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## Okun's Law and Youth Unemployment in Germany and Poland

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## Okun's Law and Youth Unemployment in Germany and Poland

### Abstract

Unemployment rates, especially among youth, have increased in various countries of Europe over the last years. This paper examines changes in youth unemployment in Germany and Poland with Okun's law, testing that young employees are more vulnerable to the business cycle. I estimate country specific Okun coefficients for five different age cohorts. The results show that youth in Poland is more sensitive to business cycle fluctuations than adults, while in Germany the difference between the age cohorts is not that distinctive. In addition, cohort differences in Germany are not statistically significant, while they are significant in Poland but only with regard to the two oldest age cohorts.

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

**Keywords:** youth unemployment, Okun's Law, Poland, Germany

**JEL:** E24, J64

### Introduction

The financial and economic crisis strongly affected European labor markets, but its impact varied in different countries. In this study I investigate unemployment developments in Germany and Poland, which were selected because their cases in the recession

are unique. In Germany, the youth unemployment rate remained stable after the financial crisis, declining slightly after 2009, even as the growth rate of the real gross domestic product (GDP) turned negative in 2009. In contrast, Poland experienced positive GDP growth rates throughout the period, but the youth unemployment rate increased. Data for the aggregate EU-15 countries are used for comparison and include all member countries of the European Union before the enlargement in May 2004<sup>2</sup>. 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, Sicari, 2013]. My hypothesis is that if the economy is in a recession, young employees are the first to be dismissed and are therefore more vulnerable to cyclical shocks. Additionally, I examine how strong the differences between the various age cohorts are and therefore estimate country specific Okun coefficients for five different age cohorts. The results show that youth in Poland is much more prone to business cycle fluctuations than adults, while in Germany the difference between the age cohorts is not distinctive.

These results lead to an examination of the two labor markets to find the causes of those differences. As there are labor market institutions that affect youth unemployment more than adult unemployment, I examine e.g. employment protection legislation, the minimum wage and the extent to which temporary contracts are used [Berlingieri et al., 2014, Brada et al., 2014]. Specific policy recommendations beyond GDP growth are formulated, tackling both the demand and supply side of the youth labor markets.

The structure of the paper is as follows: the next section provides a brief literature overview on the main aspects of youth unemployment; afterwards I describe the data set and discuss the empirical results based on Okun's law. I then examine the labor market institutions in Germany and Poland to better understand my empirical findings. The final section concludes with short and long-term policy recommendations.

## 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 GDP shock will lead to a lower demand for labor and, therefore, a rise in the unemployment rate. This is valid for the whole labor market as well as for different age cohorts [O'Higgins, 1997].

According to Choudhry et al. [2012], a decrease in labor demand implies less job openings, which means that young people are more likely to be affected by unemployment. And job destructions are also excessively affecting youth, because young employees have a higher tendency to work under temporary contracts. On the other hand, temporary

contracts may stimulate job creation in periods of economic downturns or for specific groups of workers without qualifications or work experience, such as labor market entrants [Dietrich, 2012].

The unemployment rate depends on various country-specific factors, e.g. the extent of „skills mismatch” and the transition from school to work, which tend to influence 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 companies have lower opportunity costs when discharging young employees. Following O’Higgins [1997] 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. firms select employees with experience, and therefore, labor market entrants are never employed and 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 workers for fewer jobs [Unt, 2012].

In contrast, it is argued that youth unemployment is shorter in duration and less problematic, because young people change their workplace more easily and more often to find appropriate “skill-matching” positions [O’Higgins, 2003]. But even if youth is experiencing shorter unemployment duration, it can have other effects: Berlingieri et al. [2014] argue that a failure in integrating young people means a loss of output, productivity and very likely also a loss in innovation potential. Furthermore, there is a fiscal cost connected with youth unemployment besides the associated loss in GDP, because welfare payments are increasing and tax revenues are lost [Berlingieri et al., 2014].

Additionally, Mroz and Savage [2006] find that unemployment among young workers has profound negative effects on human capital accumulation leading to lower future earnings. Youth unemployment experienced today will lead to higher social cost tomorrow and negatively impact well-being, health status and job satisfaction [Bell, Blanchflower, 2011]. Further effects can be deskilling and a degradation of physical and mental health [Berlingieri et al., 2014].

With this in mind, I test the hypothesis that young employees are more sensible to cyclical shocks.

## Data Set and Descriptive Statistics

I rely on annual real GDP, measured in 2010 prices and published in the Annual Macro-Economic Database (AMECO) of the European Commission [EC, 2015], as well as annual unemployment rates for various age cohorts provided by the Organisation for Economic Co-operation and Development [OECD, 2015b]. The data set includes 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 that the relevant countries are comparable with each other.

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 youth unemployment rates for Germany, Poland and EU-15 from 1992 until 2014, i.e. for the 15-to-24-year old age cohort. 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 rates rose again despite the fact that Poland maintained a positive GDP growth, even during the crisis. The EU-15 (in the aggregate) experienced an increase in unemployment rates after the financial crisis. For all countries the rates decreased in 2014.

