



Okun's law and youth unemployment in Germany and Poland

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Abstract

The unemployment rates, especially youth unemployment rates, increased in various countries of Europe over the last years. This paper examines youth unemployment developments in Germany and Poland with Okun's law to test the hypothesis that young employees are more exposed to the business cycle. I estimate age and country specific Okun coefficients for five different age cohorts. The results show that youth in Poland is more sensitive to the business cycle than adults, while in Germany the difference between the age cohorts is not that distinctive.

A further examination of the different labor market institutions regarding youth employment results in policy recommendations beyond GDP growth, such as job-search assistance as short-term and structural reforms regarding education as long-term recommendation.

Keywords: Youth Unemployment, Okun's Law, Poland, Germany

JEL classification: E24, J64

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1 Introduction

The financial and economic crisis strongly affected the European labor markets, but with different outcomes in the different countries. I investigate the unemployment development in Germany and Poland, because their cases in the recession are special. In Germany, the youth unemployment rate had been quite stable after the financial crisis, even declining after 2009. But the development of the growth rate of the real gross domestic product (GDP) was as expected, i.e. there was negative GDP growth in 2009. In contrast, Poland had permanent positive GDP growth rates, but the youth unemployment rate increased. EU-15 countries as an aggregate, which includes all countries that were members of the European Union before the eastern enlargement in May 2004, is used for comparison. Using Okun's law (Okun, 1962), which expresses a negative relationship between changes of the unemployment rate and the growth rate of the GDP, I examine whether youth is more sensitive to the business cycle than adults (Boulhol and Sicari, 2013). My hypothesis is that if the economy is in a recession, young employees are the first to be dismissed and therefore more vulnerable to cyclical shocks. Additionally, I examine how strong the differences between the various age cohorts are and therefore estimate age and country specific Okun coefficients for five age cohorts. The results show that youth in Poland is more prone to the business cycle conditions than adults, while in Germany the difference between the age cohorts is not that distinctive. This result will then lead to an examination of the two labor markets to find the causes of those differences. As there are labor market institutions which affect youth unemployment more than adult, I am examining e.g. the degree of employment protection legislation for different types of contracts, the minimum wage and the extent to which temporary contracts are used (Berlingieri et al., 2014, Brada et al., 2014). Policy recommendations, beyond the need of GDP growth, will be tackling the demand as well as the supply side of the labor market.

The structure of the paper is as follows: Section 2 provides a short literature overview regarding the main aspects of youth unemployment. Section 3 describes the data set. In Section 4 I discuss the empirical results according to Okun's law. Section 5 examines the labor market institutions of Germany and Poland to explain the differences found in Section 4, while Section 6 concludes the paper and recommends a course of action, divided in short- and long-term proposals.

2 Literature review

The link between unemployment and real GDP growth can be explained from the demand side. An increase in aggregated demand will lead to an increase in production. This will lead to an increase in demand for labor and therefore to a decline of the unemployment rate. Following this line of reasoning, a negative shock in the GDP will lead to a lower demand for labor and therefore to a rise in the unemployment rate. This is valid for the whole labor market as well as for different age cohorts (O'Higgins, 1997).

The unemployment rate depends on various country-specific factors, e.g. the extent of „skills mismatch“ and the transition from school to work are influencing the level of the youth unemployment rate (Dietrich, 2012). However, changes in the youth unemployment rate can also be caused by cyclical fluctuations. Young people are more sensitive to cyclical changes, because the companies have lower opportunity costs when discharging young employees. Following O'Higgins (1997) this is due to the fact that young employees have less company-specific skills and less dismissal protection in comparison to older employees. In addition, Bell and Blanchflower (2011) argue that youth finds itself in a so-called „experience trap“, i.e. employers select workers with experience, and as a result, labor market entrants are never hired and therefore cannot increase their own experience. This might lead to higher unemployment rates for young people especially in an economic downturn where they must compete with more experienced and skilled adults for fewer jobs (Unt, 2012).

In contrast, it is argued that youth unemployment is of shorter duration and less problematic, because young people would change their workplace easily and more often and look for a more appropriate (skill-matching) position (O'Higgins, 2003). But even if youth is experiencing a shorter unemployment duration, it can have other effects: Berlingieri et al. (2014) argue that a failure in integrating the young generation implies a loss of production, productivity and very likely also a loss in innovation potential. Furthermore, there is a fiscal cost of youth unemployment due to increased welfare payments and loss of tax revenues besides the associated loss of GDP (Berlingieri et al., 2014).

Additionally, Mroz and Savage (2006) find that unemployment in young years has profound negative effects on human capital accumulation leading to lower earnings in the future. Youth unemployment today will lead to higher social cost in the future and negative impacts on wellbeing, health status and job satisfaction (Bell and Blanchflower, 2011). Further effects can be deskilling and a degradation of physical and mental health (Berlingieri et al., 2014).

With this in mind, I would like to have a closer look at the hypothesis that if

the economy is in an economic downturn, young employees are the first to be dismissed and therefore more sensible to cyclical shocks.

