FOR AGENDA

SM/13/92

April 18, 2013

To: Members of the Executive Board

From: The Secretary

Subject: **Republic of Estonia—Staff Report for the 2013 Article IV Consultation**

Attached for consideration by the Executive Directors is the staff report for the 2013 Article IV consultation with the Republic of Estonia, which is tentatively scheduled for discussion on **Friday, May 3, 2013**. Unless an objection from the authorities of the Republic of Estonia is received prior to the conclusion of the Board's consideration, the document will be published. Any requests for modifications for publication are expected to be received two days before the Board concludes its consideration.

Questions may be referred to Mr. Hoffmaister (ext. 35883) and Mr. Abdoun (ext. 38088) in EUR.

Unless the Documents Section (ext. 36760) is otherwise notified, the document will be transmitted, in accordance with the procedures approved by the Executive Board and with the appropriate deletions, to the European Central Bank forthwith; the WTO Secretariat on Friday, April 26, 2013; and to the European Bank for Reconstruction and Development, the European Commission, the European Investment Bank, and the Organisation for Economic Cooperation and Development, following its consideration by the Executive Board.

This document, together with a supplement providing an informational annex, will shortly be posted on the extranet, a secure website for Executive Directors and member country authorities. The supplement, which is not being distributed in hard copy, will also be available in the Institutional Repository; a link can be found in the daily list (http://www-int.imf.org/depts/sec/services/eb/dailydocumentsfull.htm) for the issuance date shown above.

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INTERNATIONAL MONETARY FUND

REPUBLIC OF ESTONIA

STAFF REPORT FOR THE 2013 ARTICLE IV CONSULTATION

April 17, 2013

KEY ISSUES

Context: Despite global financial uncertainty, Estonia's strong macroeconomic policies and the economy's Nordic ties have underpinned the economic recovery, which has also been supported by euro adoption. With exports booming, output growth has exceeded the euro area average since 2010. Price pressures have eased in line with global fuel and food prices, but Estonia's inflation remains among the highest in the euro area. In the near term, growth is likely to slow and downside risks stem primarily from a prolonged period of slow euro area growth. Financial spillovers could also increase should the euro area crisis re-intensify.

Fiscal policy: Estonia's public finances remain strong notwithstanding a small deficit in 2012. Still, strictly adhering to budgetary allocations can avoid untimely stimulus in 2013. Should downside risks materialize however, automatic stabilizers should be allowed to operate while maintaining fiscal credibility. Establishing a full-fledged medium-term budgetary framework with multiyear expenditure ceilings can help prioritize expenditure and avoid pro-cyclical policies.

Financial sector policy: The banking sector has remained profitable, liquid, and well capitalized, and its funding has improved. Risks remain, but are mitigated by strengthening balance sheets and prudential positions. Further strengthening macro-prudential policies and enhancing long-standing cross-border supervision and prudential arrangements would help safeguard financial stability. The EU banking union can provide an additional avenue for these efforts.

Long-run growth: Beyond safeguarding Estonia's competitiveness and business friendly environment, there is an urgent need to ensure that those searching for a job possess the skills demanded by employers and to curb long-term joblessness. In this regard, continued focus on enhancing training and higher education is essential.

Approved By
Elliot Harris and Mahmood Pradhan

Discussions took place in Tallinn on March 6–18, 2013. The staff team comprised Messrs. Hoffmaister (head), Abdoun, and Srour (all EUR), and Ms. Hashimoto (STA), and it was assisted by Ms. Adu and Mr. Augustyniak (all EUR). The team met with President Ilves, Prime Minister Ansip, Finance Minister Ligi, Bank of Estonia Governor Hansson, and other senior officials, members of Parliament, and private sector and civil society representatives. Mr. Lindpere (OED) participated in the discussions. Estonia is an Article VIII country (Information Annex, Appendix I). Data provision is adequate for surveillance (Information Annex, Appendix II).

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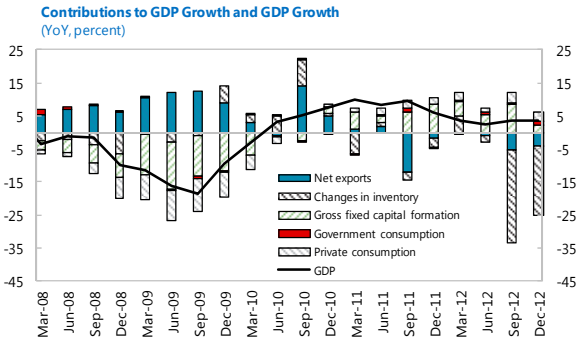
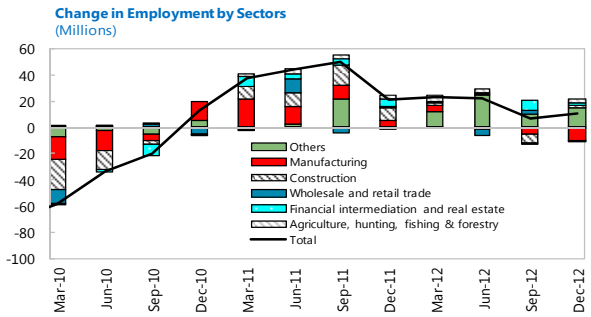
CONTEXT

1. Estonia's recovery has endured with tensions easing gradually. Steadfast implementation of strong macroeconomic policies, the economy's Nordic ties, and euro adoption have provided a strong footing for the economy. Estonia's sharp economic contraction, following a collapse of its housing market and the global financial crisis, has been left behind with exports thriving; these now substantially exceed their pre-crisis levels. Employment in export-related activities has supported the needed reorientation of resources to the tradable sector. Both overall and long-term unemployment have declined but remain above pre-crisis levels. Household balance sheets have improved but remain weak relative to corporate balance sheets (Figure 1). More recently, domestic demand has also strengthened, particularly investment, while inflation has declined due to waning external price pressures.

2. Estonia's growth returned to a sustainable pace in 2012 (Figure 2). Growth has exceeded the euro area average since 2010 despite considerable headwinds; Estonia has been among the top performers in the EU. Initially, exports—particularly those tied to the Nordic production chain—had been the main driver of the recovery with double-digit increases for a number of quarters since 2010. More recently however, tightening capacity constrains and declining inventories have boosted private investment, which has increased by more than 50 percent in the last two years. And private consumption has been supported by rising consumer confidence and positive labor market developments. Employment continued to grow in 2012 with a net increase of about 10,000 jobs or roughly 1.5 percent of the labor force.



Sources: Statistics Estonia; Haver; and IMF staff calculations.



Source: Haver.

3. Inflation eased to about 4 percent in 2012, but remained among the highest in the euro area (Figure 3). External price pressures (associated with global fuel and food prices) weakened and contributed to lower headline inflation in 2012 (Box 1). Despite rising real wages, core inflation has also declined with weaker manufacturing goods prices more than offsetting increases in rental prices reflecting rising housing prices. The labor market has remained strong and the adverse impact of real wages increases on labor costs has been offset by productivity gains (Figure 4), except recently in the manufacturing sector.

4. Domestic credit has begun to increase. In the aftermath of the crisis and reflecting a largely demand phenomenon, credit contracted by about 13 percent from its peak at end-2008. But recent credit data suggest that deleveraging may have run its course in 2012 (Figure 5). A boost in commercial and consumer lending contributed to raise credit growth (including leasing) to about 1½ percent year-on-year at end-2012. Developments in mortgage credit, which account for the bulk of household credit have been less clear cut, but the stock of credit appears to have leveled off at end–2012.

Box 1. Estonia: Inflation Trends

Estonia's CPI inflation has been the highest in the euro area for a number of years. Its inflation gap over the euro area peaked at about 8¼ percentage points at end-2008 but has since declined sharply to about 1½ percentage points; since 2000 the accumulated gap has reached about 27 percent at end-2012. Core inflation has followed a similar pattern (with an accumulated gap of about 18 percent since 2000) but declined more sharply, particularly since June 2012.

Should Estonia's inflation developments be a source of concern? Economic theory points to a number of potential factors that can explain inflation differentials in a monetary union. Higher productivity in the tradable sector—catching up from a lower level relative to trading partners—and rising income levels may be the main reasons. Such a Balassa-Samuelson effect may reflect increases in the relative demand of nontraded versus traded goods. Less benignly, a real appreciation could reflect weak domestic market competition, or an economy whose growth and cyclical position are more advanced than that of the monetary union.

In Estonia, inflation appears to have primarily reflected global fuel and, to a lesser extent, food price developments (Annex I). Moreover, commodity prices have had a larger and more persistent inflationary effect in Estonia after the crisis. This is broadly consistent with its high energy usage intensity. Regarding equilibrating real appreciation, this may have had a more prominent role in explaining inflation earlier in the decade, but recent price increases in non-traded goods sector (particularly services) have been smaller than those in the traded goods sector.

5. Credit developments in 2012 reflected improving private sector balance sheets. On the supply side, banks have been winding down the resolution of non-performing loans (NPLs), helping to stabilize commercial real estate and, to a lesser extent, mortgage borrowing, which together account for almost 60 percent of domestic credit. Improved banks' balance sheets, strong domestic deposit growth and the reduction of reserve requirements upon euro adoption have also eased liquidity. On the demand side, private deleveraging has shown signs of winding down, with household debt declining to about 86 percent of disposable income (roughly 15 percentage points lower than its peak). At the same time, the real estate market has steadily recovered, with housing prices up about 40 percent from their trough in late 2009, thus strengthening collateral value and private wealth.

6. The fiscal outturn was better than expected in 2012. A smaller fiscal deficit emerged with tax revenues—notably income tax and indirect (VAT) taxes—bolstered by a strong economy, an improving labor market, and continued revenue collection efforts. Also, a small under-execution of public investment projects—mostly tied to CO_2 emission unit sales from 2011—reduced overall public spending. These factors more than offset the envisaged drivers of the budget deficit, namely the restoration of pension pillar II contributions (previously diverted to the budget), and a small increase in basic pensions. As a result, gross public debt remains the lowest in the EU (10 percent of GDP), and fiscal buffers at about 10 percent of GDP constitute an adequate protection against Estonia's high economic and fiscal revenue volatility (Annex II).

7. A small current account deficit has emerged in 2012, despite broadly unchanged competitiveness. Besides a small deterioration in its terms of trade, the switch in the current account balance to a deficit has mainly reflected the widening of the trade deficit to about 4¼ percent of GDP (Figure 6). Import volumes have far outpaced exports volumes reflecting resilient domestic economic conditions, notably private investment. Still, the service balance has continued to record a large surplus and net income payments to foreign investors remained sizable. Competitiveness has remained roughly unchanged and the real exchange rate is broadly in line with fundamentals (Box 2).

8. Gross external debt has declined nonetheless. The capital and financial accounts posted an atypical surplus as the drop in outflows—including Estonian subsidiaries paying back loans falling due to their foreign parent banks—exceeded the decline in FDI inflows. This has reduced gross external debt by roughly 6 percent of GDP to about 93 percent of GDP in 2012. The external DSA suggests that external debt dynamics remain sustainable in plausible risk scenarios.

OUTLOOK

9. Growth will likely slow in 2013, line with less buoyant domestic demand and weaker external demand. Real GDP growth is projected to be about 3 percent in 2013. Exports will continue to provide a positive, albeit smaller, contribution to growth conditional on a euro area recovery in the second half of 2013. Private consumption is projected to expand in line with continuing improvements in the labor market, also sustained by cuts in the unemployment contribution rates. But private investment's contribution to growth is projected to decline consistent with a slowing from its double-digit growth in 2011–12.

10. Despite one-off domestic factors, inflation is projected to decline in 2013. External price pressures will continue to wane and more than offset the effects of Estonia's energy market liberalization on January 1 and of increases in excise taxes on alcohol and tobacco. Core inflation nonetheless is projected to remain roughly unchanged with productivity gains continuing to broadly offset wage increases, notably increases in public sector wages and the minimum wage.

Box 2. Estonia: Competitiveness Developments

Standard methods for evaluating real exchange rate misalignment suggest that Estonia's real exchange rate has remained broadly in line with fundamentals. Current account-based methods suggest an undervaluation, while a direct assessment of the equilibrium real exchange rate suggests an overvaluation. Taken together, these results point to a small overvaluation (about 2 ½ percent) or a slight worsening of price competitiveness compared to the assessment in the 2011 Article IV Consultation. But the magnitude of overvaluation continues to fall within the bounds of the measurement error.

REER Assessment
(Percent)

	Current assessment	2011 Art IV
Macrobalance approach	-5.6	-7.3
External Sustainability approach	-9.9	-9.5
Equilibrium Real Exchange Rate approach	15.2	6.6
REER deviation from historical average	8.0	3.2
Mid-point overvaluation range	2.6	-1.5
Memorandum items (% GDP)		
Underlying current account	-0.7	-1.3
Equilibrium current account (MB)	-1.3	-2.6
Equilibrium current account (ES)	-3.2	-3.6
Mitigating factor	1.9	2.0

Source: IMF staff estimation.

Price- and cost-based indicators support a stable trend in competitiveness (Figure 7). After declining in 2009–10, the various ULC-deflated measures of REER have remained unchanged in 2011–12. Real wage growth has been accompanied by productivity gains that have offset adverse labor cost effects. Still, the CPI-based REER for overall economy remains about 5 percent higher than its pre-crisis level.

Exports continue to perform well. Despite difficult economic conditions in euro area trading partners, the strong export rebound continued in 2012. As a result, the ratio of exports to GDP reached 92 ½ percent, the second highest in the Baltic nations and Central Europe. In addition, Estonia's shares in key export markets, such as Sweden and Russia, increased steadily in 2012.

11. Risks to the outlook for 2013 will largely be on the downside (Annex III). These stem primarily from a prolonged period of slow growth in the euro area and the potential indirect effects on key Estonian export markets. Financial market volatility in Europe has moderated largely reflecting policy developments in Europe—notably the establishment of the European Stability Mechanism (ESM) and the program of Outright Monetary Transactions (OMT) as well as troika programs in distressed countries. These developments have reduced the likelihood of extreme tail events but, with little evidence of a turnaround in the euro area, the projected pickup in external demand remains to be confirmed. Delays in the euro area recovery can slow Estonia's exports (two-thirds of which are to the EU), reduce job creation and thereby limit household's ability to service

their loans. The unwinding of past real and financial sector imbalances would thus be more protracted and weigh on domestic demand. Moreover, in the event of a sharp resurgence of global financial market volatility, financial risks could spillover from Swedish parent banks should they come under pressure. Alternatively, a faster-than-expected euro area recovery or unexpected export resilience could boost growth. In this case, continued labor market strength could fuel wage and price pressures.

12. While broadly agreeing with the outlook, the authorities expressed concern about developments in the euro area. They noted that work was underway to revise their official projections that will be available in April. Still, the authorities expected growth to remain around 3 percent in 2013 with weaker export markets.[1] In this regard, they stressed that Estonia was better able to cope with adverse external shocks as macroeconomic imbalances have declined. Regarding inflation, they expected price increases to slow as the impact of external price shocks moderates. But tight labor markets would exacerbate wage pressures, particularly in the medium term, should economic activity accelerate with productivity gains struggling to keep pace. They recognized that Estonia's inflation is higher than in its neighbors and efforts continue to assess underlying factors, including possibly weak competition in domestic markets and the economy's high energy intensity.

POLICY CHALLENGES

13. Against this backdrop, this year's Article IV consultation with Estonia focused on policies to underpin its hard-earned fiscal and financial stability as well as how best to safeguard competitiveness to support sustainable growth and employment. The authorities' policies have been in line with Fund advice (Box 3). Together with its successful euro adoption, these policies have contributed to reduce Estonia's domestic and external imbalances and vulnerabilities. To build on these achievements, three broad areas require continued attention: fiscal stability, financial sector robustness, and broadening sustainable growth

Box 3. Implications of Fund Advice

Relations between Estonia and the Fund have remained excellent. Policies have been characterized by a high degree of ownership—a key factor in its economic success—and these have been broadly consistent with Executive Board recommendations. But large increases in current spending resulted in an ill-timed loosening of the fiscal stance in the boom years. Since then, corrective actions, including expenditure reversals and increased indirect taxation, have been in line with Fund advice. Most of the key recommendations of the 2009 FSSA update have been adopted, including a domestic bank resolution framework to facilitate rapid bank restructuring. Consistent with Fund advice, the authorities have recently cut unemployment contribution rates and have been discussing enhancements to their medium-term fiscal framework to further entrench their strong fiscal position.

[1] After the mission returned, the authorities updated their macroeconomic projections in early April. For 2013, they maintained real GDP growth and headline inflation respectively at 3 percent and 3½ percent and lowered slightly the projected fiscal deficit by about ¼ percent of GDP to ½ of 1 percent of GDP.

A. Enshrining Fiscal Stability

14. Estonia's long-standing track record of fiscal prudence underpins fiscal sustainability (Figure 8). Besides resulting in the lowest public debt in the EU, Estonia's cautious fiscal policy has also supported the authorities' efforts to build fiscal buffers. These were called upon at the height of the global financial crisis and provided a secure source of financing. This flexibility proved vital in dealing with the crisis and limited the need for contractionary pro-cyclical policy.

15. Notwithstanding Estonia's record, the 2013 budget foresees a small deficit. The budget cuts total expenditures by about 1 percent of GDP. Still, the budget accommodates increases in social spending—notably old-age pensions, mean-tested child allowances, unemployment benefits, and a 5½ percent increase in the public wage bill (following a 3-year freeze). This amounts to an increase of about ¼ percent of GDP and raises the share of social spending in the budget to about 37¾ percent (an increase of about 3 percentage points). The budget also envisages an increase in public investment (about 1¾ percent of GDP), mostly associated with projects tied to EU structural funds. Spending increases are to be partially offset by cuts in other current spending. The overall tax burden is envisaged to remain broadly unchanged as cuts in the unemployment insurance contributions are offset by increases in excise taxes (tobacco and alcohol) and in pollution and navigation fees. These tax changes should nonetheless help household balance sheets. Public debt will increase by about 1 percent of GDP reflecting Estonia's contribution to the European Financial Stability Fund, an increase in the public power company's capital, and recourse to European Investment Bank loans to co-finance EU-related projects.

16. The fiscal stance will likely be broadly neutral and appropriate given cyclical conditions. Staff estimates that the cyclically adjusted fiscal balance will remain roughly unchanged. Taking into account the carry-over effects of the economy's strong second half of 2012, staff projects that total revenues will exceed the budget by about 1¼ percent of GDP, compared to unchanged revenues in the budget. These additional revenues would more than offset the budgeted spending increases and result in a small surplus of about ½ of 1 percent of GDP in 2013. The surplus could be slightly higher should capital spending (not associated with EU structural funds) be less than budgeted. With the recovery enduring, sticking to the budget's allocations would be appropriate and windfall revenues should be saved as in the past. If however, the aforementioned downside risks materialize, automatic stabilizers should be allowed to operate while maintaining fiscal credibility.

17. With the authorities' medium term target (a small surplus) in sight, Estonia faces the challenge of safeguarding this achievement while addressing medium-term needs. In the medium-term, continuing strong revenue collections are projected to result in small surpluses. Anchoring fiscal policy on a small surplus can ensure low and sustainable debt as well as keep fiscal buffers at above 9 percent of GDP. The latter will protect Estonia's ability to cope with economic volatility and downside risks. Moreover, Estonia's enviable fiscal position provides room to be mindful of public investment needed to underpin long-term growth potential and reduce the tax burden, as well as to continue efforts in addressing structural labor market issues. This scenario will

nonetheless require unwavering efforts to control current expenditure while safeguarding and gradually increasing social spending and redirecting spending to infrastructure.

18. A fully fledged medium-term fiscal framework can provide a useful tool to assess policy tradeoffs and avoid pro-cyclical policies. Such a framework should be consistent with Estonia's fiscal tradition, and thus be simple and transparent to support fiscal credibility. Multi-year expenditure ceilings should be an integral element of the framework to reduce policy uncertainty and enhance discipline on competing budgetary claims and help avoid pro-cyclical fiscal policies. Regardless of the specific fiscal rules and institutional setting chosen, it should be aligned with the requirements of the EU's Fiscal Compact (FC) and the Two-Pack (Box 4).

Estonia: Summary of General Government Operations, 2011–18

(Cash basis; percent of GDP)

	2011	2012	2013	2014	2015	2016	2017	2018
			Projections					
Revenue and grants	44.2	44.9	44.6	43.5	43.3	43.1	42.5	41.9
Revenue	36.1	36.9	36.7	36.8	36.8	36.8	36.4	35.9
Tax revenue	32.4	33.2	33.0	33.1	33.2	33.1	32.7	32.3
Nontax revenue	3.8	3.8	3.7	3.7	3.7	3.7	3.7	3.7
Grants	8.1	8.0	7.9	6.7	6.5	6.3	6.1	6.0
Expenditure	42.5	45.1	44.2	43.2	43.1	42.9	42.3	41.6
Current expenditure	39.5	41.7	39.2	38.1	37.9	37.6	36.9	36.2
Expenditure on goods and services	24.7	27.4	24.9	23.9	23.8	23.6	23.1	22.6
Current transfers and subsidies	14.8	14.3	14.2	14.2	14.1	13.9	13.8	13.6
Capital expenditure	3.0	3.4	5.1	5.1	5.2	5.3	5.4	5.5
Overall surplus (+) / deficit (-)	1.7	-0.2	0.4	0.4	0.2	0.2	0.2	0.2
Memorandum item:								
Fiscal reserves	9.9	10.1	9.9	9.7	9.4	9.1	8.8	8.5

Sources: Estonian authorities; and IMF staff projections.

Box 4. Estonia and the Fiscal Compact

In 2012, the EU adopted a Fiscal Compact (FC) and the economic governance Two-Pack. The FC is a pan-European law requiring member countries to incorporate into their national legislation a fiscal rule on the structural budget balance and the related enforcement mechanisms, a requirement for an annual debt reduction, as well as a limitation on the growth of primary expenditure.

