# When Networks Matter Differently: Networks and the Gendered Career Adjustment to Large-Scale Structural Change*

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**Abstract**

Does the effect of coworker networks on career trajectories differ between men and women? We answer this question in the context of German reunification, which provides a unique natural experiment. Before reunification, workplaces and network formation were fundamentally differently organized in socialist East Germany (GDR) and capitalist West Germany. In particular, we show that the state-governed allocation of workers to jobs due to central planning in the GDR resulted in more gender balance and equal access to high-quality networks for men and women. The massive economic transformation that happened after reunification, however, created diverging career paths for men and women, converging towards the less gender-equal West German distribution. Using novel data that links administrative records from the GDR and reunified Germany, we examine the role that workplace networks formed during the GDR regime play in the adjustment process. We find striking gender differences in the impact of networks on careers. While on average both genders benefit from having a high-quality network, the effects for men are particularly pronounced at the top of the wage distribution whereas networks benefit only women at the lower end of the wage distribution.

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# 1 Introduction

Recent literature in Economics has improved our understanding of how men and women are affected by negative labor market shocks. In addition, recent research has improved our understanding of how networks help workers adjust to negative shocks. The two strands of literature have so far mostly evolved in parallel, with little overlap. We fill this gap by investigating whether men and women leverage their professional networks differently when adjusting to large-scale, permanent structural shocks.

The setting of this study is the German reunification. We exploit the fact that, in the former German Democratic Republic (GDR), individuals were quasi-randomly assigned to occupations and workplaces under the planned economy, without regard to their preferences. This is shown in Hansch et al. (2024). We show below that the GDR's worker allocation system also led to comparable professional networks for men and women. The latter is an important asset of our context, since networks between men and women typically differ. For one, men and women form networks differently (Lindenlaub and Prummer, 2021). In addition, differences in network structures arise from gender differences in occupational sorting. In our GDR setting, however, because we have a much more gender-neutral distribution across occupations, we have a greater chance of observing women with networks that compare well with those of men. For example, in the GDR, women often worked as engineers and thus had networks of potentially successful engineers. Something which we would not expect to see as frequently in the West, simply because there were so few female engineers.

We use linked GDR-IAB data that provides us with a panel of individual level career histories for East and West Germans including individuals' 1989 GDR establishments and occupations. We examine networks formed at the workplace in 1989, defined as an individual's colleagues working in the same granular 4-digit GDR occupation by establishment cell, and assess which role they play in who has a successful career.

As a first step, we document the fundamentally different gender composition in the GDR. As a second step, we show how careers evolved after reunification. We find a substantial structural transformation, with a major reshuffling of occupations among East Germans, with the experience being very different for men and women. The reshuffle was fast, with the majority of the process finished by 1992. After the reshuffle, the female share in these high-skill occupations in the East dropped dramatically and was much more similar to that in the West. The extensive restructuring of the occupational structure in the context of German reunification creates substantial variation in career trajectories. Many women had to downgrade, but some achieved successful outcomes. This variation allows us to analyze who the women are that end up making it "against the odds," and to what extent their exogenously assigned professional network contributes to this?

The quasi-random assignment of individuals to networks during GDR times allows us to proceed with a straightforward identification strategy. We employ linear regressions to identify the female-specific component of the high-quality network effect on individual labor market outcomes. Initial findings show that women benefit in comparison to men from having high-quality network contacts when it comes to increasing log daily wage. However, when we consider outcome variables indicative of top labor market achievement, such as reaching a wage in the top

25% of the national distribution, we find that the female-specific component of the high-quality network effect becomes negative. This suggests that women no longer benefit as much as men from their high-quality networks in achieving "top" outcomes.

The positive impact of peers on performance has been documented in a multitude of contexts, including at the university level (Sacerdote, 2001; Zimmerman, 2003), and in the workplace (Guryan et al., 2009; Mas and Moretti, 2009; Cornelissen et al., 2017). Beyond the effect of an individual's direct peers on their labor market performance, past literature has also considered the impact of a broader network, often defined as family or professional social contacts, on their career outcomes. Of particular interest to us are potential differences in network use between men and women. Here, past literature has made many advances, though these studies are often limited to experimental settings (Mengel, 2020; Hederos et al., 2025; Beaman et al., 2018). Our context offers a unique advantage: we can draw conclusions about the differing impacts of professional networks for women and men in the context of a real-world, large-scale economic shock.

In other contexts, such as alumni networking, previous research has found that men and women reach out to potential network contacts in a similar manner (Gallen and Wasserman, 2021), though women disproportionately reach out to female alumni (Gallen and Wasserman, 2023). Additionally, women concentrate their networking efforts in a gender-homophilous manner to identify employers and careers that offer the highest chance of professional success (Obukhova and Kleinbaum, 2022).

Previous research has also found, that both men and women display gender homophily in referral behaviour (Zeltzer, 2020; Beaman et al., 2018). Though in a lab-experiment Mengel (2020) finds that men display more gender homophily in referrals than women, particularly when it comes to promotion decisions. Referrals to new jobs are one way individuals can benefit from their networks, but networks can also provide information about job leads. Huffman and Torres (2002) find that the quality of this job information from an individual's network is poorer for women than men. Network benefits on earnings are also far smaller for women than men (Lalanne and Seabright, 2016).

## 2 Data

Our analysis is based on a unique link of two administrative data sets, the Data Fund of Societal Work Power (*Datenspeicher Gesellschaftliches Arbeitsvermögen*, short GAV) that covers the near universe of workers in the final year of the GDR and social security records from re-unified Germany administered by the German Institute for Employment Research (IAB) for 1975–2019.

The GAV data, provided by the Federal Archives in Germany, contain demographic information and labor market characteristics of around 7 million workers in the GDR in 1989.[1] The data were used by government agencies in the GDR as part of the central planning process, e.g., to assess the demand for workers in specific occupations. It includes 72 percent of the East German labor force in 1989, covering most employees in the country. Excluded, however,

[1]The GAV data was collected on an annual basis. However, limited computer storage capacities in the GDR resulted in the deletion of previous waves of the data when a new wave was collected. Therefore, we can only use the latest wave referring to 1989.

is the so-called *Sector X*, i.e., people working for the Ministry of the Interior, the Ministry of State Security, the Socialist Unity Party, the army, or customs authorities. Further excluded are school teachers, childcare workers, and self-employed individuals. The GAV data contain demographic characteristics such as age, gender, place of residence, the number of children under 14, the number of household members in need of care, marital status, nationality, and indicators for three education groups (high school, vocational, or university degree). Further, the data include unique identifiers for each worker's establishment, industry, and occupation, as well as information on the type of employment (full-time or part-time).

Based on names, exact dates of birth, and gender, the GAV data were merged with the *Integrated Employment Biographies* (IEB), the German social security records administered by the Institute for Employment Research (IAB).[2] The IEB contain full employment and earnings histories of all workers covered by the German social security system (excluding civil servants, self-employed workers, and regular students). Due to the complexity of the administrative integration process of the East German labor market into the German social security system, East Germany is only comprehensively captured in the IEB from 1992 onward. Consequently, the combined data provide highly accurate information on GDR workers and their workplace in 1989 and their full employment biographies between 1992 and 2005.[3]

**GAV-IEB** Our main analyses are based on the full sample of all GDR workers observed in the GAV data, which allows us to observe all coworker relations in the GDR and track their subsequent labor market trajectories in reunified Germany. We restrict the sample to East Germans employed in the manufacturing sector who were between 20 and 50 years old in 1989. For labor market outcomes and individual characteristics from the IEB data, we focus on the years 1992 and 2000.

**GAV-ADIAB** For some of our descriptive analyses we also use the GAV-ADIAB data, a 10% random sample of the linked data of East Germans that is enriched with a 2.5% random sample of West Germans who were employed in 1989 and are followed over time. The GAV-ADIAB allows a comparison of labor market trajectories of individuals from the GDR with those of a representative sample of West Germans.

Table 1 shows summary statistics for the main sample for the year 1989 (the GAV data) and 1992 (IAB data), which includes full-time and part-time workers, and unemployed individuals (unemployment did ofiicially not exist in the GDR, so this information is only availlable for 1992), aged 20 to 50. The sample is restricted to the manufacturing sector.

## 3 Background and Stylized Facts

In this section, we provide historical background on work and the allocation of talent in the GDR, the transformation process after reunification, and on the labor market in reunified Germany.

[2]For details on the linkage process see Liepmann and Müller (2018) and Hansch et al. (2025).

[3]GDR workers are difficult to identify in the social security records (the IEB) without the merged GAV data, as East Germany is only covered from 1992 onward in the IEB, and the data contain no information on the place of birth. In addition, the IEB contains no information on GDR workers from GDR times.

We place particular emphasis on documenting gender differences in economic outcomes across all three historical phases. The evidence in this section is based on the GAV-ADIAB data, allowing us to compare labor markets in East and West Germany.

### 3.1 Work and Workplaces in the GDR

The allocation of workers to jobs was markedly different in the state-planned economy of the German Democratic Republic (GDR) than in a market economy, such as that in West Germany. Central planning governed the allocation of resources and price setting, as well as the allocation of talent and wage setting. The vast majority of businesses and industries were state-owned, and firms in the GDR, organized into large groups ("Kombinate"), faced minimal competition but maximal government control.

Due to central planning, there was no labor *market* (Hoene, 1991), but workplaces were organized under state control. The GDR constitution mandated full employment. Allocating people to workplaces was a centralized process heavily influenced by the state's economic planning objectives. Individuals had limited control over their job assignments, which were determined by the needs of the state-controlled economy according to the economic plan and political alignment, and less by factors such as individuals' education and skills (e.g., Gruenert, 1996). Krueger and Pischke (1992) argue that "the Communist system operated like a large internal labor market, with rules and party membership playing an important role in the allocation of jobs and wages" (p. 408).