3 Data set and descriptive statistics

The data set consists of annual real GDP, measured in prices of the year 2010 and published in the Annual Macro-Economic Database (AMECO) of the European Commission (EC, 2015). The annual unemployment rates for various age cohorts are provided by the Organisation for Economic Co-operation and Development (OECD, 2015b). It uses the earliest available entries for each country (Germany: 1992, Poland: 1993 and EU-15: 1992) and ends in 2014. The unemployment rate is based on International Labour Organisation (ILO) standards to ensure the comparability among the countries.

Figure 1 shows GDP growth in Germany, Poland and EU-15. Poland has only positive GDP growth rates during the financial crisis, while Germany and EU-15 show a negative GDP growth in 2009. Figure 2 highlights the youth unemployment rates for Germany, Poland and EU-15 from 1992 until 2014, i.e. for the age cohort of the 15-to-24-years old. The rates vary between the countries: Germany has very low rates and even after the crisis, those rates decline. Poland had declining rates before the crisis, but after 2009 the rates rose again despite the fact that Poland had always positive GDP growth, even during the crisis. The EU-15 as aggregate had the expected increase in unemployment rates after the financial crisis. For all countries the rates are decreasing in 2014.

The youth-to-adult unemployment ratio shows if the employment prospects of youths are worse than those of adults who participate in the labor market (Berlingieri et al., 2014, Bell and Blanchflower, 2011). The ratio is calculated by dividing the youth (15-to-24-year-olds) unemployment rate by the adult (25-to-64-year-olds) unemployment rate. It measures whether youth or adults are experiencing larger difficulties in the labor market and a higher ratio indicates that youth suffers disproportionately to adults. Figure 3 shows the ratios calculated for Germany, Poland and EU-15. In Poland, the youth unemployment rates are more than twice than those of adults, while in Germany, the ratio is considerable smaller. But in Germany as well as in Poland, even before the great recession this ratio increases, while in EU-15, the adult unemployment rates increases more rapidly, showing a slightly decreasing youth unemployment rate/adult unemployment rate ratio after 2008.

In the next section I am examining in detail the relationship between youth and adult unemployment rate.

4 Regression analysis

4.1 Relationship between youth and adult unemployment rates

I analyze the relationship between youth and adult unemployment rates by regressing the youth unemployment rate on the adult rate (Bell and Blanchflower, 2011, O'Higgins, 2012). The equation can be written as:

$$u_{it}^y = \alpha_i + \gamma_i u_{it}^a + \epsilon_{it}, \quad (1)$$

where u_{it}^y is the youth unemployment rate (age cohort 15-24) for country i at time t and u_{it}^a is the corresponding adult unemployment rate (age cohort 25-64). This simple analysis does not consider other factors, such as cohort size, prices or marginal products of youth and adult labor. The results are shown in Table 1 for Germany, Poland and EU-15.

The unemployment rate of the youngest age cohort in Poland changes by 2.19% for each 1% change in adult rates. While in the EU-15 it is as high as in Poland with 2.18%, in Germany the youth unemployment rate changes by 1.01% for a change of 1% in the unemployment rate of adults. The German result could be interpreted as if youth and adults are complements and a decrease in adult unemployment is accompanied by a decrease in youth unemployment (O'Higgins, 2012).

This result confirms my hypothesis that young employees, especially in Poland, are more sensitive to changes in aggregate demand of labor as adults (OECD, 2009). In the next step I would like to answer the question: how strong is the difference between the different age cohorts?

4.2 Okun's law

There are several versions of Okun's law. The original ones were proposed by Okun (1962), the so-called gap and difference version. Furthermore, there are derivations developed over time, so-called dynamic versions (see, for example, Knotek, 2007). Here, the difference version will be used to analyze the sensitivity of the unemployment rate to changes in the growth rate of GDP. The regression is given by:

$$\Delta u_{it} = \alpha_i + \beta_i GDPgrowth_{it} + \epsilon_{it}, \quad (2)$$

where Δu_{it} is the change in the unemployment rate from period $t - 1$ to t for country i , $GDPgrowth_{it}$ represents the GDP growth rate¹ and ϵ_{it} is an assumed white noise error term. The parameter β_i is the so-called „Okun coefficient“. According to Okun’s law, the coefficient should be negative, i.e. positive GDP growth should lead to a decrease of the unemployment rate (Hutengs and Stadtmann, 2014b).

In addition to the regression via Ordinary Least Squares (OLS)², a balanced panel for each country is constructed and used for further estimations. This panel resolves the problem that there is only a limited number of observations available for single OLS estimates. The panel includes the yearly changes in the unemployment rate and the GDP growth rate for five different age cohorts. Rather than estimating each beta coefficient for each age cohort separately, the panel will be estimated via a least squares dummy variable model (LSDV) for each country:

$$\Delta u_{j,t} = \alpha_j D_j + \beta_j D_j GDPgrowth_t + \epsilon_{j,t}, \quad (3)$$

where $\Delta u_{j,t}$ is the change in unemployment rate for cohort j at time t , D_j symbolizes a dummy variable representing the different age cohorts and $\epsilon_{j,t}$ is an assumed white noise error term. The parameters β_j capture the different cohort specific Okun coefficients.

