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Lithuanian Economic Review analyses the developments of the real sector, prices, public finance and credit in Lithuania, as well as the projected development of the domestic economy. The material presented in the Review is the result of statistical data analysis, modelling and expert assessment. The Review is prepared by the Bank of Lithuania.

During the preparation of the Lithuanian Economic Review, the data of the Bank of Lithuania, Statistics Lithuania, the European Central Bank, Eurostat, the International Monetary Fund and other data published up to 22 May 2018 were used.

Contents

Tables

Charts

Abbreviations

APP	asset purchase programme
AW	average wage
CEE	Central and Eastern Europe
CI	Commonwealth of Independent States
ECB	European Central Bank
EU	European Union
Eurostat	Statistical Office of the European Union
GDP	gross domestic product
HICP	Harmonised Index of Consumer Prices
MFI	monetary financial institutions
MRO	main refinancing operation
OECD	Organisation for Economic Cooperation and Development
OPEC	Organization of the Petroleum Exporting Countries
PIT	personal income tax
PSPP	Public Sector Purchase Program
SSC	social security contributions
UK	United Kingdom
US	United States of America
VAT	value added tax

ECONOMIC OUTLOOK

Global economic expansion has picked up steam. Despite growth-thwarting headwinds and heightened stability concerns (various geopolitical risks, disagreements on international trade, and uncertainty surrounding the impact of the changing financing conditions and Brexit), global economic activity is projected to remain robust. This is mainly underpinned by strengthening investment, manufacturing and external trade, which exert a positive impact on both advanced and developing countries. Economic development in advanced economies has been also spurred by improvements in labour market conditions, a rather moderate unemployment rate, favourable financing conditions and investment in the energy sector, which has gained momentum on the back of rising energy commodity prices. Economic growth should also benefit from the US fiscal stimulus, which will both boost economic activity within the States and drive the outlook for international trade. The upswing in emerging market economies, where activity in the recent past was dampened by a slump in commodity prices, reflects a number of factors: changes in the international environment, economic reforms implemented thus far, and improvement in global capital flows.

In contrast to expectations, the euro area – Lithuania's most important trade partner – has had a somewhat weaker start to the year. The euro area economy was saddled with strikes in the metal industries, bad weather conditions that put a lid on domestic demand, and fading fiscal efforts. Hence in the first quarter of the year, economic activity in the region was weaker than expected, although continued at an overall solid pace. Real GDP grew past its potential. Such developments in the euro area, as well as other parts of the world, were driven by the improving situation in the labour market, still unexploited labour resources, more supportive international environment and ongoing monetary accommodation.

Weakening external demand weighed on Lithuanian exports at the start of the year. Growth in exports of Lithuanian-origin goods, which is mainly directed towards Western countries, has scaled down markedly across many groups. This suggests that the deceleration in exports was influenced by foreign demand. Re-exports have also lost momentum. Yet this did not come as a surprise given that last year a surge in re-exports was driven by burgeoning Russian imports, which grew by roughly a sixth on account of inventory restocking after the recession. Following such a significant increase, import growth in Russia has moderated, which puts downward pressure on re-exports.

Although on a year-on-year basis export growth is less pronounced, Lithuania's cyclical assessment remains unchanged – economic activity continues at a pace above potential. A rather low unemployment rate and a relatively high level of job vacancies have led to significant wage pressures. Nowadays the labour share is quite high, exceeding the historical average. This reflects imbalances in the labour market – demand for employees has outpaced the supply of job seekers. Nonetheless, the recovery of investment in 2018 and the year before helps to ease the situation: it boosts production capacities, i.e. the potential level of economic activity, thus reducing mounting tensions. Part of investments, however, is oriented towards construction, which spurs demand for supplies in the short term, in turn widening economic imbalances. It is assumed that in 2018 the economy might see a larger inflow of EU funds, which in the past two years were contracting. This will bolster activity in many sectors, especially construction. In other words, although in the upcoming years growth in the exporting sector should be weaker than last year, certain factors will continue to stimulate economic activity, keeping it at levels above potential. Having increased by 3.9% in 2017, real GDP is projected to firm further, growing by 3.2% in 2018 and 2.7% in 2019.

Annual headline inflation has scaled down, yet shows signs of rather strong volatility. In Lithuania, like many other countries, the level of inflation is highly dependent on changes in commodity markets. For example, the significant rise in food commodity prices (end of 2016–2017) was matched with a faster increase in consumer prices for food. As the former started to decelerate, changes in consumer prices also became more moderate. Compared to last year, growth in consumer prices of milk and dairy products has slowed by nearly 25%, the growth rate of meat consumer prices has almost halved, while that of prices for food (excluding alcohol and tobacco) has reduced by roughly a sixth. Developments in headline inflation are also driven by fluctuations in oil prices. In 2017 the oil price in euro has increased by approximately one fifth, while in the first months of this year it was roughly one tenth higher than a year before. As a result, consumer fuel prices at the start of the year were following a more moderate upward path. The situation took a different turn in May this year, when high uncertainty started to cloud the outlook for oil supply due to the situation with respect to Iran. This led to an increase in global oil prices and, in turn, the overall consumer price level. Dynamics of service prices (prices that are most related to domestic economic progress) are relatively more stable. With a pick-up in labour costs and domestic demand, prices of services are growing quite considerably. Even though the overall rise in service prices has been slower than last year, with the impact of the most volatile prices eliminated the growth rate of service prices is rather stable, which also points to elevated economic activity

in the country.

Projections for 2018 remain unchanged: annual headline inflation in Lithuania is anticipated to slide below the level recorded last year. Although global oil prices have risen steeply, which leads to the assumption that their annual growth rate in 2018 will not lag behind the year-earlier figure, increases in other commodity prices, notably food, are expected to be less pronounced. More restrained increases in excise duties and somewhat weaker rise in prices of services will put downward pressure on inflation. Average annual inflation is expected to fall from 3.7% in 2017 to 2.7% in 2018.

Outlook for Lithuania's economy in 2018–2019

	June 2018 projection[a]			March 2018 projection		
	2017	2018[b]	2019[b]	2017[b]	2018[b]	2019[b]
Price and cost developments (annual percentage changes)						
Average annual inflation, as measured by the HICP	3.7	2.7	2.2	3.7	2.7	2.2
GDP deflator[c]	4.3	2.6	2.2	4.0	2.6	2.2
Wages	8.6	7.6	6.0	8.5	6.7	6.0
Import deflator[c]	4.4	2.8	1.7	4.1	2.6	1.7
Export deflator[c]	5.4	2.5	1.6	5.8	2.3	1.6
Economic activity (constant prices; annual percentage changes)						
Gross domestic product[c]	3.9	3.2	2.7	3.9	3.2	2.7
Private consumption expenditure[c]	4.1	3.8	3.5	4.2	3.7	3.5
General government consumption expenditure[c]	1.0	1.1	1.1	1.5	1.1	1.1
Gross fixed capital formation[c]	6.7	6.9	5.2	5.1	6.3	5.5
Exports of goods and services[c]	13.7	5.7	4.6	11.0	5.7	4.6
Imports of goods and services[c]	13.6	6.9	5.4	13.2	6.0	5.4
Labour market						
Unemployment rate (annual average as a percentage of labour force)	7.1	6.7	6.6	7.1	6.7	6.6
Employment (annual percentage changes)[d]	–0.5	–0.1	–0.3	–0.5	–0.3	–0.3
External sector (percentage of GDP)						
Balance of goods and services	2.3	1.2	0.5	1.1	0.6	–0.1
Current account balance	0.7	–0.2	–1.0	–0.1	–0.8	–1.6
Current and capital account balance	1.9	1.6	1.2	1.1	1.1	0.6

[a] These projections of macroeconomic indicators are based on information made available by 22 May 2018
[b] Projection
[c] Adjusted for seasonal and workday effects
[d] National accounts data; employment in domestic concept

I. INTERNATIONAL ENVIRONMENT

Rapid global economic growth was driven by more intensive international trade, higher investment, and improved expectations of households and businesses in 2017. In most countries, the development of investment, export and household consumption contributed to significant growth. According to the IMF estimates published in April 2018, the growth of global GDP should continue to be strong this and the next year and stand at 3.9%. However, the growth of advanced economies lost some of its momentum in the first quarter of 2018. The economy of the United Kingdom inched up only by 0.1% in the first three months, mostly due to the downsizing of the construction sector as well as slower production and domestic consumption growth. Economic development in France also slowed down significantly – from 0.7% (last quarter of 2017) to 0.2% (first quarter of 2018). On the other hand, slower-than-expected economic growth in the first quarter is believed to be of a temporary nature. The US economic growth in 2018 should be boosted by tax cuts and an upturn in general government spending. Meanwhile, economic growth in the euro area should no longer be affected by short-term factors, such as weather and public holidays, which influenced the data for the first quarter.

In 2017, the EU and euro area economies recorded stronger-than-expected expansion, with the annual growth rate standing at 2,5%. According to the Eurosystem forecasts, the euro area economy is projected to pick up in 2018 and 2019 by 2,1% and 1,9% respectively. Economic growth forecasts for the EU and the euro area reflect a strong business cycle impulse manifesting itself through higher economic confidence indicators, the recovery of international trade and favourable financing conditions. The continuation of accommodative monetary policy this year is expected to contribute to the growth of household consumption and the investment development. It was considered at the beginning of the year that the short-term growth of the EU and euro area economies may exceed expectations; however, a number of macroeconomic indicators turned out worse than expected in the first quarter of this year. The slowdown in GDP growth in Germany, the EU's largest economy, in the first quarter was driven by weaker-than-expected domestic consumption and private investment in construction as well as lower business expectations. It should be noted, however, that this slowdown is partly explained by temporary factors, such as strikes by workers in the metal industry, worse-than-usual weather conditions and the flu outbreak. However, some threats to economic growth in the euro area and the EU remain in the medium term. The high level of uncertainty surrounding the United Kingdom's exit from the EU and the outcome of negotiations on the new trade agreement poses risks. Moreover, economic growth in the EU and the euro area may decellerate, dragged down by weaker labour productivity growth.

In the first quarter of 2018, the UK's economic growth slowed to its weakest pace in five years. This significant slowdown stemmed from the slower pace of global economic growth, adverse climate conditions at the beginning of the year and uncertainty over the Brexit outcome. Slower than expected economic growth in the last quarter of 2017 led to weaker economic development of the past year overall. However, fastglobal and EU economic development is expected to stimulate exports. The development in exports this year and in 2019 should to some extent boost the country's GDP.

Economic activity in the US will remain high, mostly due to buoyant domestic demand. Procyclical fiscal policy has a positive effect on investment and consumption expenditure. It is therefore expected that GDP growth in the US will accelerate to 2.9% in 2018. Moreover, the US labour market remains strong. As of March 2018, the unemployment rate stood at 3.9% – the lowest in 17 years. On the other hand, despite some improvement in macroeconomic indicators, tax cuts weakened public finances, increasing the current account deficit and public debt, whereas employment

Many international institutions expect robust economic development in both advanced and emerging market economies.

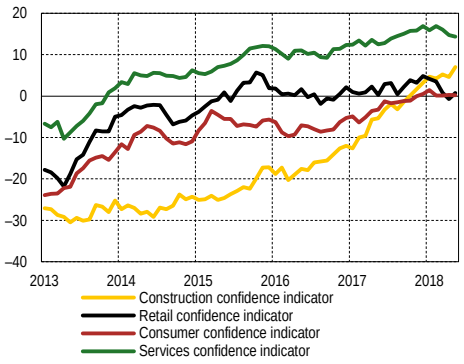
Table 1. Dynamics of GDP and consumer prices in selected advanced and emerging market economies

	2017	2018*	2019*
Real GDP change, %			
Global	3.8	3.9	3.9
Advanced economies	2.3	2.5	2.2
USA	2.3	2.9	2.7
Euro area	2.5	2.4	2.0
UK	1.8	1.6	1.5
Emerging market economies	4.3	4.6	4.9
China	6.9	6.6	6.4
Russia	1.5	1.7	1.5
Brazil	1.0	2.3	2.5
Inflation, %			
Advanced economies	1.7	2.0	1.9
Emerging market economies	4.0	4.6	4.3

* April 2018 projections by the IMF

Economic confidence indicators in the euro area have slightly decreased after showing an upward trend in 2017.

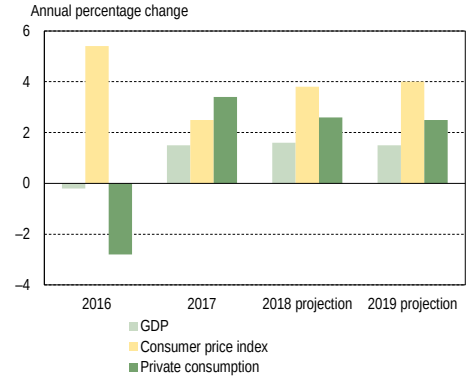
Chart 1. Dynamics of confidence indicators in the euro area



Sources: Eurostat and Bank of Lithuania calculations.

The growth of the Russian economy has stemmed from favourable external environment. Oil price developments led to a significant increase in Russia's foreign exchange reserves, whereas lower inflation allowed the central bank of Russia to reduce the annual interest rate.

Chart 2. Forecasts of Russian economic indicators



Sources: Consensus Economics and Bank of Lithuania calculations.

growth and domestic consumption are likely to push up prices in the short run.

Russia's economic growth both in 2017 and at the beginning of 2018 was rather slow, yet steady. A favourable external environment (higher commodity prices and increased international trade) strengthened Russia's current account and helped to narrow down its primary budget deficit. Oil price developments also significantly boosted in Russia's foreign exchange reserves, whereas lower inflation and its expectations allowed the central bank of Russia to reduce the annual interest rate to 7.25%.

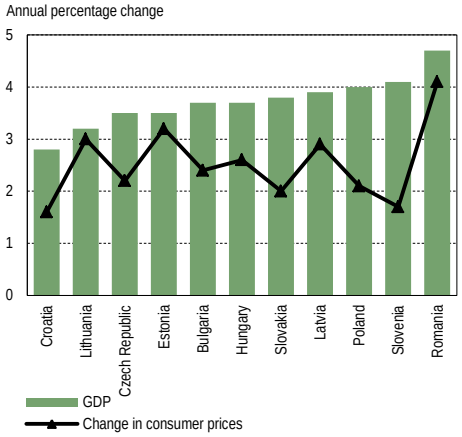
Economic growth in the neighbouring countries remains robust. In 2017, the annual growth rate of Latvia's GDP stood at 4.5%. Economic growth was underpinned by both external and domestic demand. The central bank of Latvia expects economic growth to exceed 4% in 2018, and many large-scale investment projects which were launched in 2017 will be continued this year. In addition, domestic consumption should be boosted by a substantial rise in wages. Estonia's GDP pushed up by 4.9% in 2017, recording its fastest growth rate over a decade. As in most countries, growth was driven by the development of exports and in particular a rebound in investment. Estonian economy is likely to continue on its upward climb. On the other hand, as in the other Baltic countries, growth may slow down as over the last years it has been considerably affected by an upturn in both domestic and external demand, while production capacity and labour productivity have undergone changes to a lesser extent.

Accommodative monetary policy and a more rapid pace of growth in EU countries have strengthened the economic outlook for Scandinavian countries. GDP growth in Sweden is set to remain robust on the back of accommodative fiscal policy and, in turn, more active domestic demand. In the short term, however, economic growth in Sweden is put at risk by a sluggish housing market. Because of a higher debt burden, this may significantly dampen household spending and have a damaging effect on long-term investment growth. Last year's slowdown in Norway's housing market caused a certain degree of uncertainty over the short-term growth prospects, but the latest figures show that sharp increases in employment and wages contribute to rising domestic consumption, while buoyant investment in oil is conducive to a pick up in export volumes. The outlook for economic growth in Denmark and Finland is favourable, which is suggested by higher household and business confidence indicators.

After wide fluctuations in comodity prices in 2017, at the beginning of this year their growth has been rather subdued. In contrast to previous years, oil prices rose substantially in 2017. The main underlying factors are compliance with obligations to limit oil production by OPEC and some non-OPEC countries, including Russia, as well as faster-than-expected increase in global demand, geopolitical risks and possible US sanctions against Venezuela and Iran. However, global oil prices in 2018 were higher than expected, especially in June. This was driven by an agreement between OPEC and other petroleum producing countries to reduce oil production and the US decision to withdraw from the Iran nuclear deal. In 2017, the annual growth in metal prices stood at 22%, but it is expected to scale back to 18% in 2018. The overall rise in metal prices was spurred by the widening gap between global demand and supply. Rapid global economic growth boosted demand for metal comodities amid the reduction in production in China, one of the largest exporters of metals. At the beginning of 2018, food comodity prices rose at a much slower pace than in 2017, mostly due to the fall in prices for sugar and oils. Due to improvements in raw sugar export opportunities in Brazil and India, producers were able to increase its supply, which had a downward effect on global prices. It should be noted, however, that certain comodity prices have followed a steady growing trend under the influence of adverse weather conditions, resulting in negative effects on crop production farms in North and South America and increasing cereal prices. Overall, food comodity prices are projected to grow at a much slower pace in 2018 or to be close to the 2017 price level, due to favourable climate conditions.

The economies of most Eastern and Central European countries are expected to grow well above 3% this year.

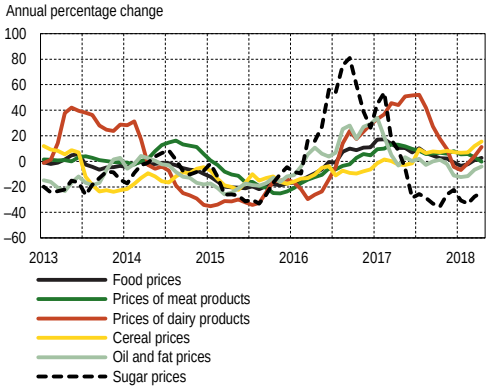
Chart 3. Inflation and GDP projections for selected Eastern and Central European countries for 2018.



Sources: Consensus Economics and Bank of Lithuania calculations.

Food comodity prices continue to rise this year, albeit at a much slower pace than in 2017.

Chart 4. Dynamics of global food comodity prices



Sources: Food and Agriculture Organization of the United Nations and Bank of Lithuania calculations.

II. MONETARY POLICY OF THE EUROSYSTEM

The Eurosystem continued implementing very accommodative monetary policy and announced its plans to keep it in place for an extended period of time. The Eurosystem continued to maintain policy interest rates at low levels and stated that they would remain at their present levels for an extended period of time, and well past the horizon of the expanded asset purchase programme (APP).

In March 2018, the Governing Council made changes to its forward guidance as regards the scope of the expanded APP, removing the reference that monthly purchases of debt securities can be increased in the future. This decision was determined by the ECB Governing Council's greater confidence that financial conditions and the balance of risks surrounding the euro area growth outlook will not see significant deterioration in the future. This confidence was reinforced by the fact that in March 2018 euro area economic growth projections were once again revised upwards, whereas inflation projections suggested that price growth is more likely to converge towards the ECB's inflation aim over the medium term. The Governing Council reiterated, however, that the duration of the APP may, if necessary, be extended. Moreover, the Governing Council continues to state that the key ECB interest rates will remain unchanged at their present low levels for an extended period of time, and well past the horizon of the expanded APP.

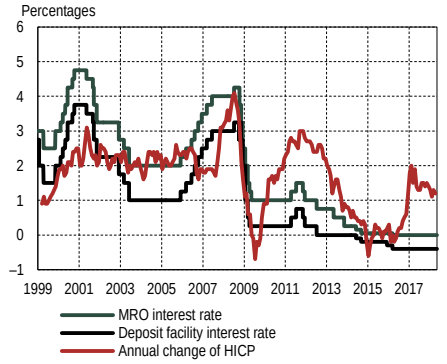
The Eurosystem continued to implement the expanded APP smoothly. Since the beginning of 2018, the expanded APP has been carried out according to the parameters of the quantitative easing scheme amended in October 2017, i.e. the monthly pace of debt securities purchases has been reduced from €60 billion to €30 billion. The expanded APP is expected to run for a total of 43 months – at least until the end of September 2018, with the overall scope of €2.6 trillion. Asset purchases made under the programme by the end of April 2018 amounted to a total of €2.4 trillion. The amount of debt securities purchased by the Eurosystem under the public sector purchase programme (PSPP) totalled €2.0 trillion, which accounts for 82% of the total assets already purchased under the expanded APP.

The Bank of Lithuania has continued to contribute to the implementation of the Eurosystem's expanded APP in a proportionate manner, as have done other national central banks of the euro area. By the end of April 2018, the Bank of Lithuania had purchased debt securities under the PSPP totalling €9.9 billion. Debt securities issued by supranational European institutions accounted for the majority of those purchases. The rest were the government debt securities of the Republic of Lithuania. These had been purchased by the Bank of Lithuania in tandem with the ECB for a total of €2.8 billion by the end of April. The current amount of government debt securities of the Republic of Lithuania purchased by the Bank of Lithuania and the ECB is equal to that of purchases as of October 2017 because in February 2018 the Government redeemed a large debt issuance, a part of which had been purchased by the Bank of Lithuania and the ECB. Given that the total amount of bonds issued by the Government of the Republic of Lithuania is smaller than the Eurosystem is ready to purchase under the expanded APP, the Bank of Lithuania and the ECB acquired new government debt securities only in the amount required to offset the February reduction. Additional planned debt securities were acquired by the Bank of Lithuania under the expanded APP as usual, by purchasing more debt securities issued by European institutions.

