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Workplace Connections and Labor Migration: The Role of Information in Shaping Expectations

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Abstract

In a context where improved employment outcomes entail relocating to a new destination, how does information from former coworkers alter workers' labor migration decisions? We explore this question using the unique backdrop of German reunification in the early 1990s. For former workers of the German Democratic Republic (GDR), improving employment outcomes typically meant relocating to West Germany, which most were reluctant to do. We show that information from former GDR coworkers in West Germany significantly increased the employment probability of East Germans in West Germany. To identify these network effects, we document and exploit that GDR workers were as-good-as randomly assigned to networks by the GDR system from the perspective of the West German market economy. We then establish that the networks only trigger migration responses among East Germans whose contacts had positive work experiences in the West *and* were similar in their earnings potential in the market-based economy of reunified Germany. These contacts, in essence, serve as role models for the workers' prospects in the West, leading workers to trust the advice and assessments provided and ultimately altering the expected benefits from labor migration for the specific worker.

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1 Introduction

Many studies document the positive role of former coworkers when it comes to job finding (Cingano and Rosolia, 2012; Glitz, 2017; Caldwell and Harmon, 2019; Saygin et al., 2021; Eliason et al., 2023). The phenomenon is often attributed to the fact that people who have worked together in the past know each other's productivity well. However, identifying the specific mechanism by which former coworkers help job finding is empirically challenging. The role of former coworkers is particularly interesting when individuals must move to a new destination to take up a new job. Migration decisions are often impeded by frictions, and the help provided by network members can contribute to overcoming these frictions (Munshi, 2020). The literature has emphasized two main mechanisms of how networks influence migration decisions: by providing information that changes the expectations of potential migrants concerning the payoffs at the new destination and by providing social support that lowers the costs of migration (Blumenstock et al., 2023).

In this study, we capitalize on the unique historical episode of German reunification in the early 1990s, and employ a novel data set to provide new empirical insights into *why* social connections impact labor migration decisions. With a particular focus on social connections established at the workplace at the origin, we disentangle the mechanisms underlying the network effects for labor migration. The German-German context presents an intriguing backdrop for investigating the role of networks in facilitating "moving to opportunity," where the literature tries to understand what impedes people from moving to better neighborhoods, among other things (see, e.g., Bergman et al., 2023). In our context, improvements in employment outcomes for former GDR workers typically meant seeking new jobs in West Germany. Yet, despite large and persistent gaps between East and West Germany, the vast majority of East Germans stayed in the East rather than "moved to opportunity" to the West.[1]

The setting allows us to overcome the two most important challenges when it comes to identifying the mechanisms by which social networks influence labor migration decisions. First, while detailed data on connections and outcomes is often available in either the origin or destination country, ideal data would involve tracking individuals in both locations before and after their migration choices. Second, even with comprehensive data, the challenge lies in the fact that social network connections are typically formed among similar individuals (network homophily). Consequently, observed correlations in outcomes among connected individuals may not necessarily result from information sharing, social support, or other network effects but could simply be due to the similar characteristics of those connected (correlated effects in Manski, 1993).

To address the data challenge, we have constructed a novel data set that links administrative data from the German Democratic Republic (GDR) with register data from post-reunification Germany at the individual level. The combined data allows us to track the labor market biographies of all East

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[1] See Section 2 for a detailed discussion.

Germans who were working in the GDR in 1989 during the years following reunification, specifically from 1992 onwards. Consequently, we can not only identify workplace connections in the GDR, such as who worked together with whom in the same occupation and establishment in 1989, but also examine whether individuals who maintained workplace contacts from the GDR in West Germany after reunification are more inclined to migrate themselves. Key to tease out the mechanisms underlying the network effect is our ability to observe the precise employment situations of these GDR workplace contacts at their new destination in West Germany. This data enables us to assess the specific labor market experiences these individuals have accumulated in West Germany, shedding light on the type of information they can provide to their contacts in East Germany regarding labor migration decisions.

To tackle the issue of identification, we leverage a unique aspect of the economic system in the socialist GDR. In contrast to Western market economies, where the allocation of workers to occupations, companies, and establishments relies on market-driven sorting mechanisms, the GDR employed a centralized planning process for such assignments. Under the GDR regime, the occupational and workplace choices of workers were not determined by market forces, but rather by state-controlled decision-making. The allocation was determined with the aims of promoting social equality, supporting working-class individuals, and advancing modernization efforts. Consequently, the relationships among workers, including the question of who worked together with whom, were predominantly influenced by the directives of the GDR government rather than being driven by considerations of future earnings and employment prospects in West Germany. We substantiate this assertion with ample evidence, demonstrating that workplace connections in the GDR can be regarded as-good-as randomly assigned due to the centralized planning system.

Combining the new data and the as-good-as-random assignment of workplace contacts, we provide new evidence on network effects in labor migration and the mechanisms underpinning them. First, we establish that having a former GDR workplace contact in West Germany increases the likelihood of an East German worker starting a new job in West Germany. We identify this effect by comparing individuals from the East German workforce who, under the same closure of an East German establishment after reunification, simultaneously lost their jobs but, in 1989, had worked in distinct GDR establishments, thereby having different former GDR workplace contacts. At the moment of job displacement, some of these workers possess former GDR workplace contacts who have since migrated to West Germany, while others lack such contacts in the West. Our comparison between these two groups unveils an average network effect of six percent. We provide ample evidence that the results are not driven by the selectivity of network formation.

Furthermore, when we dissect the overall impact on Westward migration into specific destination locations, we discover that former GDR workplace contacts in West Germany significantly increase the probability of migrating to the particular county (by 68%) or even the specific establishment (by 137%) where those contacts are employed. In contrast, having a former GDR workplace contact in the West has

no influence on the probability of migrating to some West German county devoid of any such contacts.

Secondly, we demonstrate that the overall network effect is driven by former GDR workplace contacts who find themselves in advantageous working conditions in West Germany. Specifically, the presence of a former GDR workplace contact who is *employed* in the West at the time of job displacement significantly raises the probability of labor migration. Conversely, having a non-employed contact in the West, or a contact that was in the West but has since returned to East Germany, does not exert any discernible impact on the likelihood of migration. Moreover, having a former GDR workplace contact employed in a high-quality West German establishment increases the probability of labor migration while there is a much smaller and no significant effect of having a former GDR workplace contact in a low-quality West German establishment. We measure establishment quality in various ways, including establishment fixed effects from a wage decomposition as in (Abowd et al., 1999, AKM), the poaching index as defined in Bagger and Lentz (2018), and an indicator for establishment growth. The results are consistent across all our measures of establishment quality. We confirm these findings in a second identification strategy that leverages workers with multiple West contacts and examines whether they join one of their contacts' employers. Precisely, for a given East German worker, we compare the differential impact of West contacts with different characteristics. In particular, the distinguish between the effects of West contacts in high-quality and low-quality establishments on the probability of joining their establishment. The key is that we control for a broad range of observable characteristics of the different contacts, in particular their gender, their municipality of origin, their occupation, age difference to the potential migrant, as well as their tenure and wage in the West German establishment. This way, we ensure that we compare different West contacts that are similar in their demographic characteristics and hierarchical position, but differ in their employer type. Our results show a clear pattern consistent with the findings from the establishment closure identification: Contacts who are employed in high-quality West German establishments are significantly more likely to trigger migration responses than those who are employed in low-quality West German establishments—holding constant a broad range of observables between the multiple contacts. We interpret our finding that the quality of the experience plays an important role as an initial indication that the mechanism underpinning the network effect is related to specific information rather than social support, which could potentially be provided regardless of the contact's particular employment situation.

Next, we proceed to isolate the specific mechanisms that underlie the network effects in migration, capitalizing again on the fact that many East German workers have multiple network contacts in the West. To achieve this, we assess not only the quality of the contact's West German establishment but also compare the East German worker and their contacts in terms of their earnings potential in the Western-style labor market. We measure the earnings potential by the AKM worker fixed effect estimated in the period before migration. We classify workers as having similar earnings potential if they

fall within the same quartile of the distribution of worker fixed effects.[2] Note that the opportunity to observe workers with varying earnings potential in a Western-style labor market within a single network is made possible by the distinctive social experiment upon which our study relies.

We find that the probability of migrating to West Germany is increased solely for East Germans with former GDR coworkers who are employed in a high-quality West German establishment *and* share a similar earnings potential with the prospective East German migrant. In contrast, the presence of a former GDR coworker in a low-quality West German establishment with similar earnings potential has a (non-significantly) decreasing effect on the migration probability. Former GDR coworkers with divergent earnings potential do not exert any discernible impact on the likelihood of migration, independent of the quality of the establishment.

We argue that this distinction allows us, first, to separate the information channel—West contacts providing specific and relevant information on job opportunities and conditions in their West German establishment—from the social support channel—West contacts providing a social safety net or material support to their acquaintances. Given that only workers with similar earnings prospects derive advantages from having contacts in high-quality establishments, it becomes evident that the network effect is not driven by material support or social connections to high-quality or expanding establishments *per se*. Secondly, we can pin down the specific value of the information that is provided. It appears plausible that these contacts in the West provide precise and relevant insights into the working conditions in West Germany. Having worked together during their time in the GDR, East Germans seeking new job opportunities are intimately familiar with the capabilities of their contacts. Moreover, due to their similar earnings potential, these contacts serve as blueprints for their own prospects in the West. As a result, they believe that the advice and assessments provided by these contacts accurately reflect their own prospects in the West German labor market, should they decide to move. The information shared by these contacts can, therefore, consequently impact the expected returns to labor migration for the specific East German in the network.

We contribute to a growing literature that examines the impact of networks on migration decisions. Closely related is a recent paper by Becker et al. (2022) who examines the impact of professional networks on the emigration of Jewish academics dismissed from their jobs by Nazi Germany. They show that academics with more ties to early émigrés were more likely to emigrate themselves. From other existing papers, we learn a lot about the impact of other types of networks on migration decisions, in particular, those defined by the municipality of origin (Munshi, 2003; Beine et al., 2011) or birthplace (Stuart and Taylor, 2018; Buggle et al., 2023). Munshi (2020) provides an excellent review of this literature.

