year t=-3, and is extrapolated linearly thereafter.
1/ Expansion peaks, associated with the GFC, occurred in either 2007 or 2008, for all European countries in the sample (Annex 1), except for Albania, Kosovo, and Poland, which avoided a post-GFC recession.
2/ Unweighted average of the logarithm of real output or bank credit per capita; expansion peak year t=0, and 100 equals respective trend in t=7.

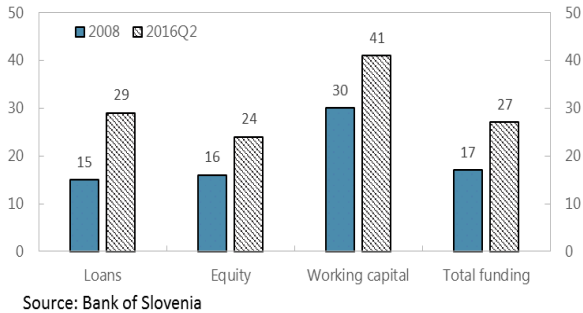
3. The "double dip" recession forced over-leveraged corporates to retrench dampening demand for investment and domestic bank lending. In addition to the enterprise sector's excessive leverage, the crisis revealed that its true equity base was much weaker than previously thought. In the wake of the sudden stop in external financing, large segments of the enterprise sector turned out to be insolvent or close to insolvency. This led to widespread bankruptcies, an inability to service debt, and mounting NPLs which consumed bank capital. The balance sheet nature of Slovenia's "double dip" recession required both Slovenian banks and their primary clients, non-financial corporations (NFCs), to focus on repairing weak balance sheets. NFCs eschewed bank borrowing and investment in favor of strengthening their balance sheets, which has relied primary on using available cash to deleverage rather equity infusions. At the same time, large NFCs began to rely more heavily on foreign financing.

Non-financial corporations balance sheets



Source: Bank of Slovenia

Proportion of non-financial corporation funding (by type) from foreign sources



Source: Bank of Slovenia

4. Considering this background, this paper draws on a cross-country and bank-level analysis to help inform policy discussions in Slovenia: [2] (i) Are Slovenia's post-GFC economic developments in line with expectations given the scale and severity of the GFC and the credit boom that preceded it? (ii) What are the main determinants of credit dynamics in Slovenia? (iii) How strong is the link between credit and economic activity? Has it changed post-GFC? The paper tackles these issues through a cross-country European and Slovenia-specific data analysis.

5. The findings of the analysis can be summarized as follows. The post-GFC recovery in Slovenia significantly lags typical post-recession recoveries for both normal and financial-crisis-driven recessions. Credit dynamics have also been much more subdued. However, controlling for Slovenia's "double dip" recession and the slowdown in global growth after the GFC, reveals that Slovenia's recovery is not atypical. The cross-country study finds that bank-specific factors—loan quality, customer deposits, capital—are the key determinants of bank lending. Also, bank credit to the private sector has a positive, but modest impact on economic activity, working mainly through the investment channel. Thus, the need to strengthen bank and corporate balance sheets in Slovenia after the GFC likely contributed significantly to weaker investment and GDP growth during Slovenia's post-GFC recovery.

B. The Post GFC-Recovery in Slovenia: Is It Different?

6. Projection paths derived from pre-GFC recession and recoveries are used to assess Emerging Europe and Slovenia's post GFC-recoveries. Drawing from Jordà, Schularick, and Taylor (2013), the local projection (LP) method is used to develop projections of 'typical' recession and recovery paths. It follows the standard specification below:

$$\Delta_h y^k_{i(r)+h} = \propto^k_i + \emptyset_h N_{it(r)} + \gamma_h F_{it(r)} + \varphi_h N_{it(r)} * \left(x_{it(r)} - \overline{x_N}\right) + \theta_h F_{it(r)} * \left(x_{it(r)} - \overline{x_F}\right)$$

$$+ \sum_{j=0}^{j=1} \beta^k_j Y_{it(r)-j} + e^k_{it(r)}$$

The dependent variable (y) is the cumulative change in key macroeconomic variables (real GDP per capita, real private-sector consumption per capita, real investment (GFCF) per capita, and real bank credit to the private sector per capita) from the beginning of each recession and recovery period included in the analysis. *N* and *F* are dummy variables indicating whether the recession and recovery episode was preceded by a financial (banking) crisis (F = financial) or not (N = non-financial). The control variables include: measures of excess credit accumulated during the expansion period $\left(x_{it(r)} - \overline{x_{F\ or\ N}}\right)$ preceding the recession; and a vector Y of the standardized percentage change in the dependent variables two-years and the year before the start of each recession. Finally, $\propto$ represents the fixed effect for *i*th country; and e is the error term.

[2] Credit Growth and Economic Recovery in Europe (forthcoming, European Department, International Monetary Fund).

7. The coefficients $\emptyset$ and γ on the non-financial and financial dummies are of interest. Intuitively, $\emptyset$ and γ are similar to the average cumulative response of the dependent variable at each horizon (projection) period and are used to construct the projection paths for 'typical' non-financial and financial recession and recovery paths plotted in the first column of the panel below. The coefficients are derived from observations on a sample of 79 recession and recovery episodes across 35 advance and large emerging-market countries (hereinafter referred to as the control group) that occurred from the beginning of the post-Bretton Woods era up to the eve of the GFC (1971–2006). With a projection horizon of 7 years, consistent with the post-GFC period from 2009–2015, 28 separate regressions were run (7 regressions for each dependent variable). The sample episodes include 20 recession and recovery periods in European countries. Out of the total episodes, 64 were classified as non-financial and 15 as financial recessions based on the definition of systemic banking crisis in Laeven and Valencia (2012).[3] The Bry and Boschan (1971) algorithm was used to date business cycles across countries.[4]

8. We then generated counterfactual dependent variable paths to account for the extremely weak global demand environment that followed the GFC. The counterfactual paths were generated as follows: (i) a contemporaneous external demand variable based on actual data was included as a regressor in the standard regressions described above to estimate its influence on the 'typical' projection path; (ii) this external demand variable was then rescaled to reflect, on average, the external demand faced by European countries after the GFC and (iii) new counterfactual dependent variables were generated using the coefficients and values of the regressors from step (i), and the counterfactual external demand values from step (ii). These steps yielded counterfactual dependent variables, which represented "what-if"' estimates of the dependent variables had the control group countries faced the same subdued external demand that European countries faced post-GFC. The standard regressions were then re-run with the new counterfactual dependent variables generate the coefficients used to construct the projection paths for non-financial and financial recession and recovery episodes plotted in column two of the panel below.

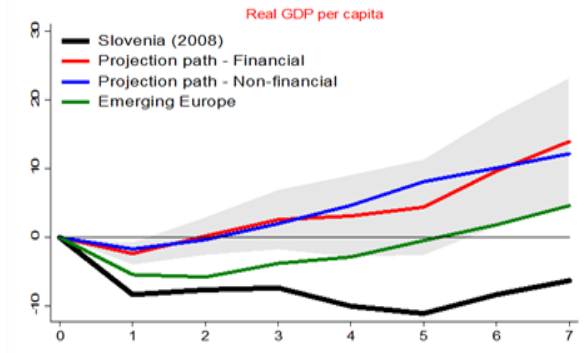
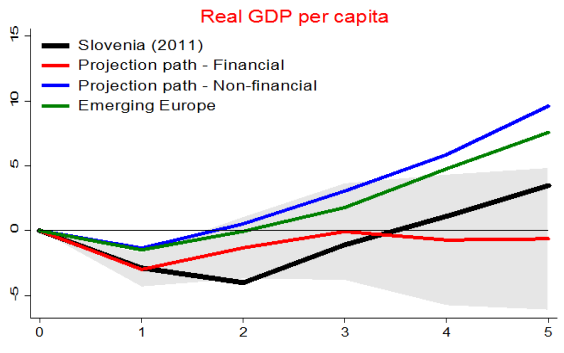
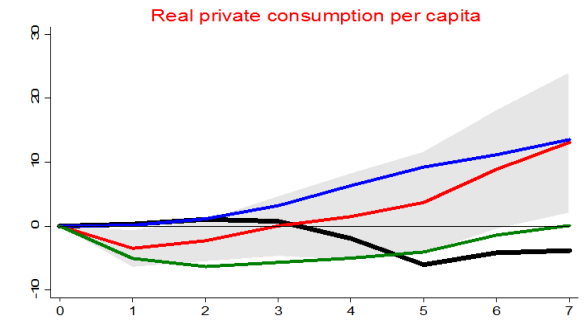
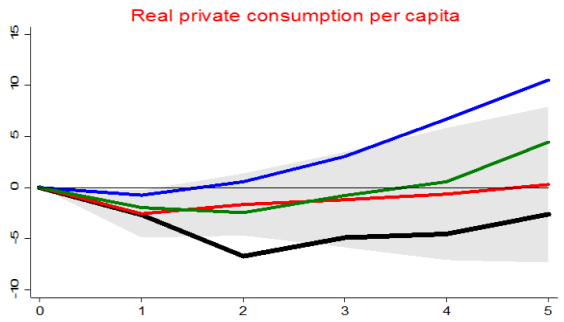
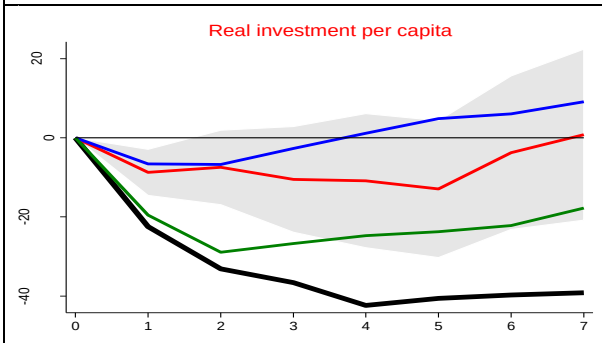
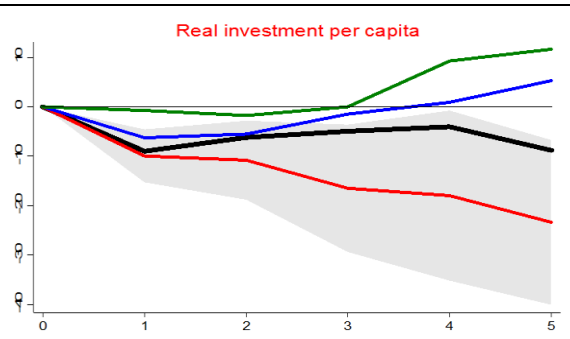
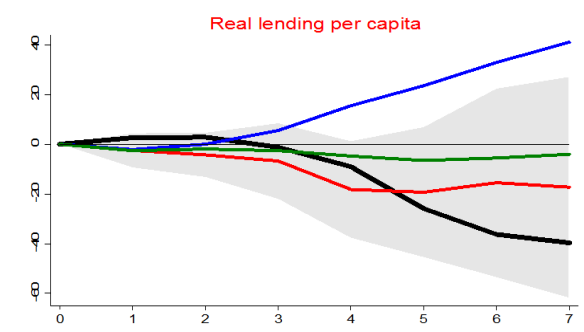
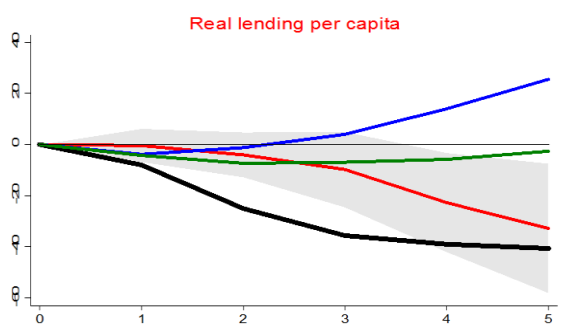
9. Before introducing controls, Slovenia's economy appears to have underperformed relative to past recession and recoveries if the starting date for the assessment is 2009. [5] Slovenia's performance, measured as the cumulative change in real GDP per capita (real GDP) for each horizon year from 2008 to 2015 is significantly below the projection path for typical recessions and recoveries following a financial crisis (Figure 1, first column). It is also below the average cumulative change for Emerging European countries that experienced a financial crisis in 2007 or

[3] In a few cases, the starting date of the financial crisis was adjusted to correspond with the peak of the business cycle. Laeven and Valencia (2012) broadly define a financial/banking crisis as being characterized by significant signs of financial distress and losses in wide parts of the financial system.

[4] The number of recession and recovery episodes from 1971-2006 was 144. However, data limitations precluded use of all the episodes.

[5]The relevant comparator countries for Slovenia are those whose recession and recovery periods were preceded by a banking crisis given that Laeven and Valencia (2012) classify Slovenia as a borderline case for experiencing a banking crisis in 2008.

Figure 1. Slovenia and Emerging Europe: Performance Relative to Projection Paths 1/ (cumulative percentage change at each horizon from start of recession percent)

GFC; standard model	Bank crisis; control external demand
	
	
	
	

Sources: BIS total credit data; Slovenian authorities; IMF staff calculations.
1/ Shaded regions is 95 percent confidence band around projection path for post-financial-crisis recession and recovery periods.

2008. Conversely, Slovenia's real private consumption per capita (real consumption), real gross fixed capital formation (real investment), and real bank credit to the private sector per capita (real bank credit) outperform these comparator groups until at least horizon year three. In addition, Slovenia's performance over the projection horizon for real investment and real bank credit is within the 95 percent confidence interval of the projected path.

10. Slovenia's 2012–13 recession and the unusually weak external environment appear to explain much of Slovenia's underperformance since the GFC. Indeed, Slovenia's performance is more typical when the starting point for the analysis is 2012 (Figure 1, second column) and the severe worldwide effects of the GFC faced by Slovenia and other European countries are considered. Specifically, on the latter point, the dependent variables used to develop the projection paths in the second column were adjusted as described above. This had the effect of dampening the cumulative growth of these paths relative to the standard projection paths in the first column, particularly for the typical financial crisis path. With these adjustments to the analytical framework, Slovenia's real investment performance since the start of the 2012 recession outperforms the projected path for real investment following a financial crisis. Real GDP also outperforms in the outer projection horizon years and real consumption remains broadly within the confidence interval of a typical recession and recovery period for countries that experienced a financial crisis. The only outlier remains real bank credit in the early projection years, but this can largely be explained by the transfer of EUR 4.9 billion in commercial bank loans to a government-sponsored bad bank (BAMC) in 2013–14. Nonetheless, as the chart shows, by end-2015 bank credit had not begun to pick up as the projection path suggests it should. To shed some light on this, the analysis now turns to determinants of bank credit extension.

C. Determinants of Credit Growth[6]

11. Bank-level cross country panel and Slovenia-specific analyses point to both bank fundamentals as well as macro factors as influencing bank credit dynamics.[7] Despite historically low lending interest rates, bank credit extension to the private sector in Europe remains weak, and in the case of Slovenia, negative. A bank-level panel analysis, covering 37 European countries (including Slovenia) and nearly 8,000 banks, point to both bank specific and demand factors driving bank credit extension.[8] The bank specific factors include bank capital, customer deposits, bank equity prices, and loan quality. The demand factors are GDP growth and inflation. The key results of

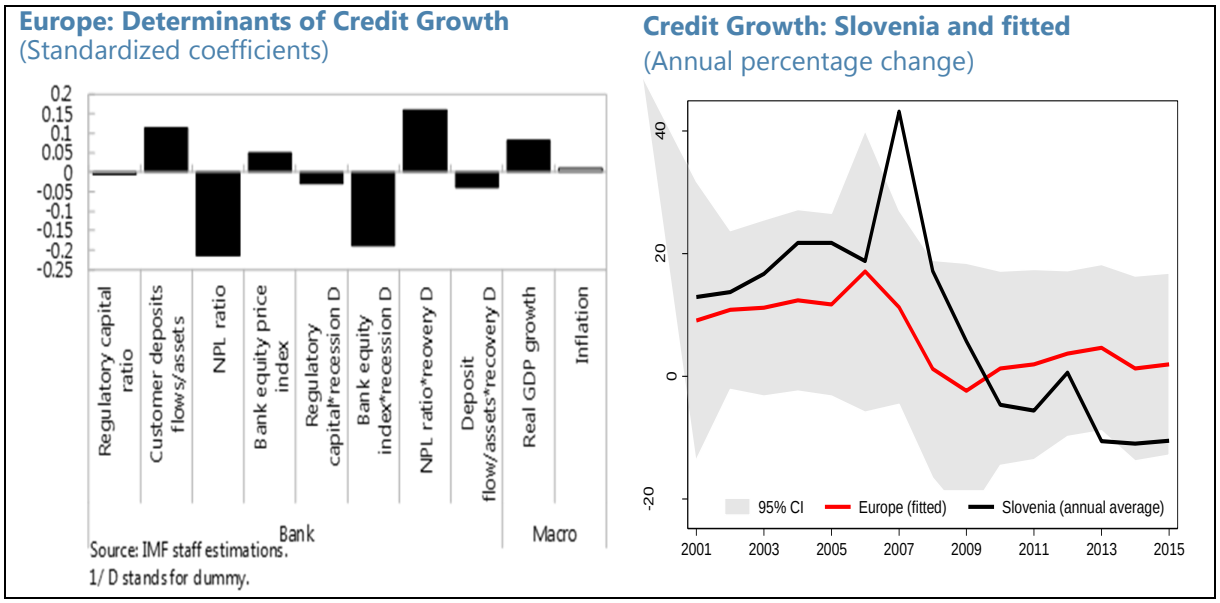
[6] In the cross-country paper, this analysis is performed by Etienne Yehoue.

[7] The analysis uses annual data over 1999–2015 from *Fitch-Connect* for the bank specific data and from the *World Economic Outlook* (WEO) for the macroeconomic data. The credit growth variable is defined as growth of gross loans extended by individual banks to borrowers of a specific country. For some banks in the panel annual loan growth is exceptionally large, suggesting that the regression results be interpreted with some caution.

[8] The analysis relies on system generalized method of moments (GMM) estimations, which appropriately lag the variables and instrument the right-hand variables. This has helped to correct for potential correlation between right hand variables—through lags of different orders for a set of variables and other instruments for the rest—as well as dealing with potential endogeneity issues. The J-test of over-identifying restrictions or the Sargan validity test for instruments embedded in system GMM ensures the goodness fit of the specifications.

the bank-level panel analysis are summarized in the bar chart below, where the bar height represents the effect of a one-standard-deviation change in the respective determinant on credit growth.[9] The regression results indicate that the quality of a bank assets, proxied by the NPL ratio, has the largest relative impact on credit growth in both the pre- and post-GFC periods.

12. Slovenia's bank credit dynamics are broadly track the model but are more volatile. The average annual growth in bank credit in Slovenia broadly co-moves with the fitted values from the panel regression. The rapid expansion of Slovenian bank credit in the pre-GFC period likely reflects nominal convergence before joining the euro area and mergers-and-acquisition activity, while the sharp drop in 2013 is primarily due to transfers of bad bank assets to the BAMC. A closer look at the regression results and the outturn of the key bank-specific factors, appears to offer a partial explanation for credit developments in Slovenia, in the post-GFC period.[10]



Bank capital

13. Bank regulatory capital as percent of total assets is found significant in the cross country analysis with a negative sign, especially during recessions. This indicates that raising regulatory capital is associated with less credit expansion.[11] Raising regulatory capital, owing to changes in regulatory standards or market requirements, either leads to less loanable funds or triggers deleveraging.[12] As can be seen in Figure 2, the average regulatory capital of Slovenian banks

[9] The black fill indicates the estimated coefficient is significant.