The cost of borrowing in capital markets for euro area governments and businesses is somewhat higher than it was in November 2017. As a result of brighter expectations about the euro area growth outlook and

The Governing Council judges that inflation is not yet sustainable enough and, therefore, continues to maintain exceptionally low key ECB interest rates.

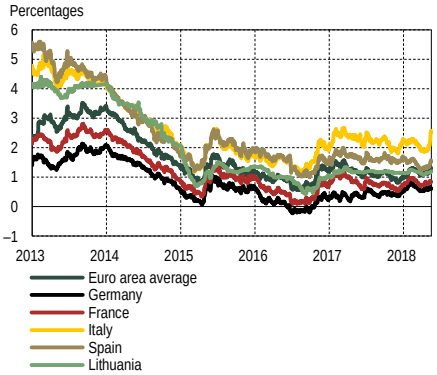
Chart 5. ECB deposit facility, MRO interest rates and inflation



Source: Thomson Reuters Datastream.

The strongest downward effect on the yields of euro area government debt securities from the expanded APP occurred before its announcement, since financial markets priced-in the growing probability that the ECB would resort to non-standard monetary policy instru-ments to asset prices. Later, a large share of fluctuations was also driven by other factors.

Chart 6. Annual yields on 10-year euro area government bonds issued in national currency

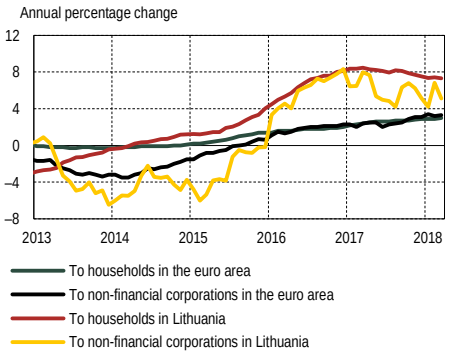


Sources: ECB and Thomson Reuters Datastream.

Note: As regards the yields of government debt securities of the Republic of Lithuania, until 31 January 2018 – Bank of Lithuania calculations, afterwards – ECB data.

Favourable funding conditions encourage lending to the real sector in the euro area and Lithuania.

Chart 7. Dynamics of the amount of MFI loans to households and non-financial corporations in the euro area and Lithuania



Sources: ECB and Bank of Lithuania calculations.

Note: Adjusted for sales and securitisation.

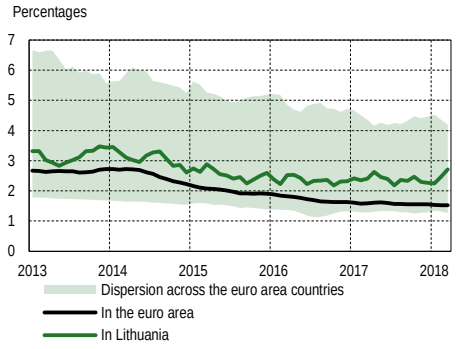
greater confidence that interest rates of major global central banks will rise at a faster pace in the future, the average yield of 10-year euro area government debt securities showed an upward trend from November 2017 to the middle of February 2018. Later, due to various factors, namely price adjustments in global equity markets, increased geopolitical unrest and somewhat worse early activity indicators of the euro area, those expectations diminished, thus, the yields of government debt securities declined slightly. In May, the yields of government debt securities of Italy and other peripheral euro area countries started increasing due to uncerntainty arising in the course of formation of Italy's ruling coalition.The yields of debt securities issued by euro area corporations were in line with the yields of government debt securities and they are also higher than they were in November 2017 (investment grade securities – by 39 basis points, and high-yield bonds – by 97 basis points).

The Eurosystem's accommodative monetary policy measures have contributed to the continued growth of bank lending in the euro area and Lithuania. It should be noted, however, that loan growth in Lithuania is currently more driven by demand factors, namely increasing business investment and rising wages.[1] Since November 2017, lending to the private non-financial sector in the euro area has been gradualy accelerating. The loan portfolio in Lithuania continues to expand at a faster pace compared to the euro area. Starting in November 2017, the average interest rates[2] on new loans to non-financial corporations have followed different trends in Lithuania and the euro area, with the interest rates going up in Lithuania (by 41 basis points) and decreasing slightly further in the euro area (by 3 basis points). In the meanwhile, the average interest rates on new housing loans in both Lithuania and the euro area have fluctuated marginally (up by 9 basis points in Lithuania and down by 3 basis points in the euro area). Overall, the level of interest rates on new loans has remained the lowest on record in the euro area and very low in Lithuania.

Very accommodative monetary policy pursued by the Eurosystem continued to exert a positive influence on macroeconomic developments in the euro area and Lithuania. ECB experts estimate that between 2016 and 2020 the Eurosystem's large-scale accommodative monetary policy will add 1.9 percentage points to the rates of both economic growth and inflation in the euro area. The positive effect of the Eurosystem's accommodative monetary policy on the Lithuanian economy mostly works through the tradeable sector, in particular as stronger demand in the euro area and the marked depreciation of the euro already before the announcement of the expanded APP have opened up more possibilities for our country's exports. The Bank of Lithuania estimates that thanks to the accommodative monetary policy the rates of domestic real GDP growth and inflation will increase by 1.0 percentage points and 1.3 percentage points respectively between 2016 and 2019.

Funding conditions for non-financial corporations have remained very favourable thanks to the accommodative monetary policy measures applied by the Eurosystem.

Chart 8. Average interest rate on new MFI loans to non-financial corporations

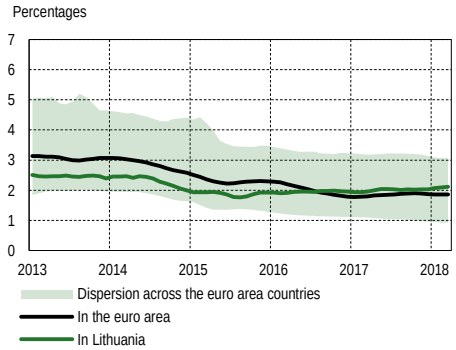


Sources: ECB and Bank of Lithuania calculations.

Note: 3-month moving average.

Although interest rates on new loans for house purchase in the euro area and Lithuania have been largely stable for some time, they remain very favourable thanks to the Eurosystem's accommodative monetary policy measures.

Chart 9. Average interest rate on new MFI housing loans



Sources: ECB and Bank of Lithuania calculations.

Note: 3-month moving average.

[1] For more details about the reasons behind the growth of the loan portfolio in Lithuania, see Chapter VII of this review.

[2] 3-month moving average values are used to compare the interest rates on new loans to non-financial corporations and households so as to minimise the effect of temporary fluctuations and filter out the trends.

III. REAL SECTOR

Lithuania's economic growth remains robust. However, compared with the first half of last year, the drivers of growth have slightly changed. Having been the main driver of economic development until the middle of last year, household consumption growth has moderated. Nevertheless, the Lithuanian economy continues to grow at strong pace, on the back of favourable external demand, which is driving growth of exports, and higher investment. It should be noted that the relatively fast economic expansion, which has been observed for quite some time, leads to a widening output gap which shows how much the current economic development has deviated from its sustainable path. A widening output gap leads to imbalances, which are now mostly noticeable in the labour market[3] and are among the main reasons for the rapid wage increases.

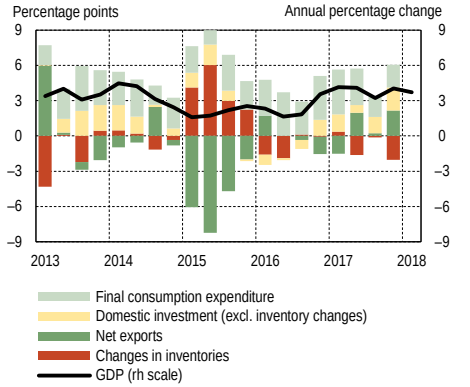
Despite robust wage growth, stagnant employment and inflation have been putting downward pressure on household consumption. They have curbed the growth of the real wage bill, one of the main factors affecting the development of household consumption. In the second half of 2017, it shrank by more than a third compared with 2016. However, wage bill, even though rising at a slower pace, has remained the main driver of the growth of real disposable income of households. Only the growth of the latter, unlike that of the real wage bill, did not slow down in the second half of 2017, which can be explained by decisions of public authorities resulting in increases in social payments to households and slower increases in social contributions. The slower growth of the latter reflects changes in the rates of Sodra (social security) contributions following the entry into force of certain provisions of the new social model, whereas higher social payments were brought about by a €10 increase in the basic pension last October. However, the gain in the household purchasing power resulting from these decisions has not yet spurred more significant growth in household consumption.

In 2017, Lithuania saw an uptick in labour productivity. With poor demographics, labour productivity is a key factor enabling economic growth. Improvements in labour productivity put the brake on the growth of the labour share in value added, which was observed in the past few years. It has been above its historical average for more than three years now. If this trend were to persist, companies would come under stronger pressure to increase prices for goods and services, which, in turn, would affect their international competitiveness.

In 2017, investment, vital for labour productivity growth, hit its fastest pace of growth in four years, which was spurred by investment both in buildings and structures and in machinery and equipment as well. Investment in the construction sector was mostly boosted by the construction of new industrial buildings and warehouses, which increased by a third, and by the modernisation and development of engineering systems, in particular gas and electricity, which also picked up by a third. Rising investment in construction bolsters activity in the construction sector as well. After a few years' break, this sector is again among the main economic activities contributing to the growth of the Lithuanian economy. An upswing in the investment in vehicles is mostly driven by the ongoing renewal and development of the truck fleet by cargo transportation companies, as well as the renewal of the passenger vehicle fleet. In the second half of 2017, investment in ICT, as well as in intellectual property products, still outpaced total investment growth. This shows that companies have been continuing automation and digitalisation of production processes. The general government sector also significantly contributed to an upturn in investment in 2017. National defence was among the largest recipients of additional investment.

With household consumption growth moderating, rapid economic growth in Lithuania is boosted by expanding export volumes, which are driven by favourable external demand and rising investment.

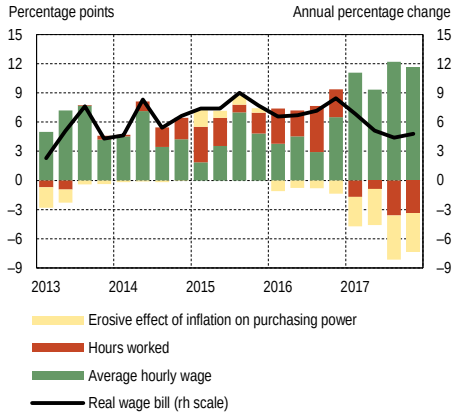
Chart 10.Contributions to real GDP by expenditure approach



Sources: Statistics Lithuania and Bank of Lithuania calculations.

Stagnant employment and inflation have dampened the growth of the real wage bill.

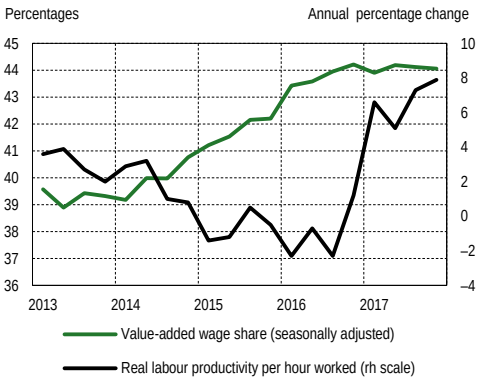
Chart 11. Contributions to the real wage bill



Sources: Statistics Lithuania and Bank of Lithuania calculations.

An uptick in labour productivity put the brake on the growth of labour share in value added, which was observed in the past few years.

Chart 12. Labour productivity and labour share in value added



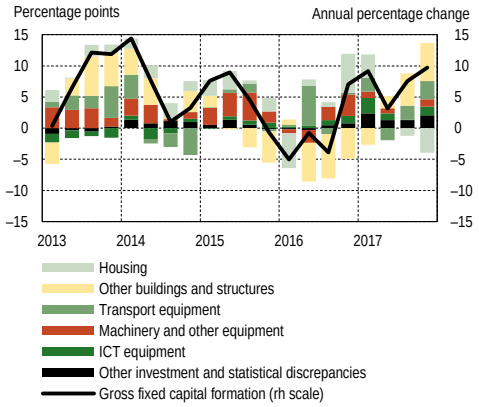
Sources: Eurostat, Statistics Lithuania and Bank of Lithuania calculations.

[3] For more details about the situation in the labour market, see Chapter IV of this review.

Increasing investment and external demand are the main drivers of rapid growth in real exports of goods and services. In 2017, it hit its fastest pace in six years. One of the factors, namely external demand, has been picking up speed form mid-2015 untill the end of 2017. Demand initially started gathering pace in the EU countries, then it also picked up in the CIS region, which started to recover in 2017 after a two-year downturn. The latest data shows that external demand should moderate this year. This will curb the development of exports of goods and services. However, the growth in exports of goods and services has been outpacing external demand for quite some time, leading to the increase of Lithuanian export market share. This shows that Lithuanian companies have been successfully investing in the expansion of production capacity and automation of processes, as well as introducing processes to achieve more efficient utilisation of the existing production capacity. The expected acceleration of investment growth should allow exporters to maintain a relatively fast growth rates.

In 2017, investment grew at its fastest pace in four years.

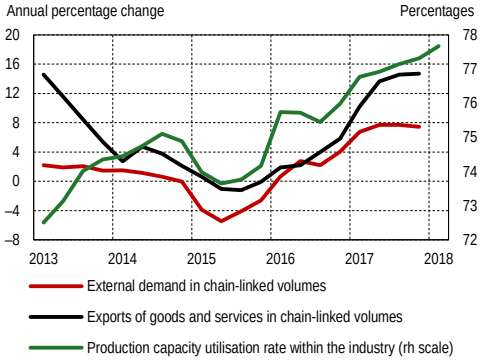
Chart 13. Contributions to investment in chain-linked volumes



Sources: Statistics Lithuania and Bank of Lithuania calculations.

Increasing investment and external demand are the main drivers of rapid growth in real exports of goods and services.

Chart 14. External demand, production capacity utilisation rate, and exports of goods and services (seasonally adjusted)



Sources: Statistics Lithuania, ECB and Bank of Lithuania calculations.

IV. LABOUR MARKET

Labour market tension has increased, but the situation varies between larger and smaller regions of the country. The unemployment rate stood at 7.2% at the beginning of the year and was 0.8 percentage point lower than a year ago. Unemployment has been declining for over a year now at a slower pace than in the last four years. This could mean that most of the unused labour resources have already been exhausted. For instance, the unemployment rate in large cities (Vilnius, Kaunas and Klaipėda), at 3.8% last year, was the same as that recorded during the boom of the last decade. At this level of unemployment, companies often hire persons already employed by other companies rather than the unemployed. However, unemployment in the rest of the country stood at 9%, which is double the rate recorded in the boom years. This reflects regional economic problems, for instance, that since 2013 economic expansion in this part of the country has been significantly slower than in major city regions.

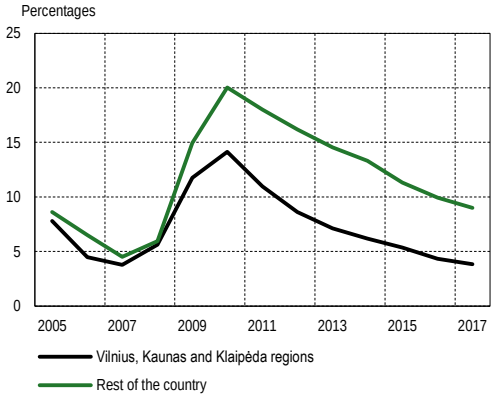
The pace of job creation has been slower than usual amid increasing difficulties for businesses to find workers. Changes in certain economic activities have been brought about by specific factors other than the labour shortage, e.g. the number of jobs in the trade sector has been declining as several larger retail chains automated, or transferred to other companies part of their functions. The decrease in jobs in educational institutions has been caused by the reduction of the network of educational institutions. As regards many other businesses, however, a slowdown in new jobs has been driven by a rising labour shortage. At the beginning of the year, 18% of companies were affected by that, against only 14% a year ago. Moreover, the growing labour shortage affects an increasing number of economic sectors: until the beginning of 2017, this increase was more noticeable only in industry and trade, whereas recently it has been picking up in construction and services as well.

Simplified immigration procedures and labour shortage have contributed to the increased number of immigrants from non-EU countries. Since the beginning of 2017, when hiring workers from non-EU countries having professions of which there is a shortage in Lithuania, it is no longer required to check whether there is an EU citizen who could fill that position. This boosted the immigration of foreigners (mainly from Ukraine and Belarus). At the beginning of the year, the list of professions with a shortage of workers[4] was supplemented by some construction professions. This will increase the number of companies which can benefit from simplified immigration procedures. However, total immigration in 2017 remained broadly unchanged as the increased immigration of foreigners was offset by the decreased return migration of Lithuanian citizens. It should be noted, however, that the latter decrease in the Lithuanian migration statistics could have been affected by a step-up in administration of debts for compulsory healthcare insurance. This factor had a marked impact on emigration data at the beginning of 2017.

Wage growth was robust, but a bit slower than in the previous quarters. The slowdown in the second half of 2017 stemmed from the fading effect of the minimum wage increase. Any further decelleration was prevented by the provision of the new Labour Code effective as of July 2017 stating that the minimum wage is paid only for unskilled work. It contributed to the decrease of the share of full-time minimum wage workers from 9.8% to 3.3%. The minimum wage pickup of 5.2% in January of this year gave a slight boost to wage growth, though less than usually, because of the decrease of the said share of workers. In general, rapid wage growth is spurred by labour shortages. Such shortages are felt most acutely by companies in major cities searching for skilled workers. This year wage growth is most likely also supported by an introduction of social insurance

Although there is a more acute shortage of workers in the country, the situation in the labour market varies across regions.

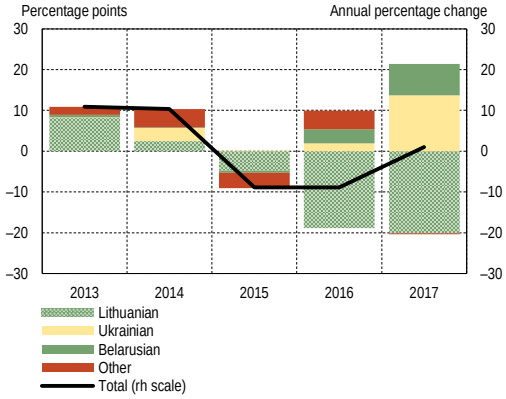
Chart 15. Unemployment rate in large cities and the rest of the country



Sources: Statistics Lithuania and Bank of Lithuania calculations.

The immigration of foreigners was triggered by simplified procedures for their employment and a growing labour shortages.

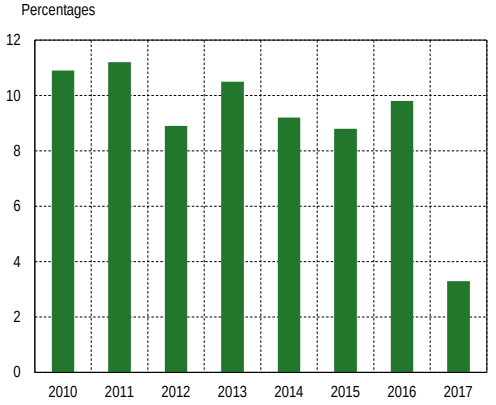
Chart 16. Contributions to immigration by citizenship



Sources: Statistics Lithuania and Bank of Lithuania calculations.

The new Labour Code contributed to the decrease in the share of minimum wage workers.

Chart 17. Share of minimum wage workers



Sources: Statistics Lithuania.

[4] It included four professions: long distance driver, welder, tailor, and ship hull assembler.

payment floors. This could have encouraged business to increase wages for employees earning less than minimum wage. Finaly, rapid wage growth is spurred by labour shortages. Such shortages are felt most acutely by companies in major cities searching for skilled workers. Another important factor is a rather rapid rise in wages in the public sector for over a year now.

