

Annex I. Comparators Groups

Nordics	CE4 (transition peers)
Denmark	Czech Republic
Finland	Hungary
Iceland	Poland
Norway	Slovak Republic
Sweden	
Anglo-Saxons (majority-Anglophone advanced economies)	Other Advanced OECD
Australia	Austria
Canada	Belgium
Ireland	France
New Zealand	Greece
United Kingdom	Israel
United States	Italy
	Japan
	Luxembourg
	Portugal
	Slovenia
	Spain
	Switzerland
DEU/NLD	Emerging OECD
Germany	Chile
Netherlands	Mexico
	Turkey
Korea	
South Korea	

CREDITLESS RECOVERY IN THE BALTICS COUNTRIES¹

A. Introduction

1. The 2008–09 global financial crisis brought the rapid economic expansion in the Baltic region to a halt and triggered a sharp correction. The credit-fueled domestic demand boom prior to the crisis ended in severe recessions in all three countries and a collapse in domestic demand and credit expansion. Vigorous adjustment measures and rebalancing of the economies permitted a recovery beginning in 2010 (Figure 1). Yet despite the strong turnaround, four years after the crisis, credit continues to decline, raising concerns that it might curtail the recovery. In short, the Baltic countries appear to be experiencing a creditless recovery.²

2. Creditless recoveries are not uncommon following financial crises. On the contrary, they have been well documented in the literature and can arise for a variety of reasons.³ They could be the result of lower financing needs due to excess capacity at the end of a deep recession, suggesting that a creditless recovery may not necessarily be an impediment to growth. On the other hand, an extended period of meager credit growth could indicate tighter lending standards, impaired bank balance sheets or other credit (supply) constraints. Understanding what is driving a creditless recovery is essential for elaborating appropriate policies.

3. This chapter examines the possible causes of the creditless recoveries in the Baltic countries. It characterizes their experience in comparison with other episodes of creditless recoveries in both advanced and emerging market (EM) economies. It also investigates demand and supply constraints to credit expansion in the Baltics.

- The analysis finds that the creditless recoveries in the Baltics are in line with past cross-country episodes. Notably, they were preceded by rapid credit expansion followed by a sharp correction—features that are found to significantly increase the likelihood of a creditless recovery.⁴ But the rebound in credit in the Baltics appears to be lagging behind what would have been expected at this stage of the recovery based on past observations. It should be noted, however, that the Baltic recoveries are heterogeneous in terms of credit growth, with Latvia and Lithuania lagging further behind Estonia.
- The analysis also suggests that the Baltics' credit expansion during the boom was driven primarily by domestic demand, but its contraction during the recession was largely explained

¹ Prepared by Weicheng Lian, Sergejs Saksonovs, and Gabriel Srouer under the guidance of Shekhar Aiyar. Bartek Augustyniak and Felix Winnekens provided excellent research assistance, and Solange de Moraes Rego and Fernando Morán Arce provided outstanding support.

² Throughout the paper credit refers to the stock of credit. See Annex 1 for some motivation.

³ Abiad et al. (2011), Dalvas (2013), Sugawara and Zaldueño (2013).

⁴ And a banking crisis in the case of Latvia.

by worsening bank asset quality (a credit supply factor). Subsequently, during the recovery, both demand and supply constraints appear to be at play, albeit to different degrees in different countries. Financial conditions at parent banks are found to matter for credit, with greater financial stress in parent banks associated with lower credit growth in Baltic subsidiaries.

4. These findings have important policy implications. While a creditless recovery was to be expected in light of the pace of the credit expansion and severity of the recession, credit growth needs to pick up at about this stage of the cycle to sustain the recovery. A lengthy process of deleveraging may have been necessary to repair balance sheets but credit will be needed to fund investment as available excess capacity is fully utilized and financing needs increase. Therefore, efforts are needed to reduce credit constraints. This could prove more difficult in the Baltic countries, since the major banks are all foreign subsidiaries. Nonetheless, steps to improve the administration of insolvency and debt restructuring regimes could help to strengthen bank asset quality, reduce perceptions of credit risk and, ultimately, promote new lending.

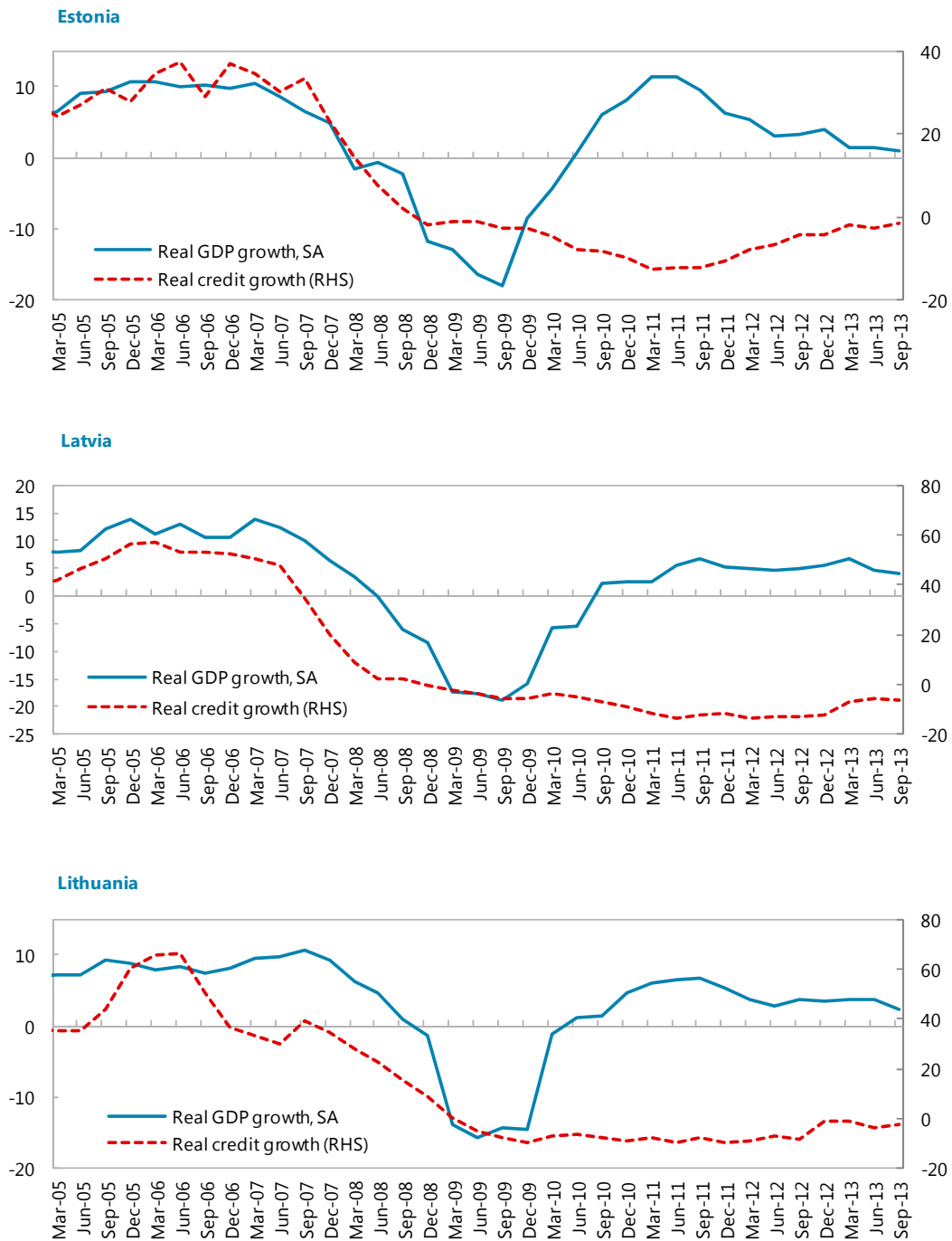
5. The Baltic countries' experience with creditless recoveries also raises the question of whether non-bank financing could offset declines in bank credit. A number of empirical studies have indeed found that better access to non-bank financing can help offset a credit crunch.⁵ Not surprisingly, given their stage of economic development and the size of markets, financial sectors in the Baltic countries are dominated by banks. However, continued efforts toward regional (financial) integration could, in the medium term, expand funding opportunities.

6. This chapter is organized as follows. Section B briefly reviews the structure of the banking sector in these countries; Section C examines past creditless recoveries across a wide range of countries and cycles, and draws stylized facts; Section D uses bank-level panel data to assess the role of specific macroeconomic and financial conditions in driving credit movements; Section E examines the scope of non-bank financing; and Section F concludes.

⁵ See Adrian et al. (2012) and Abiad et al. (2011). The finding (see Section C) that emerging economies are more prone to weaker and creditless recoveries than advanced economies also lends support to the presence of a link between the depth of financial markets and resilience to shocks.

Figure 1. Baltics: Real GDP and Credit Growth

(Percent change, y-o-y)



Sources: Haver; and IFS.

B. The Financial Sector in the Baltic Countries

7. The financial sector in the Baltic countries is heavily bank-based. Total financial sector assets amount to 140–180 percent of GDP, broadly in line with peer emerging countries (Czech Republic, Hungary, or Poland) but considerably lower than advanced countries in Europe. Banks account for about 80 percent of total financial sector assets, of which almost half is credit to the private domestic sector. Correspondingly, non-bank financing of the non-financial private sector (e.g., bonds and stock market capitalization) is small, amounting to about 4 percent of GDP in Latvia, 10 percent of GDP in Lithuania, and 17 percent of GDP in Estonia, compared to 45 percent of GDP in Poland.⁶

Financial Markets, 2012
(Percent of GDP)

	EST	LVA	LTU	SWE	CZE	HUN	POL	DEU
Banks								
Total assets	137	153	97	209	146	157	98	264
Credit	84	68	51	139	57	56	54	101
in 2001	36	27	13	98	37	33	28*	119
Bonds (stock outstanding)								
Total outstanding	8	21	34	166	59	10	61	122
Turnover (in pct of total)	3	23	70	-	-	-	-	-
Issued by general gvmt	1	19	33	35	42	0	48	61
Issued by financial sector	0	1	1	48	9	3	8	56
Issued by non-financial corporations	7	0	0	18	8	0	5	4
Stock market								
Total capitalization	10	4	10	92	27	15	40	27
Number of stock listed	16	32	33					
Memo items								
GDP (bln euro)	17	22	33	407	152	98	381	2666
GDP per capita	13000	10807	10892	42618	14480	9837	9881	32550

Sources: Authorities; Haver; and IMF staff calculations.