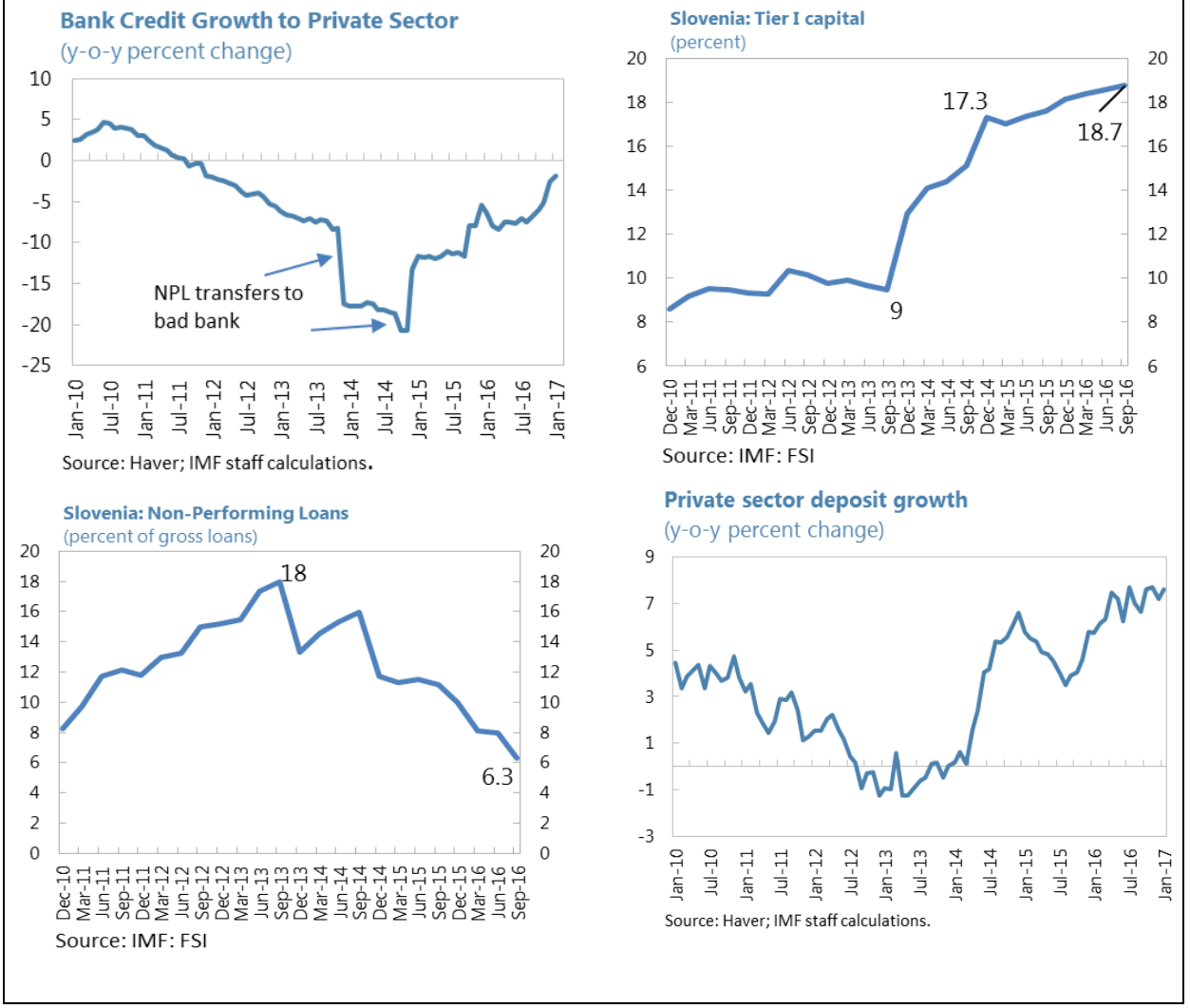
[10] The effect of changes in the bank equity index are not analyzed for Slovenia given the limited development (liquidity) of the local stock market.

[11]. Regulatory capital refers to the total bank capital as measured for regulatory purposes. It does not refer to the minimum capital required by the regulator.

[12] Reduce lending due to higher regulatory capital requirements may be somewhat transitory as a stronger capital base could induce stronger credit growth over the medium term.

has trended consistently upward since 2012, with a big jump at the end of 2013 attributable to the recapitalization of three state-owned banks as the bank crisis unfolded. Nonetheless, after the capital injection, regulatory bank capital continued to increase. Overall, the steady rise in bank capital, notwithstanding the large capital injection, likely had a dampening effect on bank credit growth in Slovenia throughout the post-GFC period.

Figure 2. Select Banking System Indicators



Customer Deposits

14. The coefficient on customer deposits is significant with an overall positive sign in the bank-level cross country analysis, though it turns negative during recessionary periods. This suggests that strong saving mobilization facilitates credit expansion. However, during a recession and uncertain recovery, growth in deposits may also reflect a desire on the part of potential consumers and investors to save rather than consume and invest. In Slovenia, deposit growth rates slid in advance of the 2012 recession and 2013 banking crisis, turning negative on the eve of the government's bank bailout, and then accelerated sharply in the aftermath of the crisis. Domestic

bank credit growth was positively correlated with deposit growth rates prior to the recession/ banking crisis, i.e., growth slowed as deposits slowed – consistent with the positive coefficient on customer deposits. After the crisis, credit growth continued to contract as the customer deposits grew, which is in line with the negative coefficient on customer deposits during recessions.

Non-Performing Loans

15. The coefficient on NPL ratio is significant with a negative sign in the cross-country analysis. An increasing NPL ratio indicates trouble in the economy or in the bank's loan selection process and hence triggers a more conservative approach to credit expansion. Even if the NPLs are fully provisioned, they still have costs in terms of credit expansion since the resources used for provisioning could have been used to extend further credits. In Slovenia, the NPL ratio rose from 2008 until the banking crisis broke in late-2013. Bank credit growth in Slovenia began decelerating in early 2010, turning negative in mid-2011 and continuing to contract thereafter. This pattern of changes in the NPL ratio and bank credit is broadly consistent with the negative correlation between the NPL ratio and bank credit growth indicated by the regression results, However, the positive correlation between the NPL ratio and bank credit extension following the banking crisis is not. This divergence can be explained by two factors. First, the aggregate NPL ratio of Slovenian remains relatively elevated at 5.1 percent despite the significant reduction over the last two years. Second, Slovenian corporates have been deleveraging since the crisis, as noted above, Thus, even though bank balance sheets have gradually improved (NPL ratio has fallen) demand for domestic bank loans from corporations has been held back by their efforts to reduce their debt burdens.

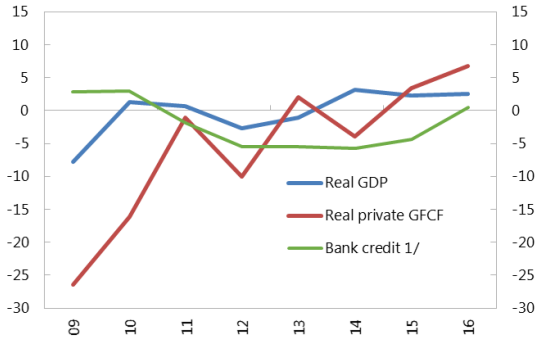
D. GDP Growth and Credit Growth in Europe and Slovenia[13]

16. In some countries there is no clear relationship between GDP growth and domestic bank credit growth after the GFC, echoing "creditless" recoveries. This appears to be the case for Slovenia with positive GDP and private investment growth while bank credit continues to contract (See text chart on next page). It is also possible that the severity of the GFC may have altered the relationship between GDP growth and bank credit extension. With this in mind, we re-assessed the extent to which bank credit growth influences GDP growth using a dynamic system Generalized-Method-of-Moments panel estimator (Blundell and Bond, 1998), to estimate the relationship between credit growth and indicators of economic activity (GDP growth and private gross fixed capital formation, GFCF). The panel included data on 39 European countries from 1999–2015.

[13] In the cross-country paper, this analysis is performed by Marco Arena.

17. The analysis revealed that the relationship between bank credit growth and GDP growth has remained essentially unchanged during and after the GFC. A positive and significant, if moderate, relationship between economic growth and bank credit growth exists. In an "average" European country, a 10 percent increase in domestic bank credit to the private sector would raise real GDP by 0.6–0.7 percent (Table 1). The main channel seems to be gross fixed capital investment, as a credit growth of 10 percentage points raises private GFCF formation by some 1½–2 percent (Table 2). In response to an influential paper (Biggs et al., 2009), we also experiment with the change in credit growth (called the credit impulse) and find that it influences GDP growth strongly and significantly during the post-GFC recessions and recoveries, helping to resolve the puzzle of "creditless" recoveries (Table 3.) During a recession, and, for the sample of CESEE countries, during the recovery, the credit impulse coefficient is significant and larger than the coefficient of bank credit growth in Table 1.

Real GDP, real private investment, and bank credit to private sector
(percent change, yoy)



Sources: Ministry of Finance; Haver; and IMF staff calculations.
1/ Adjusted for transfer of EUR 3.3 billion, EUR 1.6 billion, and EUR 0.6 billion of commercial bank claims to the BAMC in 2013, 2014, and 2016 respectively.

E. Concluding Remarks

18. The analysis indicates that Slovenia's post-GFC experience is not unusual after accounting for the severity of Slovenia's post-GFC downturn and the banking crisis in 2012-13. It also shows that bank-specific factors such as loan quality, customer deposits, and capital likely played a role in weak credit creation following the crisis. Bank credit to the private sector influences economic activity, but the impact is modest, working mainly through the investment channel.

19. Some policy recommendations can be drawn from the findings. The first relates to asset quality. The results show that non-performing loans can be a major drag on credit growth. Slovenia authorities and banks in general have made significant strides in reducing NPLs, particularly of large non-financial corporations. SMEs account for a significant portion of the remaining stock of NPLs and a concerted effort, through application of recently published guidelines on reducing SME NPLs and aggressive supervision of its implementation would be appropriate. The second relates to proper diagnosis of economic and financial developments. As the analysis shows, Slovenia's performance when benchmarked relative to the 2012–13 recession is broadly in line with the performance of other countries that experienced financial crisis. This reflects in part the time it takes for banks and corporates to work off unsustainable debt burdens. In this context, it is important to be patient and allow balance sheet repair to take its course before encouraging banks to increase lending. Finally, the sale of state-owned enterprises could add much needed equity financing to the economy, easing the need of the corporate sector to rely on deleveraging to restore financial health.

Table 1. Slovenia: GDP Growth and Bank Credit to the Private Sector: Recession and Recovery

Dynamic panel data; two-step system GMM estimator
Sample of 39 European countries, estimation period: 1999-2015

	(1) Full sample	(2) AE	(3) CESEE
GDP growth rate (t-1)	0.219**	0.149**	0.0967*
	(0.085)	(0.066)	(0.060)
Private sector credit growth	0.0711***	0.0871**	0.0558***
	(0.021)	(0.031)	(0.016)
Private sector credit growth * Dummy recession[1/]	0.0726	-0.0249	0.0170
	(0.096)	(0.093)	(0.094)
Private sector credit growth * Dummy recovery[2/]	0.0308	-0.0424	-0.0581
	(0.062)	(0.063)	(0.095)
Public consumption growth rate	-0.469*	0.206**	0.0280
	(0.251)	(0.090)	(0.051)
Private sector credit-to-GDP ratio	-0.0129*	-0.00857	-0.0405***
	(0.008)	(0.011)	(0.012)
External demand [3/]	0.253**	0.216***	0.145**
	(0.077)	(0.033)	(0.063)
Log (VIX)	-0.00388	-0.00760*	-0.0148*
	(0.005)	(0.004)	(0.009)
Dummy recession	-0.0281**	-0.0123**	-0.0369***
	(0.009)	(0.006)	(0.006)
Dummy recovery	0.000669	0.00920**	-0.000121
	(0.004)	(0.004)	(0.006)
Constant	0.0349**	0.0267	0.0821**
	(0.018)	(0.021)	(0.029)
No. Obs.	576	331	244
No. countries	39	21	18
No. instruments	20	21	20
Autocorrelation test, p-value	0.317	0.162	0.317
Hansen test, p-value	0.121	0.252	0.353

Standard errors in parentheses. * p<0.10, ** p<0.5, *** p<0.001
1/ Dummy takes the value of 1 during the recession period.
2/ Dummy takes the value of 1 during the recovery period.
3/ Volume of trading partners imports weighted by exports' shares.

Table 2. Slovenia: Private Gross Fixed Capital Formation (GFCF) and Bank Credit to the Private Sector

Dynamic panel data; two-step system GMM estimator
Sample of 39 European countries, estimation period: 1999-2015

	(1) Full sample	(2) AE	(3) CESEE
GFCF growth rate (t-1)	0.168*	0.224**	0.0948
	(0.098)	(0.083)	(0.160)
Private sector credit growth	0.200**	0.181**	0.149*
	(0.103)	(0.069)	(0.092)
General government balance ratio (% GDP)	0.493	0.664*	0.162
	(0.442)	(0.370)	(0.424)
Private sector credit-to-GDP ratio	-0.126**	-0.0743***	-0.324**
	(0.041)	(0.019)	(0.147)
Interest rate (policy rate)	-1.783***	-1.176**	-1.618**
	(0.515)	(0.507)	(0.580)
External demand	0.725**	0.718***	0.416*
	(0.236)	(0.154)	(0.238)
Log (VIX)	-0.0438	-0.00832	-0.131**
	(0.029)	(0.016)	(0.048)
Constant	0.223**	0.0793	0.562***
	(0.105)	(0.067)	(0.162)
No. Obs.	526	302	232
No. countries	38	21	17
No. instruments	18	18	17
Autocorrelation test, p-value	0.123	0.970	0.015
Hansen test, p-value	0.188	0.301	0.343

Standard errors in parentheses. * p<0.10, ** p<0.5, *** p<0.001

Table 3. Slovenia: GDP Growth and Credit Impulse: Recession and Recovery

Dynamic panel data; two-step system GMM estimator
Sample of 39 European countries, estimation period: 1999-2015

	(1) Full sample	(2) AE	(3) CESEE
GDP growth rate (t-1)	0.300***	0.198**	0.300***
	(0.030)	(0.066)	(0.040)
Change in private sector credit growth	-0.0218	-0.0244	-0.0116
	(0.023)	(0.025)	(0.015)
Change in private sector credit growth * Dummy recession[1/]	0.0888**	0.109*	0.118**
	(0.031)	(0.058)	(0.060)
Change in private sector credit growth * Dummy recovery[2/]	0.0739**	0.0537**	0.0957***
	(0.029)	(0.028)	(0.029)
Public consumption growth rate	0.0838*	0.428***	0.0152
	(0.050)	(0.099)	(0.063)
Private sector credit-to-GDP ratio	-0.0204***	-0.001	-0.0249*
	(0.006)	(0.004)	(0.014)
External demand [3/]	0.237***	0.236***	0.265***
	(0.027)	(0.057)	(0.051)
Log (VIX)	-0.00899***	-0.00926**	-0.0104
	(0.003)	(0.004)	(0.009)
Dummy recession	0.00266	0.00817**	-0.00125
	(0.003)	(0.003)	(0.005)
Dummy recovery	-0.0222***	-0.0103	-0.0324**
	(0.006)	(0.007)	(0.012)
Constant	0.0491***	0.0209	0.0556*
	(0.012)	(0.016)	(0.029)
No. Obs.	576	325	250
No. countries	39	21	18
No. instruments	19	21	19
Autocorrelation test, p-value	0.358	0.220	0.514
Hansen test, p-value	0.651	0.294	0.355

Standard errors in parentheses. * p<0.10, ** p<0.5, *** p<0.001

1/ Dummy takes the value of 1 during the recession period.

2/ Dummy takes the value of 1 during the recovery period.

3/ Volume of trading partners imports weighted by exports' shares.

Annex 1. Country Groups

	Euro area - advanced		Other European - advanced		Central, Eastern, and Southeastern European		Other
1	Austria *	1	Denmark *	1	Albania	1	Argentina *
2	Belgium	2	Iceland *	2	Bosnia & Herzegovina	2	Australia *
3	Cyprus *	3	Israel *	3	Bulgaria	3	Brazil *
4	Finland *	4	Norway *	4	Croatia	4	Canada *
5	France *	5	Sweden *	5	Czech Republic	5	China,P.R.: Mainland
6	Germany *	6	Switzerland *	6	Estonia	6	China,P.R.:Hong Kong *
7	Greece *	7	United Kingdom *	7	Hungary	7	India *
8	Ireland *			8	Kosovo	8	Indonesia
9	Italy *			9	Latvia	9	Japan *
10	Malta *			10	Lithuania	10	Korea, Republic of *
11	Netherlands *			11	Macedonia, FYR	11	Malaysia *
12	Portugal *			12	Montenegro	12	Mexico *
13	Spain *			13	Poland	13	Philippines *
				14	Romania	14	Singapore *
				15	Russian Federation *	15	South Africa *
				16	Serbia, Republic of	16	Turkey *
				17	Slovak Republic	17	United States *
				18	Slovenia		

1/ Belarus, Luxembourg, Moldova, San Morino, and Ukraine not included in sample.
* Countries with expansion peaks in 1971-2006 that are included in LP regression to derive projection paths.

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DRIVERS OF SLOVENIA'S EXPORT PERFORMANCE [1]

In the last ten years, Slovenia's external balance has experienced a dramatic increase, with the current account rising from a deficit of -4 percent of GDP in 2007 to a surplus of almost 7 percent of GDP in 2016. Such a large surplus is unusual for an advanced economy with a relatively older population. A decomposition of Slovenia's external position shows that most of the increase was due to an increase in goods exports. Thus, to understand the reasons for Slovenia's external surplus it is important to understand the drivers of goods exports. This chapter compares Slovenia's export performance to other countries in the region, examines the pattern of exports by product and partner, and assess the impact of factors such as partner growth and factor intensities.

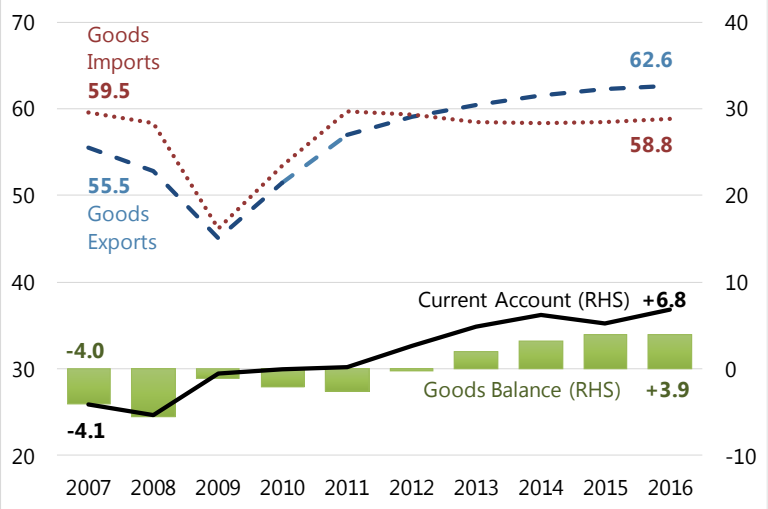
A. Developments since the Global Financial Crisis

1. Slovenia's current account balance has improved dramatically since the onset of the global financial crisis. This improvement was mainly driven by goods exports rather than a reduction in goods imports or an improvement in the services balance (Figure 1). Since 2007, Slovenia's current account balance improved by 11 percentage points of GDP, from -4.1 percent of GDP in 2007 to +6.8 percent of GDP in 2016. Most of the improvement in the current account was driven by good exports. These increased from 55½ percent of GDP in 2007 to 62¾ percent of GDP in 2016, about two-thirds of the total improvement. The increase was driven by strong export growth rather than a decline in output. In particular, the real growth of goods exports averaged 2½ percent per year from 2007 to 2016, while Slovenia's annual real GDP growth averaged only 0.1 percent. Imports declined marginally between 2007 and 2016 from 59½ to 58¾ percent of GDP. Within this overall aggregate, real imports of consumer and investment goods declined by 11 percent from 2007 to 2009 and remained subdued thereafter as businesses and consumers reduced consumption and investment due to lower income, reduced confidence, and uncertainty about the future. While services, in particular tourism, also boosted Slovenia's economy, they were a smaller contributor, with the services balance increasing from 2¾ to 5¾ percent of GDP.

