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Coworker networks in the labour market☆

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ABSTRACT

This paper studies the effect of coworker-based networks on individual labour market outcomes. I analyse how the provision of labour market relevant information by former coworkers affects the employment probabilities and, if hired, the wages of male workers who have previously become unemployed as the result of an establishment closure. To identify the causal effect of an individual worker's network on labour market outcomes, I exploit exogenous variation in the strength of these networks that is due to the occurrence of mass-layoffs in the establishments of former coworkers. The empirical analysis is based on administrative data that comprise the universe of workers employed in Germany between 1980 and 2001. The results suggest a strong positive effect of a higher employment rate in a worker's network of former coworkers on his re-employment probability after displacement: a 10 percentage point increase in the prevailing employment rate in the network increases the re-employment probability by 7.5 percentage points. In contrast, there is no evidence of a statistically significant effect on wages.

1. Introduction

In many economic situations, individuals do not act autonomously but as members of social networks. This observation has encouraged substantial theoretical and empirical research on such networks and their role in society.[1] In the labour market, social networks are likely to play an important role, primarily by facilitating the exchange of information about potential job opportunities and by reducing uncertainty about workers' and firms' characteristics. In this context, one of the key questions of interest is whether and to what extent the social network a worker is embedded in affects his or her labour market outcomes.

Using data describing the entire work histories of the universe of workers in four large metropolitan areas in Germany, I define a given worker's network as the group of all coworkers with whom he worked together in the same establishment in the past. The focus on former coworkers is motivated by the observation that in many cases in which

a worker finds a job through a social contact, this contact is work-related. For example, in Granovetter's famous study of the job search behaviour of professional, technical and managerial workers in Boston (Granovetter, 1995), 69 percent out of the 56 percent of workers who found their job through a personal contact indicated that the contact was known from a work situation (compared to only 31 percent who indicated that the contact was a relative or friend). In addition, coworkers are likely to possess good knowledge of the specific abilities of a given worker and are more aware of potential job openings than, for example, neighbours, friends or family members who, although wanting to help, often lack the attachment to the relevant labour market segment (see Antoninis, 2006). Both these properties should make coworkers particularly valuable social contacts when looking for a new job. Finally, and in contrast to most other network definitions, coworkers in the same establishment typically know each other. This is not trivial since in many studies of network effects actual personal contact between individual network members, a prerequisite for a

network-based exchange of information, is not self-evident.

In the empirical analysis of this paper, I examine in detail the role coworker-based networks play for individual labour market outcomes, focussing on a sample of male workers who were displaced from their jobs as the result of an establishment closure. In the main specification, I study how the prevailing employment rate in a displaced worker's network of former coworkers at the time of displacement – as a measure of network quality – affects his re-employment probability and wage rate in the year after displacement. To account for unobserved group level shocks and potential sorting into networks based on observable and unobservable characteristics, I include a comprehensive set of control variables that capture a worker's permanent characteristics, past employment history, and network size, as well as a full set of fixed effects for the closing establishments, hence comparing the post-displacement outcomes of workers who are displaced from the same establishment. However, since variation in the employment rates of workers' networks arises from different past work histories, it may still be that a relationship between the network employment rate and a worker's own post-displacement outcomes is due to unobserved factors shared between members of the same network rather than the exchange of job-relevant information through the network. To deal with this problem, I employ a novel instrumental variable strategy that exploits past mass-layoffs as exogenous shocks to the employment rate in a worker's network. After separating from each other, some of a displaced worker's former coworkers may themselves become unemployed as the result of a mass-layoff. Under the assumption that, conditional on observable characteristics, the extent to which a coworker network is affected by such mass-layoffs is exogenous to any unobserved factors determining a worker's post-displacement outcomes, mass-layoffs can serve as a valid instrument for the prevailing employment rate in a network.

My empirical results show that coworker-based networks are an important feature of the labour market. Being embedded in a higher quality network in terms of the prevailing employment rate has a positive effect on the employment probability in the year after displacement but no effect on starting wages in the new job. According to results from the main instrumental variable specification, a 10 percentage point increase in the employment rate of a worker's network of former coworkers at the time of displacement increases the re-employment probability in the following year by 7.5 percentage points. This effect is robust to the inclusion of establishment/education group fixed effects as well as a large number of additional robustness checks. To provide evidence for the exogeneity of the instrumental variable, I perform a number of placebo estimations which show that contemporaneous mass-layoffs are unrelated to past labour market outcomes and that future mass-layoffs are unrelated to current labour market outcomes. Among the group of former coworkers, female coworkers, coworkers from the same age cohort as the displaced workers, and coworkers with whom prior interaction was more intensive are particularly important for post-displacement employment outcomes. Finally, an analysis looking at the longer run effects reveals that the positive impact on the employment probability of a displaced worker only persists for the first year after displacement.

