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COMMISSION STAFF WORKING DOCUMENT

Country Report Poland 2016

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EXECUTIVE SUMMARY

This country report assesses Poland's economy in the light of the European Commission's Annual Growth Survey published on 26 November 2015. The survey recommends three pillars for EU economic and social policy in 2016: re-launching investment, pursuing structural reforms to modernise. Member State economies, and responsible fiscal policies.

The Polish economy continues to experience a stable economic expansion. Driven by domestic demand, real GDP is expected to grow at robust rates of 3 ½ % per year in 2016 and 2017, well above the EU average. These growth rates will add to a long period of uninterrupted economic expansion, stretching as far back as 1992 — with Poland being the only EU country that weathered the post-2007 global financial and economic crises without undergoing any recession.

The gap in living standards and employment between Poland and the EU average has narrowed significantly, but challenges remain. In 2014, Poland's GDP per capita expressed in purchasing power standards reached 68 % of the EU average, up from 53 % in 2007. Total employment has been picking up since 2013, reaching all-time highs and pushing down unemployment. Despite this significant progress, the employment rate is still below the EU average. This gap is mostly explained by significantly lower participation rates of women and the low skilled. At the same time, the weight of the agricultural sector in total employment remains high and declines only slowly. The unemployment rate has also been decreasing and was back to pre-crisis levels. Yet, long-term unemployment accounts for about 40 % of the total. The country continues to experience rapid ageing and strong outward migration.

The overall economic outlook remains positive, while domestic risks are emerging. Private consumption is set to remain the dominant growth driver, given rising wages, employment and fiscal transfers. Private investment is expected to grow strongly as a result of an already high degree of capacity utilisation. Profit margins are set to remain strong but certain policy decisions taken or announced after the last general election may affect business confidence and investment. A new tax on the assets of financial institutions is likely to weigh on investment if banks respond by adjusting their lending rates to compensate for the impact on their profitability. Public investment is expected to remain strong, partly due to the government's objective to increase the investment rate. How this objective will be reconciled with higher current expenditure and domestic and EU fiscal rules still needs to be detailed. Deflation is forecast to end in 2016 but price pressures are expected to remain limited until 2017. After several years of adjustment, the current account deficit is expected to have almost closed in 2015, thanks to the strong performance of merchandise exports driven by the country's cost-competitiveness, in spite of negative developments in neighbouring markets.

Overall, Poland has made limited progress in addressing the 2015 country-specific recommendations. No significant progress was made in broadening the tax base and in addressing extensive recourse to reduced VAT rates. No steps were taken to establish an independent fiscal council. No progress was made in creating a system to record farmers' incomes and no action was taken to align special pension regimes for farmers and miners with the universal system. Some progress was made in relation to the segmentation of the Polish labour market. Progress is deemed to be limited in removing obstacles to investment in the railways.

Regarding the progress in reaching the national targets under the Europe 2020 Strategy, Poland is performing well in reducing the greenhouse gases, energy efficiency and tertiary education, while more effort is needed increasing the employment rate, R&D investment, renewable energy, and reducing early school leaving and poverty.

The main findings of the analysis in this report, and the related policy challenges, are as follows:

- **Robust and steady growth provides an opportunity to safeguard and improve the sustainability of public finances.** While the excessive deficit procedure was closed based on 2014 data, recent budgetary decisions affect the fiscal outlook, with the structural deficit expected to widen despite robust economic growth. Unless corrective measures are taken, the general government deficit is projected to increase above 3 % of GDP in 2017. Combatting tax evasion, in particular as regards value added tax (VAT), remains a major

challenge. The relatively large tax gap — the difference between what is collected and what is theoretically due — is also related to the low efficiency of the Polish tax administration. Adding to this, the extensive use of reduced VAT rates narrows the tax base and is not effective instrument for income redistribution. Recent amendments to the still new domestic expenditure rule affect its credibility and effectiveness. The amendments also serve to emphasise the potential benefits of establishing an independent fiscal council. In the long-term, Poland faces medium risks to the sustainability of its public finances — which are mainly related to the projected increase in healthcare and long-term care spending.

- **Poland has reached a stage of economic development where efficiency gains and sustained growth are more difficult to achieve.** While the Polish economy has made steady progress over the last two decades, continuing to close the income gap with the EU average is becoming more difficult. Efficiency gains are now harder to achieve, as evidenced by decelerating total factor productivity. Moreover, the unfavourable demographic outlook is reducing the contribution of employment to Poland's growth potential. As a result, Poland's medium to long-term economic prospects depend on the capacity of its economy to move from the production of relatively low-technology goods to more advanced products and services. Remaining structural issues in the labour market, education and innovation systems continue to hinder investment, productivity growth, income levels and living standards. In effect, Polish science, higher education, research, development and innovation score low by international standards. Recent strategic plans to improve this situation have not yet been implemented.

- **Safeguarding the stability of the financial sector is crucial going forward.** The 2015 EU-wide transparency exercise, carried out by the European Banking Authority, confirmed the overall healthy state of the Polish banking sector. Profitability among banks — as an indicator of the viability of their business and ability to lend to households and corporations — decreased in 2015. At the same time, the share of non-performing loans is close to the EU average and has recently been declining. The sector faces however a number of market and regulatory challenges. The new tax on the assets of banks and insurance companies and the costs of a potential conversion of foreign-denominated loans into zloty could have a significant impact on profitability and lending rates. These are coupled with existing cost pressures from record low market interest rates, the reduction in transaction fees for payment cards and contributions to restock the Bank Guarantee Fund following payments of guaranteed deposits of resolved credit unions.

- **Despite its current strong performance, the Polish labour market faces significant challenges.** The unfavourable demographic outlook has already translated into a declining working age population. Preserving the positive trend in employment, especially of older workers, is therefore essential. The current segmentation of the Polish labour market affects productivity and the accumulation of human capital in the longer term. Shortcomings in the education system and in the design of active labour market policies lead to mismatches between labour demand and supply. Moreover, geographic and occupational labour mobility is hampered by factors such as housing policies, transport infrastructure, access to childcare and skills mismatches. Preferential sector-specific social security arrangements — in particular the highly subsidised pension systems for farmers and miners — also reduce labour mobility and have high budgetary costs. At the same time, the overall size of the Polish system of social protection remains relatively small compared to most European Union Member States and it underperforms in terms of poverty reduction.

- **While access to professional services has improved, weaknesses in the regulatory framework and public administration remain.** The business and investment environments in Poland remain burdensome and complex in a number of areas, including tax compliance, construction permits and contract enforcement. Limited progress in digitalising the public administration also acts as a bottleneck. By contrast, Poland has been

determined in fostering competition in professional services.

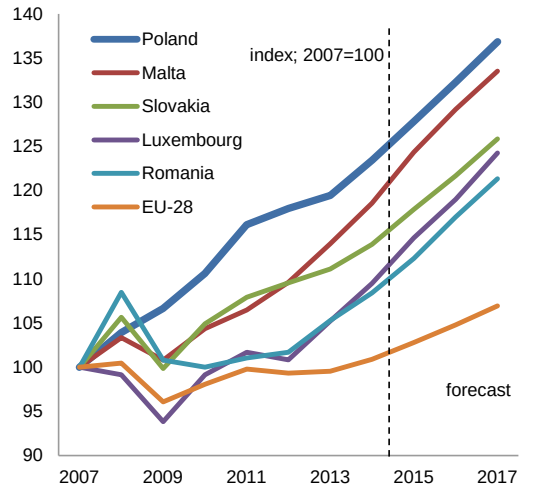
- **Investment in high quality infrastructure, including for transport, communications and energy, is critical to sustaining Poland's growth potential**. Despite sizeable investment in recent years, bottlenecks and deficiencies in transport, energy and communication networks persist. Investment activity is negatively affected by barriers related to the functioning of the public administration, taxation, and the environment for research, development and innovation activities. Weaknesses in the managerial and administrative capacity negatively affect the timely implementation of much needed investment projects in the railway sector and other transport, energy and telecommunication infrastructure. The Polish economy remains energy and carbon intensive; therefore potential gains from improving energy efficiency are significant. Electricity generation facilities are ageing and remain heavily dependent on coal. The power network is not sufficiently connected to neighbouring countries.

1. SCENE SETTER: ECONOMIC SITUATION AND OUTLOOK

Growth drivers and outlook

The Polish economy continues to experience a stable economic expansion. Poland was the only EU country that avoided a recession during the post-2007 global economic and financial crisis. In recent years, it succeeded in safeguarding macroeconomic stability and securing steady and robust economic growth (Graph 1.1). Since the second quarter of 2013, quarter-on-quarter GDP growth remained between 0.6 % and 1 % (Graph 1.2). As a result, GDP per capita expressed in purchasing power standards — a technical currency unit that eliminates price level differences between countries — increased from 53 % of the EU-28 average in 2007 to 68 % in 2014.

Graph 1.1: **Real GDP growth — 5 fastest growing EU economies during 2008-2017**

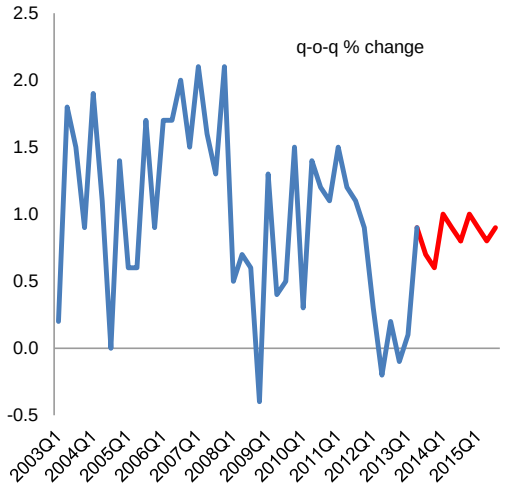


Source: Eurostat and European Commission

Economic activity remained strong in 2015. Driven predominantly by private consumption and, to a lesser extent, by investment, GDP increased by around 3.6 % in real terms (Graph 1.3). Private consumption expenditure has benefited from favourable labour market conditions and comparatively low lending rates. Net exports are also estimated to have contributed positively.

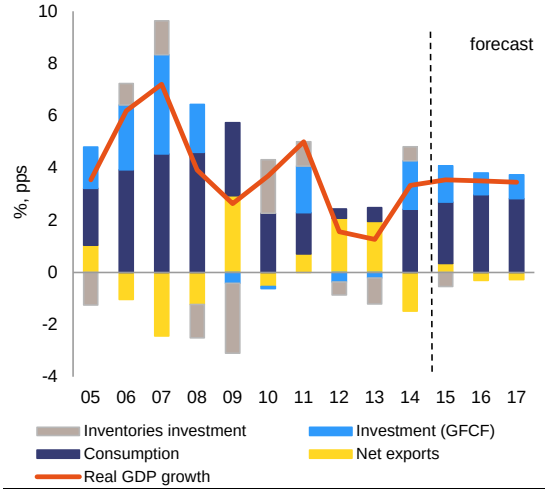
Unemployment has fallen rapidly in the last two years. At the end of 2015, the rate of unemployment returned to pre-crisis levels of around 7 % and a further improvement is expected in the next two years.

Graph 1.2: **GDP growth quarter-on-quarter, 2003-2015**



Source: Eurostat

Graph 1.3: **Contributions to real GDP growth, 2005-2017**



Source: Eurostat and European Commission

GDP growth is expected to remain steady and robust in the near term. Private consumption is projected to remain strong, supported by solid real wage growth, further employment gains and recently announced fiscal measures — notably the universal child benefit that will increase household disposable income from the second quarter of 2016. Continued low financing costs are expected to support private investment expenditure. Profit margins in the corporate sector are set to remain strong given low commodity prices, low prices of

other intermediate imported goods and wage growth broadly in line with productivity.

After an extended period of falling consumer prices, inflationary pressures are expected to remain subdued until 2017. The annual rate of consumer price inflation has remained well below the 2.5 % target of the Monetary Policy Council since late 2012. In mid-2014, inflation turned negative, mainly driven by falling energy and food prices. In 2016 and 2017, consumer prices are expected to pick up only moderately, aided by strong domestic demand, base effects in food and energy prices and, to a limited extent, the possible effects of the new tax on financial sector assets and the planned tax on the retail sector.

The risks to the overall positive outlook are broadly balanced, but changing. On the downside, some policy measures taken or announced after the last general election could have a negative impact on business confidence. For instance, the announced decrease in the retirement age, combined with the unfavourable demographic outlook in Poland, could be perceived as affecting the longer-term stability of public finances and/or the social adequacy of future pensions. The new tax on assets of financial institutions could impact lending rates and, in turn, credit growth, although the precise size of this effect is uncertain. The government has made a strong political commitment to raise the investment rate so as to boost economic growth. However, fiscal measures announced in the 2016 budget, and planned for 2017, may limit the fiscal space for investment expenditure going forward. EU-financed projects will continue to play an important role, with a likely temporary slowdown related to the ongoing transition to the new programming period of EU funding. The capacity to swiftly launch new publicly funded investment projects under the new framework (e.g. in the railway sector) will have a bearing on Poland's growth (see Section 2.5).

In the long term, Poland's biggest challenge is to upgrade its growth model. Boosting the country's innovative capacity is essential to move up the value chain (see Section 2.3). Improving the quality of education at all levels, including tertiary, is particularly important for a successful transition to a knowledge-driven economy (see Section 2.2). A high-quality infrastructure, including for communications, transport and energy, as well as strong and efficient public institutions, are also critical to addressing the challenge (see Sections 2.4 and 2.5).

Labour market developments

While employment has been increasing since 2013, employment rates remain comparatively low. Total employment was around 16.2 million persons in the third quarter of 2015, an all-time high in Poland's post-1989 history. Despite this significant progress, the employment rate of 68.4 % in the 20-64 age group was still some two percentage points below the EU average. The gap is particularly large among people aged 55 and older who are also often low skilled (see Section 2.2).

Several barriers prevent a further rise in activity and employment rates. These include the difficulty in upgrading the skills and competences among people currently detached from the labour market, in particular due to their very low skill-level, barriers to geographic mobility due to existing housing policies and transport infrastructure, and insufficient childcare facilities especially for the youngest children. These barriers as well as preferential sector-specific social security arrangements, notably highly subsidised systems for farmers and miners, hamper the mobility of workers towards more productive sectors of the economy.

The flexibility of the Polish labour market is largely reliant on temporary contracts. Poland has the highest share of temporary labour contracts of total employment in the EU. Almost all employment gains recorded in recent years were through temporary employment contracts. Only in 2015 did employment on open-ended contracts start to rise more significantly. So-called civil-law contracts, which are not subject to Labour Code regulations and which require lower or no social security contributions, account for a large share of temporary contracts. Labour market features such as the strict Employment Protection Legislation implied by the Labour Code and limited use of part-time employment arrangements constrain flexibility.

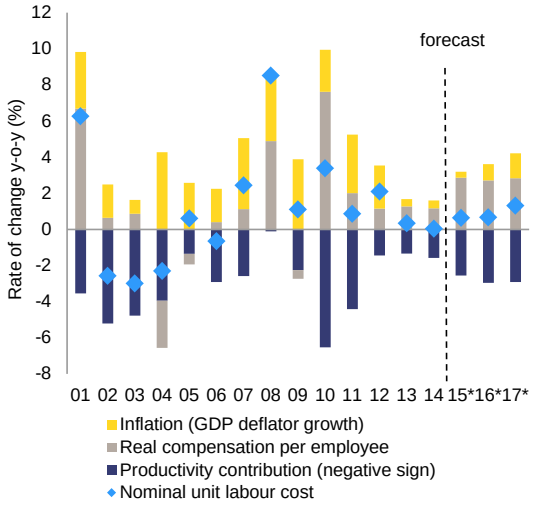
The segmentation of the Polish labour market comes with downsides. An excessive use of

temporary labour contracts has a negative impact on productivity, human capital accumulation and the adequacy of future pensions. The authorities introduced some measures aimed at limiting the use of such arrangements, e.g. by increasing social contributions. However, addressing segmentation in a comprehensive manner and striking the right balance between equalising tax and social contributions across all types of contracts while at the same time reducing the complexity of regular labour contracts remains a major challenge.

Contained wage growth safeguarded Poland's competitiveness. In recent years, wages have increased broadly in line with productivity. This has led to a moderate growth in unit labour costs without affecting Poland's cost-competitiveness (Graph 1.4). Contained wage growth can partly be attributed to the limited bargaining power of employees as a result of factors such as the high share of temporary contracts and a very decentralised wage bargaining system. In addition, during the economic slowdown in 2012-2013, adjustment was partly achieved through 'labour hoarding', i.e. reducing the number of hours worked rather than dismissals. The ensuing underemployment — the gap between preferred and actual number of hours worked — has been closing but only gradually.

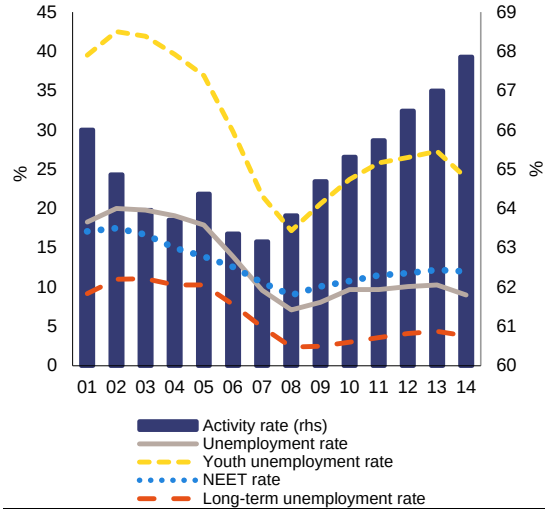
A negative demographic outlook affects the potential growth of the Polish economy. According to Eurostat's latest population projections, the population aged 15-64 will decline at an annual average rate of 0.8 % until 2030. Consequently, increasing labour force participation constitutes a considerable challenge going forward, in particular of older workers. Encouragingly, the participation among older workers has been increasing over the last few years. Plans to reverse the increase in the statutory retirement age could jeopardise this positive trend. At the same time, other factors will also play a role in the employment of older workers, including their health, flexibility of working arrangements and other adjustments by firms to better adapt to ageing. In the long-term, the increase in the school-starting age, entering into force in autumn 2016, may also limit labour supply.