Our paper also relates to a literature that examines the impact of coworker networks on job finding (Cingano and Rosolia, 2012; Saygin et al., 2021; Glitz, 2017; Caldwell and Harmon, 2019; Eliason et al., 2023). We follow their approach of relying on establishment closures to identify the effect of previous

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[2]We confirm our results using alternative measures of similarity, e.g., by education groups.

coworkers on labor market outcomes. From these studies, we learn a lot about the role of previous coworkers in job finding after displacement. The importance of networks for job referrals and job finding has also been analyzed in the context of neighborhood networks (Bayer et al., 2008; Schmutte, 2015), family connections (Kramarz and Skans, 2014), and ethnic networks (Dustmann et al., 2016; Åslund et al., 2014).

Finally, we contribute to the literature that examines the transformation of the former GDR after reunification (Findeisen et al., 2021; Hunt, 2006; Fuchs-Schündeln and Schündeln, 2009; Prantl and Spitz-Oener, 2020). In this context, the paper by (Heise and Porzio, 2022) is particularly interesting as it quantifies the spatial frictions in the German labor market.

The paper is organized as follows. Section 2 provides historical background. Section 3.1 introduces our novel data, samples, and defines the most important variables of this study. Section 3.2 introduces our identification strategy, and Section 3.3 outlines the empirical specifications used in the analysis. Section 4 includes the empirical results. Section 5 concludes. Additional details are provided in the Appendix.

2 Background

2.1 Timeline of German Reunification

In 1949, two fundamentally different German states were founded on the territory of the four Allied occupation zones that were established after the capitulation of Nazi Germany at the end of World War II. The Federal Republic of Germany (FRG)—commonly referred to as West Germany—was founded as a *democratic* state in the French, UK, and US occupation zones. The German Democratic Republic (GDR)—referred to as East Germany—was established in the Soviet occupation zone as a *socialist* state, contrary to its name. With the construction of the Berlin Wall in 1961 at the latest, the connection between East and West Germany was almost completely severed and freedom of movement did not exist any more.[3] The two opposing political systems existed until November 9th, 1989, when—suddenly and unexpectedly—the fall of the Berlin Wall marked the end of the Cold War era and the rapprochement of Eastern Europe with its Western parts. As of July 1st, 1990, the currency union between East and West Germany came into force. On October 3rd, 1990, East and West Germany were officially reunited.

2.2 Work in the GDR

The breakdown of the GDR in the autumn of 1989 was first seen as a "zero-hour" event by social scientists, politicians, and the public alike. The GDR structures, which were established and maintained for four decades, were regarded as "history" with no substantial implications for the transformation process. Only

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[3]Before the Wall's erection, 3.5 million East Germans circumvented Eastern Bloc emigration restrictions and defected from the GDR, many by crossing over the border from East Berlin into West Berlin; from there they could then travel to West Germany and other Western European countries (e.g. Black et al., 2022). Between 1961 and 1989, over 100,000 people attempted to escape, but only over 5,000 people succeeded in escaping over the Wall, with an estimated death toll of those murdered by East German authorities ranging from 136 to more than 200 in and around Berlin.

later, it was acknowledged that, while radical, the events of 1989 did not eradicate four decades of individual biographies (Lutz et al., 1996, p. 3ff.).

One essential aspect of GDR biographies is the social connections formed during GDR times, in particular, the connections formed at the workplace.[4] In the GDR, the workplace served as the focal point not only for work-related activities but also for social interactions, offering a range of services and amenities, including childcare facilities like nurseries and kindergartens, cultural activities, and sports facilities. Many activities were provided to foster a sense of community among workers. People spend a lot of time at the workplace, regardless of whether there was a high or low demand for their labor services. This was due to the official absence of the concept of unemployment in the system. The population of the GDR had the constitutional "right and duty to work". In addition, companies had a strong incentive to hide any surplus staffing to avoid being perceived as inefficient by the authorities in the GDR.

Due to central planning in the GDR, workplaces were typically organized under state control. Most businesses and industries were state-owned, which meant that the government had significant influence and control over production and employment. In a similar vein, the allocation of people to workplaces was a centralized process heavily influenced by the state and its economic planning objectives. Individuals had limited control over their job assignments, which were determined by factors such as their education, skills, political alignment, and the needs of the state-controlled economy.

Regarding education in the GDR, the decision-making process was shaped by state planning, ideology, and the requirements of the centrally managed economy. Compulsory basic education mandated that children attend school from age six until around 16, ensuring a foundational education for all. While individuals had some say in their educational paths beyond basic schooling, the state exerted substantial influence by guiding students toward particular careers and fields of study to align with its objectives and principles. The latter included the restriction of occupational choices of individuals 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 the interplay of these diverse factors, the allocation of individuals to workplaces in the GDR did not rely on their personal abilities, especially those highly regarded in a market-driven economy, like the West German economy.

2.3 East-West Migration

Despite large and persistent gaps between East and West Germany, the vast majority of East Germans stayed in East Germany since reunification. In Appendix A, we present evidence illustrating how the former East-West border continues to pose a barrier to mobility. After an initial upsurge, East-West migration was rather limited (see Appendix Figure A.1). While net migration to West Germany exceeded 350,000 in 1989 and 1990, it slowed down rapidly and was at no means sufficient to eliminate the stark

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[4]Lutz et al. (1996) provide a detailed discussion of the GDR labor market and the influence of the GDR state in the allocation of workers from which we draw in this and the next paragraph.

differences in economic opportunities and well-being.[5] East-West migration resurfaced in the early 2000s but to an even smaller extent. Although the Berlin Wall fell in 1989, it appears that an intangible barrier persists even many years later. This finding is surprising, given that there are no formal or informal impediments to mobility. As German citizens, former residents of the GDR enjoy unrestricted access to the entire German labor market. Language barriers are nonexistent, and the recognition of educational qualifications is guaranteed by the reunification treaty. Furthermore, East and West Germans have comparable levels of formal education. Additionally, the Federal Employment Agencies facilitate access to information about job opportunities across the country, aiding in the matching of job seekers with vacancies. Alongside the German welfare state, these agencies provide a financial support system and a safety net for individuals. Despite these favorable circumstances that should theoretically enhance individuals' prospects of "moving to opportunity", the empirical observations regarding East-West migration since reunification align with the survey findings in Akerlof et al. (1991). In that study, GDR citizens notably overestimated the challenges they would face in securing employment in West Germany.

3 Data and Empirical Strategy

3.1 Data, Samples, and Definitions

Data Sources Our analysis builds on a rich novel individual-level data set that allows us to observe workplace connections, migration choices, and labor market outcomes of East Germans both in the GDR and after reunification. The new data links administrative data on the near-universe of workers employed in the GDR in 1989, i.e., during GDR times, with labor market biographies of these workers in reunited Germany. The primary source is an administrative data set from the former GDR provided by the Federal Archive in Germany, the *Datenspeicher Gesellschaftliches Arbeitsvermögen* ("Data Fund of Societal Work Power"; hereafter, GAV). The data contains demographic information and labor market characteristics of around 7 million workers in the GDR in 1989.[6] The data was used by government agencies in the GDR as part of the central planning process, e.g., for assessing the demand for experts in specific occupations. It covers 72 percent of the East German labor force in 1989. It includes most workers and employees in the country. Still, it excludes 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. It further excludes school teachers, childcare workers, and self-employed individuals. The GAV data contains information on demographic characteristics such as age, gender, place of residence, the number of children under 14, the number of persons in need of care in the household, marital status, nationality, and education (high

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[5] For instance, Schöb (2001) reports results from extensive surveys on well-being in Germany in 1993 and 1998. In almost all dimensions, East Germans report lower values of life satisfaction, well-being, and living standards. Based on a sample of 50% of all German establishments, Heise and Porzio (2022) estimate a wage gap between East and West Germany of 20%, conditional on worker characteristics, establishment size, and industry.

[6] The GAV was collected on an annual basis. However, limited computer 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 of the GAV, which refers to the end of 1989.

school degree, vocational training, and university degree). Further, the data includes unique identifiers for the establishment and the firm where the worker was employed, as well as information on the type of employment, the industry, and the workers' occupation.

Based on names, exact dates of birth, and gender, the data were merged with the *Integrated Employment Biographies* (IEB), the German social security records administered by the Institute for Employment Research (IAB) in Germany. The IEB contains the full employment and earnings histories of all workers covered by the social security system in Germany (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 provides highly accurate information about GDR workers, their workplace and characteristics in 1989, and their full employment biographies between 1992 and 2005.[7]

To the best of our knowledge, we are the first to examine the labor market biographies of GDR workers after German reunification in combination with information that stems from GDR times. The link with the GAV data offers a unique opportunity to observe the labor market decisions of GDR workers in the first years after the Berlin Wall fell, including information on migration to West Germany and job mobility.

Sample Construction From the combined GAV-IEB data, we select GDR workers aged between 20 and 50 in 1989 and follow them up to 2005. Table 1, Columns 1 to 3, show the summary statistics for this **full sample**. Focusing on 1989 in Column 1 (the GAV data) shows that the 4.3 million GDR workers in our full sample were, on average, 35 years old and worked in about 24 thousand different GDR establishments, which on average employed 178 GDR workers. 46 percent of the workers were women, 13 percent had no formal vocational training (or the information on education is missing), and the majority (79%) had a vocational training degree, whereas 8% had a university degree.[8]

Column 2 of Table 1 shows summary statistics for the first year when the same 1989 GDR workers were integrated into the official social security records (the IEB data). First, note that 4 million out of the 4.3 million GDR workers observed in 1989 were successfully merged into the social security records (i.e., 93%). The remaining workers either completely left the labor force, e.g., due to early retirement, or could not be matched, e.g., due to name change after marriage. The gender distribution remained unchanged, and the education distribution remained very similar.

From the full sample of working-age individuals in East Germany, we construct two samples for our main analyses. First, we construct an **establishment-closure sample** that considers all workers

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[7]Without the merge of the GAV and the IEB, GDR workers are difficult to identify in the social security records as they are only covered from 1992 onward in the IEB and the data contains no information on the place of birth. In addition, the IEB contains no information on GDR workers from GDR times. For a more detailed description of the data sources and the linkage, see Liepmann and Müller (2018).

[8]The descriptive statistics on the GDR workforce reported here correspond to comparable figures reported in other sources such as Hoene (1991).

displaced in the closure of an East German establishment between 1992 and 2005. Establishment closures are defined as described by Hethey and Schmieder (2010), i.e., establishment closures are identified based on worker flows and separated from takeovers, spin-offs, or re-namings. We restrict the sample to displaced workers who have been employed full-time and regularly at the closing establishment for at least one year.

Second, we construct a **mover sample** that includes all GDR workers employed in East Germany who changed their employer between 1992 and 2005.