Ideology and the requirements of the centrally planned economy also shaped education in the GDR more generally. Compulsory education ensured a basic education for all children from age six until around 16. While individuals had some say in their educational paths beyond basic schooling, the state exerted substantial influence by guiding students toward specific careers and fields of study that aligned with its objectives and principles. The state restricted individuals' occupational choices to increase social equality, promote working-class children, or push modernization (e.g., Baker et al., 2007; Fuchs-Schündeln and Masella, 2016; Prantl and Spitz-Oener, 2020). Due to these factors, the allocation of individuals to occupations and workplaces in the GDR did not rely on their abilities, especially not those that would later become relevant in a market-driven economy, such as the West German economy. At the time, the latter was on the other side of a highly fortified, impenetrable wall.

Careers in the GDR were stable and predetermined, with very little turnover and firm changes. Regional mobility was particularly low. Gender differences were much less pronounced in the GDR. Consistent with this assessment, our data show much less gender homophily in GDR workplaces, occupations, and industries. Compared with West Germany, gender shares were more balanced across most occupations and industries.

Table 2 shows the gender distribution within aggregated groups of occupations, the so-called Blossfeld occupation groups, in former East vs. former West Germany. It was markedly different before reunification, as shown by column (3). It is noteworthy that, in 1989, all occupation groups have a higher female share in East Germany than in West Germany. Furthermore, 9 of the 12 occupation groups show a positive difference in the female share of greater than 10 percentage points, with the three largest differences exceeding 25 percentage points. Interestingly, the top

three occupation groups with a much larger female share in East Germany than in West Germany include Engineers and Managers, two occupation groups not associated with a high female share in Western-style labor markets.

### 3.2 Reunification Shock

Reunification meant a massive structural transformation for East German labor markets. Shocks and reallocation were massive, but also differed substantially by gender. Figure 2 shows the huge amount of restructuring after 1989. Interestingly, the process was finished in 1992.

Consistent with this assessment, Table 2, Column 2, shows the difference in female shares in occupation groups between East and West in 1992. It is immediately clear that the pattern of gender distribution within occupation groups in the East has converged with that in the West. Across the board, the occupation groups with previously uncharacteristically high female shares in 1989 East Germany have dropped to levels more comparable with those in the West. This shift in overall occupational composition is unsurprising given the massive restructuring of industrial structure that the former GDR experienced post-reunification upon merging with the West's market economy (Liepmann, 2018). The sudden, one-time nature of this shock is supported by the stability of the industrial structure in both the East and the West in subsequent years following the initial reunification shock.

Not only did the reunification shock prompt the re-shuffling of individuals in the East between occupations, impacting the occupation gender shares, it also pushed many East Germans to non-employment. To examine the employment paths of both East and West German men and women, we define a total of 6 possible year-on-year movements: switching occupation group, switching to non-employment (from employment), switching to employment (from non-employment), lateral mobility (remaining in an occupation group but switching occupation), non-mobility (employment) (remaining in the same occupation), non-mobility (non-employment) (remaining non-employed).

While employment flows for both genders in West Germany appear reasonably stable over time, this is not the case in East Germany. Figure 2 depicts employment flows over time for East and West German men and women. The year-on-year transitions begin with the 1989 to 1992 transition, followed by 1992 to 1993, 1993 to 1994, and 1994 to 1995, with the latter year of each transition shown on the x-axis.

For both men and women, trends are more stable in the West than in the East. Over the considered time frame, the majority of individuals in the West do not change their occupations, with an uptick in the share of individuals switching to non-employment in later years, driven by older individuals. In the first transition, which encompasses the reunification shock, individuals in the East experience a high degree of occupation group mobility - around half of East German men in our sample and around 40% of East German women. While the second-most frequent mobility type for East German men is lateral mobility (around 18%), for women the second-largest share experiences movement to non-employment (over 30%). This further sheds light on potential occupational restructuring in East Germany around the time of reunification, which resulted in far lower female shares across occupations.

### 3.3 Gender Differences in Careers after Reunification

We investigate gender difference in economic outcomes in reunified Germany by regressing each outcome of interest (having a censored wage in the year 2000, having a "high-quality" occupation in the year 2000, being in the occupation "manager" in 2000, being employed in an establishment with a firm AKM FE in the top 25%, having an imputed wage in the top 25% of the national distribution) on a dummy for female, education level indicators, age and age squared. We then successively add fixed effects to our specification to capture the gender gap, abstracting from within-occupation, within-establishment, or within-occupation-by-establishment (i.e., networks, as we define it here) variation.

The results from this exercise can be found in Figure 4. Across all outcome variables, women appear disadvantaged compared to men. Even when we control for occupation-by-establishment fixed effects, thereby comparing men and women within the same professional network, we find that women are significantly less likely than men to achieve top labor market outcomes. We take this as a clear sign that there must be differences in how men and women can utilize their professional networks, which at least partially drive these differences in outcomes. As a next step, we examine how varying network quality may drive differences in outcomes between men and women, as well as the impact of gender-specific network quality on outcomes.

## 4 Workplace Networks and their Effect on Women's Careers

In this section we examine the role of workplace connections, coworker relations formed at the workplace during GDR times, on career outcomes in the longer run. We particularly focus on differences in network effects between genders.

### 4.1 GDR Coworker Networks

**Defining GDR Coworker Networks** We define an individual's professional network as all co-workers who worked at the same 1989 GDR establishment and in the same 4-digit occupation.

Naturally, assuming that all coworkers in the same establishment-occupation cell are connected yields an imperfect network measure because we do not observe actual interactions or information flows. This drawback is common to most studies on labor market networks, but is substantially limited in our study for two reasons. First, workplaces in the GDR played a major role in everyday life in the GDR. The importance of the workplace extended beyond the actual work and encompassed many aspects of social life, such as providing childcare and sports facilities, organizing cultural activities and vacations. We thus believe that it is plausible to assume that individuals meaningfully interacted with colleagues at work, especially those with whom they shared a fine-grained occupation.

Moreover, we explicitly account for potential cross-gender differences in connections in a robustness check that considers only connections from the same gender.

Table 4 shows network characteristics, overall and by gender.

**Measuring Network Quality** In our baseline, we measure the quality of an individual's GDR coworker network using a binary indicator equal to 1 if this individual had at least one GDR coworker with a university degree in 1989. In addition, we use alternative measures that are equal to one if at least one co-worker is in the top 25% of the person AKM effect distribution[4].

Information on the variation of these network quality measures at the individual level is given in Table 4. While the overall share of highly educated co-workers in an individual's professional networks is relatively low at around 10% for both men and women, a substantial share of individuals have at least one highly educated network contact, implying our binary measure identifies around 60% of individuals as having a high-quality network when using the education measure.

We also consider variation in the GDR occupations in which high-quality network members may be concentrated. In Table 3 we list the percentage of GDR occupations in which individuals have an average high-quality network share across six levels. Through this, we show that there is not only variation at the individual level in exposure to high-quality network members across both definitions, but also at the occupational level.

**Quasi-exogenous Assignment to Networks** The main challenge in estimating the effect of network quality on long-term career outcomes is the presence of correlated effects (Manski (1993)). Workers with similar characteristics tend to select into similar networks, i.e., high-quality networks typically attract high-quality workers. As a result, the effect of the network quality cannot be distinguished from the common characteristics of workers in the same network.

We leverage the restrictions on worker allocation imposed by central planning in the GDR to break this correlation. Conditional on a few observable characteristics, the assignment of workers to firms and occupations can be considered as good as random (see also Hansch et al., 2024, for tests of this argument). Figure 5 illustrates this claim. We line up all East German workers by their post-reunification wages in 1992 and show the percentiles of this wage distribution on the horizontal axis. For each percentile, we then plot the probability that the individual was part of a high-quality network in 1989, as defined above. The red squares show the unconditional probability, indicating that workers with higher post-reunification wages were more likely to be part of a high-quality network in 1989. This correlation indicates that there was also some degree of sorting in the GDR: Workers with better employment prospects after reunification worked with other high-quality employees even before reunification in 1989.

The blue diamonds show the probability after residualizing with dummies for industry, state, and occupation, as well as key demographics. Within cells defined by these observables, there is no positive relation between wage residuals and the probability of being in a high-quality network in 1989. This finding indicates that, conditional on our observables, workers across the entire skill distribution had equal access to high-quality networks. In other words, we can control for the factors that determined the sorting process in the GDR. In line with the historical evidence discussed in Section 3, workers were not able to sort into workplaces as they wished. Consequently, the conditional probability that a worker at the low end of the wage distribution in 1992 has worked with a high-skilled individual before the fall of the Berlin Wall is precisely the

[4]Here we use AKM person fixed effects from the period 1992-1999, always taking the earliest possible fixed effect available for an individual.

same as the probability of a worker at the top of the wage distribution in 1992. This substantiates our claim of quasi-random assignment to networks conditional on some observables.

**No Gender Differences in Network Quality** Are men and women in different networks? Table 4 shows descriptive characteristics of men's and women's networks. On average, male's networks are slightly larger. Most notably, despite the much larger overlap in gender shares in the GDR compared to West Germany, there is a substantial amount of gender segregation in GDR coworker networks. The average share of females in a woman's network is 74%, while it is only 18% for a man's network. In all our empirical analyses we therefore control for the network size and the share of females in a network, in order to account for these differences.

In contrast, we find no evidence for differences in network quality between men and women. The share of workers with a high level of education equals to 10% in both men's and women's networks. Furthermore, there are no difference in the shares of highly-educated network members across genders. For both men and women, about 8% of female network members and about 10-11% of male network members have a university degree.