The OLS residuals have been checked for heteroscedasticity and serial correlation and I found both in all country panels (see test results in Table 2 and Table 3). As heteroskedasticity and autocorrelation may lead to inefficient estimates with biased standard errors and thus misleading results, I fitted the model with MA(1) errors. The results are shown in Table 4.

The Okun coefficients are negative across all countries and age cohorts. Thus, the expected negative relationship between changes in the unemployment rate and the real GDP growth can be confirmed. The strength of the effect differs between all countries which is expected due to different labor markets. All countries as well as the aggregate EU-15 show their highest absolute Okun coefficients among the age cohort of the 15-to-24 years old. This indicates that young people are more sensitive to the business cycle conditions than adults, especially in comparison to the age cohort of the 55-to-64-years old.

There are differences between the countries. In Poland, Okun’s coefficients in absolute values are larger than in Germany, so the Polish youth suffers

¹The GDP growth rate has been calculated as a percentage change in GDP moving from GDP_{t-1} to GDP_t : $GDPgrowth_t = \left(\frac{GDP_t - GDP_{t-1}}{GDP_{t-1}} \right) \cdot 100$.

²Estimation results can be requested from the corresponding author.

disproportionately more than the German youth. This supports the result regarding the relationship between youth and adult unemployment rates in section 4.1.

In Poland, the strongest increase in the Okun coefficient is observed from the 15-24 years cohort to the 25-34 years cohort, while in Germany the differences are not that distinct. In Germany, the strongest increase is observed between the 25-34 years cohort and the 35-44 years cohort. This might be the case, because the younger age cohort includes the ones finishing tertiary education and searching for the first job, while in comparison, the older age cohort as well as the age cohort of the 45-54 years old are mostly well established on the labor market due to their working experience as well as their accumulated skills. Bell and Blanchflower (2011) argue that young people may be less efficient in job search activities than adults and are likely to have fewer contacts and less experience of finding work which places them at a relative disadvantage compared to adults.

A closer look at the age cohort of the 25-34 years old is appropriate, as they already completed their education and enter the labor market the first time (Pastore, 2015). In Table 8 the unemployment as well as the labor market participation rates of the 25-34 years old are shown in comparison to the rates of the 15-24 years old. The unemployment rates are lower, even when their labor market participation rate is higher. The youngest age cohort is still the one that should be in the focus of the analysis.

In all countries as well as in the EU-15 countries as aggregate, the smallest Okun coefficients in absolute values are the ones for the 55-to-64 years old. This could be a result of better protection by employment protection laws. Therefore, this age cohort is less vulnerable to business cycles, because they are the last to lose their job in a recession (Hutengs and Stadtmann, 2014b).

In addition, the equality of coefficients for each country between age cohorts has been tested with a Wald-Test and the results are shown in Tables 5 to 7.³ Only for EU-15 the test confirms that the coefficients for youth (age 15-24) differs significantly from those of older age cohorts, while in Poland there is only a significance for the differences to two oldest age cohorts.

Business cycle effects are not explaining all country differences in the level of youth unemployment. The youth-to-adult unemployment ratio, which has been shown in section 3 and can be seen as an indicator of potentially existing structural problems (Cahuc et al., 2013), points at differences between the countries. Therefore, in the next section I examine the labor markets Poland

³Each table show empirical F-Values and the corresponding significance level for one country.

and Germany in detail to answer the question what the underlying causes for the differences between the age cohorts and countries could be.

5 Labor markets in detail

There are different aspects in the labor market that may affect youth employment and explain the differences between the age cohorts as found in section 4. Those aspects include e.g. the degree of employment protection legislation for different types of contracts, etc. (Berlingieri et al. (2014)). According to Brada et al. (2014), besides institutional variables such as labor taxes, unemployment benefits, unionization and collective bargaining, some specific variables for youth unemployment include the minimum wage and the extent to which temporary contracts are used. Hence, I focus here on the following issues as being the ones with the main differences between the two countries, and discuss them in detail in the following subsections:

- Economic conditions, such as the segregation of the market regarding sectors (industry, agriculture, service), mobility of the labor force and migration vs. immigration, labor market participation plus NEETs and the duality of the labor market;
- Institutional frameworks such as minimum wages, Employment Protection Legislation (EPL) and the education system.

5.1 Segregation of the market regarding sectors

The economic specialization of countries can influence the sensitivity of unemployment to cyclical conditions (Brada et al., 2014, Hutengs and Stadtmann, 2014a). In Germany as well as in Poland, the trend in the service sector is clearly showing an increase in employment, while in the other sectors such as manufacturing and agriculture the level of employment decreases, as shown in Table 9. In the service sector growth usually means that additional workforce is needed and this would decrease the unemployment rate (Prybysz et al., 2000). But the share of workers between sectors as in Table 9 shows that the service sector in Germany is higher than in Poland which could explain the higher level in the unemployment rate in Poland.

