

# Economic Growth, Current Account Dynamics and Growth Regimes in the Baltic States

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# Economic Growth, Current Account Dynamics and Growth Regimes in the Baltic States

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## Abstract

This paper considers the growth performance of the Baltic states from the mid-1990s to 2021. Economic growth was fast before the global financial crisis, but slowed markedly after the crisis. Panel data estimations using seemingly unrelated regressions suggest that the dynamics of the current account balance are important for short and medium-term growth in the Baltic states, but that there is a break signifying a change of growth regime around the time of the global financial crisis. Before the crisis, rapid growth was supported by domestic demand that was made possible by large current account deficits. After the crisis, economic growth was supported by external demand reflected in an improvement of the current account. The shift in the economic growth regime after the global financial crisis has brought lower but also more sustainable growth.

JEL Codes: F32, F34, O40

Keywords: economic growth, economic convergence, current account balance, global financial crisis

The views expressed are those of the authors and do not necessarily represent the official views of the European Commission, Eesti Pank or the Eurosystem.

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## **Non-technical summary**

This paper examines the performance and growth of the economies in the Baltic states from the mid-1990s until 2021, focusing particularly on the importance of aggregate demand and the resulting dynamics of the current account balance.

The Baltic states have overall exhibited rapid economic growth since the mid-1990s, but the path of growth has been anything but steady. Economic growth was fast until the onset of the global financial crisis in 2008, and the income gap towards Western Europe narrowed rapidly. After the crisis however, economic growth has been much lower and the income gap has narrowed much more slowly.

A central question is why the high rates of growth before the global financial crisis were followed by much lower rates after the crisis. The fall in trend growth cannot easily be reconciled with standard theories of long-term economic growth, which typically envisage a relatively stable rate of growth over time. Moreover, accession to the European Union in 2004, improvements in education and the advent of high-tech firms ought to have acted against growth slowing down in the Baltic states.

Economic growth is driven by aggregate demand in the short and medium terms. It is possible to distinguish between two different growth regimes that emphasise different key drivers of aggregate demand. Rapid growth in domestic demand can be financed by lower net exports and a deteriorating current account balance, or rapid growth in net exports can improve the current account balance. The different relationships between economic growth and developments in the current account may then provide a way of determining the regime of short and medium-term growth.

The paper uses graphical analysis and panel data estimations for the three Baltic states to investigate the relationship between economic growth and the current account balance before and after the crisis. There was rapid growth in the years before the crisis, which coincided with substantial current account deficits and a rapid accumulation of net foreign liabilities. The global financial crisis brought a stop to the accumulation of liabilities, and the growth dynamics in the Baltic states changed markedly as net exports, or improvement of the current account balance, became an important contributor to economic growth.

The analysis suggests that the global financial crisis may have brought about a change in the regime of short or medium-term growth in the Baltic states, with a change from reliance on domestic demand to reliance on external demand. The high rates of economic growth before the global financial crisis were built on accumulation of external liabilities, while the growth rates after the crisis have been lower but are arguably more sustainable.

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## 1. Introduction

The Baltic states embarked on ambitious economic reforms after they regained their independence in 1991. The aim was to eliminate shortages of goods and improve economic opportunities in the short term, but the longer-term objective was to create the foundations for economic development and a narrowing of the income gap towards the developed economies in Western Europe (Laar 2002, Staehr 2017).

The Baltic states have overall exhibited rapid economic growth since the mid-1990s, but the path of growth has been anything but steady. Economic growth was fast and the income gap towards Western Europe declined rapidly until the onset of the global financial crisis in 2008. After the crisis however, economic growth has been much lower and the income gap has narrowed much more slowly.

The slowdown of economic growth surprised experts and policymakers alike. The former Estonian prime minister Andrus Ansip prophesied in 2007 that Estonia would be one of the five richest countries in Europe within 15 years, a prophesy that may have relied on a linear projection of trends (ERR 2011). At the time of writing at the end of 2022, Andrus Ansip's prophesy has not been vindicated.

A central question is why the high rates of growth before the global financial crisis were followed by much lower rates after the crisis. The fall in trend growth cannot easily be reconciled with standard theories of long-term economic growth, which typically envisage a relatively stable rate of growth over time. Moreover, accession to the European Union in 2004, improvements in education and the advent of high-tech firms ought to have acted against growth slowing down in the Baltic states.

This paper examines the performance of economic growth in the Baltic states from the mid-1990s until 2021 through the prisms of macroeconomics and international finance. The Baltic states are small, open economies and they share very similar growth dynamics, so external conditions are likely of importance. The results of the empirical analysis contribute to an understanding of the dynamics of growth in the Baltic states over almost 30 years, including the slower growth after the global financial crisis.

One key proxy of external conditions is the current account balance, which is the sum of net exports and the net receipts of interest and dividend payments, and so is an approximate measure of the net transfer of resources to and from an economy. Obstfeld (2012) emphasises that the current account balance is (still) of key importance for macroeconomic developments in most economies.

Economic growth is driven by aggregate demand in the short and medium terms. It is possible to distinguish between two different growth regimes that emphasise different key drivers of aggregate demand. Rapid growth in domestic demand can be financed by lower net exports and a deteriorating

current account balance, while rapid growth in net exports can improve the current account balance. The different correlations between economic growth and current account developments may thus provide a means for determining the regime of short and medium-term growth.

There was rapid growth in the years before the crisis, coinciding with substantial current account deficits and accumulation of net foreign liabilities. The global financial crisis brought a stop to the accumulation of liabilities, and the growth dynamics in the Baltic states changed markedly as net exports became an important contributor to economic growth. Put simply, the high rates of economic growth before the global financial crisis were built on unsustainable external borrowing, while the rates of growth after the crisis were lower and not dependent on external borrowing.

The paper contributes to the literature that discusses the growth performance of post-communist countries and other emerging-market economies, particularly the Baltic states. Poissonnier (2017) highlights that there are many similarities in the macroeconomic performances of the three countries, suggesting the importance of external factors. Randveer & Staehr (2021) note that the macroeconomic picture changed markedly after the global financial crisis and pinpoint a number of challenges facing the Baltic states. Staehr (2015) discusses the risk of a middle income trap in the three countries. Aslund (2015) provides an upbeat assessment of the economic policies and economic results in the Baltic states.

The paper also contributes to the literature on business cycles and short and medium-term growth in emerging market economies. Empirical studies have typically found that the business cycles exhibited in emerging market economies are much stronger than those in developed economies (Kose et al. 2003). Moreover, medium-term trend growth in emerging market economies is often unsteady and appears to be pushed up and down by business cycle shocks. Aguirra & Gopinath (2007, p. 69) summarise these findings by stating that “the cycle is the trend”. The paper considers the linkages between business cycles and the medium-term growth performance of the Baltic states.

The final area of contribution relates to the discussion of growth regimes and in particular the role played by net international resource flows. Net capital flows have been found to be important for economic growth in many emerging market economies, including Central and Eastern European ones (Brixiova et al. 2010, Staehr 2018). Atoyán (2010) argues that the global financial crisis showed that this growth regime was unsustainable and raised the prospects of changes in the regime. Studies focusing on the USA and some emerging market economies have found that the global financial crisis appears to have affected the role of financial flows and economic growth (Aizenman et al. 2013, Hlatshwayo & Spence 2014, Igan et al. 2020).