The youth-to-adult unemployment ratio shows whether the labor market prospects of youth are worse than the employment prospects of adults [Berlingieri et al., 2014, Bell and Blanchflower, 2011]. Calculation of the ratio is done by dividing the youth unemployment rate (age cohort as defined above) by the adult unemployment rate (here: age cohort of the 25-to-64-years old). It measures whether youth or adults are struggling more in the labor market, with a higher ratio indicating that youth suffers disproportionately to adults. Figure 3 shows the ratios calculated for Germany, Poland and EU-15. In Poland, youth unemployment rates are more than twice than those of adults, while in Germany, the ratio is considerable smaller. But in both Germany and Poland, even before the great recession this ratio increased, while in the EU-15 adult unemployment rates increased more rapidly, showing a slightly decreasing youth unemployment rate/adult unemployment rate ratio after 2008.

In the next section I examine the relationship between youth and adult unemployment rate.

## Regression Analysis

### 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, Blanchflower, 2011, O'Higgins, 2012]. The equation can be written as:

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

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 the EU-15.

The unemployment rate of the 15-to-24-year-olds in Poland changes by 2.19 percentage points for each 1% change in adult unemployment rates. While in the EU-15 it is as high as in Poland with 2.18 percentage points, in Germany the youth unemployment rate changes by 1.01 percentage point for a change of 1% in the unemployment rate of adults. The German result could mean that 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 for labor than adults [OECD, 2009]. In the next step I attempt to answer the question: how strong is the difference between the different age cohorts?

### Okun's Law

There are several versions of Okun's law. The original ones were suggested by Okun [1962], the so-called gap and difference version. Furthermore, there are derivations developed in the course of time, so-called dynamic versions (see e.g. 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 based on the following model:

$$\Delta u_{it} = \alpha_i + \beta_i \text{GDPgrowth}_{it} + \varepsilon_{it}, \quad (2)$$

where  $\Delta u_{it}$  is the change in the unemployment rate from period  $t - 1$  to  $t$  for country  $i$ ,  $\text{GDPgrowth}_{it}$  represents the GDP growth rate<sup>3</sup> and  $\varepsilon_{it}$  is an assumed white noise error term. The parameter  $\beta_i$  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 [Huteng and Stadtmann, 2014b].

In addition to the regression via Ordinary Least Squares (OLS)<sup>4</sup>, a balanced panel for each country is constructed and used for further estimations. The panel resolves the problem of a limited number of observations available for single OLS estimation. It includes changes in the unemployment rate from year to year for the five different age cohorts plus the GDP growth rate. Instead of estimating each beta coefficient for each age cohort individually, the panel will be estimated via a least squares dummy variable model (LSDV) for each country:

$$\Delta u_{j,t} = \alpha_j D_j + \beta_j D_j \text{GDPgrowth}_t + \varepsilon_{j,t}, \quad (3)$$

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  $\varepsilon_{j,t}$  is an assumed white noise error term. The parameters  $\beta_j$  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 heteroscedasticity and autocorrelation could eventuate in inefficient estimates with biased standard errors and therefore 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 as well as all age cohorts. Thus, the expected negative relationship between changes in the unemployment rate and real GDP growth can be confirmed. The strength of the effect differs between all countries which is expected due to differences in labor markets. The countries and the aggregate EU-15 show their highest Okun coefficients in absolute terms among the age cohort of 15-to-24 years old. This indicates that youth is more sensitive to business cycle conditions than adults, especially in comparison to the 55-to-64-year old age cohort.

There are some important differences between countries. In Poland, Okun coefficients in absolute values are larger than in Germany, so Polish youth suffers disproportionately more than does the German youth. This supports the result regarding the relationship between youth and adult unemployment rates presented in section 4.1.

In Poland, the strongest increase in the Okun coefficient is observed from the 15–24 year old cohort to the 25–34 year old cohort, while in Germany the differences are not that distinct. In Germany, the strongest increase is observed between the 25–34 year old cohort and the 35–44 year old cohort. This might be the case because the younger age cohort includes those finishing tertiary education and searching for their first job, while the older cohort (as well as the 45–54 year old cohort) are mostly well established on the labor market due to their work experience as well as their accumulated skills. Bell and Blanchflower [2011] argue that adults may be more efficient in job search activities than young people and therefore young people are likely to have less contacts as well as less experience finding work, which is disadvantageous for the youth.

Typically, the 25–34 year old cohort has completed their education and entered the labor market [Pastore, 2015]. In Table 8 the unemployment, as well as the labor market participation, rates of the 25–34 and 15–24 year old cohorts are presented, showing that unemployment rates are lower among the former, even when their labor market participation rates are higher. Thus, the youngest age cohort should be the focus of the analysis.

In all countries (as well as in the EU-15 countries, aggregated), the smallest Okun coefficients in absolute terms are for the 55-to-64 year old cohort. This could be a result of better protection under employment laws. Therefore, this age cohort is less exposed to business cycles because they are the last to lose their job during 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<sup>5</sup>. Only for the EU-15 does the test confirm that the coefficients for the youngest cohort differ significantly from all older age cohorts, while in Poland there is only a significance for the differences to the

two oldest age cohorts. In Germany the differences between age cohorts are not statistically significant.

