

Skills vs. Productivity: How Important Are Firms for Understanding Trends in Wage Inequality?

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A large literature has documented striking increases in wage inequality over the past three decades in many advanced economies, including the U.S., the U.K., and Germany (e.g., Autor and Katz, 1999; Dustmann et al, 2009; Autor and Acemoglu, 2010). Using standard neoclassical economic models, analysts have attempted to partition these observed trends in the wage structure into components due to changes in the supply and demand for different types of labor and changes in labor market institutions (e.g., Juhn, Murphy, and Pierce, 1991; Bound and Johnson, 1992; Katz and Murphy, 1992). A widespread consensus is that the main source of rising wage inequality in many countries is an increase in the relative demand for more highly-skilled workers, though several studies have suggested that the decline of unionization has also contributed to the rise, particularly in the U.S. (e.g., Dinardo, Fortin and Lemieux, 1996) and Germany (Dustmann et al., 2009). Some recent studies have also tried to identify multiple dimensions of skill and look for more subtle trends in employment and wages across different occupational groups driven by technology induced changes in the returns to these skills (e.g., Autor, Levy, and Murnane 2003; Autor and Acemoglu, 2011).

A critical feature of the theoretical framework underlying this literature is the irrelevance of firms. In the standard competitive labor market models that have been used in the literature so far, a worker with a given set of skills receives the same wage at all firms. Contrary to this assumption, a growing body of theoretical and empirical work has provided evidence that firms may play an important role in wage setting. In their seminal study of the French labor market, for example, Abowd, Kramarz, and Margolis (1999) found that at least 20% of the variation in individual wages is attributed to firm-specific effects.¹ Using the same data, Postel-Vinay and Robin (2002) conclude that a relatively large share of the variation in wages – particularly for lower-skilled workers – is due to the presence of search frictions that lead to persistent wage dispersion across firms.

To our knowledge, economists have not yet investigated the possibility that trends in wage inequality might be due in part to shifts over time in the size and distribution of the firm-specific components of wages. In this research project we propose to use detailed administrative earnings data from Germany to study the changing size and distribution of firm-specific wage components in the German labor market, and measure the impact of these changes on net changes in wage inequality.

We have recently concluded a data use contract with the Institut für Arbeitsmarkt und Berufsforschung (IAB) in Nuremberg, Germany that will allow us to access 100% files of the Social Security system through the IAB's newly-developed remote access center in Ann Arbor Michigan. Joerg Heining is heading up this center and has considerable

¹ Abowd, Kramarz and Margolis (1999) use an approximating algorithm for estimating worker and firm effects that appears to under-estimate the importance of firm effects. As a result, their estimates arguably understate the importance of firm-specific components of wage variation.

experience in using the IAB data, as well as close contacts with IAB staff and programmers in Germany.

Our plan is to use the IAB administrative records to document the changing importance of firm-specific factors in overall wage inequality in Germany. We will begin by conducting a simple statistical decomposition of the variance of wages in each year into within-firm and between-firm components. The next step will be to then decompose the change in cross-sectional variance between years into components due to changes in the within and between firm variance. These components will themselves be decomposed into components due to the reallocation of workers between firms and changes in the mean and variance of wages at each firm.

This will allow us to examine, in a transparent way, whether the increase in German inequality is due to: a) increases in the average within firm variance of wages, b) the reallocation of workers from low variance to high variance firms, c) high wage firms experiencing higher wage growth than low wage firms, d) the reallocation of workers from firms paying average wages to high and low paying firms, or e) none of the above.

We will then proceed to estimate an economic model where workers and firms bargain over wages. The estimation procedure will allow us to recover the distribution of unobserved worker and firm contributions to wages. A variety of methodological problems, discussed in Abowd, Kramarz, and Woodcock (2006) will confront this part of our analysis. In particular, we will need to confront the possibility of nonrandom mobility of workers between firms, which presents an endogeneity problem of very high dimension. We have developed new econometric techniques that allow us to deal with this problem given some theoretically motivated assumptions on the nature of the mobility process. A second challenge is the possibility that worker and firm effects may not be additively separable. A number of tests exist for unmodeled interactions in variance component models. We will extend those tests to the present case where endogeneity is present. If we find that linear models provide a poor fit, we will experiment with a series of nonlinear models in an attempt to characterize the wage setting process.

Our ultimate goal will be to provide a decomposition of trends in the variance of German wages into components due to trends in the return to unobserved worker characteristics and changes in the productivity of different sorts of firms. With these estimates in hand we can then explore the factors which might have driven any firm specific productivity changes, including foreign direct investment, changes in interest rates, declines in unionization, and trade shocks.