* In 2004

The Banking Sector

8. The banking sector developed rapidly in the last decade. Credit to GDP doubled in Estonia between 2001 and 2012, and more than doubled in Latvia and Lithuania. As a result, Lithuania has caught up with, and Latvia and Estonia have distanced themselves from, their regional peers. In Estonia and Lithuania, loans to households and corporations make up most of banks' assets. Liquid assets in Estonia mainly consist of deposits at banks and the central bank, while in Lithuania they are mainly held in the form of domestic government securities. Latvia differs from the other Baltics in that it has a substantial number of domestic banks that specialize

⁶ Throughout the paper, 'non-bank' and 'market-based' are used interchangeably.

in taking non-resident deposits (NRDs)—mainly deposits from CIS countries—which are in turn mostly reinvested in assets abroad.

9. The banking sector is dominated by foreign banks.

It is almost fully privatized with high market concentration—the largest banks are all subsidiaries or branches of Nordic banks, accounting for almost 95 percent of total assets and domestic credit in Estonia and Lithuania, and 53 percent and 80 percent of total assets and domestic credit, respectively, in Latvia. The relatively smaller share of total assets in Latvia reflects the role of NRDs and foreign assets held by domestic banks. Thus, foreign banks provide the vast majority of credit to the private sector in all three countries.

10. Baltic banks remain reliant on funding from parent banks, an important source of potential spillovers.

Given the significant share of parent bank funding in bank liabilities, financial conditions in Nordic parent banks could affect the supply of funding to Baltic banks and, by extension, credit conditions. Despite the decline in parent bank funding since the crisis, domestic loan-to-deposit ratios are still quite high (around 133, 119, and 133 percent at end-2013 in Estonia, Lithuania, and Latvia).⁷

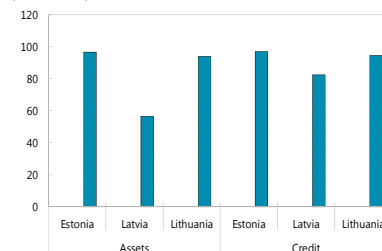
The Non-Bank Financial Sector

11. The size of the non-bank financial sector in the Baltic countries is broadly in line with their level of per capita income.

But it remains significantly smaller than in Poland relative to GDP per capita and much smaller than in advanced countries in absolute terms.⁸

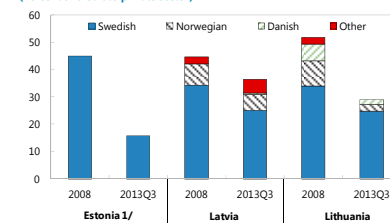
12. Non-bank investors have been relatively scarce in the Baltic countries.

Foreign Banks, 2012
(Percent of total)



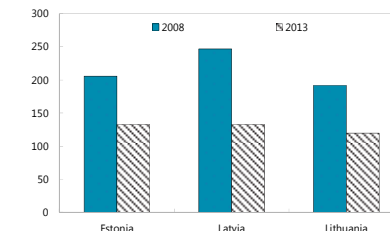
Sources: Authorities, Haver, IMF staff calculations.

Baltics: Parent Funding
(Percent of credit to private sector)



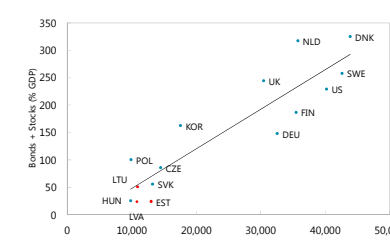
1/ No breakdown by country available for Estonia. Sources: Country authorities and IMF staff estimates.

Loan-to-Deposit Ratio
(Percent)



Sources: Authorities and IMF staff calculations.

Financial Assets and GDP per Capita



Sources: Authorities, Haver, IMF staff calculations.

⁷ Note that the total loan-to-deposit ratio in Latvia is very different from the purely domestic measure, due to the presence of the NRD banking sector. At end-2013 the total loan-to-deposit ratio in Latvia was much lower, at 80 percent.

⁸ Very similar results obtain when plotting per capita GDP against non-bank financial assets in percent of total financial assets. Čihák et al. (2012) suggest assessing financial markets on size, degree of utilization, efficiency and stability. The Baltic countries score below median in terms of size (stock and bond market capitalization), efficiency (turnover ratio) and stability (asset price volatility).

- Institutional investment has been fairly limited. Leasing, insurance, investment, and pension funds' total assets amount to around 25–30 percent of GDP compared to 40 and 60 percent in Poland and the Czech Republic, and over 500 percent in Germany. Going forward, these sectors may grow steadily as income convergence increases demand for insurance and investment services.
- Leasing grew very rapidly in Estonia during the period leading to the crisis, but fell sharply afterwards. It developed partly as an alternative to bank lending to circumvent the tighter collateral conditions required for loans and the high costs of seizing collateral in the event of default, since the asset remains legally under the ownership of the lender.⁹

Financial Sector Assets, 2012

(Percent of GDP)

	EST	LVA	LTU	SWE	CZE	HUN	POL	DEU
Banks	137	153	97	209	146	157	98	264
Other financial institutions 1/	31	30	24	301	63	32	42	553
Leasing	10	...	5	5	...
Insurance corporations	8	12	3	107	19	13	10	73
Investment and pension funds	12	...	6	9	27	...

Sources: Authorities, Haver, and IMF staff calculations

1/ includes leasing, insurance, investment, and pension funds.

13. Baltic bond markets are still undeveloped with relatively low turnover (Table 1).

- In Latvia and Lithuania government securities dominate the debt market, while the share of non-financial corporate bonds is very small. Firms in these two countries have largely relied on internal funding and bank lending for financing.
- By contrast, in Estonia, non-financial corporate bonds dominate the bond market. With very low levels of public debt, the amount of government bonds outstanding is much lower than in Latvia and Lithuania. Corporate bonds developed mainly for hedging currency risk (before euro adoption) and financing higher-risk investments, both of which declined sharply during the bust and subsequent euro adoption. In the event, corporate non-bank financing did not offset the drop in bank credit, and in fact declined slightly more than bank credit during Estonia's recession, while turnover almost came to a halt. Thus, bonds remain only a fraction of total firms' liabilities, but their share in new liabilities is increasing.

14. Equity markets in the Baltics initially saw a spurt of activity as a result of mass privatizations in the 1990s (Table 1). However, these markets soon became illiquid as shares

⁹ Comparable data are not available for Latvia and Lithuania. Most leasing agencies in Estonia are in fact bank affiliates.

were consolidated into fewer hands and a large number of corporations delisted. Although stock market development in the Baltics is somewhat comparable to other EMs, it remains in its infancy, with stock exchanges dominated by a few large corporations. There is also little indication that capital markets acted as a substitute to bank financing during the recession: turnover remained low, if not slightly lower than before the crisis.

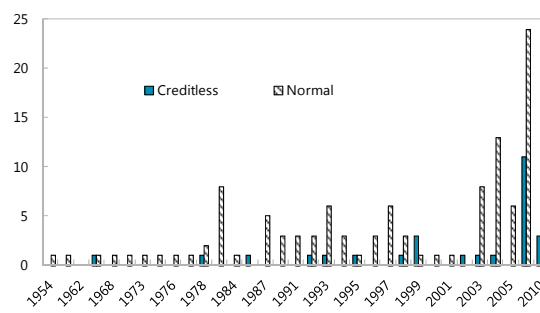
C. Creditless Recoveries: How Do the Baltics Compare?

15. In light of their dependence on bank credit, and the magnitude of the credit boom and depth of the subsequent recession, it is perhaps not surprising that credit has been slow to recover in the Baltic countries. This section aims to put the Baltic countries' experience in a cross-country setting. It examines some stylized facts regarding the likelihood and duration of creditless recoveries, and the growth performance of countries facing creditless recoveries.¹⁰ It also assesses the determinants of credit growth during the recovery and its aftermath. Box 1 provides details on the methodology.

Stylized Findings

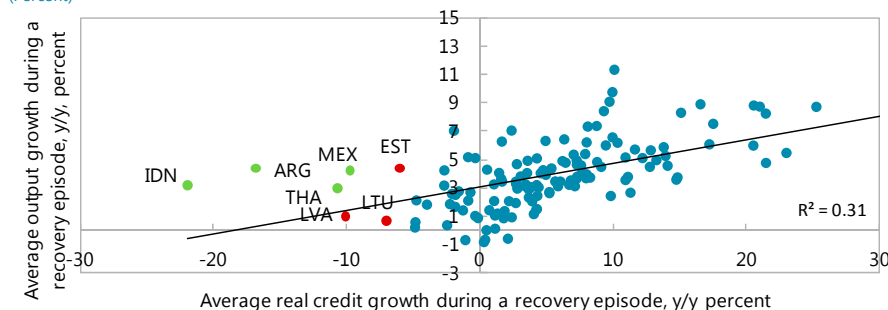
16. About one out of five recoveries—as defined in Box 1—is creditless. The frequency is higher in emerging economies (one out of three) compared with advanced economies (one out of six). The Baltic experience is similar to that of EMs that have faced crises.¹¹

Number of Normal and Creditless Recoveries



Source: IMF staff estimates.

Output and Real Credit Growth During Recovery (Percent)



Sources: WEO, IFS, Haver, IMF staff estimates.

¹⁰ See Annex I for the description of theoretical link between credit and growth and list of countries included in the exercise.

¹¹ Most of the creditless recoveries in our sample occurred in the aftermath of the 2008 global financial crisis. The results may therefore be biased by the idiosyncrasies of that episode, including global financial distress, and low economic and borrowing activity at the EU and global level. Also, the cycles in advanced countries in our sample slightly outnumber those in emerging countries. Hence, frequencies over the whole sample will be closer to those in advanced countries. The countries colored in green in the scatter plot are the few countries that have achieved higher output growth combined with even greater declines in credit than the Baltics.