The rest of the paper is organised as follows. Section 2 discusses regimes of economic growth in the short and medium terms. Section 3 presents data on economic growth and convergence in the Baltic states. Section 4 presents

data on the current account balance and net international investment position. Section 5 discusses the importance of the current account balance for economic growth in the Baltic states. Section 6 extends this analysis using panel data estimations. Finally, Section 7 summarises the paper.

## 2. Short and medium-term growth regimes and the current account

Economic growth has featured prominently in economic inquiry and debate since the publication of *The Wealth of Nations* in 1776 (Smith 1776). It is important to distinguish between perspectives that focus on economic growth in the long term and those that focus on growth in the short and medium terms.

Theories of long-term growth typically emphasise the availability of production factors like labour, physical capital and usable land or the effectiveness with which these factors are used, i.e. total factor productivity.<sup>1</sup> These theories focus on the supply side of the economy, and they may help explain trend growth over decades or even longer horizons, but they are unlikely to provide insights into sudden changes in the dynamics of growth.

For the line of inquiry that considers economic growth in the short or medium term, aggregate demand plays a crucial role. Changes in aggregate demand can affect economic growth in the short and medium terms as firms adjust production volumes to meet aggregate demand. The supply of production factors plays a limited role in the short and medium terms as their utilisation and productivity may vary over time. The role of aggregate demand in economic growth in various economic models is discussed in Hope & Soskice (2016); Kregel (2016) provides a survey of development models centred on effective aggregate demand.<sup>2</sup>

The national income identity of the national accounts stipulates that production ex post is equal to demand from consumption and investment plus demand from net exports. It is useful to distinguish between theories of short and medium-term growth that focus on *domestic demand* from consumption or investment by the private or government sector, and theories that focus on *external demand* from net exports (Baccaro & Pontusson 2016).

Models focusing on domestic demand are sometimes labelled models of balance-of-payments constrained growth (Thirlwall 1979, McCombie & Thirlwall 1994). The underlying concept is that an increase in consumption or investment will only partly be met by domestic production, so net exports will decline as imports are increased or exports reduced.

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<sup>1</sup> Barro & Sala-i-Martin (2003) is a standard reference book that discusses theories of long-term economic growth and presents empirical estimates of growth.

<sup>2</sup> Some of these models may be considered alternative and not part of mainstream economic thinking, while others are or have been part of mainstream policymaking, for instance, at the World Bank and the International Monetary Fund.

The current account balance amounts to net exports plus net income from cross-border investments and transfers. Given that income and net transfers typically change little in the short term, increased domestic demand, and hence also production, will typically be accompanied by a deterioration in the current account balance (Obstfeld 2012). This negative relationship also means that economic growth will be constrained in a country that cannot finance its possible current account deficits, as emphasised by Thirlwall (1979) and McCombie & Thirlwall (1994).

The concern that economic growth may be constrained by the current account balance goes back to the period immediately after WWII and was part of the rationale for establishing the World Bank. The two-gap model of Chenery & Strout (1966) can be used to compute the current account deficit, or the financing gap, needed to ensure the desired level of investment while not repressing domestic demand unduly.

A country may rely on inflows of foreign capital to support domestic demand and economic growth in the short or medium term (Kregel 2016). Capital inflows have driven economic growth in countries in Asia, Latin America and Europe at various times, but a key challenge is that large current account deficits lead to net foreign liabilities being accumulated, and this may jeopardise economic and financial stability over time (Obstfeld 2012).

Calvo (1998) draws attention to another case where changes in net capital inflows or the current account balance are likely to affect GDP growth. Sudden stops in net capital inflows, where a period of current account deficits ends abruptly, have often been associated with substantial economic downturns.

The other main regime of economic growth in the short and medium terms focuses on external demand. An increase in net exports will be accompanied by higher GDP, as demand from domestic consumption and investment are unlikely to decline in proportion to the increase in net exports. This implies a positive relationship between economic growth and net exports or the current account balance, and also suggests that high rates of economic growth may be associated with the accumulation of net foreign assets.

The model of external demand may be seen to support development models such as import substitution and export-led growth. The model of import substitution had its heyday in Latin America in the decades after WWII, where the substitution was often implemented through regulation of trade and finance (Kregel 2016). The export-led model gained popularity in South Korea in the 1960s and has subsequently been adopted by many countries in Asia and beyond (Giles & Williams 2000, Awokuse 2003).

The two regimes of economic growth in the short and medium terms have different observational characteristics. The regime of growth driven by domestic demand suggests a negative correlation between economic growth and the current account balance, while the regime of external demand suggests a positive correlation. These observational differences can be used

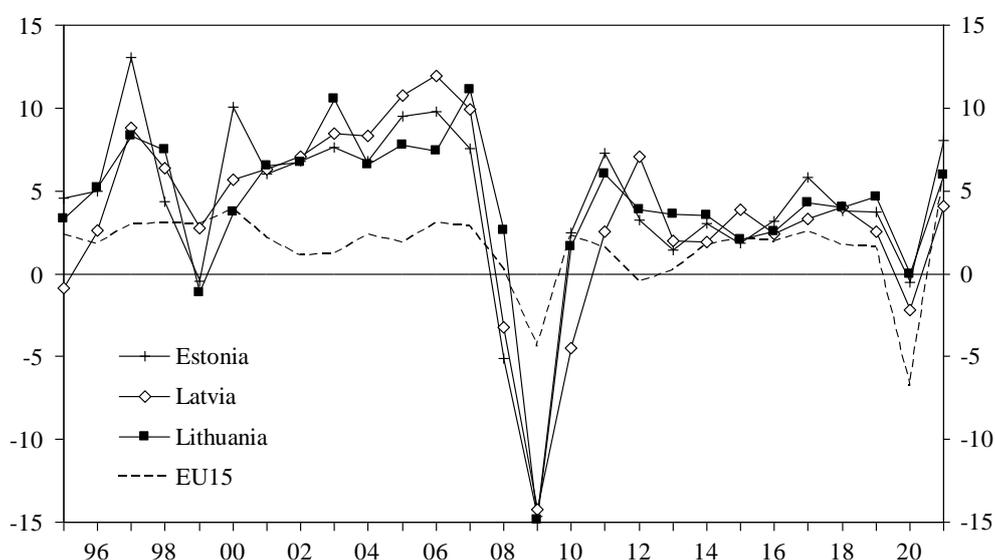
to ascertain which regime of short and medium-term economic growth applies.

As always, correlation does not mean causality. A negative correlation between economic growth and the current account balance may originate from increased domestic demand, or pull factors, causing the current account balance to deteriorate, or it could equally stem from capital inflows driven by developments outside the country, or push factors, and the capital inflows or current account deficits may be driving domestic demand. Likewise, changes in external demand may potentially have a range of causes. The empirical analysis for the Baltic states in Sections 4 and 5 establishes conditional correlations and discusses possible causal relationships only in passing.

### 3. Economic growth and convergence in the Baltic states

Economic growth in the Baltic states has been greatly affected by pronounced economic fluctuations in the three countries. Figure 1 shows the annual rate of growth of real GDP from 1995 to 2021 for the Baltic states, and for comparison also the average rate of growth for the EU15. The abbreviation EU15 refers to the first 15 countries that joined the EU, including the United Kingdom, which left in 2021.

