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Sophie Dunsch

European University Viadrina Frankfurt (Oder)
Department of Business Administration and Economics
Discussion Paper No. 386
August 2016
ISSN 1860 0921

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Sophie Dunsch*

Abstract

Unemployment rates, especially among youth, have increased in various countries of Europe over the last years. As labor force participation rate is one key influence on unemployment, I estimate country specific coefficients for the responsiveness of the labor force participation rates to the business cycle for different age cohorts. The results show that an influence of the business cycle on movements of the participation rates are only statistically significant for the youngest age cohort of the 15-to-24-years old in Germany, suggesting a discouraged worker effect.

Keywords: Youth Unemployment, Youth Labor Force Participation, Poland, Germany, Business Fluctuations

JEL classification: J13, J21, C23, E32

*Faculty of Business and Economics, European University Viadrina, Chair of Macroeconomics, Große Scharrnstrasse 59, 15230 Frankfurt (Oder), Germany, E-mail: dunsch@europa-uni.de

1 Introduction

Unemployment rates, especially among youth, have increased in various countries of Europe over the last years. As labor force participation seems to be sensitive to cyclical conditions in the labor market, this gave rise to the hypothesis of a causal link running from unemployment to participation (Elmeskov and Pichelmann, 1993). And according to Dietrich (2012), a 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. Therefore, I investigate in this paper labor force and unemployment rate developments especially for youth in Germany and Poland, which were selected because their cases in the recession are exceptional. 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 (EU) before the enlargement in May 2004.

According to Bell and Blanchflower (2011), participation is beside migration a key influence on unemployment. They found that participation rates for youth were negatively correlated with unemployment rates during the Great Recession. Corresponding to this finding, my hypothesis is that this so-called discouraged worker effect dominates for young people as they are leaving the labor market, e.g. for education. The results show that an influence of the business cycle on movements of the participation rates are only statistically significant for the youngest age cohort of the 15-to-24-years old in Germany and the aggregate EU-15 countries, suggesting a discouraged worker effect.

The structure of the paper is as follows: the next section provides a brief literature overview on the main facts of labor force participation rates, especially for youth. Afterwards I describe the data set, the regression analysis and discuss the empirical results. Then the final Section 5 concludes the paper.

2 Literature review

According to Borjas (2013), labor supply will be adjusted according to the business cycle and there are two possible ways of adjustment in a recession:

- added worker effect which refers to the situation that secondary workers, who are currently out of the labor market, are encouraged by the economic

conditions to enter the labor market, because the main breadwinner, such as husband or father, becomes unemployed or faces a wage cut;

- discouraged worker effect which defines the situation that the economic condition let the workers give up their search and let them drop out of the labor market.

The business cycle generates both effects, but for any policy it is important which effect dominates (Borjas, 2013).

As indicated by Aaronson et al. (2006b), labor force attachment among young persons tends to be more sensitive to the business cycle than that among other demographic groups. Typically, they have little work experience or career-specific education and the human capital theory suggests that individuals, who have low specialization in market and nonmarket activities, should be the most sensitive to changes in the relative returns to these activities (Aaronson et al., 2006b). Also Benito and Bunn (2011) point out that the participation rates of the young tend to vary most through a recession while examining the labor force participation in the United Kingdom.

Economic theory suggests that a reduction in financial wealth raises labor supply (and participation rates). Younger workers are likely to be less affected since they have generally accumulated less wealth (Benito and Bunn, 2011). But Pastore (2005) notes that young people (in CEE) have to face a trade-off. They can either continue to invest in their own education and hence reduce the household's budget, or they can enter immediately the labor market, therefore they contribute to the household income, but reduce their own chance to find future profitable employment (Pastore, 2005).

Additionally, for youth an increased value of education for their future earnings might cause them to increase their school enrollments and likely also the intensity with which they pursue their studies when being at school or university (Aaronson et al., 2006a). During an economic downturn, the reduction in the opportunity cost of study makes investment in human capital more attractive (Bell and Blanchflower, 2011). This could result in cyclical enrollment changes, since a booming labor market can entice pupils or students away from school and a recession send them back to acquire additional skills (Bradbury, 2005). With this in mind, I test the hypothesis that the business cycle is affecting especially the labor force participation of youth, showing a discouraged worker effect.