2. The performance of Slovenia's exports after the crisis was also strong relative to that of other countries (Figure 2). In Europe, different countries saw different patterns of GDP growth. In Slovenia, strong exports offset a decline in domestic demand and overall GDP growth was relatively flat. A few countries (e.g., Croatia and Hungary) followed a similar pattern. But in others (e.g., Austria and Poland) domestic demand was the main contributor to growth. The Slovak Republic is the only country in the sample in which both exports and domestic demand played a significant role.

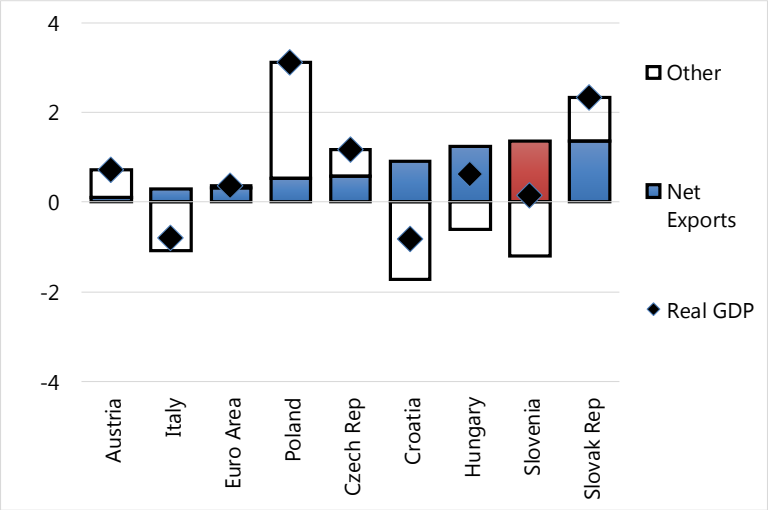
[1] Prepared by Lawrence Dwight.

Figure 1. Current Account Developments
(Percent of GDP, 2007-16 Est.)



Sources: Bank of Slovenia and IMF staff calculations.

Figure 2. Changes in Real Net Exports and Real GDP
(Annual Average as a Percent of GDP, 2008-16 Est.)



Sources: WEO database and IMF staff calculations.

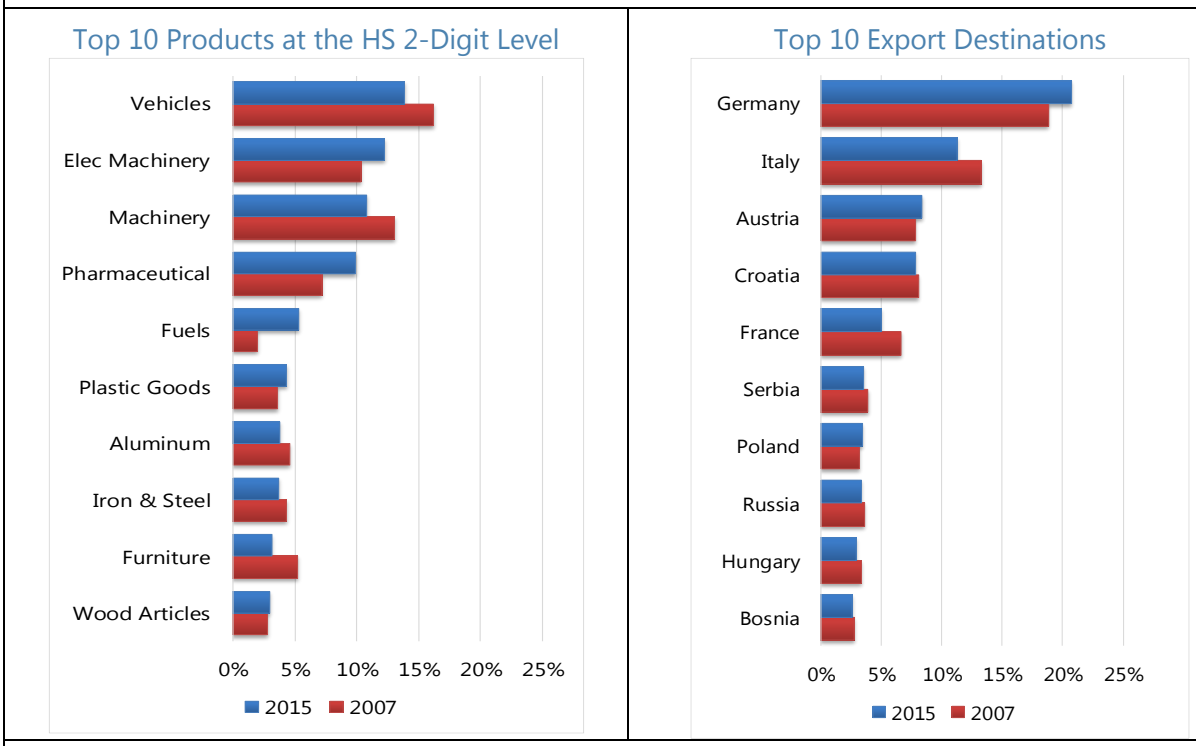
B. Structure of Goods Exports

3. Slovenia's export structure has remained relatively stable over time, despite significant changes in the international trading environment (Figure 3). These include Slovenia's 2004 accession to the EU, 2007 entry into the Euro Area, the 2007 global financial crisis, and a 2012–13 banking crisis.

- By ***product***, the top 5 categories of gross goods exports in 2015 (at the HS 2-digit level) included vehicles, electrical machinery, general machinery, pharmaceuticals, and fuel. The top 10 export categories were relatively stable between 2007 and 2015, with only one new product (fuel) appearing. The shares in total exports were also relatively stable, with the top 5 export categories making up 50 percent and the top 10 making up 80 percent of total exports in both years. Moreover, Slovenia's exports are relatively concentrated compared with other European countries and have become more concentrated over time (Figure 5).

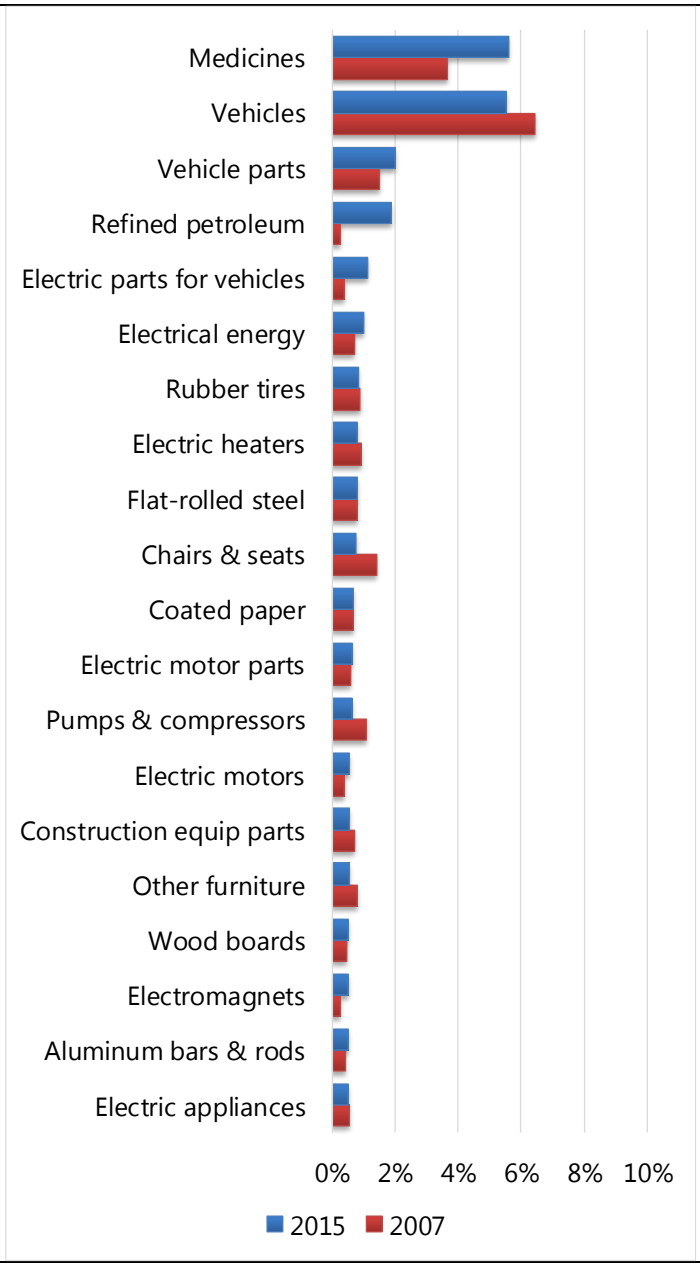
- Similarly, by ***trading partner*** Slovenia's export markets have remained stable over time, with no changes in the top 10 export destinations. The top 5 markets are Germany, Italy, Austria, Croatia and France, which accounted for just over 50% of total exports in 2007 and 2015. The top 10 export markets accounted for about 70% of total exports in both years.

Figure 3. Top 10 Gross Export Categories before and after the Crisis
(Share of Total Trade)



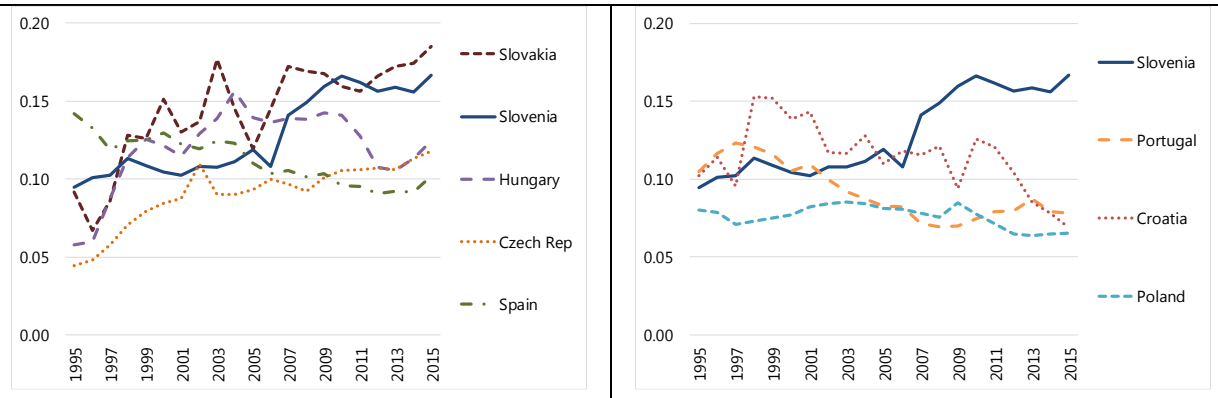
Source: UN Comtrade Database and IMF staff calculations

Figure 4. Top 20 Export Categories at the HS 4-Digit Level
(Share of Total Trade)



Sources: UN Comtrade Database and IMF staff calculations

Figure 5. Export Concentration of Selected Countries
(Normalized Herfindahl index, higher indicates greater product concentration)

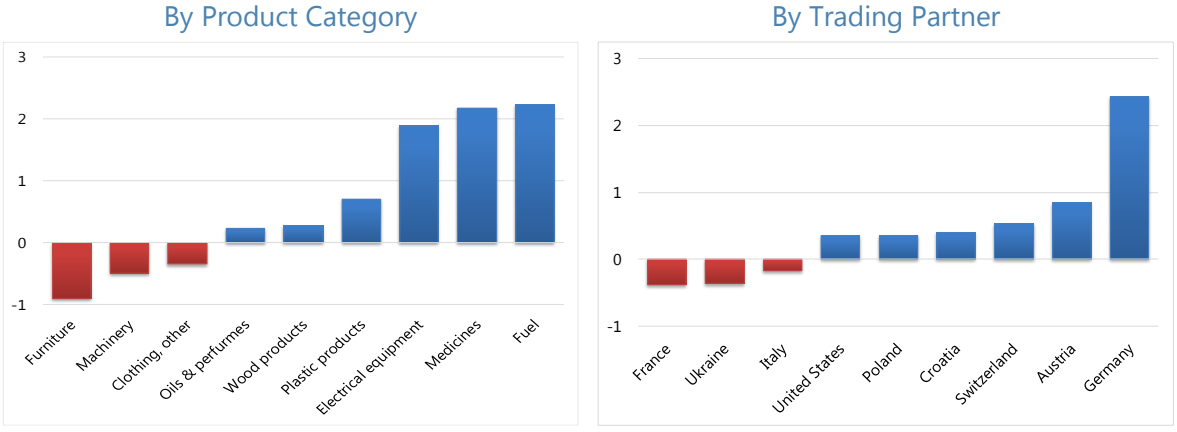


Sources: UNCTAD Trade Analysis and Information System

4. The largest changes in Slovenia's exports were concentrated in a small number of product categories and trading partners (Figure 6).

- By ***product***, the 5 categories at the HS 2-digit level with the greatest increases (fuel, medicines, electrical machinery, and plastic products) accounted for 74 percent of the total. At the same time, furniture and machinery saw significant decreases. As even the largest categories comprised only 6 percent of total exports in 2007, it does not appear that production bottlenecks were a constraint on export growth (see Figure 5).
- By ***trading partner***, the 5 countries with the greatest increases from 2007 to 2015 were Germany, Austria, Switzerland, Croatia, and Poland, accounting for 43 percent of the total increase. France, Ukraine, and Italy saw the largest decreases.

Figure 6. Largest Changes in Exports
(Percentage points of GDP, 2007 to 2015)



Sources: UN Comtrade Database and IMF staff calculations

5. The changes at the overall level, however, mask significant changes within industries (Figure 7). For example, although overall vehicle exports were the largest share of exports in both 2007 and 2015, this category was not one of the top categories for changes between 2007 and 2015. In fact, there were significant movements according to trading partner, with vehicle exports to Germany showing a large increase and vehicle exports to France and Italy showing significant decreases. A similar divergence occurred for aluminum exports.

6. A decomposition of growth shows that most of the increase occurred in exports to existing markets rather than exports to new markets or introduction of new products (Figure 8).

- Increases in existing goods to existing markets represented 95% of the increase in exports from 2007 to 2015. Of this, the top 10 export categories contributed 40% of the increase, while all other goods contributed 55%.
- Only 5% of the increase was due to exports to new markets or of new products to existing markets. With a mature economy that is well integrated into global markets, Slovenia already exports in 1,140 of 1,241 (or 92%) of the HS 4-digit product categories. Thus, it is not surprising that growth occurred in existing markets and products.

Figure 7. Largest Changes in Good Exports by Product and Trading Partner, 2007 to 2015
(Percentage points of GDP, HS 2-digit level)

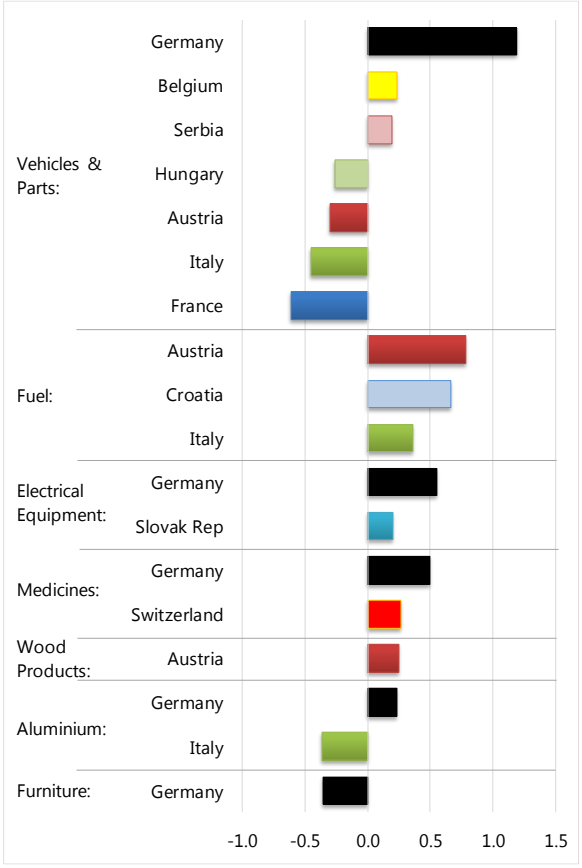
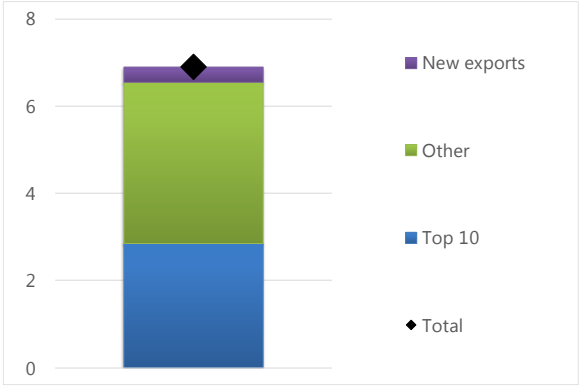


Figure 8. Decomposition of Export Growth
(Increase in export to GDP ratio, 2007 to 2015)



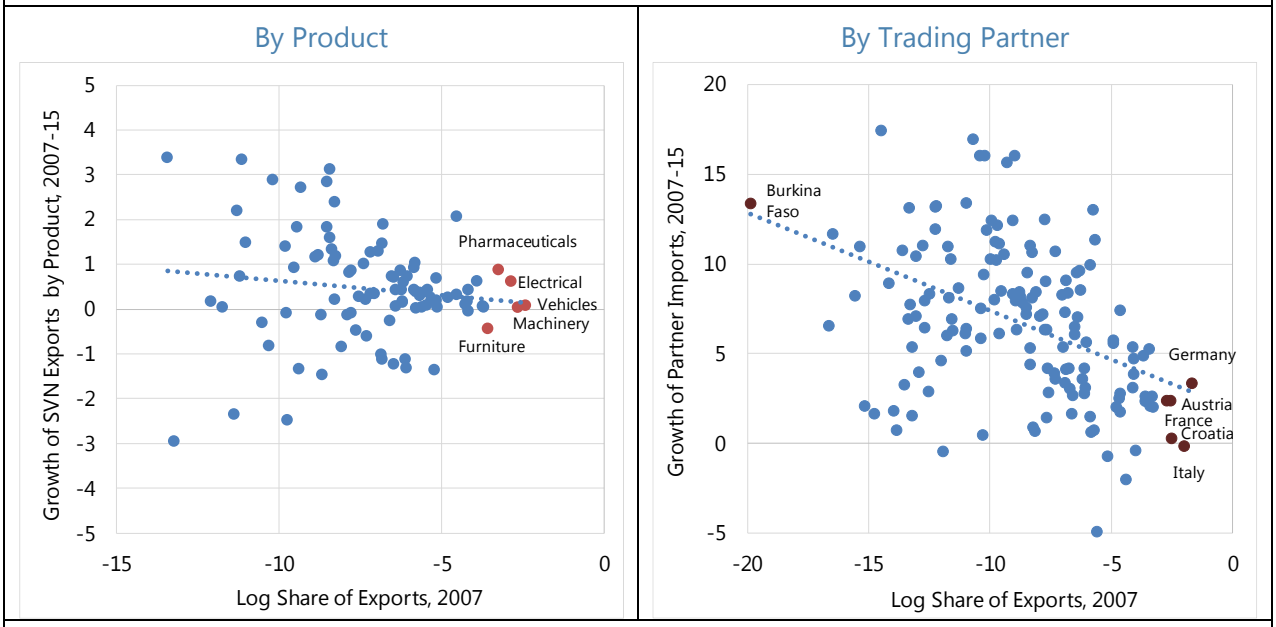
Sources: UN Comtrade Database and IIMF staff calculations.