Graph 1.4: **Unit labour costs dynamics and its decomposition, 2000-2017**



Source: Eurostat and European Commission

Graph 1.5: **Main labour market indicators, rates 2001-2014**



(1) NEET stands for young people neither in employment nor in education and training.
Source: Eurostat

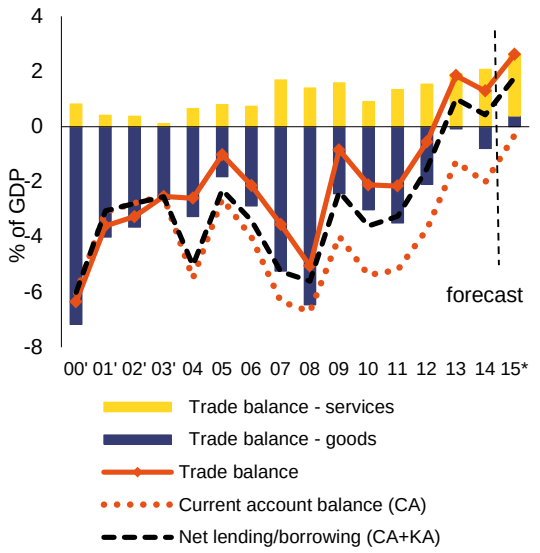
External position

Following several years of adjustment, the current account was nearly balanced in 2015. The balancing of the external position has been mainly driven by the consistently stronger performance of merchandise exports in relation to imports (Graph 1.6). Lower prices of imported energy commodities also played an important role.

The robust growth in exports in recent years is particularly impressive given the negative economic developments in Russia and Ukraine. The surplus in the services' trade in Poland has stabilised at around 2 % of GDP since 2013. Underpinning this has been the development of 'business processing centres', which provide a wide range of services to multinational companies, as well as the strong performance of transport and telecommunications, computing and information services.

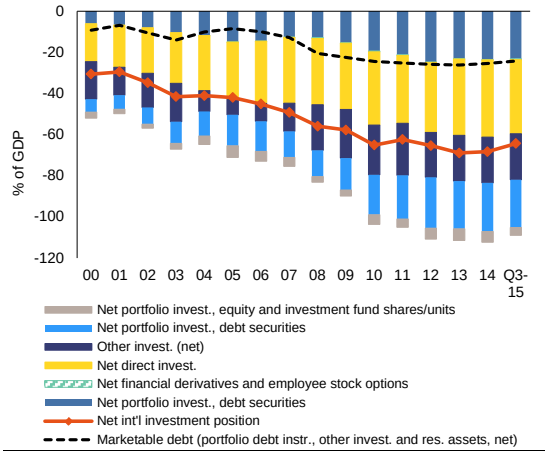
Poland's negative Net International Investment Position (NIIP) stabilised below 70 % of GDP in recent years. The private sector is responsible for most of the gross liabilities to the rest of the world. The accumulated stock of foreign direct investments constitutes the major part of the NIIP, amounting to around 37 % of GDP in 2014-2015 (Graph 1.7). This served to limit the potential risks associated with highly negative NIIP, as rapid and large swings in international capital flows that can destabilise markets are less likely in the case of direct investments. The NIIP is expected to decline in the coming years due to favourable current account balances.

Graph 1.6: **Current account balance by component, 2000-2015**



Source: Eurostat and European Commission

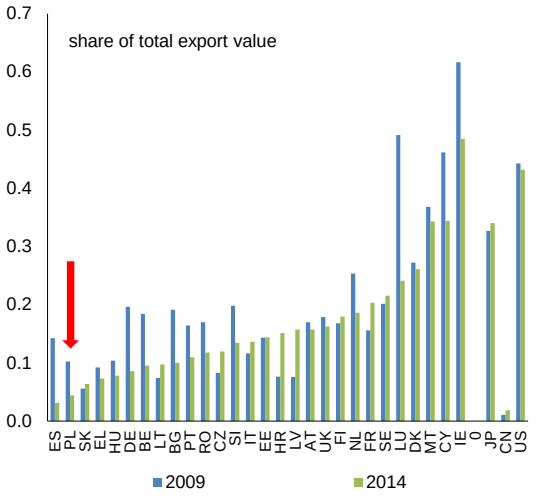
Graph 1.7: **Decomposition of net international investment position, 2000-2015**



Source: European Commission

Poland significantly increased its market share of global exports, mainly due to its cost-competitiveness. Poland's share of world exports increased by more than one third between 2004 and 2014. Moderate wage growth vis-à-vis productivity played an important role as borne out by the slow growth in nominal unit labour costs. The relative stability of the zloty-euro exchange rate also underpinned cost-competitiveness. Poland's export gains in recent years were mainly in low- or medium-technology goods and products that are not quality leaders in the EU market. Indeed, the share of 'top quality' products (based on the prices fetched on the market) in Polish exports value to the EU declined between 2009 and 2014 (Graph 1.8). The share of such products in all Polish goods exports is one of the lowest in the EU. The outlook for exports and economic growth more generally depends on the ability of the Polish economy to move up in the global value chain and expand sectors producing higher quality, and more innovative products.

Graph 1.8: **Share of value of exported goods in top quality category, 28 EU countries plus JP, US and CN, 2009 - 2014**



Source: European Commission. Methodology of the quality classification follows Vandenbussche H (2014), Quality in Exports, Economic Papers, DG ECFIN

Public finances

Poland corrected its excessive deficit in 2014. Since 2010 Poland has gradually consolidated its public finances mainly thanks to restraint on the expenditure side and robust and steady economic growth. Between 2010 and 2014 the ratio of general government expenditure to GDP declined by 3.5 percentage points, while total revenues increased by 0.7 percentage points despite value added tax revenues shrinking (by 0.5 percentage points).

The general government debt-to-GDP ratio remains below 60 % of GDP. It increased from 53.3 % in 2010 to 55.9 % in 2013, on the back of high general government deficits and slower economic growth. It then returned to 50.4 % in 2014 mainly due to a large one-off transfer of private pension fund assets. The Commission expects a debt-to-GDP ratio of above 51 % in 2015.

Plans announced or implemented since the last general elections may weigh on fiscal consolidation. The measure with the largest fiscal impact, already in 2016, is the new universal child benefit. Based on the information available, its cost is likely to be around 0.9 % of GDP in 2016 and 1.2 % of GDP in 2017. Significant one-off revenues from the sale of the mobile internet frequencies are expected to produce a small reduction in the headline deficit in 2016, compared with 2015. However, unless new measures are taken in the next budget, the deficit is expected to widen and to exceed 3% of GDP in 2017. If and when implemented, the possible increase in the tax-free threshold of personal income tax and a lower statutory retirement age will have the effect of further increasing deficit in 2017 and beyond.

The domestic fiscal framework is being amended. In addition, to the debt break built into the Polish constitution, Poland introduced a stabilising expenditure rule in 2013, which was fully applied for the first time in the 2015 budget. The rule was amended in December 2015 to create space for higher expenditure in the 2016 budget. While the impact of the amendment still needs to be determined, cross-country evidence indicates that relaxing existing constraints tends to affect the credibility of the fiscal framework. Also of note is that Poland remains the only EU country that does not have and does not plan to establish an independent fiscal council (see Section 2.1).

Developments in the financial sector

The banking sector remains well capitalised, liquid and profitable. The healthy state of the sector was confirmed by the results of the 2015 EU-wide transparency exercise carried out by the European Banking Authority. The profitability of the sector decreased in 2015 but remains at a reasonable level with a return on equity (ROE) of 6.8 % in 2015. Profits are likely to be put under pressure by the record low interest rates, the statutory reduction of interchange fees for debit and credit cards, and the introduction of higher contributions to the Bank Guarantee Fund.

The new tax on financial sector assets is expected to affect the profitability of the sector and may impact lending rates. In February 2016, a new tax on the assets of banks and insurance companies operating in Poland entered into force. According to official communications, the new levy was not introduced to address specific financial sector issues, but to finance new budgetary expenditure. The new levy is expected to affect the profitability of the sector. In addition, the prospect of a possible law on the conversion of

Swiss franc mortgage loans brings additional risks to the profitability of Polish banks. On the positive side, profitability will be supported by a fall in the burden of loan impairment provisions on earnings. This follows a decrease in loan costs and the improving financial status of many borrowers. It remains to be seen how the tax will affect the sector in general, in particular the weakest banks, and what the broader impact on credit growth will be. The tax design may give financial institutions an incentive to restructure their portfolios, predominantly towards more risky assets or by transferring assets abroad.

The share of non-performing loans is close to the EU average and has recently been falling. Non-performing loans represent about 7 % of total lending, down from around 8 % in 2013. This ratio is expected to remain fairly stable in 2016 with a bias towards slight improvements. The newly established Creditors' Support Fund is expected to assist individual mortgage holders facing problems with debt servicing. The Fund, operational since mid-February 2016, will provide temporary financial support to all mortgage holders (irrespective of the loan's currency) in distress i.e. the unemployed or those with a loan-to-value ratio above 100 % or with debt servicing costs that exceed 60 % of household income. Household loans account for around 60 % of the loan stock with a predominance of housing loans. Bank credit plays only a limited role in financing business investment, and credit growth was weak until end-2013. Since 2014 credit has been accelerating, driven by favourable financial conditions and healthy corporate balance sheets.

Although the condition of the banking sector is good overall, the legacy of foreign currency-denominated mortgage loans increases banks' vulnerability. In mid-2015, the stock of foreign currency-denominated housing loans was equivalent to about 10 % of GDP, representing 28 % of all outstanding loans to households in Poland. The bulk of these loans is denominated in Swiss francs and was granted before 2009. After the significant appreciation of the Swiss franc against the zloty in early 2015, the performance of the foreign currency mortgage loans worsened slightly in relation to previous years, but remained marginally better in comparison with housing loans denominated in zloty. Still, the depreciation of the zloty against the Swiss franc resulted in a situation where more than 200 000 outstanding mortgage loans have a loan-to-value ratio exceeding 100 %. A new draft law enabling foreign currency mortgage holders to convert their loans into zloty-denominated ones was presented by the Presidential administration in January 2016. A comprehensive impact assessment of the draft law is currently being prepared by the Polish Financial Supervision Authority. However, if a law with conversion costs falling disproportionately on the banks eventually enters into force, it may cause substantial problems for some of the banks, notably the lenders with highest share of Swiss franc mortgages on their balance sheet.

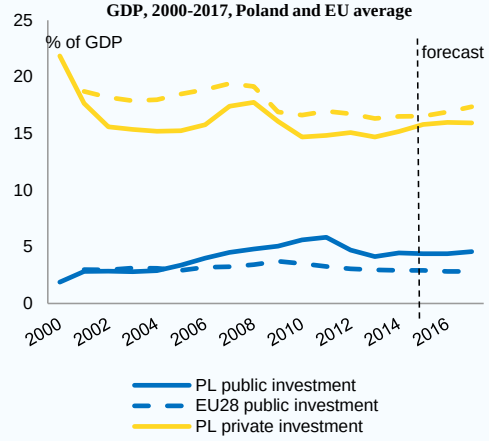
Credit unions are the most vulnerable part of the Polish financial system, yet pose no systemic risk. The entire credit unions segment accounts for less than 2 % of the banking system's assets, and is of little systemic importance for the financial system. Nonetheless, the sector experienced difficulties in meeting regulatory capital adequacy ratios, leading to most credit unions operating under strict supervision and some going into liquidation. As a result of a few recent bankruptcies, the Bank Guarantee Fund has recently been required to reimburse depositors of the credit unions concerned. This has knock-on effects in so far as the Fund needs replenishing through contributions from the entire banking sector. However, these costs are expected to be limited and do not present any systemic risk at present.

Box 1.1: **Investment challenges**

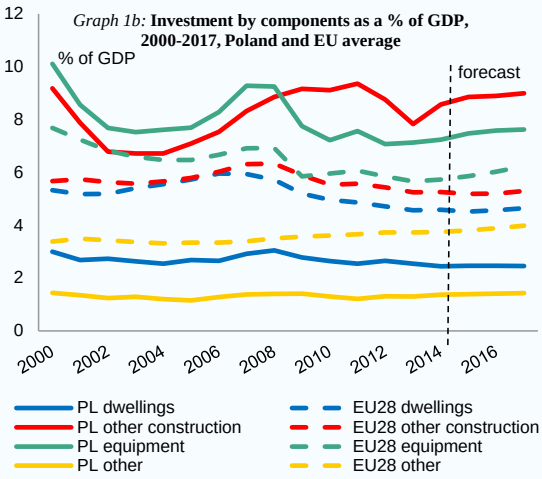
Macroeconomic perspective

Since 2008 the investment-to-GDP ratio in Poland has remained marginally above the EU average thanks to robust public investment activity. This ratio stayed significantly below that of the EU in the early 2000s. The gap closed only in the run-up to the crisis.

Graph 1a: **Public and private investment as a % of GDP, 2000-2017, Poland and EU average**



Graph 1b: **Investment by components as a % of GDP, 2000-2017, Poland and EU average**



(1) Forecast for 2015-2017 based on a no-policy-change assumption
Source: European Commission

Private investment-to-GDP ratio in Poland has stayed below the EU average ever since 2001. In the years just after 2008, overall investment trends were determined by the substantial drop in private investment, while public investment continued to rise until 2011. The resilience of public investment can be explained by needs relating to underdeveloped infrastructure (e.g. roads) along with the availability of EU funds. Following a double-digit investment growth rate in 2014, investment activity is projected to continue rising until 2017, but at a more moderate pace. Investment-to-GDP ratio is set to increase further to reach almost 21 % by 2017.

Investment in equipment and construction is relatively high in Poland, but investment in dwellings is low. The structure of investment components differs markedly between Poland and the EU average. Equipment investment contracted strongly after 2008, but has started to gradually recover recently. Investment in dwellings in Poland is significantly below the EU average. When excluding dwellings from the overall investment figure, Poland has performed consistently above the EU average, with the difference in GDP ratios exceeding 2 percentage points for the last decade.

The relatively low private investment-to-GDP ratio is due to a combination of factors. First, it partly reflects lower housing investment. Second, the combination of a relatively low investment rate with high economic growth suggests comparatively high efficiency of investments. Low labour costs encourage a predominantly labour-intensive development model for the business sector (see Section 2.2). Finally, there are several structural barriers to investment.

Assessment of barriers to investment and ongoing reforms

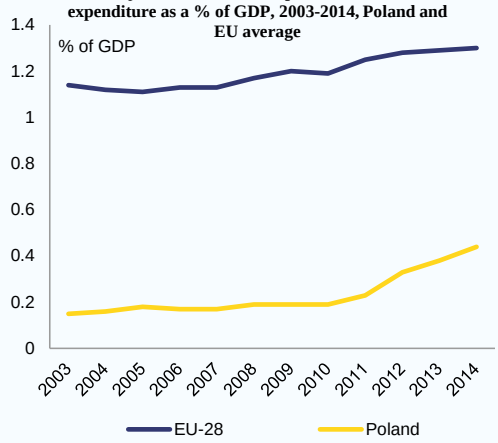
Barriers from various policy areas affect the investment climate in Poland. Their relative importance varies between sectors, company size, time horizons of investment projects, or even geographic location. The recent 2015 Staff Working Document identifies the barriers most pertinent for Poland.([1])

(Continued on the next page)

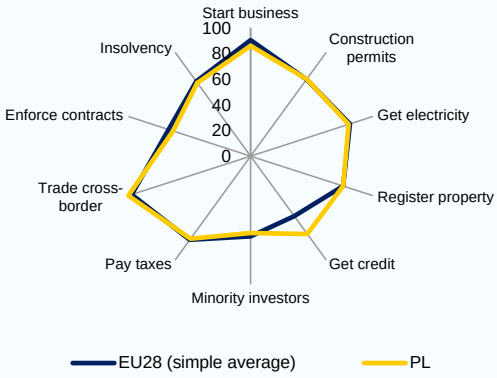
Box (continued)

These span a range of policy areas such as the overall business environment, particularly as regards: the functioning of the public administration; taxation; the environment for research, development and innovation activities; as well as sector-specific issues concerning construction, energy, transport and the digital economy sectors.

Graph 2a: **Business enterprise sector R&D expenditure as a % of GDP, 2003-2014, Poland and EU average**



Graph 2b: **Doing business 2016 - distance to frontier**



Source: European Commission, World Bank Doing business report 2016

Research, development and innovation (R&D) investment expenditure is one area where investment barriers appear to play an important role. Such expenditure has been particularly low in Poland in comparison to other EU economies (see Section 2.3). Only since 2012 has there been a gradual uptake. Low R&D investment in Poland accounts for more than half of the gap in total private investment-to-GDP ratio vis-à-vis the EU average.

Some of the investment barriers have at least been partly addressed by reform initiatives in the past year. For instance, there was a little progress in easing the burden related to obtaining the construction permits (see Section 2.4), although the relevance of the adopted changes for larger construction projects remains only indirect. Other examples include changes to the insolvency framework (see Section 2.4), legislative changes to the R&D tax incentives (see Section 2.3), and the adoption of the national Rail Programme 2023 (see Section 2.5). Given the character of challenges in all these areas, progress was gradual and limited and additional actions are still needed to further improve investment conditions. By contrast, little or no progress has been observed in the last year as regards other identified barriers such as the predictability of future national energy policy, stability and simplicity of tax laws.

Other significant investment barriers particularly important ones include those related to network industries. For some sectors, weaknesses of the railway infrastructure (see Section 2.5) may be an important issue hindering the investment decisions. Publicly and privately funded investment projects in transport, energy and telecommunication infrastructure are being delayed, made more costly or in some instances even blocked by weaknesses in the managerial and administrative capacity of relevant institutions and by a lack of clear and stable strategic vision for the future development of certain sectors (e.g. energy) (see Section 2.5).