3 Data set and descriptive statistics

Annual unemployment and labor force participation rates for various age cohorts are obtained from the Organisation for Economic Co-operation and Development (OECD, 2015). The data set starts in 1992 (the first available entries for all countries and variables) 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.

The overall labor force participation and unemployment rate, i.e. the rates for the age cohort of the 15-to-64-years old, are reported for Germany in Figure 1, for Poland in Figure 3 and for the aggregate EU-15 countries in Figure 5¹. The figures illustrate the following: The overall participation rate is slightly decreasing in Poland until 2006/07 and then increasing, while in Germany and the aggregate EU-15 countries the rates are increasing within the whole time period. However, the developments of the unemployment rate differ over the period. In Germany, the rate increases until 2005 and then decreases, albeit with a slight peak in 2009. In Poland, it shows a steep increase after 1998, followed by a decrease until 2008 and then an increase again, but slower as before 1998. In the aggregate EU-15 countries the rate is decreasing with slight movements until the crisis in 2008, then showing an increase.

As can be seen in Figure 2 for Germany, Figure 4 for Poland and Figure 6 for the aggregate EU-15 countries, the labor force participation rate of youth (age cohort 15-24) in Poland and Germany is slightly decreasing, but there is no strong effect over the past years. The same development is shown for the EU-15 countries as aggregate. In comparison to the overall participation rate, the rates for youth are lower, e.g. for Germany less than 60% instead of 70% and more for the overall participation rate of the 15-to-64-years old. In contrast, the unemployment rates are higher for youth in all countries than the overall unemployment rates. Between the countries the youth unemployment rates vary: Germany has very low rates and those rates decline. Poland had declining rates before the crisis, but after 2009 the rates rose again despite the fact that it had always positive GDP growth, even during the crisis. The aggregate EU-15 countries had the expected increase in unemployment rates after the financial crisis.

Overall, there is not a clear business-cycle behaviour of the labor participation rate visible, but I further examine the relationship between labor force participation and unemployment rate in detail in the next section.

¹The statistics for the EU-15 countries as aggregate are weighted averages of the individual EU-15 countries.

4 Regression analysis

4.1 Participation rate on unemployment rate for youth

I analyze the relationship between labor force participation and unemployment rate with a simple regression of changes in participation rates for those aged 15-24 on changes in unemployment rates for the same age group according to Bell and Blanchflower (2011) as well as Elmeskov and Pichelmann (1993):

$$\Delta p_{i,t} = \alpha_i + \beta_i \Delta u_{i,t} + \epsilon_{i,t}, \quad (1)$$

where $\Delta p_{i,t}$ is the change in the labor force participation rate for country i from period $t - 1$ to t , $\Delta u_{i,t}$ represents the corresponding change in the unemployment rate and $\epsilon_{i,t}$ is an assumed white noise error term.

The results are presented in Table 1, where negative values suggest a discouraged worker effect and positive values an added worker effect (Bell and Blanchflower, 2011). Here, Germany and the aggregate EU-15 countries show the expected negative value which is not significant for Germany, but for the EU-15 countries at the 10% level. However, Poland has a positive value suggesting an added worker effect for youth, but this is not significant. However, it points toward the result found by Pastore (2005) while examining Polish youth and their decision regarding education and labor market participation. He found that in voivodships with high unemployment young people are rather searching for a job then investing in further education (Pastore, 2005).

Furthermore, in the next step I investigate the reaction of the youth labor force participation rate in comparison to the participation rates of other age cohorts.