C. Effects of Structure on Performance

7. Despite the good overall performance from 2007 to 2015, Slovenia's export structure was actually a drag on growth of exports.

- Between 2007 and 2015, the top 10 exports grew more slowly than overall exports, falling from 70 to 67 percent of total exports.
- Similarly, an examination of the growth orientation of exports (Figure 9) shows that Slovenia's exports were growing more slowly than might be expected. Those partners or categories comprising the largest share appear on the right and are highlighted in red. As can be seen, Slovenia's exports have been concentrated in partners and in product categories that grew slower than average during 2007–15.
- These findings suggest that Slovenia's export would have done even better if the largest export categories had performed at the average level.

Figure 9. Growth Orientation of Exports



Sources: WEO database and IMF staff calculations

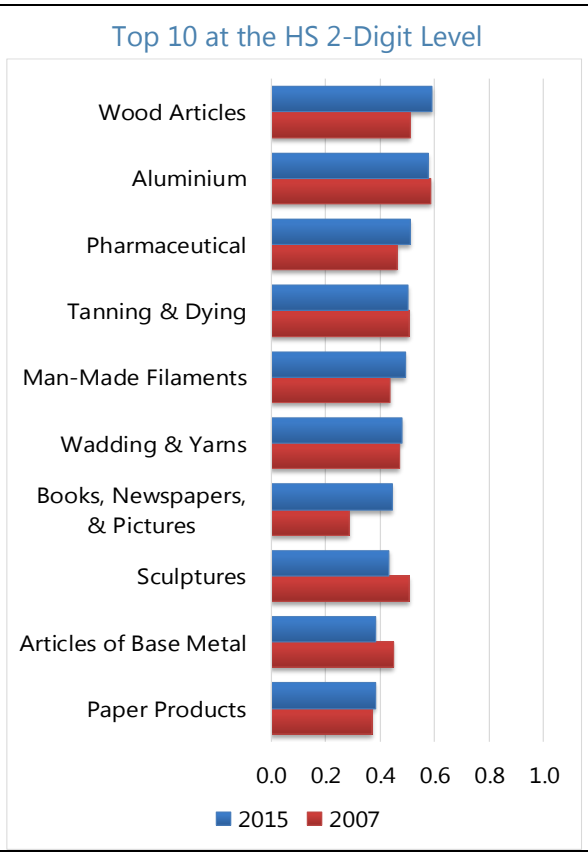
A negative slope indicates exports are concentrated in products and partners with lower growth rates.

D. Slovenia's Comparative Advantage

8. The product composition of exports can be used to estimate Slovenia's comparative advantage by industry and type of labor input.

- The first approach is based on ***Balassa's*** (1965) ***revealed comparative advantage index*** (RCA). This index identifies the categories where Slovenia's export shares are higher than the world average and thus are expected to have a competitive advantage. (Figure 10).
- As expected, pharmaceuticals are one of the categories, but most of the top 10 exports are not included. In fact, only three of the products (wood articles, aluminum, pharmaceuticals) in Figure 10 are in Slovenia's top 10 export categories (see Figure 3) and only two (pharmaceuticals and wood articles) are among the largest contributors to the growth in exports from 2007 to 2015 (see Figure 6). As discussed below, 4 of the top 10 are primarily produced with low-skilled labor, 4 with medium-skilled white-collar labor, one with medium-skilled blue-collar labor (wood products), and one (pharmaceuticals) with high-skilled labor.

Figure 10. Revealed Comparative Advantage by Product
(Normalized RCA index, 2007 & 2015)



Sources: UN Comtrade Database and IMF staff calculations.

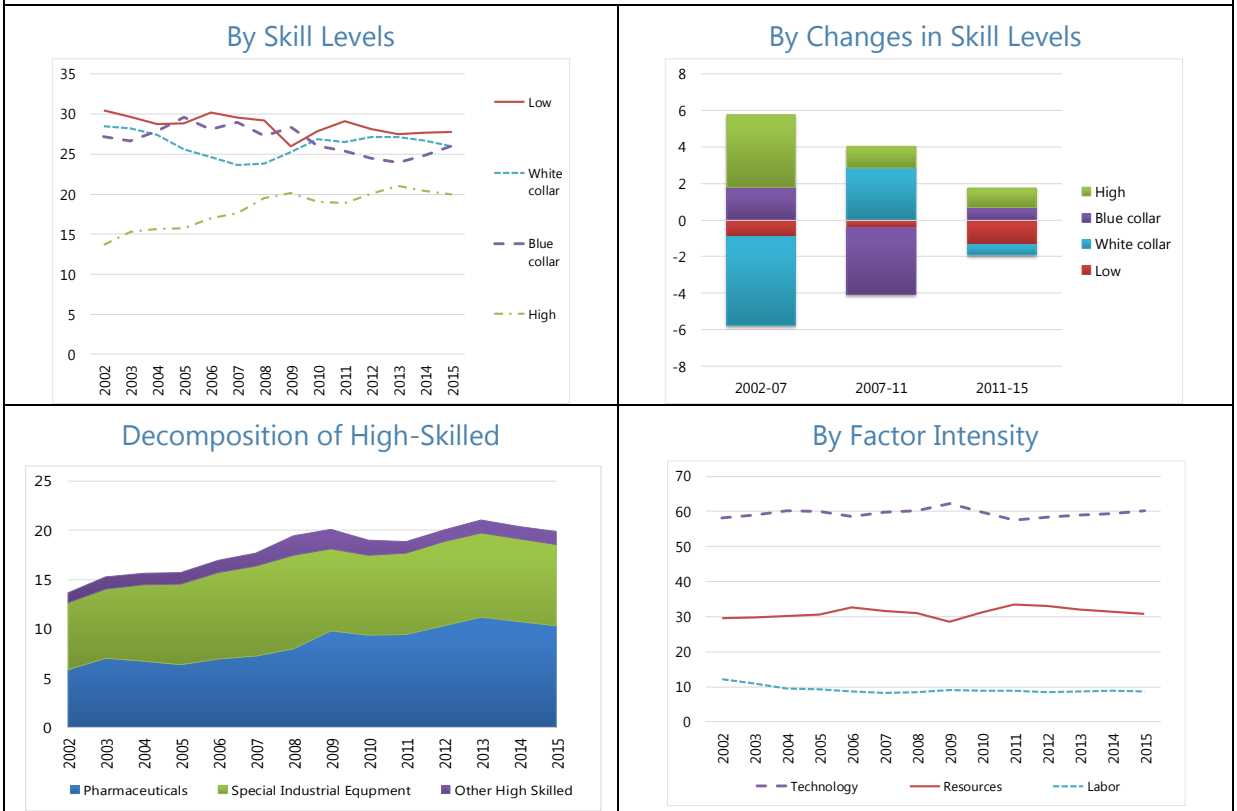
9. Another method originated by Peneder (1999) and used by Banerjee et al (2016) reveals competitiveness according to skill levels and factor intensities embodied in exports (Figure 11).

Skill Level

- By skill level, goods are classified as primarily utilizing ***low-skilled*** (metal manufactures, textiles, and rubber), ***medium-skilled blue-collar*** (e.g. vehicles, furniture, and miscellaneous manufactures), ***medium-skilled white-collar*** (e.g. electrical equipment, paper products, and power generating equipment), or ***high-skilled*** (e.g. pharmaceuticals, specialized industrial equipment, and metal working machinery) labor.

- By value, exports classified as using low-skilled, blue-collar, or white-collar labor are each about 30% of Slovenia's exports. And these shares have declined only modestly over time.
- There was a clear increase in the value of exports that use primarily high-skilled labor. This category rose from 14 to 20 percent of total exports from 2002 to 2015, with growth concentrated in specialized industrial equipment and pharmaceuticals. Most of the increase, however, occurred between 2002 and 2009, with the share of high-skilled exports relatively constant since then.
- The pattern during the GFC is also informative. Prior to the crisis, the pattern of exports suggests a trend away from white-collar towards high-skilled exports and blue-collar exports. In the immediate aftermath of the GFC, the greatest decline in exports share was concentrated in goods produced primarily by blue-collar workers, while goods produced with white-collar labor bounced back. Changes since 2011 have been relatively modest.
- Surprisingly, compared with selected advanced economies (Austria, France, Germany, and Italy), Slovenia exports greater shares of goods that embody white-collar and high-skilled labor and smaller shares of goods that embody low-skilled and blue-collar labor. This may be because of the relatively large share of manufacturing in these economies. However, Slovenia's export pattern is similar to other eastern European countries (Croatia, Hungary, Poland, and Serbia).

Figure 11. Evolution of Exports by Embodied Skill Level and Factor Intensities
(Percent of Exports, 2002–15)



Sources: UN Comtrade Database and IMF staff calculations

Factor Intensity

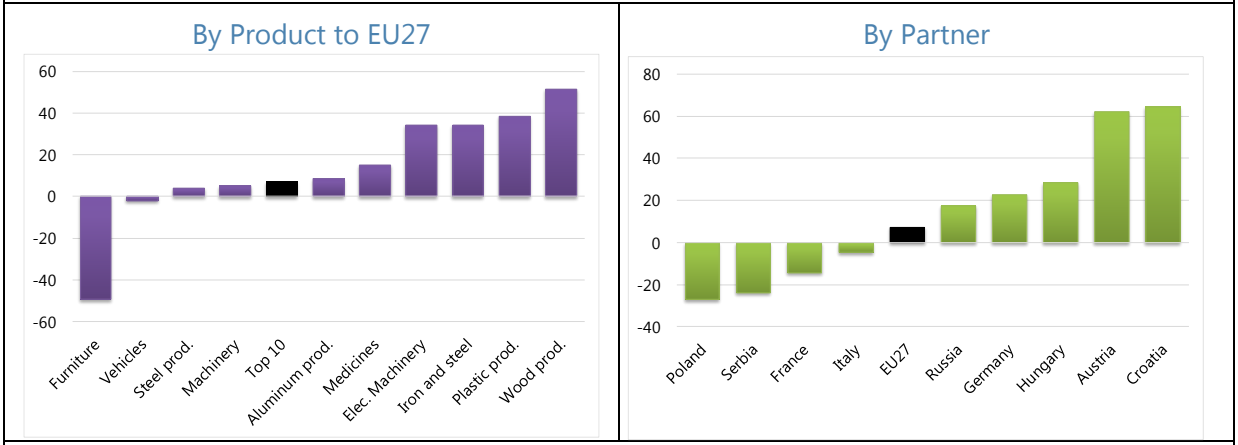
- By factor intensity, goods are classified as primarily intensive in the use of ***natural resources*** (e.g. wood, metals, or rubber), ***labor*** (e.g. textiles, apparel & footwear, and food & beverages), or ***medium- to high- technology*** (e.g. vehicles, electrical equipment, and pharmaceuticals).
- Examination of the figure shows that the shares of Slovenia's exports classified by factor intensity were relatively constant over time.
- Compared with France and Germany, Slovenia's export pattern is relatively intensive in exports that are classified as using natural resources and labor and less intensive in medium- and high-technology goods. As with exports classified by skill level, Slovenia's pattern is very similar to other eastern European countries.

E. Explanations for the Positive Contribution of Exports and Prospects for the Future

10. As shown in previously, the rapid growth of Slovenia's exports was not due to a favorable orientation of products or trading partners; it was largely due to the strong increase in partners' imports relative to GDP and in the market share of Slovenia's exports in Europe.

- Eight of the top 10 export categories (all except furniture and vehicles) saw increases in their market shares in the EU. And market shares of a few categories (wood and plastic products, iron and steel, and electrical machinery) rose by more than 20 percent in 2015 relative to 2007.
- Similarly, Slovenia's exports declined to some markets, including France, Italy, Poland, & Serbia). But this was more than offset by an increase in market share in large markets such as Austria, Germany, Croatia, and Russia. As can be seen in Figure 12, the overall result was that Slovenia's market share of its top 10 exports in the EU increased by 7 percent between 2007 and 2015.

Figure 12. Changes in Market Shares in Top 10 Export Categories, 2007 to 2015
(Percent)

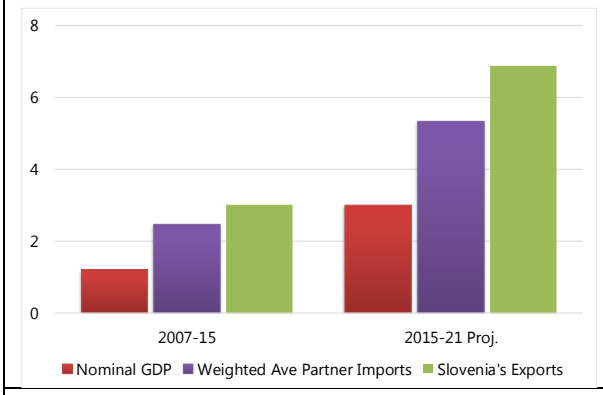


Sources: UN Comtrade Database and IMF staff calculations

11. Another factor that contributed to the large increase in exports as a share of GDP was that Slovenia's trading partners experienced strong import growth during this period.

- As seen in Figure 13, from 2007 to 2015, the average growth rate of Slovenia's trading partners' nominal imports exceeded that of Slovenia's nominal GDP (2.5 vs. 1.0 percent). And due to the increase in market share, Slovenia's export growth (averaging 3.0%) did even better than partner import growth.

Figure 13. Growth of Slovenia's GDP, Exports, and Partner Imports
(Average annual percent change, Euro millions)



Sources: WEO database and IMF staff calculations

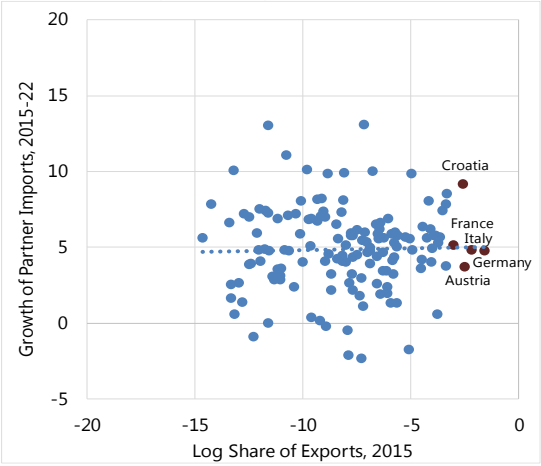
Prospects

12. Prospects for future export growth are relatively positive.

- Based on IMF projections for Slovenia's trading partners, robust export growth is expected to continue for 2016–2022. As Europe's growth recovers, Slovenia's largest trading partners are expected to have improved growth prospects relative to their past performance (Figures 13 & 14).
- A continued rise in Slovenia's market shares in partner imports would also be favorable, although this is hard to predict.

Figure 14. Future Growth Orientation of Exports

By Trading Partner



Source: WEO database and IMF staff calculations
A negative slope indicates exports are concentrated in partners with lower growth rates.

F. Conclusions

13. The improvement in Slovenia's goods exports in the wake of the GFC was not due a particularly favorable orientation with respect to products or trading partners, but due to strong growth of partner imports and increasing market share. Slovenia's current account improved dramatically from 2007 to 2016. This improvement was mainly due to higher exports of goods and, to a lesser extent, services like tourism. The strong growth of exports is striking from a cross-country perspective as Slovenia's exports performed better than most other countries in the region. Surprisingly, given the good performance, Slovenia's export structure was actually a drag on export growth from 2007 to 2016. Exports were concentrated in product categories and trading partners that grew more slowly than average during the period. Measures of Slovenia's revealed comparative advantage suggest competitiveness in medium-skilled white-collar products. Moreover, exports of products that use high-skilled labor (pharmaceuticals and specialized industrial equipment) rose quickly, although they plateaued after 2009. Given that Slovenia's export orientation was not particularly favorable in 2007, the increase in exports' share in the economy was due primarily to strong growth of partner imports and an increase in the market shares of many of Slovenia's exports in the European Union, stemming from improved competitiveness and deeper integration in regional supply chains. Prospects for future growth of exports should be good as the market orientation of exports appears better in 2016 than in 2007. Moreover, the IMF projects that the imports of Slovenia's trading partners will grow even faster from 2016 to 2022. As a result, goods exports are expected to continue supporting economic activity in Slovenia.