To more thoroughly quantify potential gender differences in network quality, we perform balancing tests where we regress various network quality measures on a dummy for female. Figure 6 shows the coefficients for three variants of the balancing test, once only including 1989 fixed effects, once including 1989 fixed effects and co-variates, and one using our full specification including 1989 and 1992 co-variates and fixed effects. While, in line with the raw differences in Table 4, there are no differences in the probability of having a highly educated network contact, other measures of network quality show systematic difference in how women vs. men are allocated when not including controls (the red squares). However, once we include 1989 co-variates in addition to the 1989 fixed effects, the relative correlation of female with the network quality measures moves much closer to, and are often indistinguishable from, zero. Once we finally include fixed effects and co-variates in line with our full specification, the predicted coefficients move closer to zero again.

**Summary** Taken together, the evidence suggests that women and men at all parts of the wage distribution had similar access to high-quality networks in the GDR, conditional on some observable characteristics. This balance allows us to estimate the causal effect of high-quality networks on differences in career outcomes between men and women and across the skill distribution.

### 4.2 Empirical Framework

While our balancing checks in the previous section show that workers from the same cell (defined by 1989 region, 1989 industry, 1989 occupation, and 1989 demographics) in all wage bins and across gender had the same probability to be working in a high-quality network, the state-planned allocation of workers created some quasi-random variation in who actually experienced a high-quality workplace environment. We use this variation in network quality among comparable individuals who however were allocated to different GDR coworker networks to identify the causal effect of network quality on labor market outcomes after reunification.

The main identifying assumption thus is that the assignment to high-quality networks is orthogonal to unobserved characteristics that determine labor market success later in life. The fact that we show independence of the network allocation to wage outcomes in 1992 already alleviates potential concerns about the validity of this assumption.[5] To further strengthen the argument, we use controls for 1992 labor market outcomes...

To estimate the impact of having a high-educated network contact in 1989 on post-reunification careers, we compare men and women with and without such a contact using a simple OLS regression framework.

$$\begin{aligned} Y_{i,2000} =& \beta_0 + \beta_1(HQNetwork_{i,89} \times Female_i) + \beta_2 HQNetwork_{i,89} + \beta_3 Female_i \\ &+ \alpha_1 X_{i,89} + \alpha_2 X_{i,92} + \lambda_{l,89} + \theta_{s,89} + \eta_{o,89} + \mu_{o,92} + \gamma_{j,92} + \varepsilon_{i,2000}. \end{aligned} \tag{1}$$

The outcome variable, $Y_{i,2000}$, comprises several labor market indicators: employment status; employment in a "high-quality" occupation (defined as any occupation in the occupation groups technician, engineer, professional, or manager), being employed as a manager, being employed in an establishment with an AKM fixed effect in the top 25% of the national distribution, earning a wage in the top quartile of the national distribution, having a right-censored wage (a feature of the German administrative data), and log daily wage (conditional on employment). All outcomes are measured in the year 2000. $HQNetwork_i$ is an indicator for having a high-educated network contact in 1989, $Female_i$ is an indicator for being female. $X_{i,89}$ is a vector of individual-level controls in 1989 including education level, parenthood status, marital status, age, age squared, part-time status, and care obligations. It also includes controls for individual $i$'s log network size in 1989 and a categorical variable capturing five levels of the share of females in the professional network in 1989. We also include a vector of 1992 controls, $X_{i,92}$, which includes $i$'s AKM worker FE level[6], part-time status and log daily wage in 1992. We include fixed effects for the 1989 federal state ($\lambda_{l,89}$), 1989 2-digit sector ($\theta_{s,89}$), 1989 4-digit GDR occupation ($\eta_{o,89}$), 1992 3-digit occupation ($\mu_{o,92}$), and 1992 establishment ($\gamma_{j,92}$).

Our coefficient of interest is $\beta_1$ which captures the female-specific component of the high-quality network effect, or the difference in how women benefit from a high-educated network contact, in comparison to men. The effect of having a high-educated network contact for women vs. women without one is captured by $\beta_1 + \beta_2$.

We estimate specifications both with and without 1992 individual-level controls and fixed effects. Our chosen 1992 controls ensure that we identify differences in the high-quality network effect for individuals who have experienced the reunification shock in a comparable way–by ending up in the same occupation and establishment following reunification. Conditioning on this identifies a lower bound for $\beta_1$, representing the high-quality network effect net of any benefits accrued from network contacts during the 1989–1992 transition.

[5] In appendix X, we show an alternative specification using the distribution of AKM worker fixed effects post reunification to measure also unobservable factors of post-reunification labor market quality. We find that conditional on our controls network quality in 1989 is also unrelated to the percentile of the AKM worker effect in 1992.

[6] We fill in information from 1992 to 1999 using the earliest available fixed effect for each individual.

**Gender-specific components of high-quality networks** To additionally investigate whether individuals may be differentially impacted by a high-educated *female* professional network contact in comparison to a high-educated *male* professional network contact, we split our previous $HQNetwork_i$ variable into a male and female part.

$$\begin{aligned} Y_{i,2000} =& \beta_0 + \beta_1(HQFemaleNetwork_{i,89} \times Female_i) + \beta_2 HQFemaleNetwork_{i,89} \\ &+ \beta_3(HQMaleNetwork_{i,89} \times Female_i) + \beta_4 HQMaleNetwork_{i,89} + \beta_5 Female_i \\ &+ \alpha_1 X_{i,89} + \alpha_2 X_{i,92} + \lambda_{l,89} + \theta_{s,89} + \eta_{o,89} + \mu_{o,92} + \gamma_{j,92} + \varepsilon_{i,2000}. \end{aligned} \quad (2)$$

In this regression equation, $\beta_1$ captures the female-specific component of the *female* high-quality network effect, or the effect on a woman of having a high-educated female professional network contact compared with the effect on a man of having a high-educated female professional network contact. Equivalently, $\beta_3$ captures the female-specific component of the *male* high-quality network effect.

We maintain the previous inclusion of 1989 and 1992 controls and fixed effects in the equation. However, we continue to report specifications with and without them to provide estimates of the network effects with and without the impact of the 1989-1992 transition.

# 5 Results

## 5.1 Effect of having a high-quality network contact

We begin by examining the impact of having a high-quality network contact on the likelihood of achieving the "top" labor market outcomes in 2000, as previously defined. Figure 7 indicates the relative effect of having a high-educated professional network contact in 1989, expressed in percent. As outlined above, we sequentially introduce additional fixed effects: starting with 1989 fixed effects (red squares), then adding the 1989 control vector (gray diamonds), and finally including both 1989 and 1992 fixed effects and controls (blue circles). In this first part of the analysis, we consider the pooled sample of both women and men and control for the female worker indicator, without interacting it with the high-educated contact indicator.

Across all specifications, the relative effect of a high-educated network contact remains consistently positive, particularly in increasing the likelihood of being a manager in 2000 or working in an establishment with an AKM fixed effect in the top 25% of the national distribution. However, the magnitude of these effects diminishes as additional fixed effects are included.

Most estimated coefficients are statistically insignificant in the full specification, which compares East Germans who experienced the tumultuous post-reunification transition period from 1989 to 1992 in a similar way, that is individuals with comparable characteristics in 1989 (e.g., occupation, industry, federal state, age, education, gender) and who were employed in the same occupation and establishment in 1992. Two exceptions emerge. First, having a high-educated contact significantly increases the likelihood of employment in a high-quality occupation in 2000 by 2.1%, significant at the 5% level. Second, it has a modest positive effect on log daily wages,

statistically significant at the 10% level, corresponding to a 0.1% relative increase.

Overall, we come to the conclusion that having a high-quality network contact is beneficial for one's likelihood of achieving top labor market outcomes. However, the findings also suggest the presence of underlying effect heterogeneity.

## 5.2 Differential effect of having a high-quality network contact for women compared to men

The next part of our analysis explores this underlying heterogeneity by accounting for gender differences. Figure 8 presents estimation results from specifications that interact the female-worker indicator for individual $i$ with an indicator for whether $i$ had at least one high-educated network contact in his or her 1989 professional network (Equation 1). Our coefficient of interest thus captures the differential effect of having a high-educated network contact on the likelihood of achieving a given career outcome in 2000 for women compared to men.

The estimated interaction effects are predominantly negative. Having a high-educated contact is associated with a lower likelihood of achieving positive outcomes for women compared to men across nearly all dimensions. The negative gender differential is more pronounced for extreme outcomes associated with top achievements in the labor market. For instance, in the full specification, having a high-educated contact reduces the probability of becoming a manager in 2000 by 20% for women relative to men. It also reduces the probability that women have a censored wage in 2000 by nearly 40% compared to men.

The relative effect of having a high-educated network contact on the probability of employment in 2000 is still negative for women compared to men, but much smaller in magnitude than the relative effect on other outcomes associated with more extreme career success above.

Only one effect is estimated to be positive. Having a high-educated contact increases log daily wages in 2000 by 0.6%, statistically significant at the 1% level.

Given these results, we cannot definitively say that women do not benefit from their high-quality network contacts; we merely conclude that they do not benefit from these contacts in the same way as their male counterparts in achieving top labor market outcomes.

We continue by analyzing the effect of a high-quality network contact on wages along the entirety of the distribution to better reconcile our findings of an average positive effect for only this outcome. We also consider the possibility of further effect heterogeneity by the gender of the high-quality network contact in Section 5.3.

**Impact of having a high-quality contact along the wage distribution** To reconcile the finding that high-quality network contacts have a positive average effect on female wages but a negative effect on the probability of reaching the top quartile of the wage distribution, we conduct a quantile regression analysis to identify where in the distribution the effect changes sign by re-estimating Equation 1.