Figure 1: GDP growth in the Baltic States and the EU15, per cent per year



Sources: Ameco (OVGD), author's calculations.

It is apparent from Figure 1 that there have been extended periods when the growth rates in the Baltic states exceeded that in the EU15, indicating that the income gap between the Baltic states and the EU15 has been narrowing over time. We will return to this point shortly. The Baltic states have seen very strong fluctuations in the business cycle since the mid-1990s, and this becomes particularly evident when the growth rates in the Baltic states are compared with those in the EU15.

The period from 1995 to 1998 saw the Baltic economies rebound after their deep declines in the early 1990s. The rebound was briefly interrupted in 1999 as the Russian financial crisis impeded exports to Russia and other ex-Soviet countries and sparked banking crises in the Baltic states. The negative fallout from the Russian crisis was short-lived though. The years from 2000 to 2007 were a golden period in the Baltic states, with high and increasing annual growth rates reaching 10 per cent or more. The boom was in large part facilitated by large capital inflows that allowed banks to extend ever more credit to households and firms (Brixiova et al. 2010, Staehr 2018).

The Baltic states were vulnerable at the start of the global financial crisis to changes in the external environment. Large capital outflows, dramatic declines in exports and collapsing confidence led to deep declines in GDP in the Baltic states, though the timing of the declines varied. All three countries experienced falls of more than 14 per cent in GDP in 2009 and total contractions of around 20 per cent over the years of the crisis. GDP growth bounced back for Estonia and Lithuania in 2011 but did so only in 2012 for Latvia.<sup>3</sup>

The years from 2012 to 2019 saw relatively stable rates of economic growth, though they were far below the rates seen before the global financial crisis. The rates in 2014–2016 were close to those of the EU15 and lower than those in the high-income countries in the region, including Sweden. These low rates of growth led to some concerns that the Baltic states risked being stuck in a middle income trap with low rates of economic growth (Staehr 2015, Aslund 2015). The concerns were largely dispelled when the economic outlook brightened and annual growth rates returned to between 3 and 5 per cent in 2017–2019.

The Covid-19 pandemic affected the dynamics of economic growth a great deal. The lockdowns led to declines in GDP in all three countries in 2020, though the declines were much smaller than the decline in the EU15. Growth rebounded strongly in 2021, especially in Estonia and Lithuania.

A key feature in Figure 1 is the substantial synchronisation of the dynamics of growth in the three Baltic states, as the timing and the size of the booms and busts are very similar in the three countries; see also Poissonnier (2017). The tight synchronisation may suggest that the business cycles in the Baltic states have in large part been driven by the same factors.

This panoramic look at the economic growth in the Baltic states reveals that the business cycles have been very strong. The global financial crisis affected the three countries to a much larger extent than it did in the West European EU countries. There was some stabilisation from 2013, but economic growth over time was lower than before the crisis. It is not possible to pin down a stable trend of economic growth in the three countries, as there have instead

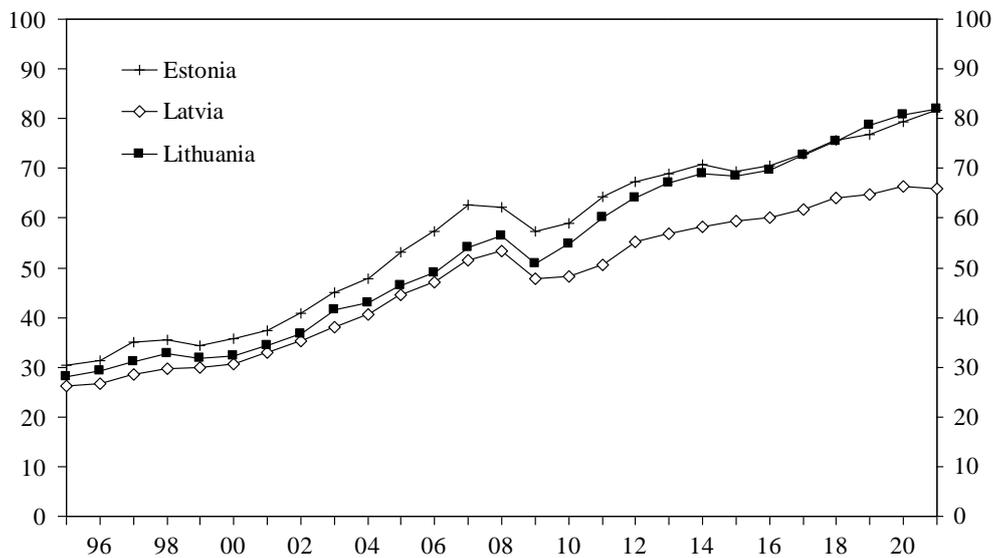
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<sup>3</sup> Latvia was arguably the hardest hit by the global financial crisis and it was the only of the Baltic states to enter a borrowing programme with the IMF, the World Bank, the EU and neighbouring countries. The programme was agreed at the end of 2008 and made in total 7.5 billion euros available for Latvia.

been discrete jumps in trend growth, as is often seen in emerging market economies (Aguira & Gopinath 2007).

The gap between the income levels of the Baltic states and that of the EU15 has declined over time. Figure 2 shows GDP per capita PPP in each of the Baltic states as a percentage of the EU15 average.<sup>4</sup> The abbreviation PPP indicates that the data are adjusted for differences in the price levels in the different countries. The GDP per capita PPP in the EU15 varies somewhat across the individual EU15 countries, but the average is close to the levels of Finland, France and the United Kingdom; for details see Eurostat (code: *NAMA\_10\_PC*).<sup>5</sup>

Figure 2: GDP per capita PPP, Baltic states, index EU15 = 100



Source: Eurostat (code: *NAMA\_10\_PC*), Ameco (code: *HVGDP*).

The paths of economic convergence are evident. GDP per capita PPP increased from around 30 per cent of the EU15 average in 1995 to around 80 per cent for Estonia and Lithuania and 65 per cent for Latvia in 2021. A comparison with Sweden, a neighbouring country with which the three Baltic states have extensive economic and financial contacts, is less encouraging, as GDP per capita PPP in Sweden was 112.5 per cent of the EU15 average in 2021 (Ameco: *HVGDP*).

The differences between the three Baltic states over the years are of some interest. Estonia has typically had the highest GDP per capita PPP of the three countries, but the gap to Lithuania started shrinking after the global financial crisis. Meanwhile, GDP per capita PPP in Latvia appears have

<sup>4</sup> The data were downloaded on 16 December 2022. The data from Ameco, the Annual Macroeconomic database of the European Commission, are from the November 2022 vintage used for the Autumn 2022 Forecast of the European Commission.

<sup>5</sup> Income levels are generally lower in Europe than in the USA; the EU15 average is around 75 per cent of the US level throughout the period considered.

lagged behind the levels in Estonia and Lithuania throughout the period from 1995 to 2021.

Figure 2 shows data for GDP per capita PPP. In some contexts it may be preferable to consider data on GDP per hour worked or GDP per person in work, since these measures reflect the productivity of those who are actually working. Labour market participation and hours worked differ across countries, so in principle there may be large differences between GDP per person and GDP per worker or per hour worked. Data for GDP per hour worked are not readily available in a format that allows comparison across countries, but the data for GDP per person employed PPP provide largely the same picture as the data for GDP per capita PPP (Ameco: *HVGDE*).