5.2 Mobility of the labor force and migration vs. immigration

Regarding the mobility of the labor force, regional unemployment data from Eurostat (Eurostat, 2015) shows that immobility is still prevalent in both countries. Between the regions in Poland as well as between the states in Germany, differences are still existent, for youth as well as for adults. Figures 4 and 5 show the regional unemployment in Germany, respectively in Poland, in 2014. In Germany, there is still an East-West divide existing. Former East Germany has higher unemployment rates than former West Germany. In Poland there is neither an East-West nor a North-South divide, but the central region including Warsaw is having the lowest rates on both youth and adult unemployment. According to OECD (2014c), there are important impediments to internal labor mobility, such as the quality of transport infrastructure and expensive urban housing, because of a lack of private rental supply.

Mobility of labor forces does not only include the mobility within the country, but also international migration. According to OECD (2014d) the number of Polish citizens who are staying abroad for more than three months increased in 2012. Kaczmarczyk et al. (2014) shows already in 2011 an increase in officially registered number of international emigrants. It was recorded that in 2011 42.5% of migrating men and 49.2% of migrating women of the permanent emigrants were persons aged between 20 and 39 years. According to Kaczmarczyk et al. (2014) most of the Polish emigrants leave the country to work abroad. The most important migrant sending regions included in absolute terms Slaskie, Malopolskie (both areas, so-called voivodeships, in region Poludniowy), Dolnoslaskie (region Poludniowo-Zachodni) and Podkarpackie (region Wschodni) and in relative terms Podlaskie and Podkarpackie (both areas in region Wschodni) (Kaczmarczyk et al., 2014). Regarding unemployment rates these are regions with the unemployment rates in the middle of the ranges, except for the region Wschodni which is the region with the highest unemployment rates for youth as well as for adults (see Figure 5). Germany is one of the main destinations of Polish emigrants, which is shown in OECD (2014a). Poland is the top one country of origin of total inflows of foreigners in 2012 as well as the annual average between 2002 and 2011. Germany does have a positive net immigration and according to OECD (2014a) this contributed to employment growth. The number of younger foreign employees with tertiary educational qualification increased in 2011 as well as the employment rate of foreign workers aged 20 to 64 with a vocational background. The labor market integration of foreign workers has improved, the policy now focus on increasing the employment rates of particular groups, such as women with a migration

background (OECD, 2014a). But on the other hand, also high educated German are leaving the country to work abroad (OECD, 2015c).

5.3 Labor market participation plus NEETs

As difficulties in finding work oblige some young persons to stay in school, to re-enter school and/or university, to start an apprenticeship etc., the labor participation rate of young persons should decrease. According to Dietrich (2012), changes in unemployment rate may be interpreted as an exchange between unemployed and employed (i.e. within labor force), but there can also be an exchange with an inactive group (outside the labor force). People in education are not counted for the unemployment rate and for the labor force, so youth unemployment rate should decline. As can be seen in Figure 6, the labor market participation rate of youth (age cohort 15-24) in Poland and Germany is slightly decreasing, but there is no strong effect. According to Dietrich (2012), the decrease in youth labor market participation shows that a change in the youth unemployment rate captures only part of the dynamic caused by the business cycle and should be investigated further.

But the labor participation rates do not include those young people that are outside of the labor force. This group is called the „youth left behind“ and can be proxied by the number of people who are neither employed nor in education or training, so-called NEETs (Scarpetta et al., 2010). Figure 7 shows the proportion of youth who are not in employment and not in education or training for Poland and Germany. The data is an indicator provided from the International Labour Organization (ILO, 2014), but only for the time period 2003 (Germany) or 2004 (Poland) until 2013. For Germany, the share is decreasing, while for Poland it is increasing since 2008.

5.4 Duality of the labor market

According to Scarpetta et al. (2010), the dominant related factor for the higher business-cycle sensitivity of youth is their high presence among those holding temporary jobs. With data from the Organisation for Economic Co-operation and Development (OECD, 2015b), the incidence of temporary employment for youth and adults is shown for Germany in Figure 8 and for Poland in Figure 9. Even though the incidence of temporary employment is increasing for adults (age cohort 25-54), there are large differences between youth and adults regarding temporary jobs. Young people in both countries have a larger proportion of temporary contracts. However, in Germany, temporary contracts are mainly

apprenticeship contracts (Scarpetta et al., 2010). Furthermore, it can be noted that temporary contracts can be so-called „stepping stones“ to permanent contracts, i.e. the probability for youth of getting a permanent job after being on a temporary job is higher than after being unemployed (Scarpetta et al., 2010). As pointed out in OECD (2009), the high share of youth holding temporary contracts in Poland can also indicate that there are structural rigidities on the labor market which affect disproportionately youth, because it puts them at a greater risk to lose their job in economic recessions. They are the first to be laid off because the contracts are not extended or because they are subject to the LIFO (last-in-first-out) rule. And strict employment protection on regular jobs could contribute to the high level of temporary contracts, because it restrains employer’s willingness to take on a risk on workers without experience, i.e. new entrants in the labor market (OECD, 2009). Temporary contracts can also be seen as dead-end jobs and a discussion can be found in Pastore (2015). But according to Baranowska et al. (2011), temporary contracts in Poland are rather used as a screening device for employers.