The quantile-specific coefficient $\beta_1^q$ captures how the interaction between high-quality network contact and female status affects the $q$-th quantile of the log wage distribution in 2000. In addition to providing insight into how the presence of high-quality contacts relates to wages

across the distribution, the quantile regression framework is inherently less sensitive to outliers, as it allows for heterogeneous effects at different points of the wage distribution.

Figure 9 presents the estimated effects. The results show that the differential effects of having a high-educated contact in 1989 on women's wages in 2000 are positive in the lower half of the distribution but turn negative in the upper half, relative to men.

When calculating the total effect of having a high-quality contact for women ($\beta_1^q + \beta_2^q$), relative to women without such a contact, the pattern mirrors a less pronounced version of the differential effect shown in Figure 9 (actual figure not yet available for the total effect). For men, the estimated effect of having a high-educated contact—relative to men without such a contact—is negative in the lower part of the wage distribution and becomes positive in the upper half. Thus, the effect of high-quality contacts moves in opposite directions across the wage distribution for men and women.

Taken together, professional networks appear to benefit women primarily at the lower end of the wage distribution, while for men, the gains are particularly concentrated at the top.

### 5.3 Differential effect of having a female (or male) high-quality network contact for women compared to men

Could differential use of female and male high-educated contacts by women explain the previous results, potentially due to homophily? Figure 10 addresses this question by accounting for the gender of the high-educated contact, as formalized in Equation 2.

Having a female high-quality contact appears to be less detrimental for women than having a male high-quality contact, particularly with respect to less extreme labor market outcomes. For instance, in the full specification, female high-educated contacts have no significant effect on women's employment probability, whereas male high-educated contacts significantly reduce it relative to men. This gendered difference in effects is statistically significant at the 5% level. Similarly, the likelihood of being employed in a high-quality occupation in 2000 is less negatively affected by female than by male high-educated contacts. The positive effect on log daily wages is somewhat larger when the high-educated contact is female; however, the difference is not statistically significant.

For top labor market outcomes among women—such as being employed as a manager, working at an establishment with an AKM fixed effect in the top quartile of the national distribution, or achieving top wage outcomes—female high-educated contacts are associated with more adverse effects than male high-educated contacts, relative to men.

In Figures 11a and 11b, we show that the effects of having a female or male high-educated contact are fairly similar across the female wage distribution when compared to the male distribution.

### 5.4 Potential Mechanisms

We show that women with high-quality network contacts do not benefit from these contacts to the same extent as their male counterparts. Additionally, we find that while the average effect of having a high-quality network contact on log daily wage in 2000 is positive for women relative

to men, this effect holds only at the lower end of the wage distribution. The opposite is true for men; they do not benefit from their high-quality contacts at the lower end of the distribution, but do benefit at the upper end.

We have not yet identified the mechanisms that could explain these effects. So far, we found that defining high-quality network contacts by gender does not change the qualitative nature of our results. Thus, the observed differential use of high-quality contacts cannot be fully explained by network homophily. Our next steps will focus on identifying the mechanisms that explain our results.

*———-WORK IN PROGRESS————*

# 6 Conclusion

This paper examines whether and how professional networks affect men's and women's career trajectories differently when adjusting to large-scale structural shocks. Using the unique natural experiment provided by German reunification, we exploit the quasi-random assignment of workers to occupations and workplaces under the GDR's centrally planned economy to identify the causal effect of network quality on post-reunification career outcomes.

Our analysis reveals three key findings. First, the GDR's state-governed allocation system created remarkably equal access to high-quality networks for men and women – a feature virtually absent in market economies. This gender balance in network quality, combined with the massive economic transformation following reunification, provides an ideal setting to isolate how men and women leverage their networks differently during periods of fundamental structural change.

Second, after reunification, East Germany experienced a dramatic occupational reshuffling that disproportionately affected women. The female share in high-skill occupations such as engineering and management, which had been substantially higher in the GDR than in West Germany, declined sharply and rapidly converged toward the less gender-equal West German distribution. This transformation was swift, with the majority of restructuring completed by 1992.

Third, and most importantly, we find striking gender differences in how networks influence career outcomes following this shock. While both men and women, on average, benefit from high-quality network contacts, the distribution of these benefits differs markedly by gender. Networks help men primarily at the top of the wage distribution and in achieving elite labor market outcomes such as managerial positions and employment at high-wage firms. In contrast, networks benefit women mainly at the lower end of the wage distribution, with diminishing or even negative relative effects at the top.

These findings have important implications for understanding persistent gender inequality in labor markets. Even when women have equal access to high-quality professional networks, they are unable to leverage these connections as effectively as men during periods of large-scale economic adjustment, particularly when competing for top positions. This suggests that gender disparities in career outcomes cannot be fully explained by differences in network quality alone.

Instead, the mechanisms through which networks operate, such as referral patterns, information transmission, or employer responses to network signals, appear to be fundamentally gendered.

Our results also speak to the broader literature on labor market adjustments to shocks. While previous research has documented that networks facilitate re-employment after displacement, we show that the protective and promotional effects of networks are highly heterogeneous by gender. This finding highlights the importance of considering gender-specific mechanisms in studies of labor market resilience and adjustment.

The historical context of German reunification offers a rare window into how networks shape gender inequality in labor markets. Our findings suggest that achieving gender equality in career outcomes requires more than simply ensuring equal access to high-quality networks; it requires addressing the deeper structural factors that determine how those networks can be mobilized and activated, especially during times of economic transformation.

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# Tables

Table 1: Sample Characteristics by Gender and Year

| | **Male** | **Female** | **Total** |
|---|---|---|---|
| *Panel A: 1989 (GAV data)* | | | |
| Gender (%) | 66.92 | 33.08 | |
| Age | 36.24 | 36.67 | 36.38 |
| | (8.56) | (8.10) | (8.41) |
| Low education (%) | 8.54 | 9.23 | 8.77 |
| Medium education (%) | 80.16 | 79.39 | 79.91 |
| High education (%) | 11.30 | 11.38 | 11.32 |
| Married (%) | 69.29 | 78.23 | 72.25 |
| Has children (%) | 36.50 | 48.16 | 40.36 |
| Care obligations (%) | 0.34 | 0.52 | 0.40 |
| Works part-time (%) | 0.21 | 20.60 | 6.96 |
| *Panel B: 1992 (IAB data)* | | | |
| Log real daily wage | 3.89 | 3.70 | 3.83 |
| | (0.30) | (0.36) | (0.33) |
| Works part-time (%) | 0.33 | 5.81 | 2.14 |
| Network Contact Employed in West Germany (%) | 71.69 | 55.68 | 66.40 |

**Notes:** This table shows descriptive statistics of GDR workers in 1989 (GAV data) and 1992 (IAB data) by and across genders. The sample includes full-time and part-time workers, as well as the unemployed (in 1992, as per the GDR dictated regime, there were no unemployed individuals). The sample is restricted to the manufacturing sector, and individuals between 20 and 50 years old in 1989.

Table 2: Total share, female share, and percentage point change in female share in Blossfeld occupations. Population aged 20 to 50 in 1989.

| | (1) East Female Share (1989) | (2) East Total Share (1989) | (3) Female Share Diff (E - W) (1989) | (4) Female Share Diff (E - W) (1992) | (5) Female Share Diff East (1992 - 1989) |
|---|---|---|---|---|---|
| | **Percent** | | **Percentage Points** | | |
| Agricultural occupations | 43.15 | 6.41 | 18.15 | 10.53 | -9.20 |
| Unskilled manual occupations | 37.78 | 13.51 | 10.32 | -2.73 | -15.58 |
| Skilled manual occupations | 16.41 | 31.69 | 7.07 | 2.03 | -5.44 |
| Technicians | 43.86 | 9.99 | 19.38 | 19.91 | -1.11 |
| Engineers | 32.47 | 5.45 | 26.19 | 15.19 | -11.33 |
| Unskilled services | 38.43 | 4.82 | 2.39 | -4.17 | -9.55 |
| Skilled Services | 79.45 | 3.74 | 1.77 | -16.47 | -21.11 |
| Semi-professions | 89.62 | 5.49 | 13.56 | 12.27 | -2.08 |
| Professions | 58.86 | 2.27 | 21.17 | 18.21 | -2.87 |
| Unskilled com. and admin. occupations | 97.03 | 8.56 | 19.87 | 2.35 | -19.46 |
| Skilled com. and admin. occupations | 90.52 | 7.77 | 29.57 | 17.79 | -12.46 |
| Managers | 67.57 | 0.30 | 40.57 | 11.68 | -30.00 |
| Non-employed | 0.00 | 0.00 | -49.45 | 7.12 | 61.48 |

**Notes:** This table gives information on the distribution of East and West German women between Blossfeld occupation groups in 1989 and 1992 to show the stark pre-reunification differences in distribution, and quick post-reunification convergence. The data used for this table comes from the GAV-ADIAB data allowing for comparison with West German individuals. The sample includes full-time and part-time workers. The sample is restricted to the manufacturing sector, and individuals between 20 and 50 years old in 1989. Individuals are defined as non-employed in 1992 if they are registered as unemployed, or if they drop out of the labor market. Differences in female share in Blossfeld occupation groups between East and West Germany in columns (3) and (4) are expressed in percentage points and are calculated as East value - West value. Column (5) gives the percentage point difference in female shares within East Germany between 1992 and 1989 calculated as the 1992 value - the 1989 value.