The Two-Pack legislation aims to improve economic governance by:

- strengthening the rules of the Stability and Growth Pact (SGP) with stronger and tighter surveillance, including at an early stage;
- introducing new controls on macroeconomic imbalances;
- establishing standards to ensure the correct and independent compilation of statistics; and
- increasing transparency in the decision-making processes and accountability of decision-makers.

The FC requires that Estonia's structural fiscal deficit not exceed 1 percent of GDP, public debt remain under 60 percent of GDP, and primary expenditure growth not exceed that of long-term nominal GDP. Given Estonia's strong public finances these are not binding, but it will need to implement a formal medium-term budgetary framework by 2014, including an expenditure rule allowing automatic stabilizers to operate.

19. The authorities highlighted that the 2013 budget adheres to the goals set out in Estonia's budget strategy, and thus protects economic stability and growth. They expressed their continued commitment to strong fiscal policy—essential to maintain macroeconomic

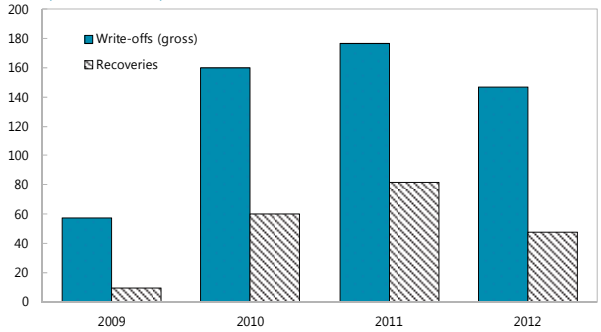
stability—while underscoring the budget's spending increases in social areas. Likewise, the authorities noted that their budgetary position had provided room for a modest increase in the public wage bill following a 3-year freeze. They also noted the need to continue improving Estonia's energy efficiency, with CO_2-related investment devoted to the construction of efficient power plants as well as energy efficiency-enhancing insulation in government and private buildings. More broadly, general government investment will remain high, with nearly half of it supported by external sources, and will focus on road maintenance, economizing water usage, and enhancing the hospital network infrastructure. Regarding automatic stabilizers, these would be allowed to operate but they would consider expenditure and revenues measures if a downturn threatens their EU commitments.

20. Regarding medium-term fiscal policy, the authorities underscored that they would continue to aim for balance or better. This would be measured in structural terms despite the inherent difficulties of assessing the output gap, all the more uncertain in the context of Estonia's small open economy. Also, they stressed that their target is tighter than required by the EU to ensure that fiscal buffers are rebuilt and thus enhance the economy's ability to cope with downside risks. The authorities concurred that a fully-fledged medium-term fiscal framework could provide a useful tool to assess policy trade-offs and avoid pro-cyclical policies. In this context, the authorities noted that, to comply with EU requirements, they will reform the Financial Management Act accordingly; it should be with Parliament later in 2013. While discussions continue, these reforms would incorporate their medium-term target and spell out how deviations will be addressed. The authorities also noted that a draft legislation regarding the establishment of an FC is under preparation and will be submitted to Parliament in 2013. In line with the EU requirements, the council will be endowed with functional autonomy, have an advisory role on budgetary and fiscal matters, and undertake regular assessments of fiscal performance. While the composition of the council is being discussed, they expected that it would begin more like a working group and evolve as experienced is gained. Finally, the authorities stressed their goal, as budgetary conditions allow, to cut labor taxes, increase the tax exempt income threshold, reduce the personal income tax, and continue increasing revenue collection efficiency.

B. Advancing Financial Sector Robustness

21. Estonia's mostly Swedish-owned financial sector has continued to strengthen. Extensive bank write-downs have cut NPLs in half from their peak in mid-2010 to about 3 percent in January 2013 (Figure 9). As the economy continues to improve and with it the quality of loans, NPLs are expected to continue declining albeit at a slower pace. Despite the write-offs, banks have remained well-capitalized, liquid, and profitable. Recovery of assets previously recorded as losses and lower provisioning requirements associated with the improving

Estonia: Loan Write-offs and Recoveries
(Millions of Euro)



Source: National authorities.

economy and asset quality have boosted profits and helped replenish banks' capital in 2012. The capital adequacy ratio has risen to about 19½ percent in January 2013, far exceeding current international norms. Meanwhile, bank funding has also improved with a declining share of foreign funding and rapidly growing domestic deposits, which has resulted in a record low loan-to-deposit ratio.

22. Risks to the financial sector remain but are mitigated by strengthening balance sheets. On the domestic side, the main source of risk stems from (flexible rate) mortgage loans—typically tied to the six-month Euribor—of which about 18 percent currently have negative equity. On the external side, Estonian subsidiaries receive significant funding from Swedish parent-banks which in turn rely on potentially volatile short-term wholesale markets, and are exposed to risks stemming from elevated household debt and house price-to-income ratio.[2] These risks appear manageable nonetheless. At present markets expect stable interest rates, allaying interest rate risks that could diminish households' ability to service their loans. Also, in Estonia, lower private debt, improving real estate prices, higher employment, and low interest rates have strengthened the ability of the private sector to service its debt. On the external side, parent-banks appear to be sound and the Swedish housing market has been gradually cooling. Moreover, parent funding of Estonian subsidiaries has been stable reflecting a strategic commitment to, and highly profitable investments in Estonia.[3] Finally, Estonia's financial exposure to EU distressed countries is limited.

23. Recent stress tests suggest that banks are reasonably well positioned to cope with risks. In an adverse scenario seeking to replicate the 2008 events, the Eesti Pank's (Estonia's central bank) bottom-up stress tests from Fall 2012 show that NPLs would rise significantly and peak at 6.5 percent at end-2013. However, the required increase in provisioning could be absorbed by bank profits. In addition, banks have substantial prudential buffers (tier 1 capital is about 13½ percent) as well as access to the ECB's liquidity facilities. Capital adequacy would remain well above statutory minimums.[4] These test results hinge however on unchanged foreign funding (notably, parent banks maintaining their Estonian exposure) as well as on the presumption that profits are not repatriated to parent banks. These assumptions are consistent with the experience following the global financial crisis.

24. Strengthening Estonia's macro-prudential policies would help reduce risks further. The EU's CRD IV capital and liquidity requirements have been designed to enhance financial stability in an increasingly challenging EU environment. Although the EU directive allows gradual adjustment, early adoption of these requirements—in tandem with parent banks—would enhance Estonia's financial sector's standing without unduly constraining banks' margins or credit growth. This is because banks already broadly meet these requirements. Similarly, in view of the prevalence of

[2] See IMF Country Report No. 12/154.

[3] Ibid.

[4] Eesti Pank, *Financial Stability Review* (2/2012).

short-term variable interest rate-linked mortgages, adopting formal caps on loan-to-value and loan-to-income ratios—consistent with Estonia's current banking sector practices—can cement stability and reduce risk exposure. Also, Eesti Pank's macro-prudential authority and existing tri-lateral (Eesti Pank, MoF, and FSA) forums can be further clarified and strengthened—in line with the European Systemic Risk Board's recommendations—to enhance the monitoring of systemic risks and limit potential fallout.

25. Looking forward, deeper cross-border prudential arrangements would help underpin financial stability in Estonia. Over a number of years, Estonia and other Baltic nations have, together with their Nordic counterparts, developed an effective regional supervision framework supported by cooperation agreements and the establishment of the Nordic-Baltic Stability Group and Macroprudential Forum. Their ongoing work has appropriately focused on establishing a burden-sharing mechanism, a common database for financial groups, and preparing for cross-border simulation exercises. In conjunction with EU-level initiatives, these efforts should move ahead by implementing key elements of the framework, notably defining criteria for burden sharing.

26. The EU banking union can further enhance Estonia's financial stability (Box 5). The banking union can bolster financial soundness throughout the EU, including by introducing uniform prudential oversight standards and burden sharing mechanisms to respond to financial shocks.[5]

Box 5. Europe's Banking Union

In September 2012, the European Commission unveiled an ambitious roadmap toward a banking union proposing a single supervisory mechanism (SSM), harmonized national resolution regimes for credit institutions and standards across national deposit insurance schemes. The SSM should be operational by 2014 and draft Directives for bank resolution and deposit insurance schemes adopted by mid-2013. Under the SSM, certain supervisory tasks would be transferred to the ECB and a supervisory board (comprised of representatives from all participating countries) would be established to act in the interest of the European Union. It is envisioned in particular that the ECB would exercise direct supervision over those institutions that are considered significant and the national authorities would supervise other institutions. In consultation with the ECB, either can adjust macro-prudential policies, including capital requirements when deemed necessary. A mediation panel would be created to help resolve disagreements between the ECB and national authorities. Non-euro countries can opt to enter into close cooperation agreements with the ECB and thereby become participating members of the SSM together with euro countries, with similar representation in the supervisory board. In contrast to euro area members, they can decide not to implement the board's decisions but this would end their participation in the board.

Finally, the EC's proposals have confirmed the EBA's powers to build a common legal framework for bank regulation and a common supervisory culture across the European Union. For purposes of the application of the single rule book, voting arrangements within EBA are to be adapted so that decision-making structures continue to be balanced between the positions of members of the SSM and those of the other EU countries.

[5] See IMF Discussion Note, No. 13/01.

In this regard, the single supervisory mechanism (SSM) will place Estonia's two largest banks under the direct supervision of the ECB. Additional efforts are, however, needed to clarify the role and powers of the Estonian authorities in this context, including in supervisory colleges and with regard to the exchange of confidential information.

27. This will nonetheless entail coordinating Estonia's long-standing arrangements with the Nordic authorities and the EU banking union. The option to join the banking union, changes proposed in the voting rights at the EBA, and other measures to ensure an EU-wide approach to financial stability in the banking union, have helped assuage non-euro area countries' misgivings about the SSM. Still, as the SSM and other elements of the banking union go forward, it is essential not to disrupt existing home-host prudential arrangements and safeguard supervisory coordination. This will entail spelling out a common agreement for bank resolution and burden sharing for financial groups—including for those groups spanning the euro and non-euro area jurisdictions—with a view of minimizing the risk of an abrupt contraction in the exposure in host countries.

28. Financial stability can also be supported by further efforts to improve bankruptcy procedures. With the adoption of the reorganization act for household restructuring in April 2011, continued efforts are needed to limit bankruptcy losses and enhance asset recovery by facilitating out-of-court debt restructuring, reducing the cost and ensuring the timely application for, and prompt resolution of bankruptcy procedures.

29. The authorities emphasized their commitment to maintain a strong financial system in the face of an evolving financial architecture. They agreed that enhancing current macro-prudential policies as advised by staff would strengthen Estonia's financial system. The authorities confirmed that these policies should not pose undue burden on banks or on credit to the economy. But they stressed that under the SSM, their implementation would require coordination with the ECB. In this regard, the authorities explained that once CRD IV was finalized, they would reform the Credit Institution Act to clarify the central bank's macro prudential authority and further tri-partite collaboration. Regarding bankruptcy reforms, they stressed that it was early to assess the new household restructuring law but planned to increase resources available to bankruptcy courts

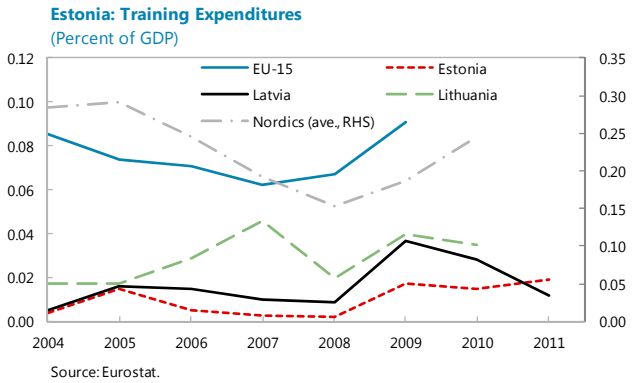
30. In welcoming the EU banking union, the authorities underscored the importance of preserving the Nordic-Baltic working arrangements. In this regard, they highlighted the need to continue clarifying the role of these arrangements within the banking union and avoid disrupting long-standing close collaboration with their Nordic colleagues.

C. Broadening Estonia's Sustainable Growth

31. While safeguarding competitiveness, further improvements in Estonia's business friendly environment are needed to secure the economy's attractiveness for FDI. Estonia's geographical location makes it a natural trading partner for Nordic countries. As a result, strong ties with Nordic economies have developed as part of their manufacturing supply chains, with Estonia's cost-effectiveness continuing to attract FDI from the region. But income convergence with the EU will require Estonia to move up the export-value chain. The challenge will be to increasingly

transform Estonia into a knowledge-based economy. Beyond continued reorientation of resources to tradable sectors, building human capital will prove essential. In this regard, the authorities have focused on building R&D capacity, improving training in technical fields, and enhancing infrastructure (supported by EU funds)

32. In addition, Estonia faces the challenge of fully employing its resources. Estonia's recovery has seen employment rebound but the recovery has also revealed long-standing structural problems in the labor market. While the unemployment rate has continued to decline, it remains among the highest in the region, and with substantial differences across Estonia's regions (Annex IV). Long-term unemployment has also declined but it too remains higher than before the crisis. Also, rising vacancies point to continued skill mismatches in the labor market. In this regard, the authorities' ongoing efforts to refocus vocational training on skills demanded by employers, introduce flexibility in voucher training programs, and improve the recently established IT platform can also support the needed reorientation of the economy. While continuing to assess the effectiveness of these programs and striving for continued efficiency gains, they may need to revisit labor market policies as Estonia's spending ranks among the lowest in region.



33. The authorities underscored their commitment to address labor market tensions and boost long-run growth. While unemployment has declined it remains high, with growing vacancies pointing to a shortage of skilled workers. They noted that while outward migration could have contributed to this shortage, most migrants have not been skilled workers. The authorities concurred with the need to continue focusing on making training plans more flexible and providing additional opportunities to accumulate human capital. Specifically, they pointed to plans to unbundle professional certifications allowing workers to divide the training needed for full certification, while achieving intermediate certifications over time. The unbundling would thus require less time away from work and improve earnings prospects while in training. The authorities also concurred with the need to develop human capital in technical fields, including by enhancing cooperation efforts among the relevant institutions to complement the collaboration of universities and technical schools with the private sector. The importance of these initiatives has been highlighted in Estonia's 2020 Competitiveness Strategy, and they stressed that improving life-long learning at all skill levels will be needed to foster continued productivity growth, maintain external competitiveness and sustain income convergence.

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34. Estonia has succeeded in reducing its macroeconomic imbalances and vulnerabilities, but faces the challenge of preserving its hard-earned fiscal and financial stability and enhancing long-term growth prospects. Supported by its Nordic links and prudent policies, Estonia's recovery has taken hold in 2012. Risks to the outlook are largely on the downside and stem primarily from a prolonged period of slow growth in the euro area. Financial spillovers could emerge in the event of a sharp resurgence of global financial market volatility. Alternatively, faster-than-expected euro area recovery or unexpected export resilience could boost growth and fuel wage and price pressures in the medium term.

35. Estonia's fiscal position is strong, but strenuous efforts will be needed to resist calls on the public purse and avoid untimely fiscal stimulus in 2013. Staff welcomes the budget's increase in social spending and investment and cuts in the unemployment insurance contribution rates, which could support household balance sheets. Moreover, the budget's fiscal stance is appropriate given cyclical conditions. In this regard, there will be a need to withstand spending pressures in the context of incipient real wage pressure and adhere to budgetary allocations and save potential windfall revenues to avert procyclical fiscal policy. If downside risks materialize, automatic stabilizers should be allowed to operate while maintaining fiscal credibility.

36. With the authorities' medium target at hand, Estonia faces the challenge of safeguarding this achievement and addressing medium-term needs. With unwavering efforts to control current spending—including continued public wage bill restraint—and redirect spending to public investment, projected revenues could result in small fiscal surpluses in the medium term. This would keep public debt low and sustainable, and preserve adequate buffers to cope with economic volatility and downside risks. But there will be a need, as budgetary conditions allow, to make room to address Estonia's medium-term economic challenges, including lowering the tax burden.

37. In this regard, adopting a fully fledged medium-term fiscal framework can help assess policy tradeoffs and avoid pro-cyclical policies. Regardless of the specific rules and institutional setup, the fiscal framework should be transparent and simple to support fiscal credibility and accountability. Multi-year expenditure ceilings should be an integral part of the framework to reduce policy uncertainty and enhance fiscal discipline. Also, its implementation would avert pro-cyclical fiscal policies while maintaining fiscal credibility.

38. Financial sector stability can be safeguarded by strengthening macro-prudential policies. Notwithstanding the banks' strength, risks can be further reduced by early implementation of forthcoming international standards. Specifically, and in tandem with parent supervisors, timely adoption of the capital and liquidity provisions of the CRD IV would enhance Estonia's financial sector resilience. This would not unduly constrain banks' margins or credit to the economy since Estonian banks already meet or exceed the likely requirements. The authorities should also consider introducing ceilings on loan-to-value and loan-to-income ratios to reduce exposure to housing market developments and downside risks. Regarding the institutional structure, the central bank's

macro-prudential authority and existing tri-party forums can be further strengthened to advance the monitoring of systemic risks and limit potential fallout.

39. Deeper Nordic-Baltic cross-border prudential arrangements and the EU banking union can further enhance Estonia's financial stability. The long-standing close Nordic-Baltic cross-border supervisory collaboration has underpinned Estonia's financial stability. In this regard, ongoing work to spell out cross-border burden-sharing mechanisms and establish a common data-exchange platform for financial groups should continue in tandem with EU-level initiatives. The EU banking union can further bolster financial soundness in Estonia and progress has been made in establishing the SSM, which will place two of Estonia's largest banks under the direct supervision of the ECB. In this regard, further work is needed to clarify the role and powers of the Estonian authorities. As the banking union goes forward, particular efforts should be made to avoid disruptions in existing Nordic-Baltic supervisory arrangements.

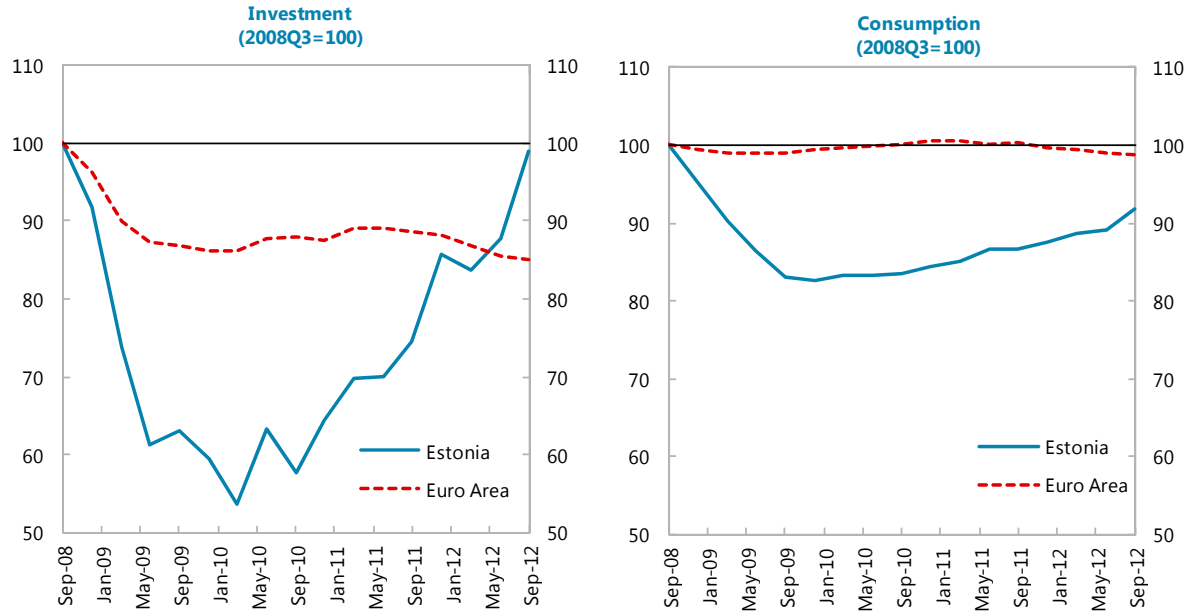
40. Estonia needs to safeguard its external competitiveness, address skill mismatches, and accelerate human capital accumulation. Increasing employment in export-related activities has supported the reallocation of resources to the tradable sector and sharply reduced unemployment. But the latter remains high and further reductions are hindered by skill mismatches and long-term structural unemployment. In addition, while the economy has remained broadly competitive, Estonia faces increasing competition from low-cost producers. As highlighted in "Estonia's 2020 Competitiveness Strategy," knowledge-based activities will hold the key to move up the export value chain. In this regard, the authorities' ongoing efforts to foster coordination among the relevant institutions and reform training and education programs are welcome. Continued attention to these areas would support human capital development, bolster productivity, and increase long-term growth prospects.

41. It is recommended that the next Article IV consultation be held on the standard 12-month cycle.

Figure 1. Estonia: Balance Sheet Stress, 2007–12

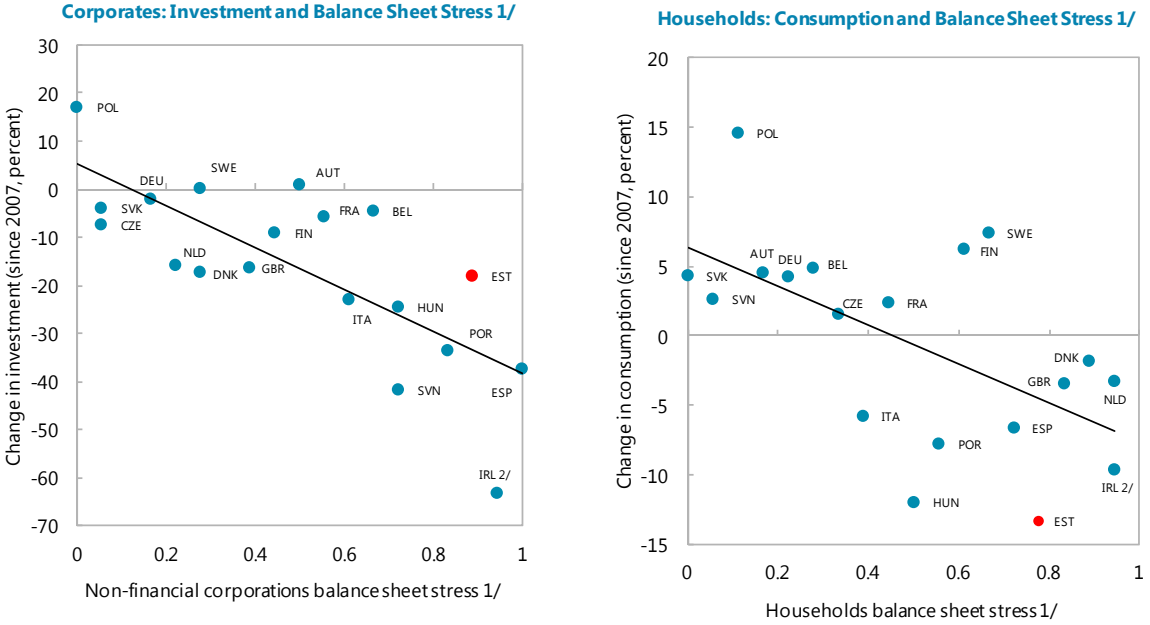
Corporate investment is now at its pre-crisis level ...