This analysis contributes to the growing empirical literature on the role of social networks in the labour market. In this literature, most studies exploit survey data and directly examine how the use of informal hiring methods is related to workers' labour market outcomes.[2] While the evidence is not unambiguous, a majority of studies suggest a positive role of informal job finding methods for workers'

labour market outcomes. In the absence of direct survey information on job finding methods and social interactions, an alternative set of empirical studies have employed a variety of network definitions likely to proxy for such interactions to indirectly test for the presence of network effects in the labour market. These network definitions comprise such diverse social groups as neighbours (e.g. Topa, 2001; Weinberg et al., 2004; Bayer et al., 2008; Schmutte, 2015; Hellerstein et al., 2011; Damm, 2014), individuals with the same (ethnic) origin (e.g. Munshi, 2003; Edin et al., 2003; Beaman, 2012; Dustmann et al., 2016), close friends (Cappellari and Tatsiramos, 2015), family members (Kramarz and Skans, 2014), freshmen hallmates (Marmaros and Sacerdote, 2002), and fellow war veterans (Laschever, 2003). The overall evidence from these studies, which typically relate the employment status of a worker to the prevailing employment rate in his network, points towards a positive role of social networks in the labour market.

The work most closely related to the present analysis is a study by Cingano and Rosolia (2012) who use matched employer-employee data for the two Italian provinces of Treviso and Vicenza over the period 1975 to 1997 to examine the response of unemployment duration to the employment rate and size of a worker's group of former coworkers. Their main result shows that a one standard deviation increase in the network employment rate reduces unemployment duration by about 8 percent (around 3 weeks for the average spell), a magnitude comparable to the findings of a more recent analysis for Austria by Saygin et al. (2014). Analyzing the heterogeneity across network contacts, Cingano and Rosolia (2012) further show that stronger ties, as measured by the joint tenure with the same employer in the past, as well as geographically and technologically closer contacts exert a particularly strong influence on employment outcomes.

While the present analysis shares, both in terms of data preparation and empirical model specification, a number of commonalities with, in particular, the analysis by Cingano and Rosolia (2012), it makes several novel contributions to the still nascent literature on the role of coworker-based networks in the labour market. First, it replicates key features of the Italian study in the alternative setting of Germany, where establishments, and hence coworker networks, tend to be larger, and where, in the empirical analysis, closing establishments pertain to both manufacturing and non-manufacturing sectors of the economy. Second, it provides additional heterogeneity analysis, in particular regarding the role of ethnic similarity and contact intensity between workers. Third, and most importantly, it employs a different identification strategy. Rather than relying exclusively on a comprehensive set of past and contemporaneous control variables to capture differences in workers' skill sets in an OLS framework, this analysis exploits mass-layoffs as exogenous shocks to the employment rate in a given worker's network of former coworkers in an IV framework to identify the network effects of interest.[3] In doing so, my study thus also speaks to the question of how employment shocks propagate through social networks as predicted by the theoretical models of, for example, Topa (2001) and Calvó-Armengol and Jackson (2004).

The remainder of the paper is organised as follows. In the next section, I sketch the theoretical framework underlying the empirical

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[2] Recent examples of such studies are Weber and Mahringer (2008) for Austria, Goel and Lang (2010) for Canada, Caliendo et al. (2011) for Germany, Frijters et al. (2005) for the UK, Kugler (2003); Loury (2006) and Brown et al. (2016) for the US, Pellizzari (2010) for a selection of European countries, and Bentolila et al. (2010) for both the US and Europe. For a comprehensive summary of the literature on the use of referrals in the labour market, see Ioannides and Loury (2004) and Topa et al. (2011).

[3] There are a number of related studies that focus on coworker relationships and their role in the labour market. In an experimental setting, Beaman and Magruder (2012) investigate whether social networks help firms screen their job applicants and provide evidence that if the pay of the worker who makes the referral is linked to the performance of the referred worker, individuals shift their choice of referrals towards coworkers and away from relatives. Åslund et al. (2014) study how the origin/ethnicity of managers affects hiring patterns in Swedish establishments and document that, conditional on hiring from their pool of former coworkers, ethnic similarity between managers and coworkers increases the latter's probability of being hired. Using Swedish matched employer-employee data, Hensvik and Skans (2016) study networks based on previous coworker relationships to systematically test Montgomery's (Montgomery, 1991) employee referral model. Finally, Colussi (2015) assesses the role of coworker-based networks for immigrants' labour market outcomes in Italy.