Figure 2 shows that the speed of convergence has not been uniform over the years and that it actually turned negative in a few years during the global financial crisis. It is instructive to consider three periods separately, taking the period before the global financial crisis, the period when the crisis affected the Baltic states, and the period after the crisis.<sup>6</sup> Table 1 shows the rate of convergence of GDP per capita PPP for each of the Baltic states relative to the EU15 and the number of years for the income gap to be halved that is implied by the rate of convergence.<sup>7</sup>

Table 1: Rates of income convergence in per cent and the implied half-life in years, various periods

	<b>Estonia</b>		<b>Latvia</b>		<b>Lithuania</b>	
	Rate	Half-life	Rate	Half-life	Rate	Half-life
<b>1995–2021</b>	3.9%	17.6	3.6%	18.8	4.2%	16.1
<b>1995–2007</b>	6.2%	10.8	5.8%	11.6	5.6%	12.0
<b>2007–2012</b>	1.4%	48.4	1.4%	49.1	3.5%	19.5
<b>2012–2021</b>	2.2%	31.5	2.0%	34.2	2.8%	24.6

Source: Ameco (*HVGDP*), own calculations.

Notes: The columns labelled “Rate” show the average annual rate of convergence of GDP per capita PPP relative to the EU15, while the columns labelled “Half-life” show the implied number of years for the income gap to be halved.

The rates of convergence were around 4 per cent per year over the entire time sample 1995–2021. This is substantially above the rate of 2 per cent per year that has come to be seen as a benchmark because it has been observed in many emerging market economies (Sala-i-Martin 1996, Abreu et al. 2005). The process of economic convergence in the Baltic states appears very respectable in this perspective.

<sup>6</sup> Notice that the crisis period 2007–2012 covers not only the deep falls in GDP but also the subsequent rebounds in Estonia and Lithuania in 2011 and in Latvia in 2012.

<sup>7</sup> The rate of convergence for a given time period is calculated as the average annual growth rate that brings the GDP per capita PPP relative to the EU15 from its initial level to the level at end of the time period considered.

The rates of convergence were very high during the 12 years before the global financial crisis when the Baltic states were booming. The rates of convergence declined markedly during the crisis years 2007–2012, but Lithuania performed better than Estonia and Latvia in this period. Finally, the rates of convergence after the global financial crisis are substantially below those seen before the crisis.

#### **4. The current account balance**

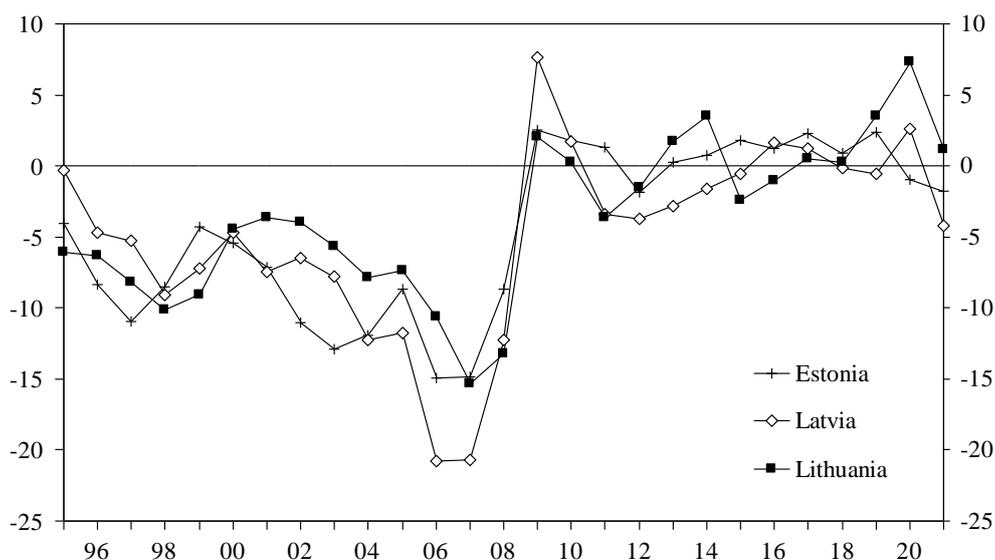
The current account is a measure of the net transfer of resources to or from an economy, and it is a key variable in macroeconomic analysis of open economies because it ties together income creation and net international capital flows. The current account balance is net exports plus net income from cross-border investments and transfers. The current account balance is also a measure of *net* capital flows, where a negative current account balance represents a net capital inflow and a positive current account balance represents a net capital outflow.

Figure 3 shows the current account balance in per cent of GDP for the three Baltic states. The countries had large current account deficits until the global financial crisis. The deficits increased markedly from the beginning of the 2000s. The capital inflows were in part caused by optimism as the Baltic states negotiated membership of NATO and the EU and then joined those organisations in 2004 (Brixiova et al. 2010, Forbes & Warnock 2012, Staehr 2017).<sup>8</sup>

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<sup>8</sup> Harkmann & Staehr (2020) use data from Central and Eastern Europe and show that the drivers of the current account balance in those countries depend on the exchange rate regime. External factors are of key importance for the dynamics of the current account in countries like the Baltic states that have fixed exchange rates or are in a currency union, whereas external factors are less important in countries with floating exchange rates.

Figure 3: Current account balance in the Baltic States, per cent of GDP



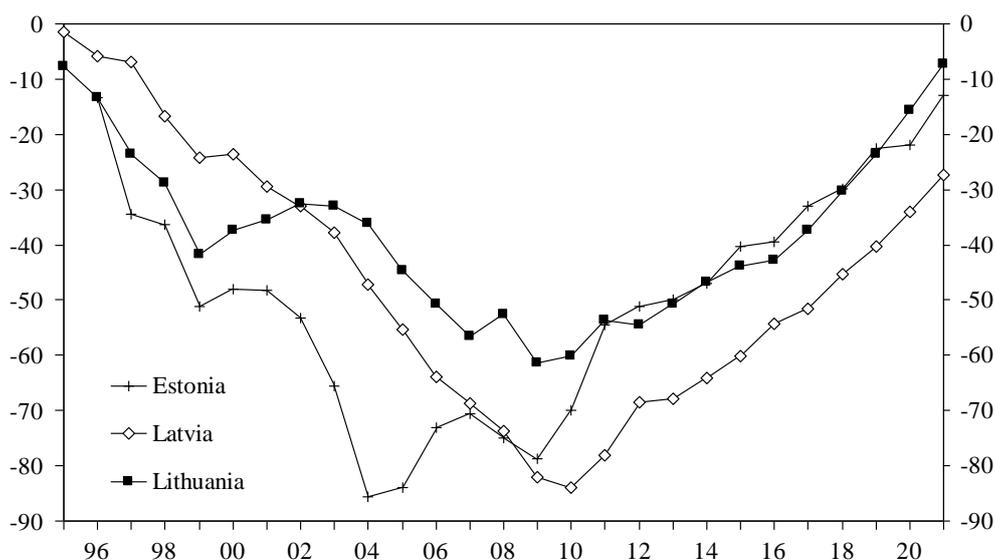
Source: Ameco (OVGD), data for Latvia for 1995-1999 are from WEO (National accounts).

The global financial crisis led to a sudden reversal of the capital flows as the extremely large inflows before the crisis were followed by current account surpluses or net capital outflows in 2009. The Baltic states were hit by a sudden stop (Calvo 1998). Numerous other emerging market economies have at times experienced sudden stops. The developed south European countries also did so after the global financial crisis.