V. EXTERNAL SECTOR

Exports saw exceptionally robust growth in 2017. Nominal exports of goods pushed up by 16.9%, supported by the rising commodity and product prices as well as by the expanding real exports. As usual, the development of exports was also bolstered considerably by the investments of Lithuanian manufacturers. Last year, tangible investment in the manufacturing sector recorded an upturn of 16.0%. This increased the production capacities of companies and, in turn, opportunities for export expansion. On the other hand, exports benefited from a much more favourable international economic environment. The global economy was gathering speed, while Lithuania's main export partners were in a better position. 2017 saw a pickup in real imports of 5.1% in Germany, 9.5% in Latvia, 3.5% in Estonia, 8.7% in Poland and 4.5% in the EU as a whole. Given that a large share of exports of Lithuanian origin go to the EU in particular, this increase in EU imports was particularly beneficial for Lithuanian manufacturers. Moreover, foreign trade with another trade partner, Russia, also saw an upswing. With the Russian economy returning to growth, the rebuilding of production, trade and other stocks commenced, which significantly raised the country's imports. Russia's real imports went up by 17.4% in 2017. Russia is a major market for Lithuania's re-exports; therefore, this increase in imports favoured the Lithuanian transport sector. In general, the development of re-exports last year accounted for almost half of the total growth in nominal exports of goods.

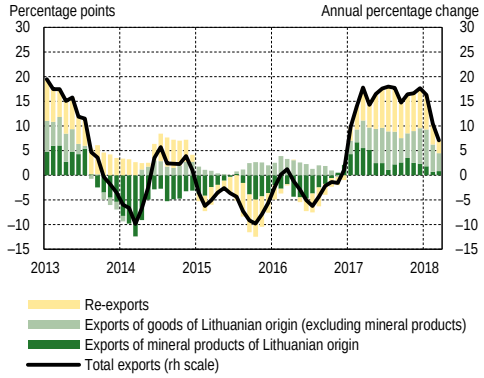
This year, growth in exports has started to lose its steam. Both exports of Lithuanian origin and re-exports have recorded a slowdown in growth. After an upswing in Russian imports last year, this year saw a decrease, which has a downward effect on the development of Lithuanian re-exports. The growth rate of exports of Lithuanian origin has also moved to a downward path; however, the growth of these exports is registered in all groups of goods. Their main destination is the EU, thus, this slowdown could have been caused by slightly weaker EU economic indicators at the beginning of the year. The development of exports is also driven by increased exports to other non-EU or CIS countries. The main destinations of increased exports include the US, United Arab Emirates, Turkey, Ukraine, and Singapore. Overall, more moderate development of exports is no accident because of a lower rise in comodity and product prices and a slower increase in external demand. Higher uncertainty over further prospects stems from foreign trade restrictions which the major powers have started applying.

The current account is close to balanced. With the growth of nominal exports outpacing that of imports, 2017 saw improvements in the trade balance. However, this is true only for the balance of trade in services, which improved mostly due to the rapidly expanding transport sector. The balance of trade in goods somewhat deteriorated on the back of higher energy comodity and product prices. The primary balance, compared with 2016 figures, slightly improved – the deficit was smaller. However, the components of this balance developed differently. The balances of labour and investment incomes remained fairly stable, whereas the balance of other primary incomes improved, mostly due to increased EU funds allocated for agricultural subsidies. The balance of secondary incomes remained fairly stable, with a similar surplus as in the previous year. All the main balances of secondary incomes – general government, personal transfers, etc. – remained at a similar level to 2016.

After recording exceptionally rapid growth in 2017, this year exports of goods continue to grow at a slower pace.

Chart 18. Exports of goods of Lithuanian origin and re-exports

(3-month moving averages)

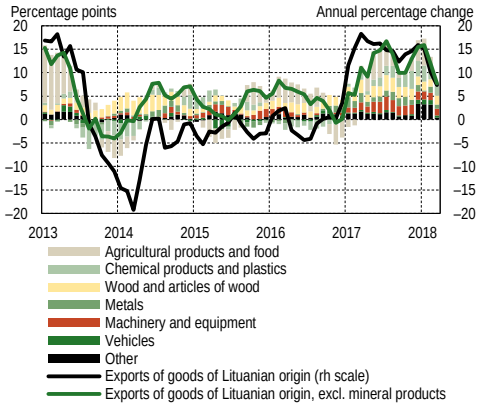


Sources: Statistics Lithuania and Bank of Lithuania calculations.

Exports of goods of Lithuanian origin have been picking up at a slower pace, but the growth of these exports is registered in all groups of goods.

Chart 19. Exports of goods of Lithuanian origin, excluding mineral products, by product

(3-month moving averages)

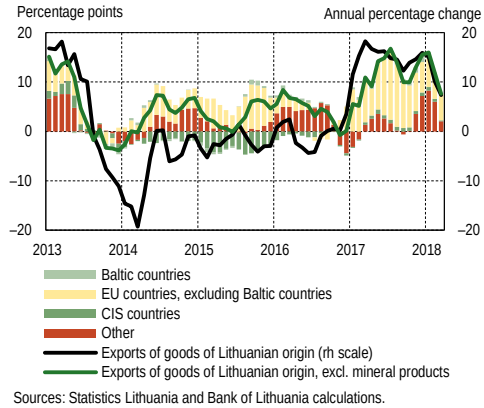


Sources: Statistics Lithuania and Bank of Lithuania calculations.

Exports of goods of Lithuanian origin to the EU have been rising slower, while the growth of exports to other non-EU countries has picked up.

Chart 20. Exports of goods of Lithuanian origin, excluding mineral products, by country

(3-month moving averages)



Sources: Statistics Lithuania and Bank of Lithuania calculations.

VI. PRICES AND COSTS

Average annual inflation, as measured by the HICP, stood at 3.7% in 2017, which is well above its level in the past few years. Annual inflation started to pick up towards the end of 2016 and in 2017 it exceeded 3% in all months, except for January. Inflation was uneven. It followed an upward path until September reaching its peak (over 4.6%), then it inched down and stood at about 3.8% at the end of the year. In 2017, the evolution of prices in all groups was less favourable for consumers than in 2016 as prices for services, food, including alcohol and tobacco, and industrial goods rose at a faster pace, administered prices decreased at a slower pace, while fuel and lubricant prices picked up significantly last year after being in decline in 2016.

In the second half of 2017, inflation reversed its upward trend and started to decline, mostly due to the developments in prices for food, including beverages and tobacco. First of all, the impact of increased taxes, in particular, a year ago raised excise duties on alcoholic beverages, started to lose their grip on headline inflation this March. No increase in excise duties on alcoholic beverages is envisaged this year, thus, the growth of prices of these beverages are expected to moderate. The growth of food prices, excluding alcoholic beverages and tobacco, has returned to a downward path since last October. The evolution of prices of milk and dairy products, which are among the most frequently consumed food products in Lithuania, has become more favourable for consumers. For instance, a substantial growth in raw milk production in Europe has given a boost to the supply of dairy and dairy-related products. Due to this as well as large milk powder reserves, at the beginning of the year, the prices of milk and dairy products, which account for nearly 4% of the average Lithuanian consumer basket, have been rising at a much slower pace than last year. The growth of other food comodity (such as meat and cereal) prices at the beginning of this year remained rather slow (less than 2%), except for sugar prices which have been on a downward path for some time due to large global reserves.

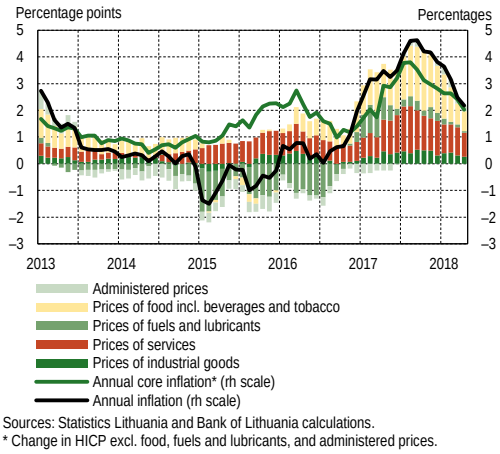
Slower growth in fuel prices also put downward pressure on headline inflation at the beginning of this year. The annual growth of these prices was about 15% at the beginning of last year, and about 2% at the beginning of this year. It should be noted, however, that global oil prices in the first months of 2018 were higher than expected and they accelerated in May. This was driven by an agreement between OPEC and other petroleum producing countries to reduce oil production. Oil prices were also affected by the US decision to withdraw from the Iran nuclear deal, unrest in Venezuela and strong global oil demand. Oil comodity prices in 2018 are expected to be higher than last year. The oil market, however, is very volatile, thus various unforeseen changes, particularly in supply, are possible.

Core inflation, the calculation of which includes only market prices for services and industrial goods, has scaled down, similarly to headline annual inflation. Having reached 3.8% in August 2017, core inflation stood at 2% this April. It was mainly affected by increasing service prices (the average annual rise in service prices exceeded 5% in 2017). These prices are markedly affected by changes in the labour market, in particular robust wage growth fuelled by the labour shortage and the minimum monthly wage increase. Wages have far outpaced labour productivity, which in turn have increased unit labour costs. Historical data indicate that the relationship between unit labour costs and service prices is positive and rather strong (see Chart 24). It should be noted, however, that these and other prices are influenced by more than one factor at the same time, but service prices seem to be more closely related to unit labour costs than some other prices.

Nevertheless, the growth of service prices should slow down somewhat in the short term. One reason to this is that in the coming years

Both in 2017 and at the beginning of 2018, inflation in Lithuania was mainly fuelled by rising prices for food products, including alcohol and tobacco, and services.

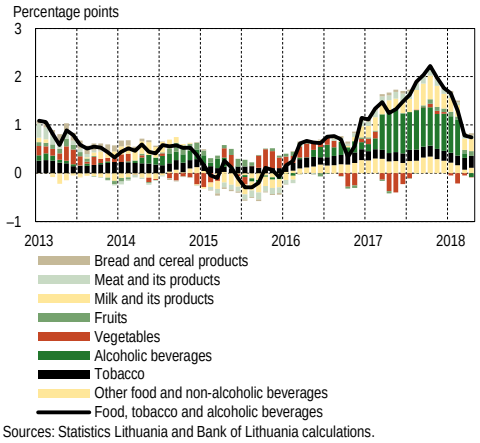
Chart 21. Contributions to annual HICP inflation



Sources: Statistics Lithuania and Bank of Lithuania calculations.
* Change in HICP excl. food, fuels and lubricants, and administered prices.

However, the general rate of growth in food prices in Lithuania has slowed noticeably.

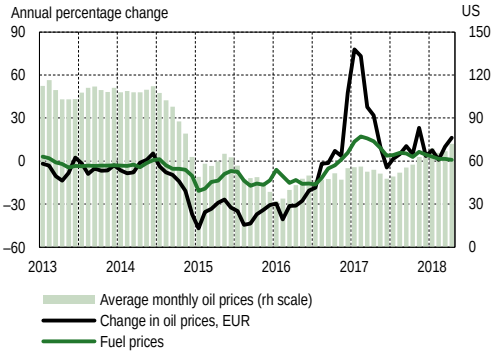
Chart 22. Contributions to headline annual inflation from prices for food, tobacco and beverages



Sources: Statistics Lithuania and Bank of Lithuania calculations.

World oil prices are picking up again.

Chart 23. Dynamics of global oil prices and fuel prices in Lithuania



Sources: Thompson Reuters, Statistics Lithuania and Bank of Lithuania calculations.

the average wage should grow at a slower pace than last year and the year before. Service prices have already returned to a downward path in the first quarter of this year. This change, however, has more to do with short-term price fluctuations, in particular prices for package holidays, passenger transport by air or accommodation services, rather than underlying economic factors, such as labour costs.

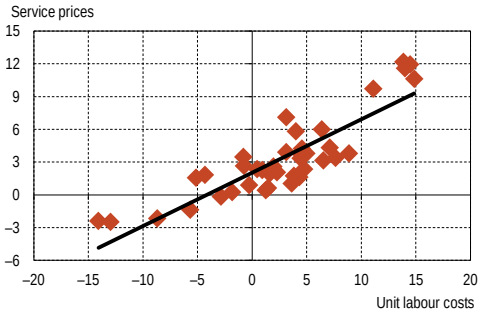
Compared to services, prices of the other component of core inflation, i.e. industrial goods, fluctuate to a lesser extent and their fluctuations are determined by seasonal factors. Fluctuations in prices in this group of goods are significantly affected by changes in clothing and footwear prices, but in the first quarter of this year they were also influenced by a pickup in solid fuel prices. In the meanwhile, pharmaceutical products have put more significant downward pressure on the overall growth in prices of industrial goods. These products saw a fall in price by 1.9% last year, and this year the prices of pharmaceutical products are 4% lower than a year ago, partly due to a reduction in VAT rate from 21% to 5% for prescription-only non-reimbursable medicines.

Contrary to other price groups, administered prices have recently been pushing up inflation more than last year. The overall growth in administered prices is mostly driven by increasing waste collection and heat energy prices. The latter went up quite significantly this season on the back of a substantial growth in biofuel prices, an increase in prices of independent heat producers and an uptick in gas prices. Annual changes in prices show that, out of administered prices relevant for households, only electricity prices were reduced.

After the upsurge in the euro area in 2017, headline inflation has recently slightly subsided. There was a decline not only in the core inflation (excluding energy and food prices), but also in the growth of other prices. This decrease was driven by a slower increase in energy prices and a somewhat weaker growth in unprocessed food prices. Simultaneously, core inflation in the euro area, currently at 1.0%, as in Lithuania, is mostly fuelled by rising service prices. Amid improvements in the economy of the euro area, the growth of service prices remains rather stable.

Rising service prices are influenced by increasing unit labour costs.

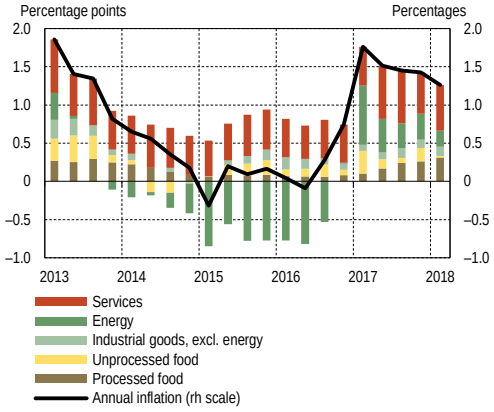
Chart 24. Relationship between the annual growth of service prices and unit labour costs between 2008 and 2017 (on a quarterly basis)



Sources: Statistics Lithuania and Bank of Lithuania calculations.

Headline inflation in the euro area has been slightly decreasing as well.

Chart 25. HICP inflation in the euro area and its contributory factors



Sources: Eurostat and Bank of Lithuania.

VII. FINANCING OF THE ECONOMY[5]

Lending in Lithuania continues its upward momentum. The portfolio of MFI loans to the private non-financial sector expanded by 6.2% year-on-year inMarch 2018, whereas the net flow of new loans picked up by 10.8% in the same period. The loan portfolio has been recording positive annual growth for the third year in a row, so far exhibiting no significant signs of slowing down. Although the pace of credit growth is still relatively fast, compared to the country's real economy, such developments can be considered to correspond to macroeconomic development. For instance, in 2017, credit in Lithuania recorded an upturn of 8.5%, while nominal GDP[6] – of 8.2%, therefore, the credit-to-GDP ratio, which indicates the level of indebtedness has not changed significantly.

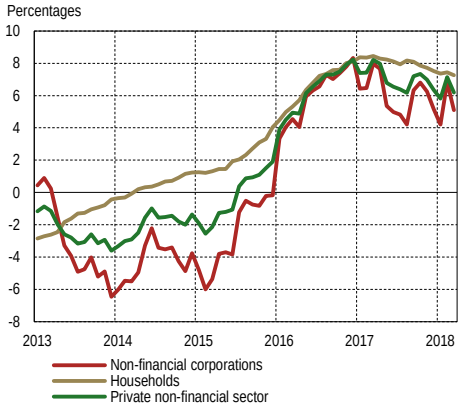
The overall growth of the loan portfolio was mainly driven by housing loans. In March 2018, the housing loan portfolio was 7.9% up on the previous year, and the net flow of new loans pushed up by 7.2%. Households also actively borrowed for consumption purposes. Although the growth rate of the consumer loan portfolio lost some of its steam compared with the beginning of 2017, it still has been fairly robust (4.7%). The main factors contributing to substantial household borrowing were low interest rates, increasing wages, stronger consumption and heightened household expectations about future prospects. Household borrowing is expected to keep rising, though at a slower pace, because interest rates on housing loans show moderate growth and activity in the real estate market has waned.

Lending to business has been stimulated by active national economy, sustainable financial position of businesses and recovering investment. The portfolio of MFI loans to non-financial corporations recorded growth and in March 2018 was 5.1% up on the previous year. Although the growth rate of individual large-scale loans is underpinned by constant fluctuations, it has been positive since the beginning of 2016. Growing credit demand is mainly driven by improving expectations of companies about business prospects and, in turn, more active investment. In addition, companies have been experiencing some positive changes for some time, namely increasing income, growing profits and improving liquidity of their assets; therefore, banks have been more willing to finance business. A significant contribution to positive credit developments was made by companies engaged in trade and professional, scientific or technical activities. In 2017, the portfolio of loans granted to those companies expanded by €146.2 million and €188.0 million respectively. The sharpest decrease is observed in the portfolio of loans granted to the energy sector, which, as a result of fast reduction in value of large short-term loans, lost two fifths of its value during 2017.

Though interest rates remain relatively low, lending conditions for certain sectors have been tightened. For instance, in recent years interest rates on housing loans have been moderately increasing. In March 2018, the average interest rate on new housing loans stood at 2.20% and was 0.17 percentage point up on the previous year. The cost of large-scale loans granted to companies carrying out construction activities recorded a significant upturn, which indicates that banks view this segment as one of the riskiest. Interest rates on new small-scale loans (up to €29 thousand) granted to construction companies remained fairly stable, whereas interest rates on large-scale loans (over €290 thousand) increased.

Lending in Lithuania continues its upward momentum.

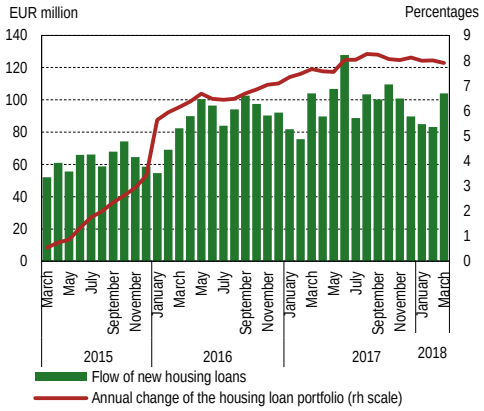
Chart 26. Evolution of the MFI loan portfolio



Source: Bank of Lithuania.

Borrowing for house purchase is not subsiding.

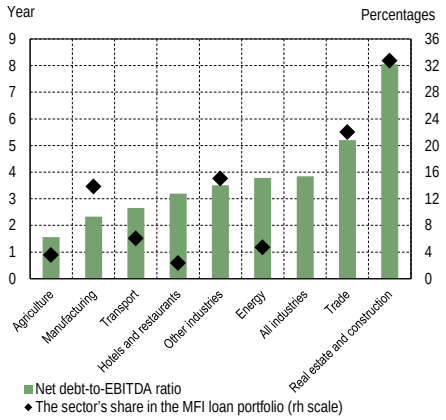
Chart 27. Net flow of new MFI housing loans and annual growth of the housing loan portfolio



Source: Bank of Lithuania.

The real estate (including construction) sector accounts for the largest share of the MFI loan portfolio and is characterised by the greatest burden of liabilities.

Chart 28. Net debt-to-EBITDA ratio and sector's share in the MFI loan portfolio



Sources: Statistics Lithuania and Bank of Lithuania calculations.

[5] In order to evaluate loans, this section includes MFI data provided by the Statistics Department of the Economics and Financial Stability Service of the Bank of Lithuania, which is adjusted to take account of the bankruptcies and mergers in the sector concerned (for more details, see Annex 2 to the Lithuanian Economic Review, December 2014). This data may differ from the data collected from banks for supervisory purposes.

[6] Four-quarter moving sum.

VIII. GENERAL GOVERNMENT FINANCE

In 2017, for the second year in a row, Lithuania recorded a positive general government balance, with a surplus amounting to 0.6% of GDP, a 0.3 percentage point increase on the previous year. This improvement in the fiscal position was mainly driven by a favourable phase of the economic cycle, which brought increases in tax revenue and social contributions, and the restrained growth of expenditure due to decreasing interest payments as well as current and capital expenditure. Although the growth of general government revenue and expenditure in 2017 was at its highest over the past few years (on the expenditure side since 2011, and on the revenue side since 2014), faster nominal GDP growth led to a decrease in the ratio of general government revenue to GDP as well as the ratio of general government expenditure to GDP to 33.9% and 33.3% respectively. On the basis of those ratios indicating what share of GDP is redistributed through the general government budget, Lithuania still has one of the lowest levels of redistribution in the EU. Though the general government balance is projected to be in surplus this year and next year, there is a risk in this phase of the economic cycle associated with the implementation of pro-cyclical fiscal policy. Since part of surplus builds up specifically because of the favourable cyclical position, it would therefore be advisable to refrain from providing additional stimulus to the economy by fiscal policy measures.