... while private consumption s is still lagging.



Corporate balance sheets are being rebuilt, but the debt ratio remains high, ...

... whereas adjustment of households balance sheet is still in progress.



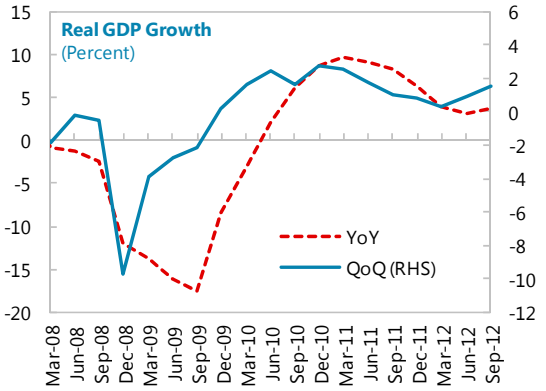
Sources: OECD; and IMF staff estimates.

1/ Balance sheet stress is defined as percentage within the country sample of sum of debt to GDP ratio in 2007 and debt to GDP increase since 2001.

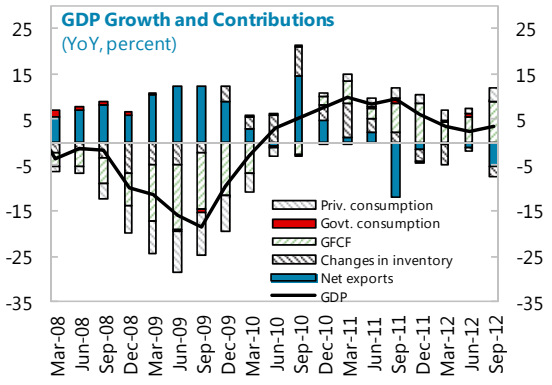
2/ For Ireland, data for investment and consumption are for Q2 2012.

Figure 2. Estonia: Towards Full Economic Recovery, 2008–12

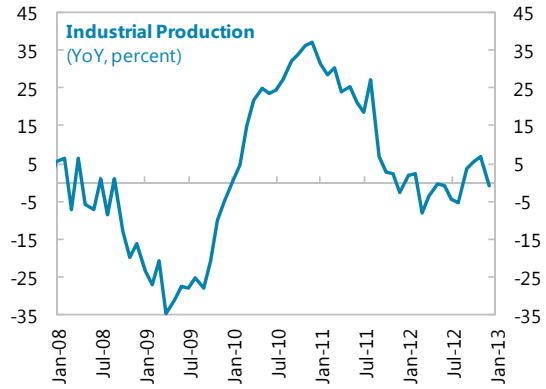
In 2012, economic conditions further strengthened, …



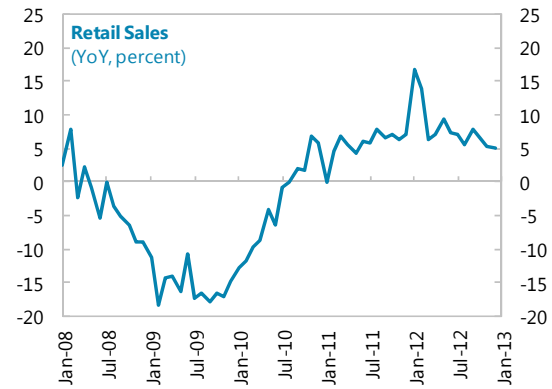
… but economic growth composition remains uneven.



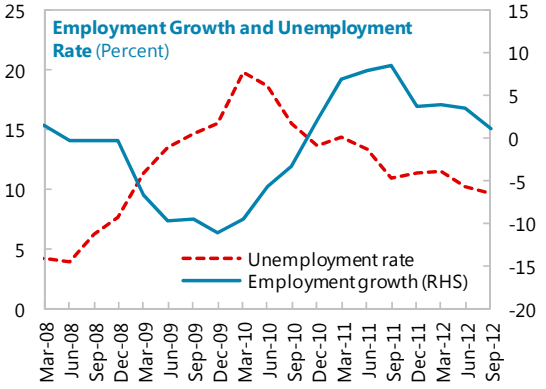
Export-related activity continues to be the locomotive…



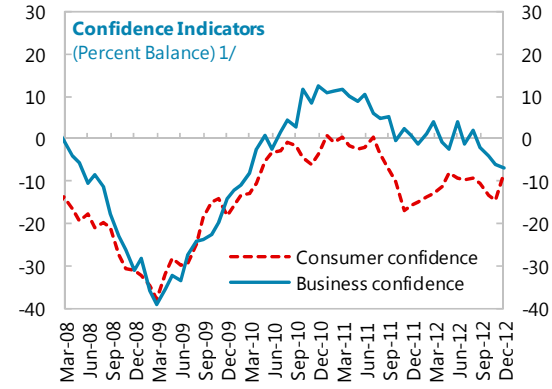
…whereas domestic demand is recovering, albeit slowly.



The labor market is improving…



… and is boosting consumer confidence.



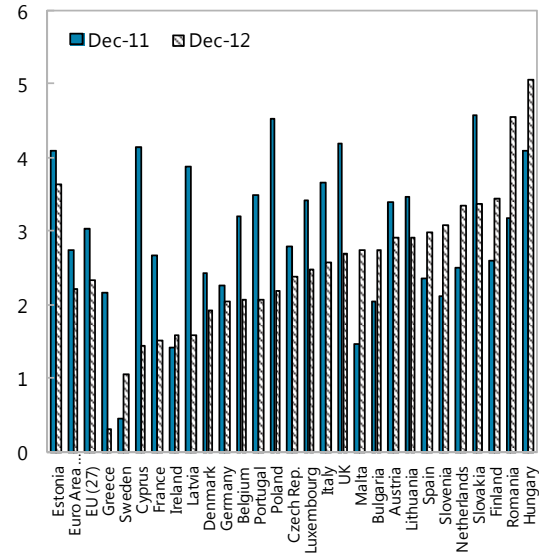
Source: Haver.

1/ Balance equals percent of respondents reporting an increase minus the percent of respondents reporting a decrease.

Figure 3. Estonia: Inflation, 2011–12 1/

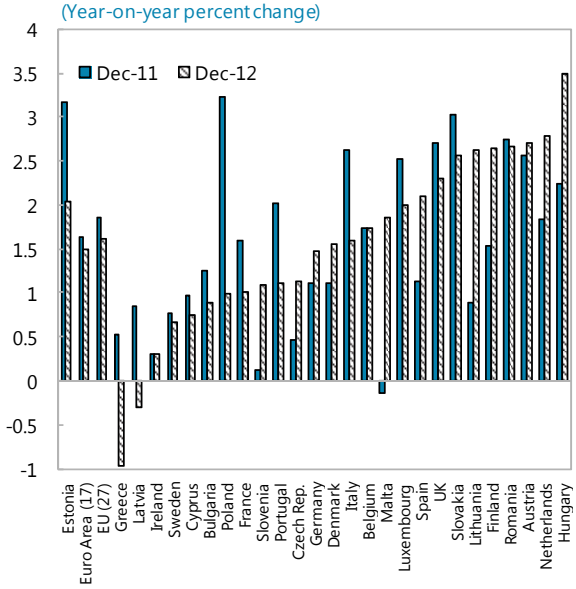
Estonia's inflation has declined in line with global fuel and food prices developments...

HICP Inflation
(Year-on-year percent change)



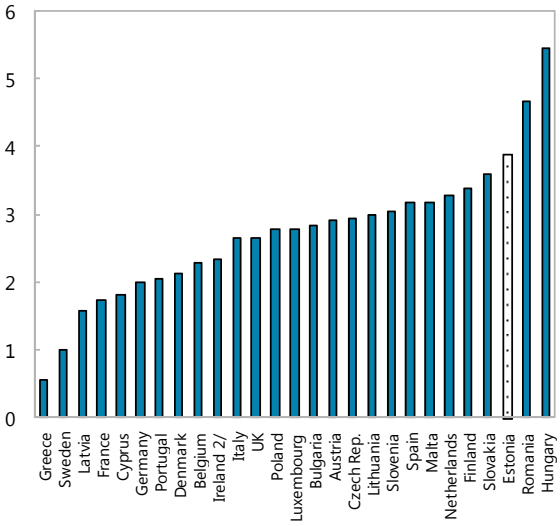
... also, reflecting the drop in core inflation, despite wage increases.

Core Inflation
(Year-on-year percent change)



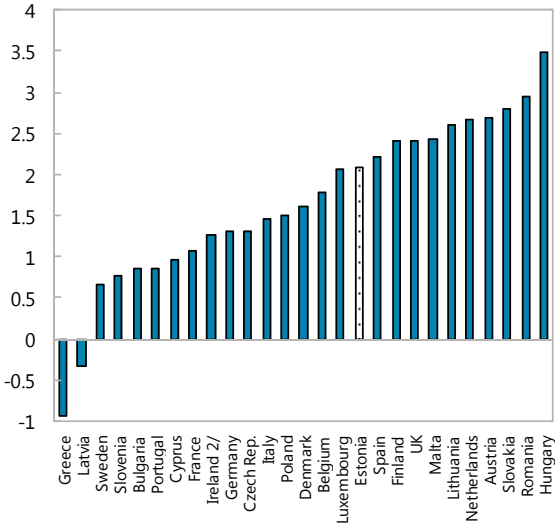
While Estonia's inflation remains among the highest in the EU ...

HICP Inflation, Q4 2012
(Year-on-year percent changes)



... its core inflation is lower than that of several other Baltic, Nordic and Euro Area countries.

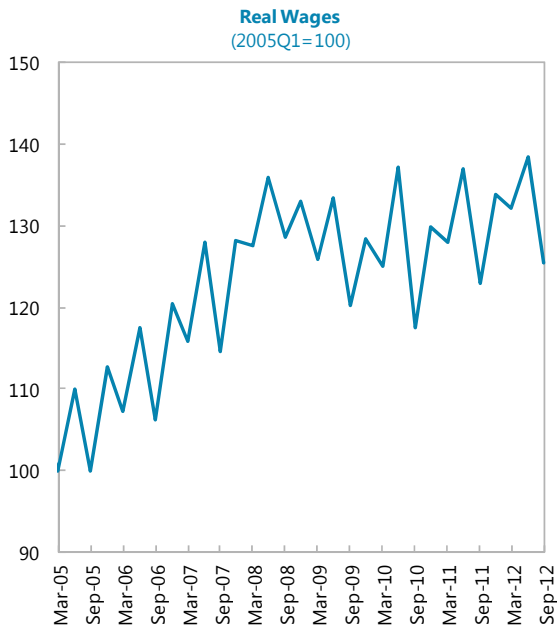
Core Inflation, Q4 2012
(Year-on-year percent changes)



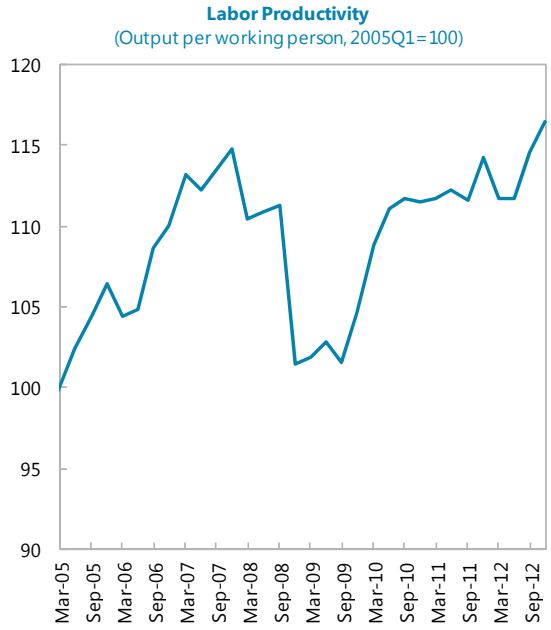
Source: Eurostat; and IMF staff estimates.
1/ Core is defined as HICP excluding energy, food, alcohol and tobacco.
2/ Data for Ireland are for Q3 2012.

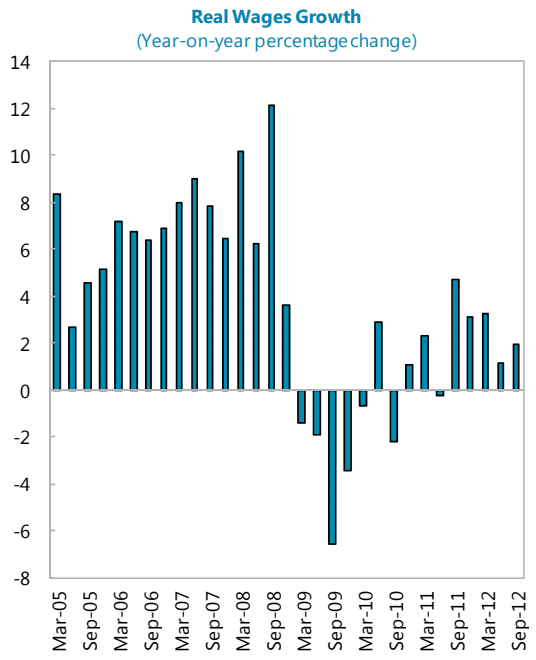
Figure 4. Estonia: Labor Market Competitiveness, 2005–12

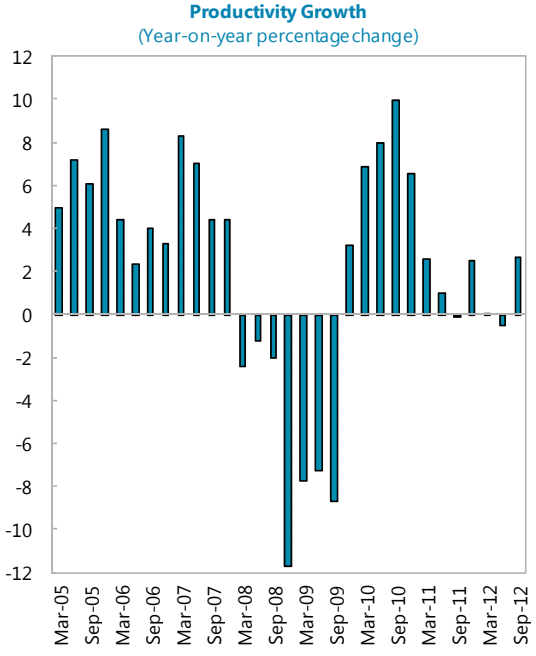
In the last two years, real wages increased only modestly …



… compared with a strong recovery of productivity.





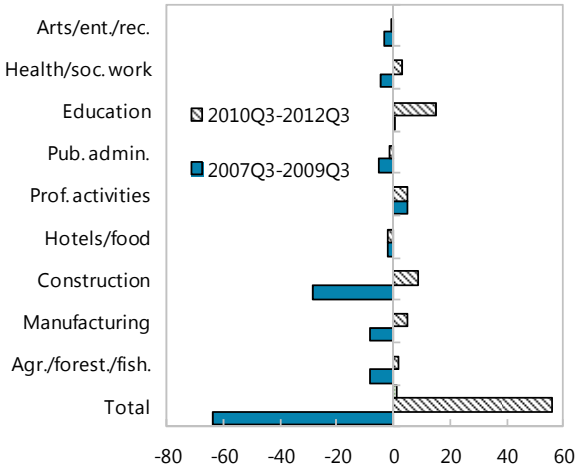


Sources:Haver; and IMF staff estimates.

Figure 5. Estonia: Tackling the Crisis

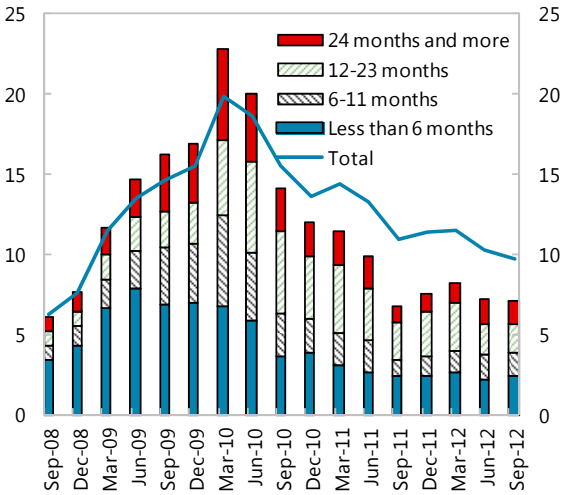
New job creations are increasing, mainly in the tradable sector...

Jobs, Lost or Gained
(Thousands of jobs)



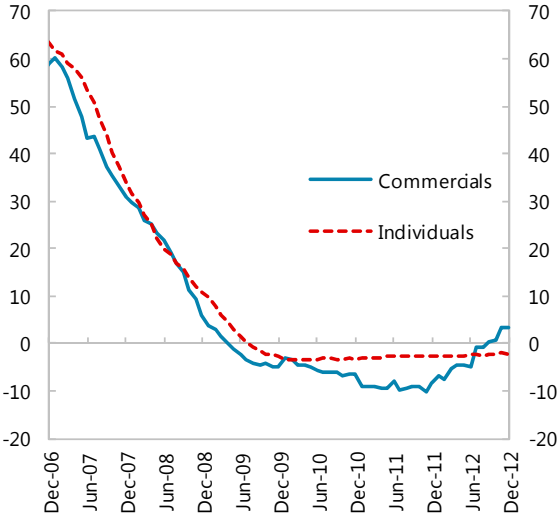
... and resulted in a decline in the number of unemployed, but long term unemployment remains high.

Unemployment Rates by Duration
(YoY, percent)



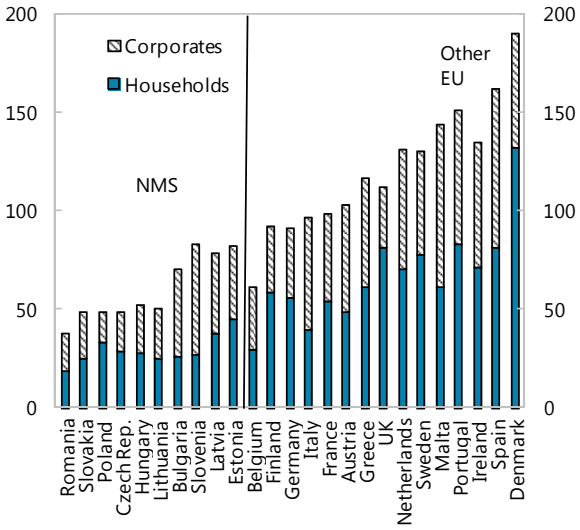
Deleveraging has run its course , and commercial credit is re-starting ,...

Credit Growth
(YoY, percent)



... but debt remains elevated.

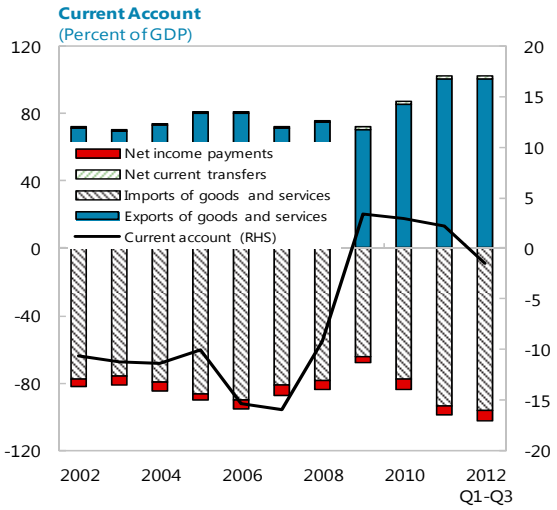
Nonfinancial Private Sector Loans, 2011
(Percent of GDP)



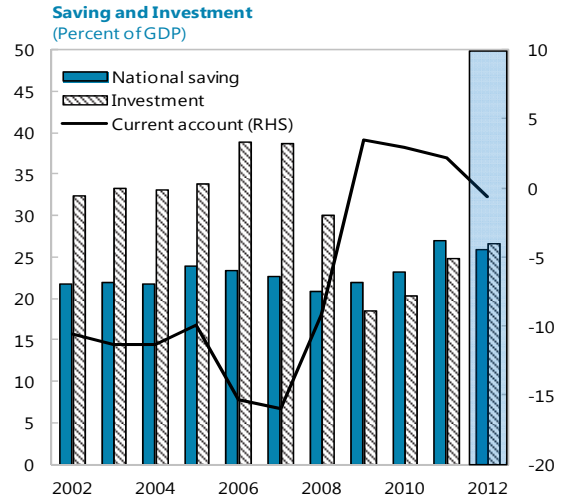
Sources: Eurostat; Statistics Estonia; and Bank of Estonia.