([1]) Staff Working Document 'Challenges to Member States' Investment Environments' SWD(2015) 400 final, http://ec.europa.eu/europe2020/challenges-to-member-states-investment-environments/index_en.htm.

Box 1.2: The European Structural and Investment Funds in Poland

Poland is the largest beneficiary of the European Structural and Investment Funds (ESIF) and can receive up to EUR 86 billion for the 2014-2020 period. This is equivalent to 2.7% of GDP annually and constitutes 54% of expected national public investment. A number of reforms were passed in order to fulfil ex-ante conditionality in areas benefiting from the Funds to ensure successful investments. Some of these reforms in areas such as health care investment, waste management and the water sector are still pending, with over 70 actions plans to be completed by the end of 2016. Where ex-ante conditionality is not fulfilled by the end of 2016, the Commission may suspend interim payment to the priorities of the programme concerned.

The programming of the Funds includes a focus on the priorities and challenges identified in recent years in the context of the European Semester, with EUR 37.2 billion of funding available until 2020. This comprises EUR 28.5 billion under the European Regional Development Fund (ERDF) and Cohesion Fund (CF) (45 % of funds) and EUR 8.7 billion available under the European Social Fund (65 % of ESF). Important investment areas linked to country-specific recommendations (CSR) include: research and innovation; linking Poland's energy networks to the EU; railways; access to employment for job-seekers and inactive people; gender equality in all areas; improving the labour market relevance of education and training systems; facilitating the transition from education to work and investment in institutional capacity. The Youth Employment Initiative in Poland is an integral part of the national Programme 'Knowledge, Education, Development'; the priority axis 'Young people in the labour market' envisages for it a total budget of almost EUR 505 million.

Implementation is regularly monitored. This includes reporting in mid-2017 on the contribution of the funds to the Europe 2020 objectives and progress in addressing relevant structural reforms to maximise the use of EU financing (notably, in: the health, rail, and R&DI sectors; the labour market, education and higher education; and social inclusion).

Financing under the new European Fund for Strategic Investments (EFSI), Horizon 2020, the Connecting Europe Facility and other directly managed EU funds would be additional to the ESI Funds. Following first rounds of calls for projects under the Connecting Europe Facility, Poland has signed agreements for EUR 251 million in the energy field and EUR 2 billion for transport projects. For more information on the use of ESIF in Poland, see: https://cohesiondata.ec.europa.eu/countries/PL

Table 1.1: **Key economic, financial and social indicators - Poland**

	2003-2007	2008	2009	2010	2011	2012	2013	2014	forecast 2015	2016	2017
Real GDP (y-o-y)	5.1	3.9	2.6	3.7	5.0	1.6	1.3	3.3	3.5	3.5	3.5
Private consumption (y-o-y)	4.2	6.1	3.4	2.7	3.1	0.7	0.2	2.5	3.0	4.0	3.9
Public consumption (y-o-y)	3.9	5.1	3.6	3.3	-1.8	-0.4	2.2	4.9	3.1	3.4	2.7
Gross fixed capital formation (y-o-y)	9.8	8.4	-1.9	-0.4	8.8	-1.8	-1.1	9.8	7.1	4.1	4.5
Exports of goods and services (y-o-y)	10.9	7.0	-6.3	12.9	7.9	4.6	6.1	6.4	5.8	5.4	6.3
Imports of goods and services (y-o-y)	11.6	9.4	-12.4	14.0	5.8	-0.3	1.7	10.0	5.2	6.4	7.2
Output gap	-1.3	2.8	1.5	1.4	2.3	0.4	-1.1	-0.9	-0.5	-0.1	0.2
Potential growth (y-o-y)	3.6	4.2	3.9	3.9	4.1	3.4	2.9	3.1	3.1	3.1	3.2
Contribution to GDP growth:											
Domestic demand (y-o-y)	5.0	6.4	2.4	2.2	3.4	0.0	0.3	4.3	3.7	3.8	3.7
Inventories (y-o-y)	0.7	-1.3	-2.7	2.0	0.9	-0.5	-1.0	0.5	-0.5	0.0	0.0
Net exports (y-o-y)	-0.6	-1.2	2.9	-0.5	0.7	2.1	1.9	-1.5	0.3	-0.3	-0.3
Contribution to potential GDP growth:											
Total Labour (hours) (y-o-y)	0.1	0.4	0.3	0.3	0.5	0.5	0.5	0.6	0.4	0.4	0.4
Capital accumulation (y-o-y)	1.1	2.1	1.9	1.8	2.0	1.7	1.4	1.6	1.7	1.7	1.7
Total factor productivity (y-o-y)	2.4	1.7	1.8	1.8	1.5	1.2	1.0	0.9	0.9	1.1	1.2
Current account balance (% of GDP), balance of payments	-4.6	-6.7	-4.0	-5.4	-5.2	-3.7	-1.3	-2.0	.	.	.
Trade balance (% of GDP), balance of payments	-2.3	-5.1	-0.8	-2.1	-2.2	-0.6	1.9	1.3	.	.	.
Terms of trade of goods and services (y-o-y)	1.2	-1.6	3.3	-1.9	-1.5	-1.2	1.0	1.9	1.9	0.3	-0.4
Capital account balance (% of GDP)	0.6	1.1	1.6	1.8	2.0	2.2	2.3	2.4	.	.	.
Net international investment position (% of GDP)	-44.4	-56.0	-57.8	-65.1	-62.4	-65.4	-69.0	-68.5	.	.	.
Net marketable external debt (% of GDP)1	-10.4	-20.5	-22.5	-24.4	-25.2	-25.9	-26.2	-25.6	.	.	.
Gross marketable external debt (% of GDP)1	36.7	45.5	47.4	50.8	54.5	54.3	53.3	55.0	.	.	.
Export performance vs. advanced countries (% change over 5 years)	.	57.5*	45.8	34.9	25.7	13.6	9.4	12.90	.	.	.
Export market share, goods and services (y-o-y)	7.7	7.3	0.3	-1.8	-1.0	-2.5	6.0	5.3	.	.	.
Net FDI flows (% of GDP)	-3.5	-1.9	-1.8	-1.8	-2.6	-1.2	-0.8	-2.0	.	.	.
Savings rate of households (net saving as percentage of net disposable income)	4.0	0.8	3.2	2.4	-1.1	-1.1	-0.1	-0.7	.	.	.
Private credit flow (consolidated, % of GDP)	6.2	16.4	4.2	5.8	7.6	3.6	3.1	4.8	.	.	.
Private sector debt, consolidated (% of GDP)	46.5	67.7	67.5	69.7	73.9	73.4	75.5	77.9	.	.	.
of which household debt, consolidated (% of GDP)	16.5	30.2	31.8	34.2	35.1	34.1	35.1	35.6	.	.	.
of which non-financial corporate debt, consolidated (% of	29.9	37.5	35.7	35.5	38.8	39.3	40.4	42.3	.	.	.
Corporations, net lending (+) or net borrowing (-) (% of GDP)	0.7	0.8	5.5	6.0	5.8	6.4	8.1	6.6	7.4	6.1	6.9
Corporations, gross operating surplus (% of GDP)	21.6	21.7	24.0	24.0	24.6	24.6	25.0	25.6	25.6	25.2	25.7
Households, net lending (+) or net borrowing (-) (% of GDP)	-0.3	-2.9	-0.3	-1.7	-3.7	-4.0	-2.6	-3.0	-3.0	-2.7	-3.5
Deflated house price index (y-o-y)	.	.	-5.4	-6.7	-4.6	-6.7	-4.7	1.2	.	.	.
Residential investment (% of GDP)	2.7	3.0	2.8	2.6	2.5	2.6	2.6	2.4	.	.	.
GDP deflator (y-o-y)	2.7	3.6	3.9	2.3	3.2	2.4	0.4	0.4	0.3	0.9	1.4
Harmonised index of consumer prices (HICP, y-o-y)	2.1	4.2	4.0	2.7	3.9	3.7	0.8	0.1	-0.7	0.6	1.7
Nominal compensation per employee (y-o-y)	2.5	8.6	3.4	10.1	5.3	3.6	1.7	1.6	3.2	3.6	4.3
Labour productivity (real, person employed, y-o-y)	3.1	0.1	2.3	6.5	4.4	1.4	1.3	1.6	.	.	.
Unit labour costs (ULC, whole economy, y-o-y)	-0.6	8.5	1.1	3.4	0.9	2.1	0.3	0.0	0.6	0.7	1.3
Real unit labour costs (y-o-y)	-3.2	4.8	-2.7	1.0	-2.3	-0.3	-0.1	-0.4	0.3	-0.2	-0.1
Real effective exchange rate (ULC, y-o-y)	-0.7	13.8	-20.4	10.4	-2.6	-3.2	0.2	-0.3	-2.3	-4.5	.
Real effective exchange rate (HICP, y-o-y)	0.8	9.0	-14.7	6.0	-2.2	-2.4	0.2	1.0	-2.2	-2.8	-0.5
Tax wedge on labour for a single person earning the average wage (%)	28.2	25.0	24.4	24.6	24.6	24.7	24.8	24.8	.	.	.
Taxe wedge on labour for a single person earning 50% of the average wage (%)	25.5*	22.6	22.2	22.4	22.5	22.7	22.8	22.9	.	.	.
Total Financial Sector Liabilities, non-consolidated (y-o-y)	19.4	6.0	9.0	12.9	4.9	7.6	7.3	0.5	.	.	.
Tier 1 ratio (%)2	.	10.5	12.6	11.5	11.2	12.0	13.4	13.2	.	.	.
Return on equity (%)3	.	17.0	9.1	12.5	13.8	11.7	9.7	8.6	.	.	.
Gross non-performing debt (% of total debt instruments and total loans and advances) (4)	.	3.4	6.4	6.4	6.0	6.4	6.0	5.4	.	.	.
Unemployment rate	16.1	7.1	8.1	9.7	9.7	10.1	10.3	9.0	7.5	7.0	6.5
Long-term unemployment rate (% of active population)	8.9	2.4	2.5	3.0	3.6	4.1	4.4	3.8	.	.	.
Youth unemployment rate (% of active population in the same age group)	34.0	17.2	20.6	23.7	25.8	26.5	27.3	23.9	20.9	.	.
Activity rate (15-64 year-olds)	63.7	63.8	64.7	65.3	65.7	66.5	67.0	67.9	.	.	.
People at-risk poverty or social exclusion (% total population)	39.7	30.5	27.8	27.8	27.2	26.7	25.8	24.7	.	.	.
Persons living in households with very low work intensity (% of total population aged below 60)	12.3	8.0	6.9	7.3	6.9	6.9	7.2	7.3	.	.	.
General government balance (% of GDP)	-4.1	-3.6	-7.3	-7.5	-4.9	-3.7	-4.0	-3.3	-3.0	-2.8	-3.4
Tax-to-GDP ratio (%)	34.1	35.2	32.3	32.0	32.5	32.8	32.8	33.0	33.2	33.7	33.5
Structural budget balance (% of GDP)	.	.	.	-8.2	-6.0	-4.0	-3.4	-2.6	-2.7	-3.2	-3.4
General government gross debt (% of GDP)	46.0	46.6	49.8	53.3	54.4	54.0	55.9	50.4	51.4	52.5	53.5

(1) Sum of portfolio debt instruments, other investment and reserve assets
(2,3) Domestic banking groups and stand-alone banks.
(4) Domestic banking groups and standalone banks, foreign (EU and non-EU) controlled subsidiaries and foreign (EU and non-EU) controlled branches.
(*) Indicates BPM5 and/or ESA95
Source: Source: European Commission, winter forecast 2015; ECB

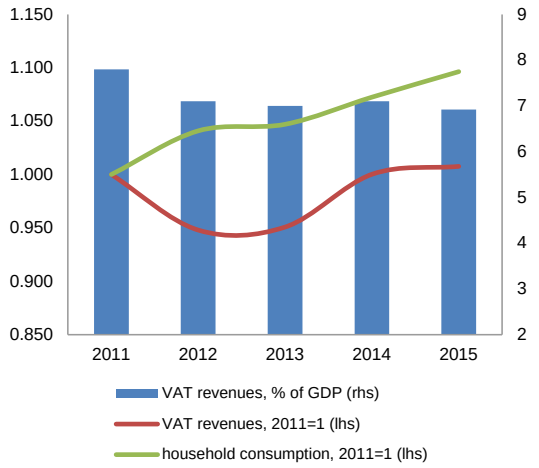
2. STRUCTURAL ISSUES

This section provides an analysis of the main structural economic and social challenges for Poland. Focusing on the policy areas covered in the 2015 country-specific recommendations, this section first analyses issues related to taxation, the fiscal framework and fiscal sustainability. Second, it reviews labour market developments, including education, social policy and healthcare. Third, it analyses Poland's R&D performance, in particular in terms of linkages between the business sector and academia, quality of science and financing of R&D activity. The key obstacles to economic activity are also analysed, with a focus on the main weaknesses in the business environment and judicial system, as well as in the public administration. Finally, the section focuses on existing infrastructure bottlenecks especially as regards transport, energy and information and communications networks. Energy efficiency and environmental issues are also discussed.

2.1. TAXATION, FISCAL FRAMEWORK AND LONG TERM FISCAL SUSTAINABILITY

Combatting value added tax (VAT) fraud remains a major challenge for Poland. A recent EU-wide study indicates that Poland had a high level of non-compliance and non-collection of VAT in 2013 ([1]). The VAT compliance gap of 26.7% was significantly above the EU average and in line with the authorities' own estimates. Another study by an international consultancy company suggests that the VAT compliance gap remained high in 2015 too ([2]). Since 2011, VAT receipts in percent of GDP have declined. In 2015, VAT collection was also significantly lower than originally planned in the 2015 state budget and this cannot be fully explained by macroeconomic developments deviating from those assumed in the budget law (mainly lower inflation) (Graph 2.1.1). In fact, in 2015 VAT revenues are forecast to have dropped to their lowest level as a share of GDP since 2004, irrespective of the measures introduced so far (such as the reverse charge mechanism or the joint liability of firms in sensitive sectors). Poland continues to implement additional measures, in particular improved planning and coordination of VAT audits and raising public awareness on VAT fraud. A key bottleneck is the lack of a comprehensive strategy for improving tax compliance with quantified targets. The new Finance Minister emphasised the intention to significantly increase VAT collection by combatting VAT fraud. A new strategy with a focus on better tax compliance and fighting tax evasion is being prepared. It is expected to include measures such as new IT tools to detect and combat VAT fraud, a reform of tax administration (see below) and a lower limit for cash payments between companies.

Graph 2.1.1: **VAT revenues in Poland**



Source: Eurostat, European Commission staff projection (based on Ministry of Finance data) for 2015

Challenges to improving the effectiveness and efficiency of the Polish tax administration persist. The cost-of-collection ratio, i.e. the administrative costs per net tax revenue collected, is the highest in the EU ([3]). Fragmentation has been consistently identified as a major weakness affecting the performance of the Polish tax administration. The tax administration remains

([1]) 2015 study by CPB/CASE for the European Commission: "2013 Update Report to the Study to quantify and analyse the VAT Gap in 26 EU Member States".

([2]) http://www.pwc.pl/pl/pdf/luka-vat-pwc-wrzesien-2015.pdf

([3]) European Commission Tax reforms in EU Member States 2015 — Tax policy challenges for economic growth and fiscal sustainability.

fragmented with 16 tax chambers and 400 tax offices and different IT support systems. According to a recent OECD survey, Poland has one of the lowest ratios of IT expenditure to total expenses in tax administration ([4]). The same survey shows that countries with tax administrations reporting high levels of IT investment tend to perform above average on efficiency-related indicators. Despite the numerous efforts, a comprehensive modernisation of tax administration in Poland is still lacking. Since April 2015, the support functions (such as human resources) of tax offices and tax chambers were merged at regional (voivoidship) level. A new law on tax administration was adopted in July 2015 aimed at improving the functioning of the tax administration and improving the quality of services for taxpayers. However, the structural weakness of fragmentation remains unresolved. A committee was set up to design a project on creating a unified national tax administration through merging existing tax offices, tax chambers and customs administration, as well as by putting in place an appropriate IT support system. It remains to be seen how this project evolves and whether it will translate into improvements in core tax administration functions such as risk assessment of tax compliance, debt collection and audit operations, supported by modern and uniform IT system.

The costs of tax compliance remain high. According to the latest World Bank report on Doing Business, while the hours needed to comply with tax obligations for businesses have decreased slightly, compared with the previous year, they remain very high (271 hours annually, compared with the EU average of 186 hours). According to other reports, the complexity of tax regulations is the most problematic factor for doing business ([5]). There have been several reforms in this field. The number of e-filings has increased and limited pre-filling has been available since 2015. The July 2015 law on tax administration aims at creating a system of taxpayer assistance and support. The first 50 tax support centres started operating in September 2015 within existing tax offices, to offer integrated advice on tax, social security and customs issues. Newly established firms are also able to benefit from the services of a tax assistant for a period of 18 months. However, the entry into force of certain stipulations of the July 2015 law has been postponed to July 2016, pending the reorganisation of the tax administration. Since July 2015, the Tax Information Offices have been specialised by type of tax. This is set to make tax interpretations more consistent and remedy the problem of different interpretations depending on the region. The tax and customs information lines have been merged.

Poland continues to apply reduced VAT rates to a large number of goods and services. This contributes to high revenue losses and reduces the efficiency of the VAT system. The potential revenue loss due to reduced VAT rates and optional exemptions is the second highest in the EU ([6]). A number of reduced VAT rates are presented as instruments to support lower-income families. However, reduced VAT rates are not an effective instrument for that purpose, particularly because they are not specifically targeted to vulnerable households. Evidence shows that they also translate into significant subsidies to rich taxpayers. Social benefits and the income tax are instruments which could be better targeted and thus more suitable to achieve redistributive goals.