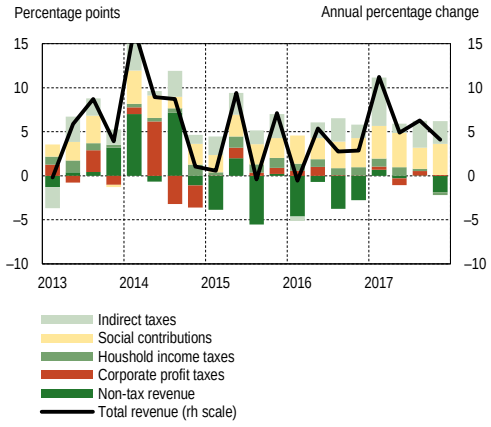
In the second half of 2017, general government revenue was 5.1% up on the previous year. Its growth was mainly driven by an upturn in social contributions as well as a rise in revenue from the three main taxes, namely VAT, personal income tax and excise duties. The growth of revenue from social contributions and personal income tax was driven by rapid wage increases. This factor spurred household consumption, which in turn pushed up revenue from indirect taxes (VAT and excise duties). Improvements in the collection of excise duties were also influenced by increases in excise duties on processed tobacco and alcoholic beverages from March 2017. It should be noted that the ratio of tax revenue to GDP scaled back slightly in 2017, as a result of worsening corporate income tax collection (partly due to previous years' profit tax overpayments being refunded or offset against other tax liabilities). Capital and current transfers (a component of non-tax revenue) followed a downward path in the second half of the year. Such developments mainly stem from the slow uptake of funds available under the EU's Financial Perspective 2014–2020.

In the second half of 2017, general government expenditure was 6% up on the previous year, mainly reflecting more rapid increases in social benefits and investment. The acceleration of the growth of social benefits was mainly driven by a €10 increase in the basic pension (resulting in a pension increase of around 4.7% on average) in October 2017. Despite weak growth in EU assistance funds, investment pushed up by 14.9% in the second half of the year. General government expenditure rose on the back of growing spending on intermediate consumption and wages. It should be noted, however, that the growth of the latter expenditure dipped to 1% in the fourth quarter of the year, once the effect of the factors which put upward pressure on expenditure, namely the minimum monthly wage increase and the wage increase for teachers, faded away. Nevertheless, some factors, such as decreasing interest contributions as well as current and capital transfers, had a restrictive effect on the growth of general government expenditure.

In 2017, the general government debt-to-GDP ratio decreased by 0.4 percentage point to 39.7%. The debt level in euro went up in 2017 (due to preparations for a redemption of bonds at the beginning of 2018), but faster growth in nominal GDP (included in the denominator of the debt-to-GDP ratio) led to the overall decrease in the ratio. In 2018, the debt-to-GDP ratio should continue its downward trend due to the redemption of the issue of Eurobonds worth €1.3 billion at the beginning of 2018.

The growth of general government revenue in the second half of 2017 was mainly due to increases in social contributions and in revenue from indirect taxes.

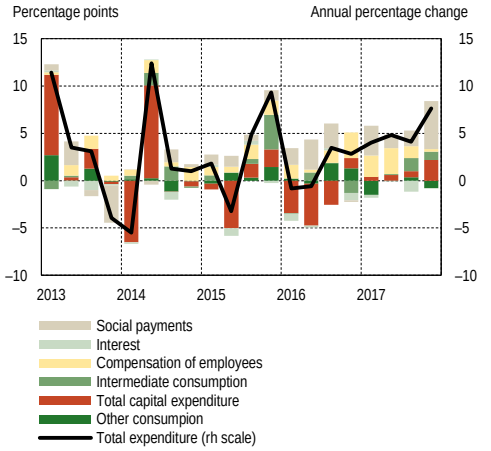
Chart 29. Contributions to general government revenue



Sources: Statistics Lithuania and Bank of Lithuania calculations.

The growth of general government expenditure in the second half of the year largely reflected increases in social benefits and investment.

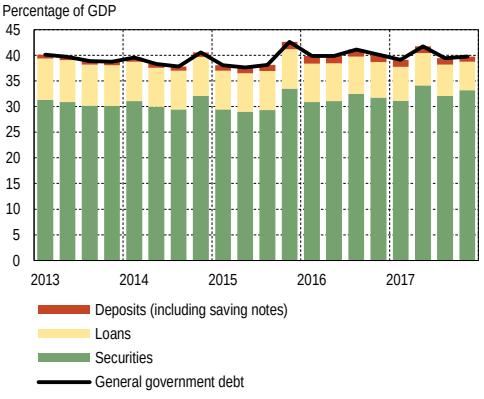
Chart 30. Contributions to general government expenditure



Sources: Statistics Lithuania and Bank of Lithuania calculations.

The general government debt-to-GDP ratio decreased to 39.7% in 2017.

Chart 31. General government debt



Sources: Ministry of Finance and Bank of Lithuania calculations.

ANNEXES

ANNEX 1. Economic convergence and its impact on prices

Monetary policy of the Eurosystem and economic convergence of the country has a long-term impact on inflation rates. The purpose of the Eurosystem is to maintain price stability in the euro area, however the Central and Eastern European (CEE) countries are the exceptions, where due to economic convergence inflation rates may be higher than in the old EU Member States. This is influenced not only by participation in the EU common market, which stimulates the convergence of prices and wages, but also the relatively more rapid pace of economic growth of less developed EU countries. This annex analyses how economic convergence influences inflation in Lithuania and other EU states.

1. Monetary policy of the Eurosystem and economic (income level) convergence

The main factor to determine certain inflation levels over the medium-term and especially the long-term period is monetary policy. The key purpose of the Eurosystem, which consists of the ECB and euro area national central banks, is to maintain price stability within the euro area. Price stability is defined as being lower than 2%, but close to this level, annual inflation within the entire euro area in the medium-term according to the HICP. Therefore, the aim is to prevent too rapid growth of prices and negative outcomes that might be caused by a prolonged period of particularly low inflation or deflation.[7]

In Lithuania, inflation over the long-term period has been also significantly influenced by price convergence, which arises from the Lithuanian economy's high openness to foreign trade, participation in the EU common market and economic (income) convergence, i.e. the process over the course of which Lithuania is becoming more advanced as an economy. The economic development of not only the EU but also euro area countries is not equal. This is evident when comparing the old and the new EU Member States: the economies of EU Member States that joined the EU in 2004 and later (their structure, living standards, labour productivity, etc.) essentially remain developing and are on the path of becoming similar to the economies of the old EU Member States over time. In such circumstances, the economies of all EU Member States, especially of the new ones, including their price developments, are affected by two significant economic processes. Participation within the EU common market promotes and accelerates the convergence of prices and wages. The relatively more rapid economic growth of the less developed EU states gives additional stimulus to their inflation. At the same time, the more robust economic growth of these countries influences the catch-up of their income level to the more developed EU states, i.e. economic convergence.

In the presence of international trade, price convergence, stimulated by participation in the EU common market, has a more pronounced impact on prices for goods, however the free movement of labour also creates preconditions for the convergence of wages, which in turn affects service prices. More intensive international competition leads to prices being more similar in the market of goods than in the market of services of different countries. With the prices for goods becoming similar, their development is then determined by common factors, thus the inflation of a certain group of products in different countries does not differ much (in a way, inflation is 'imported'). Since there is a considerable amount of services that are not traded internationally, service prices are less affected by such mechanism. However, the other cornerstone of the EU common market, namely the free movement of labour, creates preconditions for convergence of wages. This puts upward pressure on labour costs, which makes services more expensive in new EU Member States and thus stimulates price convergence for services that are not traded internationally.

Economic (income) convergence is another important factor that determines a more rapid increase in wages, living standards and price levels in the less developed EU states than in the old EU states, underpinned by the fact that labour productivity of the exporting (goods) sector outpaces that of the non-exporting (services) sector[8]. As labour productivity in the exporting sector increases, wages of persons working in this sector increase as well. This causes pressure on the wage growth in the non-exporting sector and stimulates the growth of prices within it. As a result, headline inflation increases.

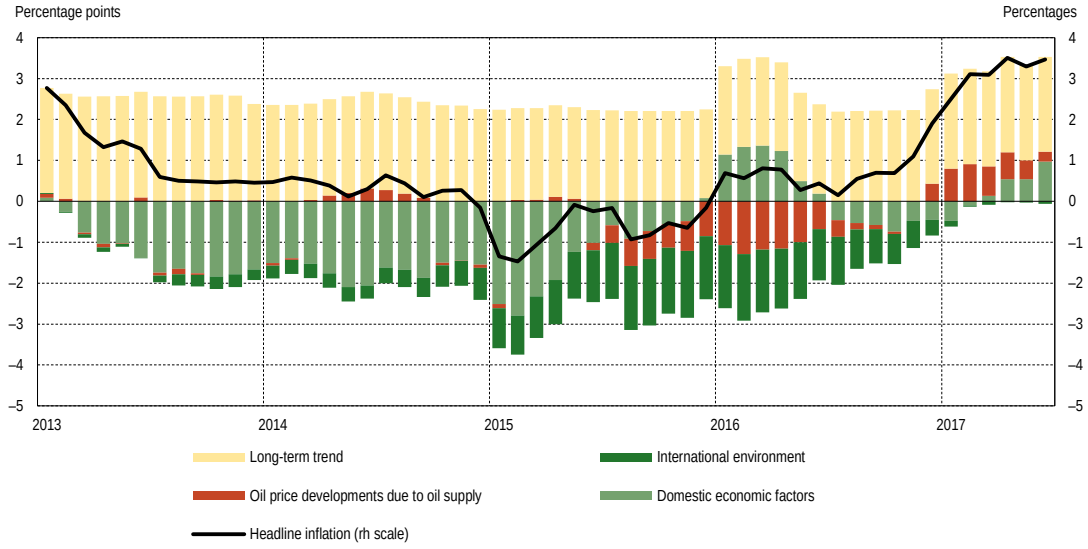
Economic research results (Halpern, Wyplosz 2001; Egert 2002; Mihaljek, Klau 2004) show that due to economic integration and convergence, price growth in the developing countries might be significantly (up to 3 percentage points) faster than in the developed ones. The results presented by the more recent research (Konopczak 2013) show that the inflation rate in CEE countries may be about 1–3 percentage points higher compared to the old EU Member States due to economic convergence. In Lithuania, the share of inflation, which is related mostly to monetary policy and convergence factors, has been assessed by Julius Stakėnas (2018). His research shows that a significant part of headline inflation is influenced by long-term trends. According to the data of 2001–2017, this trend on average might have affected 2.3 percentage points of inflation annually (see Chart A). The trend discussed is directly related to monetary policy and convergence factors, which are independent from short-term changes (e.g. oil or food commodity price fluctuations).

[7] In other words, the aim is not only to protect the purchasing power of the euro (and thus savings denominated in euro), but also to ensure the efficient operation of the price system, so as to avoid deflationary spirals, occurring when prices constantly decrease. As a result, consumers postpone consumption whilst companies postpone investment, and, consequently, this increases the risk of economic stagnation.

[8] In economic theory it is known as the Balassa-Samuelson effect (and closely related Baumol and Bowen effect).

However, inflation is not always close to the long-term trend as it is also influenced by various short-term economic factors, the international economic environment being one of them. For example, due to the sluggish growth of the global economy in the post-crisis period, the international environment had a dampening effect on inflation in Lithuania. As a result, in 2015 headline inflation in Lithuania was even negative. However, in the second half of 2016 the global economy noticeably improved, which in turn put upward pressure on inflation. The situation within the labour market is another factor having an impact on inflation. For example, during the post-crisis period unemployment level was higher and the bargaining power of employees was lower, thus the pressure on prices was not caused by the wage development. Later, when unemployment scaled back and there was a lack of qualified employees, labour costs began to increase significantly. This put upward pressure on inflation during the first half of 2016 and in 2017. Another important factor is oil price developments. The price of oil, which decreased in 2015 and picked up in the second half of 2016, had a noticeable effect on inflation.

Chart A. Factors of headline annual inflation in Lithuania (econometric analysis)



Sources: Eurostat and Bank of Lithuania calculations.

2. Economic convergence in Lithuania, the Baltic States and the EU

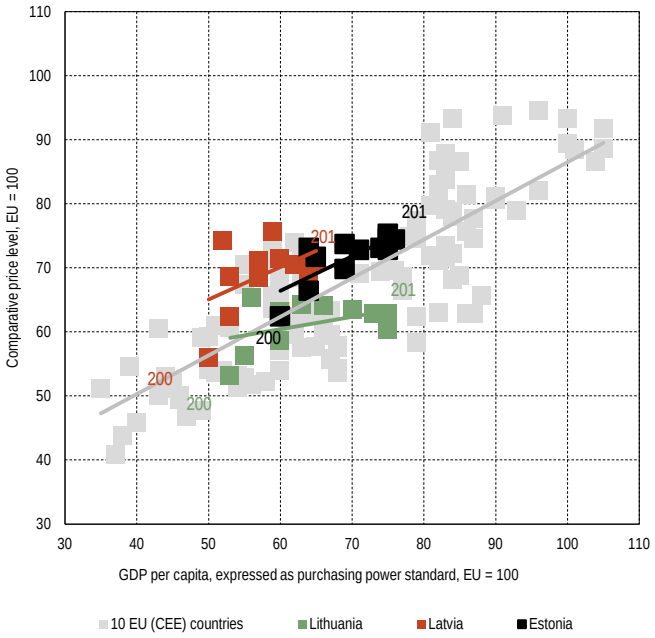
One of the most important factors of inflation determination is economic convergence. In order to better understand its rate and scope it is necessary to compare its trends within similarly developed EU states. The effect of economic integration and convergence on price levels in CEE countries between 2005 and 2016 is illustrated in Chart B. The horizontal axis indicates the level of GDP per capita in each state adjusted according to purchasing power standard[9] compared to the average within the EU[10]. The vertical axis shows the relative price level within each state: the higher the value, the higher the general price level in the country compared with the average level of the EU. The indicators discussed are strongly positively correlated, which is expressed by the grey line in the middle: the higher the income level in the state, the higher its price level. In addition, this trend shows the direction of convergence within CEE countries: over time CEE countries reach a higher level of GDP per capita and a higher price level.

Taking into account the level of economic development (income) in Lithuania, it is obvious that the general price level in Lithuania, compared to other CEE countries, apparently is not as relatively high. Analysing the situation in the Baltic States between 2005 and 2016, particularly the convergence rate of GDP per capita, it may be noted that in recent years price level in Lithuania was growing at a slower pace compared with the general experience of CEE countries, as it is shown in Chart B (green and grey lines respectively). Differently than in Lithuania, the GDP growth per capita was followed by a higher increase in price level in Latvia and Estonia between 2005 and 2016. In this period, the relative price level picked up by about 15 percentage points in Latvia and about 13 percentage points in Estonia, whilst in Lithuania the increase was less than 10 percentage points. In the meanwhile, GDP per capita went up by 15 percentage points in Latvia and Estonia, whilst in Lithuania – by 22 percentage points. According to the data of 2016, GDP per capita adjusted according to purchasing power standard in Lithuania was similar to that of Estonia (75% of the EU average) and higher than in Latvia (65%). However, the price level in Lithuania in 2016 was about 63% of the EU average and was lower than in Estonia (75%) or Latvia (71%). Thus, although average annual inflation in Lithuania was relatively high and stood at 3.7% in 2017 (in 2016 the average annual inflation was 0.7%) it could be stated that in 2017 the price level in Lithuania approached the average price level within the EU but remained lower than in Latvia and Estonia, where average annual inflation in 2017 stood at 2.9% and 3.6% respectively.

[9] Adjustment according to purchasing power standard is aimed at taking into consideration price differences within countries and thus increase comparability of economic indicators calculated on the basis of the nominal value (e.g. the euro) between countries.

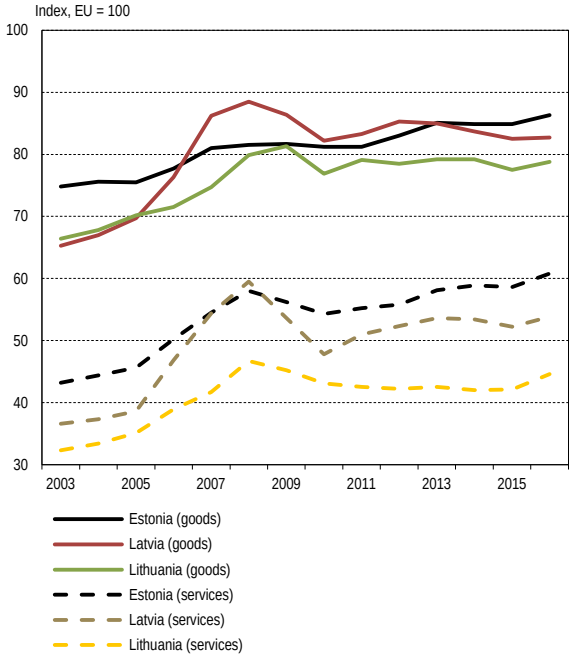
[10] In this case, income convergence is indicated as the change of GDP per capita according to the horizontal axis, moving from left to right.

Chart B. Comparison of GDP per capita (expressed in the purchasing power standard) between 2005 and 2016 and the general price level within 13 CEE countries



Sources: Eurostat and Bank of Lithuania calculations.

Chart C. Comparison of goods and services price level in Lithuania, Latvia, and Estonia between 2003 and 2016

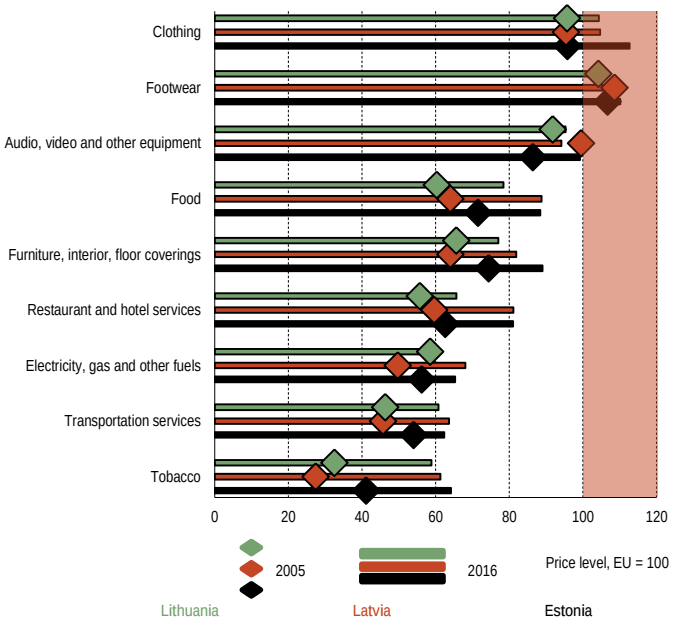


Sources: Eurostat and Bank of Lithuania calculations.

The difference between the average price level in the EU and Lithuania is essentially conditioned by service prices. Eurostat data shows that in 2016 the general price level for services in Lithuania was noticeably lower than in Latvia and Estonia and approximately twice lower than the respective EU price average (see Chart C). At the same time, prices for goods, whose convergence is particularly influenced by international trade, reached about 80% of the respective EU average. An analogous conclusion can be made when comparing particular groups of goods and services.

A more detailed comparison of prices for particular groups of goods and services confirms the overall trend that prices for goods have been closer to the average price levels of the EU than those of service prices for a long time (see Chart D). Since there is free trade within the EU and it is strongly related to trade in goods, their prices eventually converge between the EU states. At the same time, some of the prices for goods may already be very close to the average EU level since they are also affected by other factors such as the share of imported goods within a particular group of goods. Also, Lithuania has a significantly lower level of economies of scale than the major EU states, thus merchants may set higher prices to partially compensate the higher costs of sales. Coming back to particular groups of goods and services, it is evident that in Lithuania, clothing and footwear prices are above the average EU price level (according to the data of 2016, these figures were above the EU average by 4.3% and 2.7% respectively). It should be noted that this has been observed since 2008. Thus, it is not just a recent trend. In 2016, prices for food, which account for quite a large part of the residents' basket of goods and services, reached almost 80% of the EU price level. However, there are such goods and services that cost about 40% less for the Lithuanian consumer than for the average EU consumer (e.g. transportation services, electricity, gas and other fuels and tobacco). The comparison of price levels in the Baltic States in 2005 and 2016 shows that the largest price increases were for tobacco, food and transportation services. However, having compared price levels of particular groups of goods and services between the Baltic States it becomes evident that, according to the data of 2016, the price level of those goods and services in Lithuania was not higher than in Latvia or Estonia.