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Annex

Table 1. Changes in Export Products' Share of GDP
(in Percent, by HS 2-Digit Category)

Product Category	Ave Annual Growth Rate Percent	2007 % of GDP	2015 % of GDP	Change in Share % of GDP	Product Category	Ave Annual Growth Rate Percent	2007 % of GDP	2015 % of GDP	Change in Share % of GDP
Fuels	2.1	1.06	3.30	2.23	Misc manufactures	0.3	0.05	0.06	0.01
Pharmaceuticals	0.9	3.93	6.14	2.21	Musical instruments	0.9	0.01	0.01	0.00
Electrical equipment	0.6	5.67	7.56	1.89	Air & spacecraft	0.2	0.20	0.20	0.00
Plastic articles	0.6	1.97	2.67	0.70	Oil seed	0.2	0.07	0.07	0.00
Wood articles	0.4	1.54	1.83	0.29	Furskins	2.2	0.00	0.00	0.00
Essential oils & perfumes	0.7	0.58	0.81	0.24	Other animal products	1.5	0.00	0.00	0.00
Organic chemicals	1.0	0.30	0.51	0.22	Knitted fabrics	0.2	0.03	0.03	0.00
Misc edible products	1.9	0.11	0.31	0.20	Tobacco products	3.4	0.00	0.00	0.00
Misc chemicals	0.9	0.29	0.47	0.18	Tin articles	0.7	0.00	0.00	0.00
Salt & sulphur	1.5	0.11	0.24	0.13	Cork articles	0.2	0.00	0.00	0.00
Optical equipment	0.3	1.08	1.20	0.12	Straw manufactures	0.0	0.00	0.00	0.00
Beverages & spirits	0.9	0.19	0.30	0.11	Hides & skins	0.1	0.20	0.20	0.00
Clothing accessories	0.7	0.24	0.34	0.11	Vegetable materials	-2.9	0.00	0.00	0.00
Edible fruit & nuts	1.3	0.10	0.19	0.10	Umbrellas & walking sticks	-0.3	0.00	0.00	0.00
Clocks & watches	3.1	0.02	0.12	0.10	Carpets	-0.1	0.01	0.00	0.00
Man-made filaments	0.4	0.44	0.52	0.09	Silk	-2.3	0.00	0.00	0.00
Cereal & flour products	1.3	0.07	0.15	0.07	Art	-0.8	0.00	0.00	0.00
Cereals	2.8	0.02	0.09	0.07	Special woven fabric	-0.1	0.02	0.01	0.00
Toys & games	0.4	0.41	0.48	0.07	Other textiles	-2.5	0.01	0.00	0.00
Wadding, felt & yarn	0.6	0.20	0.27	0.07	Explosives	-1.3	0.01	0.00	-0.01
Gems & pearls	2.4	0.03	0.09	0.07	Vegetable & fruit products	-0.1	0.04	0.03	-0.01
Prepared seafoods	0.7	0.15	0.22	0.06	Ores, slag and ash	-0.1	0.04	0.04	-0.01
Meat	0.7	0.15	0.21	0.06	Rails & rolling stock	0.1	0.17	0.16	-0.01
Tanning & dyeing	0.3	0.82	0.87	0.06	Wool	-1.5	0.02	0.01	-0.01
Footwear	0.4	0.29	0.34	0.06	Photographic equipment	-0.8	0.03	0.02	-0.01
Dairy & eggs	0.4	0.30	0.35	0.05	Lead articles	-0.5	0.05	0.03	-0.02
Books & newspapers	0.4	0.34	0.39	0.05	Inorganic chemicals	0.1	0.42	0.40	-0.02
Live animals	1.0	0.06	0.10	0.04	Food residues	0.1	0.36	0.34	-0.02
Soaps	0.4	0.20	0.24	0.04	Copper articles	0.0	0.30	0.28	-0.02
Glass products	0.3	0.35	0.39	0.04	Nickel articles	-0.6	0.07	0.04	-0.03
Paper articles	0.2	1.49	1.53	0.04	Zinc articles	-0.3	0.13	0.10	-0.03
Fertilisers	1.8	0.02	0.05	0.03	Tools	0.0	0.59	0.55	-0.04
Leather articles	0.4	0.16	0.20	0.03	Rubber articles	0.1	1.41	1.37	-0.04
Edible vegetables	1.6	0.02	0.05	0.03	Coated fabric	-1.0	0.11	0.05	-0.06
Coffee, tea, & spices	2.7	0.01	0.04	0.03	Ceramic products	-1.1	0.11	0.05	-0.06
Stone & cement articles	0.2	0.49	0.51	0.02	Cotton	-1.2	0.16	0.06	-0.09
Other base metals	1.3	0.02	0.05	0.02	Other textiles	-1.1	0.22	0.09	-0.13
Wood pulp	1.2	0.03	0.05	0.02	Iron & steel	0.1	2.36	2.24	-0.13
Modified starches	0.9	0.04	0.06	0.02	Ships	-1.3	0.23	0.09	-0.14
Fats & oils	0.8	0.04	0.06	0.02	Aluminium articles	0.0	2.50	2.34	-0.16
Cocoa	1.1	0.02	0.04	0.02	Iron & steel products	0.0	1.51	1.35	-0.16
Misc metal articles	0.2	0.56	0.58	0.02	Vehicles & parts	0.1	8.92	8.60	-0.33
Milled products	2.9	0.00	0.02	0.01	Other clothing	-1.3	0.54	0.20	-0.34
Gums & resins	1.2	0.02	0.03	0.01	Machinery	0.0	7.16	6.69	-0.47
Seafood	1.8	0.01	0.02	0.01	Furniture	-0.4	2.85	1.95	-0.90
Live plants	1.2	0.01	0.03	0.01	Arms & ammunition	...	0.00	0.00	...
Man-made fibres	0.3	0.09	0.10	0.01	NA	...	...	...	...
Sugars & confectionary	0.4	0.07	0.09	0.01	**Totals**	**0.3**	**55.02**	**61.92**	**6.90**
Feather goods	3.3	0.00	0.01	0.01	Positive Contribution				10.11
Headgear	1.4	0.01	0.01	0.01	Negative Contribution				-3.24

Sources: UN Comtrade Database and IMF staff calculations

LABOR MARKET REFORM IN SLOVENIA: AN ASSESSMENT[1]

A. Introduction

1. Amid deteriorating labor market outcomes as the crisis deepened, Slovenia embarked on a labor market reform in 2013, aimed to ameliorate the immediate adverse impact on employment and address the root causes of labor market malfunction and pervasive segmentation. This chapter attempts a preliminary assessment of the effects of the 2013 reform.

2. The discussion is structured in a way that can be useful for drawing policy implications. Specifically, issues to be addressed include:

- What were the salient features of Slovenia's labor market that account for its unsatisfactory performance before the reform?
- How did the 2013 reform address these shortcomings? Has the mix of the reform measures been appropriate, or is there a case for some recalibration?
- Did the reform carry unintended negative side effects, and how should these best be addressed?
- Have there been areas of suboptimal labor market performance that the reform neglected, and how should these be addressed?

3. The chapter is organized as follows: The next section summarizes the performance of Slovenia's labor market during the crisis, and highlights features that could have contributed to these outcomes. This is followed by a description of the 2013 reform and its objectives. An assessment of the reform's impact is then carried out via complementary methodologies involving: relevant macro indicators; gross labor flows; and a structural model. The final section draws some key policy conclusions.

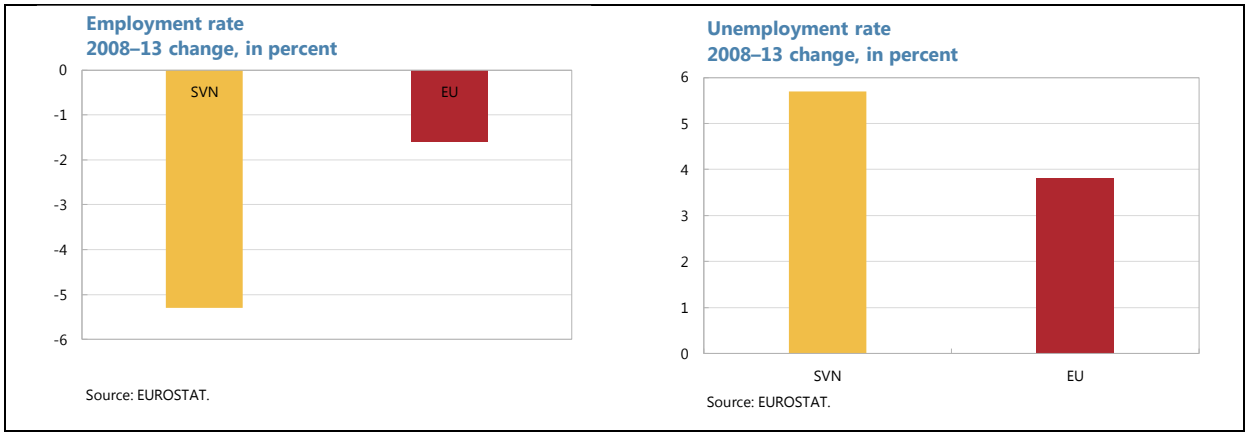
B. Context and Background

4. Slovenia's labor market outcomes deteriorated sharply with the onset of the 2009–13 crisis. In addition to the large adverse aggregate demand shock experienced by Slovenia, the crisis exposed underlying rigidities, which prevented a smooth labor market adjustment and did not facilitate the substantial labor reallocation that would be called for in response to the sectorally asymmetric nature of the shock. In addition, the major increase in the minimum wage introduced in 2010 added to the burden on labor market adjustment.[2]

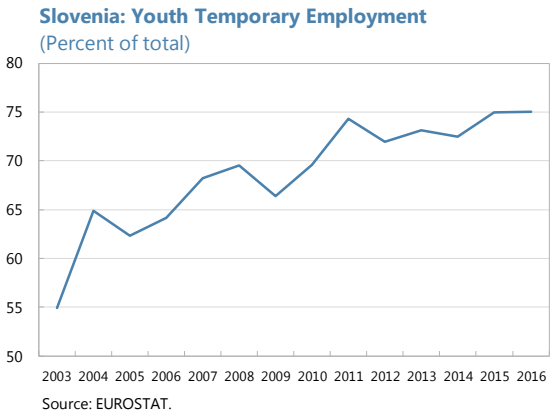
[1] Prepared by Ioannis Halikias.

[2] The increase brought the minimum wage from 41 to 51½ of the average wage, the highest ratio in the EU; see IMAD (2014). The minimum wage increase was phased in gradually to limit the burden on the labor market.

5. These factors contributed to worse labor market performance in Slovenia compared to other EU countries. Specifically, Slovenia experienced a sharper increase in unemployment and deeper reductions in employment that the average EU member (chart below). This deterioration has been even more pronounced when compared to relative output performance – even as the latter overstates the relative autonomous demand shock since it (partly) reflects the labor market performance itself. While Slovenia under-performed the EU average in terms of both employment and unemployment, its relative employment deterioration was much more pronounced; this feature will be taken up in this chapter's analytical and policy discussion.

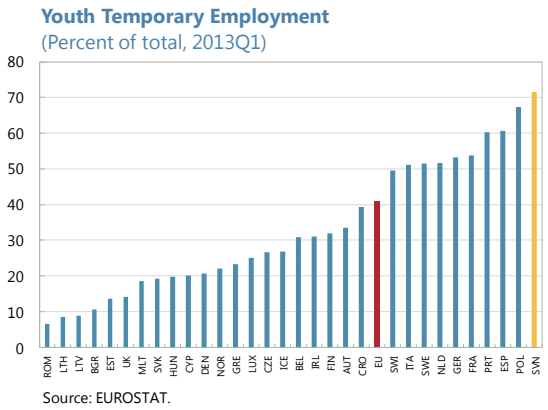


6. These aggregate trends relate importantly to labor market segmentation. Over the past decade, Slovenia's labor market has become progressively more segmented between a "core" segment of employees on open-ended contracts enjoying heavy employment protection (both by EU standards and, especially, by the standards of countries at comparable stages of development) and a segment dominated by short-term, temporary labor contracts. The latter segment has been increasingly relied on by employers to provide a missing "margin of flexibility" in response to sectoral or cyclical shocks, with temporary employment becoming increasingly pervasive particularly for the young, the single most important pool of entry to the labor market. Thus, the share of youth (15–24) employment covered by temporary contracts had been steadily increasing in the run-up to the crisis (chart).

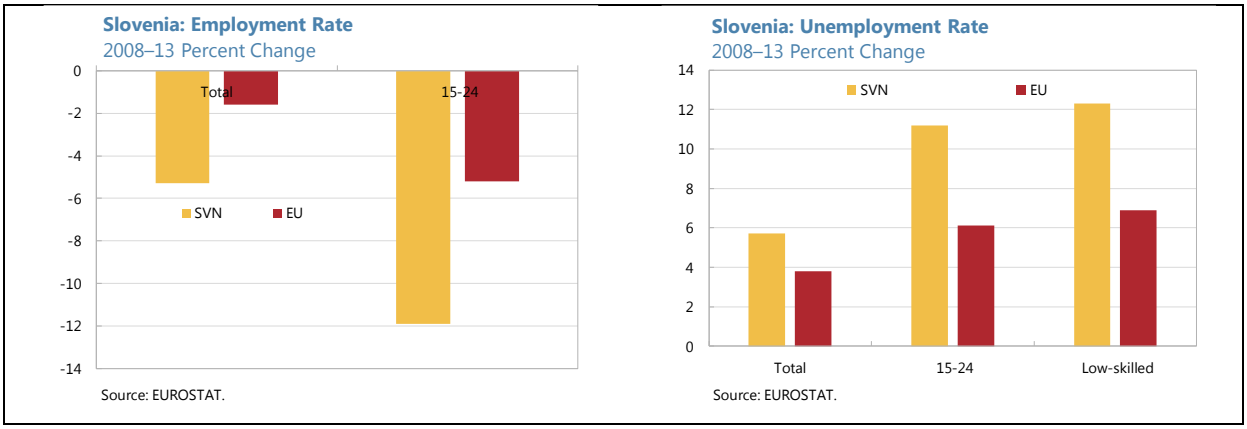


7. The incidence of temporary contracts continued to grow through the crisis. Following a brief reduction in the immediate wake of the 2008 global financial crisis, as employers resorted to layoffs of temporary workers to adjust total employment, the share of youth temporary contracts started rising again, eventually exceeding its pre-crisis peak. By the trough of the recession in early

2013, temporary contracts made up almost ¾ of youth employment, making Slovenia an outlier within the EU (chart).[3]



8. The prevalence of youth temporary contracts rendered this segment particularly vulnerable to the crisis. Thus, the youth (and the low-skilled) experienced a particularly significant deterioration in terms of employment and unemployment rates, compared both to the overall Slovenian labor force and to corresponding EU averages. Once again, the relative employment deterioration appears to have been comparatively more substantial.



9. Pervasive labor market duality, with a high incidence of temporary employment, arguably carries significant welfare costs, from both a near- and a longer-term perspective. At typical business cycle frequencies, it could lead to excessive employment fluctuations (and sub-optimal risk sharing among different groups) – a pattern consistent with a broad class of analytical models but also with Slovenia's crisis experience. From a longer-term perspective, it could entail sub-optimal human capital acquisition (particularly if temporary employment is concentrated among the young, as in Slovenia), impairing growth prospects. Against this background, it is not surprising that addressing duality without hampering employment prospects was a major objective of the 2013 labor market reform.

10. A number of policy measures to stem employment losses in the early phase of the crisis had rather limited impact. These efforts were codified in two intervention laws aimed at preserving jobs (via shortening working hours and allowing temporary layoffs)[4] and at expanding the scale of active labor market (ALM) policies, albeit from a rather low base. While Slovenia's employment losses would probably have been even worse in the absence of these policies, their

[3] It should be noted that student work makes up 15–20 percent of Slovenia's employment in the 15–29 age group.

[4] These covered almost 5 percent of the total active population; see IMAD (2014).

overall impact was limited and of rather short duration: with regard to ALM policies in particular, the number of persons involved remained generally low (and actually declined during 2011–12), as these programs ultimately ran into financing constraints in the face of Slovenia's erosion of fiscal space and loss of sovereign market access.

C. The 2013 Labor Market Reform

11. The 2013 reform was relatively comprehensive in nature, and aimed at addressing the root causes of Slovenia's labor market problems. Specifically, the reform's main objective was to limit duality by increasing employers' flexibility in handling open-ended contracts while strengthening legal protections for temporary employees. Overall, the reform entailed a range of policies targeted at both the open-ended and temporary segments of the labor market, aiming to expand the scope of the former via lowering employment protection and offering fiscal incentives for open-ended employment contracts, while reducing some of the advantages (to employers) of temporary contracts.[5]

12. Reforms to *open-ended* contracts included the following features:

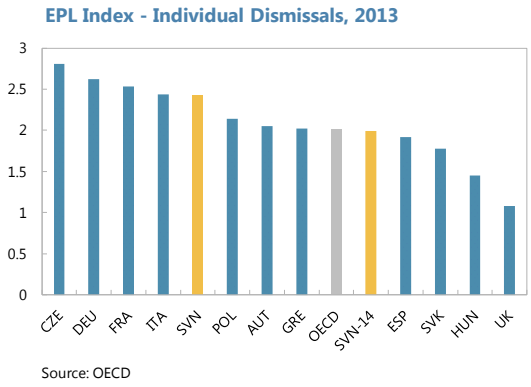
- Simplification of individual dismissal procedures – changes included allowing temporary layoffs and compensation in cash instead of reintegration and a shortening of dismissal notice periods;
- Reduction of firing costs – entailing shorter notice periods (from 120 to 60–80 days) and lower severance payments;
- Some (mostly temporary) exemptions from social contributions – these included: a 2-year exemption from contributions to unemployment insurance for new employees hired on open-ended contracts; exemptions for part of the employer pension and health contributions for hiring younger or older workers on open-ended contracts; a 2-year exemption from social contributions for hiring young, previously unemployed persons.

13. Reforms to *temporary* contracts included the following features:

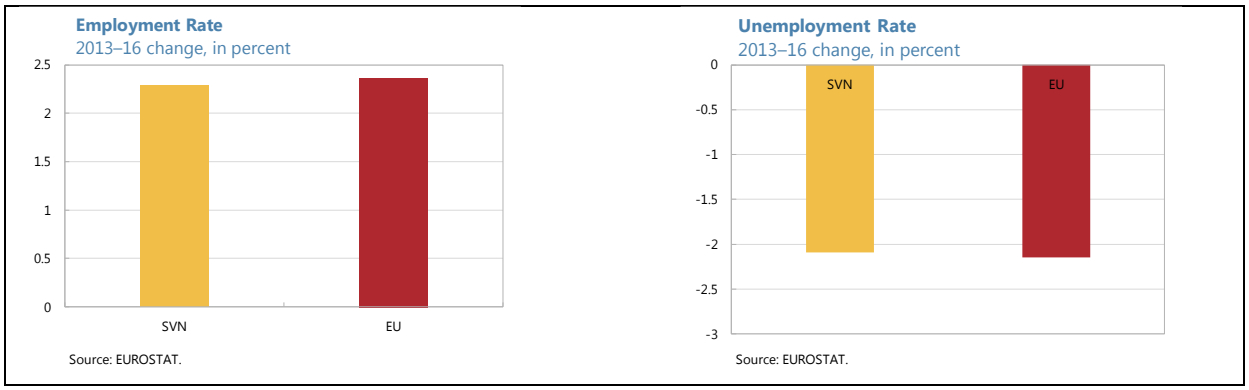
- Limits on the scope of repeated (so-called "chain") contracts – with temporary contracts allowed to be renewed up to two years for the same work, after which the employee had to be offered an open-ended contract or dismissed;
- Increase in some social contributions and severance pay for employees hired on temporary contracts;
- Student work made subject to social contributions – effective from early 2015 on.

[5] For a detailed description of the reforms see IMAD (2014).

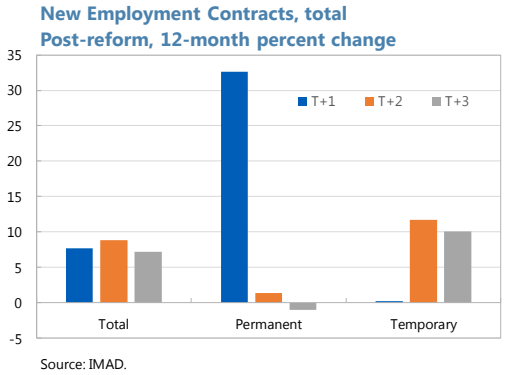
14. While overall changes in employment protection legislation under the reform were non-trivial, in some respects they arguably did not go far enough. The most substantial reduction in employment protection relates to the regime governing individual dismissals of workers under open-ended contracts: in this area, regulations have become significantly less restrictive, with the relevant index falling slightly below the OECD average – although still exceeding some other transition economies and some countries of comparable income levels (chart). On the other hand, regulations concerning temporary contracts were tightened, and remain somewhat more restrictive than the OECD average. More importantly, the regulatory regime regarding collective dismissals was not changed by the reform, and remains relatively restrictive.