Table 1. Capital Markets

(Percent of GDP)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Sep-13
Estonia											
Bank credit	52.3	62.3	71.1	83.9	92.4	97.8	108.3	100.2	83.3	77.3	75.5
Bonds (stock outstanding)											
Total outstanding	-	-	-	-	-	12.5	8.1	6.8	7.1	8.2	8.5
issued in Domestic markets	-	-	-	-	-	9.6	5.1	4.1	3.4	3.0	3.0
issued in international markets	-	-	-	-	-	2.9	2.9	2.8	3.8	5.2	5.5
Total issued by general gvmt	-	-	-	-	-	1.2	1.7	1.6	1.4	1.3	1.3
Total issued by financial sector	-	-	-	-	-	6.1	1.2	0.4	0.2	0.1	0.1
Total issued by non-financial corporate sect	-	-	-	-	-	5.2	5.2	4.8	5.6	6.8	7.1
Turnover** (in pct of total)	-	-	-	-	-	28.0	11.0	5.3	3.8	2.8	2.4
Stock market											
Total capitalization*	34.4	46.9	26.5	33.8	25.5	8.6	13.2	11.7	7.7	10.2	10.6
Banks	19.5	31.5	-	-	-	-	-	-	-	-	-
Financial non-banks	-	-	-	-	-	-	-	-	-	-	-
Private non-financial	14.9	15.4	26.5	33.8	25.5	8.6	13.2	11.7	7.7	10.2	10.6
Turnover (in pct of total capitalization)	17.0	16.7	11.4	6.2	14.1	14.0	9.7	12.2	11.2	5.6	5.9
Number of stock listed	13	13	15	17	18	18	16	15	15	16	16
Latvia											
Bank credit	37.3	48.8	69.0	88.3	89.6	92.1	105.3	99.5	81.7	68.0	61.4
Bonds (stock outstanding)											
Total outstanding	-	-	-	-	-	-	-	12.5	14.9	20.9	20.9
issued in Domestic markets	-	-	-	-	-	-	-	7.0	8.9	5.9	6.1
issued in international markets	-	-	-	-	-	-	-	5.5	6.0	14.9	14.4
Total issued by general gvmt	-	-	-	-	-	-	-	10.6	10.7	19.3	17.7
Total issued by financial sector	-	-	-	-	-	-	-	1.5	3.9	1.3	2.6
Total issued by non-financial corporate sect	-	-	-	-	-	-	-	0.3	0.3	0.3	0.6
Turnover** (in pct of total)	-	-	-	-	-	-	-	101.9	46.3	22.7	-
Stock market											
Total capitalization*	-	-	-	-	-	-	-	5.2	4.0	3.8	4.1
Banks	-	-	-	-	-	-	-	0.4	0.0	0.0	0.0
Financial non-banks	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0
Private non-financial	-	-	-	-	-	-	-	4.8	4.0	3.8	4.1
Turnover (in pct of total capitalization)	-	-	-	-	-	-	-	84.0	60.1	34.9	-
Number of stock listed	-	-	-	-	-	-	-	34	33	32	32
Lithuania											
Bank credit	22.7	28.6	40.7	49.8	59.6	62.5	69.7	63.4	53.5	51.2	46.9
Bonds (stock outstanding)											
Total outstanding	15.8	17.1	17.9	19.0	19.4	17.8	29.3	33.9	34.1	34.4	31.3
issued in Domestic markets	5.8	5.8	6.6	5.5	5.6	5.9	8.1	6.6	5.8	5.9	6.3
issued in international markets	10.0	11.3	11.3	13.5	13.9	11.9	21.2	27.4	28.4	28.6	25.1
Total issued by general gvmt	15.3	15.7	15.9	16.6	15.9	13.9	25.2	31.9	32.6	33.4	30.8
Total issued by financial sector	0.3	1.4	1.9	2.2	3.4	3.7	3.9	1.9	1.1	1.0	0.5
Total issued by non-financial corporate sect	0.1	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.4	0.0	0.0
Turnover** (in pct of total)	401.3	640.8	573.0	444.4	261.6	167.2	157.9	167.9	84.6	69.9	51.0
Stock market											
Total capitalization*	-	26.1	33.1	32.1	24.0	8.0	12.1	15.3	9.9	9.8	9.3
Banks	-	1.0	2.5	3.4	3.6	0.8	1.7	1.5	0.4	0.3	0.2
Financial non-banks	-	0.5	0.8	0.7	0.7	0.1	0.1	0.4	0.3	0.3	0.2
Private non-financial	-	17.8	24.0	20.9	12.5	4.1	6.2	8.5	6.3	6.1	5.6
Turnover (in pct of total capitalization)	-	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Number of stock listed	-	46	43	45	44	42	41	42	42	33	34

Sources: Authorities, Haver, and IMF staff calculations

Box 1. Data and Methodology

Data. The analysis covers 59 countries, both advanced and emerging economies for which data on GDP, credit and other explanatory variables are available for different time periods (Annex I). The sources of the data for credit are BIS (2013), where available, and national agencies (via HAVER). Other data are from IFS, WEO and national agencies, as available.

Timeline of a cycle

- Recessions are identified when the cyclical component of real GDP (defined as detrended real GDP using the Hodrick-Prescott filter) falls one standard deviation below zero (Abiad et. al. 2011). The recession starts in the quarter following the previous peak of the cyclical component of real GDP, and ends in the quarter when the cyclical component is at its lowest point.
- Recovery is defined as the first three years (twelve quarters) following the recession, unless a new recession starts during that period.
- A credit-less recovery is one where the average year-on-year growth rate of real credit, defined as the stock of nominal credit in national currency deflated by the GDP deflator, is negative; otherwise it is a normal recovery.
- Aftermath is defined as the next three years after the recovery.
- Booms are defined as the two years before the start of the recession.
- Alternative definitions produce broadly similar results.
- We use the updated database of systemic banking and currency crises by Laeven and Valencia (2008) to date banking and currency crises. A banking crisis is dated on the basis of financial distress and significant policy intervention (Latvia had one in 2008). A currency crisis is defined as a large (more than 30 percent) nominal depreciation, provided there has not been a large depreciation a year before.

Model selection. All variables used in the models can be defined over two periods: averages over boom (two years before recession) and recession (of variable length). In building the probit and regression models in the paper, we start with the shape of the credit cycle and add other relevant variables, on the basis of theoretical links suggested by the literature. Variables are kept in the model if they are significant relative to the model without them, provided including them does not reduce the sample size by more than 20 percent (comparable to the overall frequency of credit-less recoveries).

17. Creditless recoveries are generally weaker and follow significantly deeper recessions than normal recoveries, especially in EMs (Figure 2). For advanced economies, economic growth is about 20 percent lower in a creditless recovery compared with a normal recovery, while for EMs growth falls by about half. These differences become even more pronounced when looking at credit growth rather than economic growth. In EMs, creditless recoveries follow periods of high credit growth

	Characteristics of Creditless and Normal Recoveries			
	Normal		Creditless	
	Advanced	Emerging	Advanced	Emerging
	q/q	q/q	q/q	q/q
Average GDP growth	0.9	1.7	0.7	1.0
Standard deviation	0.4	0.8	0.4	0.5
Average real credit	1.6	2.7	-0.6	-1.6
Standard deviation	1.3	1.9	0.6	1.9
Number of episodes	64	49	12	16

Source: IMF staff estimates.

during the boom. Median credit growth in EMs reaches 25 percent during the boom in creditless episodes, against 7 percent in normal episodes, and converges to the normal recovery credit growth path only in the last two years of the aftermath.¹²

18. Compared with EMs and advanced economies (especially the Nordics), the Baltics experienced a more extreme credit cycle. The only creditless recoveries identified in the Nordic economies were in Finland and Sweden in the early nineties. They were associated with banking crises and deflating housing bubbles (Sweden) and can therefore be used as additional benchmarks for comparison. During the boom, real GDP and real credit growth rates were higher in the Baltic countries compared with the median EM or the Nordics, while they were comparatively lower (more negative) in the recession (see table below). In the recovery and its aftermath, real GDP grew at levels similar to the Nordics and the median EM (except Estonia, which had higher growth), but real credit contracted by more. In the Nordics and the median EM, real credit growth became positive a year into the aftermath (or about 14 quarters after the trough of the recession), which, for the Baltic economies would mean end-2013.¹³

Creditless Recoveries in the Baltics and Nordics

Country	Time		Real GDP	Real credit
			q/q	q/q
Estonia	2009Q4	2012Q3	1.5	-1.6
Latvia	2009Q4	2012Q3	1.1	-3.1
Lithuania	2009Q3	2012Q2	0.9	-1.9
Finland	1992Q4	1995Q3	0.7	-1.6
Sweden	1993Q1	1995Q4	0.9	-0.6

Source: IMF staff estimates.

19. However, real credit growth remains very weak in the Baltics. Indeed, it appears to be lagging behind what would be expected based on the typical pattern for creditless recoveries in EMs or the Nordic countries (Figure 3). That said, there are considerable differences in the pattern between the Baltic countries; in particular, real credit in Estonia is no longer contracting as in the other two countries.¹⁴ All three countries have made considerable progress in reducing private indebtedness since the crisis. But debt levels are still elevated compared to the level in the early years of the decade, prior to the prolonged upswing in leverage. This is in contrast to the median experience of EMs, where indebtedness levels had fallen to below pre-boom levels by this stage of the cycle.¹⁵ The steeper credit cycle in the Baltic countries created a larger overhang to resolve relative to the median EM (Figure 4).

¹² The convergence to the path of normal recoveries is faster for output than it is for credit.

¹³ Specifically, it would imply the third quarter of 2013 for Lithuania and the fourth quarter of 2013 for Estonia and Latvia.

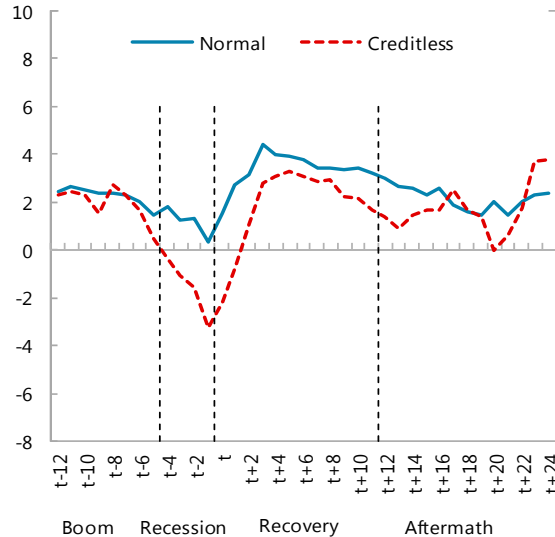
¹⁴ In 2013 Q4, year-on-year real credit growth (nominal credit growth adjusted using the GDP deflator) in Estonia was close to zero, whereas in both Latvia and Lithuania real credit contracted by more than 5 percent.

¹⁵ For this comparison, the EM sample is restricted to those countries for which data is available on a comparably long time series.