As for the overall difference of the two countries, especially during the Great Recession, it is argued that in Germany employment adjustments were mainly done at the intensive margin, i.e. reductions in hours per worker (see e.g. Cahuc et al. [2013], Rinne and Zimmermann [2012], Rinne and Zimmermann [2013], Burda and Hunt [2011], etc.). In Poland, according to OECD [2014c], schemes like short-time work, e.g. with state assistance for employee compensation while reducing work-time, were rarely used and could explain the adjustment at the extensive margin, i.e. at the employment level.

Business cycle effects do not explain all differences between countries in youth unemployment levels. The youth-to-adult unemployment ratio, which has been calculated in section 3 and can be seen as an indicator of possible structural problems [Cahuc et al., 2013], points to differences between the two countries. Therefore, in the next section I examine the labor markets of Poland and Germany in detail to answer the question regarding the underlying causes for differences between youth and adults in those countries.

## Labor Markets in Detail

Different labor market characteristics affecting youth employment may explain differences between the age cohorts, as discussed in section 4. In addition to institutional variables such as labor taxes, unemployment benefits, unionization and collective bargaining, some specific factors of relevance to youth unemployment include e.g. Employment Protection Legislation (EPL) according to Berlingieri et al. [2014] or the minimum wage and the share of temporary contracts [Brada et al., 2014]. Hence, I focus here on those issues as they appear to constitute the main differences between the two countries, especially in terms of youth unemployment. These are discussed in the following subsections:

- Economic conditions, such as segregation of the market by 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.

### Sectoral Labor Market Segregation

Sectoral labor market segregation can influence the sensitivity of unemployment to economic conditions [Brada et al., 2014, Hutengs and Stadtmann, 2014a]. In both Germany and Poland, employment has been rising in the service sector, while in other sectors such as manufacturing and agriculture employment levels have decreased, as shown in Table 9. In the service sector growth usually means that additional workforce

is needed and this would decrease the unemployment rate [Przybysz et al., 2000]. Based on a larger share of service workers in Germany than Poland, as indicated in Table 9, one would expect a higher unemployment rate in Poland.

### **Mobility of the Labor Force and Migration vs. Immigration**

Regarding labor force mobility, regional unemployment data from Eurostat [Eurostat, 2015] shows that immobility is still prevalent in both countries. Between the provinces in Poland (so-called voivodships), as well as between the states in Germany, differences in unemployment rates persist, for youth as well as for adults. Figures 4 and 5 show regional unemployment in Germany and Poland, in 2014. In Germany, there is still an East-West divide. 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 voivodship Mazowieckie in the centre of the country (which includes Warsaw) has the lowest rates of both youth and adult unemployment. According to OECD [2014c], there are important obstacles to internal labor mobility, such as the quality of the transportation infrastructure or expensive urban housing due to a shortage of private rental supply.

Mobility of labor forces does not only include mobility within the country, but also international migration. According to OECD [2014d], the number of Polish people who are living abroad for more than three months increased in 2012. Kaczmarczyk et al. [2014] shows an increase in 2011 of the number of officially registered international emigrants. It was recorded that in 2011 42.5% of men and 49.2% of women who were permanent emigrants were persons aged between 20 and 39 years. According to Kaczmarczyk et al. [2014], most Polish emigrants leave the country to work abroad. The most important sources of migrants are voivodships Śląskie, Małopolskie, Dolnośląskie and Podkarpackie in absolute terms and in relative terms Podlaskie and Podkarpackie [Kaczmarczyk et al., 2014]. With regard to unemployment rates, these are voivodships with unemployment rates in the middle of the ranges, except for the voivodship Podkarpackie which has 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 country of origin for total inflows of foreigners in 2012 as well as the annual average between 2002 and 2011. Germany has a positive net immigration and, according to OECD [2014a], this contributed to employment growth. In 2011, the number of young foreign employees with tertiary education rose. The same is true for the employment rate of foreign workers with an age between 20 and 64 years and a vocational education. As the integration of foreign workers into the labor market has ameliorated, the policy now concentrates on increasing the employment rates of certain groups, such as women with a migration background [OECD, 2014a]. But at the same time, highly educated Germans are leaving the country to work abroad [OECD, 2015c].

### **Labor Market Participation plus NEETs**

As difficulties in finding work force some young people to stay in school, to re-enter school and/or university, to start an apprenticeship etc., the labor participation rate of young workers should decrease. According to Dietrich [2012], changes in the 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 among the unemployed and as a part of labor force, so youth unemployment rates should decline. As can be seen in Figure 6, the labor market participation rate of youth (age cohort 15–24 years) 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 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 defined by the number of people who are neither employed, nor in education or training, the so-called NEETs [Scarpetta et al., 2010]. Figure 7 shows the proportion of this group in 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 in Poland it has been increasing since 2008.