Network Definition We define social networks based on connections formed at the workplace during the GDR times. Specifically, we categorize all workers who worked within the same establishment and held positions in the same 3-digit occupation in 1989 (i.e., during the GDR era) as part of the same GDR coworker network. In our main specification, we restrict all samples to networks with 100 or fewer contacts in the same occupation × establishment cell. Some establishments in the GDR were extraordinarily large, and it would be a stretch to assume that all workers with the same occupation would know each other. Similar size restrictions are typically employed in the literature, see, e.g., Eliason et al. (2023) and Caldwell and Harmon (2019).

In the establishment-closure sample, the average displaced worker has 14 former GDR coworkers who worked in the same establishment and occupation in 1989 (see Table 1 Column 4). In the mover sample, the average job switcher has 9 former GDR coworkers in their network.

3.2 Identification

An important challenge for any study of network effects is the endogeneity of the network formation. Most often, network ties are formed among individuals with similar characteristics. This homophily makes it difficult to disentangle the effect of the network from the effect of these similar, partly unobserved characteristics (Manski, 1993). In the context of workplace connections, the endogeneity of network formation and the associated correlated effects are also of concern. Typically, workers with similar observed and unobserved abilities sort into the same workplaces and occupations. As a consequence, observing two network contacts migrating to the same destination could not be due to network effects but a consequence of their similarity.

In this section, we introduce two identification strategies that we employ to address the potential selection of similar workers into common workplaces. The first identification strategy capitalizes on the historical GDR context wherein due to central planning coworker networks were established in a manner that appeared quasi-random from the standpoint of the West German labor market. The second identification strategy exploits variation across different network contacts of East Germans who have multiple contacts in West Germany.

3.2.1 Between-worker identification

As discussed in Section 2, the allocation of people to occupations and workplaces was heavily influenced by the central planning process in the GDR. As a consequence, who worked with whom—and thus, who was part of the same GDR coworker network—was not determined by consideration of future employment prospects in the market-driven economy of West Germany. In this section, we provide evidence to substantiate our assertion and show that the assignment of individuals to GDR coworker networks was as-good-as-random from the standpoint of a market economy. We will then use the as-good-as-random assignment of networks to compare East German workers with and without contacts who have migrated to West Germany.

However, even if social contacts are randomly assigned, different types of East German workers could be in high demand by West German firms at different points in time, leading to spurious correlations between outcomes of connected network members. We therefore combine the as-good-as-random assignment of network contacts with an establishment-closure design. The establishment-closure design enables us to compare the migration outcomes of displaced East German workers who are forced to seek new employment at the same point in time and under comparable conditions (as remaining at their establishment was not a viable option). We condition on workers displaced in the same establishment-closure event and employed in the same occupation. We further condition on being in the same occupation, industry, and state in 1989, before reunification. The only difference between these workers therefore is their particular establishment—and thus, the GDR coworker network—in 1989. Due to the as-good-as-random assignment of GDR coworkers, this comparison allows us to identify the causal effect of network members in West Germany by comparing the outcomes of displaced workers with GDR contacts in the West (considered the treated group) and those lacking contacts in the West (the control group). In Section 4, we show that the network characteristics of the networks with West contacts and those without are balanced, thereby substantiating our claim of as-good-as-random assignment.

Sorting in the GDR To support the assertion that the allocation of workers to occupations and establishments in the GDR was based on state planning rather than market-driven processes, we examine the sorting of GDR workers before reunification and compare it to the sorting in West Germany and reunited Germany. In particular, we assess the unobservable earnings potential of all East Germans from our full sample in the post-reunification market economy and investigate whether workers were already sorted into occupations and networks based on this market potential as early as 1989. To this aim, we decompose log wages as outlined in the influential study by Abowd et al. (1999, AKM) and calculate worker fixed effects for the post-reunification period. We interpret the AKM person fixed effects as measures of the (unobservable) transferable skills that are deemed valuable in a market-oriented economy and which GDR workers were likely to have possessed even during the GDR era.

We then examine how East German workers are distributed across occupations and establishments

and assess to what extent workers with similar post-reunification earnings potential were concentrated within the same occupations and networks, i.e., occupation × establishment-cells. To this aim, we break down the total variance of worker fixed effects into two components:

$$Var[\alpha_{i,\tau}] = \underbrace{Var[\bar{\alpha}^j]}_{\text{between component}} + \underbrace{\sum_{j=1}^{J} \frac{N_j}{N} Var[\alpha_{i,\tau}|i \in j]}_{\text{within component}},$$

In this equation, $\alpha_{i,\tau}$ represents the worker fixed effect for worker i calculated for the post-reunification period $\tau = $ 1993-1999, 1998-2004, or 2003-2010; and j pertains to the occupation (or network) where worker i is employed.

The relative shares of the between and within components indicate the degree to which workers with similar AKM person fixed effects are sorted into the same occupations (or networks). The more stringent the sorting of workers, the smaller the contribution of the within component. In the extreme scenario of perfect sorting, the within component would account for zero percent of the total variance, with all variation accounted for by the between component. Conversely, in the absence of any sorting, workers would be allocated to occupations (or networks) at random, resulting in a between component of zero because, on average, all occupations (or networks) would exhibit the same worker fixed effect.

Card et al. (2013) provide an equivalent analysis of the occupational sorting of West German men for the period between 1996 and 2002. Table 2, Column (1), shows the results from their Tables III and VI that we can use as a benchmark for the extent of sorting in the West German labor market. For West German men, the overall variance of AKM person fixed effects is 0.107, with a within-occupation share of 64 percent.

In Columns (2)-(7), we present the outcomes for the GDR workers, with two adjacent columns displaying the results for AKM person fixed effects, estimated using the same time interval. For the findings in Columns (4) and (5), the AKM worker fixed effects are computed based on data from the years 1998 to 2004, thus very similar to the period used in Card et al. (2013). Specifically, Column (4) exhibits the results regarding the occupational sorting of GDR workers in 1995. First of all, note how similar the overall variance is (0.099), as well as the within-occupation share (65 percent) for the GDR workers compared to the result in Column (1). Within several years after reunification, the GDR workers were sorted across occupations according to their unobserved, western-style labor market skills to a similar degree as the West German men considered in Card et al. (2013), suggesting that the AKM worker fixed effects do capture the unobservable earnings potential of GDR workers in the post-reunification market economy.

Using the same AKM person fixed effects, we now investigate the corresponding sorting pattern based on the occupations in which GDR workers were employed in 1989 (Column 5). In 1989, the within-GDR-occupation component was 82 percent, a 17 percentage point difference from the measure of sorting in

the West German market economy.

How does the sorting look like across our GDR coworker networks, defined as occupation × establishment cells? For this, we do not have a direct West German comparison. However, in the last row of Column (4), we can see that the within-network share of the total variance in the AKM person fixed effects is 25 percent in 1995, i.e., under market conditions in the post-reunification period. As there are many more occupation × establishment cells than occupation cells, it is not surprising that the value is much lower. The within-network share of the total variance of the AKM person fixed effects also declines using the allocation of workers during GDR times in 1989 (Column 5). However, the within component is 35 percentage points larger in 1989 than in 1995.

Note that the results are invariant to changes in the time intervals used to estimate the AKM person fixed effects. Columns (2) and (3) show the results when the AKM fixed effects are estimated using data for the immediate post-reunification period, 1993 to 1999, and Columns (6) and (7) show the results when the years 2003 to 2010 are used.

In sum, these calculations confirm that workers in the GDR were much less sorted into specific occupations and occupation × establishment cells based on their earnings potential in a market-driven economy compared to their sorting after reunification. This leads us to two conclusions. First, the GDR context offers us a setting where network homophily is much less pronounced compared to the networks typically used in the existing literature that focuses on networks formed in market economies. Second, the relatively large share of within-GDR-network variation of AKM person fixed effects provides us with an opportunity to leverage this variation in our subsequent analyses of heterogeneity.

Comparison of GDR and FRG wage structure   As a second argument as to why the allocation of workers in the GDR was not affected by considerations about future labor market prospects in West Germany, we demonstrate remarkable differences between the occupational wage structures of both countries prior to reunification. Figure 1 shows the monthly average gross incomes in West and East Germany by sector of activity for technical (blue) and commercial occupations (red), respectively.[9] As expected from a state shaped by central planning, the variance of gross income is much denser in the GDR than in the FRG.[10] More surprising is that holding the sector of activity constant, in the FRG, employees in technical occupations receive, on average, a higher income than employees in commercial occupations. In contrast, the pattern is reversed in the GDR. Consequently, individuals in higher-paid GDR jobs were not necessarily higher paid in West Germany and vice versa.

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[9]The average gross income data for the GDR stems from the "Einkommensstichprobe in Arbeiter und Angestelltenhaushalten der DDR" in 1989. The FRG data stems from the "Angestelltenverdienste in Industrie und Handel" in 1988. Both data sets are provided by the Federal Statistical Office.

[10]GDR: Mean 1109,81 (Std. Dev. 77,67); FRG Mean 4376,03 (Std. Dev. 601,75).

3.2.2 Within-worker Identification

In a second identification strategy, we focus on all East Germans who migrated to West Germany and had multiple former GDR coworkers in West Germany before their move. We then compare the effect of different West contacts on the probability that the East German job switcher joins the respective contact's establishment in West Germany. Importantly, we control for a broad range of observable characteristics of the different West contacts, in particular their gender, their municipality of origin, their occupation, age difference to the migrant, as well as their tenure and wage in the West establishment. This way, we ensure that we compare the differential effects of West contacts that are similar in their demographic characteristics and hierarchical position but differ in the type of establishment in West Germany that employs them.

The within-worker identification strategy complements our between-worker strategy in three ways. First, using only variation between West contacts of the same East German migrant addresses any remaining concern that workers with and without West contacts might be systematically different from each other (although our balance checks do not indicate any differences in observed characteristics or labor market outcomes). Second, since identification comes from within-worker variation, we can also draw on the wider sample of all job switchers (not only displaced individuals) without being concerned about selective migration. Third, it allows us to examine the mechanisms driving the network effects by investigating which type of connections trigger migration responses.