**Figure 2. Output and Credit Growth Rates in Normal and Creditless Recoveries:
Advanced versus Emerging Economies**

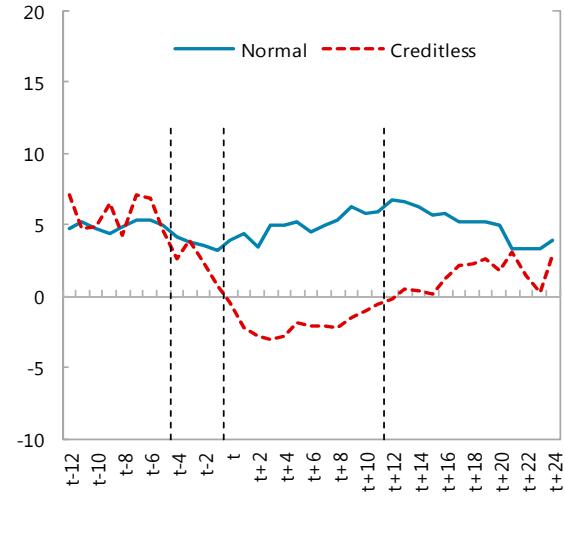
Advanced Economies Output Growth in Normal and Creditless Recoveries

(Percent, yoy)



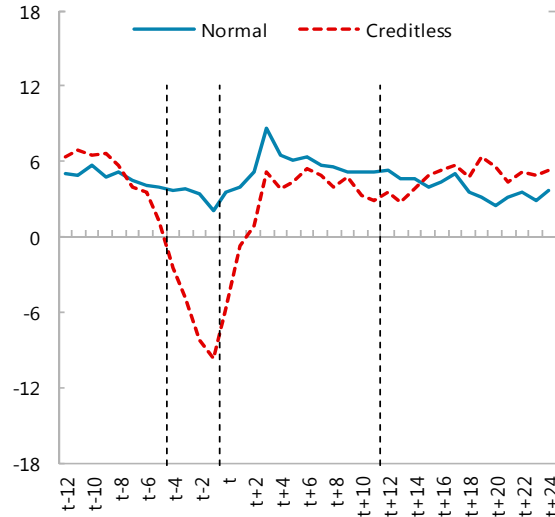
Advanced Economies Credit Growth in Normal and Creditless Recoveries

(Percent, yoy)



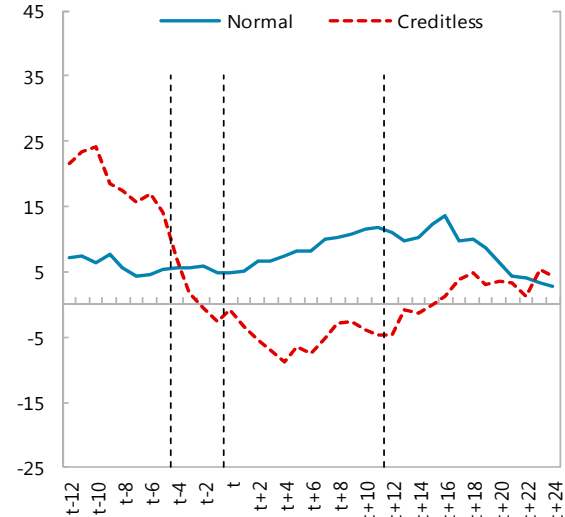
Emerging Economies Output Growth in Normal and Creditless Recoveries

(Percent, yoy)



Emerging Economies Credit Growth in Normal and Creditless Recoveries

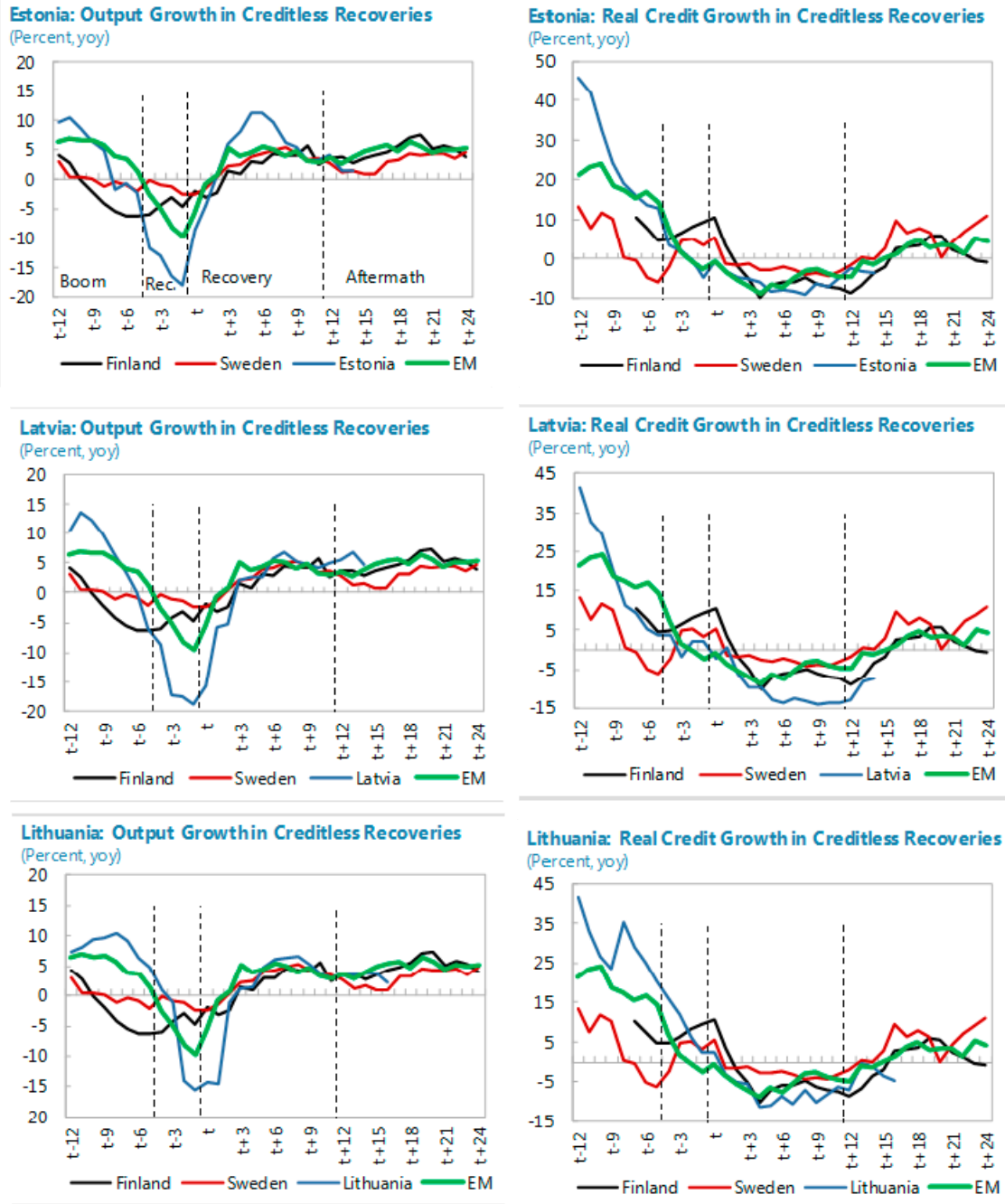
(Percent, yoy)



Sources: BIS; IFS; HAVER; and IMF staff calculations.

Notes: Solid line denotes the median growth rate for Advanced and Emerging economies at a given point in time. Percentiles are available upon request. Recessions are identified based on HP filtered output, therefore in some cases output growth may be positive during recessions. Not all recessions last 4 quarters, therefore the border between the boom and the recession is indicative.

Figure 3. Baltic, Nordic and EM Creditless Recoveries, Growth Rates

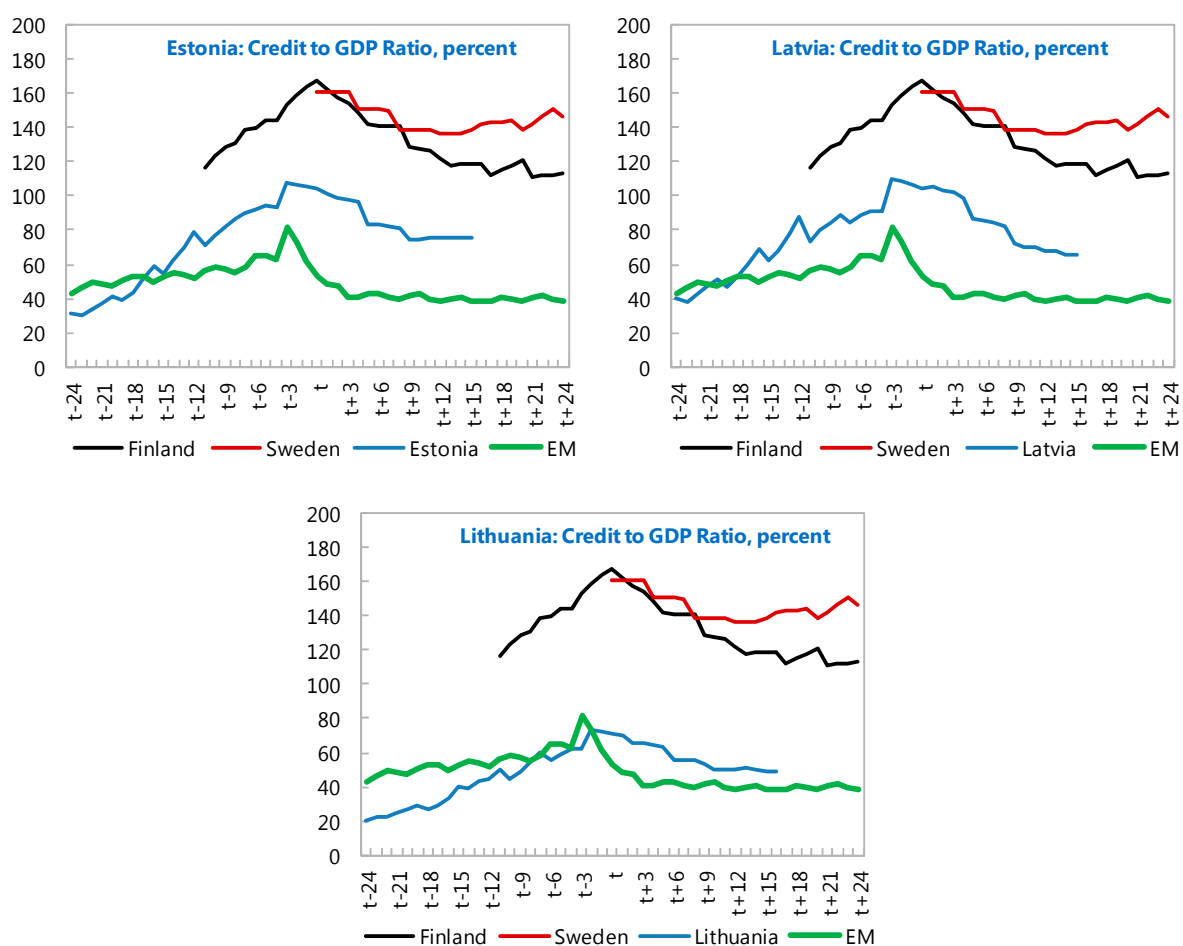


Source: BIS, IFS, Haver, and IMF staff estimates.

Notes: Note all recessions last 4 quarters, therefore the border between the boom and the recession is indicative.