Table 3: High-Quality Network Measure Characteristics by GDR occupation

| | **High-educated** |
|---|---|
| ***% Occupations with:*** | |
| HQ share $= 0$ | 0.18 |
| HQ share $\in (0, 0.25]$ | 6.59 |
| HQ share $\in (0.25, 0.50]$ | 29.32 |
| HQ share $\in (0.50, 0.75]$ | 44.47 |
| HQ share $\in (0.75, 1)$ | 19.42 |
| HQ share $= 1$ | 0.03 |

**Notes:** This table gives information on the distribution of our high-quality network measure (defined as being equal to one if an individual has at least one co-worker with a university level education in 1989) between GDR occupations. From the table we can see that the distribution of occupations in which individuals have at least one high-educated co-worker is not concentrated towards either extreme (there is not a large mass of GDR occupations where 100% or 0% of individuals have at least one high-educated co-worker).

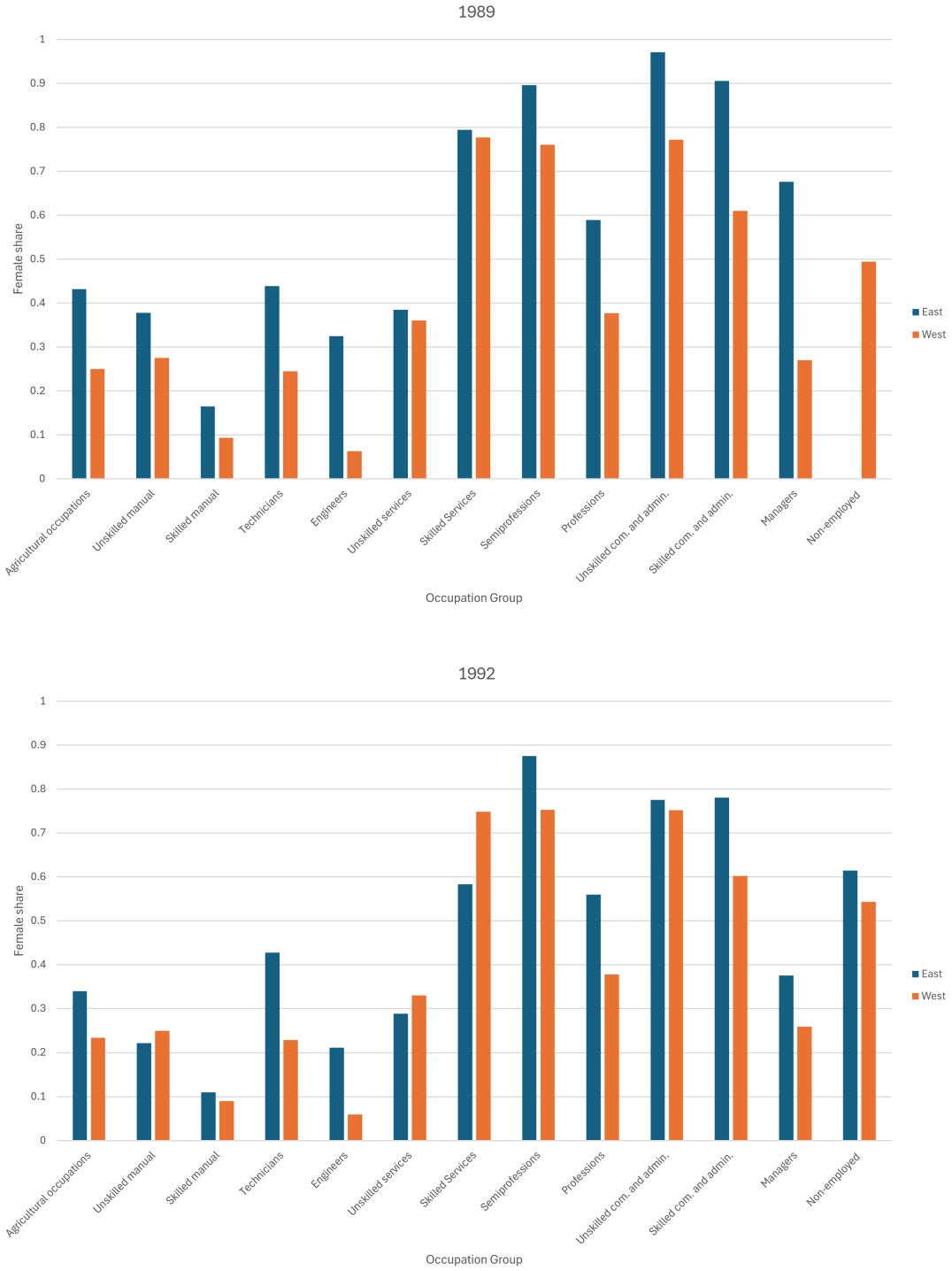
Table 4: 1989 Professional Network Characteristics by Gender

| | **Male** | **Female** | **Total** |
|---|---|---|---|
| Network Size | 33.53<br>(27.98) | 30.52<br>(27.48) | 32.54<br>(27.85) |
| Female Share (%) | 18.42 | 74.25 | 36.89 |
| *Female Share Distribution:* | | | |
| No women in network (%) | 32.88 | 3.80 | 23.25 |
| 1st Quartile (%) | 26.22 | 2.21 | 18.27 |
| 2nd Quartile (%) | 24.53 | 11.40 | 20.18 |
| 3rd Quartile (%) | 12.89 | 32.75 | 19.47 |
| 4th Quartile (%) | 3.48 | 49.84 | 18.82 |
| ***High-educated network contact*** | | | |
| Share higher educated in network (%) | 10.05 | 10.09 | 10.06 |
| Share higher educated among female network contacts (%) | 8.06 | 8.51 | 8.21 |
| Share higher educated among male network contacts (%) | 10.13 | 11.42 | 10.56 |
| Number of observations | 374,497 | 185,187 | 559,684 |

**Notes:** This table gives information characteristics of individuals' professional networks by and across gender. We show how network attributes such as size, female share, and share of high-educated individuals in a professional network vary by gender. The sample includes full-time and part-time workers, as well as the unemployed (in 1992, as per the GDR dictated regime, there were no unemployed individuals). The sample is restricted to the manufacturing sector, and individuals between 20 and 50 years old in 1989.

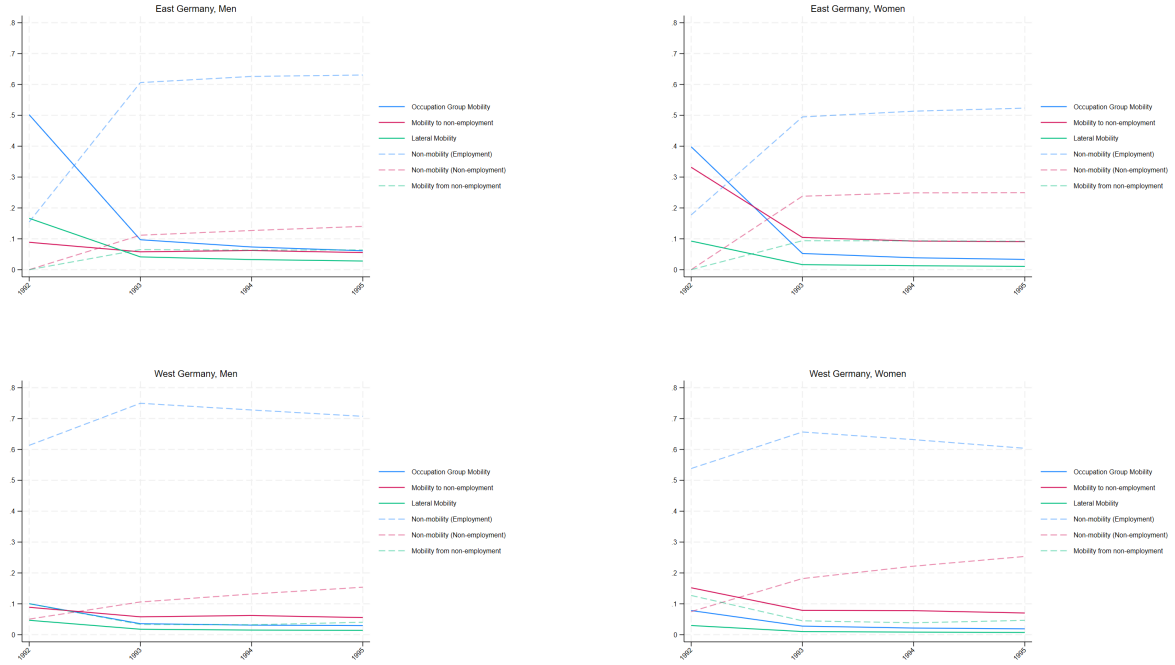
# Figures

Figure 1: Female shares by occupation groups



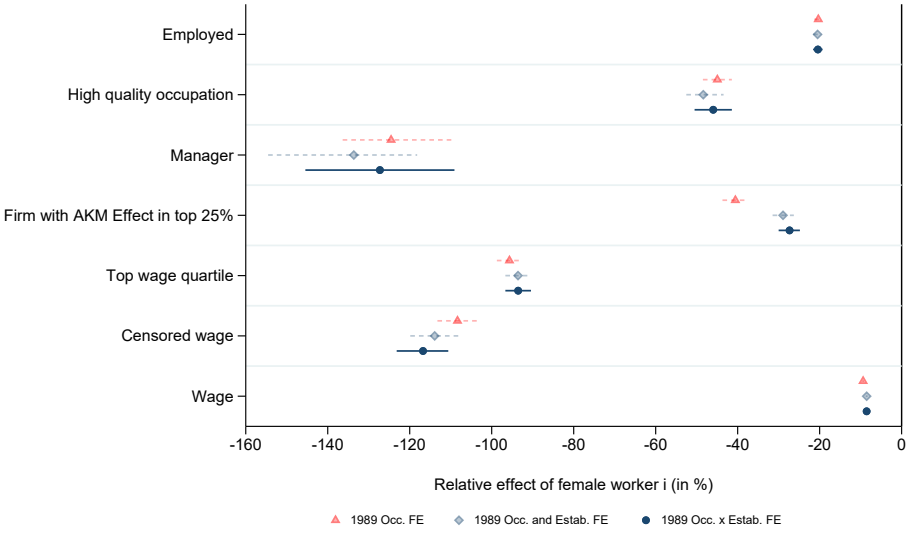

**Notes:** This figure gives information on female shares by occupation group in 1989 and 1992 in East and West Germany. The data used for this figure comes from the GAV-ADIAB data allowing for comparison with West German individuals. The sample includes full-time and part-time workers, as well as the unemployed (in 1992 for the GDR sample, as per the GDR dictated regime in 1989, there were no unemployed individuals). The sample is restricted to the manufacturing sector, and individuals between 20 and 50 years old in 1989. Individuals are defined as non-employed in 1992 if they are registered as unemployed, or if they drop out of the labor market.