Figure 6. Estonia: External Developments, 2002–12

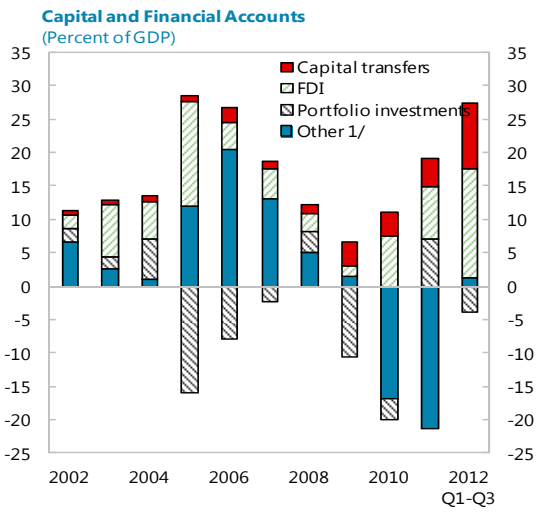
In 2012, the current account balance turned into a deficit, as imports largely outpaced exports...



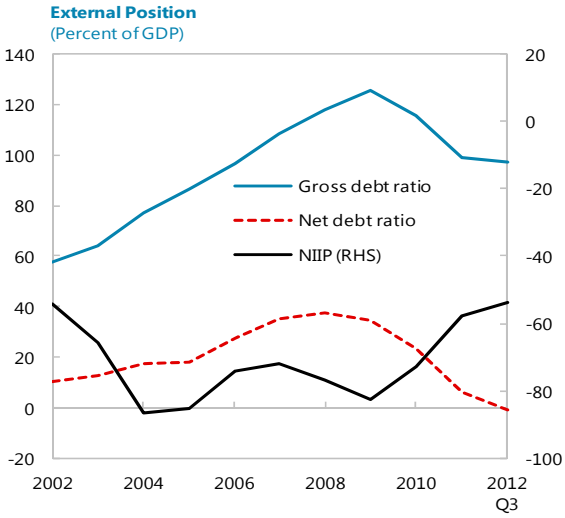
.... reflecting improved economic conditions, including a strong investment rebound.



Capital outflows continue....



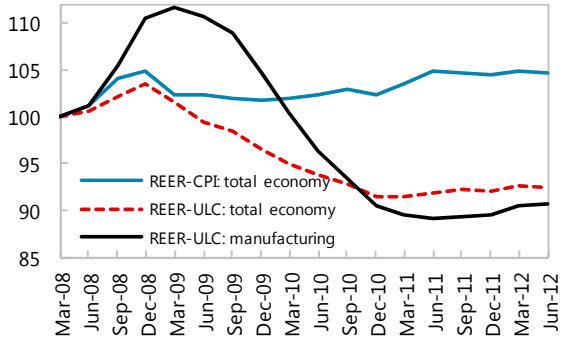
... contributing to the reduction of the external debt burden.



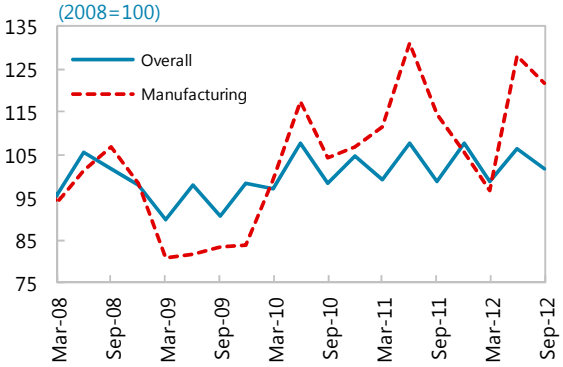
Sources: Haver; Statistics Estonia; and IMF staff calculations.
1/ Other is defined as the sum of financial derivatives, other investments, and errors and omissions.

Figure 7. Estonia: External Competitiveness, 2008–12

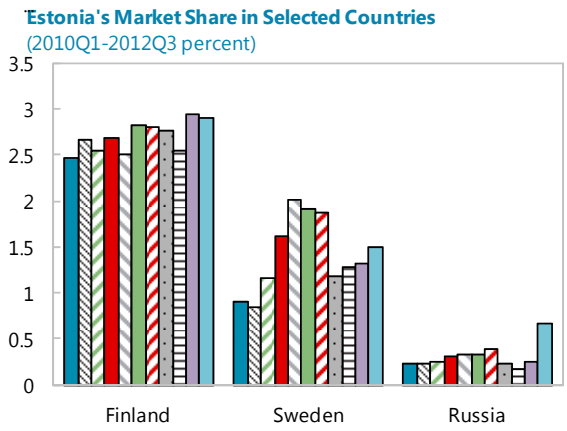
Overall and sectoral competitiveness has stabilized despite wage increases ...



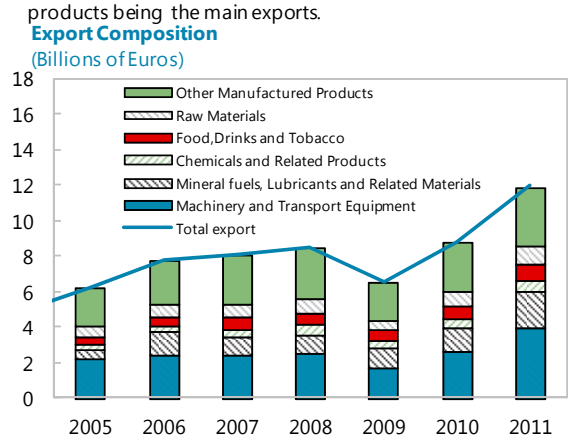
... reflecting productivity gains, mostly in the manufacturing sector.



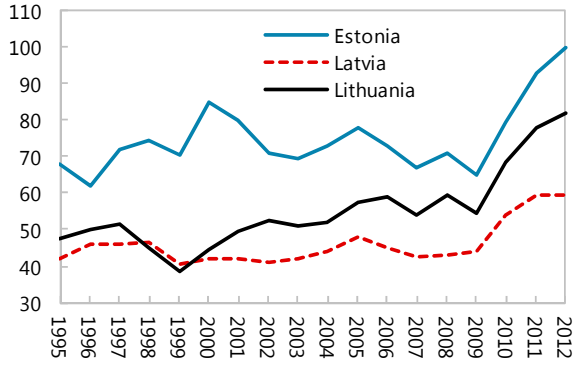
Estonia has increased its market shares in key export markets



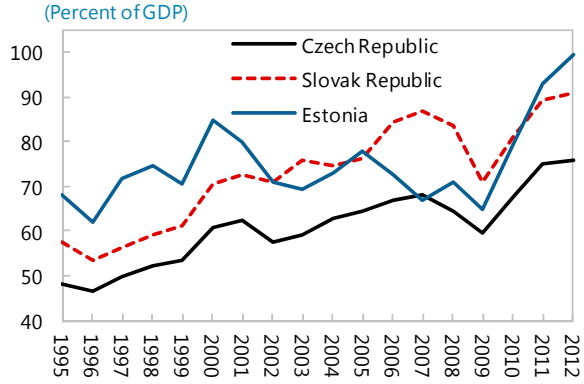
...with machinery and transport equipment, and mineral products being the main exports.



Estonia's export performance was the strongest in the Baltics...



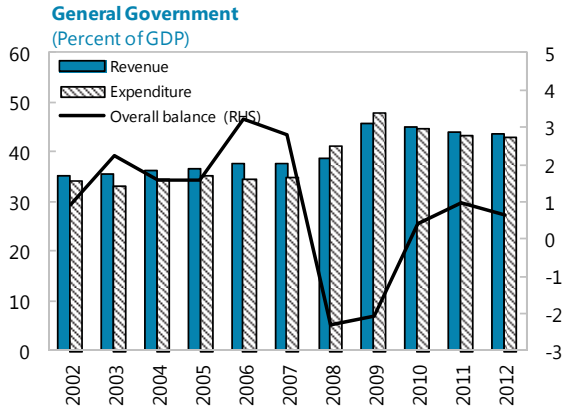
... and in line with selected CEE countries.



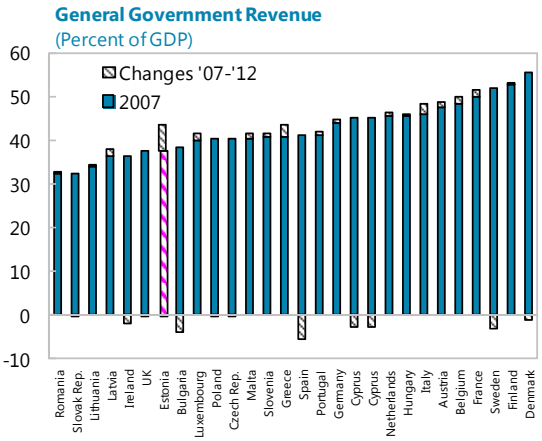
Sources: DOTS; Haver; WEO; and EU Commission.

Figure 8. Estonia: Fiscal Developments and Structure

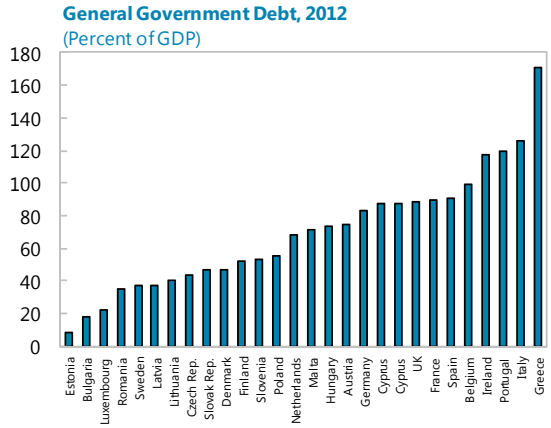
2012 is the third consecutive year to register a small surplus…



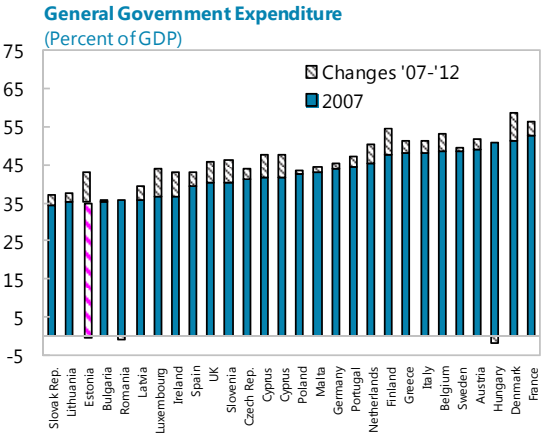
… owing to strong revenue collection performance…



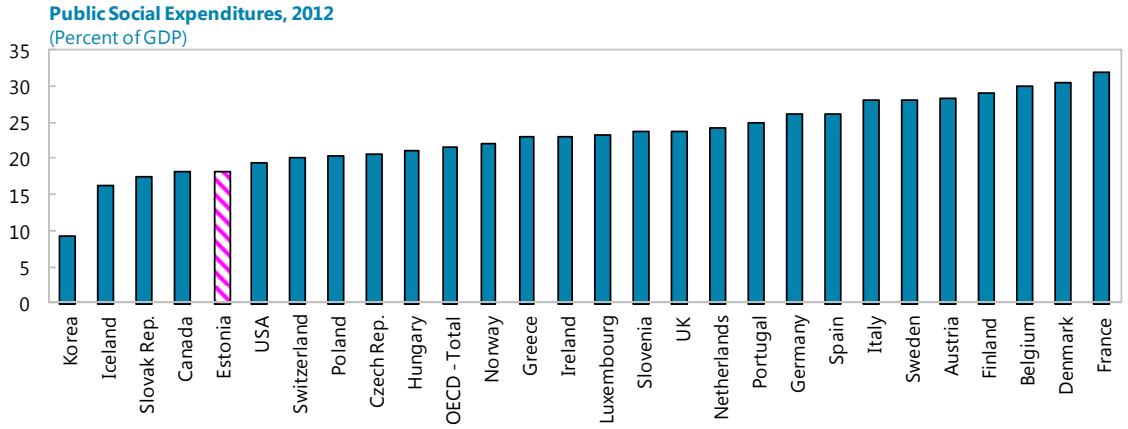
…which maintains the debt at the lowest level in the EU.



Total expenditure is nearing the EU average….



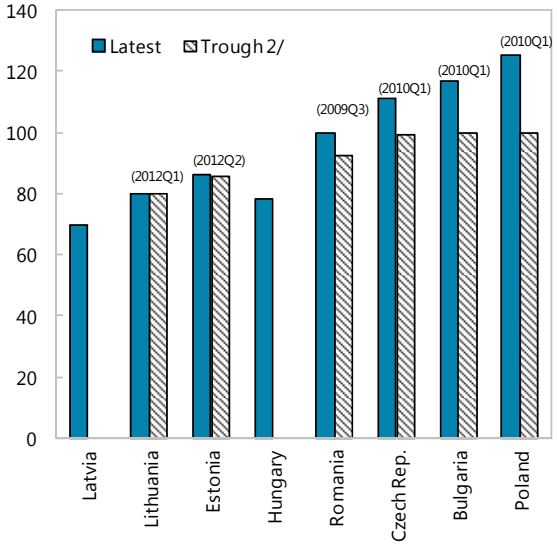
… but social spending is lagging behind among comparators.



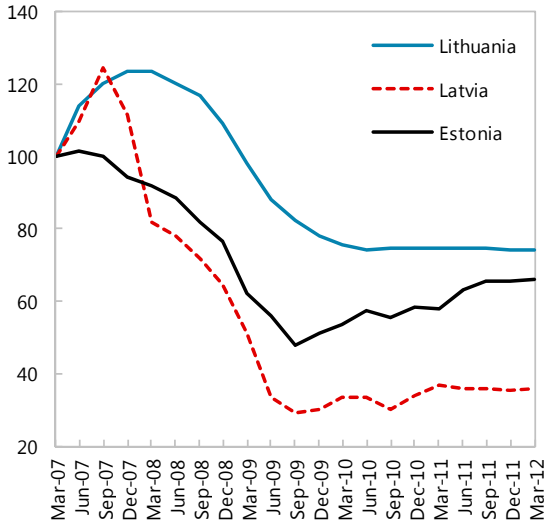
Sources: WEO; and OECD.

Figure 9. Estonia: Financial Sector Developments

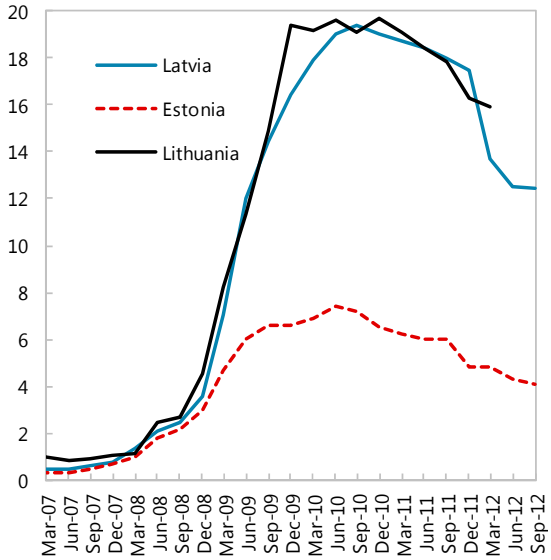
Private Credit in CEE Countries and Baltics 1/
(Percent of peak)



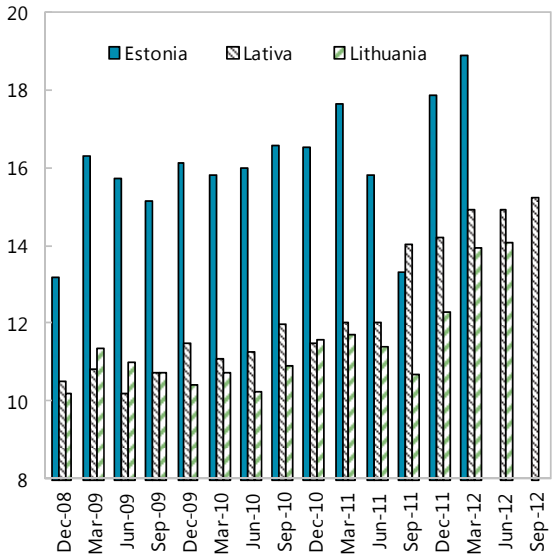
Housing Price Index
(2007Q1=100)



Non-performing Loans 3/
(Percent of outstanding loans)

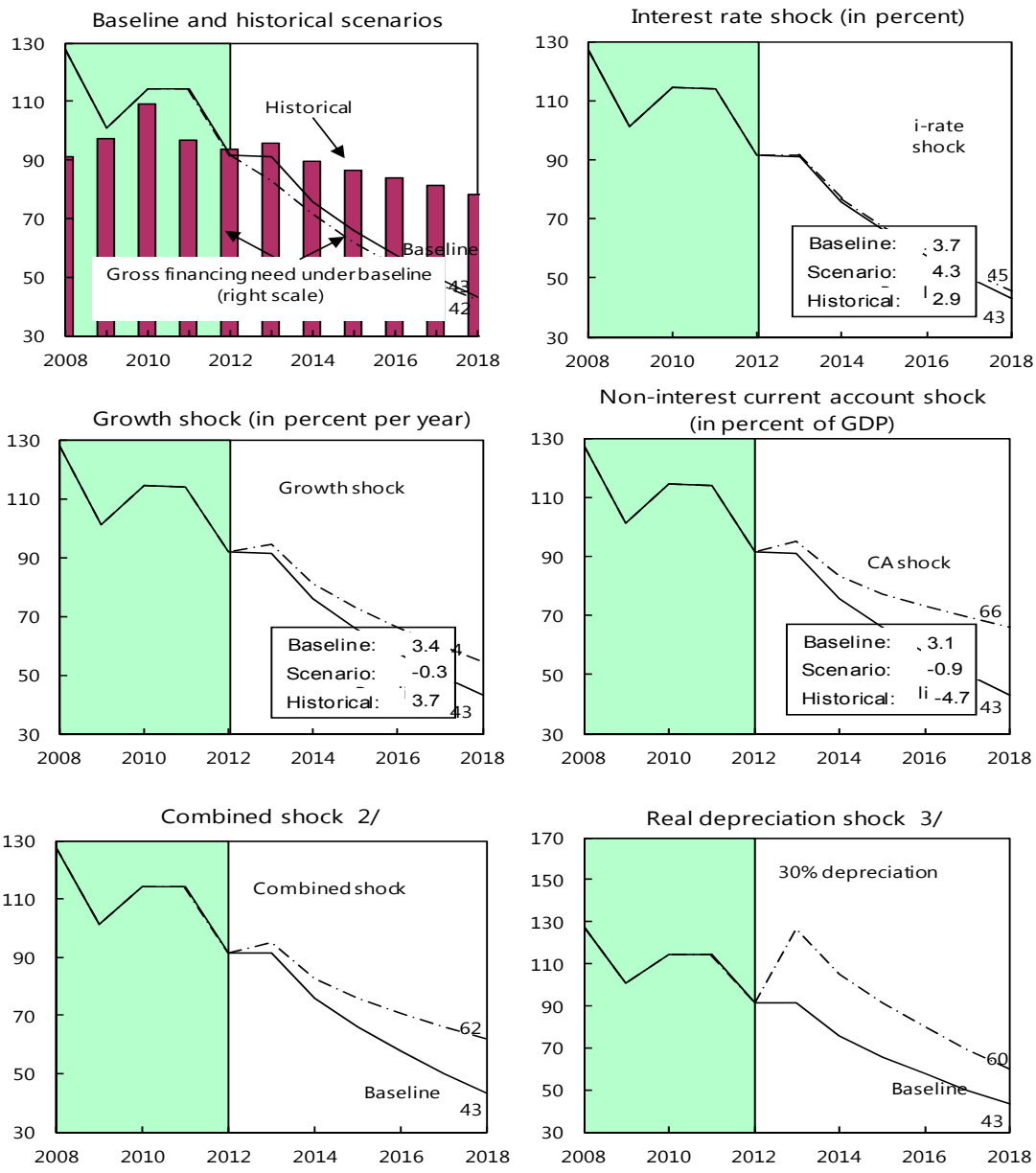


Regulatory Tier 1 Capital to Risk-weighted Assets
(Percent)



Sources: Haver; Global Property Guide; country authorities; and IMF staff calculations.
1/ For countries with only one bar, the latest is the trough. Latest data are as of 2012Q4.
2/ Timing of troughs in paretheses.
3/ In Lithuania, NPLs include impaired loans and loans past due by 60 days but not impaired; in Latvia, NPLs are loans overdue by more than 90 days; in Estonia, they are loans overdue by more than 60 days.

Figure 10. Estonia: External Debt Sustainability: Bound Tests 1/



Sources: International Monetary Fund; Country desk data; and IMF staff estimates.

1/ Shaded areas represent actual data. Individual shocks are permanent one-half standard deviation shocks. Figures in the boxes represent average projections for the respective variables in the baseline and scenario being presented. Four-year historical average for the variable is also shown.

2/ Permanent 1/4 standard deviation shocks applied to real interest rate, growth rate, and current account balance.

3/ One-time real depreciation of 30 percent occurs in 2013.