Fiscal framework

The current fiscal framework encompasses positive elements but is subject to changes that weaken its effectiveness. Poland's medium-term budgetary planning is based on the Multiannual State Financial Plan which covers four years and constitutes the basis for the preparation of annual budgets. Separate debt rules for the general government and for local governments are in place and embedded in the Polish constitution. A stabilising expenditure rule covering almost the entire general government was introduced at the end of 2013, following a Council recommendation in that year. However, the credibility of the fiscal framework is affected by frequent changes to existing rules, e.g. removal of the specific

([4]) OECD (2015), Tax Administration 2015: Comparative Information on OECD and Other Advanced and Emerging Economies, OECD Publishing, Paris.

([5]) World Economic Forum - Global Competitiveness Report

([6]) 2015 study by CPB/CASE for the European Commission: "2013 Update Report to the Study to quantify and analyse the VAT Gap in 26 EU Member States".

correction mechanism in case of breaching the 50% threshold of debt-to-GDP ratio in 2013 or removal – in the same year – of the rule providing that the draft budget cannot include a deficit higher than the one set for that year in the Multiannual State Financial Plan. The latest changes to the expenditure rule, enacted in December 2015, entail adjusting the expenditure ceiling to the medium-term inflation target of the central bank (2.5%) and allow for increased expenditure in the event of one-off and temporary revenue measures. These changes raise the expenditure ceiling given current inflation levels, thus considerably weakening the effectiveness of the expenditure rule.

The fiscal framework lacks a fully-fledged independent fiscal council. Poland is the only EU Member State without an independent fiscal council or plans to create one. Currently, only a limited set of tasks usually associated with independent fiscal councils are being carried out by existing institutions in Poland. *Ex ante*, the Monetary Policy Council of the National Bank of Poland provides an opinion on the macroeconomic assumptions underlying the state budget and the social partners are consulted. *Ex post*, the Supreme Audit Office (NIK) presents to the Parliament annual reports on the execution of the budget act and its compliance with laws and the administrative rules governing the budgetary process. However, the remit of an operationally and financially independent fiscal council would be much broader and different. Its mandate typically covers: (1) *ex-ante* checks of compliance with domestic and EU fiscal rules, an assessment of macroeconomic and budgetary forecasts and an analysis of the long-term sustainability of public finances; and (2) an *ex-post* assessment of compliance with the fiscal rules. By monitoring and assessing fiscal policy-making, as well as by issuing regular recommendations to the government, such a body could contribute significantly to enhancing transparency and accountability of fiscal policy-making. This way, an independent fiscal council would play an essential role in strengthening the Polish fiscal framework, particularly in the light of the country's track record of frequent changes to existing fiscal rules — affecting both debt and expenditure.

Long term fiscal sustainability

There are significant sustainability risks in a longer perspective due to unfavourable initial budgetary position and projected increase in costs of population ageing. Poland faces no significant short-term risks of fiscal stress ([7]), although some variables (such as the current primary balance, the share of debt held by foreign investors and the share of debt issued in foreign currency) point to possible short-term challenges. In the medium-term however, fiscal risks appear to be high from a debt sustainability analysis perspective due to the increasing and relatively high stock of debt at the end of the projection period (2026). The medium-term risks captured by the sustainability gap indicator S1 highlight medium fiscal risks mainly due to the unfavourable initial budgetary position and, to a lesser extent, to the projected increase in age-related public spending ([8]). In the long-run, Poland faces medium risks to fiscal sustainability due to the fairly sizeable value of the long-term sustainability gap indicator S2 (at 4 pps. of GDP). These risks are also largely connected to the unfavourable initial budgetary position (contribution of 2.9 pps. of GDP to the required fiscal adjustment) and to the necessity to meet future increases in the costs of ageing (1.1 pps. of GDP), notably in the healthcare and long-term care areas. Therefore, over the long-term, reduction of the projected age-related expenditure increases remains a key challenge to improving fiscal sustainability.

([7]) Based on the early-detection indicator S0; Fiscal Sustainability Report 2015, http://ec.europa.eu/economy_finance/publications/eeip/pdf/ip018_en.pdf).

([8]) For additional information on all sustainability indicators S0, S1 and S2, and the risk assessment methodology, please see ibidem

2.2. LABOUR MARKET, EDUCATION AND SOCIAL POLICY

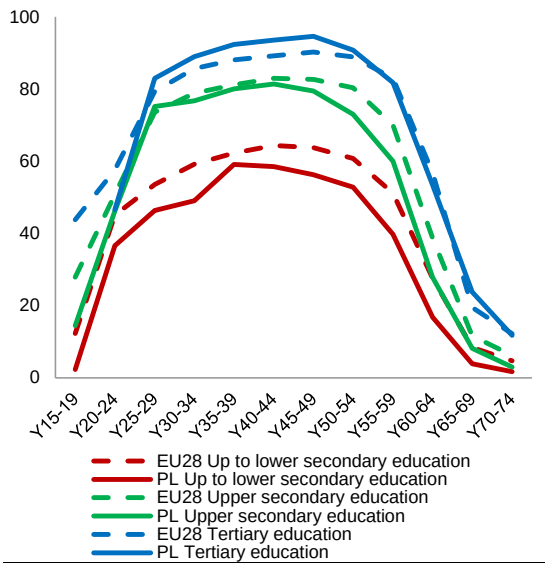
Labour market

Patterns of educational attainment and skills explain the diversity of labour market participation and employment rates. Despite substantial improvement over the last decade, the employment rate stood at 68.4 % in Q3-2015, still 2.2 pps. below the EU average. This gap is mainly the result of the significantly lower participation rates of younger and older workers, particularly women (Graph 2.2.1). Whereas lower participation in the labour market among older workers is linked to low skills and educational attainment, among young people (aged 15-24), it is linked with relatively high participation in education, especially tertiary education.

High educational attainments of younger generations bode well for the Polish economy, in contrast with the gender employment gap. The proportion of people below 40 years of age with tertiary education is high in Poland and employment rates for people with tertiary education are above the EU average. However, the gender gap in employment rates continues to pose a challenge to the potential of the Polish economy. This gap is largest in the 55-64 age group due to the early 'de-activation' of women. However, it is also high in the 25-34 age group, given the prolonged periods of labour market withdrawal by young mothers and insufficient access to childcare. Disability is another factor reducing employment chances strongly. Skill shortages, barriers to geographic mobility and the relatively low uptake of part-time work also hinder the full use of the employment potential.

Unemployment has dropped continuously but remains a challenge. The unemployment rate has been decreasing since 2013 and was back to pre-crisis levels, at 7.1 %, in Q3-2015. Long-term unemployment accounts for around 38 % of total unemployment. The youth unemployment rate (20.5 % in Q3-2015) has also fallen from the highs reached in 2013. However, jobless rates remain high for young people with low to medium skills, specifically for those with vocational qualifications. The rising number of unfilled vacancies coupled with long average job searching periods among the unemployed suggests increasing difficulties in matching existing vacancies with the remaining pool of unemployed people. In 2014, 12 % of those aged 15-24 were not in employment, education, or training (NEET), which is just below the EU average.

Graph 2.2.1: **Employment rates by educational attainment and age, Q3-2015**



Source: Eurostat

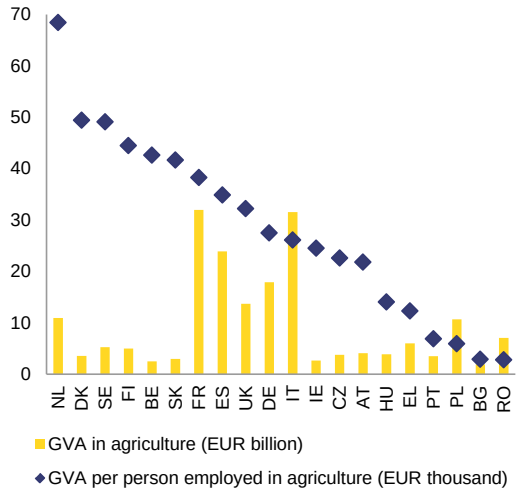
Amidst a rapidly ageing population and outward migration, a gradual increase in the retirement age and recourse to inward migration are crucial. Fertility rates have been well below the simple replacement rate for long, falling to 1.3 in 2013. The old-age dependency ratio is expected to increase from 20.9 % in 2010 to 58 % in 2050. The demographic outlook is also adversely affected by migration flows, in particular persistently high outward migration ([9]). Although the average effective retirement age increased to 59.5 for women and 62.1 for men in the five-year period 2009-2014, it remains significantly below the statutory retirement age. Current plans to reverse the ongoing gradual increase in the statutory retirement age may jeopardise efforts to address the challenge of a shrinking workforce. Inward migration, especially of workers from Ukraine plays an increasingly important role for the functioning of the labour market in Poland.

([9]) It is estimated that nearly 1.2 million people emigrated from Poland between 2009 and 2013, 280 000 people in 2013 alone. This was the fourth biggest number of emigrants in the EU in 2013. At the same time, migration inflows are increasing exponentially, and are set to play and important role for the labour market in the future (from 10 000 in 2006 to 220 000 in 2013).

Agriculture still has a high share in total employment in Poland. Agriculture accounts for nearly 12 % of the overall workforce, a share which has been declining very slowly over the last decade. Productivity in the agricultural sector is particularly low (Graph 2.2.2) ([10]) and Poland has one of the lowest average farm sizes in the EU ([11]). At 17.9 % in 2014, the proportion of self-employed workers is also one of the highest in the EU (14.4 % on average). Around 41 % of all self-employed persons aged 15-64 work in agriculture, 16.4 % in the retail trade and 9.4 % in construction. The breakdown, however, varies across regions, as the proportion of self-employed and employed in agriculture is visibly higher in the eastern part of Poland (Graph 2.2.3).

The social security and tax privileges of farmers still hamper labour mobility and are a burden on public finances. State subsidies to the Agricultural Social Insurance Fund (KRUS) amount to almost 1 % of GDP while contributions from farmers cover less than 10 % of the Fund's overall costs. The link between contributions and benefits in the scheme is weak and contributions are mostly based on a flat-rate ([12]). Moreover, there are no durable systemic solutions for means-testing, i.e. to exclude high-income farmers from participating in the scheme. As far as the preferential tax regime is concerned, currently farmers pay a farm tax based on farm size and soil quality, which is also independent of actual income. As a result, KRUS together with a preferential tax regime generate incentives to hold onto small plots of land and to stay in agriculture. This also creates hidden unemployment or underemployment in rural areas and increased participation in the informal economy.

Graph 2.2.2: **Gross value added in agriculture**



Source: AMECO

Preferential pension arrangements for miners are costly and hamper labour mobility, although to a lesser degree. Miners are exempt from the general defined-contribution public pension system with special preferential pension multiplier coefficients, which is a significant yearly cost to the public finances of over 0.5 % of GDP. According to recent Polish Social Insurance Institution (ZUS) statistics ([13]), miners' pensions amount to almost 8 % of the total pension bill, while the number of eligible miners is slightly more than 4 % of the total population of pensioners covered by ZUS. Moreover, miners enjoy the privilege of being able to opt for an earlier statutory retirement. Consequently, the effective retirement age of miners is considerably lower and miners are set to receive higher pensions for a substantially longer period relative to the general scheme participants.

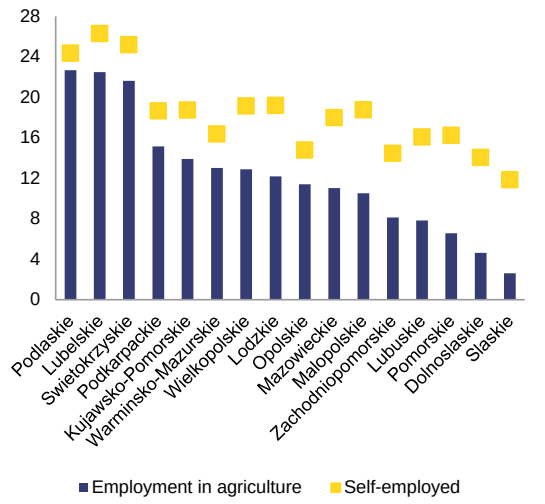
([10]) For example, in 2013 it was EUR 6 300 per capita of the value added vs. an average of EUR 19 800 in countries covered by the European Network of Agricultural Social Protection Systems (ENASP).

([11]) 11.3 hectares per farm vs an ENASP average of 47 hectares per farm. According to KRUS data, over 900 000 farms in Poland – out of the total of 1.1 million – are farms smaller than 10 hectares.

([12]) For instance, regular social contributions in the general social insurance scheme (ZUS) for the minimal salary are around PLN 500 per month (EUR 120), whereas the lowest contribution to KRUS for farms below 50 hectares (vast majority of Polish farms) is only PLN 130 per month (EUR 30) – regardless of the actual income.

([13]) For the period of January – September 2015; http://www.zus.pl/files/biul0315.pdf

Graph 2.2.3: **Employment in agriculture and self-employed persons (15-64) as a proportion of total employment, 2014**

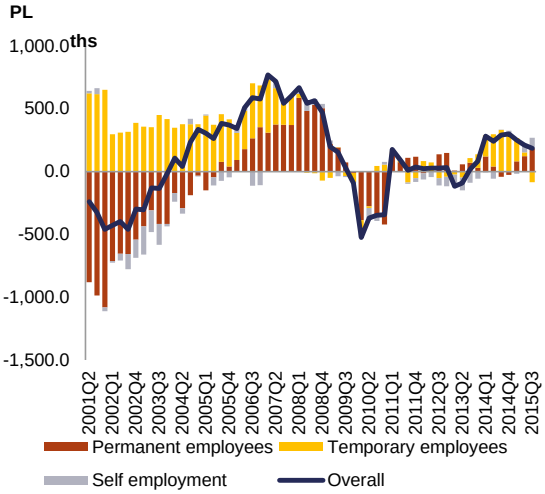


Source: Eurostat

Job creation occurred almost entirely through temporary employment contracts. At close to 28 % in Q3-2015, Poland has the highest share of fixed-term employment in the EU. Youth aged 15-24 are particularly affected, as 73 % of all employed in this age group worked on temporary contracts in Q3-2015, one of the highest rates in the EU. Almost half of all temporary workers (around 1.4 million) have civil law contracts, as opposed to contracts based on labour law. Temporary contracts became popular in the early 2000s and have remained a permanent feature of the Polish labour market since then. Between 2001 and 2014 the number of employees on temporary contracts increased by 2.3 million, while the number of permanent workers decreased by 0.2 million. However, in the first three quarters of 2015 it was permanent jobs that drove overall employment gains (Graph 2.2.4).

The use of temporary contracts in the labour market appears excessive and has a negative effect on productivity and the accumulation of human capital. These contracts are rarely a step towards standard permanent employment. In 2014, the transition rate was just 18.3 %. n most cases these arrangements are not voluntary for employees, especially young people. Employers tend to invest less in upgrading the skills and competencies of temporary employees, with long-term negative implications for the labour market, given the persistent use of such contracts among young and lower skilled workers. On a more positive note, temporary contracts appear to be effective in increasing employment among older people, who more often voluntarily choose this form ([14]).

Graph 2.2.4: **Employment by type (permanent, temporary, self-employed), year-on-year changes**



Source: Eurostat

Rigidities in the Labour Code and preferential social security and tax treatments explain the very large proportion of atypical labour contracts. Civil law contracts in Poland are associated with lower social security contributions and preferential taxation, lowering overall labour costs. In addition such contacts are easy to terminate and facilitate employment on a salary below the minimum wage. On the other hand, certain features of the Labour Code create disincentives for employers to hire people on open-ended contracts, which is predominantly due to the complexity of labour regulation and the high implicit costs of dismissals for open-ended contracts. These include high procedural costs, the costs associated with lengthy and uncertain dispute resolution mechanisms — including the possibility of reinstatement — and provisions such as the special protection of older workers from layoffs

([14]) Gatti R., Goraus K., and Morgandi, M (2014). Balancing Flexibility and Worker Protection. Understanding Labor Market Duality in Poland. The World Bank, Washington DC

(on a backlog of cases in labour courts, see also section 2.4)

Poland has recently taken some first measures to tackle labour market segmentation. An amendment to the Labour Code, which entered into force in February 2016, introduces restrictions to the number of consecutive fixed-term employment contracts and their maximum duration. Moreover, it aligns the notice period for fixed-term and permanent contracts (Box 2.2.1). Since 1 January 2016, the social security contributions connected to some civil law contracts have been increased. Also in January 2016, two draft laws were presented, which (i) strengthens the role of the State Labour Inspectorate and (ii) introduces a minimum hourly remuneration of PLN 12 for those working on civil law contracts.

Box 2.2.1: Labour Code vs. civil law contracts

Standard employment contracts

The Polish Labour Code regulates a number of different contract types: contracts for an indefinite duration; contract for a definite duration and contracts for a trial period, each of which are subject to a set of specific Labour Code provisions and grant entitlements to paid holidays, maternity and childcare leave, severance pay in the event of collective redundancies and unemployment benefits. The recourse to temporary agency work is limited to seasonal work; ad-hoc assignments, tasks that cannot be completed on time by the company's regular workers and as replacement for a company's long-term absent employee.

The stringency of employment protection legislation for both permanent and fixed-term contracts is close to average according to the indicators developed by the OECD. Collective dismissals are more strictly regulated than individual dismissals. In case of individual dismissal, the union representative must be notified, the maximum length of the notice period is average and severance pay low. Regulation related to the definition of unfair dismissal is also not particularly constraining. Yet, the legal procedures in case of dispute separation - a dimension which is not captured by the OECD employment protection indicators - are long and their outcomes highly unpredictable, thus involving heavy implicit costs and acting a as deterrent for hiring under open-ended contracts. The procedure of consultation with trade unions is extensive and time consuming, with no real protection for employees. In addition there are numerous categories of employees, including older workers with less than four years until retirement age, which enjoy enhanced job protection and cannot be dismissed unless the employer is liquidated. Re-employment obligations in case of unfair dismissal are also heavy. Moreover, there is no difference as regards protection against dismissal in large or small firms. Finally, the ceiling of three months on trial-period contracts, which can be used before an open-ended or fixed-term contract is offered, is one of the shortest in the EU, potentially limiting both hiring and the quality of matching.