3.3 Empirical Specifications

To implement our between-worker identification strategy in the establishment-closure sample, we estimate the following specification

$$
\begin{aligned}
Emp^{W}_{i,t+1} = {} & \beta_0 + \beta_1 GDRCoworker^{W}_{i,t} + \gamma_{j(i,t)} + \eta_{o,89} + \lambda_{l,89} + \theta_{s,89} + \alpha_0 X_{i,89} \\
& + \delta_{o,t} + \alpha_1 X_{i,t} + \varepsilon_{i,t+1}.
\end{aligned}
\tag{1}
$$

The main outcome variable $Emp^{W}_{i,t+1}$ is an indicator that equals one if East German worker i is employed in West Germany in the year after being displaced from his/her East German establishment j in year t. The main explanatory variable is $GDRCoworker^{W}_{i,t}$, an indicator that equals one if East German worker i who was displaced from East German establishment j in t has a GDR contact from 1989 employed in West Germany at the time of displacement. We include establishment closure fixed effects, $\gamma_{j(i,t)}$, to focus on the variation between workers displaced in the same establishment-closure event.

The shock to the GDR labor market brought about by the collapse of the GDR was mostly industry and occupation-specific. To rule out that the initial stayers with and without West contacts in t were differentially hit by this shock, we include fixed effects in the specification for the occupation ($\eta_{o,89}$) and

industry ($\lambda_{l,89}$) in which individuals worked in 1989. Note that the 1989-occupation-specific fixed effects included in the specification make sure that the identifying variation for β_1 comes from workers being in different networks because they worked in 1989 in different establishments, where this allocation was determined by the GDR system.

We also include fixed effects for the East German states in which the stayers lived in 1989, $\theta_{s,89}$, to rule out that differential location-specific shocks brought about by the collapse of the GDR system drive our results. We further control for the size of the GDR network in 1989, the gender, the marital status, the number of children in 1989, and whether the person was the main caregiver for the children in the household in 1989.

We also control for the occupation in which the workers work in t, the year of the establishment closure, to make sure that we are comparing individuals with and without West contacts whose current occupation has the same potential labor market prospect in West Germany. We control for age in t and tenure, with the latter meant to capture the quality of the match between the worker and the East German establishment that closes down. We thereby compare workers with and without West contacts for whom the fit of the closing establishment in East Germany was similar. Finally, we control for education and part-time work, with the latter taking into account the high rate of part-time workers among women.

In all specifications, we cluster standard errors at the level of the establishment closure.

The specification in Equation (1) allows us to estimate the causal effect of having a former GDR coworker in West Germany on the migration decisions of displaced workers. Further, we use the same specification to conduct tests for the as-good-as-random assignment of network contacts. In particular, we use demographic characteristics and pre-migration network characteristics as outcome variables and assess whether there are differences between displaced workers with and without contacts in the West. Finally, we can extend the specification by considering more granular treatment variables (e.g., having a former GDR coworker in a high-quality establishment in West Germany) and more granular outcome variables (e.g., migrating to the specific establishment of a West contact) in order to examine the mechanisms underlying the network effects.

To implement our within-worker identification strategy that relies on East German migrants with multiple former GDR coworkers, we set up a sample that includes for each East German migrant an observation for each of the different West contacts' establishments in East Germany. We then estimate the following specification:

$$
\begin{aligned}
Emp_{i,t+1}^{k(c)} = \beta_0 &+ \beta_1 PosExp_{c,t}^{k(c)} + \gamma_i + \delta_{(j(i,t),k(c,t))} \\
&+ \alpha_0 X_t^{i=c} + \alpha_1 X_{c,t} + \varepsilon_{i,c,t+1}
\end{aligned}
\tag{2}
$$

The outcome variable $Emp_{i,t+1}^{k(c)}$ is an indicator that equals one if worker i who switches from East

German employer j in t to a West German employer in $t+1$ joins contact c's West German employer $k(c)$. The main explanatory variable is $PosExp_{c,t}^{k(c)}$ that indicates whether the GDR-network contact c had a positive labor market experience at the West employer $k(c)$ in t. We assess the labor market experience using two measures:

First, we consider the labor market status of West contact c and $PosExp_{c,t}^{k(c)}$ equals one if c is employed at some employer k in West Germany in t (relative to being non-employed or having returned to the East after an employment spell at k). Second, we consider the quality of c's employer $k(c)$ and $PosExp_{c,t}^{k(c)}$ equals one if West employer k is in the upper half of the distribution of our measures of establishment quality (vs. the lower part, see below for a detailed definition of our measures of establishment quality).

We include worker fixed effects, γ_i, into the specification to ensure that we use the variation between West contacts of the same East German migrant. Additionally, we include the spatial distance between the location of the East German employer j and the West contacts' employers k, denoted by $\delta_{(j(i,t),k(c,t))}$, to captures potential differences in the migration probability depending on the distance to the West.

The aim of our identification strategy is to isolate the effect of the quality of the West contact's labor market experience in West Germany from other characteristics, in particular, the strength of the relation between i and c. To this aim, we create a set of variables that capture various aspects of the relation between contacts: firstly, whether i and c share the same gender; secondly, whether they resided in the same municipality in 1989; thirdly, whether they work in the same occupation t; and fourthly, the age difference between i and c. Essentially, we aim to depict them as "demographic counterparts."

Additionally, we take into consideration distinctions in the characteristics of contact c, specifically examining their age, their tenure in the West German establishment, and their AKM person fixed effect. These control variables capture potential differences in the contacts' position at the West German establishment and their ability to influence hiring decisions.

Establishment quality We quantify the quality of West German establishments using a variety of measures. Our main measure is the establishment's fixed effect from an AKM wage decomposition. We interpret the AKM establishment effect as the wage premium that is payed to all workers of an establishment and distinguish between establishments in West Germany with above and below median establishments effects. Our second measure of establishment quality is a year-specific indicator that equals to one if the number of workers employed at the establishment is growing between $t-1$ and t. Our third measure of establishment quality is the poaching index proposed by Bagger and Lentz (2018). The poaching index ranks establishments by revealed preferences and captures the share of new hires whom the establishment recruits directly from other establishments, as opposed to new hires who join the establishment from unemployment. A higher poaching index indicates a higher establishment quality, as establishments are able to poach workers from other establishments only if they offer superior jobs in terms of wages and non-wage amenities.

For each measure, we split our sample of displaced workers with West contacts into two groups: displaced workers who have at least one former GDR coworker who works for a West German employer with above median establishment quality and displaced workers who have former GDR coworkers in West Germany, but only at establishments that are below the median of the establishment quality distribution.

4 Results

4.1 As-good-as-random Networks

Table 3 reports results for our tests of the hypothesis of as-good-as-random assignment of GDR coworkers. We estimate Equation (1) using all displaced individuals from our establishment-closure sample. For each displaced worker, we compute labor market outcome measures of their former GDR coworker network. In particular, we consider the average and median log wage in the network, the standard deviation of log wages in the network, and the employment and unemployment rates among the network members. We focus on these measures in 1992, the first year available after reunification, and exclude all network members who have already migrated to West Germany by 1992.[11] Our interest is in the difference in network characteristics between workers with and without a former GDR coworker in West Germany at the time of displacement. The table shows estimates for the coefficient β_1 that quantifies this difference, conditional on all of our controls. The estimates show that there are no significant differences in network quality between workers with and without a West contact. Moreover, the magnitude of all coefficients is small.

The results in Table 3 let us conclude that there are no systematic differences in the GDR coworker composition between workers with and without contacts in West Germany and support the hypothesis that the assignment of workers is as good as random from the perspective of the post-reunification labor market.

4.2 Average Network Effects

Table 4 reports our estimated average network effects. Column (1) presents our baseline result for estimating Equation (1) in the establishment-closure sample. On average, 3.6 percent of workers displaced between 1992 and 2005 were employed in West Germany in the year after the establishment closure. There are significant differences between displaced workers who have at least one former GDR coworker employed in the West at the time of the displacement and those for whom none of the former GDR coworkers are employed in the West. Workers with a West contact are about 0.22 percentage points more likely to find a job in West Germany until $t+1$. In relative terms, having at least one employed West contact increases the probability of migrating by 6.1 percent (average network effect).

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[11]Note that wages and employment rates were substantially higher in West Germany after reunification and including them would bias the comparison of different networks.

Placebo A potential concern about the validity of our results might be that they are driven by unobserved similarities between network contacts (correlated effects in Manski's (1993) terminology) rather than by the actual presence of the former GDR coworker in West Germany. Even conditional on the rich set of fixed effects that we include in our model, unobserved demand factors could induce displaced workers and their former GDR coworkers to migrate to the West. To eliminate these concerns, we employ a placebo strategy that evaluates the effect of former GDR coworkers who eventually migrate after the displacement but are still in East Germany at the time of displacement. In particular, we include an additional indicator for the future presence of contacts in West Germany, i.e., in $t + 2$ but not before. If our findings were driven by unobserved similarities between West contacts and displaced workers, we expect a positive and significant relationship between future West contacts and worker i's migration probability. However, the results in column (2) provide evidence against this presence of correlated effects. Former GDR coworkers employed in the West in $t + 2$ but not before do not affect the probability that the displaced worker i is employed in the West in year $t + 1$. Hence, our placebo analysis suggests that our estimated average network effect is not driven by correlated effects.

Robustness Columns (3) to (8) provide several robustness checks for our baseline result. In column (3), we restrict the establishment-closure sample to workers who are employed in the year after displacement. After conditioning on re-employment, the relative effect size stays similar at 4.7 percent.

In column (4), we separate the pull factor of having a former GDR coworker in West Germany from the push factor of having fewer or no former GDR coworkers in the home location in East Germany. This distinction is potentially important since a shrinking network in the home location could also be a driver of out-migration and interfere with our effect of interest (Buggle et al., 2023). To examine this possibility, we focus on the establishment-closure sample but additionally include an indicator for having at least one former GDR-workplace contact that works in the same region as individual i in the displacement year t. Including this dummy variable does not affect the estimated coefficient of our main regressor, the employed West contact dummy, compared to our baseline result. Interestingly, in absolute value, the effect size of having former GDR coworkers in the home location is similar to our main effect. These findings suggest that the effects of the contact at home and the West contact are independent of each other.

Another alternative explanation for the correlation between migration choices of displaced workers and their former GDR coworkers is potential persistent common shocks at the regional or industry level (more granular than our fixed effects) that might have pushed both the West contact and eventually worker i to West Germany. To avoid the possibility that the correlation between the migration of West contacts and displaced workers is not driven by these local effects, we consider two subsets of our establishment-closure sample: In column (4), we consider displaced workers who changed workplace localities between 1989 and t. In column (5), we consider workers who moved to a different industry between 1989 and

the t. These restrictions ensure we focus on individuals who no longer work with their origin-workplace contacts. Thus, we can avoid potential common shocks that might have pushed both the West contact and eventually worker i to West Germany. The relative effect size slightly increases to 7.8 percent when conditioning on workers who change localities in column (4). It slightly decreases to 4.9 percent regarding workers who change industries in column (5). Despite the limited sample size and the associated loss in power, the estimated effects' relative magnitude is similar to our baseline result.