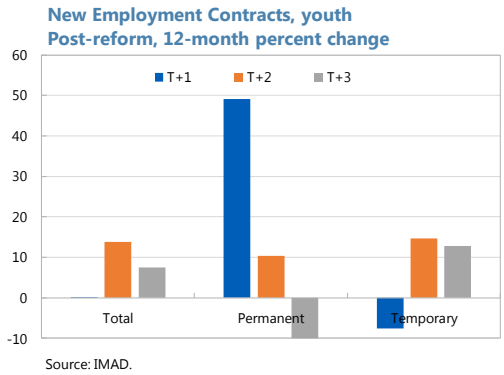
15. Post-reform aggregate labor market outcomes improved somewhat, but the picture looks less bright when adjusted for the cycle. Thus, Slovenia's employment growth and reduction in unemployment both actually fell short of the EU average (Figure), despite Slovenia's stronger post-2014 output recovery relative to the EU.



16. On the other hand, the reform had some of the intended impact on labor market duality, but this effect appears to have been largely transitory. Thus, while new contracts in the period leading up to the reform had been predominantly temporary, in the immediate wake of the reform this pattern reversed, with new open-ended contracts dominating. Specifically, over the first 12 post-reform months, the annual growth of new open-ended contracts substantially outpaced temporary contracts, especially for the youth segment of the labor market; on the other hand, the near-zero post-reform total new youth contracts suggest unintended side effects of the reform that will be taken up in subsequent discussion. However, this break with previous trends appears to have been largely confined to the immediate post-reform window, with the relative incidence of the two contract categories broadly reverting to the pre-reform picture in subsequent periods.

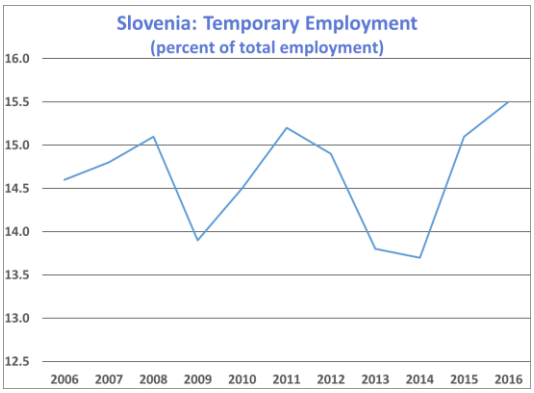


Source: IMAD.



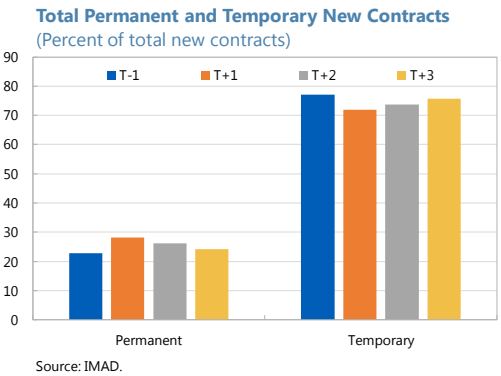
Source: IMAD.

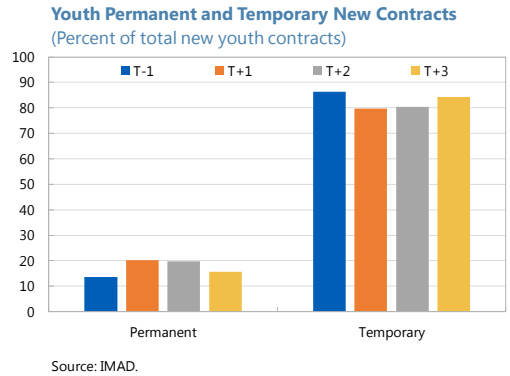
17. Alternative summaries of post-2013 data broadly confirm a mostly transitory impact of the reform on labor market duality. Year-on-year changes in new contracts could exaggerate the picture for the second and third post-reform years, as they may be distorted by high base of new open-ended contracts (and low base of new temporary contracts) of the immediate post-reform widow. To correct for this, we looked at the evolution of the share of open-ended and temporary new contracts in total new contracts, pre- and post-reform (chart below).[6] While the picture is naturally less dramatic compared to year-on-year changes, it confirms the steady decline of the reform's impact on labor market duality. It could also be argued that focusing on *new* contracts would tend to bias the results, as temporary contracts, by their nature, tend to be terminated and renewed more often than open-ended ones. Looking instead at shares of temporary contracts in the total stock of contracts rather than the flow of new ones would correct for such differential job churning. In this regard, data confirm that progress in reducing duality has been declining post-reform: while the share of temporary employment in total employment edged down in 2014, it resumed its upward trend subsequently, reaching an all-time high by 2016 (chart).



18. While illustrative, the above trends provide an incomplete picture of the reform's impact on labor market dynamics. The following sections attempt a more systematic assessment, via complementary methodologies drawing on macro evidence, in particular gross labor market transitions.

[6] Shares, rather than absolute levels, are used to correct for the impact of the cycle.





D. Reform Impact—Macro Evidence

19. This section draws on some standard macro relations to assess the post-reform functioning of Slovenia's labor market. Specifically, two broad questions are of interest in this context:

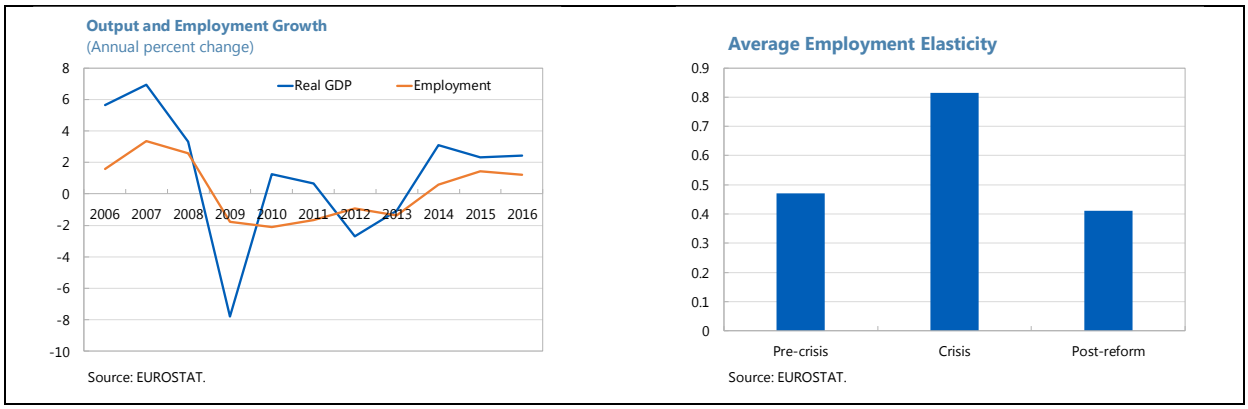
- Has growth become more "employment-friendly" since the reform?
- Has labor market matching improved since the reform?

Employment-growth relationship

20. Low employment-growth elasticities and a highly procyclical labor productivity can reflect labor market distortions. In particular, high employment protection can induce firms to hoard labor during contractions and rely heavily on overtime during expansions – these patterns appear to have characterized Slovenia in the pre-reform period. Given the reform's emphasis on loosening employment protection regulations, it is of interest to explore whether the employment-output relation has shifted in the expansionary post-reform period relative to past trends.

21. Available evidence does not suggest that growth became more "employment-friendly" post-reform. Given the sensitivity of the output-employment relation to the cycle, we distinguish between 3 sub-periods: the crisis period (2009–13); the post-reform expansion period (2014–16); and an equal 3-year pre-crisis expansion period (2006-08). The hypothesis of interest is whether the post-reform expansion leads to higher employment growth relative to the pre-crisis (and pre-reform) expansion. While the data confirm broad employment-output co-movement over the full sample, there are indications of shifts in the relation over the sub-periods considered. Calculating average sub-period employment-output elasticities to rule out transitory year-specific effects does not provide support to a salutary impact of the reform (chart): if anything, the calculated elasticity for the latest sub-period is slightly *lower* when compared with the pre-crisis expansion, although with so few data points it is not possible to measure the statistical significance of the finding. The sharp drop in the elasticity relative to the crisis period suggests that extensive layoffs during the crisis mainly via termination of temporary contracts gave way to more intensive

labor utilization (as opposed to significant new hires) as the economy transitioned to recovery, despite the reform.

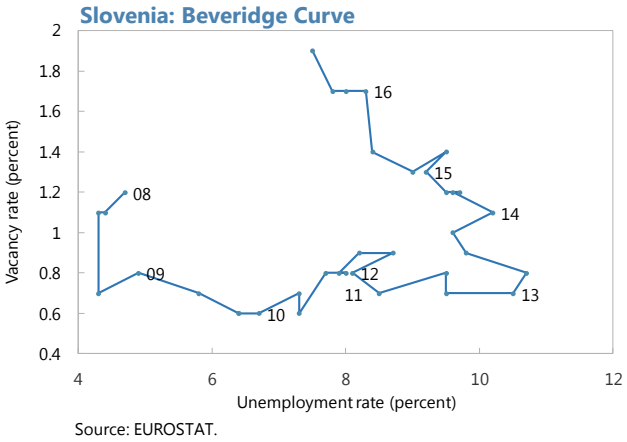


22. The above evidence raises doubt on whether the reform has achieved adequate progress in lowering effective employment protection. Certain caveats are certainly warranted. It is possible that differences in labor intensities across sectors that expanded strongly before and after the crisis (e.g., construction vs. export-oriented manufacturing) partly account for the observed differences in employment elasticities across sub-periods. However, a cursory look at relative labor intensities between construction and manufacturing makes it unlikely that they constitute a significant part of the explanation. With these caveats, however, one is left with suggestive evidence that the loosening in employment protection under the reform has not been adequate to clearly impact output-employment dynamics over the cycle.

Matching job seekers and vacancies

23. Improved labor market flexibility should yield better labor market matching between unemployment and vacancies. This would imply that, at least eventually, one would expect a reduction in unemployment for a given level of vacancies, i.e., an inward shift of the Beveridge curve. This section examines Slovenia's experience in the post-reform period against such a benchmark.

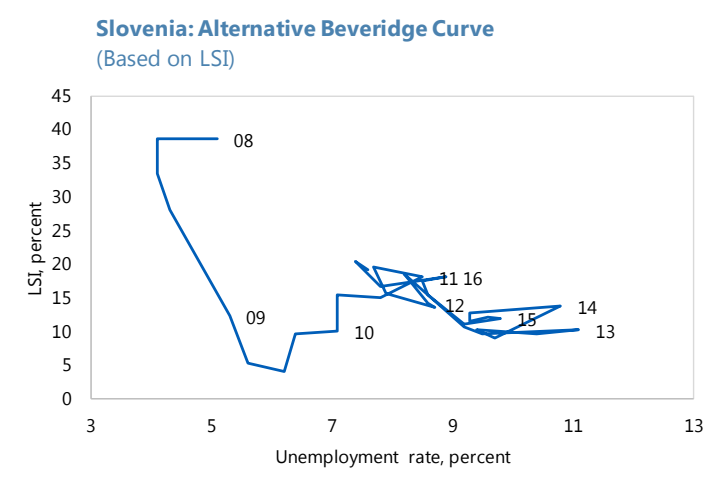
24. In addition to a spike in cyclical unemployment, the 2009–13 crisis appears to have been associated with a sharp deterioration in labor market matching. This is reflected in a major outward shift of the Beveridge curve that started in early 2009 and continued through the trough of the recession in mid-2013 (chart). While the magnitude of the shift is striking, some matching deterioration would have been expected given the large asymmetric sectoral shocks associated with the crisis – with demand

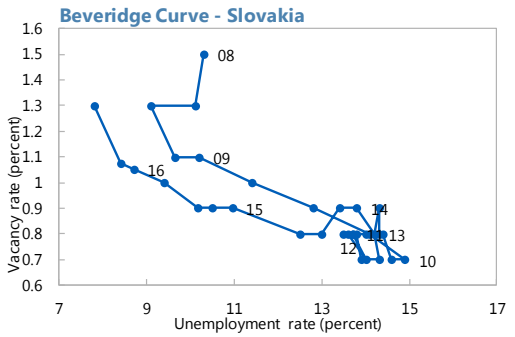


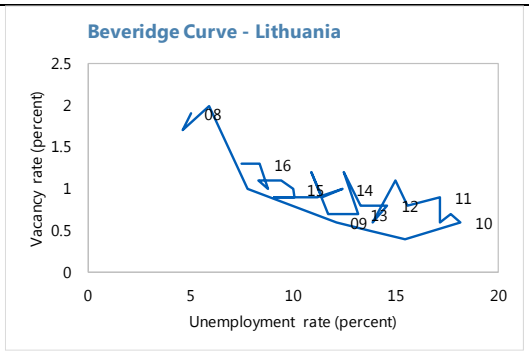
shifting sharply away from some large nontradable sectors (notably construction). Under these conditions, it should have been expected that it would take some time for the labor market to restore matching between the new skills demanded and the unemployed.

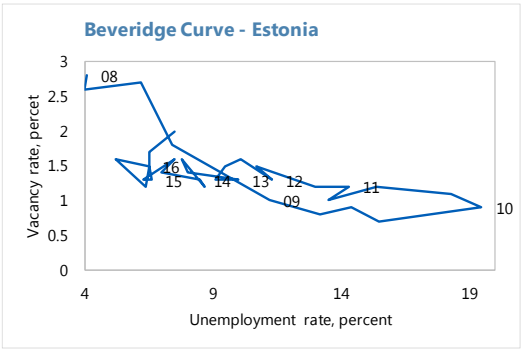
25. What is more surprising is that labor market matching has apparently failed to improve despite the increased flexibility fostered by the reform. In fact, the Beveridge curve is at its end-2011 position almost 4 years after the reform and 3 full years into the recovery. While Slovenia is not alone failing to achieve an improvement in labor market matching well into its recovery, quite a few countries of comparable income levels and flexible labor markets have seen their Beveridge curves shift back in as they exited their recessions (charts on page 42). In addition, Slovenia's Beveridge curve appears to have become relatively steep, implying an unfavorable vacancy-unemployment tradeoff: it now takes a sizeable increase in vacancies to bring about a moderate decline in unemployment.

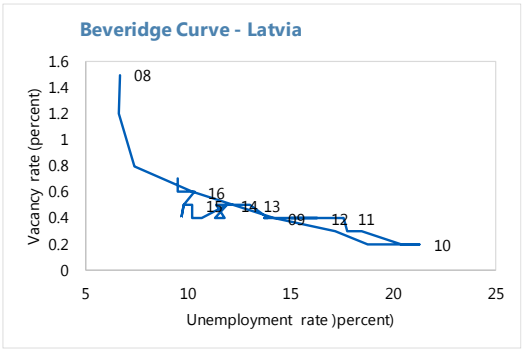
26. Some robustness analysis suggests a more nuanced assessment of Slovenia's labor market mismatches, but does not change the broad picture. Close observers of the Slovenian economy caution that vacancy data should be used with care, as they were estimated (rather than directly reported) during the 2014–15 period. Even though excluding the period in question would still suggest substantial remaining mismatches by end-2016 relative to the pre-crisis period, it would be worthwhile to check the robustness of this conclusion by using an alternative indicator of employer job postings that does not suffer from such measurement issues. One such measure is the Labor Shortage Indicator (LSI), which measures the share of employers who report labor shortages, and which has been consistently reported in Slovenia throughout the period. Clearly, this indicator is not a perfect substitute for a proper vacancy rate: it does not provide information on the *level* of vacancies, and moreover, it covers only the industry. With these caveats in mind, the adjacent chart presents an alternative Beveridge curve using the indicator in question as proxy for job openings. While the relation between LSI and unemployment is much noisier relative to the standard Beveridge curve, it conveys a somewhat more benign picture of Slovenia's labor market matching, with this alternative Beveridge curve showing signs of shifting back since the trough of the recession. Nonetheless, even this indicator suggests that substantial mismatches remain: by end-2016, for given LSI, unemployment was still some 2½ percent higher relative to the pre-crisis period. This suggest the basic conclusions are reasonably robust.

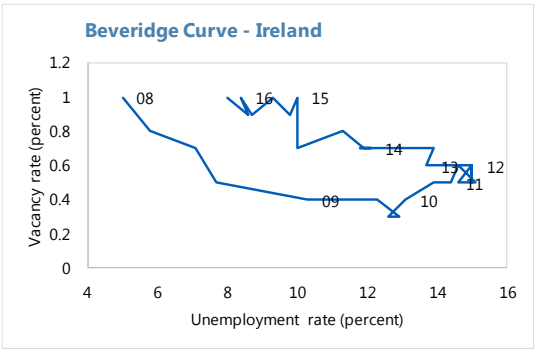


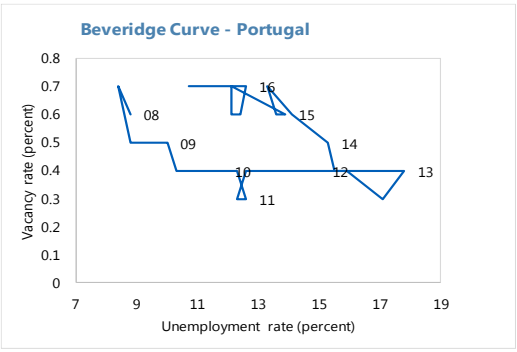


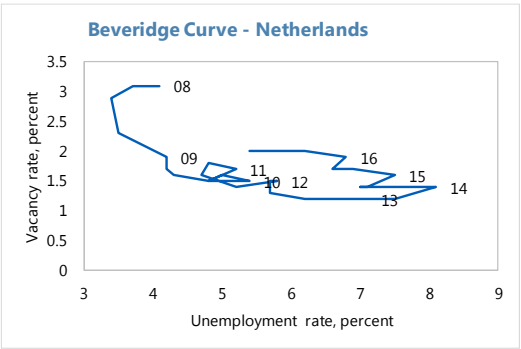


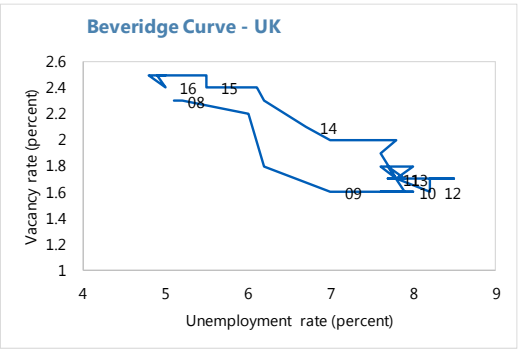












Source: EUROSTAT

27. While insufficient liberalization may be partly responsible, structural skill mismatches are probably also contributing to the stickiness of the Beveridge curve. As also argued above, insufficient progress towards loosening employment protection could be rendering employers in the sectors facing increased demand still reluctant to hire from the pool of the unemployed, preferring instead to utilize their existing work force more intensively. However, the size of the shift in the Beveridge curve relative to the pre-crisis period suggests that it is unlikely that this is the whole story. Rather, the major shifts in the structure of the economy since the onset of the crisis may have generated structural skill mismatches that may not be easily corrected via market forces alone. While this hypothesis is difficult to test conclusively, the changing composition of vacancies in terms of sectors as well as qualifications sought by employers provides suggestive evidence. In that case, while the types of policies pursued under the 2013 reform probably need to go further in the direction of liberalization, a different range of initiatives targeted at skill acquisition may need to be considered in parallel to achieve a substantial and durable improvement in labor market matching.