5.5 Minimum wages

As mentioned before, minimum wages are one labor market institution especially relevant for youth unemployment (Brada et al., 2014). Germany introduced a national minimum wage in 2015, but already had minimum wages in some sectors determined by collective agreements before. Poland already had a national minimum wage in place covering all employees (ILO, 2015). But as mentioned in OECD (2009), enterprises are allowed to pay new entrants a reduced minimum wage during the first year of employment. Still e.g. Laporšek (2013) shows that the minimum wage tends to reduce youth employment among countries in the European Union with statutory minimum wage and the disemployment effect is stronger among teenage workers. Also the differences between countries, that set a lower minimum wage for young workers and the ones that do not, the effect is the same. In Poland this might already explain part of the unemployment rate for the new entrants in the market, also shown by OECD (2009).

5.6 Employment Protection Legislation (EPL)

Because the employment protection legislation and lay-off regulations affect more the worker turnover and duration of unemployment than the unemployment level itself, they are more important for younger than for older

people (Brada et al., 2014). The OECD indicators on employment protection legislation in 2013 for Germany, Poland and the OECD unweighted average for comparative purpose are shown in Table 10 and include the protection of permanent workers against individual and collective dismissals (EPRC), protection of permanent workers against (individual) dismissal (EPR), specific requirements for collective dismissal (EPC) and regulation on temporary forms of employment (EPT) (OECD, 2015a). The scale is from 0 (least restrictions) to 6 (most restrictions). As can be seen in Table 10, Germany has stricter protection of permanent workers and less stricter regulation on temporary forms of employment than Poland (and the OECD unweighted average). If the EPL is high on „permanent contracts“, than adults are in favor and this can further increase the size and duration of unemployment for youth. The labor hoarding that took place in Germany with so-called „Kurzarbeit“ (short-term work scheme) can be seen as such a practice (Choudhry et al., 2012).

5.7 Education system

According to Scarpetta et al. (2010) low-regulated labor markets provide a smoother school-to-work transition, but with highly regulated labor markets such as Germany it is very important to have strong vocational education and training systems which can compensate the regulations. Germany has established, besides the standard curricula, a professional system which allows to combine work experience, on-the-job training and classroom teaching (Cahuc et al., 2013). According to Biavaschi et al. (2012) general schooling in Germany is followed by participation in upper secondary vocational education as a standard pathway into the labor market. Vocational qualifications can be acquired by participating in one of the following options: (a) a dual vocational training system with alternating school- and firm-based training, (b) full-time vocational schooling with a predominantly application-oriented curriculum or (c) tertiary education at vocational academies or universities. The dual apprenticeship system is generally seen as the main reason for the constantly low youth unemployment rate in Germany, because it plays a central role with two thirds among the number of youths completing general schooling each year who enter the dual apprenticeship system, while about one fifth participate in full-time vocational schooling (Biavaschi et al., 2012). But, albeit its success, this system is not very easy to implement in other countries, because it requires a big effort by all the partners involved, such as the social partners, public employment service (PES), and educational institutions (Pastore, 2015,

Biavaschi et al., 2012). And Scarpetta et al. (2010) found that in economic downturns employers become reluctant to offer apprenticeships, especially to those youth lacking educational qualifications and from an immigrant background.

In Poland, there exists three secondary schooling tracks which include general upper-secondary schools (so-called lyceum), technical upper-secondary schools (so-called technikum) and basic vocational schools. Graduates of general upper-secondary schools can continue their education in a postsecondary school and can receive a vocational diploma confirming vocational qualifications in a given occupation (EURYDICE, 2014). According to Baranowska et al. (2011) time spent in basic vocational schools is shorter, but they prepare students mainly for manual occupations, while technikums have a longer duration, but provide a mix of general and vocational education for the preparation for skilled service and technical occupations and offer the students also the possibility to transfer into tertiary education. General secondary schools provide no occupational qualifications, but prepare the students for higher education. Firm-based training is emphasized more in the curriculum of basic vocational schools than in the technikum, but employer involvement in the design and organization of training decreased in the course of economic restructuring (Baranowska et al., 2011). Higher education, i.e. tertiary education, includes degree programs, provided by public and non-public university-type and non-university higher education institutions, and further college programs, provided by colleges of social work, teacher training colleges and foreign-language teacher training colleges, where the latter two types are phased out now (EURYDICE, 2014). OECD (2009) explains as well that large segments of firm-based vocational education already collapsed with the state-owned firms in the economic restructuring, so it is now more school-based. And Polakowski (2012) confirms that the cooperation of schools and companies are low. But Baranowska et al. (2011) show that graduates of secondary vocational schools have faster transitions to employment than general secondary school graduates, especially with vocational education and firm-based training, although that does not include better chances to transfer to open-ended contracts.