Figure 2: Year-on-year employment flows



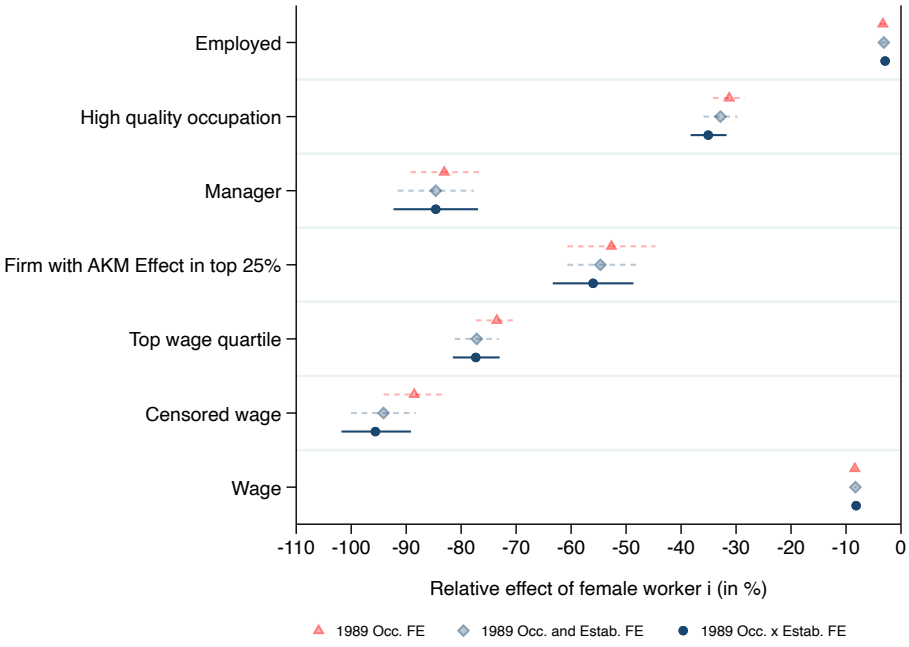

**Notes:** This figure gives information year-on-year employment transitions of East and West German men and women from 1989 to 1992. Each year on the x-axis gives the year transitioned to i.e. 1992 represents the transition from 1989 to 1992, 1993 represents the transition from 1992 to 1993 etc. (note that we do not have information for the years 1990 and 1991). There are six possible year-on-year employment transitions. These are Occupation group mobility, defined as switching Blossfeld occupation groups. Mobility to non-employment defined as switching from employment in year 1 to non-employment in year 2 (defined as being registered for unemployment benefits or leaving the labor market). Lateral mobility defined as switching 3-digit occupation within one Blossfeld occupation group. Non-mobility (employment) defined as remaining employed in the same 3-digit occupation in both years. Non-mobility (non-employment) defined as remaining non-employed in both years. And finally mobility from non-employment defined as being non-employed in year 1, and employed in any 3-digit occupation in year 2. Note that since there are no unemployed individuals in the East German portion of the sample in 1989, mobility from non-employment or non-mobility (non-employment) is not possible for any individuals in the East German sample in the intial 1989 to 1992 transition. The sample includes full-time and part-time workers, as well as the unemployed. The sample is restricted to individuals between 20 and 50 years old in 1989. We use the GAV-ADIAB data to allow for comparison of East and West Germans.

Figure 3: Gender gap in top labor market outcomes in West Germany



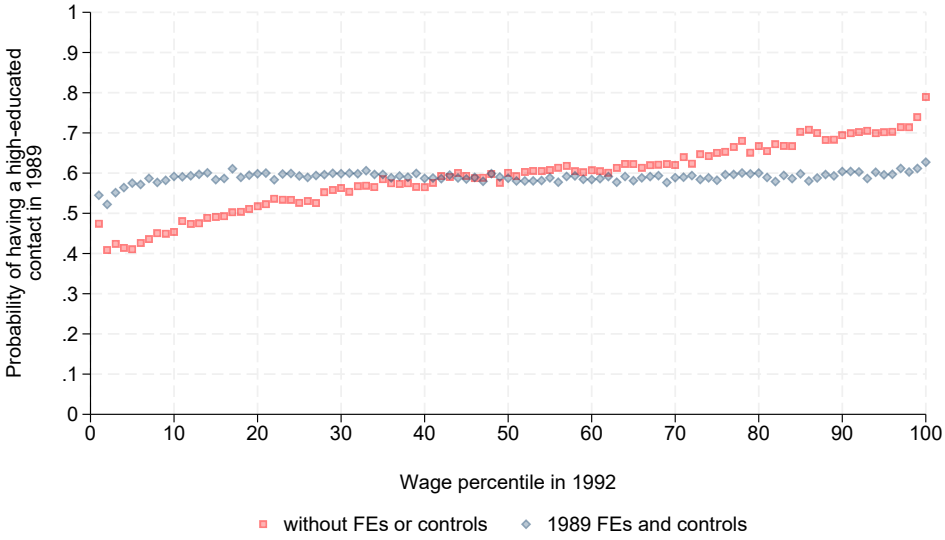

**Notes:** In this figure, we show the relative effect of being female on the probability of achieving "top" labor market outcomes in the year 2000 in West Germany. Our sample includes all West Germans from the GAV-ADIAB data working in the manufacturing sector who were between 20 and 50 years old in 1989. The "top" labor market outcomes in the year 2000 include indicators for (i) being employed, (ii) being in an occupation we define as "high-quality" (technicians, engineers, professionals, or managers), (iii) being employed as a manager, (iv) being employed in an establishment with an AKM fixed effect in the top 25% of the national distribution, (v) achieving a wage in the top 25% of the national distribution, (vi) having a right-censored wage (a feature of the German administrative data), and (vii) log wage (conditional on employment). Our specification to estimate the relative effect of being female is as follows. We regress the outcome variable of choice on a dummy for female, education in 1989 (three levels), age in 1989 and age squared. We successively include increasingly rigid fixed effects. Our first specification only includes 1989 5-digit GDR occupation FEs, we then include both 1989 5-digit GDR occupation FEs and 1989 establishment FEs, and finally an interaction of the two.

Figure 4: Gender gap in top labor market outcomes in East Germany



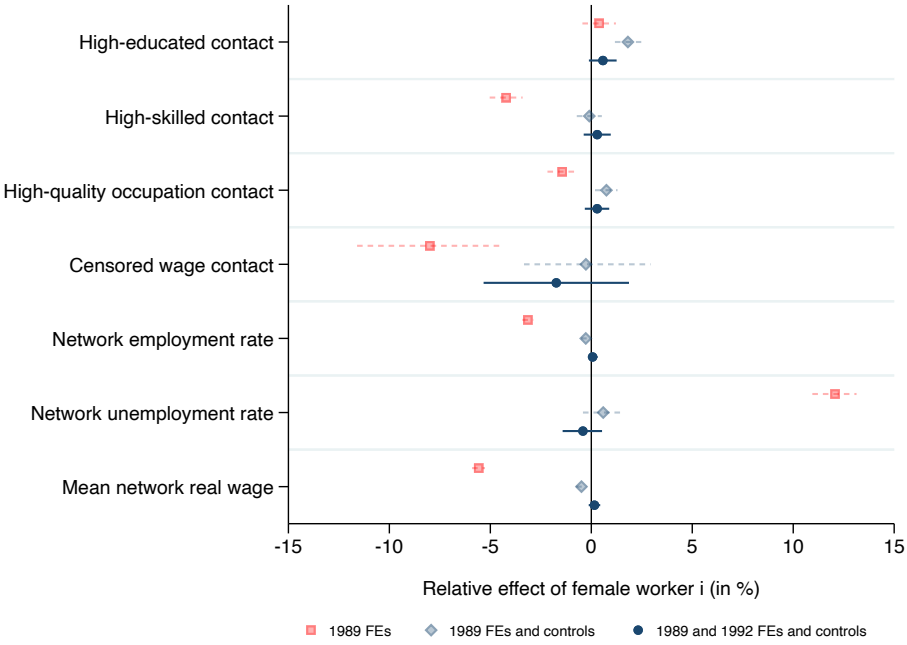

**Notes:** In this figure, we show the relative effect of being female on the probability of achieving "top" labor market outcomes in the year 2000 in East Germany. Our sample includes all East Germans from the IEB-GAV data working in the manufacturing sector who were between 20 and 50 years old in 1989. The "top" labor market outcomes in the year 2000 include indicators for (i) being employed, (ii) being in an occupation we define as "high-quality" (technicians, engineers, professionals, or managers), (iii) being employed as a manager, (iv) being employed in an establishment with an AKM fixed effect in the top 25% of the national distribution, (v) achieving a wage in the top 25% of the national distribution, (vi) having a right-censored wage (a feature of the German administrative data), and (vii) log wage (conditional on employment). Our specification to estimate the relative effect of being female is as follows. We regress the outcome variable of choice on a dummy for female, education in 1989 (three levels), age in 1989 and age squared. We successively include increasingly rigid fixed effects. Our first specification only includes 1989 5-digit GDR occupation FEs, we then include both 1989 5-digit GDR occupation FEs and 1989 establishment FEs, and finally an interaction of the two.