Common migration choices of former GDR coworkers could also be driven by a simple geographical argument. Network members, by definition, originate from the same location in 1989. Due to their close proximity to the inner-German border, some locations could generally be more likely to have migrants or even regular commuters to West Germany. To address this possibility, in column (7), we exclude individuals who worked in counties less than 80 kilometers apart from West Germany in 1989. The relative effect size of our main regressor slightly increases to 7.7 percent, suggesting that inhabitants of the border region and potential commuters are not the drivers of our estimated average network effect. In fact, including them in our sample deflates our results to some extent.

To assess whether the findings for displaced workers generalize to the overall population of job switchers, we focus on all (voluntary and involuntary) job switchers in column (8). In this specification, we estimate Equation (1) in our mover sample and replace the establishment closure fixed effects with year × origin-establishment fixed effects. Identification therefore comes from variation in former GDR coworker networks between all individuals who leave the same establishment in the same year. Standard errors are clustered at the year × origin-establishment level. On average, three percent of workers who moved to a different employer between 1992 and 2005 were employed in West Germany one year after they moved. Again, there are significant differences between workers with former GDR coworkers employed in the West at the time of the job switch and those for whom none of the former GDR coworkers are employed in the West. Workers with a West contact are about 0.15 percentage points more likely to find a job in West Germany until $t + 1$. Hence, the presence of a former GDR coworker increases the probability of migrating by five percent–a strikingly similar relative effect size compared to our establishment-closure sample.

Altogether, our results indicate a positive causal impact of former GDR coworkers in West Germany on the migration probability of their connected East Germans. Having a former colleague in the West increases the probability of migrating to West Germany by roughly six percent. Our findings for the establishment-closure sample are robust across various specifications and generalize to the broader population of job switchers.

Do West contacts direct East Germans to a specific destination?   The outcome in our baseline specification is an indicator for migrating to *some* West German location after job displacement in the East. We now examine whether the average network effects identified in our setting are directional,

i.e., whether former GDR coworkers in West Germany direct their East German connections to their own localities or employers (and potentially even divert them away from other destinations). In the recent literature, directional network effects are interpreted as an important argument for identifying the mechanisms of network effects. For instance, Becker et al. (2022) show that the academic network of early Jewish emigrants directed later emigrants who escaped from Nazi Germany to the same destination country while discouraging them from other destinations. Buggle et al. (2023) use the directed effects of network contacts to disentangle push and pull effects of Jewish migration from Nazi Germany.

In columns (9) to (11) of Table 4, we estimate Equation (1) decomposing the outcome variable into three mutually exclusive events that more precisely indicate the destination in West Germany. In column (9), we show that having a West contact does not significantly affect the probability of migrating to localities in the West different from the contact's county. In column (10), however, we show that having a West contact significantly increases the East German worker's probability of migrating to the same county (but to a different employer) by 0.23 percentage points. In relative terms, this corresponds to an effect size of 67.7 percent. Finally, in column (11), we show that the effect size doubles to 136.4 percent when considering the probability of migrating to the West contact's own employer.

Consequently, the baseline result in column (1) masks significant heterogeneity in the directive nature of the effect. A West contact not only increases the East German worker's probability of migrating to the West but also directs the worker to the contact's specific employer and—to a somewhat smaller extent—the same locality. These findings provide us with an initial insight into the underlying mechanism. Given that having a former GDR workplace contact in the West has no discernible impact on the probability of migrating to a West German county devoid of such contacts, *general* information about West Germany does not seem to be the key mechanism. Instead, more *specific* information (e.g., about local conditions and job opportunities) or on-site social support from their West contacts could play a significant role. In the following analyses, we will focus on disentangling these two channels.

4.3 The role of the contact's labor market experience in the West

Between-Worker Identification Column (1) in Panel A of Table 5 presents our baseline regression results but displays the estimated coefficients of all West contact employment status indicators. Having a non-employed contact in the West or a contact that was in the West but has since returned to East Germany does not exert any discernible impact on the probability of migrating to West Germany. The average network effect is entirely driven by the *employed* West contacts, i.e., former GDR coworkers who collected favorable labor market experience in West Germany.

In columns (2) to (4), we analyze the role of the West contact's employer quality. To this aim, we interact the indicator for having a former GDR coworker employed in the West with an indicator for the above-median quality of the West contact's employer. In column (2), we measure employer quality by the AKM establishment fixed effect. In column (3), high employer quality is associated with a growing

establishment. In column (4), we measure employer quality by the poaching index.[12]

Compared to displaced East German workers without a West contact, those with a West contact employed at a high-quality employer are significantly more likely to migrate to West Germany. The probability of migrating increases by 0.24 to 0.30 percentage points (6.7-8.4 percent) depending on the quality measure. In contrast, the migration probability increases to a smaller extent for displaced workers with West contacts employed at low-quality employers. The estimated coefficients are not significantly different from zero, with one exception in column (4).

The comparison of network effects between displaced workers with West contacts in high- versus low-quality establishments suggests that the particular labor market experience of the West contact plays an important role in triggering migration responses. In order to investigate this hypothesis in a more detailed way and pin down the mechanisms behind the network effects, we now turn to our second identification strategy that exploits within-worker variation of East Germans with multiple West contacts.

Within-Worker Identification Our within-worker identification strategy builds upon the two main findings of the preceding analysis. First, network contacts in West Germany are particularly strong in directing their East German connections towards their own employer. Second, the labor market experience of network contacts in West Germany plays an important role in migration responses among East German connections. To tease out the mechanisms behind these results, we use the sample of all East German workers with multiple West contacts and eventually migrate to West Germany. We then use variation in the labor market experiences of these West contacts *within* a given East German migrant—holding demographic characteristics of the different West contacts constant. Intuitively, we compare two West contacts of an East German migrant with the same age, gender, occupation, tenure, AKM worker fixed effect, and spatial distance to the East but differ in the quality of their West German employer (or their labor market status). We then assess whether the East German migrant ends up at one of their West German employers.

Table 5, Panel B presents the results for estimating Equation (2). In column (1), we investigate the role of the West contacts' employment status. An employed West contact significantly increases the East German worker's probability of moving to the contact's employer by 0.09 percentage points (45 percent) compared to a West contact who is either non-employed or already returned to East Germany.

In columns (2) to (4), we analyze the role of the West contacts' employer quality, again using our various measures of establishment quality. Having a former GDR coworker employed at an establishment with an above-median AKM establishment fixed effect increases the probability of moving to the same employer 24 percent more than having a former GDR coworker at a below-median establishment. The

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[12]To construct the indicator for high quality, we first compute the distribution of the respective measure among all West German establishments pooled across time. In case a displaced East German worker has multiple West contacts, we use the maximum employer quality among all West contacts. We then compute the median of the quality distribution and classify those above the median as high-quality employers. In column (3), the indicator simply equals one if the contact's establishment is growing in terms of employment in the year of displacement.

estimated effect size is similar for other measures of employer quality and varies between 24 and 36 percent.

These results are consistent with the findings from the between-worker identification: Contacts employed in high-quality West German establishments are significantly more likely to trigger migration responses than those employed in low-quality West German establishments. This finding suggests that the mechanism underpinning the network effect is related to specific information rather than social support, which could potentially be provided regardless of the contact's particular employment situation.

4.4 Social support or specific information?

To isolate whether the migration responses are driven by the information about the favorable employment conditions at high-quality or expanding establishments or by the better ability of workers at such establishments to provide material or social support, we further separate between contacts with similar or different earnings potentials in the Western-style labor market. The key idea behind this is that information about employment opportunities and conditions will only be effective in triggering migration responses if it is relevant to the receiver. Material or social support, in contrast, can be useful independently of the similarity between connected workers. To examine this idea, we interact a more granular measure of the West contact's employer quality with a dummy that equals one if the East German worker i and her West contact have a similar earnings potential. We use two measures of similarity in workers' earnings potential. First, we define workers to have similar earnings potential in the West German labor market if worker i and her contact are in the same quartile of the AKM person fixed effect distribution (pooled across the sample period from 1992 to 2005). Second, we define workers to have similar earnings potential if they have the same level of formal education.[13] As before, we define high-quality employers as establishments above the median of the AKM establishment fixed effect distribution among all West German establishments. In addition, we separate employers with AKM establishment fixed effects below the median into two groups: Establishments with an AKM fixed effect below the median of all West German establishments but above the median of all East German establishments (medium-quality employer) and those below the median of the distribution in East Germany (low-quality employer).

Table 6, column (1) shows the results using AKM worker fixed effects to measure similar earnings potential. The results are striking. The positive effect of having a former GDR coworker at a high-quality establishment in West Germany is entirely driven by those contacts who have a similar earnings potential as the East German migrant. In contrast, for West contacts who are different from the East German migrant, establishment quality makes no difference. Having a similar West contact at a high-quality establishment results in a 72% higher probability of joining this worker's employer compared to the comparison group of different workers at medium-quality establishments. All other coefficients are

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[13]Note that while our measure of similarity is based on similar contacts being in the same part of the distribution of ability, our control variables include the level of the AKM worker fixed effect of the West contact to account for the possibility that workers with a higher ability have more say in hiring decisions of their establishment.

not significantly different from the comparison group.

This pattern is very similar in column (2) when similarity is evaluated based on the education level. However, in this specification, similar West contacts that work at medium-quality employers also positively impact worker i's probability of joining the same employer but to a smaller extent. Notably, a former GDR coworker in a low-quality West German establishment with similar earnings potential has no significant effect on the migration probability in both specifications, indicating that favorable labor market experience is superior in triggering migration. Furthermore, former GDR coworkers with divergent earnings potential do not exert any discernible impact on the likelihood of migration, independent of the establishment's quality.

Given that only workers with similar earnings prospects benefit from contacts in high-quality establishments in the West, it becomes evident that the network effect is not driven by social support (e.g., through material support or social connections to high-quality or expanding establishments) *per se*. Instead, our findings point towards specific information as the underlying mechanism. While West contacts may deliver precise information about their working or living conditions to any former coworker, only those with similar earnings capacity can relate to their contact's situation and update their expectations accordingly.