### **Duality of the Labor Market**

According to Scarpetta et al. [2010], the dominant 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 for Germany is shown 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 likelihood of young people getting a permanent contract after having a temporary contract is higher than after being unemployed [Scarpetta et al., 2010]. As pointed out by OECD [2009], the high share of youth holding temporary contracts in Poland can also indicate that there are structural rigidities in the labor market which disproportionately affect youth, putting them at greater risk of job loss during a recession. They are the first to be laid off because their contracts are not extended or they are subject to the LIFO (last-in-first-out) rule. And strict employment protection applied to regular jobs could contribute to the high level of temporary contracts, because it restrains employer’s willingness to risk taking on workers without experience, i.e. new entrants in the labor market [OECD, 2009]. Temporary

contracts can also be seen as a 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.

In Poland there is another labor market duality factor, as so-called Civil Code contracts exist [Polakowski, 2012]. Those contracts are not subject to regulations regarding minimum wage, working time, holidays and overtime remuneration and include reduced social protection rights (e.g. sickness, maternity or unemployment are not compulsorily covered). About 7% of total employment and over 50% of workers between ages 18 and 32 are employed under a civil-law contract [OECD, 2014c].

Job creation can be constrained if costs associated with the dismissal of permanent workers are too high, firms increase the use of temporary contracts, or may be reluctant to hire new employees altogether. This could contribute to the duality of labor markets, and makes it difficult for youths to obtain regular positions in the labor market [Berlingieri et al., 2014].

### **Minimum Wages**

As mentioned before, minimum wages are one labor market institution especially relevant to youth unemployment [Brada et al., 2014]. Germany introduced a national minimum wage in 2015, but has had minimum wages in some sectors determined by collective agreements before and 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 wages and the disemployment effect is stronger among teenage workers. In Poland this might explain part of the unemployment rate for new entrants in the market, also shown by OECD [2009].

### **Employment Protection Legislation (EPL)**

Because employment protection legislation and lay-off regulations affect the fluctuation and the duration of unemployment more than the unemployment level itself, they are more important for youth than for adults [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 types of temporary 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 for permanent workers and less strict regulation on types of temporary employment than Poland (and the OECD unweighted average). If the EPL is high on „permanent contracts“, than adults are advantaged and this

can further raise the level and duration of unemployment for youth. The labor hoarding that took place in Germany with the so-called „Kurzarbeit“ (short-term work scheme) can be seen as such a practice [Choudhry et al., 2012].

### **Education System**

According to Scarpetta et al. [2010], low-regulated labor markets provide a smoother school-to-work transition, but in highly regulated labor markets such as Germany, regulations can be compensated for by a strong vocational education and training system. Besides traditional curricula, Germany has established a professional system which offers a combination of work experience, on-the-job training and classroom teaching [Cahuc et al., 2013]. According to Biavaschi et al. [2012], after general schooling participation in upper secondary vocational education is the usual pathway into the labor market in Germany. Through one of the following options, young people can acquire vocational qualifications: (a) a dual vocational training system with alternating school- and firm-based training, (b) full-time vocational schooling with a mainly application-oriented syllabus or (c) tertiary education at vocational academies or universities. The dual apprenticeship system is generally interpreted as the main reason for the constantly low youth unemployment rate in Germany, because it plays a central role with two thirds of young people who are completing general schooling each year and entering this system, while about 20% participate in full-time vocational schooling [Biavaschi et al., 2012]. But this system, albeit successful, is not easily implemented in other countries because it requires a major effort by all the partners involved, including 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 are less willing to offer apprenticeships, especially to young people without educational qualifications and with an immigrant background.

In Poland, there are 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], basic vocational schools prepare students mainly for manual occupations relatively quickly, while ‘technikums’ have a longer duration but offer a mix of general and vocational education as preparation for skilled service and technical occupations, as well as the possibility to transfer into tertiary education. General secondary schools offer no occupational qualifications but a preparation of the students for higher education. While in the curriculum of basic vocational schools (as compared to the technikum), firm-based training is a main part, employer participation in defining and organizing training declined while the Polish economy was restructured [Baranowska et al., 2011]. Higher education, i.e. tertiary education, includes degree

programs, offered by public and non-public university-type and non-university higher education institutions, and further college programs, offered 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 today's education is now more school-based. And Polakowski [2012] confirms that the cooperation of schools and companies is limited. But Baranowska et al. [2011] show that young people with a final secondary vocational school certificate transition more quickly to employment than do general secondary school graduates, especially with vocational education and firm-based training, although that does not increase their chances to transfer to open-ended contracts.

## Conclusions and Recommendations

In this paper I examined the development of the youth unemployment rate in Germany and Poland, using 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 terms, 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 terms, so youth are more exposed to fluctuations than other age cohorts. The differences between the age cohorts, especially between 15–24 year olds and the subsequent age cohort of the 25–34 year olds, are large, but not statistically significant.
3. The Okun coefficient for young people differs between the two countries, showing that the sensitivity of unemployment rates in Poland to changes in GDP is much larger than in Germany, i.e. 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.
4. The cohort differences are not statistically significant in Germany, while in Poland they are only significant with regard to the two oldest 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]. However, according to Polakowski [2012], the Polish economy has grown relatively fast but did not create new jobs. Employment decreased in agriculture and increased in the service sector, but labor demand declined as labor productivity increased. Still, further promotion of the service sector in Poland, as well as in Germany, is recommended as this could lead to higher job growth [Przybysz et al., 2000, OECD, 2014b].