Figure 5: Probability of having a high-educated network contact in 1989 along the 1992 wage distribution



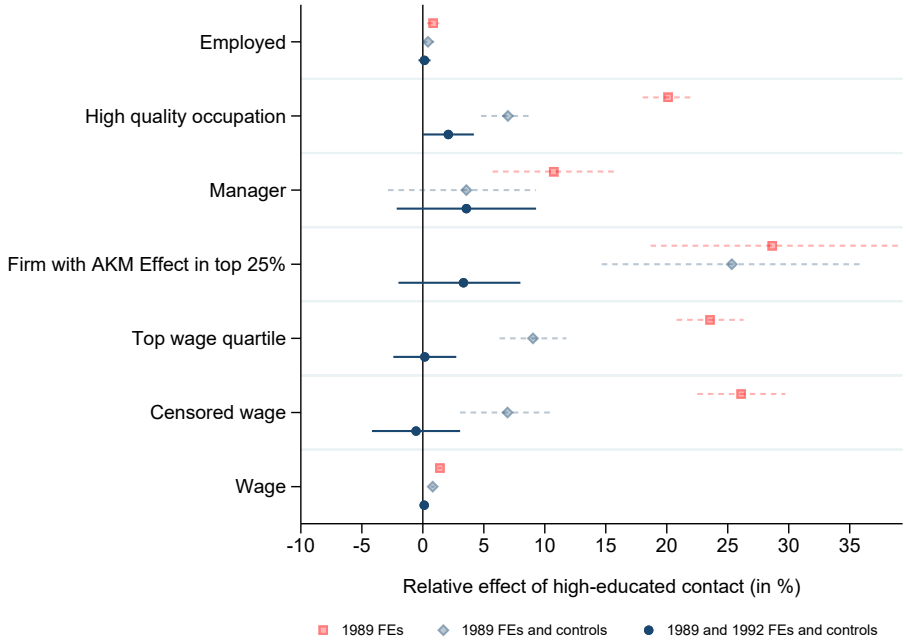

**Notes:** In this figure, we plot the share of East Germans with at least one high-educated contact in 1989 for each percentile of the 1992 log wage distribution (red squares). In a second specification, we residualize log wages in 1992 from a regression on 1989 individual characteristics, i.e., an indicator for being female, education (three levels), age and age squared, indicators for being married, having care obligations, having children, being part-time employed, and the female network share (five levels). Furthermore, we control for log network size, 4-digit GDR occupation fixed effects, 2-digit GDR industry fixed effects, and federal state fixed effects in 1989. We then calculate the share of East Germans with at least one high-educated contact in 1989 for each percentile of the residualized 1992 log wage distribution (gray diamonds). Our sample includes all East Germans from the IEB-GAV data working in the manufacturing sector who were between 20 and 50 years old in 1989. Without controls, the probability of having a high-educated contact rises with wages. By contrast, once we control for observable characteristics in 1989, the probability of having a high-educated contact is approximately uniform across the residualized wage distribution.

Figure 6: Effect of being female on network quality measures



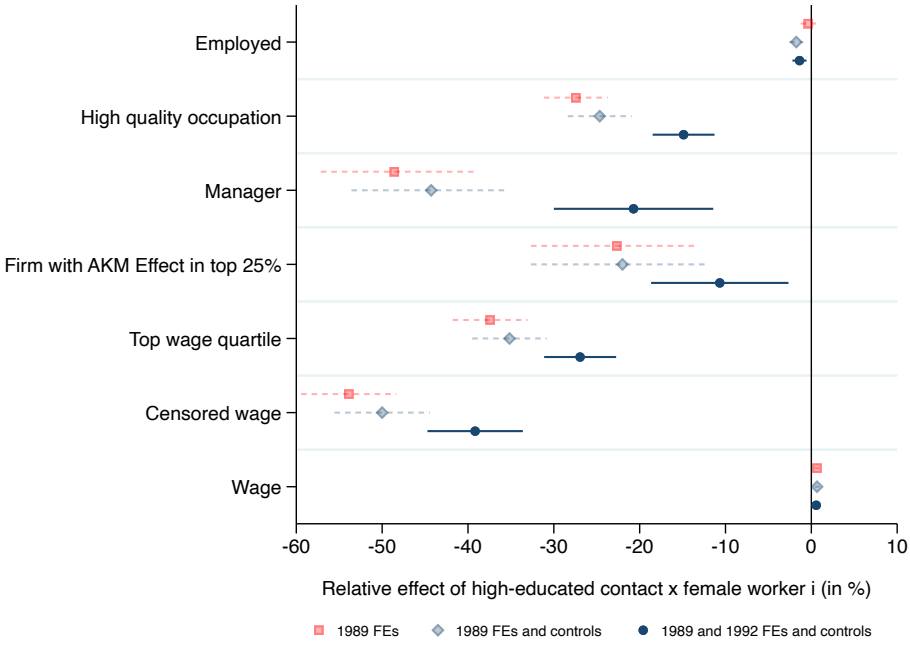

**Notes:** In this figure, we regress various measures of network quality on an indicator for being female, using three different sets of controls and fixed effects. The results indicate no systematic differences in network quality between men and women once all controls and fixed effects are included. Our sample includes all East Germans from the IEB-GAV data working in the manufacturing sector who were between 20 and 50 years old in 1989. Network quality for East German worker $i$ is measured by whether their network contains at least one contact who (i) had a high level of education in 1989, (ii) is highly skilled (person fixed effect from 1992–1999 in the top 25 percent of the national distribution), (iii) was in a high-quality occupation in 1992, or (iv) had a censored wage in 1992. We also consider continuous measures of network quality in 1992: the employment rate in the network, the unemployment insurance (UI) benefit receipt rate, and the mean real wage. In the first specification (red squares), we regress these outcome variables on an indicator for being female and a set of 1989 fixed effects, namely 4-digit GDR occupation, 2-digit industry, and federal state. In the second specification (gray diamonds), we additionally include 1989 covariates: log network size, age and age squared, indicators for education (three levels), being married, having care obligations, having children, being part-time employed, and the female network share (five levels). In the final specification (dark blue circles), we further include 1992 characteristics: log wage, the AKM worker fixed effect (1992–1999), and an indicator for being part-time employed, as well as fixed effects for the establishment and the 3-digit occupation in 1992.

Figure 7: Effect of having a high-educated contact in 1989 on top labor market outcomes in 2000



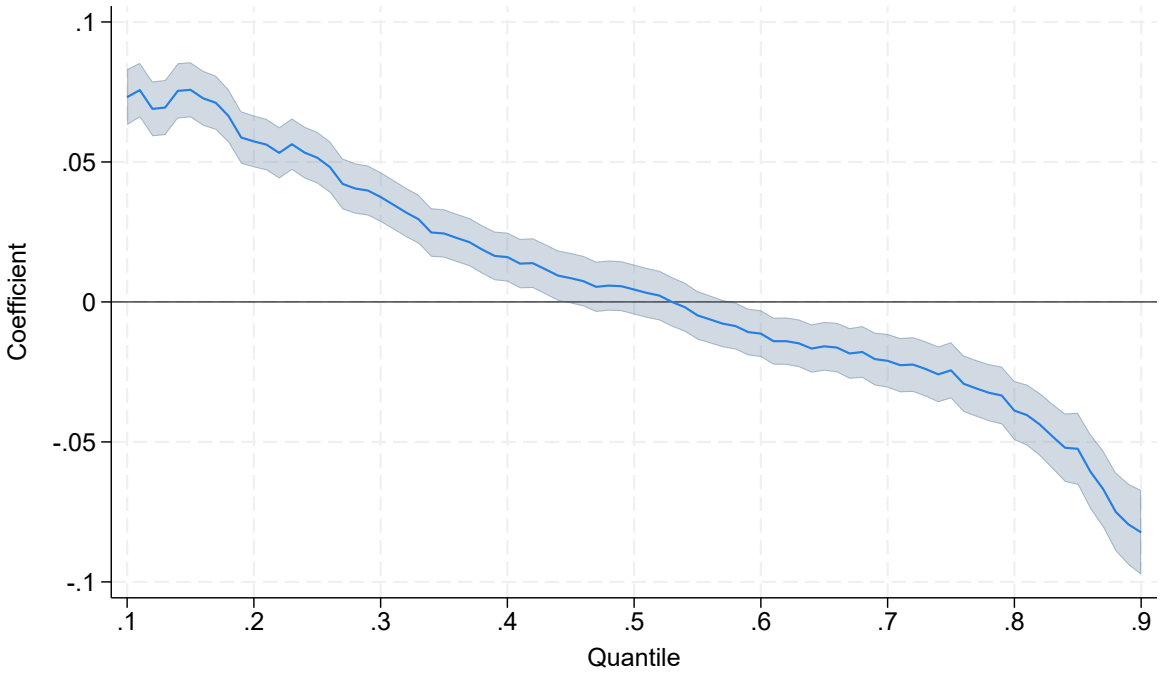

**Notes:** In this figure, we show the estimated relative effect of having a high-educated network contact in 1989 on different "top" labor market outcome measures in the year 2000 for three different sets of controls and fixed effects. Our sample includes all East Germans from the IEB-GAV data working in the manufacturing sector who were between 20 and 50 years old in 1989. The "top" labor market outcomes in 2000 include indicators for (i) being employed, (ii) being in an occupation we define as "high-quality" (technicians, engineers, professionals, or managers), (iii) being employed as a manager, (iv) being employed in an establishment with an AKM fixed effect in the top 25% of the national distribution, (v) achieving a wage in the top 25% of the national distribution, (vi) having a right-censored wage (a feature of the German administrative data), and (vii) log wage (conditional on employment). In the first specification (red squares), we regress these outcome variables on an indicator for having a high-educated network contact in 1989, an indicator for being female, and a set of 1989 fixed effects, namely 4-digit GDR occupation, 2-digit industry, and federal state. In the second specification (gray diamonds), we additionally include 1989 covariates: log network size, age and age squared, indicators for education (three levels), being married, having care obligations, having children, being part-time employed, and the female network share (five levels). In the final specification (dark blue circles), we further include 1992 characteristics: log wage, the AKM worker fixed effect (1992–1999), and an indicator for being part-time employed, as well as fixed effects for the establishment and the 3-digit occupation in 1992.