The current account balances have generally exhibited moderate deficits or surpluses since 2010, with the large surplus in Lithuania during the first year of the Covid-19 pandemic as a partial exception. Comunale (2018) argues that the current account balances in the countries in Central and Eastern Europe have generally moved closer to their sustainable levels since the global financial crisis.

The developments of the current account balance are carried into the net international investment position, a stock variable. Figure 4 shows the net international investment position in per cent of the GDP for the three Baltic states. Data and measurement issues mean that the data should only be considered as indicative.

Figure 4: Net international investment position, per cent of GDP



Sources: Eurostat (TIPSI10). Some data for the 1990s from IMF (Net international investment position) and WEO (GDP from National accounts).

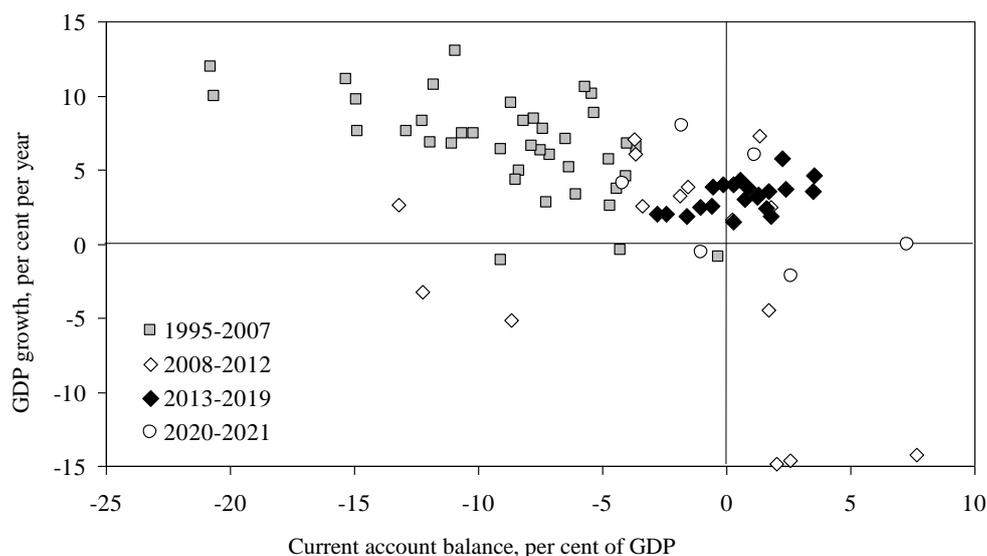
The developments are striking. The large current account deficits before the global financial crisis meant there was a substantial and prolonged deterioration in the net foreign investment position, especially in Estonia and Latvia. The net international investment positions improved markedly in all three countries in the years after the crisis. The threats to financial stability stemming from international financial imbalances and changes in sentiment have declined substantially (Obstfeld 2012, Aromí 2021).

## 5. Economic growth and the current account balance

The relationship between the rate of growth and the current account balance is of key importance for which regime of short and medium-term growth that applies; cf. the discussion in Section 2. This section investigates the relationship for the Baltic states using the data provided in Sections 3 and 4.

Figure 5 shows a scatter plot of the current account balance and the annual GDP growth for the Baltic states over the years 1995–2021. Different symbols are used for the observations across the four periods, with grey for the years 1995–2007 before the global financial crisis, white lozenges for the crisis years of 2008–2011, solid black for the years 2012–2019 after the crisis, and white circles for the two pandemic years. The figure suggests that the relationship between the current account balance and annual GDP growth changes between the periods considered.

Figure 5: Scatter plot of the current account balance and GDP growth in the Baltic states, 1995–2021



Source: See Figures 1 and 3.

Before the global financial crisis, the relationship between the current account balance and economic growth was negative, as high growth rates generally coincided with large or increasing current account deficits. The same negative relationship was seen during the global financial crisis, but the observations during the crisis were quite extreme and widely scattered.

The overall picture before and during the global financial crisis is that ebbs and flows in net capital flows into the Baltic economies are closely related to the booms and busts in the three countries. The observations are broadly consistent with economic growth being constrained by foreign capital inflows and are in line with the findings for a number of emerging-market economies and transition countries (Kaminsky et al. 2005, Aguiar & Gopinath 2007, Forbes & Warnock 2012, Staehr 2018). Before the global financial crisis, and perhaps also during the crisis, economic growth was associated with current account deficits, as would be expected in a regime of domestic demand growth.

During the years 2013–2019, after the global financial crisis, the current account balances and growth rates of GDP were much smaller in numerical terms than they were before. Moreover, the relationship between the two variables had changed and become positive in this period. Economic growth appears no longer to depend on net capital inflows and may actually have been positively related to the current account balance. Short or medium-term growth in the post-crisis period thus appears to have been associated with improvements of the current account, as would be expected in a regime of external demand growth.

The years 2020 and 2021 were unusual as the Baltic states were hit by the Covid-19 pandemic, which affected economic growth, trade and capital flows

in unprecedented ways. It is not surprising that there is not a noticeable relationship between economic growth and the current account balance during this period. The developments in 2020–2021 are thus unique and arguably have little bearing on the processes of growth in the Baltic states.

The Baltic states have been battered by numerous shocks, of which the largest was the global financial crisis but the Russian financial crisis and the Covid-19 pandemic are also noticeable. The time before the global financial crisis and the time immediately after it comprised two periods when conditions were relatively stable. The analysis in this section suggests that the short and medium-term growth regime changed between the two periods, as domestic demand dominated before the crisis and external demand took over after the crisis.

## 6. Econometric analysis

It is expedient to crosscheck the findings of the graphical analysis in Section 5 by using an econometric analysis to obtain measures of the size and statistical significance of the effects. This also makes it possible to include various control variables that could affect the year-on-year growth and thus reduce the risk of omitted variables bias.

The annual rate of economic growth is regressed on the current account balance and a varying number of control variables. All the estimations also include panel fixed effects to account for country-specific and time-invariant effects. The empirical specification is derived from specifications in Vo (2010), Aizenman et al. (2013), Staehr (2018), and Igan et al. (2020).

Most of the estimations are carried out separately for the pre-crisis sample of 1996–2007 and the post-crisis sample of 2013–2021 in order to ascertain whether there have been any changes in the association between economic growth and the current account balance. As the number of observations for each the two subsamples is very low, it is expedient to estimate the model using the method of cross-sectional Seemingly Unrelated Regression (SUR). The cross-sectional SUR is a two-step procedure that makes use of the probable correlation between the residuals across the three countries in the sample.<sup>9</sup> This correlation is a reasonable assumption given the fairly similar growth performance of the three Baltic states documented in Poissonnier (2017) and discussed in Sections 3 and 4.

The following notation is used. The variable GY denotes the annual growth rate of GDP in per cent, while CA is the current account balance in per cent of GDP. The main variable of interest is the variable CA, but we include various control variables in most of the specification. The variable YPPP is per capita income in purchasing power parity terms in per cent of the EU15

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<sup>9</sup> The first stage of the SUR methodology consists of OLS estimations with country fixed effects, from which the residuals are recovered to compute the cross-equation covariance matrix. The second stage is then a standard GLS estimation where the computed covariance matrix is used as a weighting matrix.

average; the variable is depicted in Figure 2. The variable GREER denotes the annual change in the real effective exchange rate calculated for 42 trading partners using consumer prices (Eurostat: *TIPSER13*). A positive GREER signifies a real appreciation and so indicates a deterioration in external price competitiveness. Finally, the variable FBALCYC is the cyclically adjusted budget balance in per cent of potential GDP (Ameco: *UBLGA*). Time dummies are included in some specifications to account for distinctive events.