4.2 Participation rate trends and state of business cycle

According to Pencavel (1986), year-to-year changes in the labor force participation reflect the state of the business cycle as well as underlying trends. These effects can be described based on the following model for each country:

$$\Delta p_{j,t} = \alpha_j + \beta_j \Delta u_t^r + \epsilon_{j,t}, \quad (2)$$

where $p_{j,t}$ is the labor force participation rate (expressed as a percentage) for age cohort j in time t with $\Delta p_{j,t} = p_{j,t} - p_{j,t-1}$, u_t^r represents the unemployment rate (expressed as a percentage) for the age group of males aged 35-44 years with $\Delta u_t^r = u_t^r - u_{t-1}^r$ and $\epsilon_{j,t}$ is an error term. u_t^r is used as an indicator

of the stage of the business cycle and called „r“ for „reference group“. The responsiveness of the participation rate to the business cycle is measured by β , while α reflects a linear time trend. Negative values of β suggest that the participation rate falls in a recession, i.e. the discouraged worker effect (Pencavel, 1986). This regression is done for five different age cohorts. Additionally the regression is done with the age cohort of the 15-to-64-years old and as a panel using the five age cohorts to show an overall trend. As autocorrelation and/or heteroscedasticity could eventuate in inefficient estimates with biased standard errors and therefore misleading results, I fitted the model with Newey-West standard errors. The results are shown in Tables 2 to 4 for Germany, Poland and the aggregate EU-15 countries, respectively.

As noted by Aaronson et al. (2014), using the unemployment rate as indicator of the business cycle might include potential endogeneity, as it might be endogenous to changes in the participation rate. But using instrumental variables such as (detrended) employment could include dependence on trend participation rate movements, too. Still, the results here need to be interpreted with caution.

According to the estimation results, the overall trend (as shown for the age cohort 15-to-64-years old as well as the panel data) displays an upward trend over time for Germany and the aggregate EU-15 countries, but is not statistically significant for the panel data result for Germany. The responsiveness of the labor force participation rate to the business cycle is negative, suggesting a discouraged worker effect, but this is again not statistically significant even at the 10% level for the panel data.

Overall, Poland shows only statistically significant positive coefficients for the responsiveness of the participation rate to the business cycle for the age cohort of the 25-to-34-years and 35-to-44-years old, suggesting an added worker effect for those age cohorts.

For the different age cohorts, statistically significant trends over time can be found for the age cohort of the 35-to-44-years old and subsequent age cohorts in Germany, while in the aggregate EU-15 countries, this is the case for all age cohorts except the youngest one. For the business cycle responsiveness the values here are only statistically significant for the youngest age cohort of the 15-to-24-years old, showing negative values and therefore suggesting a discouraged worker effect for this age cohort.

5 Conclusions

In this paper I examined the development of the labor participation rates in Germany and Poland. My hypothesis, that the so-called discouraged worker effect dominates for young people as they are leaving the labor market, is found to be statistically significant for the youngest age cohort of the 15-to-24-years old for Germany and the aggregate EU-15 countries. Poland shows only statistically significant positive coefficients for the responsiveness of the participation rate to the business cycle for the age cohort of the 25-to-34-years and 35-to-44-years old, rather suggesting an added worker effect for those age cohorts. However, the analysis reveals that, with those few exceptions, the labor force participation rate does not show a clear business-cycle pattern, implying that other factors influence the rate which are not examined in this paper.

Acknowledgement

The research underlying this paper was supported by the Deutsch-Polnische Wissenschaftsstiftung.

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Appendix

Table 1: Regression results: Participation rate on unemployment rate for youth (age cohort 15-24) (Bell and Blanchflower, 2011 and Elmeskov and Pichelmann, 1993).

Country	Coefficient	R^2	N
Germany	-0.2049 (0.2176)	0.042	22
Poland	0.0479 (0.0660)	0.0256	22
EU-15	-0.2735* (0.1029)	0.261	22

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

Table 2: Regression results: Germany.