E. Reform Impact—Evidence from Labor Market Transitions

28. This section draws evidence from labor market flows between employment-unemployment-inactivity to achieve a more refined assessment of the impact of the 2013 reform. Compared with relying only on employment and unemployment figures, information on flows between all possible states of the labor market provides a better picture of key adjustment mechanisms at work, allows a fuller assessment on how specific policies impact the labor market, and provides intuition about transition margins in the labor market where distortions may persist and hence additional policy interventions may be called for. These advantages, and increased availability of finely detailed data, have made this type of analysis the methodology of choice to study a wide range of labor market issues – see, for example Kugler and Saint-Paul (2000) on cross-country differences in labor market adjustment; Hall (2005) on distinguishing between labor market models; Fujita and Nakajima (2016) on identifying the cyclical impact on labor market adjustments; Diamond and Sahin (2016) on the relation of gross hires to labor market tightness in a "matching function" framework.

29. The results of this type of analysis are usually summarized in terms of relative *transition frequencies*. Transition frequencies capture the size of flows into a particular labor market state in a period from a (possibly different) labor market state in the previous period, as a percent of the previous period's population size of the originating state:

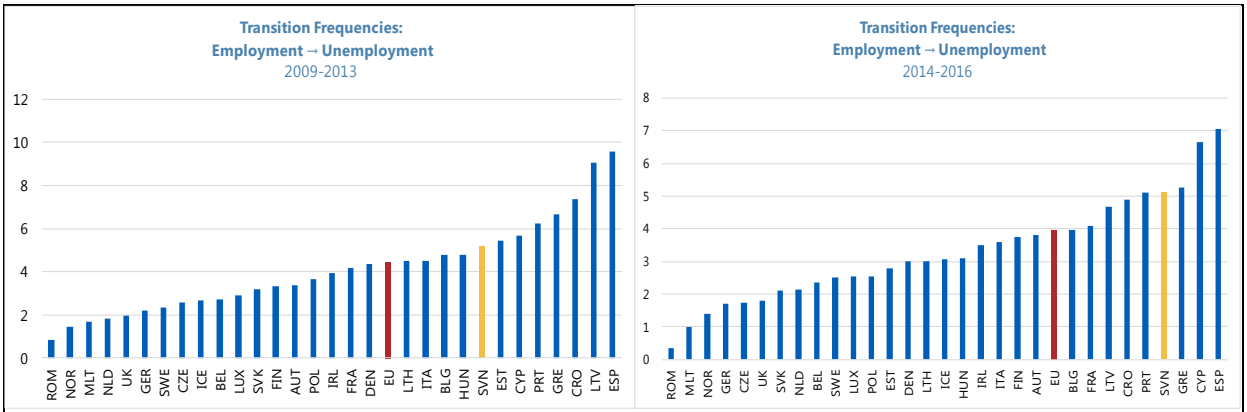
$T_{ij,t}$ = 100*(Flow from state j to state i in t)/(Population of state j in t-1),
i, j ∈ {Employment, Unemployment, Inactivity}

In a stochastic setting, these transition frequencies correspond to the more familiar *conditional* probabilities: $T_{ij,t}$ would correspond to the probability $\pi_{ij,t}$ of transitioning to state i in t conditional on being in state j in t-1.

30. The analysis relies on a recent cross-country database on labor market transitions developed by Eurostat. The database draws on a large representative longitudinal sample from the

European Union's Statistics on Income and Living Conditions (SILC) survey, which provides data on labor market transitions for 24 EU countries over the 2003-16 period; this combination of time series and cross country dimensions is particularly well-suited for policy analysis, as it allows one to contrast transition frequencies pre- and post-reform, while also offering a comparative perspective against a sample of similar countries with a large common cyclical component. This database has been used extensively in OECD research on a broad range of labor market issues – for recent examples see Cournède et. al. (2016) and Garda (2016). A particularly attractive feature of the SILC database for the issues at hand is that it provides a decomposition of total employment into self-employment, open-ended employment, and temporary employment, which will be relied on extensively in the discussion that follows.

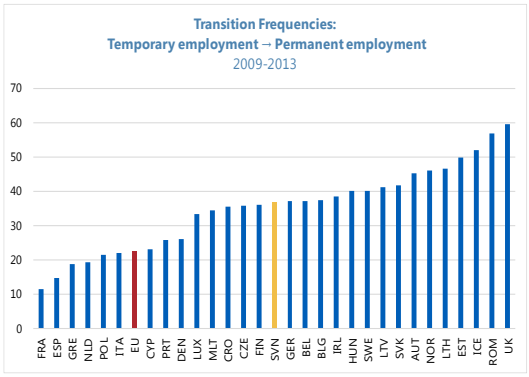
31. As elsewhere, increases in cyclical unemployment in Slovenia are not dominated by layoffs of previously employed workers but rather by inability of new labor market entrants to find jobs. Indeed, Slovenia's transition frequencies from employment to unemployment are virtually identical between the crisis and the 2014-16 recovery period (chart). This is also a central finding of Hall (2005) for the US, and has been confirmed in studies of other countries as well. While Hall (2005) interprets this result as raising doubt about the importance of wage rigidities in explaining cyclical unemployment, for the issues at hand it is perhaps more important to interpret it as cautioning that simply looking at employment and lay-off series tells us very little about unemployment dynamics, as most of the action relates to new entrants to the labor market unable to get jobs. Thus, one has to look at transition frequencies from all labor market states to capture the mechanisms at work. This should also be kept in mind in assessing the impact of policy reforms, and highlights the usefulness of the methodology.

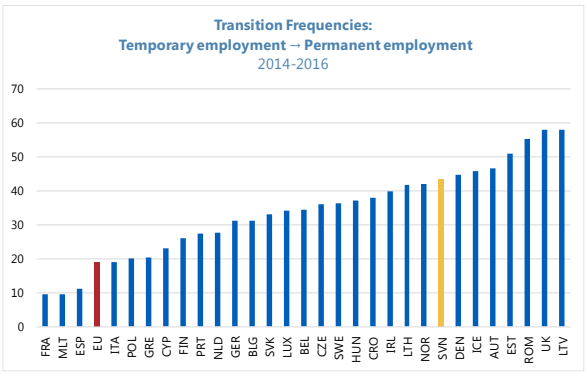


Source: EUROSTAT

32. Regarding the reform's goal to address labor market duality, transition analysis confirms a substantial but transitory shift from temporary to open-ended contracts on impact. Indeed, the transition frequency from temporary to open-ended employment jumps by almost 7 percentage points between the pre- and post-reform periods, with Slovenia moving from the middle to the upper quartile of the sample distribution (chart). At the same time, this increase relates only to the year after the reform (a 13 percentage point jump in transition frequency), as the

transition frequency essentially returns to pre-reform levels during 2015–16 (charts).[7] While uncertainty about the robustness of the recovery may have played a role, this result points to a potential problem with the chosen mix of the reform policies: with the effective loosening in employment protection viewed as inadequate, employers are mainly responding to the (temporary) fiscal incentives offered under the reform, but return to the pre-reform contract structure once other considerations outweigh these incentives.





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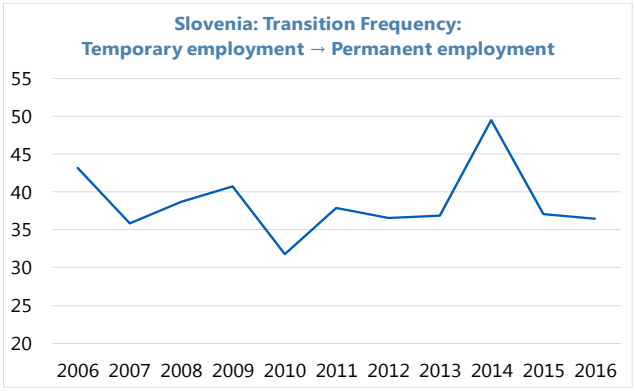

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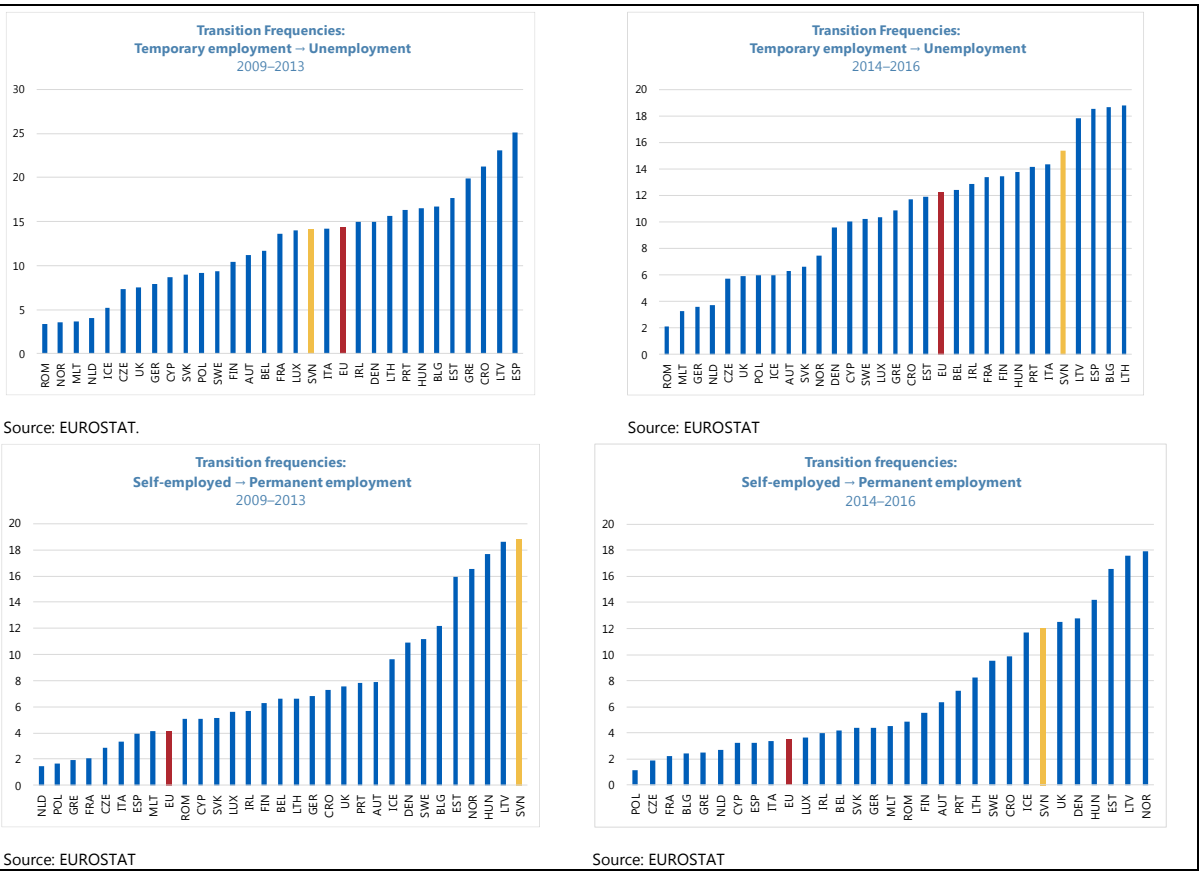
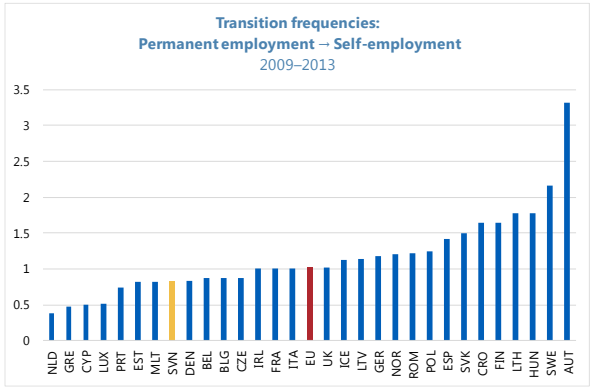
33. Transition analysis reveals further unintended consequences of the reform's policy mix. The (albeit transitory) shift from temporary to open-ended employment is not in fact the whole story. At the same time, there is a *structural* shift from temporary employment to unemployment, moving Slovenia from the middle of the sample distribution pre-reform to near the top of the distribution post-reform (chart) – the relative constancy of transition frequencies between the two sub-periods implies a substantial structural deterioration (given the very different cyclical position of the two sub-periods), adding to the NAIRU. This shift mainly reflects the impact of the cost equalization between temporary and open-ended contracts, or the provision that after two

[7] Note that in this framework there is no ambiguity relating to the high 2014 base, as these are *conditional* frequencies, i.e. they capture the probability of transitioning to an open-ended contract conditional on being in a temporary contract in the previous period.

temporary contracts the employer has to either offer an open-ended contract or dismiss the worker. Both provisions, while theoretically sound, reduced the attractiveness of temporary workers and weeded out the ones with low productivity, while the loosening of employment protection, aimed to induce employers to offer open-ended contracts, was perceived to be insufficient.[8] Another major related shift concerns the transition from self-employment to open-ended employment, with the corresponding transition frequency dropping by some 7 percentage points from pre- to post-reform (charts below): it appears that previously temporary workers replaced part of the self-employed who would normally have been offered an open-ended job. Finally, one observes a major shift from open-ended employment to self-employment, with Slovenia moving from the bottom quartile to almost the top of the distribution and the corresponding transition frequency almost tripling (charts on page 47): it appears that self-employment has increasingly become a fallback destination for those who could not find an open-ended job, possibly also reflecting employer attempts to seek additional margins of flexibility. Overall, these substitution patterns to make room for temporary workers provide further evidence that the fiscal elements of the reform (rather than looser employment protection) are the dominant influence behind employer behavior, pointing to potential problems with the reform's policy mix.



[8] There could be further unintended consequences of the reform which however cannot be captured by our data. For instance, Cahuc et. al. (2016) document that taxation of temporary jobs in France also induced a shortening of the average temporary contract duration.



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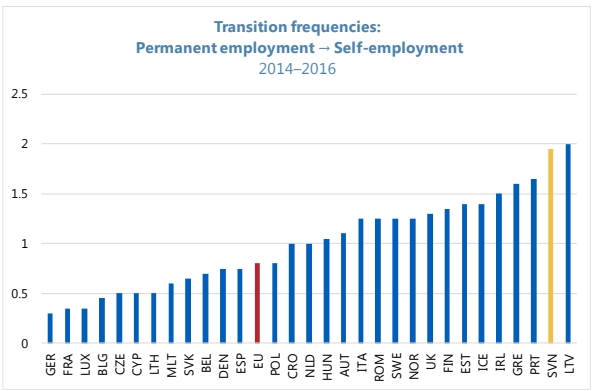
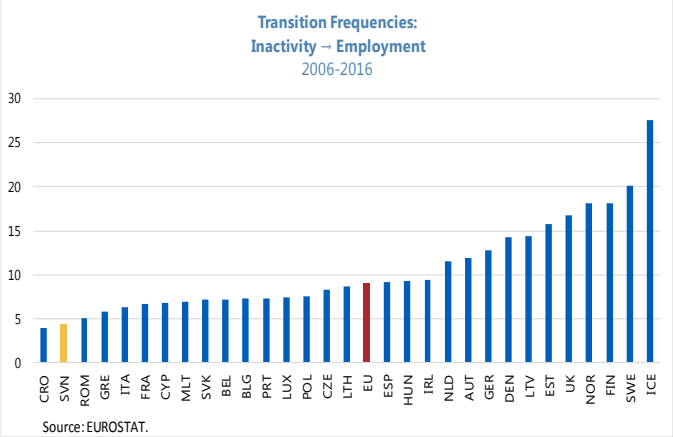
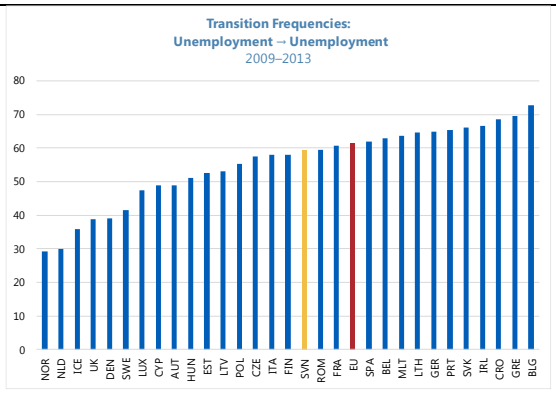


Source: EUROSTAT

34. Transition analysis identifies a number of other areas in which Slovenia is an outlier and which suggest underlying distortions that may warrant policy intervention. Perhaps the most striking is the persistently very low transition frequency from inactivity to employment, with Slovenia consistently at the very low end of the sample distribution with an average transition frequency under 5 percent (chart), and which has apparently not been impacted by the reform. While outside the purview of the 2013 reform, the scale of the problem would warrant focusing on the tax wedge at the entry level of the labor market and consider policy options to correct distortions.



35. A final noteworthy point to observe is the steady rise in transition frequencies from unemployment to unemployment. This translates into a persistent lengthening in average unemployment duration, which, while not out of line with EU trends, is all the more striking given the healthy recovery of the past three years. This steadily increasing incidence of long-term unemployment has recently come into policy focus – see OECD (2016). While policies to foster further labor market liberalization and correct unintended consequences of the recent reform would go some way towards addressing the problem, they may need to be supplemented by targeted initiatives to upgrade the skills of the long-term unemployed.



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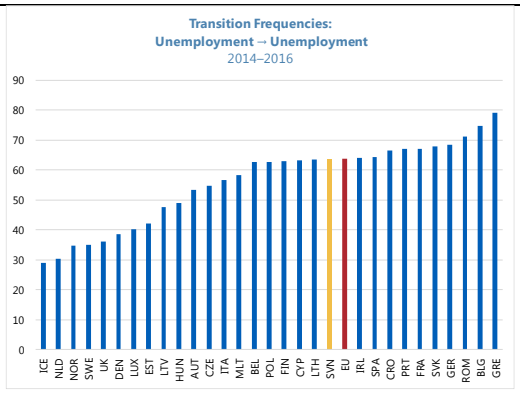

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F. Reform Impact—A Structural Model

36. This section draws on a simple structural model to shed additional light on the impact of the 2013 reform. Structural modeling has the advantage of grounding some of the stylized facts on labor market transitions of the previous section in a rigorous framework, thus allowing an evaluation of the causal content of the hypotheses of the previous section. It also allows for micro-founded welfare analysis that can inform a normative assessment of the components of the 2013 reform.

37. The model uses as a starting point the analytical framework of the seminal Blanchard and Landier (2002) paper (B-L henceforth). The B-L framework explicitly addresses labor market dualism by exploring the implications of introducing temporary contracts alongside highly-protected open-ended contracts. In this setting, B-L motivates temporary contracts as a screening device in an environment of worker heterogeneity in terms of productivity and asymmetric information, whereby firms cannot observe worker-specific productivity prior to employment. In this setting, allowing temporary contracts gives employers the option to hire workers in entry-level, temporary jobs, find out how good the resulting matches are, and decide whether to keep them in higher-productivity, permanent jobs.

38. Under plausible parametrizations, the B-L framework could imply that introducing temporary contracts may entail perverse labor market outcomes. Two underlying effects work in opposite directions: on the one hand, employers should now be more willing to hire workers to see how they perform; on the other hand, access to temporary contracts could render employers more reluctant to keep workers in permanent jobs – even if a match turns out profitable, a firm may still prefer to fire the temporary worker while the firing cost is low and take a chance with a new worker. Plausible parametrizations led B-L to conclude that this latter, perverse outcome is quite likely. In that case, labor market outcomes would include: more low-productivity entry-level jobs and fewer regular jobs (i.e. more pronounced labor market duality), lower overall productivity and output, and higher turnover in entry-level jobs. From a welfare perspective, the B-L results are even sharper: even if unemployment is reduced, workers may still be worse off as they may have to go through many spells of unemployment and entry-level jobs before obtaining a regular job.