The obstacles to internal mobility in Poland should be reduced e.g. by continuing to develop transportation infrastructure, particularly quality of the rail system, and improving housing policies [OECD, 2014c].

The number of NEETs in Poland are rising, which is a cause for concern. Scarpetta et al. [2010] proposes better cooperation between public employment services and the education system to diminish the risk of disengagement among young people as well as early job-search guidance to school-leavers and a „learn/train-first” approach to keep youth connected to the labor market.

If temporary contracts in Poland are used as screening device, as described by Baranowska et al. [2011], then qualifications such as certificates do not signal the quality of certificate holders to 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 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 labor-market duality and the sensitivity of youth to business cycles. OECD [2009], too, suggests a reduction in the gap in employment protection between open-ended, fixed-term contracts and the „commission contracts” in Poland and OECD [2014b] also recommends reducing the discrepancy in employment protection between permanent and temporary contracts in Germany.

The major challenge for Germany is the labor market integration of young people who are not able to enter regular vocational training [Biavaschi et al., 2012]. It should include apprenticeships for young people without qualifications, as well as support to help apprentices whose contracts have ended, to complete their training [Scarpetta et al., 2010].

All in all, my proposals are:

- in the short-term: job-search assistance and guidance for young people by public employment services [Scarpetta et al., 2010, Berlingieri et al., 2014];
- 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 offer a second chance of qualification for every young person [Scarpetta et al., 2010].

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## Notes

- <sup>1</sup> Author's e-mail address: dunsch@europa.uni.de
- <sup>2</sup> The statistics are weighted averages of the individual EU-15 countries.
- <sup>3</sup> The GDP growth rate has been calculated as a percentage change in GDP moving from  $GDP_{t-1}$  to  $GDP_t$ :  $GDPgrowth_t = \left( \frac{GDP_t - GDP_{t-1}}{GDP_{t-1}} \right) \cdot 100$
- <sup>4</sup> Estimation results can be requested from the author.
- <sup>5</sup> Each table show empirical F-Values and the corresponding significance level for one country.

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## Appendix

### Regression Analysis, Tables and Graphics

**TABLE 1. Youth vs. adult unemployment [O'Higgins, 2012]**

Country	coefficient	R <sup>2</sup>	N
Germany	1.0070*** (0.1924)	0.5436	25
Poland	2.1856*** (0.1126)	0.9472	23
EU-15	2.1756*** (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	26.1837	0.0019
EU-15	19.1254	0.0242

Source: own calculations. 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

Source: own calculation. 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 <sup>2</sup>	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

S o u r c e : 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**

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

S o u r c e : own calculations. Notes: significance at \*\*\* 1% level, \*\* 5% level, \* 10% level.

**TABLE 6. Wald test for equality of coefficients – Poland**

	$\beta_{25-34}$	$\beta_{35-44}$	$\beta_{45-54}$	$\beta_{55-64}$
$\beta_{15-24}$	2.386	3.6506	4.6633*	6.6801*
$\beta_{25-34}$		0.113	0.3416	1.096
$\beta_{35-44}$			0.0616	0.5055
$\beta_{45-54}$				0.2141

S o u r c e : own calculations. Notes: significance at \*\*\* 1% level, \*\* 5% level, \* 10% level.

**TABLE 7. Wald test for equality of coefficients – EU-15**

	$\beta_{25-34}$	$\beta_{35-44}$	$\beta_{45-54}$	$\beta_{55-64}$
$\beta_{15-24}$	9.1537**	22.563***	28.482***	30.737***
$\beta_{25-34}$		3.023	5.3589*	6.3322*
$\beta_{35-44}$			0.3318	0.6063
$\beta_{45-54}$				0.0416

S o u r c e : own calculations. 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	16.39	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

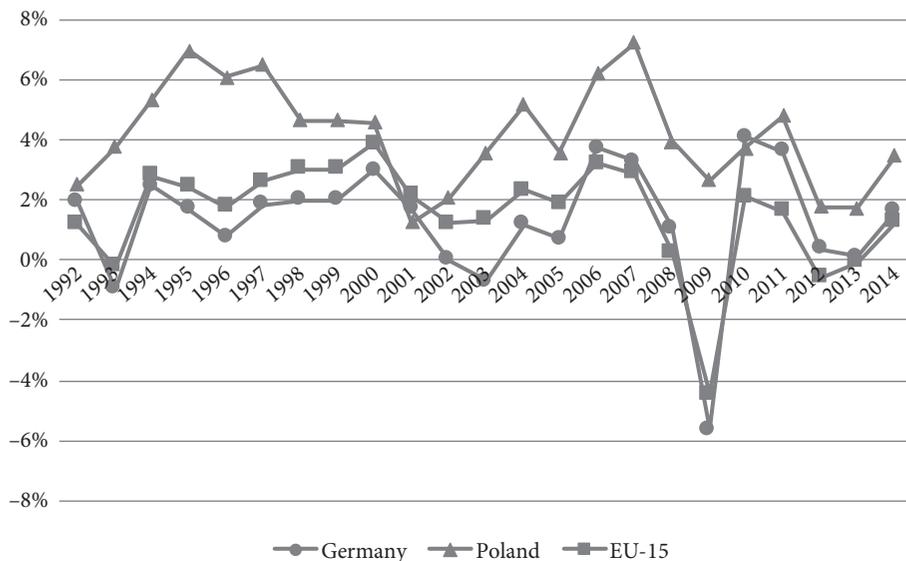
Source: own elaboration with data from OECD [2015b]. Industry is excluding Construction.