Table 1. Estonia: Selected Macroeconomic and Social Indicators, 2008–14

(Units as indicated)

	2008	2009	2010	2011	2012	2013	2014
					Prelim.	Proj.	
National income, prices and wages							
GDP (billions of Euro)	16.2	13.8	14.3	16.0	17.0	18.2	19.3
Real GDP growth (year-on-year in percent)	-4.2	-14.1	3.3	8.3	3.2	3.0	3.2
Average HICP (year-on-year change in percent)	10.6	0.2	2.7	5.1	4.2	3.2	2.8
GDP deflator (year-on-year change in percent)	5.4	-1.4	0.7	2.9	3.2	3.8	2.9
Average monthly wage (year-on-year growth in percent)	13.8	-4.6	0.9	5.4	6.0	4.5	4.5
Unemployment rate (ILO definition, percent)	5.5	13.8	17.3	11.7	9.8	7.8	6.2
Average nominal ULC (year-on-year growth in percent)	19.0	0.7	-6.4	4.8	4.4	2.9	2.6
Saving-investment balances (percent of GDP)							
National saving	20.8	21.9	23.2	26.9	26.4	27.6	27.3
Private	21.1	24.0	23.4	26.4	26.6	25.4	24.0
Public	-0.3	-2.2	-0.2	0.5	-0.2	2.1	3.2
Domestic investment	30.0	18.5	20.3	24.8	27.6	27.5	27.2
Private	26.6	15.0	17.3	21.8	24.2	22.5	22.2
Public	3.4	3.4	2.9	3.0	3.4	5.1	5.1
Foreign saving	9.2	-3.4	-2.9	-2.1	1.2	0.0	-0.1
General government (ESA95 basis; percent of GDP)							
Revenue	36.7	43.5	40.8	39.4	40.2	39.9	38.8
Expenditure	39.7	45.5	40.7	38.3	40.5	39.6	38.5
Net lending (+)/borrowing (–)	-3.0	-2.0	0.2	1.2	-0.3	0.3	0.3
External sector (percent of GDP)							
Trade balance	0.0	-4.3	-1.9	-1.4	-4.3	-3.2	-2.6
Service balance	8.1	10.1	9.4	7.8	7.2	7.2	7.4
Income balance	-5.4	-3.7	-6.2	-5.8	-5.6	-5.3	-5.5
Current account	3.5	3.4	2.9	2.1	-1.2	0.0	0.1
Gross international reserves (millions of Euro)	2,776	2,766	1,935	1,947	...	...	...
In months of imports	3.2	4.7	2.6	1.9	...	...	...
In percent of gross short-term debt (including trade credits)	39.9	41.6	32.6	36.7	...	...	...
In percent of base money	114.8	121.8	82.9	...	...	...	...
Gross external debt/GDP (percent) 1/	117.6	125.7	115.2	97.7	93.0	82.5	71.9
Net external debt/GDP (percent) 2/	37.8	35.4	23.8	6.6	4.9	-2.3	-8.0
General government external debt/GDP (percent)							
Excluding government assets held abroad	3.3	5.4	5.3	3.4	7.4	8.6	8.1
Including government assets held abroad 3/	-4.8	-3.0	-1.9	-3.0	0.7	3.0	2.9
Exchange rate (EEK/US$; euro/US$ - period averages) 4/	10.7	11.3	11.8	0.72	0.78	...	...
Money and credit (year-on-year growth in percent)							
Domestic credit to nongovernment 5/	7.2	-5.3	-1.0	-3.6	0.0	...	...
Base money	28.5	-6.1	2.8	...	...	...	...
Broad money 6/	5.5	0.8	2.8	12.6	7.1	...	...

Social Indicators (reference year):

Population (2012): 1.34 million; Per capita GDP (2012): €12,753; Life expectancy at birth (2012): 81.1 (female) and 71.2 (male);

Poverty rate (share of the population below the established risk-of-poverty line, 2009): 23.4 percent; Main exports: machinery and appliances.

Sources: Estonian authorities; Eurostat; and IMF staff estimates and projections.

1/ Includes trade credits.

2/ Net of portfolio assets (including money market instruments), financial derivative assets, other investment assets, and reserve assets held by Estonian residents.

3/ Includes the Stabilization Reserve Fund (SRF).

4/ The Estonian kroon was pegged at 15.6466 kroons to the euro. Estonia adopted the euro on January 1, 2011.

5/ Domestic credit to nongovernment euro area resident sectors beginninhg in 2011.

6/ Beginning in 2011 data are for contributions to euro area M2 aggregate.

Table 2. Estonia: General Government Accounts, 2008–12

(ESA95 basis; percent of GDP)

	2008	2009	2010	2011	2012
Statement of Operations					
Revenue	36.7	43.5	40.8	39.4	40.2
Taxes	19.8	22.3	20.7	20.4	21.2
Direct taxes	7.9	7.6	6.8	6.6	7.0
Indirect taxes	12.0	14.8	13.9	13.8	14.3
Capital taxes	0.0	0.0	0.0	0.0	0.0
Social contributions	11.8	13.4	13.3	12.3	11.9
Current transfers	0.9	1.2	1.4	1.6	1.2
Capital transfers	0.4	1.7	1.4	1.4	1.9
Other revenue	3.7	4.9	4.1	3.7	3.9
Expenditure	39.7	45.5	40.7	38.3	40.5
Expense	33.5	41.5	38.7	36.1	36.0
Compensation of employees	11.3	12.9	11.9	11.1	10.8
Use of goods and services	7.0	7.7	7.5	7.2	7.4
Interest	0.2	0.2	0.1	0.1	0.2
Subsidies	1.0	1.0	1.1	1.1	1.0
Capital transfers	1.3	0.8	1.0	0.8	0.9
Social benefits	12.1	16.1	14.9	13.4	13.1
Other expense	0.6	2.9	2.2	2.4	2.6
Net acquisition of nonfinancial assets	6.1	4.0	2.0	2.2	4.5
of which: acquisitions of nonfinancial assets	5.4	5.3	3.9	4.3	5.6
Gross Operating Balance	3.2	2.0	2.1	3.4	4.2
Net Operating Balance	1.5	-0.1	0.0	1.3	2.1
Net lending (+)/borrowing (–)	-3.0	-2.0	0.2	1.2	-0.3
Government financing					
Statistical descrepancy	0.0	0.0	-0.1	0.1	-0.4
Net acquisition of financial assets	-1.4	0.7	0.6	-0.3	4.1
Net incurrance of liabilities	1.5	2.6	0.3	-1.4	4.1
Financial Balance Sheet					
Financial assets	34.0	41.5	47.8	46.3	47.9
Currency and deposits	3.6	6.8	5.6	5.3	5.8
Securities other than shares	6.7	6.9	6.5	4.6	4.3
Loans	1.0	1.6	1.5	1.7	3.7
Shares and other equity	18.2	20.2	28.2	27.9	27.4
Other financial assets	4.6	6.0	6.1	6.8	6.7
Financial liabilities	8.5	12.8	12.5	11.2	15.3
Currency and deposits	0.0	0.0	0.0	0.0	0.0
Securities other than shares	1.1	1.8	1.7	1.6	1.5
Loans	3.5	5.5	5.0	4.9	9.0
Shares and other equity	0.0	0.0	0.0	0.0	0.0
Other financial assets	3.9	5.5	5.8	4.7	4.8
Net financial worth	25.5	28.7	35.3	35.1	32.6
Memorandum items:					
GDP (millions of Euro)	16,235	13,762	14,323	15,951	16,998
General government debt (Maastricht definition)	4.5	7.2	6.7	6.1	10.0
Net lending/borrowing (cash basis)	-2.3	-2.1	0.4	1.7	-0.2

Sources: Eurostat; Statistics Estonia; and IMF staff calculations.

Table 3. Estonia: Summary of General Government Operations, 2008–13

(Cash basis; percent of GDP)

	2008	2009	2010	2011	2012	2013
					Prelim.	Proj.
Revenue and grants	38.9	45.9	45.1	44.2	44.9	44.6
Revenue	35.9	40.6	39.2	36.1	36.9	36.7
Tax revenue	31.8	34.9	34.0	32.4	33.2	33.0
Direct taxes	19.7	20.8	20.9	19.0	19.5	19.3
Personal income tax	6.2	5.7	5.4	5.3	5.5	5.6
Corporate profits tax	1.6	1.9	1.4	1.3	1.5	1.3
Social security tax	6.4	7.2	7.0	6.3	6.4	6.3
Medical insurance tax	4.9	5.2	4.8	4.5	4.5	4.5
Unemployment insurance tax	0.3	0.8	1.3	1.2	1.2	1.2
Land and property taxes	0.3	0.3	0.4	0.3	0.4	0.4
Indirect taxes	12.1	13.7	13.8	13.4	13.7	13.8
VAT	8.1	8.7	8.7	8.4	8.8	8.8
Excises	3.6	4.6	4.7	4.5	4.6	4.6
Other taxes (incl. on intern. trade)	0.5	0.3	0.4	0.5	0.4	0.4
Nontax revenue	4.1	5.7	5.2	3.8	3.8	3.7
Grants	3.0	5.3	5.9	8.1	8.0	7.9
Expenditure	41.2	47.9	44.7	42.5	45.1	44.2
Current expenditure	37.8	44.5	41.7	39.5	41.7	39.2
Expenditure on goods and services	24.6	28.4	25.4	24.7	27.4	24.9
Wages and salaries	7.5	8.3	7.7	7.0	6.7	6.7
Other goods and services	17.0	20.0	17.8	17.8	20.7	18.3
Current transfers and subsidies	13.1	15.9	16.1	14.7	14.1	14.1
Subsidies	0.3	0.3	0.3	0.3	0.2	0.2
Transfers to households	11.6	14.4	14.6	13.2	12.8	12.8
of which: Pensions	7.0	8.6	8.8	8.0	7.9	8.0
Family benefits	1.5	1.8	2.0	1.8	1.5	1.5
Sickness benefits	1.0	1.0	0.6	0.5	0.5	0.5
Unemployment benefits	0.3	1.1	1.0	0.3	0.3	0.3
Income maintenance	0.0	0.1	0.1	0.1	0.0	0.1
Disability benefits	0.3	0.4	0.4	0.4	0.3	0.4
Prescription drug benefits	0.5	0.6	0.6	0.6	0.6	0.6
Other	1.0	1.0	1.1	1.4	1.7	1.4
Transfers to the EU budget	1.2	1.2	1.1	1.2	1.1	1.1
Interest payments	0.1	0.2	0.2	0.1	0.1	0.2
Capital expenditure	3.4	3.4	2.9	3.0	3.4	5.1
Overall surplus (+) / deficit (-)	-2.3	-2.1	0.4	1.7	-0.2	0.4
Memorandum items:						
Primary fiscal balance (+, surplus)	-2.2	-1.8	0.6	1.8	-0.1	0.6
Overall balance, ESA95 basis	-3.0	-2.0	0.2	1.6	-0.1	0.4
Total general government debt						
Excluding government assets held abroad	4.5	7.2	6.7	6.1	10.0	11.0
Including government assets held abroad	-4.7	-2.3	-1.4	-0.3	4.0	5.4
Nominal GDP (billions of Euro)	16.2	13.8	14.3	16.0	17.0	18.2

Sources: Estonian authorities; and IMF staff estimates and projections.

Table 4. Estonia: Summary of Balance of Payments, 2008–13

	2008	2009	2010	2011	2012 Prelim.	2013 Proj.
	(Millions of Euro)					
Current Account	563	471	419	339	-204	7
Primary Current Account 1/	-602	977	1,313	1,272	745	971
Trade Balance	8	-591	-267	-221	-735	-582
Exports	8,490	6,460	8,769	12,056	12,565	13,588
Of which: goods for processing	825	836	1,103	1,644	1,342	1,451
Imports	-10,531	-7,051	-9,036	-12,277	-13,300	-14,170
Of which: goods for processing	-915	-801	-929	-1,308	-1,141	-1,215
Services Balance	1,315	1,391	1,340	1,239	1,221	1,306
Receipts	3,601	3,201	3,441	3,900	4,242	4,586
of which: travel and tourism	808	780	809	897	950	1,027
Payments	-2,285	-1,810	-2,102	-2,660	-3,021	-3,280
Income	-884	-506	-894	-933	-950	-964
Current Transfers	123	177	240	254	259	247
Capital and Financial Account	1,943	-513	-1,177	-281	361	408
Capital Transfers	212	486	505	669	582	604
Financial Account	1,730	-998	-1,682	-951	-220	-196
Direct Investment	421	211	1,100	1,234	455	768
From abroad	1,182	1,324	1,207	185	1,144	1,119
Outward (by Estonians)	-760	-1,114	-107	1,049	-689	-351
Net equity investment	49	-143	-274	22	-276	-32
Loans and other investments 2/	1,259	-1,066	-2,508	-2,207	-399	-932
of which:						
Banks	1,023	-911	-1,747	-2,308	-74	-128
Government	317	334	-26	-111	333	440
Monetary Authorities	-111	7	7	345	-1,117	-1,117
Errors and Omissions	47	-22	-74	-45	-87	0
Overall balance	2,552	-64	-831	13	70	416
Memorandum Items:	(Percent of GDP, unless otherwise specified)					
Current Account	3.5	3.4	2.9	2.1	-1.2	0.0
Trade balance	0.0	-4.3	-1.9	-1.4	-4.3	-3.2
Non-factor services balance	8.1	10.1	9.4	7.8	7.2	7.2
Income balance	-5.4	-3.7	-6.2	-5.8	-5.6	-5.3
Compensation of employees, net	0.9	0.9	0.9	1.2	1.2	0.9
Reinvested earnings, net	-4.5	-2.2	-5.7	-4.8	-5.8	-3.7
Other income, net	-1.8	-2.3	-1.5	-2.3	-1.0	-2.5
Current transfers	0.8	1.3	1.7	1.6	1.5	1.4
Capital and financial Account	12.0	-3.7	-8.2	-1.8	2.1	2.2
Export growth (in percent)	4.4	-23.9	35.7	37.5	4.2	8.1
Import growth (in percent)	-2.2	-33.0	28.1	35.9	8.3	6.5
Net FDI	2.6	1.5	7.7	7.7	2.7	4.2
Gross International Reserves (Euro millions) 3/ 4/	2,776	2,766	1,935	...	...	...
In months of imports	3.2	4.7	2.6	...	...	...
Relative to gross short-term debt (ratio) 5/ 6/	0.4	0.4	0.3	...	...	...
Total external debt 7/						
Gross	117.6	125.7	115.2	97.7	93.0	82.5
Net 8/	37.8	35.4	23.8	6.6	4.9	-2.3
NIIP	-76.8	-82.5	-72.8	-57.8	-53.8	-47.0
General government external debt 9/						
Excluding Govt. assets held abroad	3.3	5.4	5.3	3.4	7.4	8.6
Including Govt. assets held abroad	-4.8	-3.0	-1.9	-3.0	0.7	3.0
Debt Service/Exports of GNFS (percent)	66.9	105.7	78.1	50.4	54.7	50.4

Sources: Bank of Estonia; and IMF staff estimates and projections.

1/ Excluding interest payments and reinvested earnings.
2/ Includes operations in debt securities.
3/ Excludes Government deposits held abroad (including in the SRF).
4/ Changes in gross international reserves may differ from flows implied by overall balance of payments due to valuation changes.
5/ Includes trade credits.
6/ Short term debt is defined on the basis of original maturity.
7/ Starting in 2000, the definition of external debt was widened to include money market instruments and financial derivatives.
8/ Net of portfolio assets (including money market instruments), financial derivative assets, other investment assets, and reserve assets held by Estonian residents.
9/ Includes government guaranteed debt.

Table 5. Estonia: Macroeconomic Framework, 2008–18

(Percent of GDP; unless otherwise indicated)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
					Prelim.	Projections					
GDP real growth (percent)	-4.2	-14.1	3.3	8.3	3.2	3.0	3.2	3.4	3.5	3.6	3.7
Contribution to real GDP growth (percent)											
Consumption 1/	-2.0	-8.5	-1.5	2.1	3.0	2.7	2.2	2.2	2.2	2.3	2.3
Investment 2/	-8.1	-15.0	2.3	5.6	3.2	1.1	1.0	1.0	1.3	1.3	1.6
Exports (goods and nonfactor services)	0.7	-14.7	14.9	18.7	5.1	5.0	4.7	4.6	4.7	4.7	4.8
Imports (goods and nonfactor services)	5.3	24.0	-12.4	-18.2	-8.1	-5.7	-4.8	-4.5	-4.6	-4.7	-4.9
National saving	20.8	21.9	23.2	26.9	26.4	27.6	27.3	27.4	27.9	28.5	29.2
Private	21.1	24.0	23.4	26.4	26.6	25.4	24.0	24.0	24.3	24.7	25.2
Public	-0.3	-2.2	-0.2	0.5	-0.2	2.1	3.2	3.4	3.6	3.8	4.0
Investment	30.0	18.5	20.3	24.8	27.6	27.5	27.2	27.1	27.2	27.4	27.9
Private	26.6	15.0	17.3	21.8	24.2	22.5	22.2	21.9	21.9	22.1	22.4
Public	3.4	3.4	2.9	3.0	3.4	5.1	5.1	5.2	5.3	5.4	5.5
Foreign saving	9.2	-3.4	-2.9	-2.1	1.2	0.0	-0.1	-0.3	-0.6	-1.1	-1.4
Memorandum items:											
Fiscal balance 3/	-2.3	-2.1	0.4	1.7	-0.2	0.4	0.4	0.2	0.2	0.2	0.2
Revenues and grants	38.9	45.9	45.1	44.2	44.9	44.6	43.5	43.3	43.1	42.5	41.9
Expenditure and net lending	41.2	47.9	44.7	42.5	45.1	44.2	43.2	43.1	42.9	42.3	41.6
Cyclically-adjusted balance	-4.3	1.2	3.0	2.2	0.0	0.6	0.6	0.4	0.4	0.3	0.2
Total general government debt	4.5	7.2	6.7	6.1	10.0	11.0	10.4	9.9	9.3	8.8	8.3
Net non-debt creating capital inflows ("+" inflow)	4.2	4.0	9.3	12.1	4.5	7.4	6.3	6.2	6.2	6.2	6.1
Capital transfers 4/	1.3	3.5	3.5	4.2	3.4	3.3	2.2	2.0	1.9	1.8	1.7
Net equity investment	0.3	-1.0	-1.9	0.1	-1.6	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1
Net foreign direct investment	2.6	1.5	7.7	7.7	2.7	4.2	4.3	4.4	4.4	4.5	4.5
HICP inflation (average, in percent)	10.6	0.2	2.7	5.1	4.2	3.2	2.8	2.5	2.2	2.0	2.0
CPI inflation (average, in percent)	10.4	-0.1	2.9	5.1	4.2	3.2	2.8	2.5	2.2	2.0	2.0
Employment growth (average, year-on-year in percent)	0.2	-9.3	-4.2	7.6	1.6	1.4	1.2	1.0	0.9	0.8	0.7
Unemployment rate (percent)	5.5	13.8	17.3	11.7	9.8	7.8	6.2	5.6	5.0	5.0	5.0
Average wage growth (percent)	13.8	-4.6	0.9	5.4	6.0	4.5	4.5	4.5	4.5	4.5	4.5
Labor compensation share of GDP	50.8	51.9	48.1	46.7	47.2	46.9	46.7	46.8	46.6	46.4	46.1
Output gap (in percent of potential output)	6.3	-9.4	-7.6	-1.6	-0.7	-0.7	-0.6	-0.5	-0.4	-0.2	0.0

Sources: Estonian authorities; and IMF staff estimates and projections.

1/ Includes government, private and nonpublic institutions serving households.
2/ Includes private and public capital formation, changes in inventories, and statistical discrepancy.
3/ Cash basis. Public savings minus public investment differs from the fiscal balance by the amount of capital transfers received from abroad.
4/ Mainly EU capital grants, all of which are channelled through the budget.

Table 6. Estonia: Indicators of External Vulnerability, 2008–12

(Percent of GDP; unless otherwise indicated)

	2008	2009	2010	2011	2012
Financial indicators					
Public sector external debt 1/	3.3	5.4	5.3	3.4	7.4
Private sector credit (year-on-year, percent) 2/	8.4	-5.1	-5.0	-2.7	0.0
External Indicators					
Exports (year-on-year, percent)	4.4	-23.9	35.7	37.5	4.2
Imports (year-on-year, percent)	-2.2	-33.0	28.1	35.9	8.3
Current account balance	3.5	3.4	2.9	2.1	-1.2
Capital and financial account balance	12.0	-3.7	-8.2	-1.8	2.1
Total external debt 3/	118	126	115	98	93
of which: Public sector debt 1/	3.3	5.4	5.3	3.4	7.4
Net external debt 4/	37.8	35.4	23.8	6.6	4.9
Debt service to exports of GNFS	66.9	105.7	78.1	50.4	54.7
External interest payments to exports of GNFS (percent)	6.4	4.7	2.6	1.8	1.4
External Amortization payments to exports of GNFS (percent)	60.5	101.0	75.5	48.7	53.3
Exchange rate (per US$, period average) 5/	10.6	11.2	11.8	0.72	0.78
REER (percent change, period average; appreciation (+))	6.8	1.1	-1.9	1.3	-0.5
Financial Market Indicators					
Stock market index 6/	274	405	698	531	734
Foreign currency debt rating 7/	A	A-	A	AA-	AA-
Money market spread 8/	4.10	2.35	0.11	n.a.	n.a.

Sources: Estonian authorities; Bloomberg; Standard & Poor's; and IMF staff estimates.

1/ Total general government and government-guaranteed debt excluding government assets held abroad.
2/ Credit to households and nonfinancial institutions.
3/ External debt includes money market instruments and financial derivatives.
4/ Net of portfolio assets (including money market instruments), financial derivative assets, other investment assets, and reserve assets held by residents.
5/ For 2008-10, EEKs per US$; starting in 2011, Euros per US$.
6/ Tallinn stock exchange index (OMX Tallinn), end of period.
7/ Standard & Poor's long-term foreign exchange sovereign rating.
8/ One-month spread between Tallinn interbank borrowing rate (TALIBOR) and the corresponding EURIBOR rate.