6 Conclusions and recommendations

In this paper I examined the development of the youth unemployment rate in Germany and Poland, using the estimates of age-cohort specific Okun coefficients. The main empirical results can be summarized as follows:

1. Germany: The Okun coefficient for young people is larger than for other age cohorts in absolute value, so youth are more sensitive to the business cycle than adults, but the differences between the age cohorts are small and not statistically significant.
2. Poland: The Okun coefficient for young people is larger than for other age cohorts in absolute value, so youth are more exposed to fluctuations than other age cohorts. The differences between the age cohorts, especially between 15-24 years old and the subsequent age cohort of the 25-34 years old, are large, but not statistically significant.
3. The Okun coefficient for young people differs between the two countries, showing that young Polish people are hit harder by macroeconomic shocks in comparison to young German people. This result not only holds for youth, but for all age cohorts.

Any policy recommendation here should consider GDP growth, because youth unemployment is more sensitive to business fluctuations and it is a relevant factor for adult unemployment as well. And without economic growth no youth policy can ever be effective (Pastore, 2015). But according to Polakowski (2012), the Polish economy has grown comparatively fast, but without creating new jobs. There had been a decrease in employment in agriculture and the growth of the service sector, but also a decrease in demand for labor due to increased labor productivity. Still, further promotion of the service sector in Poland as well as in Germany is recommended as this could lead to a higher growth of the job market (Prybysz et al., 2000, OECD, 2014b).

The obstacles to internal mobility in Poland should be reduced e.g. by continuing to develop transport infrastructure, such as the quality of the rail network, and reforming housing policies (OECD, 2014c).

The number of NEETs in Poland are rising which is a reason of concern. Scarpetta et al. (2010) proposes a better cooperation between employment services and education system to reach youth as soon as there is a risk of disengagement, as well as an early guidance to school-leavers in search of a job and a „learn/train-first“ approach to maintain youth connected to the labor market.

If temporary contracts in Poland are used as screening device, as discovered by Baranowska et al. (2011), then qualifications such as certificates are not signaling the quality of the certificate holders to the companies. Therefore, as suggested by OECD (2009), a universal Vocational Education and Training (VET) classification system should be implemented in Poland. Further proposals are made by OECD (2014c), such as enhancing work-based learning in VET programs by boosting social partners' involvement and raising the quality of teaching as well as strengthening the link with businesses.

Scarpetta et al. (2010) proposes to rebalance the employment protection, so that youth can gradually move from entry jobs to career employment, i.e. a smooth transition from temporary to more stable and rewarding jobs which could reduce the labor-market duality and the sensitivity of youth to business cycles. OECD (2009), too, suggests to reduce the gap in employment protection between open-ended, fixed-term contracts and the „commission contracts“ in Poland and OECD (2014b) recommends to reduce the gap in employment protection between permanent and temporary workers in Germany.

The major challenge for Germany is the labor market integration of young people failing to enter regular vocational training (Biavaschi et al., 2012). Apprenticeships for unskilled young people and support measures to help apprentices whose contracts had been ended to complete their training should be included (Scarpetta et al., 2010).

All in all, my proposals are:

- in the short-term: job-search assistance and guidance for all youth by public employment services (Scarpetta et al., 2010);
- in the long-term: for Poland structural reforms regarding the education system, employment protection and mobility as described above; for Germany strategies to avoid school drop-outs and offerings of a second chance of qualification for every young person (Scarpetta et al., 2010).

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Appendix

Regression analysis, tables and graphics

Table 1: Youth unemployment vs. adult unemployment (O’Higgins, 2012).

Country	coefficient	R^2	N
Germany	1.0070*** (0.1924)	0.5436	25
Poland	2.1856*** (0.1126)	0.9472	23
EU-15	2.1765*** (0.1535)	0.8974	25

Source: Own elaboration with data from OECD (2015b). Notes: N - number of observations; standard errors in parentheses; significance at *** 1% level, ** 5% level, * 10% level.

Table 2: Results Breusch-Pagan-Test for heteroscedasticity.

Country	BP	p-Value
Germany	17.2055	0.0456
Poland	26.1937	0.0019
EU-15	19.1254	0.0242

Nullhypothesis: Homoskedasticity.

Table 3: Results Durbin-Watson-Test for serial correlation.

Country	DW	p-Value
Germany	1.0771	0.0000
Poland	1.0428	0.0000
EU-15	1.4533	0.0002

Nullhypothesis: No autocorrelation.

Table 4: Panel Regression Results with fitted MA(1) residuals.