5 Conclusion

In a context where improved employment outcomes entail relocating to a new destination, how does information from former coworkers alter workers' labor migration decisions? In this study, we answer this question by exploring the unique backdrop of German reunification in the early 1990s. Improvements in employment outcomes for former GDR workers typically meant seeking new jobs in West Germany. Yet, despite large and persistent gaps between East and West Germany, the vast majority of East Germans stayed in the East rather than "moved to opportunity" to the West.

Building on several identification strategies, we can show that information from former GDR coworkers in West Germany significantly increased the employment probability of East Germans in West Germany. Furthermore, we can establish that the networks only trigger migration responses among East Germans whose contacts had positive work experiences in the West *and* were similar in their earnings potential in the market-based economy of reunified Germany. These contacts, in essence, serve as role models for the workers' prospects in the West, leading workers to trust the advice and assessments provided and ultimately altering the expected benefits from labor migration for the specific worker.

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Figures and Tables

Figure 1: **G**ross Income in West Germany and the German Democratic Republic Before Reunification
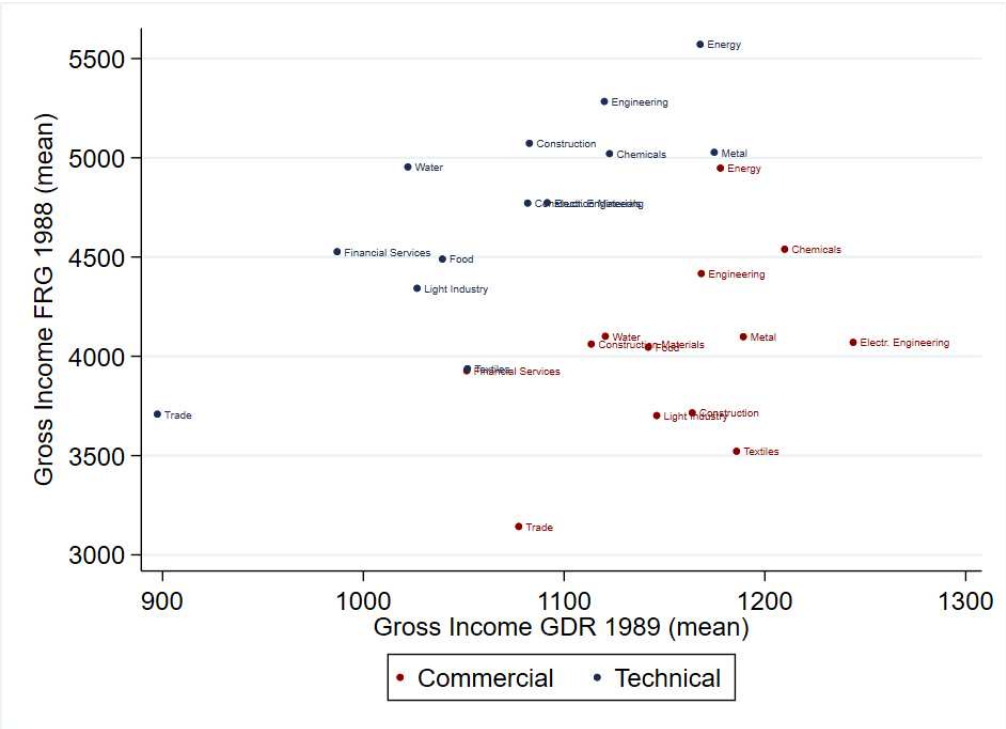
Notes: The GDR data stems from the "Einkommensstichprobe in Arbeiter und Angestelltenhaushalten der DDR" in 1989. The FRG data from the "Angestelltenverdienste in Industrie und Handel" in 1988. Both data sets are provided by the Federal Statistical Office.

Table 1: Summary Statistics

	Full Sample			Establishment-closure Sample	Mover Sample
	(1) 1989 (GAV)	(2) 1992 (All)	(3) 1992-2005 (Employed)	(4) 1992-2005 (Employed)	(5) 1992-2005 (Employed)
Individual Characteristics					
Share Female	.46	.46	.43	.33	.37
Education: Share...					
Low (or missing)	.13	.11	.04	.03	.04
Medium	.79	.81	.85	.88	.85
High	.09	.09	.11	.09	.11
Average Age (SD)	35.08 (8.74)	38.07 (8.74)	42.78 (8.31)	43.08 (8.24)	43.73 (9.01)
Network Characteristics (Sumstats calculated at Network Level)					
Total Number of Networks	551,485	528,456	521,361	122,470	256,581
Average Network Size in 1989 (SD)	6.78 (60.30)	7.05 (61.58)	7.15 (62.00)	13.61 (17.71)	8.51 (13.78)
(10pct; 50pct; 90pct)	(0; 1; 12)	(0; 1; 12)	(0; 1; 12)	(1; 7; 36)	(1; 3; 22)
Share Female in 1989 Networks	.49				
Average Age of 1989-Network Members	35.87 (6.82)				
Average Education in the 1989 Network: Share...					
Low (or missing)	.13				
Medium	.75				
High	.13				
Average Number of West Contacts from the 1989 Network (SD)	-	.57 (4.28)	.73 (6.26)	1.20 (2.11)	0.76 (1.59)
(10pct; 50pct; 90pct)		(0; 0; 1)	(0; 0; 1.29)	(0; 0.33; 3.33)	(0; 0; 2)
employed	-	.52 (3.97)	.62 (5.41)	1.00 (1.82)	.63 (1.37)
		(0; 0; 1)	(0; 0; 1.07)	(0; 0; 3)	(0; 0; 1.8)
nonemployed	-	.05 (0.41)	.11 (0.92)	.20 (0.47)	.13 (0.33)
		(0; 0; 0)	(0; 0; 0.21)	(0; 0; 1)	(0; 0; 0.5)
returned	-	.05 (0.41)	.25 (1.80)	.47 (1.02)	.27 (0.72)
		(0; 0; 0)	(0; 0; 0.71)	(0; 0; 1.5)	(0; 0; 0.89)
Employer Characteristics (Sumstats calculated at Estab. Level)					
Average Establishment Size (# of former GDR workers in the Full Sample)					
in East Germany (SD)	177.97 (856.34)	12.76 (80.32)	5.74 (26.77)	4.85 (14.56)	9.76 (38.34)
(10pct; 50pct; 90pct)	(4; 52; 385)	(1; 2; 21)	(1; 1.67; 9.86)	(1; 2; 10)	(1; 3; 18.38)
in West Germany (SD)	-	2.38 (5.36)	1.70 (3.42)	-	-
(10pct; 50pct; 90pct)	-	(1; 1; 4)	(1; 1; 2.54)	-	-
Average Establishment Size (# of former GDR workers in the establishment-closure sample or Mover Sample, East Germany) (SD)	-	-	-	2.50 (5.66)	2.04 (4.41)
(10pct; 50pct; 90pct)	-	-	-	(1; 1; 5)	(1; 1; 3.29)
Average Establishment Size (# of full-time workers according to the EHP)					
in East Germany		20.48 (120.10)	8.94 (40.37)	7.43 (20.58)	15.43 (57.92)
		(1; 4; 33)	(0.83; 2.70; 16.33)	(1; 3; 16)	(1; 5; 29.4)
in West Germany		81.97 (465.24)	37.18 (209.39)	-	-
		(3; 17; 160)	(1; 9; 72.25)	-	-
Number of Observations	4,290,085	3,966,065	35,724,219	332,166	2,557,680
(N x Year but censored if individual leaves sample; multiple occ. possible for establishment-closure sample/mover sample)					
Number of Individuals N	4,290,085	3,966,065	3,865,336	297,905	1,539,756
employed in East Germany	4,290,085	2,732,436	3,600,642	297,905	1,539,756
employed in West Germany	0	276,055	683,942	0	0
not employed (=no workplace)	0	957,574	0	0	0
Number of Establishments that employ former GDR workers	24,105	330,260	1,119,226	132,647	375,716
in East Germany	24,105	214,218	698,675	132,647	375,716
in West Germany	-	116,042	420,841	-	-

Notes: In this table, we report summary statistics of GDR workers who were aged 20 to 50 in 1989 for the full sample, the establishment-closure sample, and the mover sample. The samples exclude Berlin. The figures for 1989 in column (1) stem from the GDR data (GAV). The figures in the other columns stem from the German social security records (IEB) after the merge of the GAV and the IEB. Apart from the age restriction, the full sample in column (2) includes no further restrictions, i.e., it includes employed and unemployed individuals. The samples in columns (3) to (4) show the summary statistics for the employed between 1992 and 2005 in the full sample, the 'establishment-closure sample, and the mover sample. See Section 3.1 for further details on the samples. Establishment size statistics in 1989 are calculated from the GAV data. Establishment size statistics after 1989 are extracted from the Establishment History Panel (EHP) and take all full-time workers at a given establishment into account (including West Germans).

Table 2: Sorting

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	CHK (2013) results for West-German men	Our results for East German men & women					
	Person FE 1996-2002	Person FE 1993-1999		Person FE 1998-2004		Person FE 2003-2010	
		in 1995	in 1989	in 1995	in 1989	in 1995	in 1989
Overall Variance	0.107	0.078	0.085	0.099	0.106	0.113	0.123
Share "Within"							
Occupation	64%	63%	81%	65%	82%	69%	83%
Occupation × Establishment		22%	59%	25%	60%	27%	60%

Notes: As a benchmark, column (1) illustrates the results on occupational sorting for West German men after reunification by Card et al. (2013), extracted from their original Tables III and VI. The authors' estimates refer to the sample period 1996-2002. In columns (2)-(7), we present our results for East German men and women based on AKM person fixed effects from slightly different time intervals (i.e., 1993-1999, 1998-2004, and 2003-2010). We display the occupational and network-specific (occupation × establishment) sorting results of East German workers before reunification in 1989 and after reunification, exemplarily for 1995.