Table 7. Estonia: External Debt Sustainability Framework, 2008–18

(Percent of GDP; unless otherwise indicated)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Debt-stabilizing non-interest current account 7/
						Projections						
Baseline: External debt	127.5	100.9	114.2	114.1	85.9	92.1	88.8	86.2	84.4	82.7	81.2	1.7
Change in external debt 1/	-14.7	-26.7	13.3	-0.1	-28.2	6.1	-3.2	-2.7	-1.8	-1.7	-1.5	
Identified external debt-creating flows (4+8+9)	-30.3	-21.1	-12.8	-15.9	-2.8	-4.7	-5.2	-5.9	-6.4	-6.6	-6.8	
Current account deficit, excluding interest payments	4.7	-5.4	-5.1	-4.6	0.0	0.3	-0.3	-1.1	-1.5	-1.7	-1.7	
Deficit in balance of goods and services	4.8	-4.7	-7.4	-7.5	-2.4	-1.2	-2.2	-2.9	-3.3	-3.6	-3.7	
Exports	80.8	56.3	84.5	116.8	96.9	106.2	106.9	107.5	109.0	110.5	112.2	
Imports	85.6	51.7	77.1	109.4	94.5	105.1	104.7	104.6	105.7	106.9	108.4	
Net non-debt creating capital inflows (negative)	-6.6	-8.4	-5.7	-3.9	-1.9	-4.9	-5.2	-5.2	-5.3	-5.4	-5.6	
Automatic debt dynamics 2/	-28.4	-7.3	-2.0	-7.5	-1.0	-0.1	0.2	0.4	0.4	0.5	0.5	
Contribution from nominal interest rate	5.2	2.6	2.2	2.1	2.1	2.5	2.9	3.2	3.3	3.4	3.4	
Contribution from real GDP growth	4.5	16.5	-4.2	-9.5	-3.1	-2.6	-2.7	-2.8	-2.9	-2.9	-2.9	
Contribution from price and exchange rate changes 3/	-38.2	-26.5	...	...	...	...	...	...	...	...	...	
Residual, incl. change in gross foreign assets (2-3) 4/	15.7	-5.6	26.1	15.8	-25.4	10.8	2.0	3.3	4.6	5.0	5.3	
External debt-to-exports ratio (percent)	157.9	179.1	135.1	97.7	88.7	86.7	83.1	80.2	77.4	74.8	72.4	
Gross external financing need (billions of US dollars) 5/	20.1	23.2	21.0	18.4	21.0	21.4	22.3	23.1	23.9	24.8	25.7	
(percent of GDP)	91.3	97.1	109.3	96.8	94.5	97.4	95.6	93.3	91.6	90.1	88.6	
Scenario with key variables at their historical averages 6/			114.2	114.1	85.9	81.4	75.4	70.1	65.4	0.0	0.0	-12.1
Key Macroeconomic Assumptions Underlying Baseline											For debt stabilization	
Nominal GDP (US dollars)	22.0	23.9	19.2	19.0	22.2	21.9	23.4	24.8	26.1	27.6	29.0	
Real GDP growth (in percent)	-4.2	-14.1	3.3	8.3	3.2	3.0	3.1	3.4	3.5	3.6	3.7	
GDP deflator in US dollars (change in percent)	36.7	26.2	-22.4	-8.4	13.2	-4.1	3.3	2.5	1.9	1.8	1.6	
Nominal external interest rate (in percent)	4.8	2.2	1.7	1.8	2.2	2.9	3.4	3.8	4.1	4.2	4.4	
Growth of exports (US dollar terms, in percent)	13.7	-24.4	20.4	37.0	-3.2	8.4	7.2	6.5	7.0	6.9	6.9	
Growth of imports (US dollar terms, in percent)	5.7	-34.6	19.7	40.6	0.9	9.9	6.1	5.8	6.6	6.7	6.9	
Current account balance, excluding interest payments	-4.7	5.4	5.1	4.6	0.0	-0.3	0.3	1.1	1.5	1.7	1.7	
Net non-debt creating capital inflows	6.6	8.4	5.7	3.9	1.9	4.9	5.2	5.2	5.3	5.4	5.6	

Source: Estonian authorities; and IMF staff estimates and projections.

1/ Large reductions in 2010-11 reflect in part the impact of reserve requirement harmonization associated with euro adoption.

2/ Derived as [r - g - r(1+g) + ea(1+r)]/(1+g+r+gr) times previous period debt stock, with r = nominal effective interest rate on external debt; r = change in domestic GDP deflator in US dollar terms, g = real GDP growth rate, e = nominal appreciation (increase in dollar value of domestic currency), and a = share of domestic-currency denominated debt in total external debt.

3/ The contribution from price and exchange rate changes is defined as [-r(1+g) + ea(1+r)]/(1+g+r+gr) times previous period debt stock. r increases with an appreciating domestic currency (e > 0) and rising inflation (based on GDP deflator).

4/ For projection, line includes the impact of price and exchange rate changes.

5/ Defined as current account deficit, plus amortization on medium- and long-term debt, plus short-term debt at end of previous period.

6/ The key variables include real GDP growth; nominal interest rate; dollar deflator growth; and both non-interest current account and non-debt inflows in percent of GDP.

7/ Long-run, constant balance that stabilizes the debt ratio assuming that key variables (real GDP growth, nominal interest rate, dollar deflator growth, and non-debt inflows in percent of GDP) remain at their levels of the last projection year.

Annex I. Estonia: Inflation[1]

1. Estonia's inflation has been higher that in the euro area for a number of years. During the boom years, inflation developments reflected growing macroeconomic imbalances and contributed to competitive losses.[2] More recently, the economy has been adjusting and, while remaining high compared to the euro area, inflation has eased and productivity gains have supported competitiveness.

Inflation in a Monetary Union

2. In principle, a number of factors may underlie inflation in a monetary union. A simple framework—taken from the open macroeconomics literature[3]—can help to understand Estonia's inflation developments. Consider the following expression decomposing a country's inflation differential with monetary union into tradable and non-tradable goods inflation:

$$\pi_t - \pi_t^* = (\pi_t^T - \pi_t^{T*}) + \gamma_t(\pi_t^N - \pi_t^T) - \gamma_t^*(\pi_t^{N*} - \pi_t^{T*}) \qquad (1)$$

where π_t, π_t^T, π_t^N stand for headline inflation, tradable and non-tradable goods inflation respectively, and γ_t represents the share of non-tradable goods in the consumption basket; an asterisk denotes the euro area counterparts and inflation is measured as year-on-year log differences.[4] The inflation differential thus reflects deviations from the law of one price in tradable goods (the first term on the right) and/or differences in the relative inflation in non-tradable and tradable goods. The other two terms can capture the Balassa-Samuelson (B-S) effect: as Estonia tradable goods sector's productivity catches-up with the euro area, its higher relative productivity (versus non-tradable goods) sector pushes up economy-wide real wages, resulting in higher non-tradable inflation and higher overall inflation.[5]

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[1] Prepared by Giang Ho.

[2] IMF Country Reports consistently discussed the impact of the boom years on inflation and competitiveness, including IMF Country Report No.10/4.

[3] Chinn, Menzie, 2008, "Real Exchange Rates", New Palgrave Dictionary.

[4] This expression does not fully capture inflation associated with price level convergence. To the extent that price and income are related, price convergence can arise in economies whose incomes are below the average of the monetary union. Nor is the model equipped to identify non-tradable goods inflation associated with an economy running ahead of the monetary union's business cycle.

[5] In this framework, the response of inflation in tradable goods in Estonia to tradable goods inflation in the euro area ($\frac{\delta\pi_t^T}{\delta\pi_t^{T*}}$) provides a simple way to think about competition in domestic markets. Strong competition (including contestable markets) should limit this response to at most one. Weak competition would allow tradable goods inflation to exceed that in the euro area (once trade price levels have converged). This avenue however is not explored here due to data limitations. Anecdotal data point to specific instances of outlying prices increases but limited product market regulations (compared to EU countries) in the OECD's 2008 assessment would suggest that markets have been free to operate.

3. An economy's preference for services (non-tradable) can also impact its inflation differential. Typically, as a country becomes richer a larger share of its consumption will fall on (non-tradable) services, that is, γ will tend to increase. Formally, this would correspond to non-homothetic preferences giving rise to an expansion curve that bends toward non-tradable goods. Thus, as technology advances the real exchange rate appreciates due to consumer preferences. The effect on the inflation differential can be approximated by taking the partial derivative of equation 1 with respect to γ_t:

$$\frac{\partial(\pi_t - \pi_t^*)}{\partial \gamma_t} = (\pi_t^N - \pi_t^T) + (1 - \gamma_t)\frac{\delta \pi_t^T}{\delta \gamma_t} + \gamma_t \frac{\delta \pi_t^N}{\delta \gamma_t} \qquad (1')$$

Equation 1' captures the effect of an increase in non-tradable goods in the consumption basket on the inflation differential.[6] Note that the inflation differential increases to the extent that non-tradable good inflation exceeds that of tradable goods, as well as when inflation in tradable goods and non-tradable goods (weighted by their consumption shares) rise.

4. Likewise, inflation can reflect asymmetric responses to tradable goods shocks across a monetary union. These responses can proxy for shocks in commodity prices and in terms of equation 1 can be expressed by taking the partial derivative with respect to π_t^{T*}:

$$\frac{\partial(\pi_t - \pi_t^*)}{\partial \pi_t^{T*}} = \left((1 - \gamma_t)\frac{\delta \pi_t^T}{\delta \pi_t^{T*}} - (1 - \gamma_t^*)\right) + \gamma_t \frac{\delta \pi_t^N}{\delta \pi_t^{T*}} - \gamma_t^* \frac{\delta \pi_t^{N*}}{\delta \pi_t^{T*}} \qquad (1'')$$

where the impact on inflation differential will depend on the response of Estonia's tradable and non-tradable goods inflations as well as on the share of non-tradable goods in the consumption basket. Note that the impact on the inflation differential can be zero if the law of one price holds ($\frac{\delta \pi_t^T}{\delta \pi_t^{T*}} = 1$), and the impact on inflation in non-tradable goods as well as the consumption baskets are the same in Estonia and the euro area.

Suggestive Empirical Evidence for Estonia

Balassa-Samuelson

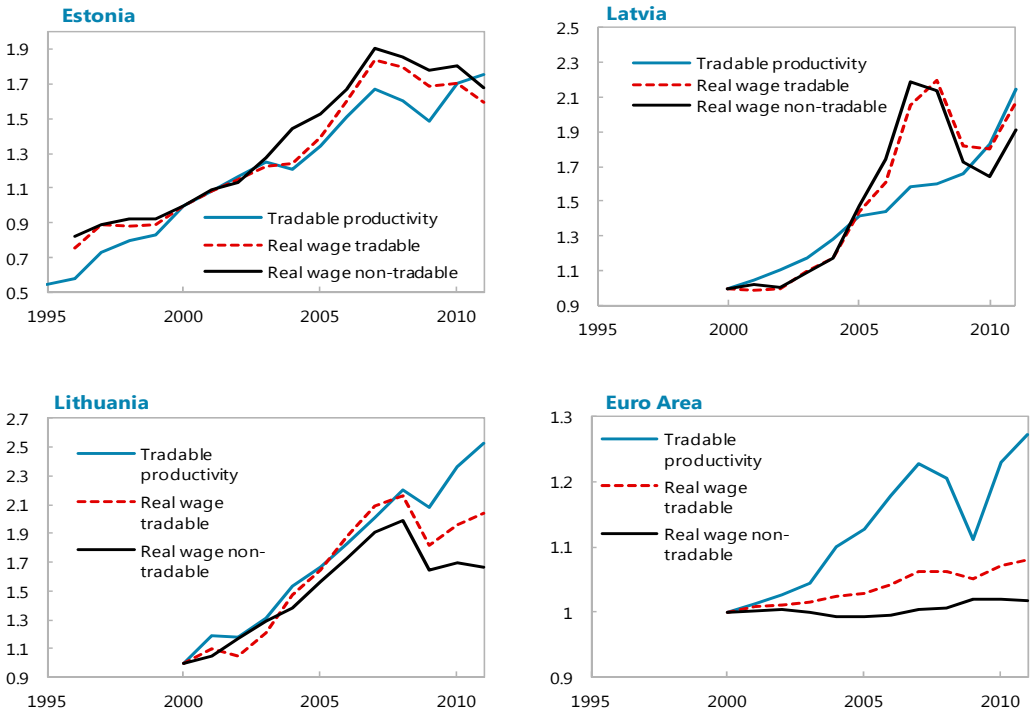
5. Stylized facts suggest that B-S could explain inflation in the Baltic countries (Figure 1).[7] Between 2000 and 2011, productivity increases in the tradable sector have been of the range of 170 to 250 percent in the Baltic countries, compared to about 25 percent in the euro area. Also, real wages in both tradable and non-tradable goods sectors have in general experienced commeasurable increases in the Baltic countries. In Estonia and Latvia, wages experienced rapid

[6] In rigor, equation 1' is an approximation. This is because it takes the standard model (derived with homothetic preferences) and then assumes that prices are a function of preferences. The proper way to proceed would have been to start with a model that assumes non-homothetic preferences and derive the price equations in that context. These models however typically have non-tractable solutions.

[7] Productivity is calculated by dividing real sector output by total employment in the tradable goods sector. The real wage is gross wage bill deflated by HICP index, and divided by total employment. The tradable sector includes agriculture, forestry, fishing, and industry (manufacturing and mining), while the non-tradable sector includes construction and all services. All data are taken from Eurostat.

growth during the boom (2005–07), particularly in the non-tradable goods sector (e.g. construction). But since then, wages growth has declined to levels supported by productivity growth. On the other hand, wage growth in non-tradable goods sector in Lithuania and the euro area has been relatively restrained, especially after crisis.

Figure 1. Tradable Productivity and Real Wages (2000=1) 1/



Sources: OECD; Eurostat; and IMF staff calculations.
1/ Tradable sector includes agriculture and industry. Non-tradable sector includes construction and services. Productivity is calculated by dividing real sector output by sector employment.

6. But the difference in productivity underlying the Balassa-Samuelson effect suggests otherwise. The relative differential in non-tradable and tradable productivity between Estonia and the euro area is small and unlikely to fuel the (overall) inflation differential. Starting from a standard two-sector small open economy model with Cobb-Douglas production functions and perfect labor mobility across sectors[8] (see Rabanal, 2009, and Mihaljek and Klau, 2008), non-tradable goods inflation relative to tradable goods inflation can be expressed in terms of relative productivity:

$$\pi_t^N - \pi_t^T = \frac{\theta^{NT}}{\theta^T}(\Delta a_t^T - \Delta a_t^{NT}) \qquad (2)$$

[8] Rabanal, Pau, 2009, "Inflation Differentials Between Spain and the EMU: A DSGE Perspective," Journal of Money, Credit and Banking, Vol. 41, No. 6, and Mihaljek, Dubravko and Marc Klau, 2008, "Catching-up and Inflation in Transition Economies: The Balassa-Samuelson Effect Revisited," BIS Working Paper No. 270.

where θ denotes the labor share in production, and a denotes the log of labor productivity. Substituting (2) into (1) yields the relationship between the (overall) inflation differential and relative productivity differential:

$$\pi_t - \pi_t^* = \pi_t^T - \pi_t^{T*} + \gamma_t \frac{\theta^{NT}}{\theta^T}(\Delta a_t^T - \Delta a_t^{NT}) - \gamma_t^* \frac{\theta^{NT*}}{\theta^{T*}}(\Delta a_t^{T*} - \Delta a_t^{NT*}) \quad (3)$$

Assuming that there are no significant differences in consumption basket ($\gamma \approx \gamma^*$) and the labor intensity across sectors ($\theta^{NT} \approx \theta^T, \theta^{NT*} \approx \theta^{T*}$), the difference in (overall) inflation would be a function of the difference in the relative growth rates of tradable and non-tradable productivity ($(\Delta a_t^T - \Delta a_t^{NT}) - (\Delta a_t^{T*} - \Delta a_t^{NT*})$). In this regard, Estonia's relative productivity growth has been similar to that of the euro area (averaging about 2 percentage points in 2001–11), but this difference has increased after the crisis.

Average productivity growth 2001-2011
(percent)

	Tradable	Non-tradable	Difference	Difference 2001-07	Difference 2008-11
Euro Area	2.3	0.4	1.9	2.5	0.9
Estonia	5.5	3.6	1.9	2.0	1.8
Latvia	7.3	4.7	2.6	1.8	3.9
Lithuania	9.0	2.9	6.1	6.3	5.8

Sources: Haver; and IMF staff calculations.

7. Also, tradable versus non-tradable inflation differentials point away from the Balassa-Samuelson effect in Estonia, particularly after the crisis (Figure 2). The difference between services and goods price inflation in Estonia has recently been negative, albeit becoming less so.[9] This would thus put downward pressure on (overall) inflation differential. (There is some contribution from the euro area's sectoral inflation differential but it is likely to be small.) Weighting by the share of non-tradable goods consumption shows a similar picture. Thus, while non-tradable inflation may have contributed to the inflation differential during the boom, it is less likely to have as large an effect more recently.

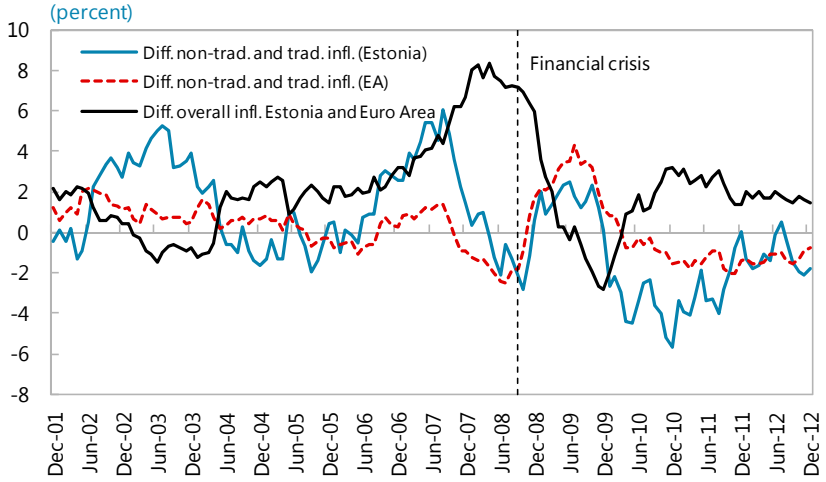
Average Inflation Rates in Tradable (T) and Non-tradable sectors (NT)

	2002-2007			2008-2012		
	T	NT	NT - T	T	NT	NT - T
Euro Area	1.9	2.5	0.6	2.2	1.9	-0.3
Estonia	3.4	5.1	1.7	5.0	3.6	-1.3
Latvia	5.7	5.9	0.1	5.3	3.6	-1.7
Lithuania	1.9	3.0	1.2	5.0	4.1	-0.9

Sources: Haver; and IMF staff calculations.

[9] Goods price inflation has been used as proxy for inflation in the tradable sector, and services prices as a proxy for non-tradable sector.

Figure 2. Inflation Differentials between Estonia and Euro Area 1/
(percent)

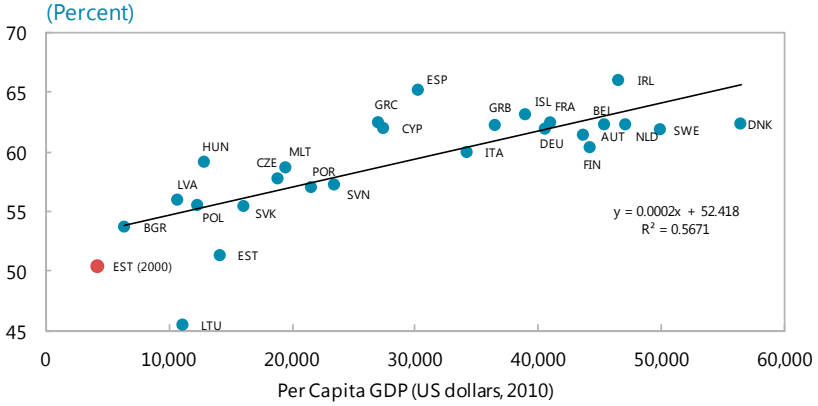


Sources: Haver; and IMF staff calculations.
1/ Tradable inflation is proxied by goods inflation, and non-tradable inflation by services inflation.

Non-tradable goods bias in consumption

8. Even though Estonia's income has more than doubled in the past decade, the share of non-tradable (services) goods in consumption has barely increased (Figure 3). Consistent with the lack of price pressures in the non-tradable goods sector, there is scant evidence supporting that non-homothetic preferences underlie Estonia's inflation differential with the euro area.[10] Moreover, the share of services in total consumption is lower than what would be predicted from its relative income level in 2010.

Figure 3. Non-tradable Share in Household Consumption
(Percent)

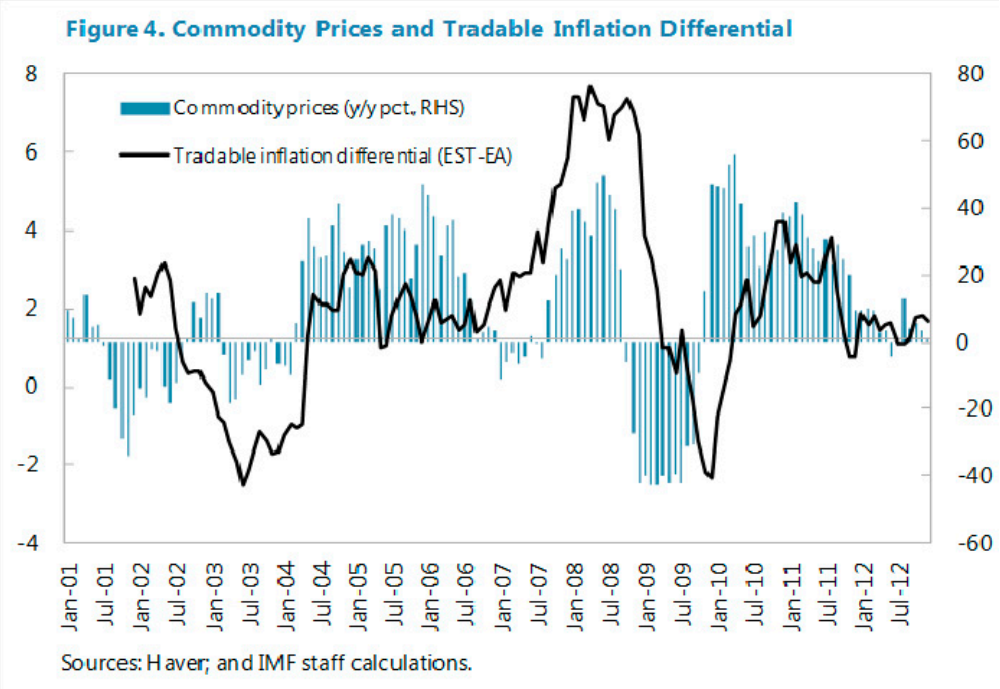


Sources: OECD; and IMF staff calculations.