Figure 4. Credit-to-GDP Ratios in the Baltics

(In percent of GDP)



Sources: IFS, Haver; and IMF staff estimates

Determinants of Creditless Recoveries

20. What are the determinants that govern a creditless recovery? We employ an econometric methodology using both probit models (which estimate the probability that a recovery would be creditless) and standard regression models (which estimate the impact of a set of explanatory variables on credit growth during a recovery). The analysis also estimates the relationship between credit and output growth in creditless recoveries, through a panel dataset. Finally, it examines the behavior of credit growth during the aftermath of the recovery.

21. The results from the probit models confirm that the steepness of the cycle and the presence of a banking crisis are important predictors of a creditless recovery.

- The strength of the expansion during the boom and the depth of the contraction—measured by credit, GDP, and investment growth—are indicators of a creditless recovery. More

specifically, the results suggest that an increase in the average real credit growth rate of 1 percentage point during the boom raises the probability of a creditless recovery by 2 percentage points on average.¹⁶ Conversely, an increase in the average real credit growth rate of 1 percentage point during the recession lowers the probability of a creditless recovery by 2 percentage points (Model 1).

- A banking crisis before the recession, as was the case in Latvia, raises the probability of a creditless recovery by an average of 20 percentage points (Models 2 through 5). Higher export growth during the boom is found to lower the probability of a creditless recovery.¹⁷ One explanation is that an export-driven boom does not lead to a build-up of unsustainable macroeconomic and financial imbalances that ultimately require substantial adjustment.
- Regression models of average credit growth during recovery support the results from the probit models.¹⁸ They also highlight the role of currency crises during the recession, which lower the credit growth rate in recovery by 8½–10 percentage points consistent with the idea that a sudden stop in capital flows can make a recovery creditless (Calvo et. al. 2006).

Average Marginal Effects of Determinants of Creditless Recoveries (Probit model) /1

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Average credit growth during boom	0.019*** (0.004)	0.014*** (0.004)	0.011*** (0.004)	0.006 (0.005)	0.007 (0.005)
Average credit growth during recession	-0.021*** (0.006)	-0.020*** (0.005)	-0.019*** (0.005)	-0.015*** (0.005)	-0.014** (0.005)
Recession preceded by a banking crisis?		0.268*** (0.047)	0.199*** (0.062)	0.170*** (0.062)	0.192*** (0.065)
Real GDP change during recession			-0.013* (0.007)*	-0.006 (0.008)	-0.008 (0.009)
Investment growth during recession				-0.007** (0.003)	-0.006* (0.003)
Exports growth during boom					-0.014* (0.008)
Number of observations	125	125	125	111	108
Pseudo R-squared	0.16	0.32	0.35	0.40	0.42
Area under ROC curve /2	0.71	0.87	0.88	0.89	0.90

Notes: /1 Robust standard errors for coefficients are in brackets. /2 A measure of performance for probit models, showing the probability that a model will rank the probability of a creditless recovery higher for a randomly chosen creditless recovery than a normal one.

Source: IMF staff estimates.

¹⁶ The average real credit growth rate during the boom is no longer significant when the cumulative change in real GDP, export growth during the boom, and investment growth during the recession are included. Including additional variables reduces the sample size by more than 10 percent—from 125 to 111 and 108 observations—which is significant given that the overall frequency of creditless recoveries is around 20 percent.

¹⁷ In the same line, higher current account deficits (prevalent for Baltic economies) during the boom tend to raise probability of credit-less recovery.

¹⁸ Detailed results are available upon request.

22. The panel data estimates suggest credit and output (and investment) growth are negatively correlated during creditless recoveries (Table 2). This is consistent with balance sheet repair and/or substitution to alternative financing driving the credit decline in these episodes. The relationship reverts back to positive in the aftermath of the creditless recovery. This effect is relatively robust to measurement errors (dropping outliers from the data), estimation technique (fixed effects and IV estimation) and controlling for additional variables and interaction terms. However further analysis, using for instance more detailed data on debt restructuring, is needed to establish whether this result is robust.¹⁹

Table 2. Panel Regression Results

	Y/Y GDP Growth			Y/Y Investment Growth		
	Fixed Effects	FE w/o outliers /2	IV /3	Fixed Effects	FE w/o outliers /2	IV /3
Credit Growth /1	0.135*** (0.017)	0.159*** (0.015)	0.143*** (0.008)	0.334*** (0.059)	0.457*** (0.056)	0.368*** (0.045)
Credit Growth X Normal Recovery	0.046*** (0.017)	0.053*** (0.016)	0.062*** (0.010)	0.217*** (0.057)	0.222*** (0.061)	0.238*** (0.035)
Credit Growth X Creditless Recovery	-0.224*** (0.077)	-0.404*** (0.076)	-0.380*** (0.032)	-1.163*** (0.256)	-1.223*** (0.385)	-1.151*** (0.100)
Credit Growth X Normal Aftermath				0.122* (0.068)	0.160*** (0.069)	0.183*** (0.041)
Credit Growth X Banking Crisis	-0.113*** (0.041)	-0.051*** (0.028)	-0.042** (0.020)			
Y/Y credit growth rate above 1 s.d.?	-1.267*** (0.349)	-1.487*** (0.308)	-1.407*** (0.160)			
Credit Growth X Y/Y credit growth rate above 1 s.d.?					-0.308*** (0.076)	-0.306*** (0.037)
Currency Crisis	-6.048*** (1.353)	-5.632*** (1.326)	-5.682*** (0.375)	-24.840*** (4.432)	-26.604*** (4.481)	-26.589*** (1.421)
Credit to GDP ratio	-0.029*** (0.005)	-0.028*** (0.004)	-0.028*** (0.001)	-0.068*** (0.014)	-0.062*** (0.013)	-0.066*** (0.005)
Credit Growth X Credit to GDP ratio				0.001** (0.0005)	0.000 (0.000)	0.001** (0.000)
Constant	5.427*** (0.489)	5.191*** (0.479)	5.293*** (0.172)	7.765*** (1.534)	6.854*** (1.415)	7.452*** (0.588)
Number of Observations	4926	4816	4764	4420	4324	4280
Overall R-squared	0.22	0.21	0.20	0.26	0.23	0.23

Notes: /1 Robust standard errors for coefficients are in brackets. /2 Regression based on dropping very high (above 99th percentile) and very low (below 1st percentile) observations on credit growth. /3 Lagged credit growth used as an instrument for credit growth.
Source: IMF staff estimates.

23. In the aftermath of recoveries, the analysis suggests that the shape of the credit cycle, banking and currency crises, and private sector indebtedness matter for credit growth. A stronger boom-bust cycle leads to lower credit growth in the aftermath. Similarly, banking crises have long-lasting effects, lowering credit growth in the aftermath by around 4–5 percentage points on average. The overall indebtedness of the private sector also matters—

¹⁹ Some authors have argued that a rebound in the flow of credit has a closer relationship with economic recovery than a rebound in the stock of credit (see e.g. Biggs et al. (2009)). In terms of specifications in Table 7, this is equivalent to stating that lagged credit growth should have been included among explanatory variables. Such a specification was considered, but lagged credit growth, while having a correct sign, was found to be insignificant.

countries with higher a credit to GDP ratio during the recession have lower credit growth rates in the aftermath. This suggests that the process of debt restructuring and balance sheet repair occurring during the recovery may be more prolonged in countries with high indebtedness.

24. To summarize: the Baltic countries had steeper boom-bust cycles than the median EM, so the fact that they are experiencing creditless recoveries is in line with the past empirical record. At the same time, they have all reached or passed the point at which other EMs began to experience a resumption in credit growth. Moreover, private debt-to-GDP ratios in all three Baltic countries have now returned to pre-boom levels, which in other countries was also associated with a pick-up in credit. It may be that the Baltics should expect a somewhat longer-than-average period of negative credit growth, owing to the steeper-than-average boom-bust cycle in these countries. That said, the empirical record is clear that a creditless recovery cannot be indefinitely prolonged. If past experience is any guide, the Baltics are at or near the stage when credit growth should resume.

Determinants of Credit Growth in the Aftermath of the Recovery /1

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Average credit growth during boom	-0.326*** (0.106)	-0.289*** (0.109)	-0.304** (0.117)	-0.312*** (0.113)	-0.337*** (0.104)
Average credit growth during recession	0.296** (0.144)	0.300** (0.152)	0.306** (0.154)	0.293** (0.146)	0.302** (0.135)
Recession preceded by a banking crisis?		-3.902*** (1.435)	-4.011*** (1.479)	-5.317*** (1.519)	-3.445** (1.730)
Y/Y credit growth during boom above 1 s.d.?			0.964 (1.393)	0.592 (1.391)	0.758 (1.286)
Currency crisis during recession				5.845** (2.551)	3.871 (2.904)
Average credit to GDP ratio during recession					-0.036*** (0.011)
Constant	5.523*** (0.762)	6.139*** (0.806)	5.918*** (0.784)	6.151*** (0.790)	9.844*** (1.558)
Number of observations	124	124	124	124	122
R-squared	0.12	0.18	0.19	0.22	0.31

Notes: /1 Standard errors for coefficients are in brackets and are robust to heteroskedasticity and autocorrelation

Source: IMF staff estimates.

D. Explaining Credit Developments in the Baltics: Demand or Supply?

25. This section takes a closer look at the evolution of credit in the Baltic countries themselves. The analysis encompasses an econometric exercise—broadly following the methodology of Everaert et al (2014) (detailed explanations of data and methodology can be

found in Annex II)—complemented by evidence from surveys and discussions with the authorities and economic agents.