Table 3: Network Quality Balancing Tests

	(1)	(2)	(3)	(4)	(5)
	Average Log Wage	Median Log Wage	Std. Dev. Log Wage	Employment Rate	Unemployment Rate
GDR coworker employed in West in t	-0.0004	0.0017	0.0025	-0.0019	0.0052
	(0.0050)	(0.0049)	(0.0052)	(0.0059)	(0.0051)
Establishment closure FE	Yes	Yes	Yes	Yes	Yes
Occupation FE (1989)	Yes	Yes	Yes	Yes	Yes
Industry FE (1989)	Yes	Yes	Yes	Yes	Yes
State FE (1989)	Yes	Yes	Yes	Yes	Yes
Occupation FE (t)	Yes	Yes	Yes	Yes	Yes
Individual characteristics (t & 1989)	Yes	Yes	Yes	Yes	Yes
Observations	12,130	12,130	10,805	12,483	12,483
Mean of dependent variable	3.83	3.84	0.26	0.78	0.16
(β_1/Mean Y)*100	-0.010%	0.044%	0.962%	-0.244%	3.250%

Notes: The sample consists of workers employed in East Germany in 1989 and involved in a plant closure event in 1992 (establishment-closure sample). Plants in Berlin are excluded throughout. For each worker i, the GDR workplace network consists of all former coworkers employed at the same establishment in the same (4-digit) occupation in 1989. The sample is restricted to workers with at most 100 coworkers. The outcome variables measure each worker i's network quality in 1992 in terms of average log(real wage), median log(real wage), standard deviation of real wages, employment rate (= # employed/ # total network), and unemployment rate (= # UI benefit recipients / # total network) of worker i's former GDR coworkers in 1992. For the construction of network quality measures, we exclude former GDR coworkers employed in West Germany in 1992 from the sample to avoid endogeneity. The main regressor is a dummy variable, indicating whether at least one of worker i's former GDR coworkers is employed in West Germany in t. We include the following contemporaneous control variables: a dummy for having a non-employed West contact in t, a dummy for having a contact that already returned to East Germany in t, a female dummy, and a dummy for the education level, tenure, age, and age squared. We also include the worker's characteristics that refer to 1989: a dummy for being married, a dummy for care responsibilities, a dummy for kids in the household, a dummy for having a part-time job, and the network size. Additionally, all regressions include fixed effects for the plant closure event, fixed effects for the worker's (3-digit) occupation in t and 1989 and fixed effects for the industry and federal state in 1989. Standard errors in parentheses are clustered by the closing (origin) establishment. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1. Results hold without the inclusion of FE and individual characteristics.

Table 4: The Effect of GDR Coworkers in West Germany on Migration Decisions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
						Worker displaced in t is employed in West in $t+1$					
	Baseline	**Placebo**			**Robustness**					**Different destinations**	
		Future	Employed	Contact	Switchers of		Excluding	All	County	Contact's County	
		West Contacts	in $t+1$	at Home	Region	Industry	Border Region	Movers	without Contact	Different Employer	Same Employer
GDR coworker employed in West in t	0.22**	0.21**	0.26*	0.22**	0.45*	0.19*	0.24**	0.15***	-0.04	0.23***	0.03***
	(0.09)	(0.10)	(0.14)	(0.10)	(0.26)	(0.11)	(0.10)	(0.03)	(0.09)	(0.03)	(0.01)
in $t+2$ (but not before)		-0.04									
		(0.30)									
Contact at home				-0.26**							
				(0.12)							
Establishment closure FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Origin-establishment × year FE	No	No	No	No	No	No	No	Yes	No	No	No
Occupation FE (1989)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (1989)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE (1989)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupation FE (t)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual characteristics (t & 1989)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	246,415	246,415	146,430	246,415	46,635	196,398	183,216	1,986,511	246,415	246,415	246,415
Number of establishments	46,914	46,914	30,099	46,914	11,230	40,566	35,532	156,651	46,914	46,914	46,914
Mean of dependent variable	3.6	3.6	5.5	3.6	5.8	3.9	3.1	3.0	3.2	0.34	0.022
(β_1/Mean Y)*100	6.11%	5.83%	4.73%	6.11%	7.80%	4.87%	7.74%	5.00%	-1.23%	67.65%	136.36%

Notes: The sample in column (8) consists of workers employed in East Germany in 1989 who switched jobs from an East German establishment between 1992 and 2005 (mover sample). In the remaining columns, the sample consists of workers employed in East Germany in 1989 and involved in a plant closure event of an East German establishment between 1992 and 2005 (establishment-closure sample). Plants in Berlin are excluded throughout. For each worker i, the GDR workplace network consists of all former coworkers employed at the same establishment in the same (4-digit) occupation in 1989. The sample is restricted to workers with at most 100 coworkers. In columns (1) to (8), the outcome variable indicates whether worker i, displaced (or switched jobs) in year t, is employed in West Germany in $t+1$. In column (9), the binary outcome variable indicates whether worker i is employed in a West German county in $t+1$ where she has no contacts. In column (10), the binary outcome variable indicates whether worker i is employed in the same West German county as her contact in $t+1$ but not at the same employer. In column (11), the outcome variable indicates whether worker i is employed at the same West German employer as her contact in $t+1$. The main regressor is a dummy variable, indicating whether at least one of worker i's former GDR coworkers is employed in West Germany in t. We include the following contemporaneous control variables: a dummy for having a non-employed West contact in t, a dummy for having a contact that already returned to East Germany in t, a female dummy, and a dummy for the education level, tenure, age, and age squared. We also include the worker's characteristics that refer to 1989: a dummy for being married, a dummy for care responsibilities, a dummy for kids in the household, a dummy for having a part-time job, and the network size. Additionally, all regressions include fixed effects for the worker's (3-digit) occupation in t and 1989 and fixed effects for the industry and federal state in 1989. In column (8), we include plant × year fixed effects. In the remaining columns, we include fixed effects for the plant closure event. Standard errors (in parentheses) are clustered at the establishment-closure (origin establishment) level. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.

Table 5: The Role of the West Contact's Employment Status and Employer Quality

	(1)	(2)	(3)	(4)
Panel A. Between-worker Identification	Worker displaced in t is employed in West in $t+1$			
	Employment Status	AKM Estab. FE	Growing Estab.	Poaching Index
GDR coworker employed in West in t	0.22**			
	(0.09)			
GDR coworker non-employed in West in t	0.13			
	(0.10)			
GDR coworker returned in t	0.06			
	(0.10)			
GDR coworker employed in West in t × high-quality employer		0.30**	0.27**	0.24**
		(0.12)	(0.11)	(0.13)
GDR coworker employed in West in t × low-quality employer		0.17	0.15	0.21**
		(0.11)	(0.11)	(0.10)
Establishment closure FE	Yes	Yes	Yes	Yes
Individual characteristics (t & 1989)	Yes	Yes	Yes	Yes
Occupation FE (t)	Yes	Yes	Yes	Yes
Occupation FE (1989)	Yes	Yes	Yes	Yes
Industry FE (1989)	Yes	Yes	Yes	Yes
State FE (1989)	Yes	Yes	Yes	Yes
Observations	246,415	239,356	239,356	239,356
Number of establishment closures	46,914	45,806	45,806	45,806
Mean of dependent variable	3.60	3.59	3.59	3.59
($\beta_{employed}$/Mean Y)*100	6.1%			
($\beta_{non-empl.}$/Mean Y)*100	3.6%			
($\beta_{returned}$/Mean Y)*100	1.7%			
($\beta_{employed,high-quality}$/Mean Y)*100		8.4%	7.5%	6.7%
($\beta_{employed,low-quality}$/Mean Y)*100		4.7%	4.2%	5.8%
Panel B. Within-worker Identification	Job switcher i in t has a new job in $t+1$ at West contact's current or last employer k			
GDR coworker employed in West in t (vs. nonemployed/returned)	0.09***			
	(0.02)			
GDR coworker employed in West in t × high-quality employer (vs. low-quality employer)		0.06**	0.08***	0.09***
		(0.03)	(0.03)	(0.03)
Individual FE	Yes	Yes	Yes	Yes
Spatial distance to West contact's employer	Yes	Yes	Yes	Yes
Demographic twin	Yes	Yes	Yes	Yes
Contact's characteristics in t	Yes	Yes	Yes	Yes
Observations	276,914	156,402	156,402	156,402
Number of job switchers	43,773	34,204	34,204	34,204
Number of origin establishments	28,501	23,137	23,137	23,137
Mean of dependent variable	0.20	0.25	0.25	0.25
(β_1/Mean Y)*100	45%	24%	32%	36%

Notes: Panel A refers to the establishment-closure sample and follows our baseline specification, i.e., the omitted category is East German workers without a West contact. The outcome variable indicates whether displaced worker i is employed in West Germany in $t+1$. In column (1), we show our baseline regression results but display the estimated coefficients of all West contact employment status indicators. In columns (2)-(4), we interact the West contact dummy with an employer quality indicator. High-employer quality is associated with a growing establishment or an establishment with a Poaching Index (=# new hires directly from other establishments /# hires from unemployment) or AKM establishment FE above the median of the distribution among all West German establishments (pooled across time), respectively. We use the maximum employer quality among displaced worker i's West contacts to define the quality indicator. Standard errors (in parentheses) are clustered at the establishment-closure level.

Panel B refers to the Mover Sample. The observation unit is worker i × West contact pairs. We restrict the sample to establishment switchers employed in West Germany in $t+1$ with multiple (former) West contacts. We exclude establishments in Berlin as potential destinations and drop workers whose origin establishment (in t) is located in Berlin. The outcome variable indicates whether worker i is employed at her West contact's employer in $t+1$. Besides individual FE, we control for spatial distance (between worker i's origin establishment in t and her West contact's establishment as a potential destination) and distance squared. Furthermore, we include controls for whether the West contact and worker i are demographic twins, i.e., dummy variables that indicate whether worker i has at least one GDR coworker at the potential destination establishment that has (a) the same gender, (b) lived in the same municipality in 1989, (c) works in the same occupation in t and the maximum age difference between worker i and contacts at the potential destination establishment. We also control for the contacts' characteristics, i.e., the maximum age, tenure, and AKM person FE of contact(s) at the potential destination establishment. In column (1), we analyze the role of the West contact's employment status. In columns (2)-(4), we interact the West contact dummy with the employer quality indicator defined above. Standard errors (in parentheses) are clustered at the worker level. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.