Civil law contracts

While permanent, fixed-term and other temporary contracts are all regulated by the Labour Code, employment relations can also be regulated by the Civil Code. Civil Code contracts differ from the above mainly in that they specify a piece of work to be done within a defined period. These contracts are cheaper for employers, since they set limited social protection requirements. The most popular of these are:

1. *Umowy zlecenia*, which relate to the performance of a specified activity. The essence of this type of contract is that one party (the principal) orders another party (the agent) to perform specific activities. The predicted result is only probable; the risk of contract performance is borne by the principal. An order does not have to be made in writing, and is not necessarily remunerated. This contract is not subject to mandatory health insurance, but if it is the only source of income for the agent, or if the principal is the agent’s usual employer with whom he has an employment contract, retirement and disability insurance contributions are due. The contract is subject to income tax. As of 2016 all *umowy zlecenia* will be subject to mandatory social contributions (corresponding to minimum pay).
2. *Umowy o dzieło*, or "contracts of mandate" which relate to the achievement of a specific result (and do not specify a time or place of work and there is no supervision by the employer). Contracts to perform a specified task or work are frequently concluded because they are not subject to social security contributions. However, if a firm concludes a contract to perform a specific task or work with an employee, it is obliged to pay social security contributions just as in the case of a contract of employment. The contract is subject to income tax.

Important characteristics which distinguish employment contract from civil law contracts are that in the former case: (a) an employee is subordinated to an employer; (b) an employee performs work in a set place and time; (c) remuneration is paid on a monthly basis; (d) work must be performed in person and the work is supervised by the employer; (e) duties may be amended in the course of employment; and (f) the employee is covered by mandatory health insurance. Civil law contracts do not need to comply with Labour Code regulations, do not pay for overtime and holidays, and are not subject to mandatory health insurance. Also, workers under civil law contracts do not have the right to unionise.

The Public Employment Service has been reformed to improve job-matching efficiency. The reform aims at a better targeting of services to the unemployed and closer cooperation with the private sector. Legislative changes enacted in 2014 provide for: outsourcing of activation services by the Public Employment Service; the setting-up of an 'Activation and Integration Programme' for individualised activation services (jointly funded by employment offices and social assistance centres); and the profiling of the unemployed.

Wage bargaining is highly decentralised in Poland, while a recently established Social Dialogue Council could strengthen social dialogue. The trade union density is very low; the same holds for the employer organisation density. Poland is also one of Member States with the lowest collective bargaining coverage ([15]). Bargaining predominantly takes place at company level. The number of multi-employer pay agreements at sector level remains very small. At national level, social dialogue underwent a crisis in 2013 when trade union organisations withdrew from a tri-partite commission. As a result of this stalemate, the new Social Dialogue Council was established in October 2015. It has greater powers than the old tri-partite commission and enjoys the right to propose legislative initiatives on issues related to socioeconomic development, the enhancement of national economic competitiveness and social cohesion.

Education

The education system in Poland has significantly improved over the last years. Poland has one of the EU's lowest proportions of early school leavers (5.4 % in 2014, compared to the EU average of 11.1 %). Moreover, 2012 OECD PISA survey results on basic skills are very good; in particular Poland stands among the countries with the highest literacy ratios. The rate of low achievers among 15 year-olds in OECD PISA 2012 is significantly lower than the EU average in all three tested fields. Nevertheless, there are substantial differences in achievement between various types of schools and a strong influence of the students' socio-economic background, which raises accessibility concerns.

The education system is less successful in equipping pupils with the transversal skills that are necessary for the rapidly changing labour market and innovation. The school system is centred on transferring knowledge using passive learning methods and preparing students for testing by imposing ready-made solutions rather than supporting independent problem solving, critical thinking and creativity. This is, among others, due to the fact that teachers are often not equipped with appropriate, modern and innovative didactic methods ([16]).

Participation in tertiary education is very high, but the quality of education is affected by institutional and demographic factors. The tertiary attainment rate for 30-34 year olds stood at 42.1 % in 2014, compared to the EU average of 36.9 %. This ratio has almost quadrupled in the last 15 years. However, due care was not taken to assure appropriate levels of quality of tertiary education provision. Recent tertiary education graduates in Poland perform somewhat below the EU average in numeracy, while they are on par with the EU average in literacy as measured by the OECD PIAAC survey. Academic teachers are not motivated by the assessment system to introduce innovative teaching methods. The degree of internationalisation of Polish higher education is very limited both in terms of foreign students and participation in international scientific collaboration. The financing model of higher education to a great extent relies on past standing and quantities variables of universities, such as the number of students and academic staff. Therefore, falling student numbers in the wake of negative demographic trends result in a worsening of the financial situation of higher education institutions. This forces many higher education institutions to lower admission criteria in order to attract more students. This also affects teaching quality. As a result, the comparative average standing of Polish

([15]) 12.7 % in 2012 for trade union density (trade union members as a percentage of all employees in dependent employment); and 20 % in 2012 for employer organisation density (percentage of employees employed by companies that are members of an employer organisation). The coverage of collective bargaining was 14.7 % in 2012. ; Updated ICTWSS data. 2015.

([16]) See Czajkowska, M. M.Grochowalska, M.Orzechowska (2015).

higher education is relatively low (see also Section 2.3).

The links between higher education and the labour market have not yet been fully established. Career offices at higher education institutions are often understaffed and are not subject to a proper quality assessment. At the same time, while higher education considerably increases chances to be employed, finding suitable employment after graduation can be difficult and time-consuming. There is a substantial and increasing number of over-qualified workers with tertiary education performing medium or low skilled jobs, which reveals skill mismatches in the labour market ([17]). However, despite this increase, the extent of over-qualification in Poland remains significantly below the EU average as evidenced by recent Cedefop and OECD studies ([18]).

Similarly, the quality and labour market relevance of initial vocational education and training (iVET) is still limited. The practical preparation of teachers of vocational subjects, the quality of teaching in general subjects and the quality of career and educational counselling in secondary schools remain a challenge. Systematic cooperation with companies to improve the link with the labour market is missing. The mismatch between qualifications required by the labour market and those provided by VET schools remains significant. The funding method for VET means that regional authorities fund VET programmes even if qualifications are not in demand, while it discourages them from funding vocational qualifications that are more costly to provide ([19]).

Poland lags behind peer countries on adult participation in lifelong learning. The rate of adult participation in lifelong learning in Poland decreased to 4.0 % in 2014, which is far below the EU average of 10.7 %. Invariably participation tends to be lowest among people who most need to upgrade their skills: those with basic levels of education, those over 50 years and those who are inactive on the labour market. According to the PIAAC survey results, the skills of adults were on average lower than their OECD peers in all tested categories. In particular, the assessment of problem-solving skills in technology-rich environments revealed that the proportion of adults attaining higher proficiency levels is significantly smaller in Poland than in any other country participating in the survey. The issue of the employability of people who are currently out of work can be illustrated by the rising proportion of employers finding it difficult to attract employees with the required skills (up to 80 % in 2014). In 2014, 43 % of employers declared that their employees needed upskilling ([20]). Finally, there is no coordination of lifelong learning policy.

Despite certain improvements, the coverage of childcare facilities for children below three and in rural areas continues to be problematic. The national rate of participation in education for three to six year olds increased rapidly in the last few years. Participation of three to four year olds increased by 7.4 pps. (to 71.6 %) in the school year 2014/15 compared with 2013/14 ([21]) . Participation for five year olds reached 94 %. However, challenges remain in reducing disparities in access to early childhood education for children under three years old. According to Eurostat, in 2013 only 4 % of them were covered by formal childcare arrangements (14 % in the EU). While there is strong evidence that early learning is crucial for later school and labour market success, in particular for children in families with the lower socio-economic status, the school entry age was recently raised from six to seven years. This change is likely to impact on the availability and take-up of pre-school education, as the six years olds will have to stay in kindergartens occupying places that could be allocated to younger children and compulsory pre-school education for five years olds will be abolished. These changes are

([17]) In 2013 the share of persons with tertiary education aged 25-34 and employed in elementary occupations stood at 28.3%. This percentage rose by 6.4 pps in comparison to 2010 The European Higher Education Area in 2015; Bologna process Implantation Report, European Commission.

([18]) Cedefop 2015, Skills, qualifications and jobs in the EU: the making of a perfect match?; OECD 2013, OECD Skills Outlook 2013: First Results from the Survey of Adult Skills.

([19]) Cedefop 2015, Poland. VET in Europe – Country report 2014.

([20]) PARP and Jagiellonian University, 2015, Study of Human Capital in Poland.

([21]) Central Statistical Office, 'Education in 2014/2015 School Year', November 2015.

likely to negatively affect children from poorer backgrounds and the supply of labour.

Social policy

In recent years, progress on inequality and poverty reduction has been mixed. Since 2008, the number of people living in poverty or social exclusion has decreased continuously, meeting the Europe 2020 target. Since the mid-2000s, Poland has also recorded the largest drop in income inequalities in the region ([22]). In 2014, the at-risk-of poverty or social exclusion rate for working age population stood at 24.7 %, very close to the EU average. At the same time, extreme poverty has been on the rise since 2008, stabilising in 2013-2014 at 7.4 % of all households. Between 2008 and 2013, the at-risk-of poverty rate for the population living in jobless households increased substantially by 10.2 pps. to 59.4% (EU average: 56.6%). In this same vein, in 2014, more than 30% of Polish households with at least two unemployed members lived in extreme poverty and 36% of households with a main source of income other than a salary or pension lived in relative poverty ([23]). This may be partly attributed to low coverage and adequacy of unemployment benefits, along with relatively strict eligibility criteria and low replacement rates ([24]).

The Polish system of social protection is small and underperforms on poverty reduction. Expenditure on social protection benefits (17.6% of the GDP in 2012) is one of the lowest in the EU and social benefits, social contributions and direct taxes contribute relatively little to reducing poverty. The observed reduction in the number of people living in poverty is mainly the result of market income. In 2014, the at-risk-of-poverty rate before social transfers (excluding pensions) stood at 23.1%, decreasing to 17% after social transfers (EU averages: 26.1 % and 17.2 %, respectively). The poverty gap is 1.5 pps. below the EU average, but has been increasing since 2010. Excluding pensions, other social benefits are few and have been diminishing over time. Although the pension system is relatively effective in preventing poverty in old age ([25]), spending on pensions (11.3% GDP) remains much higher than on other social policies, partly due to the unreformed pension schemes for farmers and miners. The social security privileges in these sectors, especially the farmers' pension scheme, use resources that could be reallocated to more effective social programmes with a stronger overall impact on poverty reduction (Graph 2.2.5).

Adequacy of social benefits is low. The coverage of social assistance is insufficient due to low income thresholds allowing for social benefits and relatively complex eligibility criteria ([26]). In case of single households, the total amount of social assistance benefits reaches only 29% of the poverty threshold (26% for couples), one of the lowest levels in the EU ([27]). For some types of households, social benefits are lower than the subsistence minimum. The lack of adequate income support in Poland exposes a large proportion of children to the risk of poverty. The coordination of family benefits with social assistance benefits — in terms of governance, benefit indexation and eligibility rules — is weak. The risk of poverty or social exclusion among children stood at nearly 30% in 2013, whereas the risk of poverty of children living in jobless households was as high as 78.5%, well above the European average.

The child benefit system has been reformed. In 2015, the child tax credit in the personal income

([22]) IMF (2015), Republic of Poland, Article IV Staff Report

([23]) Central Statistical Office, 'Ubóstwo ekonomiczne w Polsce w 2014', 9.06.2015, Statistical Annex

([24]) The coverage of short term unemployed by unemployment benefits remains low at 15 % in 2014, 22 pps. lower than the EU average. This reflects the fact that the duration of benefits for short work records is only average (maximum of 26 weeks in 2015), while eligibility conditions are relatively strict (qualifying period of at least 12 months of employment in the 18-month prior to unemployment). In addition, replacement rates after six months of unemployment are below the EU average. For instance, based on the OECD tax-benefit model information, replacement rates after six months for a single earner without children were at 39% in 2013, around 10 pps. below the EU average.

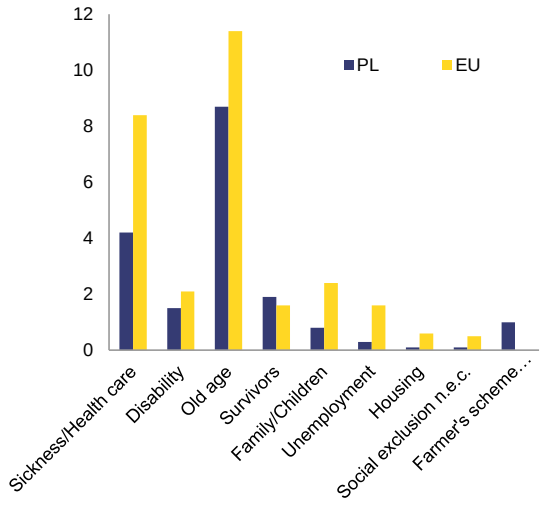
([25]) The at-risk-of-poverty or social exclusion rate for the 65+ age group is 18.2 %, close to the EU average and well below that of the Polish population in general.

([26]) According to a report by the Polish Committee of the European Minimum Income Network, at least 40 % of the extremely poor are not covered by the minimum income scheme.

([27]) Bradshaw J. and S. Marchal, A Comparison of Minimum Income Schemes in European Countries Using MIPI Data, 2015.

tax was modified. In 2016, new rules determining the amount of family benefits (złotówka za złotówkę programme) entered into force and the eligibility to parental pay benefits was extended. These measures aim at supporting larger families and promoting labour market participation. ([28]) Poland is currently introducing the so-called 500+ PLN programme, a monthly child allowance of PLN 500 for every child, with means-testing applying for the first child. The reform will be implemented from the second quarter of 2016 and goes on top of existing benefits. The authorities are introducing the programme with a view to increasing the fertility rate. However, empirical evidence suggests that the overall effect of policies of direct financial transfers on fertility rates is small ([29]).

Graph 2.2.5: **Expenditure on social protection in Poland and EU28, 2012 (% of GDP)**



Source: Eurostat

Healthcare

The Polish healthcare system faces challenges in terms of effectiveness and accessibility. Unmet needs for healthcare, especially due to long waiting lists, are reported to be high ([30]), and there is a low rate of physicians (the lowest number per 100 000 inhabitants in the EU in 2013) and nurses. Life expectancy remains noticeably lower than the EU average for both genders, but in particular for men. The rates of amenable and preventable mortality are higher than the EU average and survival rates for various types of cancer (colorectal, breast and cervical) are lower. Mortality rates below the age of 64 are estimated to reduce the workforce in Poland by 1.8 % when compared with the workforce potential estimated with a use of average EU mortality rates ([31]).

Poland also faces the challenge of continuing the shift towards ambulatory and primary care, and restructuring service provision to reduce waiting lists and improve the referral system. Poland is among the EU Member States with one of the most hospital-centred health-care systems, meaning that there is considerable potential to increase efficiency in the delivery of healthcare services by shifting care to ambulatory care settings. This is reflected in a high share of spending on inpatient care of total healthcare expenditure, a high number of curative hospital beds per inhabitant, a low share of spending on typically more cost-efficient outpatient care services and below EU average spending on prevention and public health services. Relevant initiatives include the adoption of the Policy Paper for Health Care 2014-2020 and a new Public Health Law, the preparation of the National Health Programme and the development of Health Needs Maps. This also holds for the 'waiting lists package' and the 'oncology package', which aim at reducing waiting times by shifting patients to the lowest appropriate level of care and prioritising patients with greater needs.

([28]) Ministry of Finance, 'Przegląd wydatków publicznych w obszarze wsparcia rodzin o niskich dochodach Wnioski i rekomendacje'; http://www.mf.gov.pl/documents/764034/3090067/20151112_Przeglad_wydatkow_wsparcie_rodzin_o_niskich_dochodach

([29]) For example see: OECD (2011), Doing Better for Families

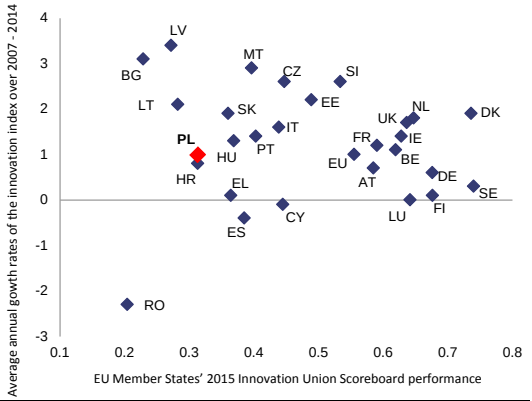
([30]) According to EU SILC self-reported data, one reason for unmet needs for medical examination is: 'Too expensive or too far to travel or waiting list'. At 8.8 %, Poland ranks fifth, among Member States, one of the highest in the EU (average 3.6 %). It has been scoring consistently high for a number of years.

([31]) European Commission calculations on the impact of mortality on labour force size, measured as the number of potential working life years per birth cohort, standardised for population size and age cohort mix, based on Eurostat 2013 figures.

2.3. R&D AND INNOVATION

Despite the steady increase in R&D spending, progress towards higher innovation output is limited. Gross domestic R&D expenditure (GERD) has been increasing steadily in recent years, but at 0.9 % of GDP in 2014 it is still one of the lowest in Europe and well below the EU average of slightly above 2 %. R&D in Poland still relies predominantly on the public sector supported mainly by EU Structural Funds. However, an important development is the increase is business enterprise expenditure, which in 2014 reached 0.4 % of GDP, up from 0.2 % five years earlier. Despite recent efforts, Poland performs below the EU average on all dimensions of the 2015 Innovation Union Scoreboard (IUS). (Graph 2.3.1) There is a fairly strong deterioration in innovation activities by SMEs, while weak performance in patents and other innovation indicators persists. The quality of scientific activities in Poland is not improving, as evidenced by the low score in the Research Excellence Indicator of the 2015. 4.2 % of Polish scientific publications among the 10 % most-cited worldwide (2010), ranking Poland 24th in the EU (ahead of only four countries: Romania, Bulgaria, Croatia and Latvia).