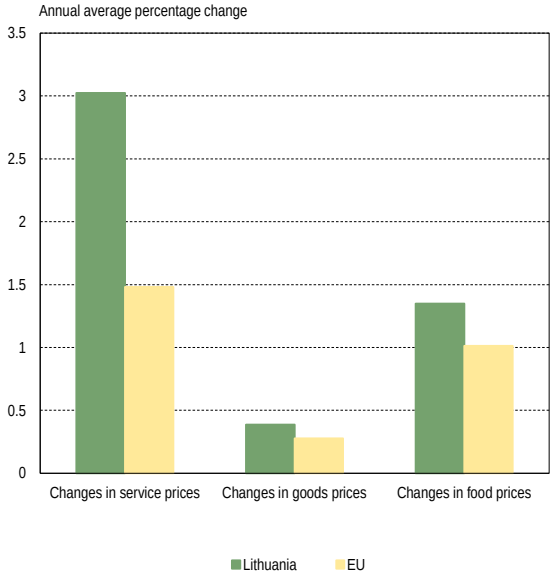
Chart D. Price level of some goods and services in Lithuania, Latvia and Estonia compared to the average of the EU in 2005 and 2016



Sources: Eurostat and Bank of Lithuania calculations.

Note: groups of goods, of which the price level in certain years exceeded that of the EU, are presented in

Chart E. Average service, goods (including food) and food price growth in Lithuania and the EU in 2013–2017



Sources: Eurostat and Bank of Lithuania calculations.

Over the long-term, changes in the price level of services should be affected more by factors related to economic convergence, whilst the dynamics of prices for goods should mostly be affected by global factors and trends. That might be envisaged, taking into account that the price level of goods is much closer to the EU average than that of services. The data of 2013–2017 basically confirms such expectations as well: as opposed to goods and food prices which in Lithuania showed a slightly higher increase compared with the EU average, the increase in service prices was two times higher than in the EU (see Chart E).

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ANNEX 2. Effective tax rates on labour and capital

Effective tax rates allow assessing the tax burden that falls on labour and capital and the comparison of the tax burden in different countries as well as its development. Statutory tax rates are not suitable for such comparison due to tax base differences, whereas effective tax rates make it possible to take into consideration not only the statutory tax rate, but also tax credits and the application of the non-taxable minimum. This Annex compares effective tax rates on labour and capital in Lithuania and the EU states and examines the main reasons that determine their differences.

There is no general agreement on how much labour and capital should be taxed and how the tax burden should be divided among them. Some theoretical models show that the optimum capital income tax rate is zero, i.e. that capital income should not be taxed (e.g. Chamley, 1986). In practice, the main argument for lower capital taxation is the fact that capital is more mobile and it is easier to avoid its taxation, therefore, more favourable rates are established for it with the aim of containing capital in the country (for example, the Scandinavian countries apply the dual income taxation system, i.e. progressive and higher taxation is applied to labour income and proportional and lower taxation is applied to capital income). A further argument is that countries compete to attract investment, whereas higher profit taxation could determine its outflow from the country and lower investment (Crivelli et al. 2015). Moreover, according to the data of the OECD research, the corporate income tax is the most harmful to economic growth (Brys et al. 2016), whereas the highest corporate income tax burden still falls on employees (Fuest et al. 2017). However, there are other arguments stating that effective labour and capital income tax rates should be similar, since lower capital income taxation creates income shifting possibilities for the self-employed and small enterprises, i.e. the choice is made to receive remuneration as dividends (i.e. as income from capital) instead of wages (Pirttilä, Selin 2011). Capital income is distributed less evenly than labour income and a faster income growth among those earning the largest income has been determined by capital income since 2000 (Piketty et al. 2016). Thus, higher capital income taxation would reduce income inequality (Farhi, Werning 2008). Lower tax burden falling on labour has a positive effect on labour market indicators, such as activity and unemployment rate. To add, various institutions usually recommend reducing labour taxation and increasing taxes that are less harmful to economic growth, such as real estate, environmental and other taxes, to stimulate economic growth (European Commission 2017b).

Effective tax rate on labour indicates the average tax burden that falls on employees, whereas the effective capital tax rate shows the average tax burden falling on enterprises, the self-employed and households (capital income, property, etc.). The first rate (referred to as labour tax rate in this Annex) is calculated by dividing the personal income tax (PIT) and social security contributions (SSC) paid by employees or for them by the respective tax base – the wage fund, by including employment expenses incurred by the employer (this corresponds to the total labour costs). Capital taxes cover taxation of dividends, wealth, profit, capital gains, interest and similar taxation. Effective capital tax rates may be calculated at the macro-level, i.e. by including the whole economy, using the tax revenue and national accounts data, or at the micro-level, using corporate statistics and financial statements. They may also be calculated as theoretical effective rates (Gorter, de Mooij 2001). The first method will be used for the calculation of effective capital tax rates in this Annex. Definitions of effective tax rates are provided in Table A.

Table A. Definitions of effective tax rates

	Tax revenue [1]	**Tax base [2]**
Effective tax rate on labour [1] / [2]	D.51A + D.51C1 (PIT paid by employees) + D.29C (wage bill and payroll taxes) + D.611C (compulsory employers' actual SSC) + D.613CE (compulsory employees' actual SSC)	GRS_A1_100 (AW) * lfsa_emppaid (number of employees) + D.29C (wage bill and payroll taxes) + D.611C (compulsory employers' actual SSC)*
Effective tax rate on capital [1] / [2]	D.51A + D.51C1 (share of PIT received from capital income and income of self-employed) + D.51B + D.51C2 (corporate income tax including holding gains) + D.51D (taxes on winnings from lottery and gambling) + D.51E (other taxes on income n.e.c.) + D.613CS (compulsory actual SSC by self-employed) + D.214B (stamp taxes) + D.214C (taxes on financial and capital transactions) + D.29A (taxes on land, buildings or other structures) + D.29B (taxes on the use of fixed assets) + D.29E (business and professional licences) + D.29H (other taxes on production n.e.c.) + D.59A (current taxes on capital) + D.59F (other current taxes on capital n.e.c.) + D.91 (capital taxes)	B.2n_S.11–12 (net operating surplus of corporations) + B.2n_S.14–15 + B.3n_S.14 (net operating surplus and mixed income of households and non-profit institutions serving households) + D.41_S.11–12rec (interest received by corporations) – D.41_S.11–12pay (interest paid by corporations) + D.44_S.11–12rec (insurance property income attributed to policy holders received by corporations) – D.44_S.11–12pay (insurance property income attributed to policy holders paid by corporations) + D.45_S.11–12rec (rents received by corporations) – D.45_S.11–12pay (rents paid by corporations) + D.42_S.11–12rec (dividends received by corporations) – D.42_S.11–12pay (dividends paid by corporations) + D.42_S.13rec (dividends received by general government) + D.42_S.2rec (dividends received by rest of the world) + D.41_S.14–S15rec (interest received by households and non-profit institutions serving households) – D.41_S.14–S15pay (interest paid by households and non-profit institutions serving households) + D.45_S.14–S15rec (rents received by households and non-profit institutions serving households) – D.45_S.14–S15pay (rents paid by households and non-profit institutions serving households) + D.42_S.14–15rec (dividends received by households and non-profit institutions serving households) + D.44_S.14–15rec (insurance property income attributed to policyholders received by households and non-profit institutions serving households)
Effective corporate income tax rate [1] / [2]	D.51b + D.51c2 (corporate income tax including holding gains)	B.2n_S.11–12 (net operating surplus of corporations) + D.41_S.11–12rec (interest received by corporations) – D.41_S.11–12pay (interest paid by corporations) + D.45_S.11–12rec (rents received by corporations) – D.45_S.11–12pay (rents paid by corporations) + D.42_S.11–12rec (dividends received by corporations) – D.42_S.11–12pay (dividends paid by corporations) + D.42_S.13rec (dividends received by general government) + D.42_S.2rec (dividends received by rest of the world) + D.42_S.14–15rec (dividends received by households and non-profit institutions serving households) + D.44_S.11–12rec (insurance property income attributed to policy holders received by corporations) – D.44_S.11–12pay (insurance property income attributed to policy holders paid by corporations)

Table A. Definitions of effective tax rates

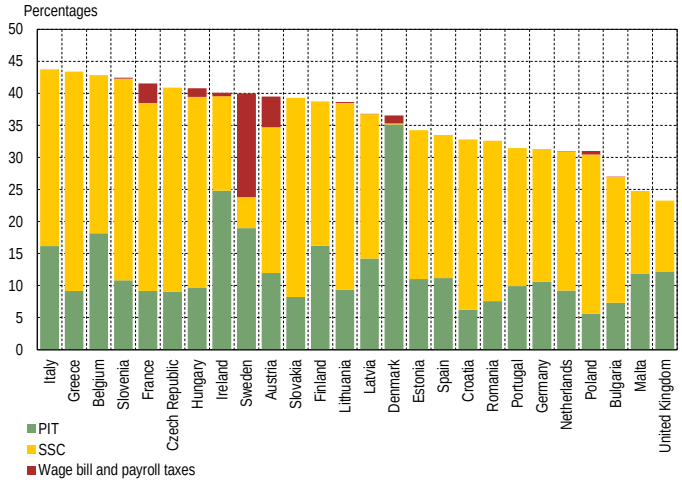
	Tax revenue [1]	Tax base [2]
Effective tax rate on capital and business income of households [1] / [2]	D.51A + D.51C1 (share of PIT received from capital income and income of self-employed) + D.51D (taxes on winnings from lottery or gambling) + D.51E (other taxes on income n.e.c.) + D.613CS (compulsory actual SSC of self-employed)	B.2n_S.14–15 + B.3n_S.14 (net operating surplus and mixed income of households and non-profit institutions serving households) + D.41_S.14–S15rec (interest received by households and non-profit institutions serving households) – D.41_S.14–S15pay (interest paid by households and non-profit institutions serving households) + D.45_S.14–S15rec (rents received by households and non-profit institutions serving households) – D.45_S.14–S15pay (rents paid by households and non-profit institutions serving households) + D.42_S.14–15rec (dividends received by households and non-profit institutions serving households) + D.44_S.14–15rec (insurance property income attributed to policyholders received by households and non-profit institutions serving households)

Sources: European Commission (2017a).

Note: Markings beside indicator names correspond to markings in national accounts and government finance statistics.
* In other sources (e.g. Mendoza et al. 1994; European Commission 2017a), the data from national accounts on compensation of employees are used as an equivalent of wage fund. A decision was made not to use such data in this publication, since each country includes different shadow economy estimates in national accounts. Therefore, effective tax rates of countries with larger shadow economies would be lower (shadow economy is not included in tax revenue, however, it would be included in the tax base and would artificially increase it).

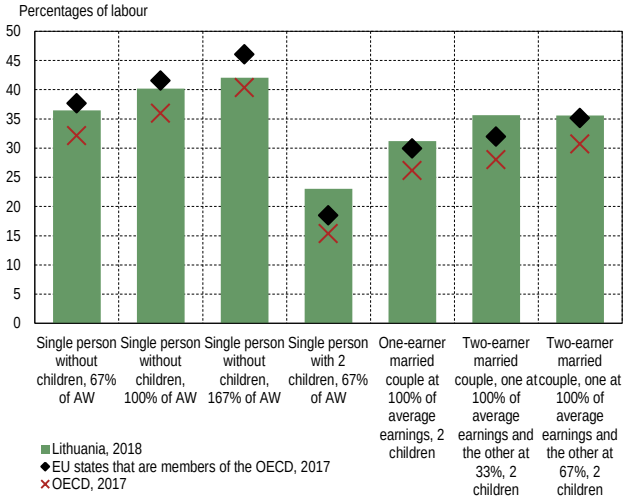
The average taxation of employees in Lithuania is close to the EU average – the effective labour tax rate stands at 38.6%. This rate may be divided into the effective PIT rate and the effective SSC rate. Such division shows that the effective PIT rate in Lithuania is lower than the EU average, whereas the SSC rate is significantly higher (see Chart A). Effective tax rates are slightly lower in Latvia and Estonia than in Lithuania. Nevertheless, the effective tax rate, which shows the average tax burden, does not allow to assess progressiveness of the tax system, differences in the tax burden falling on a person and a family, etc. Such differences may be assessed by using the tax wedge, which is calculated not from macroeconomic data, but at the level of an individual household, taking into account the legislation of each country. The numerator of the tax wedge is the PIT paid by the person, SSC paid by the employer and the employee and other wage bill and payroll taxes after subtracting cash benefits paid to families, whereas its denominator is the labour costs. The tax burden of a person receiving the average wage (AW) who does not have children in Lithuania, after taking into consideration the latest data and the legislative amendments made in 2018, is close to the EU average, but slightly lower[11]. The tax wedge stands at around 40% in Lithuania and around 42% in the EU on average. If we compared the tax wedge of a household consisting of one person, it would become evident that both the tax wedge of a person earning less than the AW and that of a person earning more than the AW is lower than the EU average, however, a larger gap is observed among higher earners. This is underpinned by relatively low progressiveness: a single 15% PIT rate is applied in Lithuania, whereas there are no progressive tax rates applicable to higher earners (progressiveness generated by the size of non-taxable minimum is not high as well). When calculating the tax wedge of persons with children, i.e. by including not only taxes paid, but also benefits paid to families, it is shown that the tax wedge is higher than the EU average in all cases indicated in Chart B. The largest difference, compared to the EU, is observed among persons with lowest wages raising two children: the tax wedge of a person earning 67% of the AW and raising two children in Lithuania is around 5 percentage points higher than the EU average. As family income increases, the tax wedge increases and becomes closer to the EU average. When comparing the tax wedge with the OECD countries' average instead of the EU average, it becomes evident that Lithuania has higher taxation than the OECD average in all cases demonstrated in Chart B. However, the tax wedge calculation does not include transfers by employers and employees to private pension funds. In some countries, these transfers are quite significant (e.g. in the US and the UK).

Chart A. Effective tax rate on labour in the EU states in 2015



Sources: Eurostat, European Commission and Bank of Lithuania calculations.

Chart B. Tax wedge by household composition

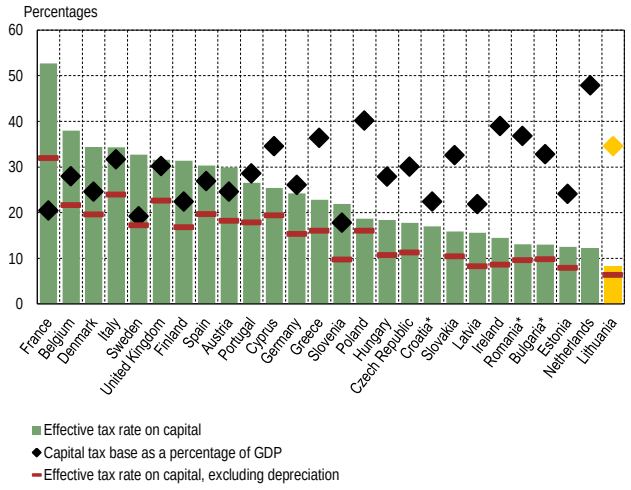


Sources: OECD, Statistics Lithuania and Bank of Lithuania calculations.

[11] Here the EU average corresponds to the average of EU states belonging to the OECD. This indicator is used because the latest data published by the Eurostat are from 2015, whereas the OECD data are from 2017.

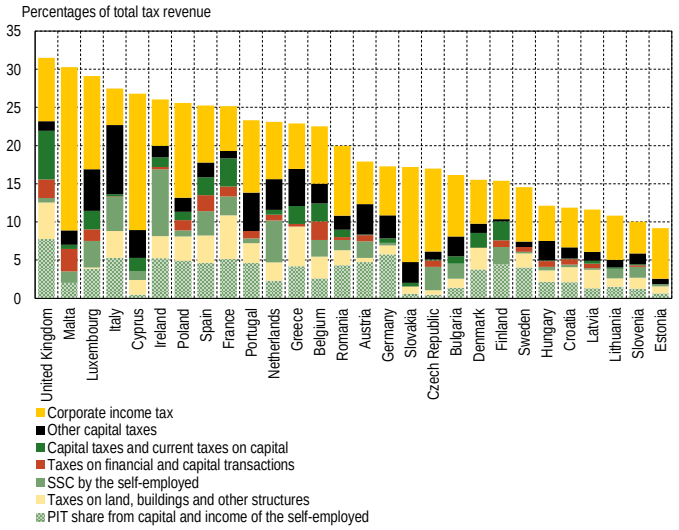
The average effective tax rate on capital in Lithuania is the lowest in the EU – it stood at 8.3% in 2015.[12] The corresponding rates of other Baltic countries, Latvia and Estonia, were slightly higher and stood at 15.6% and 12.5% respectively. Although the effective capital tax rate in Lithuania is not high, the capital base (as a percentage of GDP) is one of the larger in the EU (see Chart C). Low tax revenues, compared to the tax base, may indicate that the rates in Lithuania are lower than in other EU states, since many exemptions or reliefs are applied, tax compliance is not ensured, etc. Tax revenues from capital in Lithuania comprises around 11% of total tax revenue. According to this indicator, Lithuania is the third from last in the EU (see Chart D). In Lithuania, as in most other EU states, the largest part of capital taxes consist of tax revenues from the corporate income tax, however, a comparatively small part consists of tax revenue from the PIT, which is collected from capital income and income received by the self-employed, taxes on land and buildings as well as various other taxes on capital.

Chart C. Effective tax rate on capital in the EU states in 2015



Sources: European Commission, Eurostat and Bank of Lithuania calculations.
* Data for 2014.

Chart D. Capital tax revenue structure in the EU states in 2015



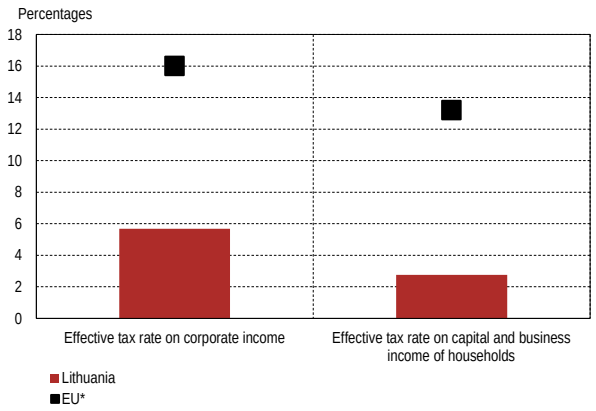
Sources: Eurostat, European Commission and Bank of Lithuania calculations.

Particularly low overall capital tax burden in Lithuania is determined by both relatively low effective corporate income tax rate and low effective tax rate on capital and business income of households (this category also includes income of the self-employed). The effective corporate income tax rate in Lithuania stands at around 6% (see Chart E). Lower than the EU average rate is determined by the low statutory corporate income tax rate and the application of various preferential rates and exemptions. The statutory corporate income tax rate in Lithuania stands at 15% and is the fifth lowest in the EU (see Chart F). Moreover, Lithuania applied the preferential rate of 5% to small enterprises (with up to 10 employees and the annual turnover of up to €300 thousand) as well as various reliefs (for example, to those engaged in scientific research, experimental development, investment projects, for cinema, etc.). Since 2015 (effective rates are calculated for this year) the corporate income tax law was amended: some previous reliefs were abandoned, for example, for sea port and air navigation services fees, social enterprises, etc. However, new reliefs were introduced, for example, for newly registered entities, investment incentive was expanded, etc.[13] Although the application of preferential rates and exemptions is also characteristic of other countries, higher standard corporate income tax rates are usually applied there. Moreover, only a small number of countries apply a preferential rate to enterprises according to an enterprise's size. It is considered inexpedient, since it reduces incentives for enterprises to grow, contributes to market distortions, expands tax arbitrage possibilities, etc. Still, when the taxable profit is calculated from the national accounts data, the calculated effective rates may be not fully accurate, since each country includes different shadow economy estimates in the national accounts. The effective corporate income tax rate in Lithuania calculated from the statistical data of enterprises is slightly higher – it made up around 10.5% in 2016.

[12] Effective capital tax rates are usually calculated by including net operating surplus in the tax base, i.e. by subtracting depreciation, which corresponds to consumption of fixed capital in national accounts. Nevertheless, this indicator is highly different from depreciation calculated in enterprises. Thus, gross operating surplus may also be included in the tax base, i.e. without subtracting depreciation. The Lithuanian effective capital tax rate calculated in this way would comprise 6.4%.

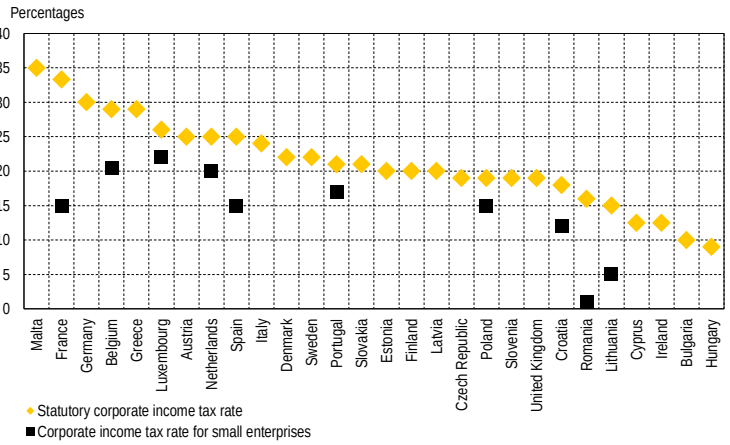
[13] For details on amendments, see http://www.vmi.lt/cms/web/kmdb/1.13.0/-/asset_publisher/OtufxF8GISPM/content/pelno-mokescio-istatymo-pakeitimai-nuo-2018-metu/10174.