Country	15 – 24	25 – 34	35 – 44	45 – 54	55 – 64	R^2	N
Germany	-0.3258*** (0.0895)	-0.2875** (0.0893)	-0.1789* (0.0891)	-0.1728 (0.0891)	-0.1411 (0.0898)	0.3548	115
Poland	-1.1360*** (0.2378)	-0.6093* (0.2362)	-0.4972* (0.2359)	-0.4144 (0.2361)	-0.2601 (0.2359)	0.4481	110
EU-15	-0.7252*** (0.0624)	-0.4600*** (0.0621)	-0.3077*** (0.0620)	-0.2572*** (0.0620)	-0.2393*** (0.0625)	0.7067	115

Source: Own elaboration with data from OECD (2015b). Notes: N - number of observations; standard errors in parentheses; significance at *** 1% level, ** 5% level, * 10% level.

Table 5: Wald test for equality of coefficients - Germany

	β_{25-34}	β_{35-44}	β_{45-54}	β_{55-64}
β_{15-24}	0.0922	1.3545	1.4693	2.1415
β_{25-34}		0.7423	0.8279	1.3477
β_{35-44}			0.0023	0.0895
β_{45-54}				0.063

Notes: significance at *** 1% level, ** 5% level, * 10% level.

Table 6: Wald test for equality of coefficients - Poland

	β_{25-34}	β_{35-44}	β_{45-54}	β_{55-64}
β_{15-24}	2.486	3.6506	4.6633*	6.8601*
β_{25-34}		0.113	0.3416	1.096
β_{35-44}			0.0616	0.5055
β_{45-54}				0.2141

Notes: significance at *** 1% level, ** 5% level, * 10% level.

Table 7: Wald test for equality of coefficients - EU-15

	β_{25-34}	β_{35-44}	β_{45-54}	β_{55-64}
β_{15-24}	9.1537**	22.653***	28.482***	30.737***
β_{25-34}		3.023	5.3589*	6.3322*
β_{35-44}			0.3318	0.6063
β_{45-54}				0.0416

Notes: significance at *** 1% level, ** 5% level, * 10% level.

Table 8: Unemployment rates and labor market participation rates in % in 2014.

Country	age cohort 15-24		age cohort 25-34	
	Unemployment rate	Labor Market Participation rate	Unemployment rate	Labor Market Participation rate
Germany	7.76	49.95	5.79	84.95
Poland	23.87	33.86	9.79	85.64
EU-15	21.64	45.70	12.49	84.68

Source: Own elaboration with data from OECD (2015b).

Table 9: Employment changes between 2007 and 2014 and share of workers in sectors in % in 2014.

Country	Agriculture		Construction		Industry		Manufacturing		Service	
	2007-2014	share	2007-2014	share	2007-2014	share	2007-2014	share	2007-2014	share
Germany	-33.63	1.19	8.20	5.73	-4.62	17.73	-6.92	16.38	9.11	58.97
Poland	-18.74	9.63	12.59	6.28	0.61	19.31	-3.98	16.07	10.65	48.72

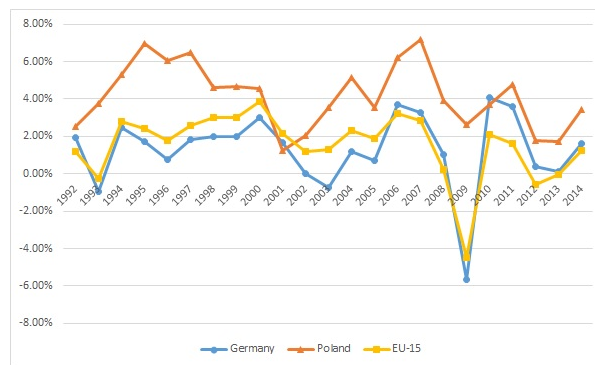
Source: Own elaboration with data from OECD (2015b). Industry is excluding Construction.

Table 10: OECD indicators on EPL in 2013.

Country	EPRC	EPR	EPC	EPT
Germany	2.98	2.72	3.63	1.75
Poland	2.39	2.20	2.88	2.33
OECD unweighted average	2.29	2.04	2.91	2.08

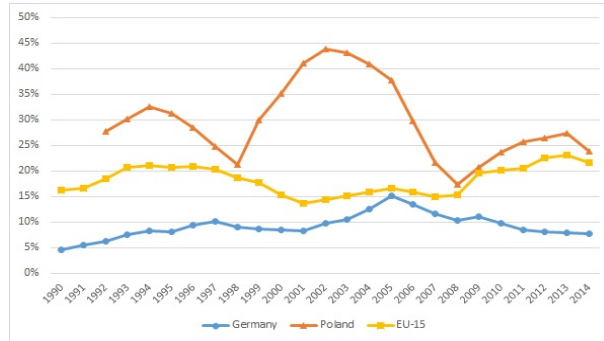
Source: Own elaboration with data from OECD (2015a).

Figure 1: GDP Growth.