Graph 2.3.1: **Poland's ranking in the Innovation Union Scoreboard**

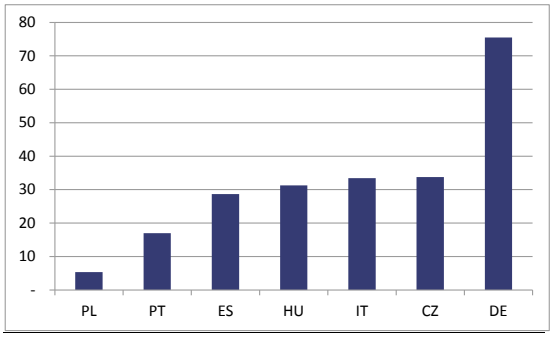


Source: European Commission

Weak linkages between the business sector and academia persist. Only around 10 % of innovative companies cooperate with universities and higher education institutions. In terms of public-private scientific co-publications, which can be used as a measure for the link between business and academia, Poland trails behind regional peers such as the Czech Republic or Hungary (Graph 2.3.2).

In order to improve the collaboration between science and industry, a number of policy initiatives were introduced in recent years, but the results still remain to be seen. Apart from the 2014 amendments to higher education laws, affecting the system of intellectual property rights, work is still ongoing to amend industrial property law more broadly. This work aims at simplifying procedures, notably before the Patent Office, including through the use of electronic tools.

Graph 2.3.2: **Public-private scientific co-publications per million population, 2012**



Source: European Commission

Strengthening the quality and internationalisation of science in Poland is proving challenging. Deficiencies in human resources management result in a lack of mobility and a limited influx of young researchers to both academia and the corporate sector. The average age of academic teachers is increasing and the impact of scientific output in Poland is well below the OECD average ([32]). Moreover, the quality and organisation of doctoral study programmes is lacking. Doctoral curricula are often overly theoretical, while issues such as research methodology are not adequately addressed. A recently approved government document on open access to scientific information lacks some important provisions ([33]).With a view to tackling the quality and internationalisation of science, a dedicated 'Programme for the development of

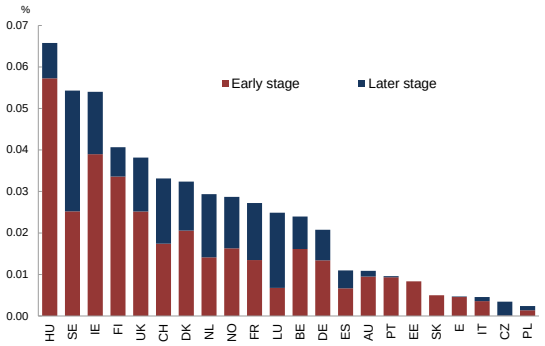
([32]) Measured by the normalised impact of scientific production (OECD Science, technology and industry scoreboard 2013 based on Scopus Custom Data)

([33]) E.g. it does not include the requirement of providing open access to Ph.D. dissertations repositories. "Kierunki rozwoju otwartego dostępu do publikacji i wyników badań naukowych w Polsce", Ministry of Science and Higher Education, 2015

higher education and science 2015-2030' was proposed in 2015. It aims at improving the quality of public research and higher education through changes in their governance, management and funding. Nevertheless, it neither includes specific financial commitments nor an action plan for implementation.

The sources of financing firms' R&D activity remain limited. While access to bank loans is easier in Poland than in many other EU countries, the covering of alternative financing is limited, particularly among SMEs. The use of venture capital and private equity instruments to innovative projects is particularly low (Graph 2.3.3). In 2014, these sources of financing amounted to EUR 251 million, or 0.06 % of Polish GDP, well below levels in more advanced EU economies and less than in countries such as the Czech Republic and Hungary ([34]). The limited availability of venture capital, which plays a more prominent role at a later stage of the innovation cycle, is especially problematic for young firms that intend to commercialise their products and roll them out to the market. Nevertheless, multiple measures have been introduced recently under the European Regional Development Fund's (ERDF) 'Smart Growth' Operational Programme to provide alternative financing to companies wishing to engage in R&D. This includes the '4Stock' instrument aimed at assisting SMEs wishing to raise equity or debt finance in capital markets. Another instrument, 'Biznest', is expected to help bring together private investors and entrepreneurs interested in syndicated private investment for start-ups based in Poland ([35]).

Graph 2.3.3: **Venture capital investment in selected OECD countries as % of GDP, 2012**



Source: OECD

Recent initiatives set out a comprehensive medium-term agenda for R&D, but their roll-out remains challenging. The Polish research and innovation system has been significantly restructured in recent years. The most important changes include the 2013 Strategy for Innovation and Effectiveness of the Economy 2020 (SIEG) that defines research and innovation policy priorities, and the 2014 Enterprise Development Programme (PRP) that proposes a wide range of measures to improve the support system for innovative activities of enterprises. The strategic framework is strengthened by operating programs under the ERDF. In addition, support to Polish innovative companies is envisaged under the new EU flagship initiative — the European Fund for Strategic Investments (EFSI), within the so-called 'SME window'. The EFSI offers guarantees and counter-guarantees, aimed specifically at the high-risk, innovative or research-oriented companies' needs ([36]). Currently, the key challenge is to implement the strategic policy framework effectively, also taking on board lessons learnt from the previous EU programming period (2007-2013). In particular, multiple dedicated government agencies face the challenge of creating

([34]) 2015 European Private Equity Activity, European Private Equity and Venture Capital Association, May 2015

([35]) 2015 SBA Fact Sheet

([36]) The first facilities under the "SME window" are already operational in Poland For example, in July 2015, the European Investment Fund (EIF) and Bank Gospodarstwa Krajowego (BGK) — the Polish national promotional bank — signed an agreement for EUR 250 million to reach SMEs over the next two years under the COSME Loan Guarantee Facility.

operational synergies in order to better integrate the research and innovation policies that support, among other things, applied research and the commercialisation of innovative ideas. The new government reinforced this framework by creating an Innovation Council in January 2016 to coordinate the innovation policies of the government. It comprises, inter alia, three deputy prime ministers (Development, Culture and National Heritage, and Science and Higher Education). The main policy initiatives of the Council will aim at building on the competitive advantages of the Polish economy and include the introduction of fast-track funding for innovation.

The system of R&D tax incentives has been overhauled to better stimulate innovation. In the past, R&D tax incentives in Poland were not effective in stimulating private R&D due to their design and implementation, but a new law on supporting innovativeness introduces new R&D tax incentives from the beginning of 2016 ([37]). The definition of qualifying R&D costs is now broader and has been extended to internal R&D. The new R&D tax incentives consist of a 30 % deduction in the wages of R&D personnel and 10 % in qualifying R&D costs (20 % for SMEs). However, the effectiveness of new R&D tax incentives will depend on the way they are implemented; much depends on how easy it will be for young and small companies to apply for the new R&D tax solutions. For example, a short carry forward of unused deductions and lack of cash refunds may limit the attractiveness of tax incentives for young innovative companies. The new law also creates tax exemptions for funds on the sale of stocks of qualifying companies in which funds hold at least 10 % of capital. This aims at stimulating equity financing for innovative businesses. The Innovation Council has underlined the need for further changes in R&D tax incentives, including introducing tax breaks stimulating science-to-business collaboration.

([37]) Ustawa z dnia 25 września 2015 r. o zmianie niektórych ustaw w związku ze wspieraniem innowacyjności http://isap.sejm.gov.pl/DetailsServlet?id=WDU20150001767.

2.4. BUSINESS ENVIROMENT AND PUBLIC ADMINISTRATION

Business environment

Although a number of measures to facilitate business activity were implemented, obstacles in several areas remain to be addressed. According to the World Bank report on Doing Business 2016 it takes 30 days to start a business in Poland, which puts the country at the very tail of the EU Member States ([38]). From January 2016 all significant business registers have been electronically connected to phase out surface mail communication. Nevertheless, the registration process is still hampered by shortcomings in the e–registration system and incompatibilities across various agencies. For instance, in order to submit an application, shareholders and board members are required to hold electronic signatures and must use the same computer at the same time. Such obstacles often discourage entrepreneurs from using the electronic channels to avoid possible complications. The business environment is also encumbered by discrepancies in the administrative capacity of public authorities at local level, resulting in significant differences in the time needed for procedural steps (e.g. construction permits, registering property and enforcing contracts) ([39]). Nonetheless, legislative works initiated in recent years to strengthen the rights of entrepreneurs are on-going. The new bankruptcy framework entered into force in January 2016. It provides debtors with more avenues to restructure company and limit their obligations towards creditors, thus making easier firm entry and exit and supporting business environment and domestic innovations.

The business support system is underdeveloped. The support provided by business environment institutions remains highly fragmented comprising some 800 entities. The support system is primarily oriented towards providing basic services and its infrastructure capacities, which have been substantially improved in recent years, remain underutilised. The government has taken an important step to introduce a system of accreditation to ensure quality and service orientation as a condition for accessing EU funding. However, the current limited application of the accreditation system may hamper its capacity to bring about a substantial change to the whole business support sector.

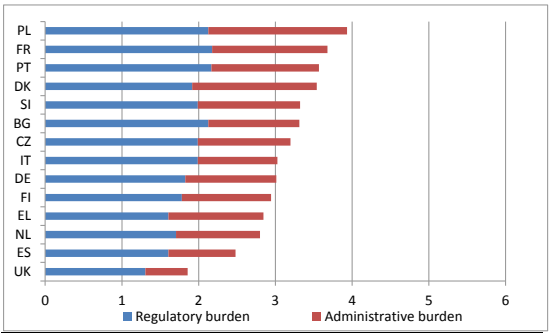
The government plans to adopt a new law on the retail sale tax. All retail chains and retailers would be covered with a new progressive tax based on the monthly sale turnover. The draft presented in January envisages that retailers would pay 0.7 % in tax on monthly sales under PLN 300 million, while those above this threshold would pay 1.3 %. A higher rate (1.3 and 1.9 %, respectively) would be applied to turnovers generated on Saturdays, Sundays and public holidays. The government plans to introduce the new tax as of Q2-2016.

The administrative burden of dealing with construction permits remains high. The biggest challenge for investors is to comply with a number of legal and administrative obligations, coupled with a lack of electronic handling of requests. In practice, dealing with construction permits can take up to one year or up to four years in the case of appeals. The obstacles, particularly for infrastructure projects, mainly stem from lengthy procedures, which are due to the high number of additional administrative permits and documents required, as well as the number of the administrative bodies involved and procedural steps required (Graph 2.4.1). In terms of dealing with construction permits Poland has moved down three places and now ranks 52nd out of 189 economies in the World Bank report on Doing Business report 2016. On average, obtaining the construction permit for a warehouse requires 16 procedures, takes 156 days and costs 0.3 % of the warehouse value. Since June 2015, a new Construction Law has simplified the administrative obligations regarding construction; however, it addressed only a limited number of issues. In particular construction permits are no longer necessary for residential houses and other small buildings construction. Instead, a declaration to the local authorities is sufficient. Moreover, small and medium retail enterprises no longer need an occupancy permit to run their business.

([38]) According to Polish authorities, the estimated time needed to start business following (as of January 2016) the electronic connection of all significant business registers and the phase out of surface mail communication, is now 14 days. According to the 2015 SBA Fact Sheet, the time needed to start a business in Poland is 1 day.

([39]) Regional Doing Business in Poland, World Bank, 2015.

Graph 2.4.1: **Overall restrictiveness of building permits**



The higher the number, the higher restrictiveness
Source: Ecorys 2015 study on simplification and mutual recognition in the construction sector under the Services Directive

One of the key factors hampering investments, in particular in construction, is the spatial planning at a local level ([40])**.** In 2014, only 29 % of the territory of Poland was covered by local spatial plans (so-called 'zoning'), however, this coverage was below 10 % in some cities ([41]). In this area, over-regulation and inconsistency of regulatory frameworks are the key challenge, as spatial planning is regulated by a number of bills at different levels of government and there are inconsistencies between the most important laws ([42]). In addition IT systems are underutilised due to, for example, a lack of connection between platforms dealing with construction permits. Moreover, the geographical information systems often lack integration with different registers (e.g. property and land registers, plot registers, and national judicial register) devolved across all the administrative levels. Additionally, local spatial plans frequently change and are often inconsistent with regional spatial planning documents.

Recent judicial reforms are paving the way to simplify contract enforcement, but no substantial results can be observed yet. The 2015 reforms of the civil code, the code of civil procedure and the law on enforcement agents and execution introduced important changes concerning, for example the obligation to establish electronic communication between enforcement agents and the bodies of public administration. The new regulation also brings in certain safeguard measures preventing enforcement agents from accumulating backlogs. The importance of further improvements in this area can be illustrated by the relatively low ranking of Poland in terms of contract enforcement as reported by the Doing Business 2016 report. It takes almost five additional months more than the OECD average to enforce a contract in Poland. In terms of civil and labour court proceedings, the accumulation of backlogs also remains a key issue. The clearance rate of the first instance courts in civil law cases was only 99.3 % in 2014, extending the existing backlog, while the length of proceedings in this category of cases grew to 203 days in 2014 from 195 in 2012. First instance labour courts continue to accumulate backlog as well. In 2014, the clearance rate of labour courts amounted to 89.0 % in courts of first instance and the average length of proceeding went up from 139.1 days in 2013 to 160.9 days in 2014 ([43]).

In 2015 Poland adopted the third and last tranche of the ambitious deregulation reform. The reform covered 248 professions. For 70 of them, barriers have been completely abolished, while for others the existing barriers have been partially abolished (e.g. by lowering educational requirements or shortening the certified professional experience period or lifting the professional entry examination). Polish authorities estimate that a complete deregulation will affect professions and activities accounting for almost 0.5 million professionals. The reform has already started showing some positive results in terms of employment and entrepreneurship in certain professions ([44]). Poland has also been taking an active part in the mutual evaluation of regulated professions process conducted at the EU level.

([40]) Spatial planning impacts directly two key 'doing business' areas, which is a time necessary for obtaining construction permits and registering property. Lack of local planning also increases the risk of corruption as it pursues arbitrary administrative decisions regarding location of investments.
([41]) Central Statistical Office, Local Data Bank
([42]) That is law on spatial planning; construction law and law of real-estate management. *Koncepcja Przestrzennego Zagospodarowania Kraju / National spatial planning strategy*, 2010.
([43]) Statistics by the Ministry of Justice; http://isws.ms.gov.pl/pl/bazastatystyczna/opracowania-jednoroczne/rok-2014
([44]) The professions are lawyers, tourist guides, and taxi drivers; 'Deregulation of Professions in Poland. Preliminary Evaluation', analysis prepared by Institute for Structural Research as part of the World Bank Technical Assistance to the Government of Poland, June 2015.

However, the recently submitted action plan does not indicate any concrete actions going beyond the recent reform. To the contrary, regulation of access to some previously unregulated professions has recently been introduced (e.g. physiotherapists) and for some other professions it is currently being reconsidered (e.g. psychologists) ([45]). As a matter of fact, Poland restricts access to almost all regulated professions by reserving activities exclusively to (a group of) professionals holding specific qualifications, which is the strictest type of occupational regulation ([46]).

Public administration

Despite the efforts to enhance the scope of digitalisation, Poland still has low online interactions between public authorities and citizens compared with most EU Member States. In 2014, only 24 % of Polish citizens used the internet to interact with public authorities, while the EU average was 47 % ([47]). Active use of e-government services is particularly low with 21 % of users returning completed forms to the public administration. On the other hand, Poland scores well in e-services for enterprises, where the uptake was 90 %, compared with the EU average of 88 % ([48]). Although recent investments projects increased the availability of e-services, their fragmentation and low quality remains a key obstacle to developing modern e-administration. On a positive note, interoperability and high degree of maturity of e-services is now required for every newly launched e-administration project co-financed by the European Regional Development Fund. The Point of Single Contact has been developing well and in 2015 performed above the EU average. In terms of e-procurement, few e-services are currently available and the level of the uptake is still very low. Poland committed itself to introduce a comprehensive system along with the introducing of e-submissions by 2016. To this end, in October 2015 the Council of Ministers adopted public procurement law introducing a single, free of charge platform for e-procurement for central administration. The law also embraces a number of measures aimed at enhancing public procurement transparency.

New legislation introduces significant chances in the recruitment procedures and employment conditions in the civil service. Under a new law, adopted in January 2016, managerial posts in the Polish civil service will no longer be filled by way of open competitions but by direct appointment. Employment arrangements with top-level civil servants have also been altered. Their contracts expired thirty days after the new law came into force except for those civil servants who received a new job offer or wage conditions by that deadline. The effects of this reform — for instance as regards business continuity or the professionalization and independence of the civil service in Poland — still need to be determined.

([45]) Within the transposition of the Professional Qualifications Directive, by 18th January 2016, Member States had to submit their final national action plans presenting the outcomes of the assessment of proportionality of their regulation and, as a result, identifying need for reforms.