Chart E. Effective corporate and household tax rates



Sources: European Commission, Eurostat, Statistics Lithuania and Bank of Lithuania calculations.
* Non-weighted average.

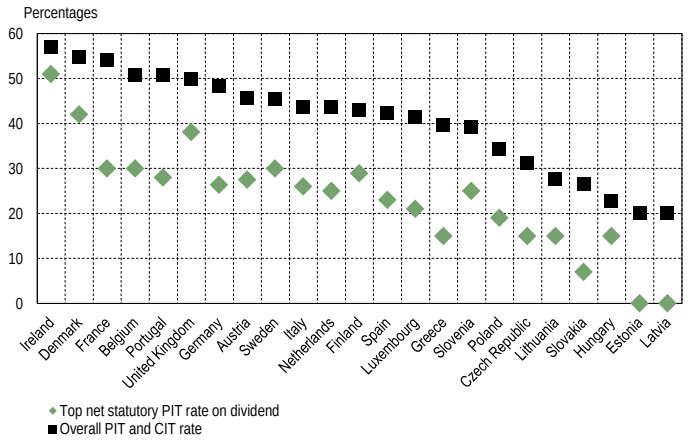
Chart F. Corporate income tax rates in the EU states in 2018



Sources: KPMG, Deloitte.

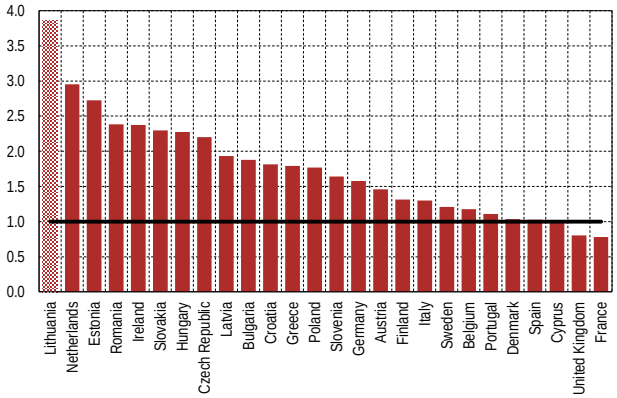
According to the data of 2015, the effective tax rate on capital and business income of households stood at around 2.8% and was also lower than the EU average. This effective rate includes both income of the self-employed and household property income. Both these factors determine the low overall rate. The procedure of taxation of self-employed persons changed in Lithuania since 2015, however, their taxation remains lower than that of persons with employment contracts. This is determined by the fact that self-employed persons are not insured by all types of social insurance: the SSC base is comprised of 50% of taxable income or the minimum wage and the SSC ceiling is applied, contrary to persons with employment contracts. Moreover, some types of self-employed persons (owners of sole proprietorships, members of small partnerships) are not obliged to receive income related to labour relations, so they can avoid paying the SSC. Tax credit is applied to persons engaged in individual activities[14] (the application was started in 2018; in 2015, the PIT rates of 5% and 15% were applied to them, depending on the type of activity). Due to such system the effective tax rate of persons earning very low income is higher than that of persons with employment contracts, however, progressiveness is significantly lower: the effective PIT rate of persons with employment contracts is 15% when earning around 1.3 AW, whereas that of the persons engaged in individual activities – when earning from 3.3 AW (i.e. if their taxable income corresponds to 3.3 AW). On the other hand, the taxation of self-employed persons is lower than that of employees in other EU states as well and the difference may amount to more than ten times. The lower taxation of household income from capital than in other EU states is also determined by a lower PIT rate. For example, the 15% PIT rate is applied to income from dividends in Lithuania. When the corporate income tax paid is included as well, the rate comprises 27.8% (or 19.3%, if the enterprise is small). This is one of the lowest rates in the EU (see Chart G). The PIT paid is also determined by the application of the non-taxable minimum to income from securities (it comprised €3,000 in 2015 and declined to €500 in 2016) and the possibility to reduce the tax liability for certain income (life assurance, contributions to third pillar pension funds).

Chart G. The highest standard PIT rate on dividends, taking into account the corporate income tax paid



Sources: OECD and Bank of Lithuania calculations.

Chart H. Ratio of effective labour and capital tax rates



Sources: European Commission, Eurostat and Bank of Lithuania calculations.

Note: Here effective tax rates on capital and labour are calculated on the basis of the national accounts data.

[14] The concept of self-employed persons is broader – it covers both persons engaged in individual activities and owners of sole proprietorships, members of partnerships and small partnerships. The concepts are separated, since the PIT payment procedure applied to owners of sole proprietorships and members of partnerships and small partnerships is the same as that applied to employees (if income is attributed to income related to labour relations), whereas tax credit is applied to persons engaged in individual activities.

In almost all EU states, the effective tax rate on capital is lower than the tax rate on income from employment, however, in Lithuania this gap is the largest in the EU (see Chart H). In 2015, the effective capital tax rate in Lithuania was 3.9 times lower than that of labour income. Moreover, Lithuania is one of the small number of countries, where this gap had been increasing (at least until 2015). Although, as previously mentioned, there is no common opinion regarding the equal taxation of capital and labour, still such a large imbalance is not characteristic of most other EU states. Better alignment of labour and capital tax burden would help solving some current shortcomings of the tax system. If taxation differences encourage the income shifting to a less taxed base (i.e. from labour to capital) in turn creating possibilities for the tax arbitrage, they would be eliminated if effective capital and labour income tax rates were more aligned. This would also help strengthen horizontal and vertical equity (Brys et al. 2016).

The analysis of effective labour and capital tax rates shows that the tax burden on labour in Lithuania, compared to other EU states, is average, whereas the tax burden on capital is the lowest in the EU. Although the effective labour tax rate shows that Lithuania is not distinguished from other EU states by excessively high or low taxation, attention should be paid to the fact that the average effective rate does not take into account the person's family situation or household composition. If not only taxes paid, but also benefits to families were included in the calculations, the average tax burden falling on employees in Lithuania would become higher than the EU average. Furtermore, the effective capital tax rate is the lowest in the EU. It is low both due to the effective corporate income tax rate, which is lower than the EU average and due to lower than average effective tax rates on capital and business income of households. The effective capital tax rate is around four times lower than the effective labour tax rate and this difference is the highest in the EU.

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ANNEX 3. Value added tax gap in Lithuania and methods of its reduction

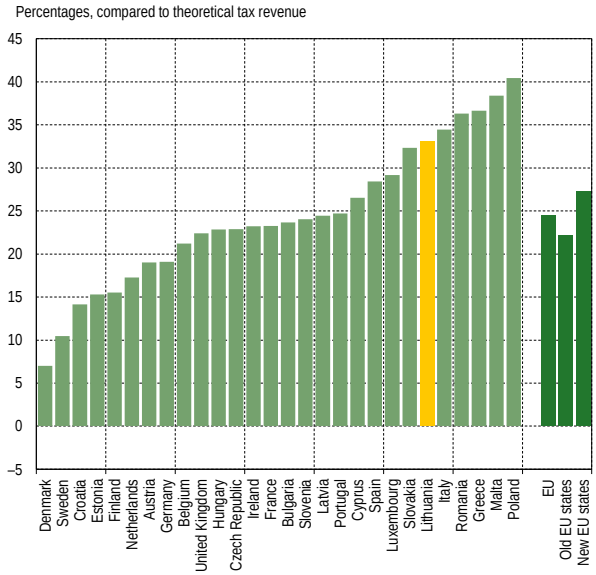
VAT taxable base is wide and relatively stable, therefore, this tax is one of the most important sources of general government revenue in the EU countries. Lithuania stands out from other EU countries not only by a large share of VAT revenue, compared to total budget revenue, but also by a large VAT gap. It shows what amount of income from VAT is not received due to reduced rates, exemptions and law violations. The gap related to non-compliance with the laws in Lithuania is one of the largest in the EU and it declined only slightly in recent years. The gap related to reduced rates and exemptions is relatively small; however, the justification for some reduced rates is worth discussing.

1. VAT gap sources

The VAT gap is the difference between theoretical and actually collected income. Theoretical VAT income may be calculated by multiplying a theoretical tax base, for example, the final household and government consumption, by the standard tax rate (21% in Lithuania). According to the European Commission's assessment, the VAT gap comprised 33% in Lithuania in 2015. It was larger only in five other EU states: Italy, Romania, Greece, Malta and Poland (see Chart A). The VAT gap in Latvia and Estonia was notably smaller than in Lithuania and stood at 24% and 15%, respectively. The average VAT gap of the EU states was 25%, whereas the gap in new member states was larger than in the old ones and stood at 27%.

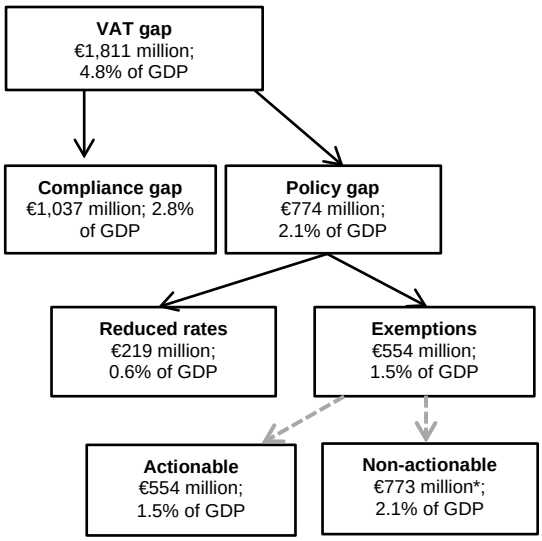
The VAT gap is determined by two causes: the decision not to tax certain goods and services or to tax them by applying a reduced rate, as well as the tax payer behaviour that does not comply with the laws. The decline in VAT revenue is called the policy gap, when it is determined by the first cause and the compliance gap, when it is determined by the second cause. The policy gap consists of the gaps caused by reduced rates and exemptions (see Chart B).

Chart A. VAT gap in the EU states in 2015



Sources: European Commission and Bank of Lithuania calculations.

Chart B. Breakdown of the VAT gap in Lithuania in 2015



Sources: European Commission and Bank of Lithuania calculations.
* This amount is not included in the sums indicated in upper rectangles.

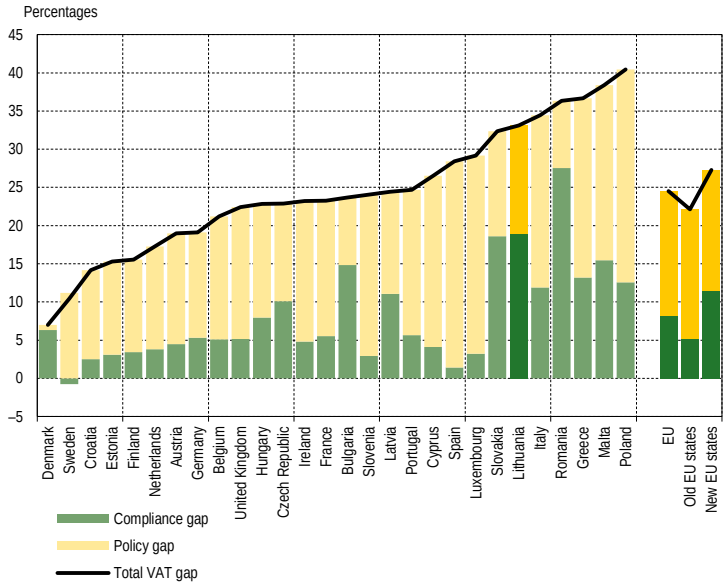
The policy gap accounts for a smaller share of the VAT gap in Lithuania. It amounted to €774 million or 2.1% of GDP in 2015. Compared to other EU states, reduced rates were applied to a relatively small number of goods and services in Lithuania. The reduced rate of 9% was applied to central heating, books, publications, passenger transportation and accommodation services, whereas the rate of 5% was applied to reimbursable medicines and prescription-only non-reimbursable medicines. Moreover, the VAT taxation exemptions were applied in Lithuania to a number of services that are important to society, for example, health, social, education, culture and sports services. Financial, insurance, gambling and other services and, in some cases, real estate services were untaxed. Exemptions to be applied by the EU states are established in the VAT Directive[15], therefore, the policy gap related to them may not be eliminated or significantly reduced.

A part of the exemption gap cannot be eliminated at all, since it is impossible to tax certain services in principle. For example, countries usually raise the objective of providing primary education services for free, thus their taxation would contradict this objective. Certain services, such as national defence or ensuring of competition, are not provided to each resident individually, but jointly for all residents, therefore, it is impossible to tax them. The VAT gap calculation methodology applied by the European Commission assumes that the non-actionable exemption gap consists of the lost VAT revenue for imputed rents and the provision of public and financial services. This revenue amounts to €773 million or 2.1% of GDP in Lithuania.

[15] Directive 2006/112/EC on the common system of value added tax.

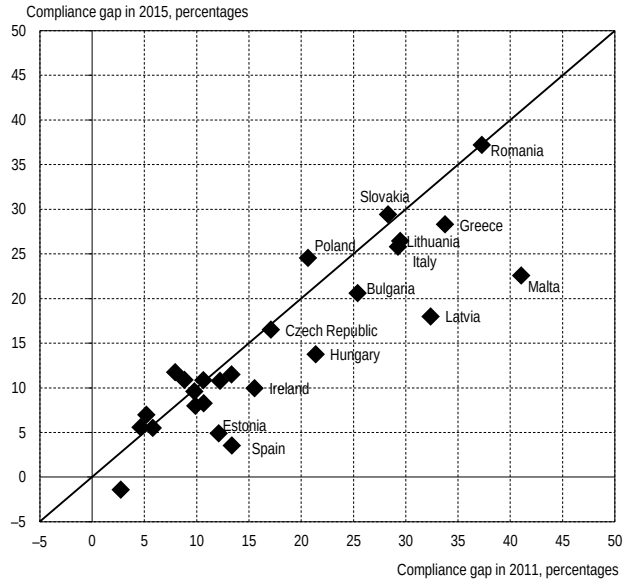
The compliance gap accounts for a larger share of the VAT gap in Lithuania: it amounted to €1,037 million or 2.8% of GDP in Lithuania in 2015. The importance of this gap is similar in most other new EU states, whereas the policy gap is more important in old EU states (see Chart C). The compliance gap results from fraud schemes, tax evasion and avoidance, fraudulent bankruptcies, unintentional errors in VAT reports, etc. On the other hand, the compliance gap in Lithuania is not only one of the largest in the EU, but also it does not decline significantly (see Chart D). It scaled back by 10% over four years (from 29.5% to 26.4%) – this is the third smallest decrease, compared to other EU states. The compliance gap of ten EU states (mostly new ones) exceeded 20% in 2011. In more than a half of these states the compliance gap was reduced significantly – by 16–45%.

Chart C. VAT gap in the EU states in 2015 according to cause



Sources: European Commission and Bank of Lithuania calculations.

Chart D. Change of the VAT gap in the EU states in 2011–2015



Sources: European Commission and Bank of Lithuania calculations.

2. Measures for compliance gap reduction in the EU states

EU states applied a number of measures to facilitate the reduction of the compliance gap. Each year, the European Commission analyses and reports on the VAT gap developments in the EU states. In this annex, three frequently applied gap reduction methods were selected from the European Commission's reports published in 2015–2017 (European Commission 2015, 2016b, 2017).Their selection process focused on those countries that achieved the largest reduction of the VAT gap and the new EU states. Three measures whose application could have significantly reduced the VAT gap in recent years are the VAT reverse charge mechanism, a register of high tax evasion risk entities and the application of information technologies in invoicing and in cash registers.

EU states applied the VAT reverse charge mechanism quite actively. When applying the usual taxation, the seller issues an invoice with the price of a product or service exclusive of VAT and the VAT amount. The buyer pays to the seller both the amount exclusive of VAT and the VAT. Then the seller pays the received VAT to the state or pays only a part of it, if it acquired goods or services, to which the VAT was applied earlier, in the process of production or provision of services. Each further resale of a product or service is related to further payment of the VAT amount. One enterprise pays the VAT and another enterprise reduces the VAT payable to the state by the amount of the paid VAT. However, problems arise when in the process of such resale one of the enterprises does not pay the VAT and becomes unreachable (the company is liquidated or it becomes impossible to contact it, since it was fictitious, etc.). Such situations are created in the so-called carousel fraud scheme, when goods are imported into the country, then resold several times and finally exported to the same importer. Thus, some enterprises reduce the payable VAT, whereas others do not pay it and, consequently, the state budget incurs losses (European Commission 2016a).

The VAT reverse charge mechanism may help avoid the damage done by the so-called missing traders. It may be applied to certain specific goods and services. When applying such taxation, the duty to pay the VAT to the state falls on the buyer of goods or services instead of their seller. For example, the seller may issue an invoice, which indicates the price without VAT and includes an instruction for the buyer to pay the VAT to the state budget. Thus, the buyer has to pay the VAT and also, in this way, he can reduce the payable VAT amount in the future. Such mechanism hinders the so-called carousel fraud scheme, since the VAT is paid and recovered by the same enterprise, therefore, the actual payment of the VAT does not take place. Thus, the problem of the so-called missing traders is solved this way.

On the other hand, the current application of the reverse charge mechanism deviates from the key principles of the VAT system used in the EU. This mechanism is only a temporary measure at the EU level, which is used to

reduce the VAT gap in those states where it is particularly large, until the final VAT system reform is completed. When the amount of goods and services provided by a taxable person or enterprise under one invoice exceeds €10,000, the VAT Directive allows to apply the local VAT reverse charge mechanism until 2022 (European Commission 2014). A number of discussions arise with regard to the fact that active application of this mechanism in specific sectors may encourage fraud in other areas, whereas a large-scale application of the mechanism may turn the VAT into the sales tax.

More active use of electronic devices contributed to a more efficient control of compliance with tax laws. Since the VAT is used to tax turnover, an enterprise may attempt to report lower turnover than it is in reality. If cash payments are made, cash may be not included in cash registers or special software may be used to delete or edit a part of cash register's sales records to reduce the reported turnover and the payable VAT. When a tax inspection is conducted, it is often impossible to see if a part of records were edited or deleted. Fiscal cash registers that immediately register the sale record are used to deal with this problem. The technology used in them does not allow deleting or changing records without leaving evidence, therefore, all these actions can be seen by a tax inspector. Some countries, for example, Czech Republic, Slovenia and Hungary, plan to connect cash registers to the tax administrator's databases. This allows a real-time transfer of the data of each sale transaction to the tax administrator. This measure allows selecting enterprises that pose higher tax evasion risk for tax inspection more accurately, to perform such inspection remotely, reduce the time needed for such inspection and increase its efficiency. Under the risk of higher fines, enterprises would be less inclined to take risks and evade taxes. This could increase the VAT revenue in those service sectors where payments are often made in cash, for example, restaurant, accommodation services, etc. Similar application of information technology in business-to-business invoicing also could increase the effectiveness of tax inspection.

One more significant measure for reducing the gap is the register of high tax evasion risk entities. There are cases when a natural person deliberately liquidates an enterprise and creates a new enterprise that takes over the former enterprise's assets, customers, etc., but not its tax debt. The scale of damage done by such activity has not been accurately estimated, however, the persons that perform such manipulations could be included in a certain register, which in turn would limit their capacity to create new enterprises.

3. VAT exemptions and reduced rates

VAT efficiency usually depends on the demand response to the change in the prices of taxable goods and services. When the demand for goods and services is elastic to price, even small price changes may significantly affect it. In this case, the VAT rate applied to goods and services may substantially change consumer decisions. The economic intuition is that in the efficient tax system goods and services that have low price elasticity should be taxed more than those goods and services whose demand is more elastic. In turn, the application of different VAT rates would ensure higher efficiency of the tax system. On the other hand, it is difficult to evaluate elasticity of the demand for goods and services to price in practice. Tax authorities should not only evaluate price elasticity for each product and service in the market (in each EU country), but also regularly assess elasticity after the change of consumer preferences or if there is a market entry of new products that may affect elasticity of demand for existing products. Thus, the differentiation of VAT rates without having comprehensive information on elasticity of the prices of goods and services would not increase efficiency, therefore, the application of a single VAT rate is a much simpler solution.

On the other hand, lower-income households usually spend a larger share of income for consumption than higher-income households, therefore, as a consumption tax the VAT is regressive and leads to a heavier burden for households with lower income. Usually the tax system is considered to be regressive, when the share of taxes, compared to total income, decreases, when income grows. To make VAT less regressive and protect the most sensitive residents, governments choose the differentiation of VAT rates and exemptions as a solution. However, the empirical research results show that the application of different VAT rates does not always ensure progressiveness and incurs losses to the state budget.