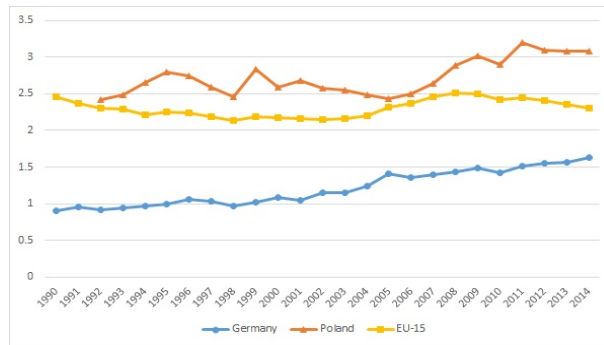
Source: Own elaboration with data from EC (2015).

Figure 2: Youth unemployment rate (age cohort 15-24).



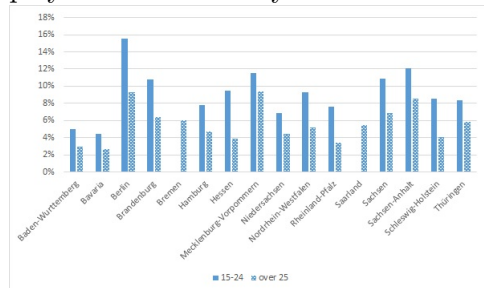
Source: Own elaboration with data from OECD (2015b).

Figure 3: Youth-adult unemployment rate ratio.



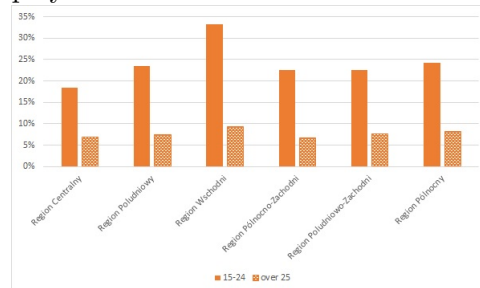
Source: Own elaboration with data from OECD (2015b).

Figure 4: Incidence of regional unemployment in Germany in 2014.



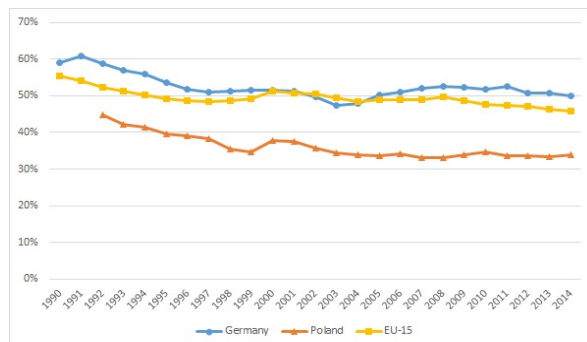
Source: Own elaboration with data from OECD (2015b).

Figure 5: Incidence of regional unemployment in Poland in 2014.



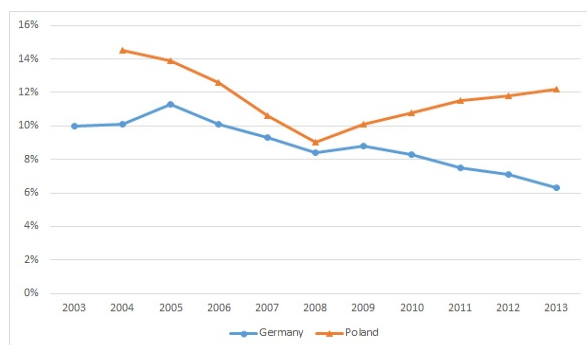
Source: Own elaboration with data from OECD (2015b).

Figure 6: Labor market participation rate youth (age cohort 15-24).



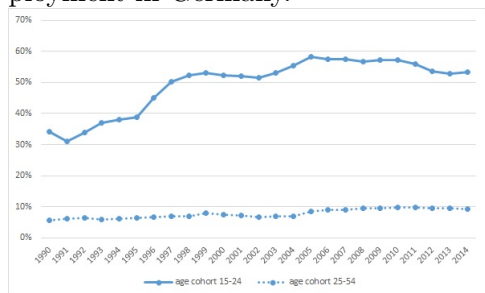
Source: Own elaboration with data from OECD (2015b).

Figure 7: Youth (age cohort 15-24) not in employment and not in education or training (NEET).



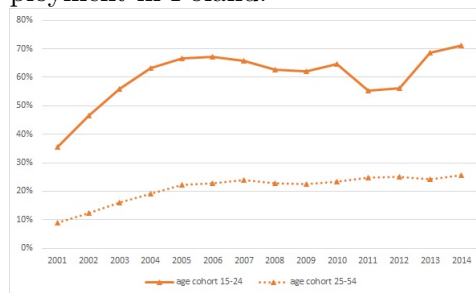
Source: Own elaboration with data from ILO (2014).

Figure 8: Incidence of temporary employment in Germany.



Source: Own elaboration with data from OECD (2015b).

Figure 9: Incidence of temporary employment in Poland.



Source: Own elaboration with data from OECD (2015b).