[10] Non-homothetic preferences could lead to increase the share of non-tradable (services) in GDP as a country's income levels rise.

Asymmetric response to commodity price shocks

9. An asymmetric response to global commodity prices shocks has characterized Estonia's inflation. The correlation between global commodity prices and the difference between Estonia's tradable price inflation and that of the euro area is high (Figure 4).[11] Episodes of large commodity price booms tend to coincide to a large extent with increases in tradable goods prices in Estonia relative to the rest of euro area, albeit with a lag.



10. Moreover, the asymmetry appears to have become more pronounced after the crisis. Staff and Eesti Pank have previously discussed how Estonia inflation response tends to be larger than that of the Baltic countries, which in turn far exceeds that of the euro area (see IMF Country Report No. 11/34). The evidence discussed below confirms previous findings but points to larger and more persistent inflationary effect in Estonia from global commodity prices shocks in the more recent period.

The empirical model and detailed results

11. Reduced-form VAR models have been used to examine the relative impact of global food and fuel price shocks on Estonia. Specifically, these models have included three variables of interest: commodity prices, nominal effective exchange rate (NEER), and headline (HICP) prices. A second four-variable model—splitting prices into tradable and non-trade goods prices—has also been considered to examine the sectoral impact of global price shocks. Logged indexes spanning

[11] The monthly HWWI Euro area EUR Commodity Price Index is used here.

January 2000 to December 2012 were used to estimate models for Estonia, Latvia, Lithuania, and the euro area. For consistency and cross-model comparability, all models have included two lags in accordance to the Akaike Information Criteria. Global shocks were placed first in the Cholesky ordering, with the exchange rate and prices placed last; the four-variable model places tradable goods prices next to last and non-tradable goods prices last. The responses depicted below show the impact of a standard one-error shock.

12. The results for Estonia's inflation can be summarized as follows:

- A commodity price shock (about 6 percent on impact and dissipating within three months) results in inflation rising by about ¾ of 0.1 percent on impact, peaking in a month, and slowly returning to zero.[12] The cumulative impact is about ½ of 1 percent in six months (Figure 5).
- A shock to the NEER does not appear to have much of a pass-through effect before two months have gone by (Figure 5).
- A commodity price shock has a more persistent impact on inflation after the crisis. While the magnitude of shocks (not shown) is similar before and after the crisis, a commodity price shock in the 2008–12 period produces a mildly stronger but much more persistent response of headline inflation: it takes almost a year (compared to three months in the early period) to dissipate (Figure 6).
- The pass-through effect from the NEER exchange has diminished post-crisis (Figure 6).
- Not surprisingly, tradable goods inflation responds more to exchange rate and commodity price shocks than non-tradable goods inflation (Figure 7). This result can reflect the relative energy intensiveness and imported inputs needed for the production of tradable goods (notably manufactured products) compared to non-tradable goods.

13. In addition, Estonia's inflation remains more sensitive to commodity shocks than the inflation in other Baltic countries. Despite facing a similar shock, headline inflation in Lithuania is less sensitive and its response dissipates more quickly than Estonia (Figure 8). In Latvia, headline inflation responds modestly (not much different from zero). Of note, Estonia and the euro area have broadly similar inflation responses in the first couple of months (a bit higher in Estonia), but inflation persists longer in Estonia.

14. Estonia's inflation might reflect its intense use of energy. Specifically, primary energy intensity (0.24 koe/$05p) is twice as high as EU average and substantially higher than in the other Baltic countries. Of note, the energy intensity in agricultural production is particularly high (0.27 compared to 0.09 EU average), and has increased significantly since the crisis.

[12] The average (monthly) shock to commodity prices during 2010–11 has been in the order of 32 percent.

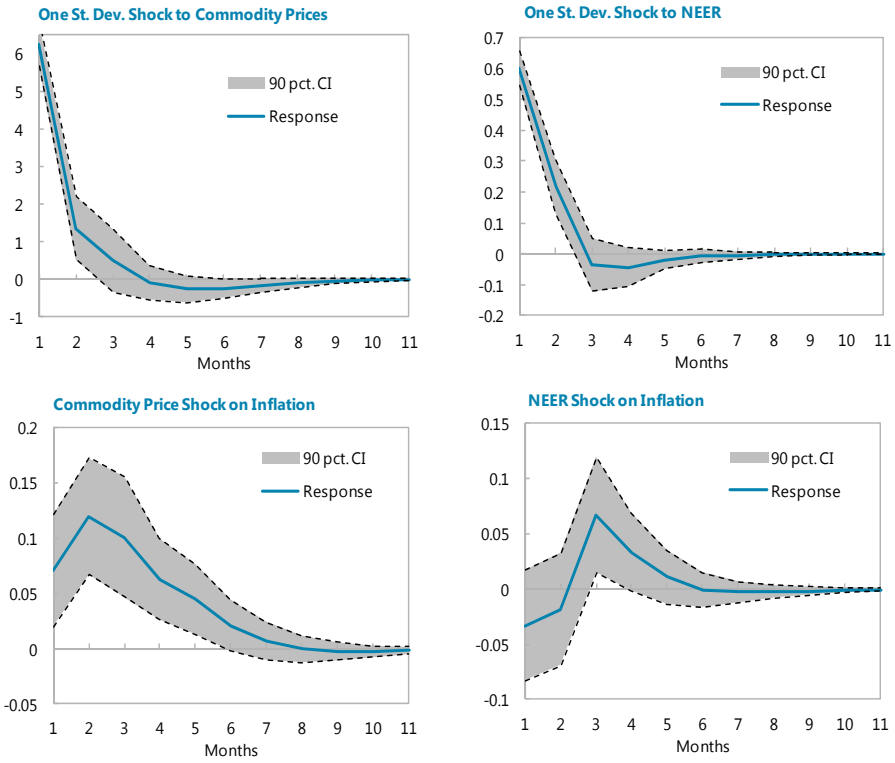
Estonia: Energy Intensity to Value Added in 2010

(PPP, koe/$05p)

	Estonia	Latvia	Lithuania	European Union	Estonia (2005)
Primary energy intensity	0.24	0.16	0.14	0.12	0.23
Final energy intensity	0.13	0.15	0.09	0.08	0.13
Industry	0.10	0.14	0.06	0.09	0.12
Transport	0.03	0.04	0.03	0.02	0.03
Services	0.03	0.03	0.02	0.02	0.03
Agriculture	0.27	0.16	0.07	0.09	0.17

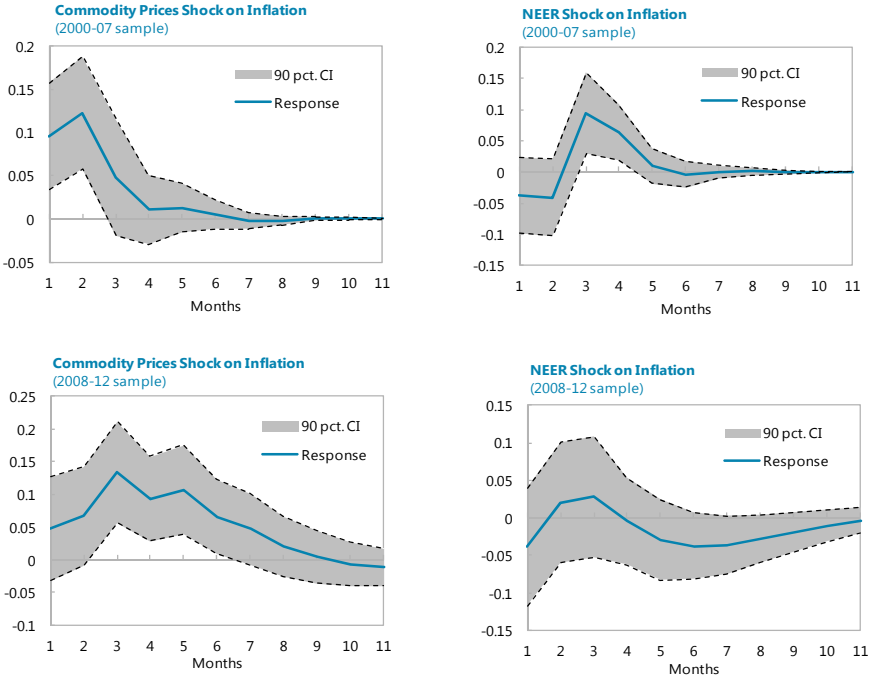
Source: Enerdata.

Figure 5. Estonia: Response of Headline Inflation to Commodity Prices and Exchange Rate Shocks



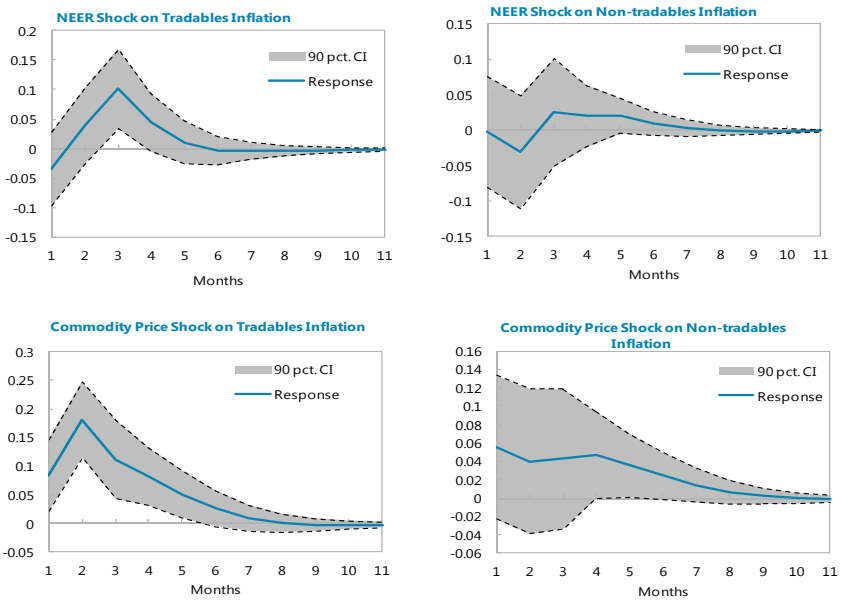
Source: IMF staff estimates.

Figure 6. Estonia: Responses of Headline Inflation in Pre- and Post-Crisis



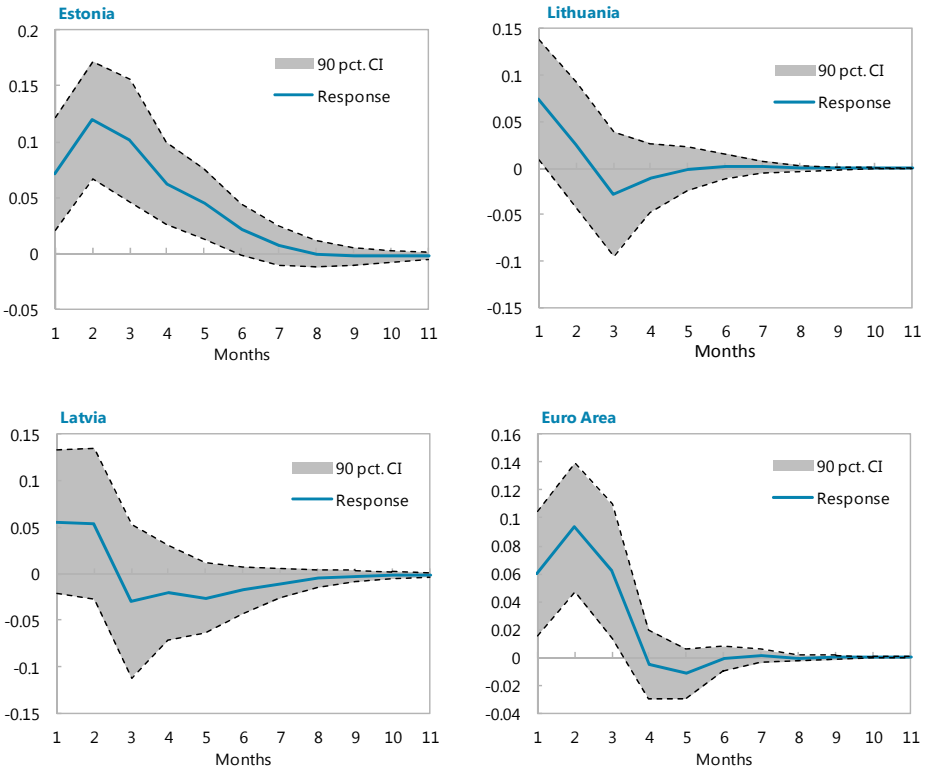
Source: IMF staff estimates.

Figure 7. Estonia: Responses of Tradable and Non-tradable Inflation



Source: IMF staff estimates.

Figure 8. Responses of Headline Inflation to Commodity Price Shocks in the Baltics and Euro Area

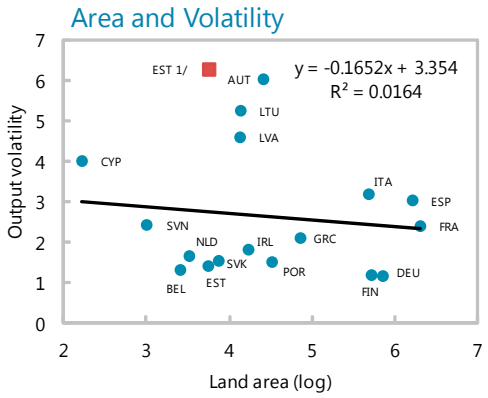


Source: IMF staff estimates.

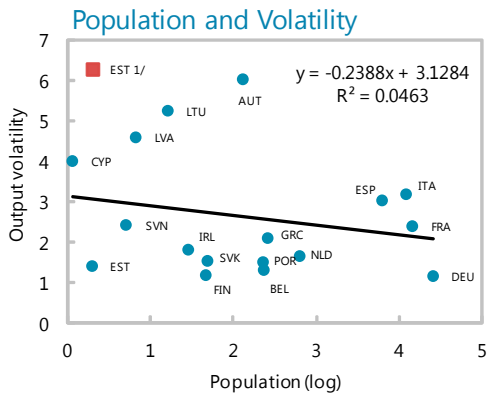
Annex II. Estonia: Economic Volatility[1]

1. Smaller economies typical face higher volatility. This can reflect a small country's narrow production base limiting its ability to diversify risks and cope with idiosyncratic shocks. For practical purposes, an economy's size can be thought to be an exogenous factor that can be correlated with other factors associated with volatility, notably openness.

2. While historically Estonia's output volatility does not appear to be high for its size, its volatility has risen sharply since the crisis. The increase in volatility could mirror the intensity of Estonia's downturn and thus volatility may dissipate as the recovery takes hold. At this stage however it is difficult to assess whether the crisis will have lasting effect.



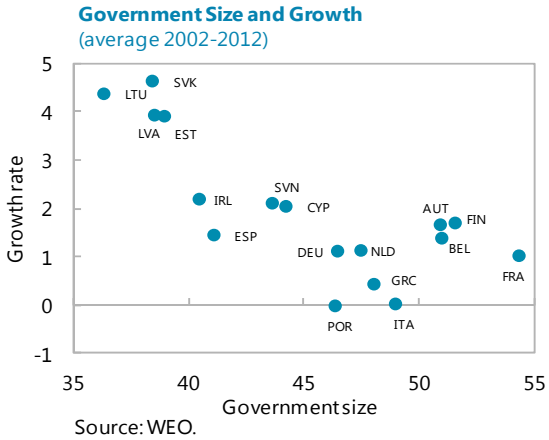
Sources: WEO; and IMF staff estimates.
1/ Volatility for 2008-2012 period.



Sources: WEO; and IMF staff estimates.
1/ Volatility for 2008-2012 period.

3. A number of factors can affect economic volatility. These can include:

- *Openness*. Often noted as potential increasing volatility is exposure to international trade. Compared to a closed economy, international trade introduces a constellation of trade shocks that can buffet an economy. These can interact with domestic shocks to reinforce economic volatility. But greater openness can also provide integration to more stable markets, diversifying economic risks and possibly reducing volatility.



Source: WEO.

[1] Prepared by Bartek Augustyniak and Giang Ho.

- *Government size*. A larger public sector might be better able to cope with shocks than smaller (credit constrained) households and firms. In principle, transitory shocks might be more readily financed by the public sector, thus contributing to smooth adjustment. In practice nonetheless, it is difficult to assess the permanence of a shock in real time. Shocks requiring adjustment (as opposed to financing) can be misinterpreted and a larger government can thus prove to be a hindrance. Likewise, a larger government will require higher taxes to be sustainable, which in turn can reduce long-run growth[2] and ultimately possibly undermining sustainability.

- *Income per capita*. As a country develops, its production base typically expands to less volatile activities[3]. Specifically, the relative importance of the primary sector (agricultural) diminishes, with the secondary (manufacturing) and tertiary (services) sectors accounting for a large share of value added. Besides the intrinsic lower volatility of these sectors, the greater diversification can further reduce volatility.

4. Estonia's volatility stands out from Europe in a number of dimensions. While Estonia's openness is similar to that of Belarus, Ireland, and Slovakia, its output volatility is at least twice that experienced in these countries (column 3, Figure 1). Likewise, Estonia's employment and, to a lesser extent, fiscal revenues volatility are also higher. Moreover with the exception of fiscal revenues, these differences appear to have increased more recently. Consistent with other Baltic countries, Estonia's public sector is smaller than the European average and experiences above average output and employment volatilities (column 2, Figure 1). Of note, fiscal revenue volatility appears in line with its European partners and has declined more recently. Looking at the relation between Estonia's volatility and per capita GDP suggests that output and employment volatility are high but revenue volatility is about as expected (column 1, Figure 1).

5. Still, not all of these differences withstand simple empirical analysis. Cross-section regressions for the 17 euro area countries (using ordinary least squares), suggest that openness, size of government, and per capita income can explain a substantial share of the volatility of output, employment, and fiscal revenues (R^2 exceeds 0.5). But given the sample size, these regressions are hard-pressed to apportion the impact of these individual factors: individual t-tests are not consistently statistically significant despite the fact that the F-tests are (multi-colinearity). At best, the results are suggestive of favorable impact of government size on the volatility of employment and fiscal revenues. Controlling for country size (land area or population) does not qualitatively change the results but does improve the regressions' ability to explain volatility.

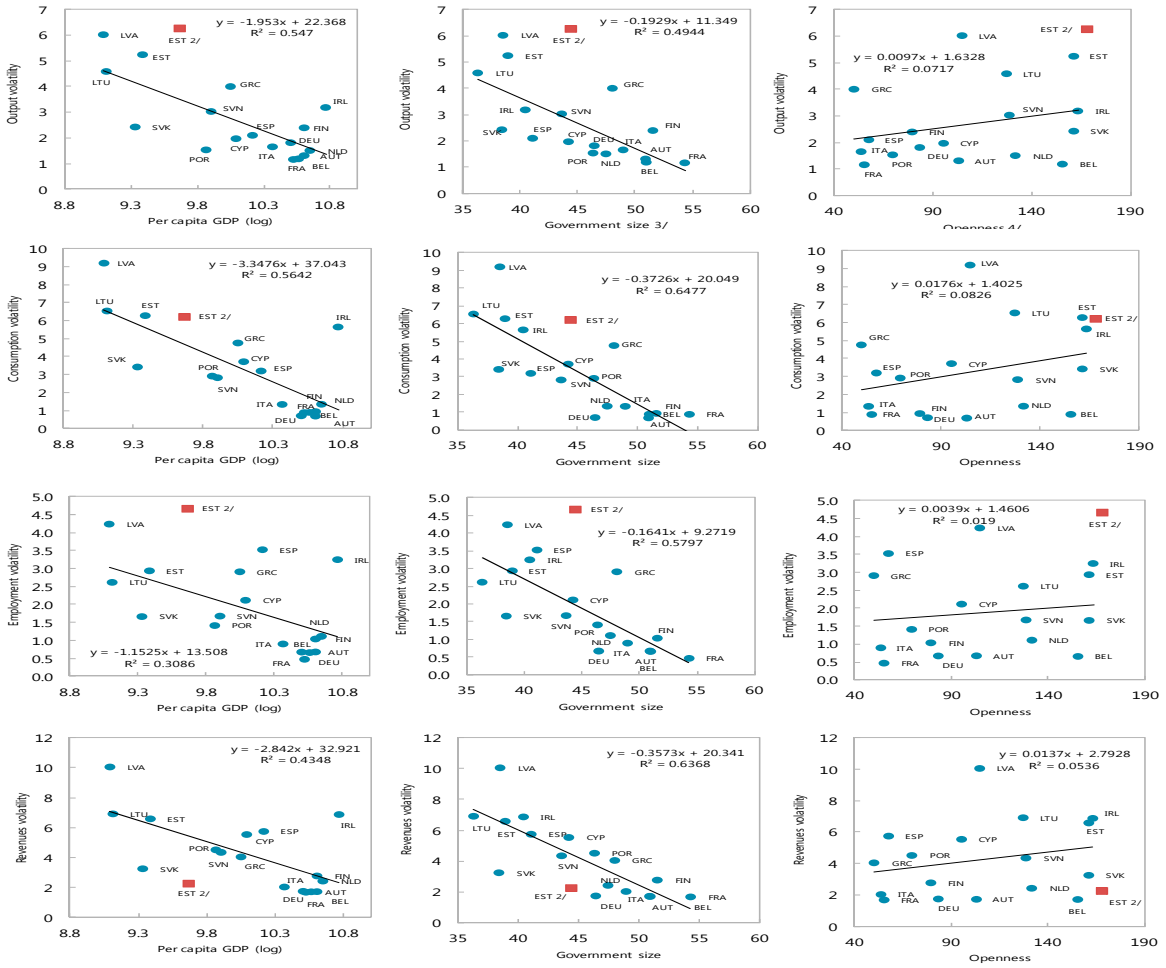
6. More robust empirical evidence does not fully support simple stylized facts. The available evidence on the openness-volatility relationship is mixed. Industry-level data suggests that

[2] Furceri, David. and Georgios Karras, 2009, "Tax and growth in Europe," *South Eastern Europe Journal of Economics*, Vol. 7, pp. 181–204, and Afonso, Antonio and David Furceri, 2010, "Government size, composition, volatility and economic growth," *European Journal of Political Economy*, Vol 26, pp. 517–32.