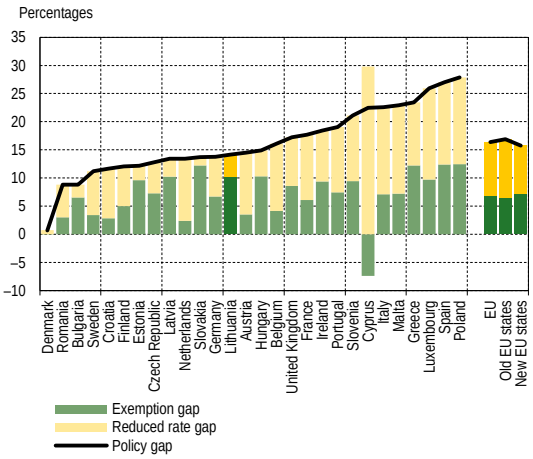
Reduced VAT rates are often applied in certain sectors with the expectation that the VAT rate reduction will increase the demand for low-skilled employees in these sectors and ensure competitiveness at the international level. For example, reduced VAT rates are applied in most countries in labour intensive sectors, especially in restaurant and hotel sector, with the aim of increasing employment. Lower-skilled staff is often employed there, so the VAT reduction should theoretically increase the demand for such employees, whereas the decline in the final prices for hotel and restaurant services would stimulate tourism more. Nevertheless, the empirical research results show that the economic impact of reduced VAT rates is not always such as expected (Harju, Kosonen 2016). The effect is often temporary and works in countries with inflexible and unstable labour market.

The solutions to issues of progressiveness and competition are not the only reason for the application of reduced VAT rates. Different VAT rates may be applied to stimulate the demand for certain goods and services, because consumers often underestimate their long-term benefits. For example, although a person earning higher income may also acquire goods, for which reduced VAT rates are applied, most EU states apply reduced rates for books and publications and in turn directly stimulate the transfer of knowledge.

Compared to other EU states, Lithuania does not stand out in terms of overall policy gap (see Chart E),

however, part of the gap determined by tax exemptions is relatively significant. Although Lithuania applies only those exemptions that are indicated in the above-mentioned VAT Directive, the cases when the provision of goods or services is not taxed may emerge due to a relatively broad definition of exemptions. Such definition may create possibilities to avoid taxation of those goods and services, for which taxation was intended. For example, it may be not clear whether services related to a person's appearance or recreation may be considered as personal health services. Such application of exemptions may in certain cases lead to an unjustified reduction of general government revenue. The value and benefits of applying reduced rates are also to be considered. Although reduced rates (for example, those applied to passenger transportation, heating or medicines) are meant to help low-income residents, in reality these reduced rates benefit not only low-income households, but high-income ones as well. Thus, such support is inefficient and a relatively significant amount of state revenue is lost because of it (see Chart A).

Chart E. VAT policy gap in 2015 according to cause



Sources: European Commission and Bank of Lithuania calculations.

On the other hand, fairness and reallocation would be better ensured by progressive direct income taxes and a system of targeted benefits than by the application of reduced VAT rates and exemptions (Mirrlees et al. 2011). The differentiation of VAT rates is usually beneficial only when the state has the aim of reallocation, but does not apply an efficiently operating system of direct taxes and social benefits. The abandonment of reduced VAT rates and the unification of the tax base would ensure simplicity of the indirect tax system and reduce the administrative burden of enterprises that deal with several VAT rate categories, as the burden of documentation and additional calculations would be lifted. Finally, a uniform VAT tax rate would simplify the political decision-making, as the system of different rates is favourable for interest groups to compete for reduced rates and discounts. The reduction of the tax wedge of persons with lower income and the adaptation of the labour market would be a substantially more efficient measure for increasing the demand for low-skilled employees (Le 2003).

Table A. The assessment of reduced rates established in the Republic of Lithuania Law on VAT

Reduced rate	Theoretical justification	Problems arising	VAT income losses due to reduced rates (EUR million and as a percentage of GDP)
Medicine and medical assistance tools, technical assistance devices for the disabled	Reallocation, support for persons with low income	Beneficial to households with both low and high income; a targeted system of benefits (allowances) would ensure better reallocation	97.7 (0.22%)
Central heating and hot water	Reallocation, support for persons with low income	The reduced rate is beneficial to households with both low and high income; a substantial loss of budget revenue	47.0 (0.11%)
Passenger transportation according to set regular transport routes, passenger luggage transportation services	Attractiveness of the public transport system and access to it for persons with low income	The reduced rate is beneficial to households with both low and high income; a substantial loss of budget revenue	31.0 (0.07%)
Hotels and special accommodation services	Growth of demand for low-skilled employees, increase in the sector's competitiveness	Economic impact on labour market is temporary or insignificant; analysis of consumer prices shows that the sector's competitiveness not necessarily increases	14.2 (0.03%)
Books and periodicals	Stimulation of the demand and supply of goods and services, taking into consideration the long-term benefit	Most countries apply this reduced rate	12.0 (0.03%)

Sources: State Tax Inspectorate under the Ministry of Finance of the Republic of Lithuania.

Lithuania's VAT gap – the difference between actual and theoretical tax revenue – is one of the highest in the EU. Its largest part is determined by the tax payer behaviour that does not comply with the laws (compliance gap). In this aspect, Lithuania stands out among the EU states, where the largest part of the VAT gap is determined by the policy gap (reduced rates and exemptions established by laws). Lithuania differs from most of the other EU states with a large compliance gap, since it reduced the gap only slightly over four years. In recent years, the EU states have applied a number of measures, which contributed to the reduction of the VAT gap. A more active application of the VAT reverse charge mechanism could have reduced the losses related to the so-called carousel tax fraud schemes. A more active application of electronic means allowed to perform a more efficient control of compliance with tax laws and created possibilities to increase its volume. Creation of the register of high tax evasion risk entities could have reduced the probability of VAT evasion by liquidating old and creating new enterprises. Although the policy gap in Lithuania is not large, the justification of some reduced VAT rates is worth discussing. For example, the reduced rate for heating is not an efficient measure to reduce the tax burden for persons with low income, since this rate is applicable to all residents. The relatively broad definitions of the VAT taxation exemptions could also add to the increase of policy gap.

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ANNEX 4. Progressiveness of labour income taxation in OECD countries

When discussing the revision of taxes and social security contributions, it may be relevant to look at the practices and insights of various countries described in the available economics literature. Labour income tax progressivity is the object of discussion that has garnered a lot of attention. Aiming to have a better understanding of the personal income tax (PIT) progressivity trends that prevail in developed countries, an analysis of an effective PIT rate progressivity level and its development in OECD states is delivered in this annex. Effective PIT rate progressivity is calculated using the methodology presented in OECD publications.[16] It assesses effective PIT progressivity when household labour income changes between 67% and 167% of AW. In this annex, a 'household' refers to a single person without children.

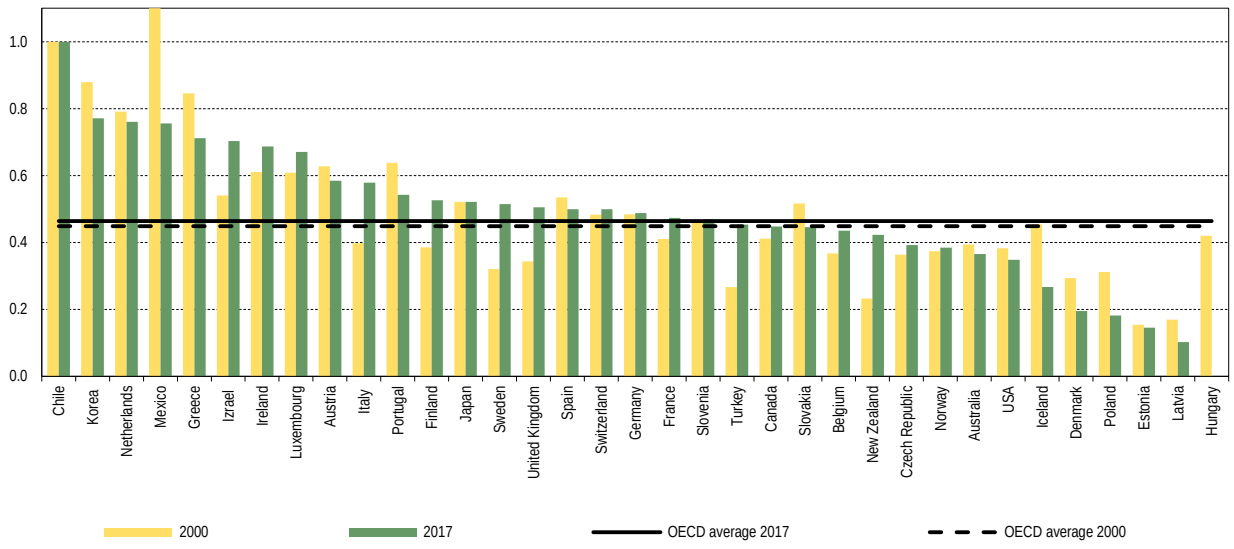
1. PIT progressivity in economic theory

Economics literature says that simplicity and fairness are one of the most important goals of a good tax system. Simplicity is ensured by aiming to develop a tax system that is clear and understandable both to its participants and developers, imposing as low as possible an administrative system and tax compliance costs. To ensure fairness, PIT must follow two principles: horizontal and vertical equity. The principle of horizontal equity states that anyone who has equal socio-economic status should be taxed equally as they have equal capacity to be able to pay that tax. In other words, persons with equal income should be taxed by applying the same tax rate, independently of the form in which their income is received. The principle of vertical equity states that tax payers who are enjoying a better economic situation should bear a higher tax burden, i.e. that they should pay a larger share of the income towards tax. In other words, personal inequality after tax must be less than it is before taxes are applied, while the effective income tax rate must be relevant for the level of income being received by tax payers. The principle of vertical equity can be implemented in several ways: through tax allowances or tax credits, or via a progressive income tax rate, or both. Taxpayers' satisfaction with the use of taxes that are collected by the state, their trust in the justifiable nature of the tax system, and the knowledge that other market participants are complying with the tax system as well are also very important for a properly functioning tax system.

2. PIT progressivity and its development in OECD states

Over the past two decades, PIT progressivity extensively varied, however, a single common trend was not noted in OECD states. In 15 OECD states PIT progressivity increased, in 16 it decreased, while in the rest it remained unchanged (see Chart A). The analysis of aggregated data from all OECD states shows that taxation differences between persons earning 167% of AW and those earning 67% of AW changed very little. The difference between effective PIT rates, which were applied to persons who were earning 167% of AW and those earning 67% of AW makes almost a half of the effective PIT rate applied to persons who are earning 167% of AW, i.e. in 2017 this indicator was at 0.46 (while in 2000 it was at 0.45).

Chart A. Effective PIT rate progressivity for household labour income in 2000 and 2017



Sources: OECD and Bank of Lithuania calculations.

Note: Higher number translates into higher progressivity. Progressivity is calculated using a formula (T167-T67)/T167, where T167 refers to effective PIT rate for a person earning 167% of AW, while T67 is the effective PIT rate for a person earning 67% of AW.

Nevertheless, PIT progressivity varies greatly within OECD states. In 2017, the highest PIT progressivity was recorded in Chile, Korea, the Netherlands and Mexico, while the lowest was in Latvia, Estonia, Poland, and Denmark. Hunga-

[16] Progressivity is calculated using a formula (T167-T67)/T167, where T167 refers to effective PIT rate for a person earning 167% of AW, while T67 is the effective PIT rate for a person earning 67% of AW.

ry was the only OECD state in which a progressive effective PIT rate was not applied in 2017 to households which consisted of a single person without children. Between 2011 and 2013, this state implemented a PIT reform and replaced a previously applied progressive PIT rate with a flat tax rate (Eurostat 2014). The reform also saw the withdrawal of all PIT-related tax reductions, leaving the only exception for households with children.

Table A. Labour income tax indicators for OECD states in 2017

Country	The effective PIT rate applied by the entire governmental sector, %	Central government			Other governmental sub-sectors		
		Number of PIT rates	Lowest nominal PIT rate, %	Highest nominal PIT rate, %	Personal income tax	Lowest nominal PIT rate, %	Highest nominal PIT rate, %
Ireland	15.38	2	20.00	40.00	none		
Australia	24.38	5	0.00	45.00	none		
Austria	14.44	7	0.00	55.00	none		
Belgium	26.55	5	25.00	50.00	progressive	25.00	50.00
Czech Republic	**13.11**	**1**	**15.00**	**15.00**	**none**		
Chile	0.00	8	0.00	40.00	none		
Denmark	36.06	2	10.08	25.08	proportional	22.50	27.80
Estonia	**16.77**	**1**	**20.00**	**20.00**	**none**		
Greece	9.97	4	22.00	45.00	none		
Iceland	28.33	2	22.50	31.80	flat	12.44	14.52
Spain	15.06	5	9.50	22.50	progressive	9.50	21.00
Italy	21.99	5	23.00	43.00	flat	1.23	3.83
Israel	9.72	7	10.00	50.00	none		
Japan	7.91	7	5.00	45.00	flat	10.00	10.00
United States	18.49	7	10.00	39.60	flat	2.40	4.25
United Kingdom	13.98	3	20.00	45.00	none		
Canada	16.63	5	15.00	33.00	progressive	5.10	13.20
Latvia	**18.91**	**1**	**23.00**	**23.00**	**none**		
Poland	7.24	2	18.00	32.00	none		
Luxembourg	16.74	23	0.00	42.00	none		
Mexico	9.84	11	1.92	35.00	none		
New Zealand	18.13	4	10.50	33.00	none		
Norway	19.42	5	9.55	24.07	flat	0.00	14.45
The Netherlands	17.28	4	8.90	52.00	none		
South Korea	6.12	6	6.00	40.00	flat	5.00	15.00
Portugal	16.48	5	14.50	48.00	none		
France	14.84	5	0.00	45.00	none		
Slovak	10.13	2	19.00	25.00	none		
Slovenia	11.65	5	16.00	50.00	none		
Finland	20.99	5	0.00	31.50	flat	17.00	22.50
Sweden	17.99	3	0.00	25.00	flat	29.19	35.15
Switzerland	10.71	11	0.00	11.50	progressive	0.00	13.00
Turkey	12.92	4	15.00	35.00	none		
Hungary	**15.00**	**1**	**15.00**	**15.00**	**none**		
Germany	19.11	Formula	0.00	45.00	none		

Sources: OECD and Bank of Lithuania calculations.

Note: indicators for households which consist of one single person earning AW.

3. Nominal PIT rates

As mentioned, the principal of vertical equity can be implemented in several ways. But not all of them are equally popular (see Table A). **When taking into account tax rates applied by central governments alone, progressive PIT rates are applied extensively enough in OECD states; they are applied in 31 OECD states out of 35.** Only four OECD states – Czech Republic, Estonia, Latvia[17] and Hungary – apply a flat PIT rate (one rate) as regards to labour income. Lithuania

[17] In Latvia, a flat PIT rate was applied until the end of 2017. In 2018, they adopted a progressive PIT system which involved three rate bands.

also applies a flat PIT rate. Estonia and Latvia adopted flat PIT rates after the restoration of their independence, while Czech Republic and Hungary adopted them following tax reforms in 2008 and 2011 respectively. Previously, both states had used flat PIT rates. In the Czech Republic and Hungary, tax reforms were aimed at transferring the tax burden from personal income to consumption, adverse factors (those which were related to environmental or health impacts), or property taxes. The reforms were aimed at promoting efficiency and increasing employment rates (IMF 2008; Ministry for National Economy 2012).

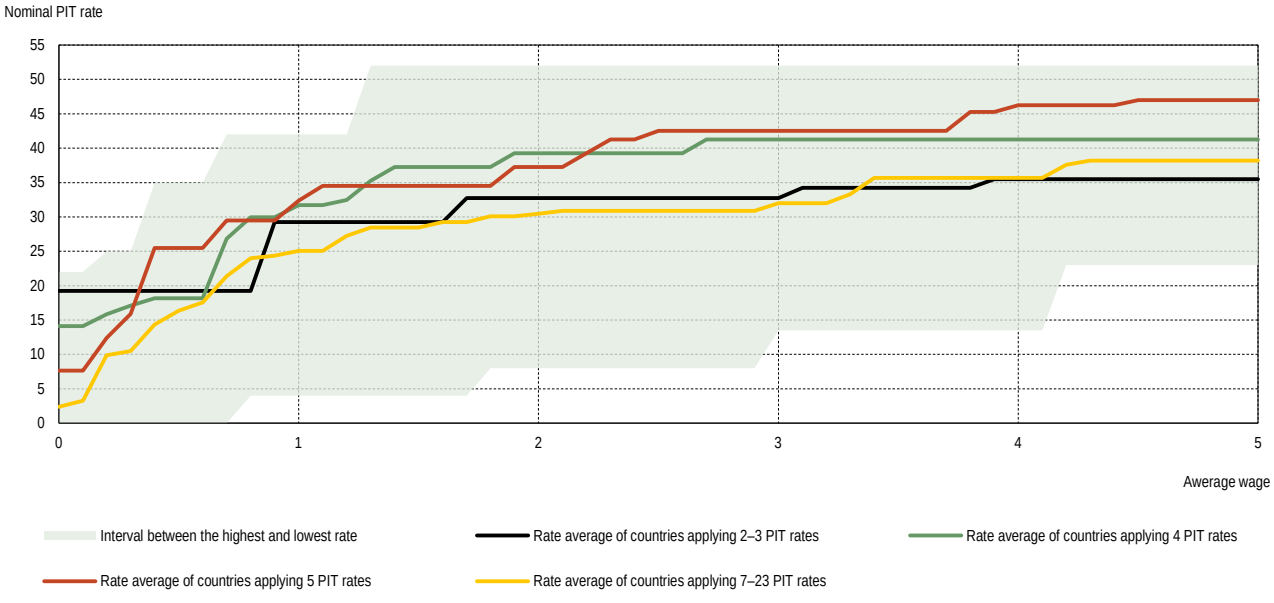
In more than a third of OECD states, PIT is also applied by other governmental sub-sectors (such as the municipality, or the federal land institution). However, PIT which is collected by them is most often calculated by using a flat rate (out of thirteen states in which labour income is taxed by other governmental sub-sectors, nine use a flat tax rate). The distribution of collected PIT varies extensively between central government and other governmental sub-sectors. In some states such as, for example, Italy or Korea, the largest proportion of PIT is collected by central governments, while in other states, such as Finland, Sweden, or Switzerland, it is collected by other governmental sub-sectors.

There are significant differences in the number and level of PIT rates used among OECD states which are using progressive PIT rates. The number of PIT rates varies from 2 (Ireland, Denmark, Iceland, Poland, and Slovakia) to 11 (Mexico and Switzerland), or even 23 (Luxembourg). In 2017, OECD states applied on average almost five PIT rates, if states with flat rates are deducted, this number would increase to almost 5.5. When compared to the data for 2000, the average number of applied PIT rates decreased slightly (0.2–0.4). And yet there were two periods with different development trends in 2000–2017. In 2000–2009 the average number of rates decreased, while in 2010–2017 the decrease was followed by an increase. The decrease in PIT rates in 2000–2009 can be explained by attempts to make the personal income tax system simpler and reduce taxes for persons who were earning the highest levels of income (OECD Tax Policy Studies 2006). While increase in PIT rates in 2010–2017 was mostly related to the need to increase governmental revenue (OECD 2014).

In OECD states, progressive nominal PIT rates tend to increase rather rapidly until household income reaches AW, and then the increase slows down (see Chart B). States with more PIT rates tend to tax households with the lowest income on a lower rate than states with less rates. However, states with more PIT rates do not necessarily apply higher average nominal PIT rates to households with the highest labour income than those states with less rates. Chart B shows the development of nominal PIT rates up to the income level of five AW only; however, in some countries, nominal PIT rates also increase when households reach an income level of eight or even 22–25 AW.

Luxembourg's nominal PIT rate system stands out amongst all of the OECD states. This involves 23 nominal PIT rates: the lowest is 0% and the highest is 42%. However, most of them are used for the taxation of household labour income which is below AW. When the income of a household which consists of one person without children reaches AW, the nominal PIT rate used is already at 39%.

Chart B. Progressive PIT rates in OECD states in which income tax is collected by central government only, 2017



Sources: OECD and Bank of Lithuania calculations.

4. Tax allowances and credits

The nominal PIT rate or the development of it does not provide the whole information needed for evaluating both the tax burden of households and effective PIT rate progressivity. Tax allowance and tax credit systems also play an important role. The same level of governmental revenue from PIT can be achieved by applying lower rates to

households and by not using any deductions from taxable income or taxes, or by applying higher rates and presenting the opportunity to reduce taxable income or taxes.

Potential deductions most often consist of two groups: tax allowances and tax credits (OECD, 2006). Tax allowances cover personal income that may be deducted from all income received, thereby reducing the amount of taxable income that is subject to PIT. In OECD states, the most popular tax allowances include basic allowances (non-taxable income), deductions for social-security contributions, work-related expense deductions, and tax allowances for people with children or other dependent persons. Tax credit is the amount of money that can be subtracted from an already-calculated tax amount. In OECD the most popular tax credit forms include the basic credit, tax credit for children, or tax credit for the main wage-earner.