The number of observations along the time dimension is very low so tests of the time series properties of the panel data have limited power and may not be informative. The Fisher  $\chi^2$  tests derived from augmented Dickey-Fuller tests and Phillips Perron tests suggest that the current account CA has a unit root in the pre-crisis sample and possibly also in the post-crisis sample. The variable YPPP has a unit root in both time samples. The other variables are generally found to be panel stationary in both the pre-crisis and the post-crisis sample.

The exact form in which the current account balance enters the model of economic growth cannot be derived from economic theory. Moreover, the panel unit root tests have limited power in the type of panels available for the Baltic states. The strategy is therefore to estimate two sets of panels, one set with the current account balance CA as the key regressor, and one set with the change in the current account balance in per cent of GDP,  $\Delta CA$ , as the key regressor.

Table 2 present the results of the panel data regressions for the pre-crisis sample from 1995 to 2007 using the current account balance CA. Column (2.1) shows the results when only the current account balance CA enters the fixed effect estimations. The coefficient of CA is negative and statistically significant. In the pre-crisis sample a deterioration in the current account deficit of 5 per cent of GDP is associated with economic growth being 1.8 percentage points higher than would otherwise have been the case.

Table 2: Economic growth and the current account balance in the Baltic states, pre-crisis sample 1996–2007

	(2.1)	(2.2)	(2.3)	(2.4)	(2.5)	(2.5)
<b>CA</b>	−0.357*** (0.067)	−0.342*** (0.092)	−0.312*** (0.097)	−0.345*** (0.065)	−0.350*** (0.061)	−0.314*** (0.074)
<b>YPPP(−1)</b>	..	0.044 (0.103)	..	..	..	..
<b>GY(−1)</b>	..	..	0.032 (0.140)	..	..	..
<b>GREER(−1)</b>	..	..	..	−0.165** (0.064)	−0.156** (0.063)	−0.174** (0.064)
<b>GYEU15</b>	..	..	..	..	−0.210 (0.593)	−0.334 (0.604)
<b>FBALCYC</b>	..	..	..	..	..	−0.155 (0.130)
<b>Observations</b>	36	36	36	36	36	36
<b>R<sup>2</sup> (weighted)</b>	0.459	0.426	0.411	0.545	0.546	0.539

*Notes:* The dependent variable is GY, the annual rate of GDP growth in per cent. The panel models include country fixed effects and are estimated using cross-sectional SUR. Standard errors estimated using cross-sectional SUR are shown in parentheses. Superscripts \*\*\*, \*\*, \* indicate statistical significance at the 1, 5 and 10 per cent levels respectively.

Additional regressors or control variables are included to assess the robustness of the results. When the lagged income level YPPP(−1) is included in Column (2.2), the coefficient of CA changes little. The coefficient of YPPP(−1) is statistically insignificant and the sign is counterintuitive, perhaps because the variable exhibits a panel unit root. The variable will be left out in further specifications in Table 2 given the risks of spurious results due to the panel unit root.

Column (2.3) includes the lagged dependent variable GY(−1). The coefficient of the variable is very small and statistically insignificant, while the coefficient of CA remains virtually unchanged. The first stage of the SUR estimation is the fixed effects least squares estimator. Including the lagged dependent variable can give rise to the Nickell bias when a dynamic panel model is estimated with fixed effects least squares (Nickell 1981). The lagged dependent variable will not be used in most specifications, since the variable appears unimportant, and including it could introduce a Nickell bias.

Columns (2.4) to (2.6) show the results when other control variables are included. An appreciation of the real effective exchange rate GREER has a negative effect on economic growth in the Baltic States as would be expected (see for instance Rodrik 2008). The growth rate of GDP in the EU15 countries appears is of little importance in this period. Discretionary fiscal policy has a negative effect as would be expected but the coefficient is not statistically significant. It is noticeable however that the coefficient of the current account CA remain largely unchanged despite the inclusion of these control variables.

The upshot from Table 2 is that there is a clear negative association between the current account balance and economic growth in the Baltic states in the pre-crisis sample. This applies even when a number of control variables are included. The results are generally consistent with the domestic growth regime, in which domestic demand is facilitated by a deteriorating current account balance.

Table 3 presents the results of same estimations as used in Table 2, but now for the period after the global financial crisis. This sample covers the period of the Covid-19 pandemic, which led to lockdowns and disruptions to trade and capital flows, and so the estimations include time dummies for 2020 and 2021.

Table 3: Economic growth and the current account balance in the Baltic states, post-crisis sample 2013–2021

	(3.1)	(3.2)	(3.3)	(3.4)	(3.5)	(3.6)
<b>CA</b>	0.239*** (0.065)	0.210** (0.078)	0.244*** (0.062)	0.241*** (0.067)	0.225*** (0.064)	0.167*** (0.053)
<b>YPPP(-1)</b>	..	0.075 (0.056)	..	..	..	..
<b>GY(-1)</b>	..	..	-0.103 (0.115)	..	..	..
<b>GREER(-1)</b>	..	..	..	-0.021 (0.099)	-0.129 (0.111)	-0.058 (0.085)
<b>GYEU15</b>	..	..	..	..	0.666** (0.298)	0.620** (0.224)
<b>FBALCYC</b>	..	..	..	..	..	-0.303*** (0.093)
<b>Observations</b>	27	27	27	27	27	27
<b>R<sup>2</sup> (weighted)</b>	0.788	0.835	0.792	0.787	0.835	0.897

*Notes:* The dependent variable is GY, the annual rate of GDP growth in per cent. The panel models include country fixed effects and time dummies for 2020 and 2021 and are estimated using cross-sectional SUR. Standard errors estimated using cross-sectional SUR are shown in parentheses. Superscripts \*\*\*, \*\*, \* indicate statistical significance at the 1, 5 and 10 per cent levels respectively.

Column (3.1) shows the results when the current account CA is the only regressor (besides the country fixed effects and the time dummies for 2020 and 2021). The coefficient of CA is statistically significant and a bit above 0.2, suggesting that an improvement in the current account balance of 5 percentage points is associated with GDP growth being 1.2 percentage points higher.

The estimates of the coefficient of CA change relatively little when the various control variables are included. It follows from Column (3.5) that the coefficient of the growth rate in the EU15 is around 0.6, suggesting substantial synchronisation of the business cycle in the Baltic states with that in the EU15; this was not the case in the estimations for the pre-crisis sample shown in Columns (2.5) and (2.6) in Table 2. Column (3.6) suggests that

discretionary fiscal policy has had a substantial effect on economic growth in the Baltic states in the post-crisis period.

The estimations in Table 3 included time dummies for 2020 and 2021 to account for the unusual economic developments during the pandemic. The coefficient of the dummy for 2000 is always negative, while the dummy for 2021 is typically positive but not statistically significant in most specifications. The results in Table 3 do not, however, depend on the inclusion of the years 2020 and 2021. Table A1 in Appendix A shows the results when the post-crisis sample comprises only the years 2013–2019, and the results are qualitatively the same as those in Table 3.