[3] Koren, Miklos and Silvana Tenreyro, 2007, "Volatility and Development," *The Quarterly Journal of Economics*, Vol. 122, pp. 243–87.

trade openness increases volatility.[4] In particular, sectors more open to international trade are more volatile and less correlated with the rest of the economy. Moreover, trade is accompanied by increased specialization, contributing to enhance aggregate volatility. But trade openness can in fact reduce volatility for countries with relatively diversified export baskets.[5]

Figure 1. Estonia: Macroeconomic Volatility, 2002-2012 1/



Source:WEO.
1/ Volatility is defined as simple average of absolute differences from the average for a specified sample period.
2/ Sample period 2008-2012.
3/ General government expenditures in percent of GDP.
4/ Sum of exports and imports in percent of GDP.

[4] Di Giovanni, Julian and Andrei Levchenko, 2009, "Trade Openness and Volatility," *The Review of Economics and Statistics*, No. 91, pp. 558–85.

[5] Haddad, Mona, Jamus Jerome Lim, Cosimo Pancaro, and Christian Saborowski, 2012, "Trade Openness Reduces Growth Volatility When Countries are Well Diversified," ECB Working Paper No. 1491.

Macroeconomic Volatility in the Euro Area, 2002-12
(Ordinary Least Squares)

	Volatility of:			Volatility of:			Volatility of:		
Dependent variable:	Output	Employment	Fiscal revenues	Output	Employment	Fiscal revenues	Output	Employment	Fiscal revenues
log (GDP per capita)	-1.314	0.320	-0.345	-0.914	0.690	0.659	-1.407	0.397	-0.059
	(0.759)	(0.547)	(1.116)	(0.801)	(0.549)	(1.003)	(0.818)	(0.588)	(1.174)
Government size	-0.095	-0.223	-0.373	-0.102	-0.228	-0.388	-0.089	-0.228	-0.394
	(0.085)	(0.061) **	(0.124) *	(0.082)	(0.057) **	(0.103) **	(0.089)	(0.064) **	(0.128) **
Openness	-0.000	-0.009	-0.011	-0.006	-0.015	-0.026	0.002	-0.012	-0.019
	(0.008)	(0.005)	(0.011)	(0.009)	(0.006)	(0.011) *	(0.010)	(0.007)	(0.015)
log (Land area)				-0.345	-0.319	-0.866			
				(0.264)	(0.181)	(0.331) *			
log (Population)							0.131	-0.109	-0.403
							(0.323)	(0.232)	(0.464)
Memo items:									
Number of observations	17	17	17	17	17	17	17	17	17
Standard error of the regression									
R^2	0.59	0.66	0.67	0.65	0.73	0.79	0.60	0.67	0.69
Adjusted R^2	0.50	0.58	0.60	0.53	0.64	0.72	0.47	0.55	0.59
F-test	6.36 ***	8.39 ***	8.86 ***	5.45 ***	8.08 ***	11.35 ***	4.51 **	5.97 ***	6.71 ***

Sources: WEO; and IMF staff estimates.

Note: Output, employment, fiscal revenues, GDP per capita, government size, opennes, population, and land area are measured as the real GDP (2005=100), millions of individuals employed, total general government revenues, output divided by population, government spending as percent of output, exports plus imports as a percent of output, millions of citizens, and thousands of square kilometers. Volatility is defined as simple average of absolute differences from the 2002-12 period average. The sample covers the 17 euro area countries (excluding Luxembourg) over the years 2002-12. Standard errors of the coeficients are shown in parenthesis, and *, **, and *** denote statistical signifcance at 10, 5, and 1 percent.

Annex III: Risk Assessment Matrix[1]

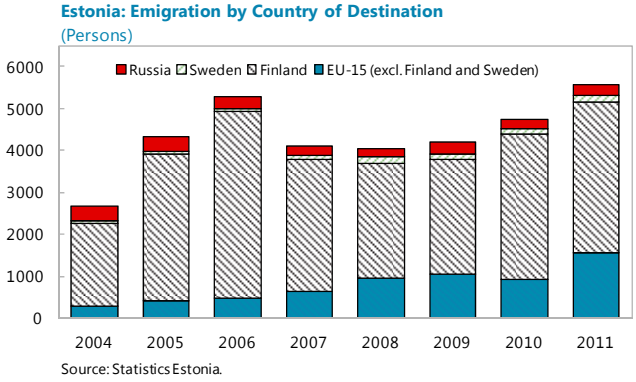
Risk	Relative Likelihood	Impact if Realized
1. A prolonged period of low growth in the euro area.	**Medium** The damage to the euro area's potential output growth from the financial crisis may be greater than estimated or deleveraging may have a larger impact on real activity than envisaged.	**Medium** Spillovers can be mitigated should the Nordics prove to be less affected by the euro area weakness.
2. Re-intensification of the euro area crisis.	**Medium** Beyond trade effects, spillovers can emerge through the financial channel. Estonian banks may be called on to support their Swedish parent banks—dependent on short-term wholesale funding—should financial markets be severely disrupted.	**Low/Medium** Particularly should Nordic trading partners be affected, trade effects, and knock on effects on output, employment, and ability to service debt can disrupt the recovery. Economic conditions could further deteriorate should Estonian banks also tighten credit conditions.
3. Rapid economy-wide wage increases resulting in losses in competitiveness.	**Low/Medium** Continued scarceness of skilled workers in booming export-related activities can escalate wage demands and trigger increases far in excess of productivity gains.	**Medium** The recovery and potential growth could be undermined with exporter seeking to relocate to low-cost countries.
4. Global oil price shock	**Low** Geopolitical risks in the Middle East could precipitate a collapse in oil supply, resulting in sharp increases in global oil prices.	**Medium** Given Estonia's relatively high energy intensity, an oil shock would have adverse effects on inflation and output.

[1] The Risk Assessment Matrix shows events that could materially alter the baseline path discussed in this note (which is the scenario most likely to materialize in the view of staff). The relative likelihood of the risks is staff's subjective assessment of the risks surrounding this baseline.

Annex IV. Labor Market Developments: Skill Mismatches and Unemployment[1]

1. Estonia's unemployment spiked in the wake of the global financial crisis but has since declined markedly. From early 2008, Estonia's unemployment increased fourfold to about 20 percent in 2010. For their part, other Baltic countries have also endured far sharp increases in unemployment. But as economic growth resumed, the unemployment rate in the Baltic nations have declined sharply. Notwithstanding Estonia's more pronounced declines compared to other Baltic countries, its unemployment rate has remained high and above historical averages.

2. Cross-border workers and emigration may have contributed to reduce Estonia's unemployment. The geographic proximity and cultural ties with Nordic countries, Finland in particular, has contributed to cross-border work and emigration. The number of port passengers between Finland and Estonia (excluding cruise passengers) has increased steadily and consistently accounted for more than 80 percent of overall passenger traffic. Cross-border emigration has broadly reflected push and pull factors in recent years. In the depth of Estonia's contraction, emigration to Finland—less affected by the euro area crisis—increased markedly. In fact between 2009 and 2010, Estonians working in Finland increased by about 12,000 (or roughly 250 percent)[2] bringing Finland's share of those working abroad to 70 percent (25 percentage points increase) of all Estonian working abroad. More often than not, Estonians working abroad appear to have been employed in construction markets abroad. More recently, emigration to advanced EU countries have increased possibly reflecting job opportunities abroad in business service, IT, and professional and scientific sectors, notably medical doctors and nurses. These sectors have had greater job vacancy rates abroad than in Estonia; Estonians working abroad in the tertiary sector have experienced an increase of almost 70 (y-o-y) in 2012. Of note, emigration to Sweden and Russia has remained broadly stable.



[1] Prepared by Yuko Hashimoto and Giang Ho.

[2] This reflects those working abroad anytime in the past 12 months and includes weekly and seasonal workers.

Estonians Working Abroad by Sector
(Thousands)

	2006	2007	2008	2009	2010	2011	2012
Primary sector	1.1	0.9	0.6	1.6	1.2	0.9	1.1
Secondary sector	5.9	8.6	10.3	9.9	13.4	15.0	15.0
Of which: construction	4.5	6.5	8.4	8.3	10.9	13.2	11.8
Tertiary sector	3.8	5.2	4.9	7.7	7.5	5.7	9.6

Source: Labor Force Survey, Statistics Estonia.

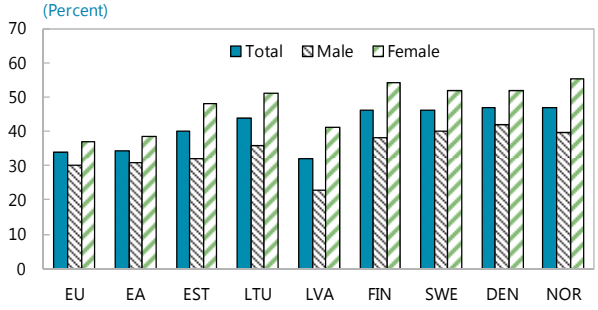
3. Estonia's higher human capital attainment could have also contributed to reduce unemployment indirectly through emigration. Labor force survey suggests that skilled Estonian workers have emigrated to Finland and, to less extend, to some of the advanced EU countries—benefiting from the low unemployment in relevant jobs abroad and in search of higher paying job, particularly as employment opportunities were significantly curtailed during the Estonia's downturn. Still, while migration of highly educated individuals experienced an increase of almost 40 percent in 2012, these represent only about a quarter of Estonians working abroad.

Estonians Working Abroad by Level of Education
(Thousands)

	2006	2007	2008	2009	2010	2011	2012
Below upper secondary	1.1	1.9	2.7	2.4	2.9	2.9	3.9
Upper secondary, post-secondary non-tertiary	7.3	9.9	10.2	13.2	16.2	15.7	17.5
Tertiary	2.3	2.9	2.9	3.7	3.0	3.1	4.3

Source: Labor Force Survey, Statistics Estonia.

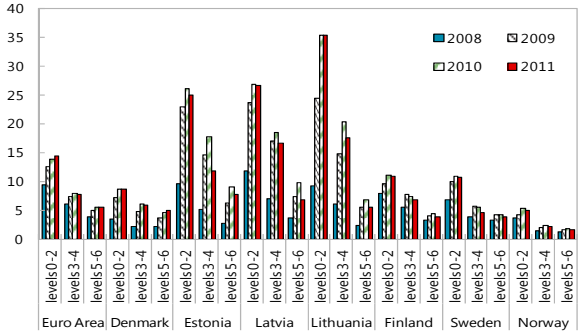
Estonia: Share of 30-34-year-olds with Tertiary Education, 2010
(Percent)



Source: Eurostat.

4. In contrast to other Baltic countries, the largest declines in unemployment have been for workers with intermediate skills. While the incidence of unemployment declines sharply with the level of education, workers with high and low skills appear to have benefited less from the recovery so far. These developments mirror the migration of workers with intermediate education attainment in 2010–11 and are in contrast with developments in other Baltic countries, where declines in unemployment are commensurate with the level of educational attainment. Estonia's geographical proximity and close cultural ties with Nordic countries might explain the difference with other Baltic nations.

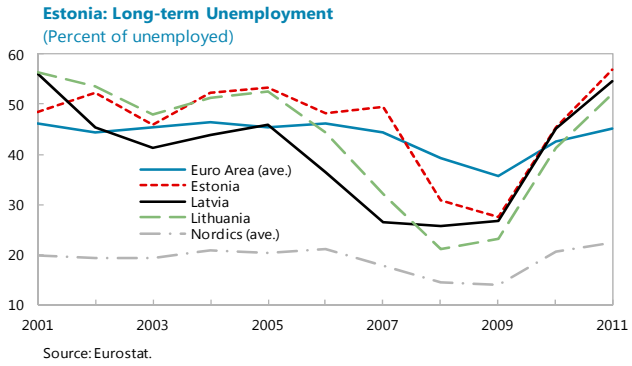
Estonia: Unemployment Rate by Education Level 1/
(Percent)



Source: Eurostat.
1/ Pre-preliminary, primary and lower secondary education (levels 0-2); Upper secondary and post-secondary non-tertiary education (levels 3-4); First and second stage tertiary education (levels 5-6).

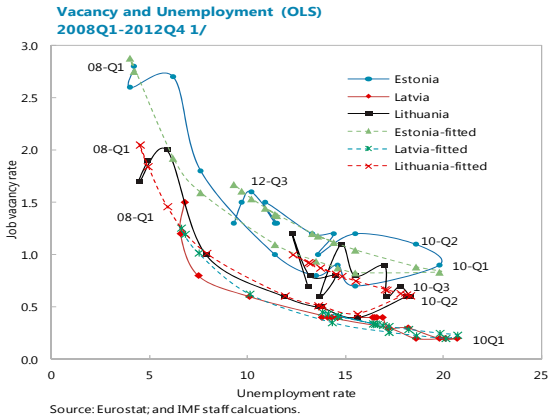
5. But as Estonia's unemployment has eased, labor market shortcomings have come to the fore. Specifically,

- *Long-term joblessness has re-emerged*. This long-standing labor market problem was temporarily masked during the boom years. The share of long-term unemployed workers declined from an average of about 50 percent in the early part of the first decade of the 21st century to about 30 percent during the boom. Long-term unemployment had risen sharply in the aftermath of the economy's downturn but has declined in 2012.

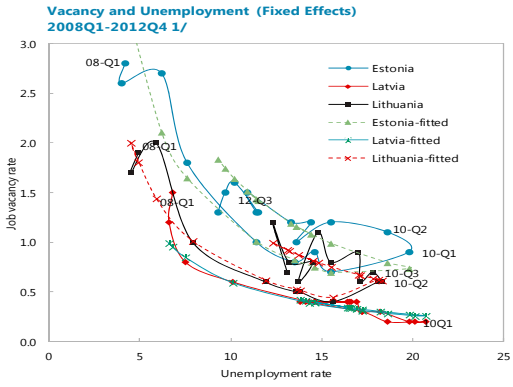


Source: Eurostat.

- *Skill mismatches have worsened*. As expected, recent declines in unemployment have been accompanied with declining vacancy rates. But this pattern (known as the Beveridge curve) appears to have changed in early 2010, so that now at the same rate of unemployment higher vacancies emerge even though both declined in the fourth quarter of 2012. Also, vacancies have become particularly prominent in communication and information sector. Empirical evidence from OLS and panel regressions (based on data from 2008–12) suggests an upward shift after 2010 for Estonia and Lithuania (to a lesser extent, Latvia). Recent changes in unemployment benefits could have contributed to the shift in Estonia where these have increased, but these benefits were reduced in Lithuania in 2009.



Source: Eurostat; and IMF staff calcuations.
1/ Ordinary Least Squares approach for each country.



Source: Eurostat; and IMF staff calcuations.
1/ Panel approach with fixed effects.

	Ordinary Least Squares (Independent variable is log of vacancy rate)			Panel with Fixed Effects (Independent variable is log of vacancy rate)		
	Estonia	Latvia	Lithuania	Estonia	Latvia	Lithuania
Const.	2.335 ***	3.323 ***	2.597 ***	2.915 ***	2.040 ***	2.572 ***
	(0.201)	(0.291)	(0.305)	(0.187)	(0.209)	(0.196)
2010 dummy	0.234 ***	0.192 **	0.540 ***		0.289 ***	
	(0.078)	(0.082)	(0.116)		(0.068)	
ln(unemp)	-0.922 ***	-1.640 ***	-1.249 ***		-1.179 ***	
	(0.090)	(0.117)	(0.137)		(0.084)	
Adj. R^2	0.849	0.923	0.816		0.899	
Obs.	20	20	20		60	

Note: *, **, *** denote 10, 5, 1 percent significance, respectively. Standard errors in parentheses.

6. In addition, differences across the Baltic countries could reflect idiosyncratic unemployment responses to economic activity. Consider the standard Okun's law specification (Owyang and Sekhposyan, 2012):

$$u_{i,t} = \alpha_i + \beta_i\left(y_{i,t} - \overline{y_{i,t}}\right) + \varepsilon_{i,t} \qquad (1)$$

where u is the unemployment rate (in percent), y is the log of real output, and $\overline{y}$ is log of real potential output (estimated with an HP filter); both output terms have been multiplied by 100 to express the output gap, $y - \overline{y}$, in percent. The subscripts i and t denote country and time respectively. In this equation, β is the elasticity of the unemployment rate to the output gap, and α captures the long-run unemployment rate (loosely the "natural" rate) that prevails when the output gap is zero.

7. The differences among Baltic countries center on the long-run rate of unemployment (Table 1). Specifically, estimation results from panel regressions (with fixed effects and using quarterly data since the first quarter of 1995) suggest that Estonia's long-run unemployment is about 10 percent, with Latvia's and Lithuania's long-run unemployment estimates at about 13 percent and 12 percent respectively. Moreover, the crisis appears to have increased these long-run rates by about 3 percentage points throughout the region. The elasticity of the unemployment rate to the output gap is estimated to be about -½ in Estonia and Latvia, with Lithuania's unemployment estimated to be a bit more sensitive to the output gap. Of note, the crisis did not appear to have impacted the sensitivity of unemployment to the output gap

The long-run rate of unemployment also varies across Estonia's regions (Table 2).[3] Specifically, estimation results from panel regressions (with fixed effects and using quarterly data since the first quarter of 2000) suggest that Tallinn's long-run unemployment is about 9 percent,

[3] Analysis of regional patterns in other Baltic countries may also provide useful insights and this work could be taken up in future research efforts.

but for the Estonia's West region it is about 1 percentage point lower, while in the Northeast it is about 7½ percentage points higher. The estimates also point to a generalized increase of about 3 percentage points in the long-run unemployment after the crisis. The elasticity of unemployment to the output gap is estimated to be roughly -½, with the elasticity closer to -¼ in Estonia's West region. The latter may reflect the seasonal nature of work in this region and the likelihood that the labor market adjustment could be changes in hours worked as opposed to outright dismissal. In any case, the crisis does not appear to have impacted the elasticity of unemployment to the output gap in Estonia.

Table 1. Okun's Law for Estonia's Regions
(Dependent variable is regional unemployment rate)

	(I)	(II)	(III)
Constant	9.846	8.975	8.748
	(0.253) ***	(0.406) ***	(0.192) ***
Constant*North		-0.485	
		(0.573)	
Constant*Northeast		7.249	7.585
		(0.573) ***	(0.390) ***
Constant*Central		-0.159	
		(0.573)	
Constant*West		-1.314	-0.995
		(0.573) **	(0.390) ***
Constant*South		-0.064	
		(0.573)	
Output gap	-0.532	-0.608	-0.561
	(0.046) ***	(0.073) ***	(0.032) ***
Output gap*North		0.036	
		(0.103)	
Output gap*Northeast		-0.006	
		(0.103)	
Output gap*Central		0.070	
		(0.103)	
Output gap*West		0.225	0.171
		(0.103) **	(0.077) **
Output gap*South		0.127	
		(0.103)	
Post crisis	3.166	3.082	3.166
	(0.534) ***	(0.855) ***	(0.345) ***
Post crisis*North		0.045	
		(1.209)	
Post crisis*Northeast		0.521	
		(1.209)	
Post crisis*Central		-0.107	
		(1.209)	
Post crisis*West		0.480	
		(1.209)	
Post crisis*South		-0.431	
		(1.209)	
Memo items			
Number of observations	306	306	306
Regression standard error	3.86	2.52	2.49
R-squared	0.41	0.76	0.76
Adjusted R-squared	0.41	0.75	0.75
F-test	107.0 ***	54.3 ***	188.1 ***

Source: IMF staff estimates.

Note: Estimation method is ordinary least squares (OLS). The sample covers the six regions in Estonia (Tallinn, North, Northeast, Central, West and South) for 2000Q1-2012Q4 period. The output gap refers to national output. Standard errors are shown in parentheses, and *,**, and *** denote statistical significance at 10, 5, and 1 percent respectively.

Table 2. Okun's Law for Baltic Countries
(Dependent variable is unemployment rate)

	(I)	(II)	(III)	(IV)
Constant	11.650	10.269	9.754	9.701
	(0.205) ***	(0.316) ***	(0.314) ***	(0.293) ***
Constant*LVA		2.503	2.385	2.470
		(0.453) ***	(0.454) ***	(0.404) ***
Constant*LTU		1.766	1.688	1.741
		(0.473) ***	(0.471) ***	(0.421) ***
Output gap	-0.584	-0.542	-0.482	-0.482
	(0.044) ***	(0.071) ***	(0.074) ***	(0.043) ***
Output gap*LVA		0.010	-0.028	
		(0.095)	(0.100)	
Output gap*LTU		-0.180	-0.217	-0.193
		(0.109) *	(0.109) **	(0.085) **
Post crisis			2.727	3.146
			(0.770) ***	(0.444) ***
Post crisis*LVA			1.080	
			(1.116)	
Post crisis*LTU			0.674	
			(1.156)	
Output gap*Post crisis			-0.078	
			(0.152)	
Output gap*Post crisis*LVA			0.259	
			(0.204)	
Output gap*Post crisis*LTU			0.247	
			(0.262)	
Memo items				
Number of observations	198	198	198	198
Regression standard error	2.89	2.68	2.41	2.39
R-squared	0.47	0.55	0.65	0.65
Adjusted R-squared	0.47	0.54	0.63	0.64
F-test	174.3 ***	47.8 ***	31.7 ***	70.3 ***

Source: IMF staff estimates.

Note: Estimation method is ordinary least squares (OLS). The sample covers the three Baltic countries for 1995Q1-2012Q4 period. "LVA" and "LTU" are country dummies. "Post crisis" is a dummy that equals 1 in the post-crisis period. The unemployment rate is measured in percent. The output gap (in percent of potential output) is contructed using the HP filter. Standard errors are shown in parentheses, and *,**, and *** denote statistical significance at 10, 5, and 1 percent respectively.