**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

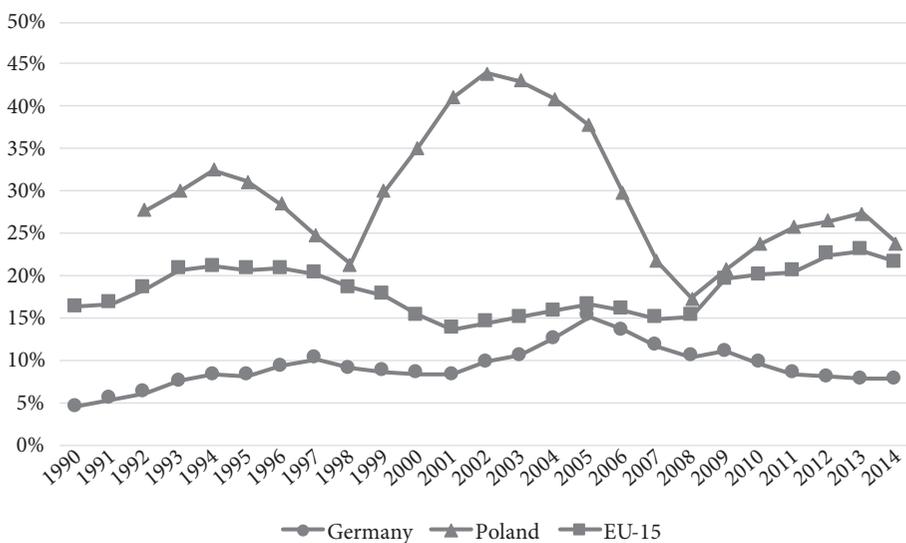
Source: own elaboration with data from OECD [2015a].

FIGURE 1. GDP growth



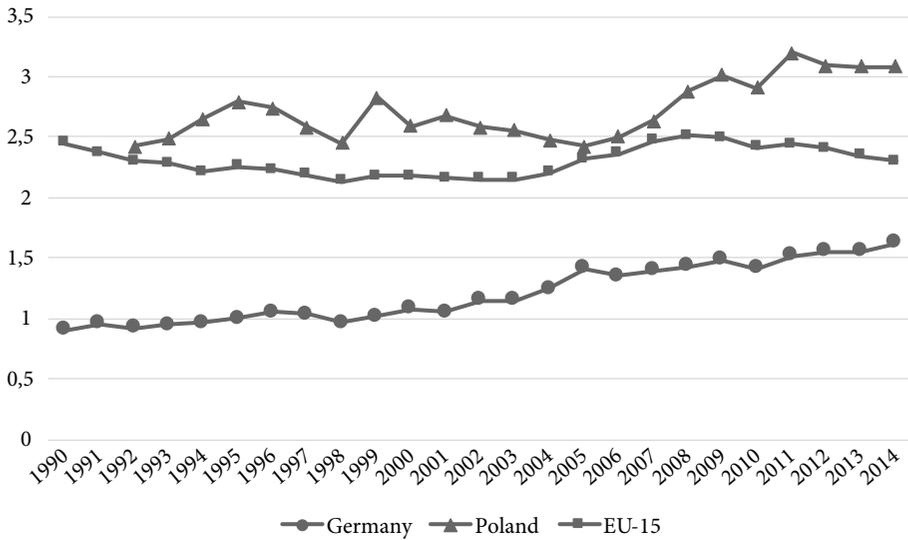
Source: own elaboration with data from EC [2015].

FIGURE 2. Youth unemployment rate (age cohort 15–24)



