Demographic change and the labor market: Do smaller entry cohorts reduce unemployment?

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Extended Abstract

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In this paper we analyze the consequences of smaller labor market entry cohorts on unemployment in Western Germany. Given the sharp decline in birth rates since the beginning of the 1970s the baby boom generation was followed by a baby bust generation. In addition, Germany will also experience significant demographic changes in the decades ahead so that the question whether the shrinkage and the aging of the working population will have any effects on the labor market is of high interest.[2] In order to study the effect of cohort size on unemployment we use regional data from the Federal Statistical Office of Germany and the IAB employment sample for the years 1978 to 2004.

The relationship between demographic changes in the workforce and unemployment has been studied for the United States whereas this issue has not been considered in Germany so far. In general, there are two approaches to analyze the effect of an aging and shrinking workforce on unemployment. First, there is a direct effect which is simply the result of changes in the age composition of the workforce since the weighted age-specific unemployment rates are used to calculate the overall unemployment rate. In particular, since the aggregate unemployment rate is the product of age-sex-specific weights and age-sex-specific unemployment rates changes in the overall unemployment rate may stem from two sources. Cohort sizes may increase or decrease, i.e. the age-sex-specific weights may change, and/or age-sex-specific unemployment rates may vary across years. Shimer (1998) uses age-sex-specific fractions of the workforce as weights for the calculation of the aggregated

unemployment rates in the United States. According to his calculations the unemployment rate has risen by 0.74 percentage points in the period 1954 to 1978 and has decreased by 0.73 basis points from 1978 to 1997 due to the cohort structure. As an explanation for this development Shimer (1998) suggests that the aging of the baby boomer explains to a large extent the decline of the unemployment rate since 1979. Since this direct effect of aging on unemployment has not been calculated for Germany so far we will provide in a first step how compositional changes of the workforce has affected the unemployment rate in Germany during the years 1978 to 2004.

In addition to the direct effect we have discussed so far there may be a second (indirect) effect on unemployment. According to the cohort crowding hypothesis workers perform worse on the labor market if they belong to bigger cohorts. Easterlin (1961) was among the first to note that the relative size of the birth cohort is negatively correlated to labor market opportunities. Korenman and Neumark (2000) provide a good overview on this literature and also perform a cross-national analysis on cohort crowding and youth labor markets. They use OECD data for fifteen countries for the years 1970 to 1994 and conduct their investigation on a national level.[3] Overall, they find evidence of cohort crowding on youth unemployment but only a very small effect on youth employment.

Whereas the argument of cohort crowding on unemployment seems straightforward at first glance this hypothesis has been challenged by recent empirical works. Shimer (2001) uses state-level data for the United States from 1978 to 1996 and shows that the labor market entry of large cohorts entails positive effects not only for the same birth cohorts but also for prime aged workers, i.e. a decrease in unemployment and an increase in employment, respectively. As an explanation for this empirical finding Shimer (2001) provides a theoretical model showing that companies have an incentive to create more jobs in regions with a high birth rate so that overall unemployment declines.[4] Foote (2007) augments the investigation conducted by Shimer (2001) by controlling for spatial auto-correlations in the state-level data and by extending the sample period until the year 2005. In contrast to Shimer (2001) but in line with the cohort crowding literature, Foote (2007) confirms that the youth share effect (cohort crowding) on unemployment is positive.

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[3] The following countries are considered in this investigation: Australia, Canada, Japan, United States and 11 European countries.
[4] Nordström-Skans (2005) performs a similar analysis for the Swedish labor market. He also finds that young workers benefit from belonging to a large cohort. However, in contrast to the study for the United States Nordström-Skans (2005) does not find any positive effects for older workers in Sweden.

Since the large baby boomer generation entered the labor market in the past previous studies tested the cohort crowding hypothesis. However, in our paper we investigate whether cohort shrinking has any impact on unemployment. This approach is justified by the sharp decline in birth rates in Germany since the 1970s. The baby boom generation was followed by significantly smaller cohort sizes entering the labor market since the beginning of the 1990s. Transferring the ambiguous results from the cohort crowding literature to cohort shrinking implies on the one hand that (youth) unemployment could fall due to less competition on the labor market. On the other hand, the model of Shimer (2001) suggests that companies may create fewer jobs in regions with a low birth rate so that overall unemployment increases.

In order to analyze the effect of cohort shrinking on unemployment in Germany we estimate whether there is a statistically significant relationship between the share of young inhabitants (aged 20 to 30 years) in a particular region and the unemployment rate in the same region. The dependent variable *ur* is the logged unemployment rate in district *i* in year *t*. The coefficient *α* captures regional and the coefficient *β* time effects. The random disturbance term is represented by *ε*. The coefficient of interest *γ* indicates the sign and the size of the youth share effect on unemployment.

$$\log ur_{it} = \alpha_i + \beta_t + \gamma \log\left(\frac{population(20-30\,years)}{population(20-65\,years)}\right)_{it} + \varepsilon_{it} \qquad (1)$$

However, the youth share in specification (1) may be endogenous if individuals are moving across regions due to favourable labor market conditions. In order to address the endogeneity of the youth share we instrument for the cohort size by lagged birth rates, i.e. we use the number of births from the years in which the current cohorts were born. Since we consider the population aged 20 to 30 years as the youth we lag the population by 20 years and arrive at equation (2):

$$\log ur_{it} = \alpha_i + \beta_t + \gamma \log\left(\frac{population(20-30\,years)-20}{population(20-65\,years)-20}\right)_{it} + \varepsilon_{it} \qquad (2)$$

References

Easterlin, R.A. (1961): The American Baby Boom in historical perspective, American Economnic Review 51, 869-911.

Foote, C. (2007): Space and Time in Macroeconomic Panel Data: Young Workers and State-Level Unemployment Revisited, Federal Reserve Bank of Boston, Working Paper 07-10.

Korenman, S. and D. Neumark (2000): Cohort Crowding and Youth Labor Markets: A Cross-National Analysis, NBER Chapters in "Youth Employment and Joblessness in Advanced Countries", 57-105, University of Chicago Press.

Nordström-Skans, O. (2005). Age Effects in Swedish Local Labor Markets, Economics Letters 86, 419-426.

Shimer, R. (1999): Why is the U.S. Unemployment Rate so much lower?, NBER Macroeconomics Annual 1998, 13, 11-74.

Shimer, R. (2001). The Impact of Young Workers on Aggregate Labor Markets, The Quarterly Journal of Economics 116, 969-1007.