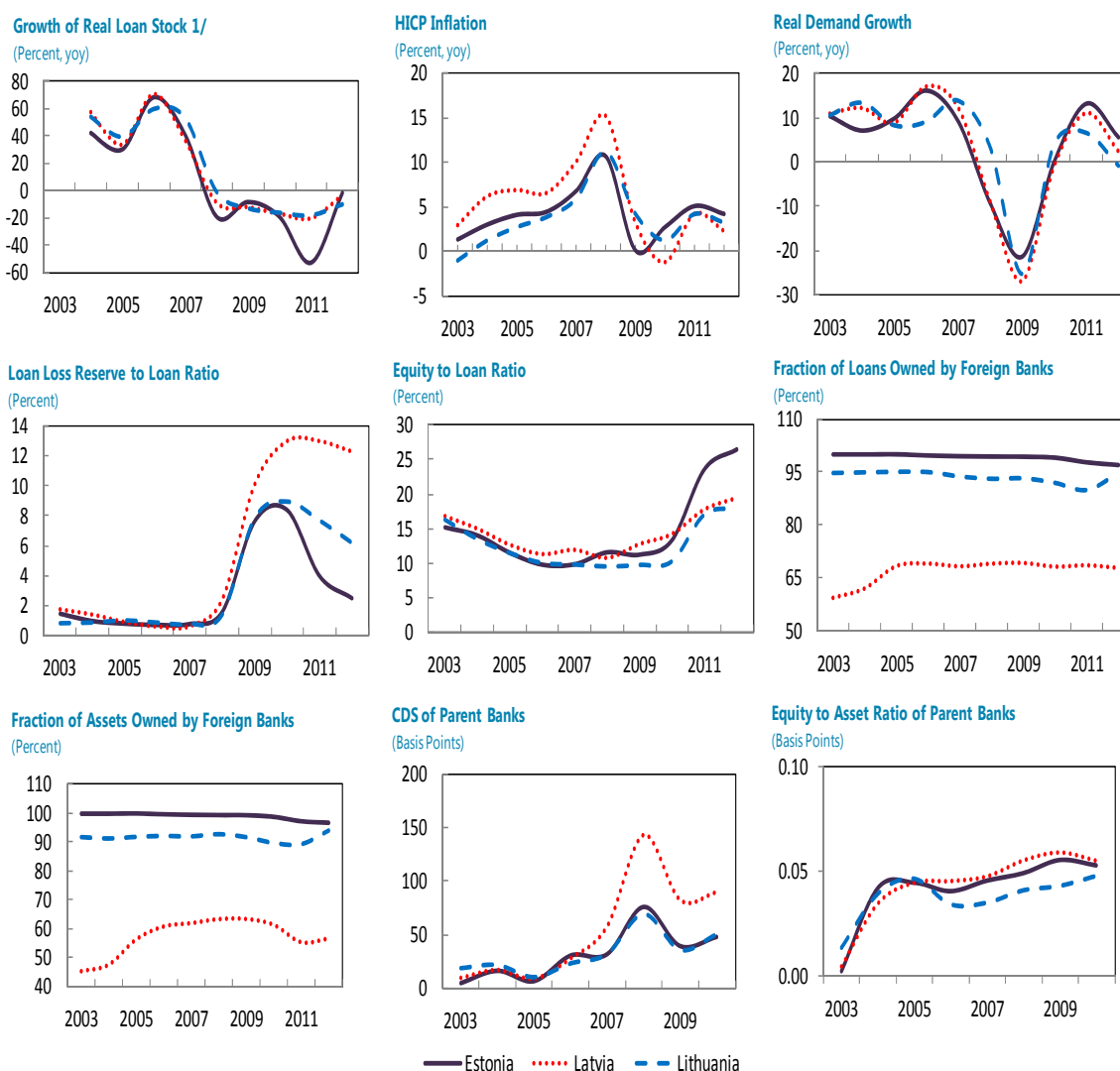
26. The econometric analysis uses cross-country bank-level panel data to explain credit growth in terms of macroeconomic and financial market conditions (Figure 5).²⁰ It finds that the sensitivity of credit growth to credit demand and supply varied over time. A number of specifications have been explored, though data limitations circumscribe the way we measure credit demand and supply. In our preferred specification, credit demand is measured by domestic demand (sum of consumption and investment), and credit supply by asset quality (proxied by the ratio of loan loss reserves to loans) and parent bank characteristics. Several other variables are considered but dropped as they are insignificant in the results: they include time dummies (to capture global credit supply conditions), interest rates, inflation, loan to deposit ratios, equity to asset ratios, etc. (see Annex II for details). Given that foreign banks dominate the Baltic domestic loan markets, the main conclusions are taken from a regression specification using only foreign banks (Model 1 in Table 3), with the full sample used as supporting evidence (Model 3 in Table 3).

- The econometric results suggest that domestic demand growth was a key driver of the aggregate credit boom before 2008: a percentage point increase in domestic demand growth is associated with a 3.7 percentage point increase in credit growth. However, the elasticity of credit growth to domestic demand growth almost disappeared during the recession.
- The econometric results regarding the role of supply factors during the boom are inconclusive—the estimated coefficient in the regression is statistically insignificant—partly because the indicator (the reserves-to-loans ratio) used as a proxy for supply was relatively constant during the boom, making it difficult to identify its effects on credit. However, anecdotal evidence suggests that the interest rate margin shrank substantially during the boom, indicating a role for supply factors in spurring credit growth.
- Credit supply factors appear to have mattered more in the recession. Deteriorating bank asset quality (captured by larger provisioning ratios) was associated with the contraction of credit during this period. A 1 percentage point increase in the loan loss reserve ratio implied

²⁰ Loans and assets shown in Figure 5 include both foreign and domestic loans and assets, as Bankscope data does not provide a breakdown. The fraction of assets owned by foreign banks is lower in Latvia than in Estonia and Lithuania because of the presence of sizable domestic banks specializing in the NRD business. The econometric exercise undertaken here is subject to several important caveats, so that this exercise forms only one component of the analysis of demand and supply conditions, and needs to be supplemented with other, more anecdotal evidence. First, the sample size of banks is rather small, and the sample size of parent banks is smaller still (since some big Nordic banks have subsidiaries in more than one Baltic country), limiting the statistical power of the results. Second, the measure of asset quality used in the chapter—the loan loss reserve ratio—is not ideal. Non-performing loans (NPLs) would be a better measure, but bank-specific time-series data are too patchy. Third, we lack firm-level data on the demand side, instead use a less precise macroeconomic measure: the sum of aggregate consumption and investment. And finally, some variables that would ideally have entered the regression specifications—such as interest rate margins—are not available.

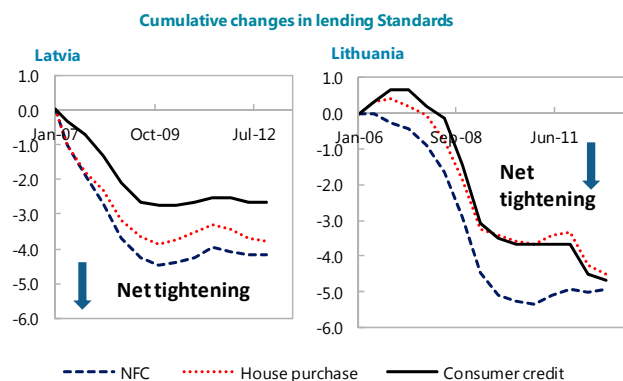
a 1.7 percentage point reduction in credit growth. And because asset quality deteriorated by a large amount during the recession, the economic impact on credit was much more substantial, dominating demand side variables. A plausible explanation for this is that there was a zero lower bound on new credit for borrowers whose demand for credit was sensitive to macroeconomic conditions. When the collapse in domestic demand drove these borrowers out of the loan market, credit growth decoupled from domestic demand growth (since borrowers could not demand negative credit). On the other hand, deteriorating macroeconomic conditions, as reflected in asset quality, tend to lead banks to tighten credit conditions.

Figure 5. Macroeconomic Conditions and Bank Characteristics in Baltics, 2003–12



1/ Total loans derived from Bankscope database deflated by CPI

- During the economic recovery, demand again plays a role in determining credit, although to a lesser extent than during the boom: a 1 percent increase in domestic demand growth led to 0.78 percent increase in credit growth. The coefficient on bank asset quality has the expected sign, and is significant in the full sample regression, although identification for the sample of foreign banks is difficult, possibly reflecting that foreign subsidiaries of Baltic countries share many of the same parent banks.
- In the case of Latvia and Lithuania, the view that supply factors remain important in the economic recovery is supported by the fact that credit institutions tightened lending standards severely during the recession and have not significantly relaxed these standards even in economic recovery.²¹ Discussions with Nordic bank subsidiaries (responsible for the bulk of domestic lending in the Baltics) suggest that, with greater emphasis on credit risk after the crisis, screening costs for small and medium enterprises (SMEs) are often regarded as too high. Moreover, banks' screening criteria put large weight on backward-looking indicators, such as credit history, effectively rationing a number of firms that performed poorly during the recession. In Estonia, however, bank lending was relatively less affected, in line with the relatively lower deterioration and more rapid improvements in the quality of the loan portfolio. Thus supply factors are currently less important in Estonia: bank balance sheets are healthier—as reflected in much lower NPL ratios—and real credit stopped contracting at end-2013. Moreover, in recent years, domestic loans have partly been substituted by cross-border loans from parent banks.



27. Turning to parent bank characteristics, liquidity conditions of the parent bank can play a role in subsidiaries' lending decisions. A 1 percent higher parent bank CDS spread implied 0.63 percent lower credit growth of its subsidiary.²² This result suggests that liquidity shocks to parent banks can lead to credit supply shocks in host economies.

28. To summarize, during the recession, supply side factors became temporarily binding, with demand factors taking a backseat to balance sheet retrenchment. With the

²¹ Cumulative changes in lending standards are constructed based on financial institutions' responses to the Survey of Credit Institute Lending conducted in Latvia and the Bank Lending Survey in Lithuania. A more negative value means tighter lending standards. For cumulation, it is assumed that the magnitudes of lending standard changes are similar across periods.

²² We do not interact parent bank CDS with pre-crisis, crisis and recovery dummies, because parent CDS is patchy, making it difficult to identify the elasticity of credit growth to CDS period by period.

economic recovery, however, both demand and supply factors now play a role in credit growth in Latvia and Lithuania, while supply-side constraints appear to have receded in Estonia.

Table 3. Estimation Results of Credit Growth Determinants

VARIABLES	(1)	(2)	(3)
	Foreign banks	Domestic banks	All banks
Domestic demand growth (2003 - 07)	3.650*** (0.508)	3.800*** (0.280)	3.680*** (0.212)
Domestic demand growth (2008 - 10)	0.0207 (0.182)	0.492** (0.188)	0.338*** (0.0874)
Domestic demand growth (2011 - 12)	0.779** (0.261)	1.228*** (0.251)	1.057*** (0.116)
Bank size	-0.0952 (0.0597)	-0.0814 (0.0862)	-0.0939** (0.0291)
Reserves to loan ratio (2003 - 07)	2.259 (6.834)	-10.54 (5.999)	-8.367 (5.202)
Reserves to loan ratio (2008 - 10)	-1.726** (0.648)	-2.449*** (0.666)	-2.394*** (0.479)
Reserves to loan ratio (2011 - 12)	-0.514 (0.501)	-1.165* (0.525)	-1.241** (0.364)
Parent bank leverage	0.702 (0.970)		
Parent bank CDS	-0.631* (0.314)		
Constant	-0.162 (0.135)	-0.0998 (0.173)	-0.0961 (0.0706)
Observations	113	87	204
R-squared	0.808	0.824	0.794
Number of banks	20	24	40

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: IMF staff estimates.

E. Non-Bank Financial Market Development in the Baltics

29. Could non-bank financial markets provide an alternative source of financing for firms at times when banks are unable or unwilling to extend credit? This section examines prospects and challenges for further development of the non-bank financial sector in the Baltics.

30. The Baltic countries have made significant progress in developing some of the institutional features that have been found to be important for the development of an efficient market-based sector. They compare favorably to peer countries, including Poland and Hungary, in several of these areas. These include: (i) a strong underlying legal framework and enforcement, especially regarding investor protection; (ii) good corporate governance with high disclosure standards; (iii) efficient trading and settlement systems; and (iv), the absence of distortions in taxation or regulations to ensure a level playing field.