Age cohorts	$\hat{\alpha}$ (Newey-West standard errors)	$\hat{\beta}$ (Newey-West standard errors)	R^2	N	BP (p-value)	DW (p-value)
15 – 24	-0.4075 (0.2414)	-0.8813*** (0.1281)	0.310	22	0.6947 (0.4046)	1.5299 (0.1081)
25 – 34	0.1319 (0.0925)	-0.3116 (0.1905)	0.089	22	1.7899 (0.1809)	3.0996 (0.9967)
35 – 44	0.1454* (0.0657)	0.0278 (0.0441)	0.006	22	0.2915 (0.5893)	1.733 (0.2281)
45 – 54	0.3099*** (0.0760)	0.1289 (0.1282)	0.040	22	2.7931 (0.0947)	2.3443 (0.7592)
55 – 64	1.3493** (0.4536)	-0.0939 (0.2298)	0.002	22	0.0698 (0.7916)	0.7967 (0.0005)
15 – 64	0.3105* (0.1217)	-0.1800** (0.0607)	0.089	22	0.1671 (0.6827)	1.0697 (0.0072)
overall	0.3058 (0.1612)	-0.2260 (0.1373)	0.024	110	2.0348 (0.1537)	0.9956 (0.0000)

Source: Own elaboration with data from OECD (2015). Notes: N - number of observations; significance at *** 1% level, ** 5% level, * 10% level. Nullhypothesis for BP: Homoscedasticity. Nullhypothesis for DW: No autocorrelation.

Table 3: Regression results: Poland.

Age cohorts	$\hat{\alpha}$ (Newey-West standard errors)	$\hat{\beta}$ (Newey-West standard errors)	R^2	N	BP (p-value)	DW (p-value)
15 – 24	–0.4574 (0.2618)	0.1902 (0.1483)	0.053	22	1.4186 (0.2336)	1.6488 (0.162)
25 – 34	0.0711 (0.0557)	0.1458*** (0.0371)	0.219	22	3.7095 (0.0541)	2.3385 (0.7449)
35 – 44	–0.0526 (0.0881)	0.1126*** (0.0257)	0.163	22	5.0241 (0.025)	1.6227 (0.147)
45 – 54	0.1564 (0.2654)	–0.0762 (0.1272)	0.016	22	0.1342 (0.7141)	1.4939 (0.0862)
55 – 64	0.3207 (0.5228)	–0.0818 (0.1881)	0.006	22	0.8987 (0.3431)	1.4114 (0.0583)
15 – 64	–0.0541 (0.2151)	0.0746 (0.0561)	0.034	22	0.9882 (0.3202)	0.81 (0.0006)
overall	0.0076 (0.1426)	0.0581 (0.0568)	0.007	110	1.4847 (0.223)	1.3924 (0.0006)

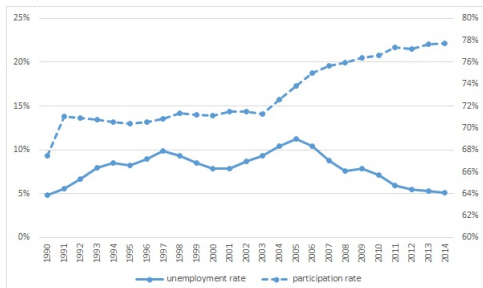
Source: Own elaboration with data from OECD (2015). Notes: N - number of observations; significance at *** 1% level, ** 5% level, * 10% level. Nullhypothesis for BP: Homoscedasticity. Nullhypothesis for DW: No autocorrelation.

Table 4: Regression results: EU-15.

Age cohorts	$\hat{\alpha}$ (Newey-West standard errors)	$\hat{\beta}$ (Newey-West standard errors)	R^2	N	BP (p-value)	DW (p-value)
15 – 24	–0.2107 (0.1464)	–0.5978* (0.2117)	0.268	22	2.2015 (0.1379)	1.9005 (0.3754)
25 – 34	0.1325* (0.0513)	–0.0788 (0.1015)	0.024	22	0.0096 (0.9218)	1.7119 (0.2216)
35 – 44	0.2100*** (0.0429)	–0.0218 (0.0567)	0.004	22	0.1376 (0.7106)	1.9828 (0.4509)
45 – 54	0.4077*** (0.0907)	0.0277 (0.1039)	0.004	22	0.1139 (0.7358)	0.893 (0.0016)
55 – 64	0.8481*** (0.2189)	0.0717 (0.1995)	0.002	22	0.1765 (0.6744)	2.1222 (0.5814)
15 – 64	0.2903*** (0.0488)	–0.1075* (0.0462)	0.084	22	0.4028 (0.5257)	2.2025 (0.6537)
overall	0.2775** (0.0929)	–0.1198 (0.0999)	0.012	110	0.3428 (0.5582)	1.3692 (0.0004)