The key regressor in the estimations shown in Tables 2 and 3 is the current account balance. As argued earlier, this choice was only partly guided by theory and statistical analysis, and so the estimations are repeated with  $\Delta CA$ , the annual change in the current account in per cent of GDP, as the key regressor.

Table 4 shows the results for the pre-crisis period. When  $\Delta CA$  is the only regressor besides the country fixed effects, the coefficient estimate of  $\Delta CA$  is  $-0.445$  and it is statistically significant at the 1 per cent level. A deterioration in the current account balance of 5 percentage points is associated with GDP growth being 2.2 percentage points higher. The result is broadly in line with that found in Column (2.1) in Table 2, where the current account balance  $CA$  is used as the only regressor. When additional control variables are included, the coefficient of  $\Delta CA$  is still around or slightly below  $-0.4$  and it is always statistically significant.

Table 4: Economic growth and changes in the current account balance in the Baltic states, pre-crisis sample 1996–2007

	(4.1)	(4.2)	(4.3)	(4.4)	(4.5)	(4.5)
<b><math>\Delta CA</math></b>	$-0.445^{***}$ (0.127)	$-0.373^{***}$ (0.117)	$-0.403^{***}$ (0.113)	$-0.407^{***}$ (0.130)	$-0.393^{***}$ (0.132)	$-0.336^{***}$ (0.123)
<b>YPPP(-1)</b>	..	$0.194^{**}$ (0.082)	..	..	..	..
<b>GY(-1)</b>	..	..	$0.240^{**}$ (0.119)	..	..	..
<b>GREER(-1)</b>	..	..	..	$-0.144^{**}$ (0.070)	$-0.156^{**}$ (0.074)	$-0.206^{***}$ (0.069)
<b>GYEU15</b>	..	..	..	..	$0.064$ (0.710)	$-0.258$ (0.590)
<b>FBALCYC</b>	..	..	..	..	..	$-0.421^{***}$ (0.139)
<b>Observations</b>	36	36	36	36	36	36
<b><math>R^2</math> (weighted)</b>	0.274	0.341	0.325	0.324	0.321	0.452

*Notes:* The dependent variable is  $GY$ , the annual rate of GDP growth in per cent. The panel models include country fixed effects and are estimated using cross-sectional SUR. Standard errors estimated using cross-sectional SUR are shown in parentheses. Superscripts  $^{***}$ ,  $^{**}$ ,  $^*$  indicate statistical significance at the 1, 5 and 10 per cent levels respectively.

Table 5 shows the results for the post-crisis sample when  $\Delta CA$  is used as the main regressor of interest. The estimated coefficient of  $\Delta CA$  is positive, around 0.2, and statistically significant at the 1 per cent level in all cases. The results are again in line with those obtained in Table 3. The exact specification of the current account balance in the estimations of GDP growth appears to be of little importance.

Table 5: Economic growth and changes in the current account balance in the Baltic states, post-crisis sample 2013–2021

	(5.1)	(5.2)	(5.3)	(5.4)	(5.5)	(5.6)
<b><math>\Delta CA</math></b>	0.202*** (0.048)	0.208*** (0.051)	0.207*** (0.052)	0.217*** (0.048)	0.238*** (0.056)	0.211*** (0.042)
<b>YPPP(-1)</b>	..	0.126 (0.051)	..	..	..	..
<b>GY(-1)</b>	..	..	0.087 (0.154)	..	..	..
<b>GREER(-1)</b>	..	..	..	0.074 (0.100)	-0.067 (0.121)	0.028 (0.103)
<b>GYEU15</b>	..	..	..	..	0.809** (0.351)	0.707** (0.286)
<b>FBALCYC</b>	..	..	..	..	..	-0.300*** (0.081)
<b>Observations</b>	27	27	27	27	27	27
<b>R<sup>2</sup> (weighted)</b>	0.735	0.812	0.739	0.753	0.791	0.867

*Notes:* The dependent variable is GY, the annual rate of GDP growth in per cent. The panel models include country fixed effects and time dummies for 2020 and 2021 and are estimated using cross-sectional SUR. Standard errors estimated using cross-sectional SUR are shown in parentheses. Superscripts \*\*\*, \*\*, \* indicate statistical significance at the 1, 5 and 10 per cent levels respectively.

The robustness of the results are examined in a number of robustness checks. Table B1 in Appendix B shows the results when the pre-crisis and post-crisis samples are combined. The current account balance CA is interacted with dummies for the pre-crisis period and the post-crisis period to allow the coefficient of this variable to be different in the two periods. The results for the current account variable are qualitatively the same as those found previously. The coefficients of CA are positive and statistically significant for the pre-crisis period, though marginally larger than those found in Table 2. The coefficients of CA are negative and of the same size as those found in Table 3, but only statistically significant at the 10 per cent level. The slight changes in the results in Table B1 from those in Tables 2 and 3 are probably due to the fixed effects and the coefficients of the control variables being assumed to be equal in the two time periods when the pre-crisis and post-crisis samples are combined.

It is also possible to let to the coefficients of all of the regressors vary between the two periods but keep the fixed effects equal in the two periods. The results are shown in Table B2 in Appendix B. The results for the current

account balance for the pre-crisis and post-crisis periods are very close to those in Table B1.

The results are qualitative unchanged if the fixed effect models in Table 3 are estimated with fixed effects OLS instead of SUR, but the standard errors increase and the coefficient of the current account variable is sometimes not statistically significant in the post-crisis sample (not shown). Including other control variables, like the short-term and long-term real interest rates, export market growth, and various dummies such as one for the Russian crisis in 1999, does not change the results qualitatively (not shown).

The econometric analysis in this section lends support to the hypothesis of a change in the relationship between economic growth and the current account balance from the period before the global financial crisis to the period after the crisis. Before the crisis, growth was associated with a deteriorating current account balance, but after the crisis growth became associated with an improving current account balance.

The break is consistent with a change in the growth regime from one where growth is driven by domestic demand to one where growth is driven by external demand (Kregel 2016, Giles & Williams 2000). This paper is the first to identify such a structural change for the Baltic states, but studies for other countries have also found that the crisis led to changes in the structure of the economy and in the drivers of growth (Aizenman et al. 2013, Hlatshwayo & Spence 2014, Igan et al. 2020).

## **7. Final comments**

This paper considers the growth performance of the Baltic states over almost three decades from the mid-1990s to 2021. There have been strong business cycles and noticeable changes in trend growth, as is often seen in emerging market economies. Trend growth and income convergence were fast before the global financial crisis, but slowed down markedly after the crisis.

The growth performance of the Baltic states can in large part be accounted for by studying macroeconomic developments, in particular the drivers of aggregate demand and the resulting dynamics of the current account balance. Graphical and econometric analyses confirm that economic growth and the current account balance are interrelated, but in different ways before and after the global financial crisis. The relationship was negative before the crisis, as economic growth went hand-in-hand with a deterioration in the current account, while the relationship was positive so that economic growth coincided with an improvement in the current account after the crisis. These results are robust to a number of specification changes, including the addition of a number of other variables that may drive economic growth.