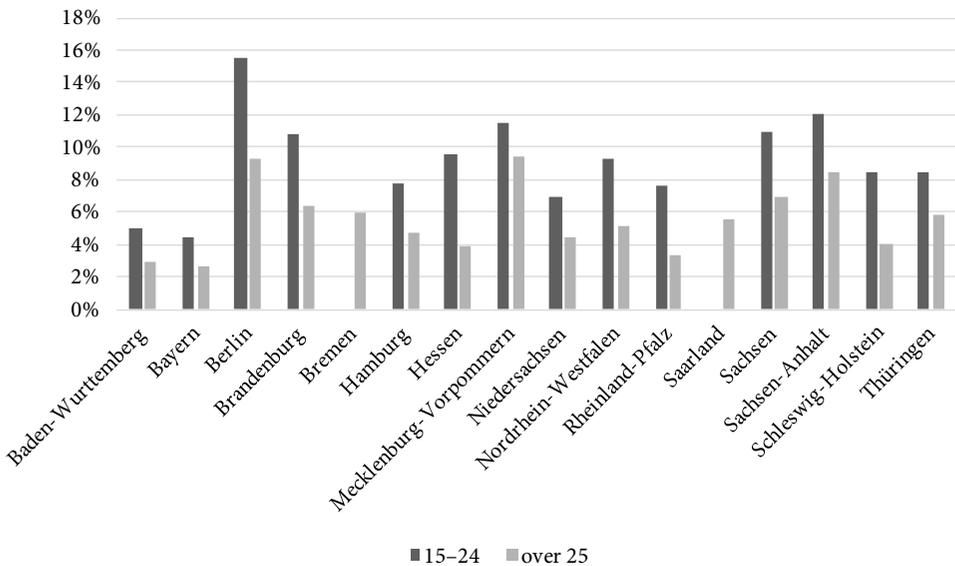
Source: own elaboration with data from OECD [2015b].

**FIGURE 3. Youth-adult unemployment rate ratio**

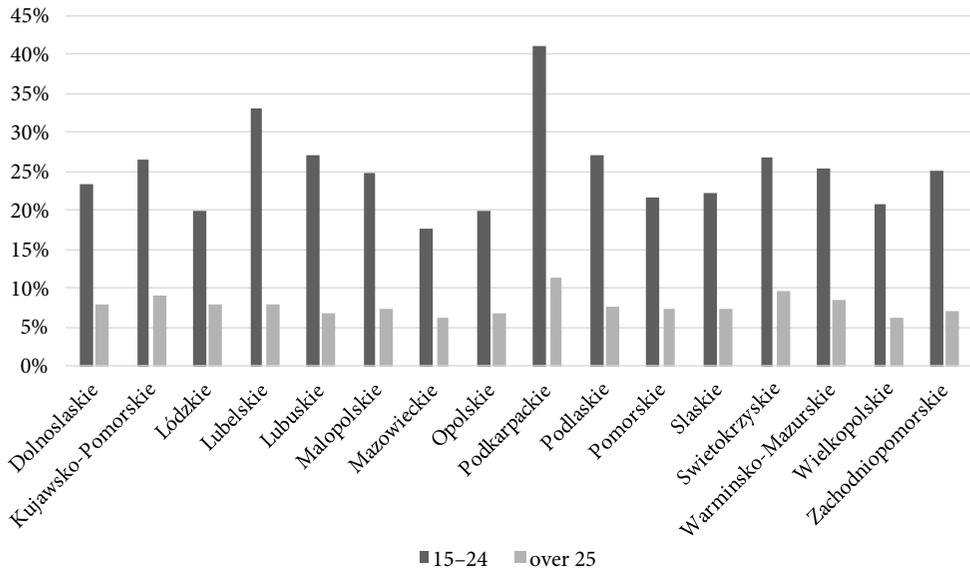


Source: own elaboration with data from OECD [2015b].

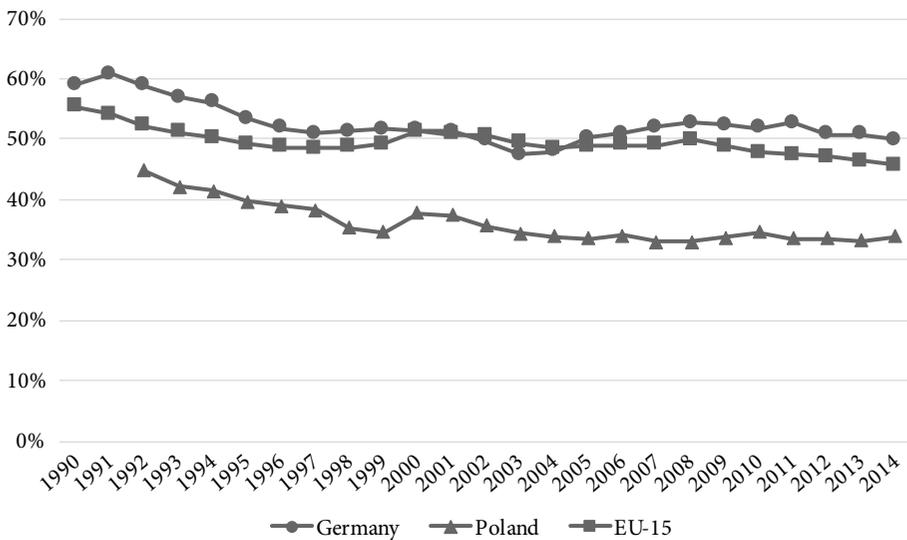
**FIGURE 4. Incidence of regional unemployment in Germany in 2014**



Source: own elaboration with data from Eurostat [2015].