([46]) see type of regulation by country: http://ec.europa.eu/growth/tools-databases/regprof/index.cfm?action=map_regulations ;

([47]) European Commission, eGovernment in Poland, January 2015, Edition 17.0

([48]) According to the Digital Economy and Society Index developed in the framework of Digital Agenda for Europe Scoreboard: http://ec.europa.eu/digital-agenda/en/digital-agenda-scoreboard

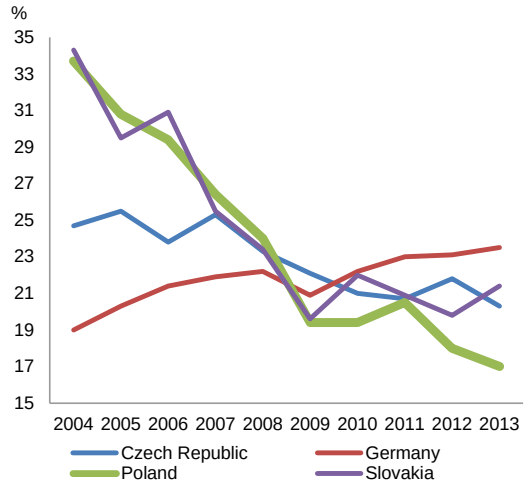
2.5. NETWORK INDUSTRIES, ENERGY AND ENVIRONMENTAL ISSUES

Transport infrastructure

Railway transport continues to underperform due to traffic restrictions and degraded infrastructure in spite of investment co-funded by the EU ([49]). Currently, about only half of the roughly19000 km of operated railway lines are in a good technical condition. A substantial portion of the population does not have access to affordable public railway transportation that is nearby ([50]). These two factors, coupled with high track access charges and significant improvements in road infrastructure, have resulted in the dramatic loss of competitiveness of rail vis-à-vis road transport (Graph 2.5.1). The low penetration of rail transport comes with increasing negative environmental effects in the form of greenhouse gas emissions, and air and noise pollution.

Delays in implementing of railway investment projects are mainly due to institutional factors. The burdensome regulatory environment is coupled with inadequate administrative and organisational capabilities by the body that manages the railway infrastructure. These result in poor planning and design of tenders, low-quality tender documentation, public procurement awards granted solely on price criteria, and weak supervision and enforcement of contracts. Progress in project implementation is still slow and a breakthrough remains to be seen. Many projects have not been completed within their envisaged time frames of the 2007-2013 EU financial period and will be finalised using resources from the 2014-2020 period. Some steps have been taken towards addressing structural issues in infrastructure project planning and implementation; however project management and investment planning remain weak.

Graph 2.5.1: **Modal share of railways in inland freight transport**



Source: Eurostat

Road transport, which receives preferential treatment by the national authorities, remains dangerous and congested. With 84 fatalities per million inhabitants, Poland is one of the six EU Member States with the highest road fatality rate well above the EU average of 51 (2014 data). Despite some progress in improving road safety could be observed, it is slower than elsewhere in the EU. At the municipal level, the high rate of road accidents and fatalities is accompanied by increasing congestion, which is due to development in individual motorised transport ([51]). The structure of urban transport presents the problem of sustainability, which primarily originates from underinvestment, a low number of comprehensive urban transport/mobility plans; the-lack of integration of different transport modes, insufficient usage of Intelligent Transport Systems; and the lack of incentives supporting the use of non-petrol vehicles. The preference for individual motorised transport also generates negative safety loopbacks; transport in cities is characterised by a very high ratio (over 50 %) of vulnerable users such as pedestrians and cyclists who are frequently the fatal victims of road accidents, despite accounting for far less of all travels. In addition, vulnerable users are disproportionately affected in

([49]) The average commercial speed of freight trains on the Polish railway network is 27 km/h (2015), much less than in the neighbouring countries and largely unable to effectively compete with the road transport that has seen a massive increase in the quality and quantity of its infrastructure in 2004-2015.

([50]) There are 100 cities of over 10 000 inhabitants that do not have a railway connection in Poland

([51]) In 2013 Poland has exceeded the EU average, with 504 passenger cars per 1,000 inhabitants (Source: EU Transport in figures, Statistical Pocketbook 2015)

built-up areas, as they are involved in 70 % of road accidents.

Current national transport programmes point to the continued imbalance in the development of rail and road transport. The recently adopted National Road Programme 2014-2023 provides around EUR 40 billion for roads, while the National Railway Programme 2014-2023 allocates only some EUR 16 billion for railway investment. Additionally, a different legal arrangement for the bodies managing the railways and roads adds to the difficulties of the railway sector in obtaining state financial guarantees and the flexibility required to finance railway projects, which also impacts negatively the level playing field between modes ([52]). This situation, together with high infrastructure access charges for rail operators, further hinders the competitiveness of rail freight and slows down the development of passenger railway services. All this leads to underutilisation of the Polish rail network in comparison with the neighbouring countries ([53]).

Broadband

Fixed broadband coverage and uptake remains a challenge, while mobile broadband demand booms. In 2014, fixed broadband covered 85 % of households, which is the lowest in the EU. Fast broadband (of at least 30 Mbps) was available to only 53 % of households compared with the EU average of 68 %. Fixed broadband uptake was relatively low as well, amounting to 60 % versus 70 % in the EU ([54]). The percentage of enterprises with a broadband connection in Poland has increased from 69 % in 2010 to 90 % in 2014. By contrast, Poland belongs to the best performing EU countries in terms of mobile broadband use. The high uptake of mobile broadband (86 % versus 72 % in the EU) signals a strong demand. However, the supply of fourth generation mobile coverage is available to only 67 % of the population ([55]). The recently finalised auction for the new mobile broadband spectrum is expected to help fill this gap. Other high speed internet investment challenges concern the commercial viability of modern infrastructure outside the urban agglomerations. Future public funding initiatives are needed to address these challenges by concentrating on areas affected by market failures ([56]).

Energy

Despite some progress, Poland remains one of the most energy-intensive economies in the EU, so potential gains from improving energy efficiency are significant ([57]). In recent years, energy intensity in the industrial sector declined more rapidly in Poland than in the rest of the EU. However, reductions were relatively limited in the household sector (Graph 2.5.2). About 70 % of houses are poorly insulated and 70 % of single family houses are heated with coal which adds to environmental pollution and creates challenges for public health. Poland has earmarked significant resources (EUR 2 billion) for energy efficiency projects under the 2014-2020 EU funds programming period, in particular housing insulation, coal boilers replacement, extension of district heating and combined heat and power (CHP). There is further potential for energy efficiency investments in the energy-generation and residential sectors, in particular by developing investment schemes and energy service markets (including energy service companies, ESCOs) that would allow full advantage to be taken of the system of energy efficiency certificates (white certificates). This system supports investment in the cogeneration of electricity. However, it will be active only until 2018, which may limit incentives for investments in the energy sector over the medium term.

([52]) Road manager, GDDKiA, is a State agency having direct access to the National Road Fund, meanwhile railway manager, PKP PLK, is a commercial law company.

([53]) Utilisation of the railway network, measured by dividing train movements (in thousands of train-kms) by the total length of tracks in a given year, is much lower in Poland than the EU on average. In relation to the neighbouring countries it is almost 2 times lower than in Czech Republic (2012), over two times lower than in Slovakia (2012) and 4.6 lower than in Germany (2013)

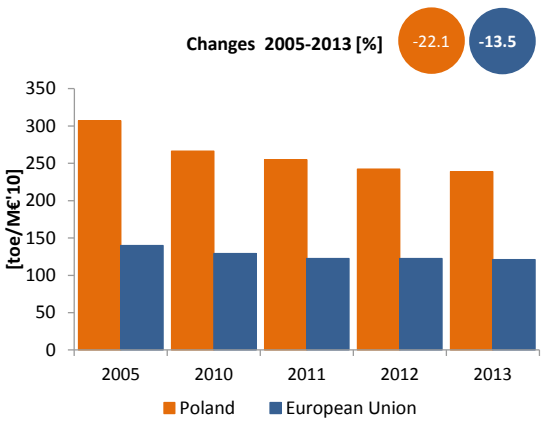
([54]) Digital Economy and Society Index developed in the framework of the Digital Agenda for Europe Scoreboard: http://ec.europa.eu/digital-agenda/en/digital-agenda-scoreboard

([55]) European Commission, eGovernment in Poland, January 2015, Edition 17.0

([56]) Operational Programme Digital Poland 2014-2020: https://mac.gov.pl/files/program_operacyjny_polska_cyfrowa_05122014.pdf

([57]) Country Factsheet Poland accompanying the document: State of the Energy Union; SWD(2015)234 final

Graph 2.5.2: **Primary energy intensity in Poland and the EU**



Primary energy consumption measures the total energy demand of a country. It covers consumption of the energy sector itself, losses during transformation (for example, from oil or gas into electricity) and distribution of energy, and the final consumption by end users. It excludes energy carriers used for non-energy purposes (such as petroleum not used not for combustion but for producing plastics).
Source: European Commission

Enhancing competition in the energy market remains a challenge. The gas market is still dominated by the incumbent company. Limited market competition remains the main source of economic inefficiency in the energy supply chain. By contrast, the electricity market has seen rising competition despite regulated electricity prices for consumers who remain with the incumbent default supplier instead of switching. The regulatory practice allows non-incumbents to charge a different price, thereby making limited competition possible. This arrangement allows new entrants to undercut the regulated price of the default supplier. Currently, 60 % of electricity trade takes place through the power exchange. The share of gas sold through the gas exchange increased further in 2015 due to the imposition of certain legal requirements on companies engaged in gas trading.

The development of energy interconnectors is slow, which hampers the security of gas and electricity supply and the integration of the energy markets in the region. Poland has completed a number of works co-financed by the European Regional Development Fund on the electricity interconnector with Lithuania ('LitPolLink'), which helped develop trade between both energy markets. However, development of the interconnectors with Germany and Slovakia has not progressed. As a consequence, Poland is one of the least connected EU Member States, which exposes its electricity system to risks, as evidenced by unexpected supply shortages in August 2015. The power exchange is not linked by market coupling to neighbouring countries except Sweden. In the gas sector, the expected June 2016 launch of a liquid natural gas terminal in Świnoujście will improve diversification and security of supply. Other relevant investments include the Jamal pipeline reverse flow mechanism as well as over 1000 km of additional transmission pipelines and additional underground storage capacity. However, delays are reported in the construction of new gas interconnectors with the Czech Republic and Slovakia. The gas interconnector with Lithuania has been progressing, as an agreement on its financial structure was reached. A grant for this project, amounting to EUR 295 million under the EU's Connecting Europe Facility programme, was signed in October 2015.

Poland's energy generation capacity is ageing and heavily coal-reliant, while subsidies to domestic coal production add to electricity generation costs. Coal and lignite account for nearly 85 % of electricity generation and significant new generation capacity running on coal is under development ([58]). A number of Polish coal mines that are unable to compete with imports have obtained sizeable public subsidies, which add to energy production costs and create a competitive disadvantage for domestic private coal producers that operate without public support. The restructuring of the coal mining sector is slow, creating uncertainty for investments in the entire energy sector in Poland. Significant employment in the sector (nearly 130 000 people) concentrated in a single region (Upper Silesia) makes the reform of the sector challenging also from a social perspective.

Additional renewable energy capacity was introduced in 2015. However, further development of new renewables capacities will only be possible, when the new support scheme,

([58]) Currently, work is on-going on modernising and developing two power plants owned by PGE (Turow and Opole), on one owned by Tauron (Jaworzno) and one owned by Enea (Kozienice)

based on auctioning and premia complementing the market price, will enter into force. The scheme was foreseen to be effective since 1 January 2016, but this has been delayed by the new government and it is not certain when the first auctions will take place. Therefore, it is difficult to anticipate if the impact of the new auctioning system will effectively support further investment in the development of renewable energy sources, and if it will help reaching the Europe 2020 target.

Environmental issues

Poland is on track to deliver on its commitment as regards greenhouse gas (GHG) emissions in sectors outside the Emissions Trading System (ETS). Under the EU 2020 strategy, Poland is allowed to increase its GHG emissions in these sectors by up to 14 % between 2005 and 2020. According to the government's 2015 projections and taking into account existing measures, GHG emissions in these sectors will rise by 6 % by 2020, i.e. well below the target. Based on recent approximated estimates for 2014, Poland increased emissions by 8 % between 2005 and 2014, which is below the envisaged annual target of 10 %. The main source of GHG emissions in Poland is the energy industry (48 % of total emissions), followed by direct fuel consumption (e.g. residential heating) and the transport sector.

The particulate matter pollution in Polish cities continues to be one of the worst in the EU. More than 80 % of the urban population is exposed to concentrations of air pollution by particulate matter above the EU air quality standards, compared with an EU average of slightly above 21 % ([59]). Existing legislative measures related to air quality are insufficient to substantially reduce of the air pollution. The National Programme for Air Protection does not have sufficient executive empowerment to ensure effective implementation of its measures. In this respect, the key challenge is to develop technical and fuel standards for domestic coal boilers, which are the main sources of continued poor air quality in Poland. Nevertheless, the September 2015 anti-smog law will provide additional scope to local authorities to introduce measures limiting low emissions, including measures leading to the replacement of coal boilers.

Environmental taxes do not provide sufficient incentives for a more efficient energy usage and for reducing greenhouse gas emissions. The implicit tax rate on energy remains comparatively low in Poland (EUR 125 per tonne of oil equivalent in 2013). Tax rates on transport fuels are below the EU average, while the tax system is still characterized by a number of environmentally harmful subsidies, e.g. exemptions for agriculture and energy-intensive industries. Poland is one of the few Member States whose vehicles' tax is not linked to environmental performance (CO2 emissions).

Recycling remains low but waste management is improving, helped by EU co-financed investments. Due to delays in launching projects the 2007-2013 EU funds programme, the number of waste projects implemented was smaller than expected and the implementation of some of them was postponed to the next programing period of 2014-2020. Nevertheless, the infrastructure built up until 2015 has improved the situation considerably. The most prominent example is a shift from landfill to incineration, which amounted to 8 % of all treated waste in 2013. There has also been an increase in the recycling rate from 13 % in 2012 to 16 % in 2013. However, recycling still remains well below the EU average of 28 %. The main bottlenecks to achieving an adequate level of recycling in the near term are: insufficient separate collection; inadequate infrastructure for alternative treatment; and weak enforcement of the Extended Producer Responsibility schemes.

([59]) European Environment Agency, Poland air pollution fact sheet 2014: http://www.eea.europa.eu/themes/air/air-pollution-country-fact-sheets-2014

ANNEX A

Overview Table

Commitments	Summary assessment ([60])
2015 Country specific recommendations (CSRs)	
CSR1: Following the correction of the excessive deficit, achieve a fiscal adjustment of 0.5 % of GDP towards the medium- term budgetary objective both in 2015 and 2016. Establish an independent fiscal council. Broaden the tax base, in particular by limiting the use of the extensive system of reduced VAT rates.	Poland has made **no progress** in addressing CSR 1 (this overall assessment of CSR 1 does not include an assessment of compliance with the Stability and Growth Pact): • **No progress** has been made regarding the fiscal council • **No progress** has been made on VAT rates
CSR2: Start the process of aligning the pension arrangements for farmers and miners with those for other workers, and adopt a timetable for progressive full alignment; put in place a system for assessing and recording farmers' incomes.	• Poland has made **no progress** in addressing CSR 2: • **No progress** in aligning the pension arrangements for farmers and miners with those for other workers. • **No progress** in putting in place a system for assessing and recording farmers' incomes.
CSR3: Take measures to reduce the excessive use of temporary and civil law contracts in the labour market.	• Poland has made **some progress** in addressing CSR 3: • An amendment to the Labour Code has been adopted and social security contributions connected with civil law contracts have been increased.
CSR4: Remove obstacles to investment in railway projects.	• Poland has made **limited progress** in addressing CSR 4: • In September 2015 the National Rail Programme 2023 was adopted. An amendment to the Railway Act of 15/01/2015 aims to facilitate procedures for investing in railway infrastructure. Regarding the period 2014-2020, accelerating the processes for project preparation has not yet resulted in investments getting off the ground;

([60]) The following categories are used to assess progress in implementing the 2015 CSRs:
No progress: The Member State (MS) has neither announced nor adopted measures to address the CSR. This category also applies if the MS has commissioned a study group to evaluate possible measures.
Limited progress: The MS has announced some measures to address the CSR, but these appear insufficient and/or their adoption/implementation is at risk.
Some progress: The MS has announced or adopted measures to address the CSR. These are promising, but not all of them have been implemented and it is not certain that all will be.
Substantial progress: The MS has adopted measures, most of which have been implemented. They go a long way towards addressing the CSR.
Fully implemented: The MS has adopted and implemented measures that address the CSR appropriately.

Europe 2020 (national targets and progress)	
Employment rate target: 71%	Despite substantial improvement over the last ten years, the employment rate stood at 68.4 % in Q3-2015, still 2.2 pps. below the EU average and 2.6 pps. below the target.
R&D target set in the 2013 NRP: R&D intensity target is 1.7% for 2020	**0.94% of GDP (2014)** Although public R&D intensity has been growing on average by 7.5% over the 2007-2014 period, Poland will reach its national target for 2020 only if it achieves a substantial increase in R&D intensity and the average annual growth is raised to 10.5% over the 2014-2020 period.
Greenhouse gas (GHG) emissions target: - National greenhouse gas (GHG) emissions target: +14% in 2020 compared to 2005 (in non-ETS sectors)	**2020 target**: 14% According to the latest national projections and taking into account existing measures, the target is expected to be achieved: 6 % in 2020 compared to 2005 (with a margin of 8 percentage points). **Non-ETS 2014 target**: 10%. According to approximated data for 2014 greenhouse gas emissions from sectors not covered by the Emissions Trading System increased by 8% between 2005 and 2014.
2020 Renewable energy target: 15% Share of renewable energy in all modes of transport: 10%	According to the latest Eurostat data Poland has met the 2013-2014 interim trajectory towards its 2020 target of 15% share of renewable energy of final energy consumption. In transport sector however, Poland is lagging behind its National Renewable Energy Action Plan trajectory towards the 10% target of renewables in the transport sector. In 2014 the share of renewable energy reached 11.4% of gross final energy consumption, with 12.4% in the electricity sector, 13.9% in heating and cooling and 5.7% in the transport sector. There is a high level of uncertainty as to whether Poland will achieve the 2020 renewable energy sources (RES) target with current policies and measures in place. Significant additional investments will still be required to reach the 2020 targets, as well as legal certainty, predictability and stability of the investment framework.
Energy efficiency: reduction of energy	Even if Poland's current primary energy

consumption Poland has set an indicative national energy efficiency target of 13.6 Mtoe primary energy savings in 2020 reaching a 2020 level of 96.4Mtoe primary consumption and 70.4 Mtoe final energy consumption.	consumption is below its 2020 target, it could continue its current efforts to keep it at this level or increase it slightly, which will be challenging in light of the relatively high economic growth forecasted for the coming years.
Early school leaving target: 4.5%	The share of early school leavers from education and training stood in 2014 at 5.4%.
Tertiary education target: 45%	The tertiary attainment rate for 30-34 year olds stood at 42.1 % in 2014, which is slightly below the target.
Risk of poverty or social exclusion target: Target on the reduction of population at risk of poverty or social exclusion in number of persons: 1 500 000	Since 2008, the number of people living in poverty or social exclusion has been continuously reducing and the EU 2020 target has been achieved. In 2014, the at-risk-of poverty or social exclusion rate (AROPE) for the working age population stood at 24.7 % (EU average: 24.4 %). At the same time, extreme poverty has been on the rise since 2008 with a stabilisation in 2013-2014 at the level of 7.4 % of all households.