Figure 8: Differential effect of having a high-educated contact in 1989 on top labor market outcomes in 2000 for women compared to men



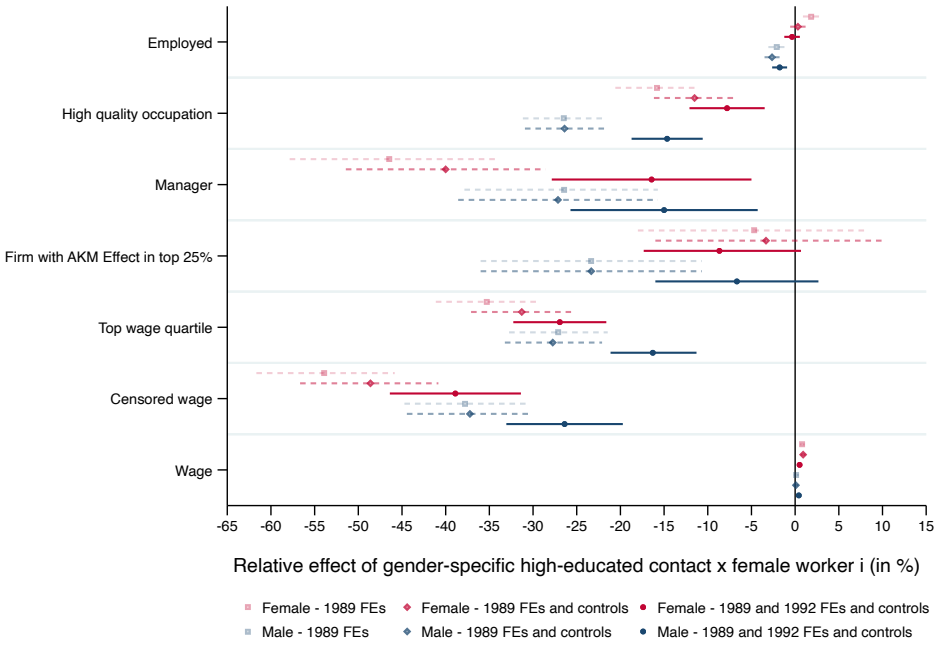

**Notes:** In this figure, we show how the estimated relative effect of having a high-educated network contact in 1989 on various "top" labor market outcomes in 2000 differs between women and men. Our sample includes all East Germans from the IEB-GAV data working in the manufacturing sector who were between 20 and 50 years old in 1989. The "top" labor market outcomes in 2000 include indicators for (i) being employed, (ii) being in an occupation we define as "high-quality" (technicians, engineers, professionals, or managers), (iii) being employed as a manager, (iv) being employed in an establishment with an AKM fixed effect in the top 25% of the national distribution, (v) achieving a wage in the top 25% of the national distribution, (vi) having a right-censored wage (a feature of the German administrative data), and (vii) log wage (conditional on employment). In the first specification (red squares), we regress these outcome variables on the interaction between an indicator for having a high-educated network contact in 1989 and an indicator for being female, the corresponding main effects, and a set of 1989 fixed effects, namely 4-digit GDR occupation, 2-digit industry, and federal state. In the second specification (gray diamonds), we additionally include 1989 covariates: log network size, age and age squared, indicators for education (three levels), being married, having care obligations, having children, being part-time employed, and the female network share (five levels). In the final specification (dark blue circles), we further include 1992 characteristics: log wage, the AKM worker fixed effect (1992–1999), and an indicator for being part-time employed, as well as fixed effects for the establishment and the 3-digit occupation in 1992.

Figure 9: Differential effect of having a high-educated network contact in 1989 on each quantile of the wage distribution in 2000 for women compared to men



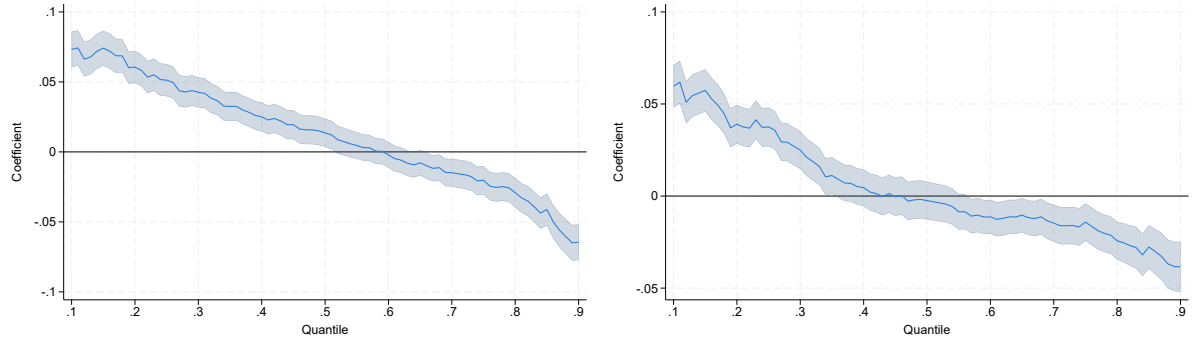

**Notes:** In this figure, we show how the estimated effect of having a high-educated network contact in 1989 on the 2000 log wage distribution differs between women and men, based on a quantile regression framework. We regress log wages in 2000 on the interaction between an indicator for having a high-educated network contact in 1989 and an indicator for being female, the corresponding main effects, and a set of fixed effects: 4-digit GDR occupation in 1989, 2-digit industry in 1989, federal state in 1989, 3-digit occupation in 1992, and establishment in 1992. Furthermore, we include 1989 covariates: log network size, age and age squared, indicators for education (three levels), being married, having care obligations, having children, being part-time employed, and the female network share (five levels). We also control for the log wage in 1992, the AKM worker fixed effect (1992–1999), and an indicator for being part-time employed in 1992. Our sample includes all East Germans from the IEB–GAV data working in the manufacturing sector who were between 20 and 50 years old in 1989 and employed in both 1992 and 2000, due to our use of log wages.

Figure 10: Differential effect of having a female (or male) high-educated contact in 1989 on top labor market outcomes in 2000 for women compared to men




**Notes:** In this figure, we show how the estimated relative effect of having a high-educated female (male) network contact in 1989 on various "top" labor market outcomes in 2000 differs between women and men. Our sample includes all East Germans from the IEB-GAV data working in the manufacturing sector who were between 20 and 50 years old in 1989. The "top" labor market outcomes in 2000 include indicators for (i) being employed, (ii) being in an occupation we define as "high-quality" (technicians, engineers, professionals, or managers), (iii) being employed as a manager, (iv) being employed in an establishment with an AKM fixed effect in the top 25% of the national distribution, (v) achieving a wage in the top 25% of the national distribution, (vi) having a right-censored wage (a feature of the German administrative data), and (vii) log wage (conditional on employment). In the first specification (squares), we regress these outcome variables on the interaction between an indicator for having a high-educated network contact in 1989 and an indicator for being female, the corresponding main effects, and a set of 1989 fixed effects, namely 4-digit GDR occupation, 2-digit industry, and federal state. In the second specification (diamonds), we additionally include 1989 covariates: log network size, age and age squared, indicators for education (three levels), being married, having care obligations, having children, being part-time employed, and the female network share (five levels). In the final specification (circles), we further include 1992 characteristics: log wage, the AKM worker fixed effect (1992–1999), and an indicator for being part-time employed, as well as fixed effects for the establishment and the 3-digit occupation in 1992.

Figure 11: Differential effect of having a high-educated female (or male) network contact in 1989 on each quantile of the wage distribution in 2000 for women compared to men




(a) High-educated *female* network contact

(b) High-educated *male* network contact

**Notes:** In this figure, we show how the estimated effect of having a high-educated female (or male) network contact in 1989 on the 2000 log wage distribution differs between women and men, based on a quantile regression framework. We regress log wages in 2000 on the interaction between an indicator for having a *female* high-educated network contact in 1989 and an indicator for being female, an interaction between an indicator for having a *male* high-educated network contact in 1989 and an indicator for being female, the corresponding main effects, and a set of fixed effects: 4-digit GDR occupation in 1989, 2-digit industry in 1989, federal state in 1989, 3-digit occupation in 1992, and establishment in 1992. Furthermore, we include 1989 covariates: log network size, age and age squared, indicators for education (three levels), being married, having care obligations, having children, being part-time employed, and the female network share (five levels). We also control for the log wage in 1992, the AKM worker fixed effect (1992–1999), and an indicator for being part-time employed in 1992. Our sample includes all East Germans from the IEB–GAV data working in the manufacturing sector who were between 20 and 50 years old in 1989 and employed in both 1992 and 2000, due to our use of log wages.