39. For the purposes of this chapter, we made a few extensions to the B-L framework. The B-L modeling assumption of prohibitively high employment protection in open-ended contracts appears unduly restrictive, while the B-L framework leaves out some policy instruments that were important components of the 2013 reforms. Accordingly, B-L was extended in two directions:

- Fully endogenize open-ended contracts in the firms' optimization problem: By treating layoff costs on open-ended contracts as large but finite, firms are modelled as jointly determining the terms for regular contracts (employment/wages) together with those for temporary contracts. This modelling strategy is analytically more satisfactory, and renders the analysis more relevant to the features of the 2013 reform.

- Incorporate payroll taxes on regular and temporary work as additional policy variables: In addition to constituting important features of the 2013 reform, inclusion of payroll taxes into the analysis can shed light on the likely labor market impact of the income tax reform currently being implemented by the authorities.

  While these modeling extensions substantially complicate the analysis relative to the B-L model, they also allow much richer welfare and policy evaluation.

40. The mechanics of the extended model deviate from B-L in some important respects. As in B-L, the extended model (details and derivations in the Annex) follows the search-theoretic tradition, whereby workers with heterogeneous (and *ex ante* unobservable) productivity are matched with potential employers. Worker productivity is subject to random shocks that can give rise to layoffs; however, in an important departure from B-L, the model allows layoffs both out of temporary *and* out of regular workers (albeit at a higher cost relative to the former). Firms and workers interact in a repeated Nash game and optimize on the basis of the probability distribution of the shocks and of preference, technological, and policy parameters – the latter including layoff costs and payroll taxes – to determine labor flows and wages. In this richer environment, the model endogenously pins down two key productivity thresholds: (i) the match-specific productivity at which firms are indifferent between ending temporary jobs and converting temporary into permanent jobs; (ii) the match-specific productivity at which firms are indifferent between dismissing and retaining workers under open-ended contracts. In turn, these thresholds are an important determinant of firms' optimal wage and employment decisions under the two contract types.

41. A number of specification choices simplify the model's solution method. These include imposing risk neutrality on both workers and firms, allowing flows into employment from the pool of unemployed only (i.e. ruling out inactivity-employment transitions), and ignoring transition dynamics (e.g. via adjustment costs), in order to facilitate closed-form solutions that are amenable to comparative statics analysis. These restrictions, which are shared with B-L, do not qualitatively affect the main results of interest. The higher complexity of the model necessitates an additional, somewhat less innocuous, restriction of setting the expected utility of the unemployed to zero.

42. The model's equilibrium conditions highlight the joint determination of the main variables of interest across contractual arrangements. The model determines endogenously

steady state unemployment, as well as wages and employment for workers under temporary and open-ended contracts. In contrast to B-L, where permanent employment is largely exogenous to factors affecting temporary contracts, in the extended model the equilibrium wage and employment terms of both types of contracts are determined as the solution of a single optimization problem, and thus depend on the full range of relevant variables: both productivity thresholds defined above, as well as the model's policy variables and structural parameters. This feature of the model has an important bearing on its policy implications.

43. The model's policy implications provide strong causal support to the main hypotheses advanced in the previous section to explain post-reform labor market transitions in Slovenia. While some of the B-L results are confirmed, the richer environment of the extended model leads to the rejection of others, and also allows assessment of policy changes (specifically as regards payroll taxes) that, by construction, the B-L model cannot address. In particular:

- The B-L result on the ***impact of lowering layoff costs on aggregate labor market outcomes*** continues to hold under the extended model: Lower layoff costs for open-ended contracts tend to increase both hiring and dismissals, with an ambiguous net impact on aggregate employment and unemployment.

- On the other hand, in contrast to B-L, the extended model removes the ambiguity regarding the ***impact of lowering layoff costs on labor market segmentation***: Lower layoff costs for open-ended contracts lead to higher conversions of temporary jobs to regular jobs, as well as a narrowing of regular-temporary wage differentials, thus implying an unambiguous reduction in labor market duality.

- A ***reduction in payroll taxes for regular contracts*** unambiguously reduces unemployment as well as labor market segmentation.
- Under plausible calibrations of the model,[9] an ***increase in payroll taxes for temporary contracts*** tends to reduce labor market segmentation but increase unemployment.[10] At the same time, simulation results suggest a strong interaction with the extent of employment protection: for a given payroll tax increase, the adverse impact on unemployment is smaller, and the favorable impact on duality larger, the lower the level of layoff costs on permanent contracts.

44. Overall, the extended model is broadly consistent with Slovenia's post-reform labor market transitions. Viewed through the lens of the model, the stylized facts of the previous section can be interpreted as a shift to a new equilibrium under the impact of the various components of

[9] The restriction of zero expected utility for the unemployed (needed to obtain closed-form solutions), together with the free entry/zero profit condition, have the implication that payroll taxes drop out from the model's equilibrium conditions. In order to meaningfully analyze the impact of this policy variable, the utility of the unemployed had to be endogenized, and the model calibrated.

[10] At the same time, when temporary contracts are widely used for work that would normally be done under open-ended contracts, unifying payroll taxes for both types of contracts helps avoid tax evasion.

the reform. Regarding labor market duality in particular, the observed improvement is consistent with the model's predicted combined impact of lower employment protection for regular contracts and reduced (increased) social contributions on regular (temporary) jobs. At the same time, the model can account for the limited, and (mostly) transitory, improvement in labor market segmentation by the temporary nature of social contribution cuts on regular jobs, as well as by too little liberalization of employment protection restrictions in the overall reform package.

G. Policy Implications

45. The assessment of the 2013 labor market reform suggests a mixed record. While the reform design appropriately identified rigid employment protection as a key root cause behind the pervasive labor market dualism, the outcomes were mixed. The mix of policies would thus need to be recalibrated to support improved aggregate outcomes, render the reform's objectives more durable, and correct unintended side effects. In addition, a number of important problem areas that were kept out of the reform agenda would need to be addressed.

46. A major policy message from the analysis of this chapter is that the role of faster and deeper loosening of employment protection regulations should be increased. This is key in order to ensure that the initial gains in reducing dualism are sustained, limit unintended outflows of workers under temporary contracts into unemployment, and improve labor market matching by facilitating labor mobility and reallocation in the face of major sectoral shifts. While reluctance to proceed further in this area at the time of the reform may have been understandable given fears of deeper job losses at the trough of the recession, the current environment of steady recovery should be much more favorable for further progress. Loosening of restrictions on individual dismissals has brought Slovenia's regulatory regime to the OECD average, but more seems needed to bring it closer to that of some of its eastern and southern European peers; and progress needs to be made to loosen the regime governing collective dismissals which was not touched by the reform and remains relatively restrictive.

47. On the other hand, the role of fiscal instruments providing incentives for open-ended contracts and penalizing all forms of temporary contracts may have to be rethought. In the absence of further significant progress on employment protection, such instruments are not a good substitute: they cannot prevent suboptimal aggregate employment (via suboptimal flows to unemployment and inactivity); they cannot be relied upon to achieve sustainable progress in addressing duality; and they may distort flows of other groups into employment.

48. Improving labor market matching may require additional policy interventions. While further liberalization would be important to strengthen labor mobility and reallocation, further action may be needed to address structural skill mismatches. An intensified retraining program could be a suitable first step. More generally, an enterprise-based, apprenticeship-type system, coordinated with the school system, would be the best option in the medium term, as firms are better placed to assess needed skills in a fast changing environment and they would also optimally share in training costs – given substantial industry- or firm-specific component of acquired human

capital that would lead to open-ended contracts. The authorities can support these efforts via derogations from the minimum wage and targeted fiscal incentives while the system is being set up.

49. Strengthening transitions from inactivity to employment from current very low levels is an important priority. Policies would need to ensure that the overall level of the marginal tax wedge at the entry level is appropriately low to limit disincentives – in this regard both taxes and social benefits may have to be reassessed. If action on the tax side is taken, it should preferably take the form of general reductions in labor taxes – but concentrated at the low end of the wage distribution. More broadly, a comprehensive reform strategy is essential, taking care that labor market reforms affecting other segments are mutually reinforcing.

50. Addressing rising long-term unemployment is an important challenge. Further market liberalization would help, but would need to be complemented by initiatives on the marginal tax wedge, derogations from the minimum wage for certain groups, and training initiatives where skill gaps exist (or human capital has depreciated) designed to ensure adequate mobility across sectors.

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Annex

This Annex presents the details and derivations of the extended model of Section F. It discusses, in turn, the firms' optimization problem, the workers' optimization problem, and the model's equilibrium and comparative statics.

Firms

Firms are risk neutral and discount the future at discount rate ρ and can offer either regular or temporary contracts to fill vacancies. Denote the cost of carrying an unfilled vacancy by C^V.

Temporary jobs are filled from the pool of unemployed and regular jobs from the pool of temporary workers (i.e. workers are first hired into temporary jobs). New (temporary) matches start with productivity $z_0 \geq 0$. Match-specific productivity of permanent jobs is a random variable z, drawn from a distribution with cumulative density function F:

$$z \sim F \text{ on } [0, z^{max}], \quad z^{max} > z_0$$

Following initial match, jobs (both regular and temporary jobs) are subject to productivity shock, with instantaneous probability π. Denote new match-specific productivity by z', also drawn from F. When hit by a productivity shock, temporary jobs are either terminated or converted to regular, while regular jobs are either terminated or continued.

Firing costs and payroll taxes differ between regular and permanent jobs. Denote firing cost for regular jobs by C^R, and, without loss of generality, set firing cost for temporary jobs to 0. Flat payroll taxes for regular and permanent jobs are, respectively, t_{RW_R} and t_{TW_T}, where w_i, i=R,T is the wage rate.

The present discounted value to the firm of temporary and regular jobs can be written, respectively, as the Bellman equations (with E being the conditional expectation operator):

$$\rho V^{F,T}(z_0) = z_0 - (1+ t_T) w_T(z_0) + \pi E(V^{F,R}(z') - V^{F,T}(z_0) \mid z' \geq \underline{z}) ;$$

$$\rho V^{F,R}(z) = z - (1+ t_R) w_R(z) + \pi E(V^{F,R}(z') - V^{F,R}(z) \mid z' \geq \hat{z}) + \pi (V^{F,T}(z_0) - V^{F,T}(z) - C^R) F(\hat{z}) ;$$

where:

$\underline{z}$: Productivity threshold at which firm is indifferent between terminating a temporary job and converting it to a regular one.

$\hat{z}$: Productivity threshold at which firm is indifferent between laying off and retaining workers under regular contracts.

Workers

Without loss of generality, the labor force is normalized to 1. Temporary and regular workers receive, respectively, their wage w_T and w_R and a fraction of payroll taxes as benefits, $bt_T w_T$ and $bt_R w_R$ ($0<b<1$). Workers are infinitely lived, risk neutral, and discount the future at rate ρ.

It is assumed that the unemployed have zero utility, and must enter a temporary job before moving on to a regular job. In line with standard search theory, the arrival rate of temporary jobs (θ) can be written as:

$$\theta = h / u ,$$

where h are total hires and u is the number of unemployed.

The present discounted values (to the worker) of a temporary job, a regular job, and being unemployed, $V^{W,T}$, $V^{W,R}$, and U, respectively, take the form of the following Bellman equations:

$$\rho V^{W,T}(z_0) = (1+bt_T) w_T(z_0) + \pi E(V^{W,R}(z') - V^{W,T}(z_0) \mid z' \geq \underline{z}) + \pi [U - V^{W,T}(z_0)] F(\underline{z});$$

$$\rho V^{W,R}(z) = (1+bt_R) w_R(z) + \pi E(V^{W,R}(z') - V^{W,R}(z) \mid z' \geq \hat{z}) + \pi [U - V^{W,R}(z)] F(\hat{z});$$

$$\rho U = \theta [V^{W,T}(z_0) - U]$$

Equilibrium

The model assumes free entry of firms, implying that the number of vacancies is determined by the zero net profit condition:

$$V^{F,T}(z_0) = C^V$$

Since firms' net present value of regular jobs increases in productivity, the zero profit condition can be used to determine the two key productivity thresholds:

$$V^{F,R}(\underline{z}) = V^{F,T}(z_0) = C^V \quad (1)$$
$$V^{F,R}(\hat{z}) = V^{F,T}(z_0) - C^R \quad (2)$$

Wage setting is determined by symmetric Nash bargaining, under continuous renegotiations. The Nash bargaining conditions for temporary and regular jobs can be written as:

$$V^{F,T}(z_0) - C^V = V^{W,T}(z_0) - U \quad (3)$$
$$V^{F,R}(z) - V^{F,T}(z_0) + C^R = V^{W,R}(z) - U \quad (4)$$

Substituting the zero-profit condition in equation (3) yields:

$$V^{W,T}(z_0) = U \ (=0)$$

Integrating equation (4) over $\underline{z}$ and z^{max}, one obtains:

$$E(V^{F,R}(z') - V^{W,R}(z') \mid z' \geq \underline{z}) = (C^V - C^R) [1 - F(\underline{z})]$$

The above equation, together with the **U**=0 assumption and the temporary job Bellman equation, yields an expression for the temporary job wage, in the form of the Bellman equation:

$$\mathbf{w_R}(\mathbf{z}) = [\, \mathbf{z} - \boldsymbol{\rho}\,(\mathbf{C^V} - \mathbf{C^R})\,] \,/\, [\, 2 + (1+\mathbf{b})\mathbf{t_R}\,]$$

With regard to regular jobs, integrating equation (4) over $\hat{\mathbf{z}}$ and $\mathbf{z^{max}}$, one obtains:

$$\mathbf{E}(\, \mathbf{V^{F,R}}(\mathbf{z}') - \mathbf{V^{W,R}}(\mathbf{z}') \mid \mathbf{z}' \geq \hat{\mathbf{z}}\,) = (\mathbf{C^V} - \mathbf{C^R})\,[1 - \mathbf{F}(\hat{\mathbf{z}})]$$

The above equation, together with the **U**=0 assumption and the regular job Bellman equation, yields an expression for the regular job wage, in the form of the Bellman equation:

$$\mathbf{w_R}(\mathbf{z}) = [\, \mathbf{z} - \boldsymbol{\rho}\,(\mathbf{C^V} - \mathbf{C^R})\,] \,/\, [\, 2 + (1+\mathbf{b})\mathbf{t_R}\,]$$

Substituting the wage equations and the zero profit condition into the firm's net present value Bellman equation for permanent jobs, and evaluating at $\hat{\mathbf{z}}$ and $\underline{\mathbf{z}}$, one can obtain expressions implicitly defining the two productivity thresholds. These take the form of the Bellman equations:

$$(\boldsymbol{\rho} + \boldsymbol{\pi})\,\mathbf{C^V} = \left\{\, [(1+\mathbf{bt_R})\,\underline{\mathbf{z}} + \boldsymbol{\rho}(\mathbf{C^V} - \mathbf{C^R})] \,/\, [\, 2 + (1+\mathbf{b})\mathbf{t_R}\,] \right\} + \boldsymbol{\pi}\,\mathbf{E}(\, \mathbf{V^{F,R}}(\mathbf{z}') \mid \mathbf{z}' \geq \hat{\mathbf{z}}\,) + \boldsymbol{\pi}\,(\mathbf{C^V} - \mathbf{C^R})\,\mathbf{F}(\hat{\mathbf{z}}) \qquad \textbf{(5)}$$

$$(\boldsymbol{\rho} + \boldsymbol{\pi})\,(\mathbf{C^V} - \mathbf{C^R}) = \left\{\, [(1+\mathbf{bt_R})\,\hat{\mathbf{z}} + \boldsymbol{\rho}(\mathbf{C^V} - \mathbf{C^R})] \,/\, [\, 2 + (1+\mathbf{b})\mathbf{t_R}\,] \right\} + \boldsymbol{\pi}\,\mathbf{E}(\, \mathbf{V^{F,R}}(\mathbf{z}') \mid \mathbf{z}' \geq \hat{\mathbf{z}}\,) + \boldsymbol{\pi}\,(\mathbf{C^V} - \mathbf{C^R})\,\mathbf{F}(\hat{\mathbf{z}}) \qquad \textbf{(6)}$$

Subtraction of equation (6) from (5), and substitution of the equation for $\mathbf{w_R}$ into the firm's net present value Bellman equation for regular jobs, integration by parts, and use of the threshold equations (1) and (2), yields the final expressions for the two productivity thresholds:

$$\hat{\mathbf{z}} = (\boldsymbol{\rho} + \boldsymbol{\pi})\,(\mathbf{C^V} - \mathbf{C^R}) - \boldsymbol{\pi}\,\mathbf{z^{max}} / \boldsymbol{\rho} + (\boldsymbol{\pi}/\boldsymbol{\rho})\,[\, \mathbf{F}(\mathbf{z^{max}}) - \mathbf{F}(\hat{\mathbf{z}})\,]$$

$$\underline{\mathbf{z}} = (\boldsymbol{\rho} + \boldsymbol{\pi})\mathbf{C^V} - \boldsymbol{\pi}\,\mathbf{z^{max}} / \boldsymbol{\rho} + (\boldsymbol{\pi}/\boldsymbol{\rho})\,[\, \mathbf{F}(\mathbf{z^{max}}) - \mathbf{F}(\hat{\mathbf{z}})\,] + (\boldsymbol{\rho} + \boldsymbol{\pi})(1+\mathbf{t_R})\mathbf{C^R}/(1+\mathbf{bt_R})$$

The above expressions allow comparative statics on the two productivity thresholds with respect to changes in the policy variables (layoff costs and payroll taxes):

- A reduction in $\mathbf{C^R}$ reduces the difference between $\hat{\mathbf{z}}$ and $\underline{\mathbf{z}}$ - as $\hat{\mathbf{z}}$ falls and $\underline{\mathbf{z}}$ rises.

- A reduction in $\mathbf{t_R}$ has the same effect as long as the link between benefits and payroll taxes is not perfect ($\mathbf{b}$<1); if $\mathbf{b}$=1, only $\hat{\mathbf{z}}$ falls.

Once the productivity thresholds have been determined, one can derive the steady-state values for unemployment (**u**), temporary employment ($\mathbf{e_T}$), and regular employment ($\mathbf{e_R}$). Since the flow out of

unemployment has to equal the flow into unemployment plus the flow into temporary employment, one obtains:

$$\theta u = \pi \left[e_T F(\underline{z}) + e_R F(\hat{z}) \right] = \pi e_T$$

Using the productivity threshold steady-state conditions and the identity $u+e_T+e_R \equiv 1$ (as inactivity is assumed away in the model) yields steady-state unemployment, temporary employment, and regular employment:

$$u = \left[\pi F(\hat{z})\right] / \left[\pi F(\hat{z}) + \theta \left(F(\hat{z})+\pi(1- F(\underline{z}))\right)\right]$$

$$e_T = \left[\theta F(\hat{z})\right] / \left[\pi F(\hat{z}) + \theta \left(F(\hat{z})+\pi(1- F(\underline{z}))\right)\right]$$

$$e_R = \left[\theta(1- F(\underline{z})\right] / \left[\pi F(\hat{z}) + \theta \left(F(\hat{z})+\pi(1- F(\underline{z}))\right)\right]$$