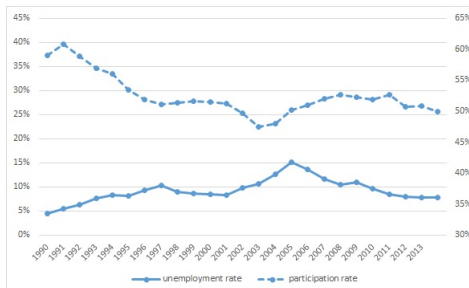
Source: Own elaboration with data from OECD (2015). Notes: N - number of observations; significance at *** 1% level, ** 5% level, * 10% level. Nullhypothesis for BP: Homoscedasticity. Nullhypothesis for DW: No autocorrelation.

Figure 1: Overall participation rate and unemployment rate (age cohort 15-64) in Germany.



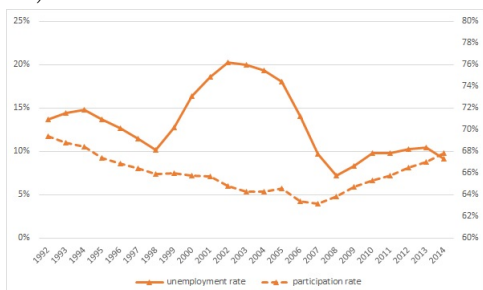
Source: Own elaboration with data from OECD (2015). Unemployment rate on left axis and participation rate on right axis.

Figure 2: Youth participation rate and unemployment rate (age cohort 15-24) in Germany.



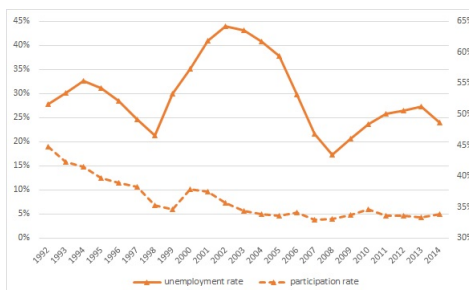
Source: Own elaboration with data from OECD (2015). Unemployment rate on left axis and participation rate on right axis.

Figure 3: Overall participation rate and unemployment rate (age cohort 15-64) in Poland.



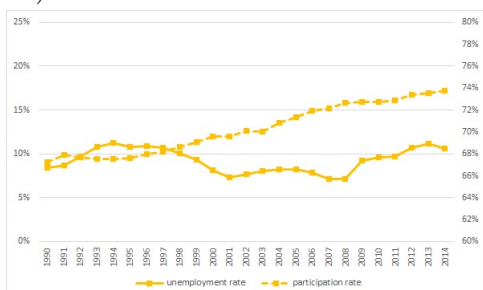
Source: Own elaboration with data from OECD (2015). Unemployment rate on left axis and participation rate on right axis.

Figure 4: Youth participation rate and unemployment rate (age cohort 15-24) in Poland.



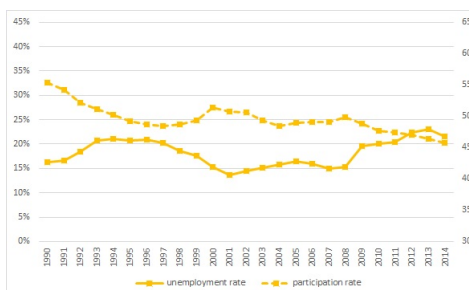
Source: Own elaboration with data from OECD (2015). Unemployment rate on left axis and participation rate on right axis.

Figure 5: Overall participation rate and unemployment rate (age cohort 15-64) in EU-15.



Source: Own elaboration with data from OECD (2015). Unemployment rate on left axis and participation rate on right axis.

Figure 6: Youth participation rate and unemployment rate (age cohort 15-24) in EU-15.



Source: Own elaboration with data from OECD (2015). Unemployment rate on left axis and participation rate on right axis.