The results for the pre-crisis period would be consistent with economic growth being driven in large part by domestic demand that is at least partly financed by net capital inflows or current account deficits. The results for the

post-crisis period would be consistent with economic growth being driven by net external demand as measured by net capital outflows. The global financial crisis may thus have brought about a change in the regime of short or medium-term growth in the Baltic states, with a change from reliance on domestic demand to reliance on external demand. The high rates of economic growth before the global financial crisis were built on accumulation of external liabilities, while the growth rates after the crisis are lower but arguably more sustainable.

This paper is the first to provide econometric evidence for a change in the short and medium-term growth regime in the Baltic states. However, other studies have reached similar conclusions for other countries. Aizenman et al. (2013) use data for many countries over the years 1990–2010 and find that the relationship between economic growth and various types of capital flows changed during the global financial crisis. Hlatshwayo & Spence (2014) consider the US economy and argue that domestic demand played an outsized role for economic growth before the global financial crisis, while net exports played a larger role afterwards as witnessed by a reorientation of the structure of industry towards the production of tradable products. Igan et al. (2020) show that the relationship between foreign capital flows and production in various sectors in emerging market economies changed noticeably after the global financial crisis.

The analysis in this paper leaves open a number of issues. First, it would be interesting to ascertain the causal direction of the links between economic growth and the current account balance, and particularly whether internal factors or external factors are driving the current account. Second, a deeper analysis may uncover how the global financial crisis changed the underlying behaviour of firms, households and government, which manifested itself at the macroeconomic level in the changed relationship between economic growth and the current account balance. Third, the growth performance of Latvia appears to have lagged that of Estonia and Lithuania, and a comparative analysis of the factors behind this difference in performance could provide important insights. Finally, it is of policy relevance to distil policies that may speed up the process of convergence to the level of the EU15 or the Nordic neighbours. These questions are left for future research.

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## Appendix A

Table A1: Economic growth and the current account balance in the Baltic states, post-crisis sample 2013–2019

	(A1.1)	(A1.2)	(A1.3)	(A1.4)	(A1.5)	(A1.6)
<b>CA</b>	0.308*** (0.041)	0.301*** (0.044)	0.318*** (0.021)	0.307*** (0.041)	0.316*** (0.043)	0.170** (0.064)
<b>YPPP(-1)</b>	..	0.043 (0.050)	..	..	..	..
<b>GY(-1)</b>	..	..	-0.189*** (0.068)	..	..	..
<b>GREER(-1)</b>	..	..	..	-0.0066 (0.092)	-0.071 (0.115)	-0.023 (0.051)
<b>GYEU15</b>	..	..	..	..	0.474 (0.321)	0.447** (0.155)
<b>FBALCYC</b>	..	..	..	..	..	-0.824*** (0.117)
<b>Observations</b>	21	21	21	21	21	21
<b>R<sup>2</sup> (weighted)</b>	0.676	0.696	0.794	0.742	0.632	0.841

*Notes* The dependent variable is GY, the annual rate of GDP growth in per cent. The panel models include country fixed effects and are estimated using cross-sectional SUR. Standard errors estimated using cross-sectional SUR are shown in parentheses. Superscripts \*\*\*, \*\*, \* indicate statistical significance at the 1, 5 and 10 per cent levels respectively.

## Appendix B

Table B1: Economic growth and the current account balance in the Baltic states, pre-crisis and post-crisis samples combined

	(B1.1)	(B1.2)	(B1.3)	(B1.4)	(B1.5)	(B1.6)
<b>PRE×CA</b>	-0.391*** (0.049)	-0.383*** (0.052)	-0.398*** (0.066)	-0.407*** (0.045)	-0.397*** (0.047)	-0.389*** (0.051)
<b>POST×CA</b>	0.251* (0.136)	0.262* (0.138)	0.251* (0.137)	0.240* (0.130)	0.233* (0.131)	0.253* (0.131)
<b>YPPP(-1)</b>	..	-0.010 (0.027)	..	..	..	..
<b>GY(-1)</b>	..	..	-0.018 (0.108)	..	..	..
<b>GREER(-1)</b>	..	..	..	-0.137** (0.052)	-0.147** (0.056)	-0.157** (0.058)
<b>GYEU15</b>	..	..	..	..	0.235 (0.434)	0.197 (0.442)
<b>FBALCYC</b>	..	..	..	..	..	-0.075 (0.095)
<b>Observations</b>	21	21	21	21	21	21
<b>R<sup>2</sup> (weighted)</b>	0.590	0.592	0.581	0.646	0.654	0.636

*Notes* The dependent variable is GY, the annual rate of GDP growth in per cent. The variable PRE takes the value 1 for the pre-crisis period 1996-2007 and otherwise 0, while the variable POST takes the value 1 for the post-crisis period 2012-2021 and otherwise 0. The panel models include country fixed effects and time dummies for 2020 and 2021 and are estimated using cross-sectional SUR. Standard errors estimated using cross-sectional SUR are shown in parentheses. Superscripts \*\*\*, \*\*, \* indicate statistical significance at the 1, 5 and 10 per cent levels respectively.

Table B2: Economic growth and the current account balance in the Baltic states, pre-crisis and post-crisis samples combined

	(B2.1)	(B2.2)	(B2.3)	(B2.4)	(B2.5)	(B2.6)
<b>PRE×CA</b>	-0.391*** (0.049)	-0.311*** (0.07952)	-0.372*** (0.085)	-0.409*** (0.046)	-0.353*** (0.055)	-0.324*** (0.065)
<b>POST×CA</b>	0.251* (0.136)	0.248* (0.138)	0.254* (0.136)	0.225* (0.136)	0.229* (0.137)	0.249* (0.137)
<b>PRE×YPPP(-1)</b>	..	0.070 (0.080)	..	..	..	..
<b>POST×YPPP(-1)</b>	..	0.021 (0.040)	..	..	..	..
<b>PRE×GY(-1)</b>	..	..	0.013 (0.128)	..	..	..
<b>POST×GY(-1)</b>	..	..	-0.078 (0.161)	..	..	..
<b>PRE×GREER(-1)</b>	..	..	..	-0.138** (0.052)	-0.168*** (0.057)	-0.188*** (0.059)
<b>POST×GREER(-1)</b>	..	..	..	-0.109 (0.225)	-0.00088 (0.235)	0.0046 (0.237)
<b>PRE×GYEU15</b>	..	..	..	..	0.302 (0.416)	0.226 (0.422)
<b>POST×GYEU15</b>	..	..	..	..	-0.302 (0.504)	-0.475 (0.603)
<b>PRE×FBALCYC</b>	..	..	..	..	..	-0.145 (0.112)
<b>POST×FBALCYC</b>	..	..	..	..	..	-0.039 (0.188)
<b>Observations</b>	21	21	21	21	21	21
<b>R<sup>2</sup> (weighted)</b>	0.590	0.607	0.583	0.647	0.688	0.676

*Notes* The dependent variable is GY, the annual rate of GDP growth in per cent. The variable PRE takes the value 1 for the pre-crisis period 1996-2007 and otherwise 0, while the variable POST takes the value 1 for the post-crisis period 2012-2021 and otherwise 0. The panel models include country fixed effects and time dummies for 2020 and 2021 and are estimated using cross-sectional SUR. Standard errors estimated using cross-sectional SUR are shown in parentheses. Superscripts \*\*\*, \*\*, \* indicate statistical significance at the 1, 5 and 10 per cent levels respectively.

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