31. However, the size of the Baltic economies poses a challenge for the development of the non-bank financial sector. The small scale of these markets entails high costs of trading and difficulty in attracting investors and issuers. Thus, markets tend to be relatively illiquid, possibly tying up liquidity even further during downturns instead of providing alternative financing venues.²³

32. Closer links with each other and integration with larger markets—the Nordics and the EU—could be the way forward. There is ample evidence globally of migration of firms' trading and capital-raising to large international exchanges in search of wider investor bases, more liquid markets, and lower trading and funding costs.²⁴ The economic literature finds that cross-listing of a firm's shares abroad enhances a firm's visibility and ability to raise financing, while lowering funding costs.²⁵ Admittedly, such migration reduces the liquidity of the domestic corporate debt and equity markets, and hence the commercial viability of local exchanges and related financial services, but benefits could still outweigh these costs.²⁶

33. Capital markets in the Baltic region have been consolidating for a while, and have already reached an advanced level of integration.

September 2004 was one milestone when the exchange members began trading on a common Nordic-Baltic trading system and adopted common member rules.

- Baltic countries' securities exchanges are now fully integrated with the Nordic exchanges (within the Nasdaq OMX group), supported by coordinated regulations and supervision under multilateral MOUs, a common trading platform, and a common Baltic securities lists and indexes. Market participants can access and trade on all Nordic and Baltic exchanges through a single entry point, making the region's capital markets more attractive to global investors.



²³ A market is considered to be liquid if transactions can be executed rapidly and with little impact on prices.

²⁴ See for instance Steil (2002).

²⁵ See for instance Karolyi, 2006, Pagano et al., 2002, Witmer, 2006.

²⁶ Domowitz et al. (1998).

- In parallel, greater integration with the EU is ongoing, with most barriers to cross-border equity transactions now removed. Although the data are still too scarce and highly influenced by the recent boom-bust cycle to allow a comprehensive analysis, such integration should provide the same benefits of cross-listing discussed above.
- Central securities depositories (CSDs) in the three Baltic countries are also now highly integrated, allowing for single securities account. Cross-border links enable a close to real-time movement of financial instruments registered with any of the three CSDs. Work is also ongoing on adoption of a new single CSD system and implementation of the euro area single securities settlement infrastructure (Target 2 Securities T2S) by 2017. Nonetheless, some fragmentation remains in regulation, taxation of interest income and capital gains, corporate governance, and auditing and accounting standards, hampering cross-border transactions and investments.

34. Despite these positive steps, more can be done to strengthen existing non-bank financial markets and build the foundation for integrated capital markets.

- Government actions to pin down the yield curve—notably by issuing treasuries at different maturities—remain important to provide a benchmark for local corporate debt, thereby encouraging issuance of longer-term securities. The fact that many EMs typically do not have an efficient government benchmark yield curve to price corporate bond issues is seen as a major impediment for the development and growth of corporate bond markets in surveys of market regulators in EMs (IOSC, 2011). On the other hand, one should be cautious that the crowding-out effects of government issues may be significant in local bond markets of Baltic countries, given their relatively small investor base.
- Further efforts are needed to bring trading rules, corporate governance, disclosure standards, and withholding taxation (including those related to interest income and capital gains) in the Baltics in line with ongoing revisions to the EU regulatory framework, for example, updated rules for markets in financial instruments (MiFID II). This would facilitate cross-border investment and promote financial development.²⁷ Authorities in EMs with relatively large corporate bond markets—including Brazil, Chile, Mexico, and Peru—took significant measures to overcome similar obstacles in the past (GFSR (2005)).
- Strengthening the investor base is also important for local capital market development, as institutional investors' demand growth has been identified an important factor promoting corporate bond market development in several countries in Latin America and Asia (GFSR (2005)). Institutional demand, however, is shaped by a variety of considerations such as regulatory requirements to hold a minimum of assets in government bonds, limits on maximum exposures to corporate bonds, and favorable tax treatment (IOSC, 2011). These regulatory levers can be reviewed with the objective of fostering bond market development.

²⁷ See for instance Claessens et al. (2000) and Steil (2001).

With the aging of the population and further economic development, the further growth of pension funds and the insurance industry in the Baltic countries can be an impetus for its corporate bond market development.

35. A particular concern for the Baltics, and indeed for the EU in general, is that, despite integration within larger markets, obstacles may remain for smaller firms or startups (Box 2). These firms arguably underpin economic growth (accounting for about 70 percent of total value added in 2013), while at the same time are the most vulnerable to bank credit crunches. It is likely that these firms will continue to face financing constraints due to high administrative costs of small-scale debt issuance, high risk perception, asymmetric information, and lack of collateral.

Box 2. Financing SMEs

Access to finance by SMEs is an EU-wide concern. According to the European Commission and European Central Bank "Access to Finance" survey (2013) about one third of the SMEs surveyed did not manage to get the full financing they had planned for during 2013, and another ten percent either declined the loan terms offered or did not apply because of anticipated rejection. 15 percent of survey respondents saw access to finance as a significant problem for their companies. In comparison, only 3 percent of loan applications from large enterprises were rejected.

Equity financing was used by only 5 percent of SMEs mainly due to high costs related to the small-scale of issuance and high risk, and the loss of control. On a scale from 1 to 10 (10 meaning extremely important), EU managers rated measures to facilitate equity investments (4.0) relatively lower among various mechanisms to help their company's financing in the future. But the rate appears to be higher for Lithuania and Latvia. Large proportions of SME managers did not think that funding from equity investments and debt securities were relevant to their firm (71 percent and 79 percent, respectively).

Equity financing was the most common among SMEs in Lithuania (45 percent). Well behind this level, but also above average were Latvia (16 percent), Sweden (12 percent), and Finland (10 percent). It was very little used though in Croatia, Estonia, Hungary, and Portugal.

Bank loans remain the preferred type of external financing amongst SMEs that expect to grow in the next two to three years (favored by 67 percent of managers). The next most popular source of external financing was other types of loans, such as trade credit or a loan from a related company, shareholders, or public sources (favored by around 12 percent of managers). Equity investments were typically chosen by only 6 percent of SME managers as the preferred source of financing, but were significantly higher in Latvia (5 percent) (data unavailable for Estonia or Lithuania).

36. Approaches targeting smaller firms have been introduced, but remain in their infancy. The launch in 2007 of an alternative self-regulated stock exchange market (First North), based on the same trading and settlement systems as the main markets, but with less stringent requirements and regulatory demands, is a step in the right direction. This exchange suits companies in all industries and of all sizes, combines the benefits of being public with simplicity, and is often the first step towards listing in the main market. Due to the global crisis, First North did not become operational until 2011, and currently admits only two listed corporations (with a capitalization of a little over 30 million euro). But it could become more active in the future. The example of Israel—a country with a small domestic capital market—is instructive in this regard,

and shows that the lack of a deep domestic market does not necessarily mean that smaller and new companies cannot successfully access financing on a primary market elsewhere. While large Israeli corporations tend to select the Nasdaq for their IPOs, a significant number of small Israeli firms have been listed on the London-based alternative exchange, the Alternative Investment Market (AIM) which targets smaller companies than NASDAQ and is less costly.²⁸ Capitalization of Israeli companies on the AIM exchange has reached almost 5 percent of total stock capitalization compared to ½ percent for First North.

37. Other measures could be explored to ease credit constraints for SMEs. The development of regional rating agencies specialized in the Baltics could provide more informed assessments about the region to supplement those of international rating agencies. This would help mitigate concerns about the creditworthiness of equity and bond issuers, and hence facilitate cross-border investments. The development of a credit guarantee system is another possible route that could be explored to improve firms' access and cost of financing, especially for SMEs lacking collateral or insufficient equity.²⁹ Credit guarantors could involve regional private agencies (banks, insurance companies) or public institutions, subject to prudent risk management. The Latvian Guarantee Agency (LGA) for example is a public institution that runs active programs to improve SMEs access to financing and support entrepreneurs in early development stages, including through loan guarantees for projects in priority areas. The LGA plans to support the Baltic Innovation Fund—a pan-Baltic effort to promote innovation—which has a fund size of €100 million, including €20 million from each Baltic country and €40 million from European Investment Fund. Another example is Poland's loan guarantee program ("de minimis") launched in autumn 2012 and run by state-owned bank BGK granting guarantees for working capital loans for SMEs. According to BGK, guarantees granted under this program reached PLN 8.4bn by Mar 15, 2014, enabling almost 45,000 companies to access credits worth PLN 15bn or close to 3% of total fixed investment in 2013.

38. However, local markets may be too small to be commercially viable, and government-sponsored credit guarantees run the risk of creating distortions, moral hazard, and being inefficient, as evidenced by the mixed past performance of such schemes in other countries. Analysis is also needed to examine the prospects for appropriately regulated securitization, such as pooling together bonds issued by SMEs, to mitigate concerns about credit risk.³⁰ Before the financial crisis, securitization had been an effective tool for rapid corporate bond market development in Latin America and Korea (GFSR, 2005).

²⁸ See Friedman and Grose (2006).

²⁹ See for instance Shimizu (2007).

³⁰ See for instance Eichengreen (2004).

F. Conclusion

39. The empirical record suggests that the creditless recovery in the Baltics largely fits the historical pattern, but that the rebound in credit has lagged behind what would have been expected at this stage of the recovery. Although this may be partly explained by the Baltic countries' particularly steep boom-bust cycle, the fact that real credit growth continues to be negative in Latvia and Lithuania and remains weak in Estonia is a concern.

40. Analysis suggests that at the current juncture, in the case of Latvia and Lithuania, both credit demand and credit supply factors are important; while in Estonia supply-side credit constraints appear to have receded and low lending activity is more a consequence of weak demand. For foreign subsidiaries, the cost of funding faced by parent banks is an important determinant of credit growth, in addition to the balance sheet of the subsidiary itself. This finding is an important consideration in foreign-dominated banking systems like the Baltics.