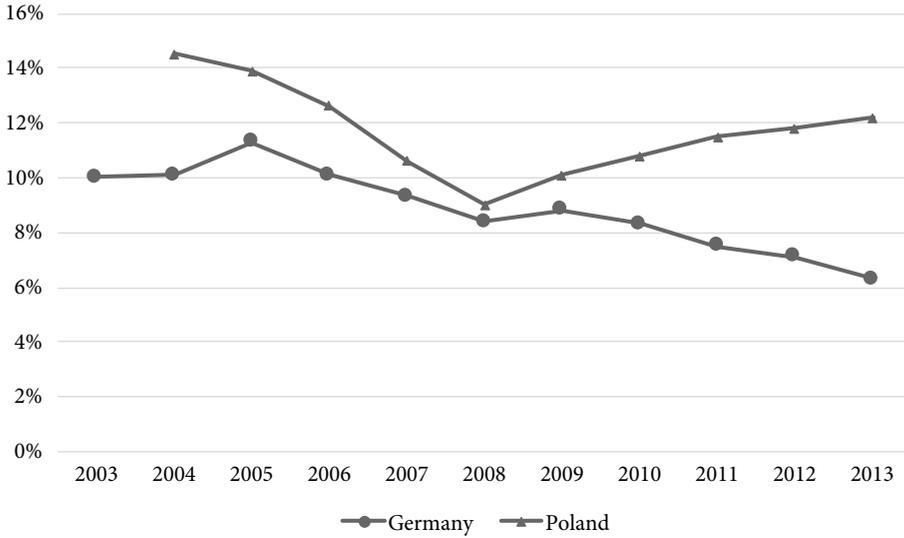
**FIGURE 5. Incidence of regional unemployment in Poland in 2014**

Source: own elaboration with data from Eurostat [2015].

**FIGURE 6. Labor market participation rate youth (age cohort 15–24)**

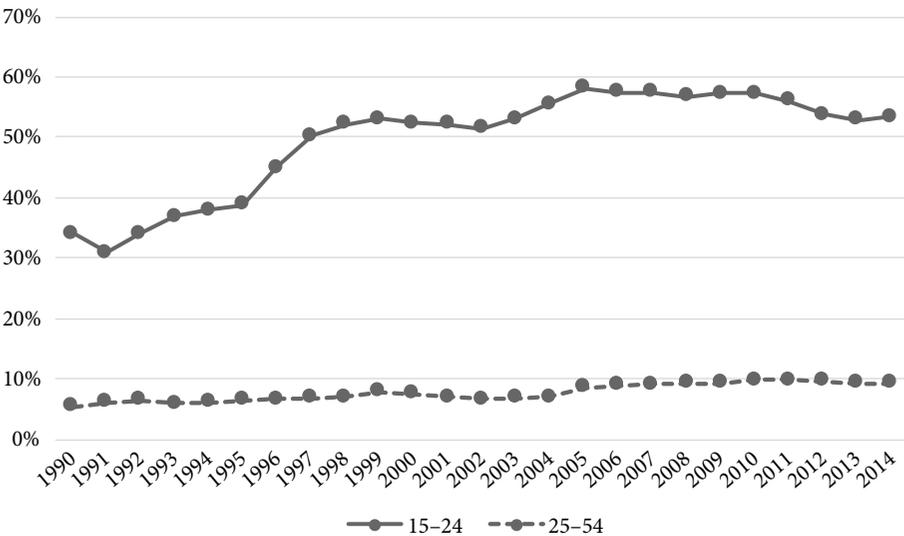
Source: own elaboration with data from OECD [2015b].

**FIGURE 7. Youth (age cohort 15–24) not in employment and not in education or training (NEET)**

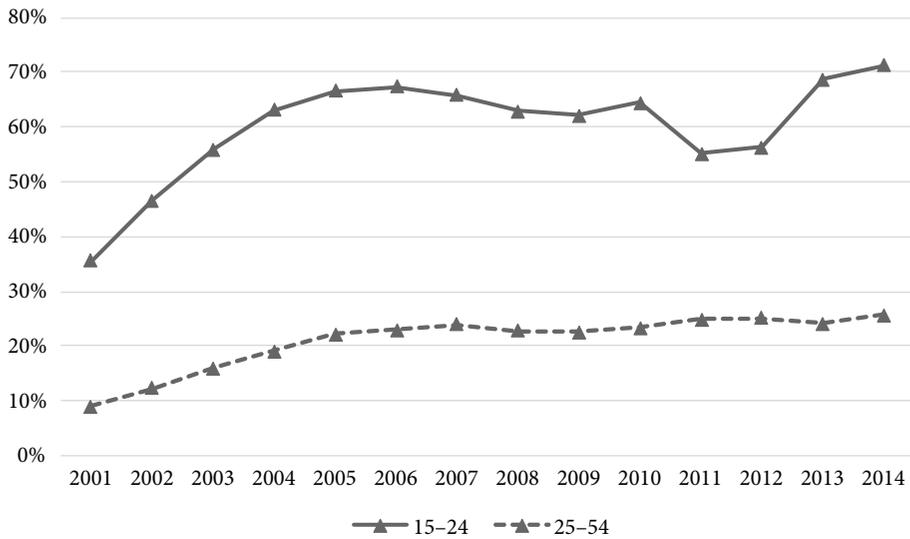


Source: own elaboration with data from ILO [2014].

**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].