ANNEX B
MIP scoreboard

Table B.1: **The MIP scoreboard for Poland**

			Thresholds	2009	2010	2011	2012	2013	2014
External imbalances and competitiveness	Current account balance, (% of GDP)	3 year average	-4%/6%	-5.4	-5.2	-4.8	-4.8	-3.4	-2.3
	Net international investment position (% of GDP)		-35%	-57.8	-65.4	-62.9	-65.9	-68.7	-68.3
	Real effective exchange rate - 42 trading partners, HICP deflator	3 years % change	±5% & ±11%	-3.9	-1.4	-11.6	1.2	-4.3	-1.3
	Export market share - % of world exports	5 years % change	-6%	33.5	22.4	13.9	1.0	0.0	4.8
	Nominal unit labour cost index (2010=100)	3 years % change	9% & 12%	12.4	13.4b	5.4	6.4	3.3	2.5p
Internal imbalances	Deflated house prices (% y-o-y change)		6%	-5.4e	-6.7e	-4.6	-6.6	-4.7	1.1
	Private sector credit flow as % of GDP, consolidated		14%	4.2	5.8	7.7	3.6	3.1	4.7
	Private sector debt as % of GDP, consolidated		133%	67.5	69.7	73.9	73.5	75.4	77.9
	General government sector debt as % of GDP		60%	49.8	53.3	54.4	54.0	55.9	50.4
	Unemployment rate	3 year average	10%	8.3i	8.3	9.2	9.8	10.0	9.8
	Total financial sector liabilities (% y-o-y change)		16.5%	9.2	13.3	4.8	10.5	7.6	0.6
New employment indicators	Activity rate - % of total population aged 15-64 (3 years change in p.p)		-0.2%	1.3	2.1b	1.9	1.8	1.7	2.2
	Long-term unemployment rate - % of active population aged 15-74 (3 years change in p.p)		0.5%	-5.3	-1.9	1.2	1.6	1.4	0.2
	Youth unemployment rate - % of active population aged 15-24 (3 years change in p.p)		2%	-9.2i	2.1	8.6	5.9	3.6	-1.9

Flags: b: break in time series. e: estimated. i: see metadata. p: provisional.
Figures highlighted are those falling outside the threshold established in the European Commission's Alert Mechanism Report.
For REER and ULC, the first threshold applies to euro area Member States.
Source: Source: European Commission

ANNEX C
Standard Tables

Table C.1: **Financial market indicators**

	2010	2011	2012	2013	2014	2015
Total assets of the banking sector (% of GDP)	86.1	81.5	90.9	91.6	92.4	92.6
Share of assets of the five largest banks (% of total assets)	43.4	43.7	44.4	45.2	48.3	-
Foreign ownership of banking system (% of total assets)	65.8	65.3	62.8	65.3	65.8	-
Financial soundness indicators:						
- non-performing loans (% of total loans)[1)]	4.9	4.7	5.2	5.0	4.8	4.7
- capital adequacy ratio (%)[1)]	13.9	13.1	14.8	15.7	14.7	15.3
- return on equity (%)[1)]	13.3	16.1	14.0	12.1	12.3	11.2
Bank loans to the private sector (year-on-year % change)	5.9	5.9	7.3	4.0	5.4	5.8
Lending for house purchase (year-on-year % change)	19.3	8.8	6.8	3.0	3.4	4.3
Loan to deposit ratio	104.2	105.4	101.7	99.5	98.3	97.2
Central Bank liquidity as % of liabilities[2)]	0.1	0.0	0.0	0.0	0.0	0.0
Private debt (% of GDP)	69.7	73.9	73.5	75.4	77.9	-
Gross external debt (% of GDP)[3)] - public	22.6	23.6	29.6	28.3	29.1	29.0
- private	27.1	27.6	28.7	28.5	28.8	28.9
Long-term interest rate spread versus Bund (basis points)*	303.8	334.8	350.5	246.3	235.3	220.6
Credit default swap spreads for sovereign securities (5-year)*	129.4	172.0	154.1	77.4	60.8	61.1

1) Latest data Q2 2015.
2) Latest data October 2015.
3) Latest data September 2015. Monetary authorities, monetary and financial institutions are not included.
* Measured in basis points.
Source: IMF (financial soundness indicators); European Commission (long-term interest rates); World Bank (gross external debt); Eurostat (private debt); ECB (all other indicators).

Table C.2: **Labour market and social indicators - part A**

	2010	2011	2012	2013	2014	2015 (4)
Employment rate (% of population aged 20-64)	64.3	64.5	64.7	64.9	66.5	67.5
Employment growth (% change from previous year)	-2.7	0.6	0.1	-0.1	1.7	1.3
Employment rate of women (% of female population aged 20-64)	57.3	57.2	57.5	57.6	59.4	60.7
Employment rate of men (% of male population aged 20-64)	71.3	71.9	72.0	72.1	73.6	74.4
Employment rate of older workers (% of population aged 55-64)	34.1	36.9	38.7	40.6	42.5	43.7
Part-time employment (% of total employment, aged 15 years and over)	8.4	8.0	7.9	7.8	7.8	7.4
Fixed term employment (% of employees with a fixed term contract, aged 15 years and over)	27.3	26.9	26.9	26.9	28.4	28.0
Transitions from temporary to permanent employment	22.4	19.5	20.4	16.4	18.3	-
Unemployment rate(1) (% active population, age group 15-74)	9.7	9.7	10.1	10.3	9.0	7.6
Long-term unemployment rate(2) (% of labour force)	3.0	3.6	4.1	4.4	3.8	3.1
Youth unemployment rate (% active population aged 15-24)	23.7	25.8	26.5	27.3	23.9	20.9
Youth NEET(3) rate (% of population aged 15-24)	10.8	11.5	11.8	12.2	12.0	-
Early leavers from education and training (% of pop. aged 18-24 with at most lower sec. educ. and not in further education or training)	5.4	5.6	5.7	5.6	5.4	-
Tertiary educational attainment (% of population aged 30-34 having successfully completed tertiary education)	34.8	36.5	39.1	40.5	42.1	-
Formal childcare (30 hours or over; % of population aged less than 3 years)	2.0	3.0	5.0	4.0	-	-

1 Unemployed persons are all those who were not employed but had actively sought work and were ready to begin working immediately or within two weeks.
2 Long-term unemployed are peoples who have been unemployed for at least 12 months.
3 Not in Education Employment or Training.
4 Average of first three quarters of 2015. Data for total unemployment and youth unemployment rates are seasonally adjusted.
Source: European Commission (EU Labour Force Survey).

Table C.3: **Labour market and social indicators - part B**

Expenditure on social protection benefits (% of GDP)	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Sickness/healthcare	4.7	4.4	4.2	4.1	-	-
Invalidity	1.5	1.5	1.5	1.4	-	-
Old age and survivors	11.8	11.1	10.6	10.4	-	-
Family/children	1.3	1.3	1.3	0.8	-	-
Unemployment	0.4	0.4	0.3	0.3	-	-
Housing and social exclusion n.e.c.	0.1	0.1	0.1	0.1	-	-
Total	19.9	19.1	18.1	17.2	-	-
of which: means-tested benefits	0.7	0.7	0.6	0.7	-	-
Social inclusion indicators	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
People at risk of poverty or social exclusion[1] (% of total population)	27.8	27.8	27.2	26.7	25.8	24.7
Children at risk of poverty or social exclusion (% of people aged 0-17)	31.0	30.8	29.8	29.3	29.8	28.2
At-risk-of-poverty rate[2] (% of total population)	17.1	17.6	17.7	17.1	17.3	17.0
Severe material deprivation rate[3] (% of total population)	15.0	14.2	13.0	13.5	11.9	10.4
Proportion of people living in low work intensity households[4] (% of people aged 0-59)	6.9	7.3	6.9	6.9	7.2	7.3
In-work at-risk-of-poverty rate (% of persons employed)	11.0	11.4	11.1	10.4	10.7	10.6
Impact of social transfers (excluding pensions) on reducing poverty	27.5	27.9	26.6	25.3	24.8	26.4
Poverty thresholds, expressed in national currency at constant prices[5]	10048	10291	10555	10551	10550	10848
Gross disposable income (households; growth %)	8.5	5.0	4.9	4.5	3.2	3.8
Inequality of income distribution (S80/S20 income quintile share ratio)	5.0	5.0	5.0	4.9	4.9	4.9

(1) People at risk of poverty or social exclusion (AROPE): individuals who are at risk of poverty (AROP) and/or suffering from severe material deprivation (SMD) and/or living in households with zero or very low work intensity (LWI).
(2) At-risk-of-poverty rate (AROP): proportion of people with an equivalised disposable income below 60 % of the national equivalised median income.
(3) Proportion of people who experience at least four of the following forms of deprivation: not being able to afford to i) pay their rent or utility bills, ii) keep their home adequately warm, iii) face unexpected expenses, iv) eat meat, fish or a protein equivalent every second day, v) enjoy a week of holiday away from home once a year, vi) have a car, vii) have a washing machine, viii) have a colour TV, or ix) have a telephone.
(4) People living in households with very low work intensity: proportion of people aged 0-59 living in households where the adults (excluding dependent children) worked less than 20 % of their total work-time potential in the previous 12 months.
(5) For EE, CY, MT, SI and SK, thresholds in nominal values in euros; harmonised index of consumer prices (HICP) = 100 in 2006 (2007 survey refers to 2006 incomes)
Source: For expenditure for social protection benefits ESSPROS; for social inclusion EU-SILC.

Table C.4: **Structural policy and business environment indicators**

Performance indicators	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Labour productivity (real, per person employed, y-o-y)						
Labour productivity in industry	5.24	13.76	6.61	3.53	-1.03	2.71
Labour productivity in construction	6.07	11.55	11.07	-0.70	1.14	5.78
Labour productivity in market services	0.38	3.07	3.19	2.07	4.23	-0.51
Unit labour costs (ULC) (whole economy, y-o-y)						
ULC in industry	-1.63	-1.68	-1.23	2.39	-0.30	-0.12
ULC in construction	-3.50	4.76	-1.10	1.85	1.49	-16.41
ULC in market services	1.49	5.32	2.24	3.80	0.38	3.87
Business environment	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Time needed to enforce contracts[1] (days)	830	830	830	830	685	685
Time needed to start a business[1] (days)	31.0	32.0	32.0	32.0	32.0	30.0
Outcome of applications by SMEs for bank loans[2]	0.96	na	0.52	na	0.59	0.75
Research and innovation	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
R&D intensity	0.67	0.72	0.75	0.89	0.87	0.94
Total public expenditure on education as % of GDP, for all levels of education combined	5.09	5.17	4.94	4.91	na	na
Number of science & technology people employed as % of total employment	35	37	37	38	40	41
Population having completed tertiary education[3]	18	19	20	22	23	24
Young people with upper secondary level education[4]	91	91	90	90	90	90
Trade balance of high technology products as % of GDP	-2.23	-2.30	-2.21	-1.97	-1.68	-1.50
Product and service markets and competition				**2003**	**2008**	**2013**
OECD product market regulation (PMR)[5], overall				2.42	2.04	1.65
OECD PMR[5], retail				2.52	2.43	2.55
OECD PMR[5], professional services				3.29	3.33	3.24
OECD PMR[5], network industries[6]				3.20	2.70	2.34

(1) The methodologies, including the assumptions, for this indicator are shown in detail here: http://www.doingbusiness.org/methodology.
(2) Average of the answer to question Q7B_a. "[Bank loan]: If you applied and tried to negotiate for this type of financing over the past six months, what was the outcome?". Answers were codified as follows: zero if received everything, one if received most of it, two if only received a limited part of it, three if refused or rejected and treated as missing values if the application is still pending or don't know.
(3) Percentage population aged 15-64 having completed tertiary education.
(4) Percentage population aged 20-24 having attained at least upper secondary education.
(5) Index: 0 = not regulated; 6 = most regulated. The methodologies of the OECD product market regulation indicators are shown in detail here: http://www.oecd.org/competition/reform/indicatorsofproductmarketregulationhomepage.htm
(6) Aggregate OECD indicators of regulation in energy, transport and communications (ETCR).
Source: European Commission; World Bank — Doing Business (for enforcing contracts and time to start a business); OECD (for the product market regulation indicators); SAFE (for outcome of SMEs' applications for bank loans).

Table C.5: **Green growth**

Green growth performance		2009	2010	2011	2012	2013	2014
Macroeconomic							
Energy intensity	kgoe / €	0.32	0.33	0.31	0.30	0.29	-
Carbon intensity	kg / €	1.30	1.32	1.25	1.21	1.19	-
Resource intensity (reciprocal of resource productivity)	kg / €	2.08	2.09	2.46	2.12	1.97	1.92
Waste intensity	kg / €	-	0.52	-	0.50	-	-
Energy balance of trade	% GDP	-2.2	-2.6	-3.3	-3.4	-2.7	-2.6
Weighting of energy in HICP	%	12.69	13.05	13.94	15.41	15.67	14.93
Difference between energy price change and inflation	%	6.8	1.4	3.4	2.9	-1.3	-0.1
Real unit of energy cost	% of value added	16.4	17.1	18.6	-	-	-
Ratio of labour taxes to environmental taxes	ratio	4.8	4.6	4.8	5.1	5.5	5.1
Environmental taxes	% GDP	2.5	2.6	2.5	2.5	2.4	2.5
Sectoral							
Industry energy intensity	kgoe / €	0.21	0.19	0.19	0.18	0.18	-
Real unit energy cost for manufacturing industry	% of value added	28.0	35.7	39.7	-	-	-
Share of energy-intensive industries in the economy	% GDP	13.24	14.01	14.77	14.69	-	-
Electricity prices for medium-sized industrial users	€ / kWh	0.09	0.10	0.10	0.09	0.09	0.08
Gas prices for medium-sized industrial users	€ / kWh	0.03	0.03	0.03	0.04	0.04	0.04
Public R&D for energy	% GDP	-	-	-	0.01	0.01	0.01
Public R&D for environment	% GDP	-	-	-	0.02	0.02	0.02
Municipal waste recycling rate	%	17.4	21.4	17.5	19.6	29.2	-
Share of GHG emissions covered by ETS*	%	49.2	48.9	49.9	49.1	52.1	50.8
Transport energy intensity	kgoe / €	1.35	1.42	1.28	1.10	1.03	-
Transport carbon intensity	kg / €	3.68	3.86	3.48	2.99	2.79	-
Security of energy supply							
Energy import dependency	%	31.6	31.3	33.5	30.7	25.8	-
Aggregated supplier concentration index	HHI	29.2	29.7	29.2	30.3	27.3	-
Diversification of energy mix	HHI	0.38	0.38	0.38	0.36	0.37	-

General explanation of the table items:
All macro intensity indicators are expressed as a ratio of a physical quantity to GDP (in 2005 prices)
Energy intensity: gross inland energy consumption (in kgoe) divided by GDP (in EUR)
Carbon intensity: greenhouse gas emissions (in kg CO2 equivalents) divided by GDP (in EUR)
Resource intensity: domestic material consumption (in kg) divided by GDP (in EUR)
Waste intensity: waste (in kg) divided by GDP (in EUR)
Energy balance of trade: the balance of energy exports and imports, expressed as % of GDP
Weighting of energy in HICP: the proportion of "energy" items in the consumption basket used for the construction of the HICP
Difference between energy price change and inflation: energy component of HICP, and total HICP inflation (annual % change)
Real unit energy cost: real energy costs as a percentage of total value added for the economy
Environmental taxes and labour taxes : from European Commission, 'Taxation trends in the European Union'
Industry energy intensity: final energy consumption of industry (in kgoe) divided by gross value added of industry (in 2005 EUR)
Real unit energy costs for manufacturing industry: real costs as a percentage of value added for manufacturing sectors
Share of energy-intensive industries in the economy: share of gross value added of the energy-intensive industries in GDP
Electricity and gas prices for medium-sized industrial users: consumption band 500–20 00MWh and 10 000–100 000 GJ; figures excl. VAT.
Municipal waste recycling rate: ratio of recycled municipal waste to total municipal waste
Public R&D for energy or for the environment: government spending on R&D (GBAORD) for these categories as % of GDP
Proportion of greenhouse gas (GHG) emissions covered by EU Emission Trading System (ETS): based on greenhouse gas emissions (excl land use, land use change and forestry) as reported by Member States to the European Environment Agency
Transport energy intensity: final energy consumption of transport activity (kgoe) divided by transport industry gross value added (in 2005 EUR)
Transport carbon intensity: greenhouse gas emissions in transport activity divided by gross value added of the transport sector
Energy import dependency: net energy imports divided by gross inland energy consumption incl. consumption of international bunker fuels
Aggregated supplier concentration index: covers oil, gas and coal. Smaller values indicate larger diversification and hence lower risk.
Diversification of the energy mix: Herfindahl index over natural gas, total petrol products, nuclear heat, renewable energies and solid fuels
* European Commission and European Environment Agency
Source: European Commission (Eurostat) unless indicated otherwise