41. Policy should now focus on easing both demand and supply constraints. The latter is more challenging in the Baltics than other economies, because of the dominance of foreign banks; policy makers have more limited influence on the lending decisions of the subsidiaries of large foreign groups compared to domestic banks. Nonetheless, some policy measures could act on both demand and supply positively, in particular, measures to further reduce the overhang of private debt which remains significantly higher than its pre-boom level in all three Baltic countries. On the demand side, healthier balance sheets could spur domestic demand, while on the supply side, balance sheet repair could improve perceptions of credit risk (despite tighter lending standards), thus reinvigorating credit supply. Such measures could involve reforms to improve debt resolution, such as fast-tracking the legal system to clear such cases, improving implementation of existing procedures where necessary, and exploring arbitration procedures to reduce the caseload on regular courts. Latvia, for example, has recently created more courts to reduce the backlog of legal cases, and allowed cases to be shifted from overburdened courts to other jurisdictions. Insolvency procedures could be further speeded up by encouraging alternatives to the formal legal system, such as mediation or arbitration

42. The chapter also reviewed the scope for market-based financing in the Baltics as an alternative to bank credit. Ongoing regional integration—including, most importantly, with the Nordic countries—should facilitate cross-border investment and enhance firms' ability to raise capital and lower the cost of external funds. But access may still be limited for smaller firms, which may find it difficult to comply with higher standards.

43. For policymakers, the challenge will be to continue regional integration while at the same time facilitating access to capital markets by smaller firms. Over the medium term, regional working groups could be established to explore various promising routes, including ways to strengthen the alternative exchange market First North, the development of regional rating agencies, a credit guarantee system, and securitization tools, together with fostering institutional investors in the region to efficiently use the region's savings.

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Annex I. A Simple Model for Credit-Less Recoveries

This annex describes a simple theoretical underpinning for creditless recoveries. It also lists the sample of countries used for the empirical work in Section III.

1. **A standard growth model, $F(K,L)$, with capital stock K equated to the stock of credit (e.g., because firms need to borrow to invest),** implies a direct positive correlation between output and credit growth in line with conventional wisdom. Short of adjusting capital, output would change only if labor changed (which is usually linked to short term rather than long term financing).
2. **However, more realistically, over a cycle output is also adjusted by changing the degree of utilization, m , of capital, i.e., the production function takes the form $F(mK,L)$.** At the end of a recession, growth can then take place by restoring m and/or L to previous levels without necessitating an increase in capital, and the stock of credit could continue to decline at the pace of amortization of loans and/or write-offs.
3. **A clearer picture can be drawn if we assume two sectors, say construction and manufacturing, and the production function takes the form $F(m_1K_1, m_2K_2, L)$.** During the recession both m_1 and m_2 dip quickly, but the construction sector undergoes a structural correction and its capital becomes unproductive, while manufacturing is relatively insulated. Subsequently, manufacturing rebounds (also as a result of higher productivity/lower costs) raising m_2 and employment, and pulling aggregate output with it, without a proportional increase in K_2 . Construction, on the other hand, continues a process of liquidation, entailing in turn deleveraging from that sector. How long this takes and its effect on growth then depends on the characteristics of insolvency laws in place, the impact of asymmetric information between borrowers and creditors and efficiency of debt resolution mechanisms, and its impact on resources and demand in the rest of the economy.
4. **A similar scenario could be described for households,** as they shift spending from big-item durable goods (e.g., housing) requiring long-term financing to consumption goods which require shorter-term financing, thus allowing demand growth while the stock of credit declines.
5. **Adding a demand side to the model above, $F(K,L) = C + I$, one obtains that output growth is also correlated with the growth of the *flow* of credit,** since investment essentially equals the flow of capital, and consumption is more related to the flow than the stock of credit if it refers to non-durable goods. The need for short-term operational funds for production introduces another link with the flow of credit. Indeed it is hard to imagine an economic recovery not being correlated with an increase in the flow of credit, as demand for new loans would likely increase, and improving economic conditions would ease the supply of credit and likely reduce the level of write-offs. For that very reason in this paper we focus on the stock of credit rather than the flow, as the stock contains more information.

Table: Sample countries

Advanced economies	Sample	Emerging economies	Sample
Australia	1959Q3 - 2013Q2	Argentina	1993Q1 - 2013Q2
Austria	1988Q1 - 2013Q3	Brazil	1994Q1 - 2013Q2
Belgium	1980Q1 - 2013Q2	Bulgaria	1997Q1 - 2013Q2
Canada	1981Q2 - 2013Q2	Chile	1997Q4 - 2013Q2
Cyprus	2005Q4 - 2013Q2	China, Mainland	1992Q1 - 2013Q3
Denmark	1988Q1 - 2013Q2	Colombia	2001Q1 - 2013Q2
Finland	1975Q1 - 2013Q2	Croatia	1997Q1 - 2013Q2
France	1980Q1 - 2013Q2	Czech Republic	1996Q1 - 2013Q2
Germany	1991Q1 - 2013Q2	Egypt	2001Q3 - 2013Q2
Greece	1970Q1 - 2013Q2	Estonia	1997Q1 - 2013Q2
Iceland	2001Q4 - 2013Q2	Hong Kong	1990Q1 - 2013Q3
Ireland	1997Q1 - 2013Q2	Hungary	1995Q1 - 2013Q2
Italy	1970Q1 - 2013Q2	India	1996Q2 - 2013Q2
Japan	1980Q1 - 2013Q3	Indonesia	1983Q1 - 2013Q3
Luxembourg	2003Q1 - 2013Q2	Israel	1999Q4 - 2013Q3
Malta	2005Q1 - 2013Q2	Jordan	2002Q1 - 2013Q3
Netherlands	1988Q1 - 2013Q3	Korea	1970Q1 - 2013Q3
New Zealand	1988Q1 - 2013Q2	Latvia	2001Q1 - 2013Q2
Norway	1978Q1 - 2013Q3	Lithuania	2001Q1 - 2013Q3
Portugal	1995Q1 - 2013Q2	Malaysia	1991Q1 - 2013Q2
Spain	1980Q1 - 2013Q2	Mexico	1993Q1 - 2013Q1
Sweden	1980Q1 - 2013Q2	Morocco	2006Q1 - 2013Q3
Switzerland	1980Q1 - 2013Q2	Peru	1980Q1 - 2013Q2
United Kingdom	1963Q1 - 2013Q1	Philippines	2001Q4 - 2013Q2
United States	1952Q1 - 2013Q1	Poland	1995Q1 - 2013Q2
		Romania	2004Q4 - 2013Q2
		Russia	1995Q2 - 2013Q1
		Singapore	1991Q1 - 2013Q1
		Slovak Republic	2006Q1 - 2013Q3
		Slovenia	2007Q1 - 2013Q2
		South Africa	1965Q1 - 2013Q1
		Thailand	1993Q1 - 2013Q3
		Turkey	1987Q1 - 2013Q2
		Ukraine	2002Q4 - 2013Q2
Total: 59 countries			

Annex II. Data and Methodology of the Regression Analysis in Section IV

1. The analysis broadly follows the methodology in Everaert et al. (2014), by using bank-level balance sheet characteristics from the Bankscope data set and country-level variables to explain credit growth in terms of macroeconomic and financial market conditions. Variables that are considered to reflect credit demand include macroeconomic variables, such as domestic demand and inflation. On the supply side, loan loss reserves and the equity to loan ratio represent, respectively, asset quality and banks' ability to expand lending. Moreover, given that foreign banks have a dominant presence in the Baltics, characteristics of parent banks (including measures that represent possible funding stress) are also included. This bank-level methodology alleviates the well-known simultaneity problems that arise in aggregate analyses. Our sample is restricted to the Baltics to achieve a better fit to these countries. The econometric model is specified as follows:

$$g_{i,t}^{Credit} = \alpha + \bar{\beta}_{Bank} \cdot \overline{X}_{i,t}^{Bank} + \bar{\beta}_{Capital\ market} \cdot \overline{X}_{i,t}^{Capital\ market} + \bar{\beta}_{Parent\ bank} \cdot \overline{X}_{i,t}^{Parent\ bank} + \bar{\beta}_{Demand} \cdot \overline{X}_t^{Demand} + \rho_i + C_t + \varepsilon_{i,t}$$

where $g_{i,t}^{Credit}$ is the credit growth rate of bank i at time t , $(\overline{X}_{i,t-1}^{Bank})$, $(\overline{X}_t^{Demand})$, and $(\overline{X}_t^{Capital\ market})$ represent bank characteristics at time $t-1$, aggregate demand conditions, and capital market conditions in the current period respectively, (ρ_i) is bank fixed effects and (C_t) is year fixed effects.

- **Bank characteristics include three categories of variables:** variables measuring the asset quality of portfolios, proxied by (loan loss) reserve to loan ratio; variables measuring room to expand for individual banks, such as equity to loan ratio, loan to deposit ratio and bank asset size; and variables measuring liquidity, proxied by current assets divided by short-term debt.
- **Capital market conditions include cost of funding and return on equity.** Cost of funding is measured by the three-month unsecured loan rate.
- **Aggregate macroeconomic variables include domestic demand growth and inflation.** Higher domestic demand growth may entail higher credit growth as households borrow more to spend and firms borrow to expand their business. Higher inflation increases economic uncertainty, and has a negative impact on credit.
- **Time-fixed effects for 2008–12 and bank fixed effects are also used as controls.** The former are relevant as the recession periods of the Baltic countries coincided with the global banking crisis. Shocks to global capital markets could affect all banks in the Baltic region and time-fixed effects can capture such shocks. The latter are important as they control for unobserved time-invariant bank characteristics. To save degrees of freedom, we set: $C_t = 0$ for $t < 2008$.

- **Interaction terms between explanatory variables and pre-crisis, crisis, and recovery dummies are also included** to allow for the elasticities of credit growth to differ between these periods. To save degrees of freedom, we only keep those which are significant in our preferred estimation. **For subsidiaries of foreign banks, the characteristics of their parent banks are introduced in the regressions.** These include the CDS of parent banks whenever available¹ and the equity to asset ratio of parent banks. The former provides an indication of the liquidity of parent banks, while the latter measures their leverage.
- **The data sample covers commercial banks operating in Baltic countries** in the period between 2003 and 2012. This yields 288 bank-year observations. Summary statistics are shown in the table attached below.

2. We use the following strategy to test the validity of our explanatory variables: first, we run a simple regression with only time fixed-effect dummies, and second, we run a full-fledged regression with all variables. Given that important factors influencing credit growth are controlled for, we should expect the time fixed effect dummies to lose most of their economic and statistical significance in the full-fledged regression compared to the simple regression. We do find these in our results.

3. Another consideration in designing the regression model is that we drop all the variables which do not have significant coefficients. An important reason for doing this is that we tend to have multiple variables in one category of factors, and they inevitably may correlate with each other and make the identification difficult. For this reason, we drop inflation and several variables of bank characteristics.

4. Finally, our preferred specification restricts the sample to foreign banks. Given the dominance of foreign banks in domestic credit markets, adding in a large number of small domestic banks responsible for a very small share of lending creates noise. Nonetheless, we use the sample of domestic banks, and the sample of all banks, as robustness tests.

¹ If the parent bank CDS is not available, we use sovereign bond CDS of the country the parent bank is headquartered in plus a spread. The spread is defined as the average difference between bank and sovereign CDS over a period where (i) both time series are available; and (ii) markets are relatively calm.