Table B. Ratio of tax allowances or tax credits and income for households with income equal to AW in 2017

(percentages)

Country	Tax allowances			Tax credits			All possible deductions from taxable income and taxes
	Basic allowances	Other	Total	Basic credit	Other, %	Total	
	(1)	(2)	(3) = (1) + (2)	(4)	(5)	(6) = (4) + (5)	(7) = (3) + (6)
Ireland	0.00	0.00	0.00	4.54	4.54	9.08	9.08
Australia	0.00	0.00	0.00	0.00		0.00	0.00
Austria	0.02	3.43	3.45	0.00	0.87	0.87	4.32
Belgium	0.00	7.03	7.03	0.00	3.84	3.84	10.87
Czech Republic	**0.00**	**0.00**	**0.00**	**0.00**	**6.99**	**6.99**	**6.99**
Chile	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Denmark	0.00	1.70	1.70	1.31	0.00	1.31	3.01
Estonia	**2.92**	**0.32**	**3.24**	**0.00**	**0.00**	**0.00**	**3.24**
Greece	0.00	2.24	2.24	9.10	0.00	9.10	11.34
Iceland	0.00	0.32	0.32	7.13	0.00	7.13	7.45
Spain	0.00	2.35	2.35	3.98	0.00	3.98	6.32
Italy	0.00	1.77	1.77	3.18	0.00	3.18	4.95
Israel	0.00	0.00	0.00	3.92	0.00	3.92	3.92
Japan	0.45	2.79	3.24	0.00	0.00	0.00	3.24
United States	2.94	0.00	2.94	0.00	0.00	0.00	2.94
United Kingdom	6.02	0.00	6.02	0.00	0.00	0.00	6.02
Canada	0.00	0.00	0.00	3.72	0.94	4.66	4.66
Latvia	**1.50**	**2.40**	**3.90**	**0.00**	**0.16**	**0.16**	**4.05**
Poland	0.00	2.00	2.00	1.12	6.69	7.81	9.81
Luxembourg	0.16	2.28	2.44	0.55	0.00	0.55	2.99
Mexico	0.23	0.00	0.23	0.00	0.00	0.00	0.23
New Zealand	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Norway	0.00	2.98	2.98	0.00	0.00	0.00	2.98
The Nether-lands	0.00	0.88	0.88	0.00	1.69	1.69	1.69
South Korea	0.35	3.74	4.09	1.43	0.00	1.43	5.52
Portugal	4.87	0.00	4.87	0.00	0.00	0.00	4.87
France	0.00	5.61	5.61	0.00	0.00	0.00	5.61
Slovak	6.32	2.55	8.87	0.00	0.00	0.00	8.87
Slovenia	3.37	4.26	7.63	0.00	0.00	0.00	7.63
Finland	0.00	0.66	0.66	2.88	0.00	2.88	3.54
Sweden	0.00	0.00	0.00	0.00	13.15	13.15	13.15
Switzerland	0.00	0.25	0.25	0.00	0.00	0.00	0.25
Turkey	0.00	2.25	2.25	3.97	0.00	3.97	6.22
Hungary	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Germany	0.00	4.21	4.21	0.00	0.00	0.00	4.21

Source: OECD and Bank of Lithuania calculations.

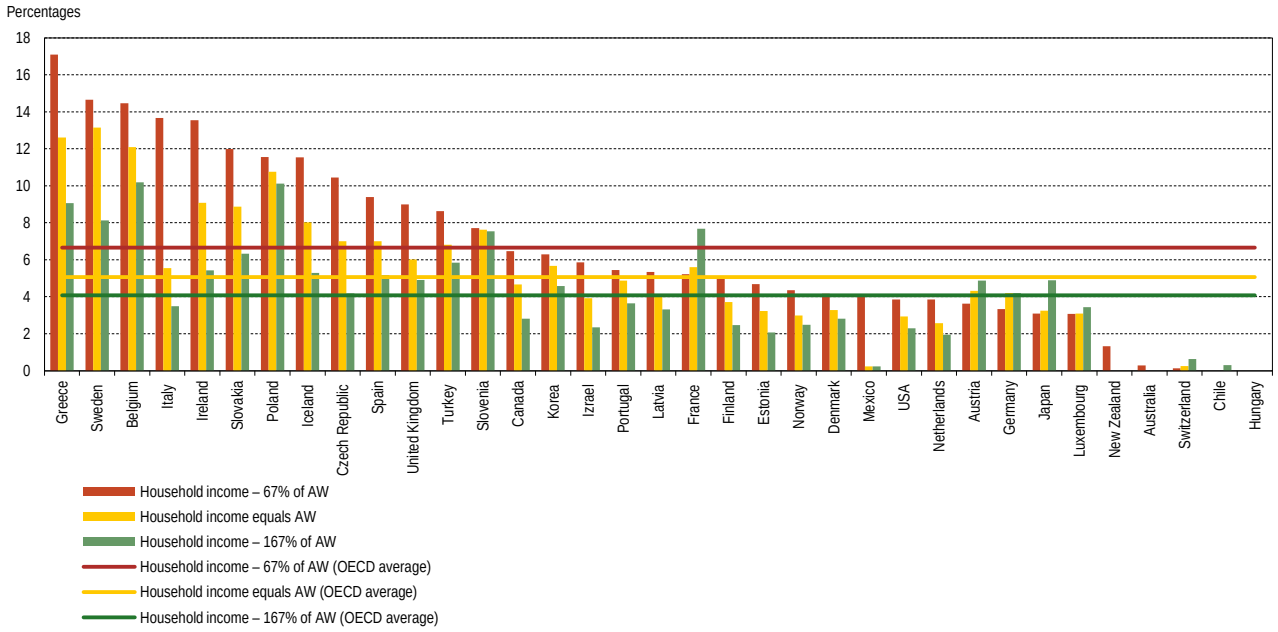
In most OECD states, the tax burden for households consisting of a single person without children and earning an income which is equal to AW may be reduced using possible deductions from income received or taxes calculated in 2017 (see Table B). Out of 35 OECD Member States, tax allowances are applied in 28 countries, tax credits in 19

countries, and 13 countries apply both tax allowances and tax credits. Households consisting of a single person without children and earning an income that is equal to AW are not able to reduce their taxable income or tax burden with legal deductions in three OECD states only: Australia, New Zealand, and Hungary.

In OECD states, the effective PIT rate for households earning an income that is equal to AW goes down by a little over five percentage points due to tax allowances and tax credits being applied. Even so, there are significant variations: some countries do not offer any such incentives, while others reduce the effective PIT rate by more than 10 percentage points (Belgium, Greece, Poland and Sweden). The effective PIT rate drops almost equally when tax allowances or when tax credits are being applied. Due to basic allowances, the effective PIT rate decreases by an average of 0.8 percentage points; other types of allowances also have a significant effect in OECD states. Out of tax credits, the most noticeable effect on the PIT rate can be seen in the application of the basic credit (1.3 percentage points).

In most OECD states, the effect of tax allowances and tax credits on the effective PIT rate drops when household income increases (see Chart C). When household income makes up 67% of AW, the effective PIT rate drops by an average of 6.7 percentage points due to tax allowances and tax credits; when an income is equal to AW – by 5.1 percentage points; whereas when it makes up 167% of AW – by 4.1 percentage points. Such a declining effect of tax allowances and tax credits on the effective PIT rate is observed in most OECD states; however, there are also countries in which the effect of tax allowances and tax credits on the effective PIT rates increases with the increase of household income (such as in Austria, Japan, Luxembourg, France and Germany). In such countries, the tax allowance and tax credit system is based on social security contributions and other deductions which can be made from income and which increase together with household income. Moreover, in Japan and France, the increase in personal income is followed by an increase in deductions for work-related expenses. However, it should be noted that in all such countries an effective PIT rate progressivity is close to or above the OECD average. This happens thanks to a quite rapid increase in nominal PIT rates when household income is rising.

Chart C. Ratio of tax allowances or tax credits and income in OECD states, 2017



Sources: OECD and Bank of Lithuania calculations.

Note: Household here means a single person without children.

In countries in which basic tax allowance has a minor or zero effect, tax credit schemes are most often used to increase effective PIT rate progressivity. Tax credits mostly affect the effective PIT rate in countries in which there is no tax allowance schemes (such as Ireland, the Czech Republic and Sweden), or where allowances do not significantly increase effective PIT rate progressivity (Greece, Spain and Poland). In countries in which both tax allowances and tax credits are applied, the latter usually have a greater influence on the effective PIT rate. While comparing tax allowance progressivity and tax credit progressivity, it has been noted that in the OECD states the tax credit impact on the effective PIT rate is reduced faster than the impact of tax allowance upon any increase in household income.

In almost all OECD states in which tax credit schemes are applied, the tax credit amount remains unchanged or drops with any increase in household income. Only in three countries – Canada, Poland and Sweden – tax credit amounts in terms of absolute value go up with any increase in household income. In Canada this is possible due to permitted deductions for the Canada pension plan and Employment insurance contributions, while in Poland – due to deductions for health insurance contributions, and in Sweden – due to deductions for employee social security contributions and Earned Income Tax Credit system. And yet, in these countries the deductible tax credit amount goes up more slowly than household income, thus its effect on the effective PIT rate decreases with any increase in household income.

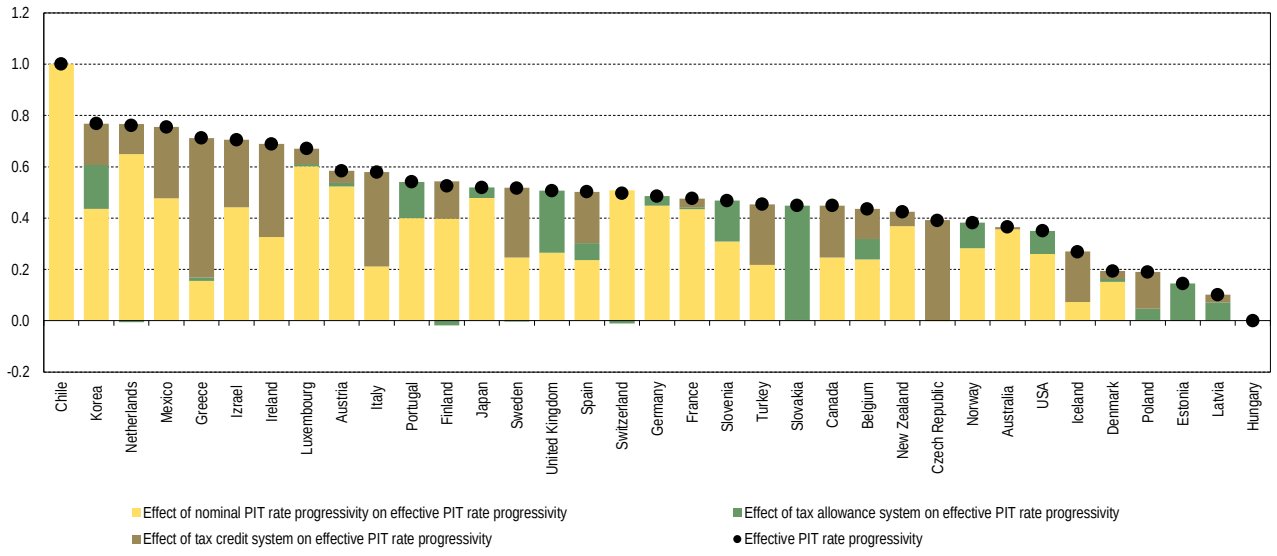
Between 2000 and the global financial crisis, the effect of tax allowances and tax credits on the effective PIT rate in the OECD states essentially remained unchanged, but then it began to increase, thereby reducing the effective PIT rate. Such changes were mostly noticeable for households which had a lower income. For example, due to possible deductions, the effective PIT rate for a household consisting of a single person without children and earning 67% of AW was lower by 5.8 percentage points than the nominal PIT rate in 2000–2002, while in 2015–2017 this difference increased to 6.8 percentage points. With household income for a single person without children being equal to AW, the impact of possible deductions increased at a lower rate, i.e. from 4.7 percentage points to 5.1 percentage points, and with income reaching 167% of AW, the effective PIT rate did not change at all and stood at 4.1 percentage points. The effect on the PIT rate of potential deductions from income earned or taxes calculated went up due to increasingly intensive use of tax credits, while the effect of tax allowances went down in the period being discussed. Such changes were observed for all levels of income that had previously been analysed, but to different extent.

The trends mentioned were mostly influenced by PIT reforms in the Czech Republic, Greece, Italy and Sweden (out of the OECD states). In Greece, changes were related to the PIT reform of 2013, which involved a reduction in the number of PIT rates, abolishment of a large proportion of tax allowances and implementation of a basic tax credit system (IMF 2013). In the Czech Republic a new PIT system was launched in 2008, when a progressive four-rate PIT scheme was replaced by a flat rate scheme (European Commission 2009), which also expanded the scope of tax credits schemes (IMF 2008). In 2007, Sweden launched a tax credit system which was dependent upon income earned (Edmark et al, 2012) with the primary objective of promoting increased participation of labour force. With the launch of this system, neither tax allowance schemes nor the PIT rate system were significantly changed. In Italy, two PIT system reforms were implemented within the period being discussed (in 2003 and 2007). In 2003, Italy reduced the number of available PIT rates and replaced the tax credit system with a tax allowance system (OECD 2004); however, in 2007 it increased the number of PIT rates again and returned to the tax credit system (OECD 2007). However, in Italy – in opposition to other countries – the tax changes had a significant impact only upon households which were in the lower income brackets.

5. Effective PIT rate progression drivers

The comparison between effective PIT rate progressivity drivers in the OECD states shows that it is mostly affected by nominal PIT rate progressivity (see Chart D). It is the most important effective PIT rate progressivity driver in almost a third of the OECD states; moreover, in some countries such as Australia, Chile and Switzerland it is the only one. When the income of households which consists of a single person increases from 67% to 167% of AW, nominal PIT rate progressivity cannot be seen only in six countries (Czech Republic, Estonia, Latvia, Poland, Slovakia, and Hungary). The fact that nominal PIT rate progressivity is an important factor when it comes to relatively higher effective PIT rate progressivity is confirmed by the data from these six countries, where effective PIT rate progressivity does not go beyond the OECD average, while in four of them effective PIT rate progressivity is the lowest of all of the OECD states.

Chart D. Effects of tax allowances, tax credits, and nominal PIT rate progressivity on effective PIT rate progressivity in OECD states, 2017



Sources: OECD and Bank of Lithuania calculations.

Those OECD states which have the highest effective PIT rate progressivity often apply not only a progressive PIT rate, but also a tax credit system. The latter has significant influence on PIT rate progressivity in Ireland, Greece, Italy, Israel and Mexico. In general, nine out of ten OECD states with the most progressive effective PIT rates apply a tax credit system, while in seven it significantly contributes to effective PIT rate progressivity. Tax credit is the main PIT rate progressivity driver in eight OECD states. In one country (the Czech Republic) the tax credit system is the only factor which determines the progressivity of the effective PIT rate.

Although tax allowances are prevalent amongst OECD states, their contribution to effective PIT rate progressivity is not extensive in most of these countries. Amongst the ten OECD states which have the most progressive PIT rates, tax allowances significantly contribute towards effective PIT rate progressivity in only one of them (Korea). Out of 28 OECD states which currently apply tax allowance systems, these systems are the main effective PIT rate progressivity driver in only three of them (Estonia, Latvia, and Slovakia). However, only in Slovakia tax allowance system allows reaching effective PIT rate progressivity similar to the average OECD level. It was done by setting the highest basic tax allowance amount of all of the OECD states, which was equal to about one third of AW.

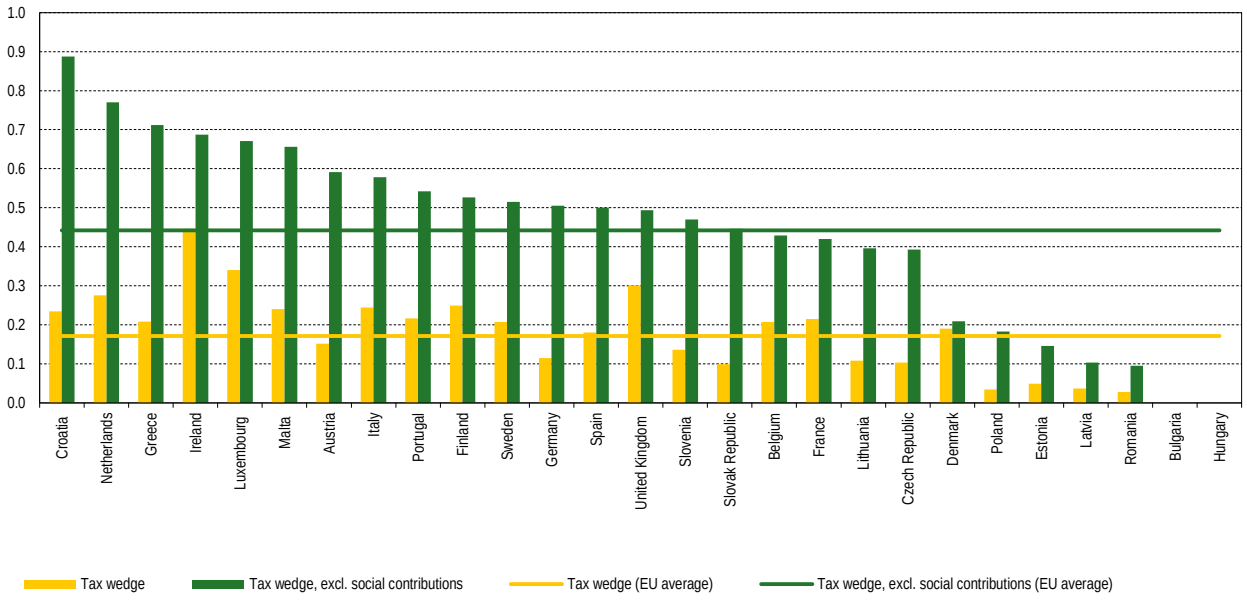
When deciding to apply or extend tax credit schemes, governments usually base their decisions on the argument that the value of the tax credit being offered is equal for everyone (as long as they pay sufficient amount of PIT), while possible tax allowances under the application of a progressive PIT rate often go up with an increase in income (OECD 2006). PIT progressivity can be increased even more if a country's government applies a so-called non-wastable tax credit. Under this scheme, if households' tax burden before tax credit is lower than the value of tax credits, the household is paid a sum of money that is equal to the unused value of the tax credits.

6. PIT and tax wedge progressivity

From the 1990s until the global financial crisis, the trend in PIT rate reductions prevailed in many countries. This reduction was often compensated by increased social security contributions and consumption taxes as well as expanded tax base. **Tax system progressivity dropped with the increased importance of social security contributions within the tax wedge.** This ensued because social security contributions are usually subject to flat rates. Tax system progressivity was reduced even more by the ceiling set for social security contributions, which were introduced in some of these countries. Therefore the progressivity is significantly lower when a tax wedge, not an effective PIT rate, is assessed (OECD 2006).

Chart E shows tax wedge progressivity in EU states which were assessed by using the previously-applied progressivity calculation method. This compares tax wedges for persons earning 167% and 67% of AW and tax wedges which do not take into account social contributions. **The comparison shows that tax wedge progressivity is higher when the effect of social contributions is not assessed almost in all countries except Bulgaria and Hungary**. As mentioned, this is often related to flat rates that are applied to social security contributions, as well as the ceiling of social security contributions being applied in many countries. Even so, progressivity differences that appear due to social security contributions rather vary between the countries. In some countries, such as Greece, Croatia, and the Netherlands, they are very high, while in others, such as Denmark, Latvia, and Romania they are rather low. In Lithuania, progressivity reduction thanks to social security contributions more or less corresponds to the average for the EU. Nevertheless, both tax wedge progressivity, which does not take into account social security contributions, and total tax wedge progressivity in Lithuania are among a third of the lowest in the EU.

Chart E. Effect of social contributions on household tax wedge in EU states, 2017



Sources: European Commission and Bank of Lithuania calculations.

Note: Higher number translates into higher progressivity. Progressivity is calculated using a formula (T167-T67)/T167, where T167 refers to effective PIT rate for a person earning 167% of AW, while T67 is the effective PIT rate for a person earning 67% of AW. Due to lack of data indicators for Cyprus are not included.

Conclusions

The comparative personal income tax analysis which has been delivered in this annex calls for the following conclusions. First, effective PIT rate progressivity in the OECD states is mostly affected by nominal PIT rates, while tax allowances and tax credits contribute to progressivity to a lesser degree. Progressive PIT rates are applied by most OECD states. Second, the tax burden is reduced upon application of tax allowances and/or tax credits in many OECD states. The OECD states with the highest effective PIT rate progressivity, apart for progressive PIT rates, often apply tax credit systems, while tax allowances contribute to effective PIT rate progressivity to a significantly lesser degree, notwithstanding their popularity amongst OECD states. Third, effective PIT rate progressivity is far higher than that of the tax wedge progressivity. Usually this difference is determined by the flat rate of social security contributions and the ceiling applied to social security contributions in some countries.

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