Table 6: The Role of the West Contact's Similarity

	(1)	(2)
	Job switcher i in t has a new job in $t+1$ at West contact's current or last employer k	
	Similarity defined by:	
	AKM Person FE	Education
GDR coworker employed in West in t in establ. k of...		
... high quality $\times$ similar worker ($i = c$)	0.18***	0.20***
	(0.05)	(0.05)
... high quality $\times$ different worker ($i \neq c$)	0.03	0.08
	(0.03)	(0.05)
... medium quality $\times$ similar worker ($i = c$)	0.08	0.15***
	(0.05)	(0.05)
... medium quality $\times$ different worker ($i \neq c$, omitted)		
... low quality $\times$ similar worker ($i = c$)	-0.10	0.10
	(0.09)	(0.09)
... low quality $\times$ different worker ($i \neq c$)	-0.02	-0.15
	(0.08)	(0.10)
Individual FE	Yes	Yes
Spatial distance to West contact's employer	Yes	Yes
Demographic twin	Yes	Yes
Contact's characteristics in t	Yes	Yes
Observations	156,402	156,402
Number of job switchers	34,204	34,204
Number of origin establishments	23,137	23,137
Mean of dependent variable	0.25	0.25
$(\beta_{high,similar}/$Mean Y$)*100$	72%	80%
$(\beta_{high,different}/$Mean Y$)*100$	12%	32%
$(\beta_{medium,similar}/$Mean Y$)*100$	32%	60%
$(\beta_{low,similar}/$Mean Y$)*100$	-40%	40%
$(\beta_{low,different}/$Mean Y$)*100$	-8%	-60%

Notes: Mover Sample. The observation unit is worker i $\times$ West contact pairs. We restrict the sample to establishment switchers employed in West Germany in $t+1$ with multiple (former) West contacts. We exclude establishments in Berlin as potential destinations and drop workers whose origin establishment (in t) is located in Berlin. The outcome variable indicates whether worker i is employed at her West contact's employer in $t+1$. Besides individual FE, we control for spatial distance (between worker i's origin establishment in t and her West contact's establishment as a potential destination) and distance squared. Furthermore, we include controls for whether the West contact and worker i are demographic twins, i.e., dummy variables that indicate whether worker i has at least one GDR coworker at the potential destination establishment that has (a) the same gender, (b) lived in the same municipality in 1989, (c) works in the same occupation in t and the maximum age difference between worker i and contacts at the potential destination establishment. We also control for the contacts' characteristics, i.e., the maximum age, tenure, and AKM person FE of contact(s) at the potential destination establishment. In this table, we interact a more granular measure of employer quality with the employed West contact indicator and a dummy for similarity between worker i and her West contact. High-quality employers are, again, employers above the median of the AKM establishment FE distribution among all West German establishments. However, employers with AKM establishment FE below the median are further distinguished in whether their AKM FE is above (medium-quality employer) or below the median of the distribution in East Germany (low-quality employer). In column (1), the similarity dummy indicates whether worker i and her contact are in the same quartile of the AKM person FE distribution pooled across the sample period (1992-2005). In column (2), similarity is evaluated based on the education level instead. Standard errors (in parentheses) are clustered at the worker level. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.

Appendix

A   Former Inner-German Border as Hurdle to Job Mobility

As illustrated in figure A.1, after an initial upsurge, East-West migration was rather limited from 1986 to 2005. While net migration to West Germany exceeded 350,000 in 1989 and 1990, it flattened soon after. East-West migration resurfaced in the early 2000s but to an even smaller extent. Over the same period, labor reallocation within East Germany was high (Findeisen et al., 2021), partly triggered by the extensive privatization program administered by the Treuhandanstalt (Mergele et al., 2022). Although East Germans were frequently forced to switch jobs and locations during this transformation period, and despite significantly higher wages and better employment prospects in the West, the vast majority of East Germans did not move towards opportunity in West Germany.

To illustrate this point, we examine worker mobility at the county level. We construct a data set of origin-destination county pairs where the origin county a is located in East Germany, and the destination county $b \neq a$ can be located either in East or West Germany. For each origin-destination county pair ab, we count all migration flows, $flows_{ab}$, where an East German worker is employed in county a in year t and in county $b \neq a$ in year $t + 1$, aggregating all flows between 1992 and 2005. We then estimate the equation

$$\log(flows_{ab}) = \beta_0 + \beta_1 west_b + \beta_2 dist_{ab} + \beta_3 dist_{ab}^2 + \beta_4 city_b + \delta_a + \varepsilon_{ab}, \tag{3}$$

where $west_b$ indicates whether the destination county b is located in West Germany, $dist_{ab}$ measures the distance between counties a and b in kilometers, $city_b$ indicates whether the destination county is an urban area, and δ_a are origin-county fixed effects that capture that some counties are generally more likely to lose workers. Our coefficient of interest is β_1, the difference in flows to destinations in West Germany. We exclude Berlin from the sample as it cannot be unambiguously assigned to East or West Germany.

Conditional on being separated by the same distance, flows into West German counties are much rarer than flows within East Germany. Column 1 of Table A.1 shows that aggregate flows are roughly 90 percent lower if the destination county is in West Germany, conditional on the distance. In column 2, we show that this result is robust to excluding West German counties further away from the East than the maximum distance between counties within East Germany. Our estimates are very similar to those obtained in a related gravity equation by Heise and Porzio (2022), who use LIAB data to show that for East Germans, the probability of switching across the East-West border is only a twentieth as high as the transition rate within regions.

The striking difference in job mobility suggests that spatial frictions prevent workers from migrating to West Germany after reunification, even though there are frequent worker flows of similar distances. A potential explanation is the lack of information about employment opportunities and wage prospects in West Germany. In our main analysis, we examine the role of former GDR coworkers who have already migrated to West Germany for migration decisions of East German workers. Having a former coworker in the West might reduce the hurdle to migrating by providing relevant information about labor market opportunities.

Figure A.1: Migration between East and West Germany, 1986-2005
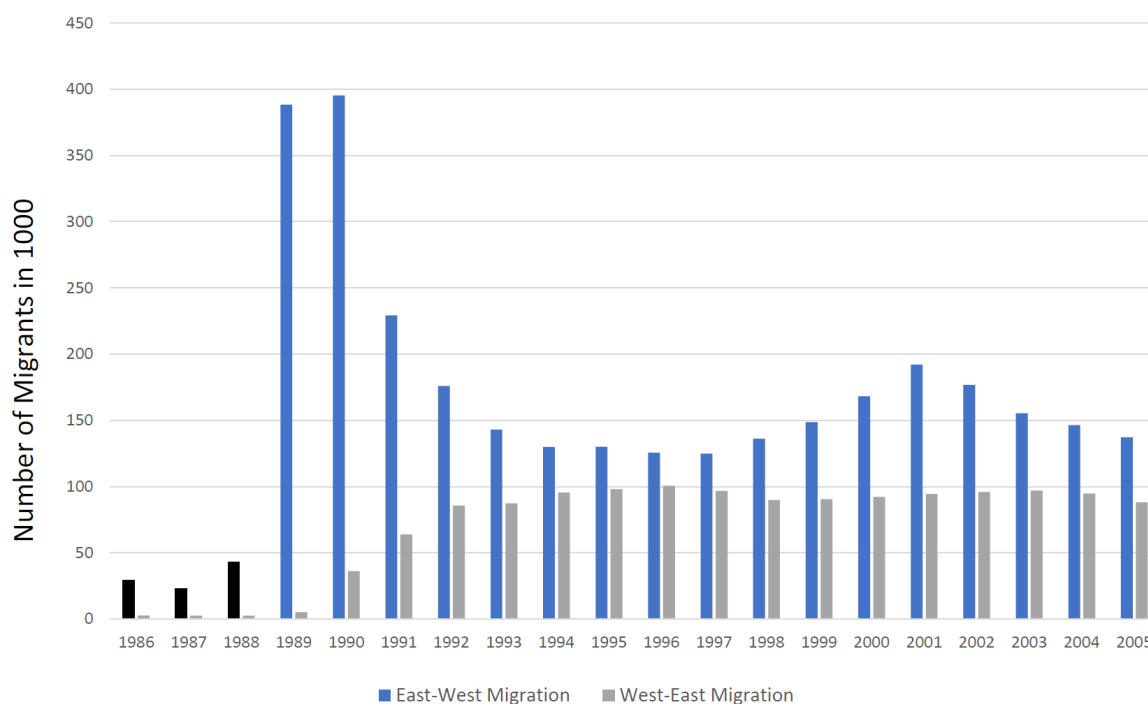
Notes: In this figure, we show the pattern of migration between East and West Germany from 1986 to 2005. The East-West migration that we capture in our data is highlighted in blue. Source: Federal Statistical Office of Germany (2004, 2007).

Table A.1: The Effect on East German Migration Flows when the Destination is in West Germany

	(1)	(2)
	Log aggregate flows of East German workers	
	All Counties (excl. Berlin)	Distance Restriction
Destination in West Germany	-0.9009***	-0.8565***
	(0.0199)	(0.0191)
Distance and Distance^2	Yes	Yes
Destination City County	Yes	Yes
Origin County Fixed Effects	Yes	Yes
Observations	28,809	24,090
$Adj.R^2$	0.543	0.584

Notes: The sample includes origin-destination pairs of counties where the origin county is located in East Germany and the destination county can be located either in East or West Germany. The outcome variable is log aggregated migration flows of East German workers. For each origin destination pair, we aggregate all migration flows between 1992 and 2005 where a worker works in the origin in t and the destination in $t+1$. Column (1) excludes Berlin (as it cannot be unambiguously assigned to East or West). Column (2) excludes Berlin and restricts the sample to pairs with at most the largest possible distance within East Germany. Standard errors in parentheses are clustered by county-pair. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.

B Data

B.1 Data Sources

As demonstrated in Figure B.1, we use a rich, novel data set that links survey data from the former GDR to social security records in reunited Germany. More specifically, we obtained data from the so-called "Data Fund of Societal Work Power" ("Datenspeicher Gesellschaftliches Arbeitsvermögen (GAV)" in German) from the Federal Archive in Germany. It provides information on the demographics and labor market characteristics of around 7 million persons in the GDR in 1989. Based on names, exact dates of birth, and gender, the data were merged with the so-called "Integrated Employment Biographies" (IEB data). The IEB data contain the complete employment and earnings histories of all workers covered by the social security system in Germany. The combined data allow us to address questions regarding mobility across jobs, occupations, and migration decisions after German reunification.[14]

B.1.1 GAV data

The GAV is a large, cross-sectional data set that contains information on the demographics and labor market characteristics of workers in the GDR. The data collection was organized by the government agency for labor and wages (Staatssekretariat für Arbeit und Löhne) since the original purpose of the GAV data was to inform central planning (Gebauer et al., 2004).[15] More specifically, firms and establishments had to report information on their employees to the district councils and update these data monthly.[16] This information formed the basis of the GAV data set. While the GAV data had been compiled yearly, only its last version from December 31st, 1989, exists today.[17]

The 1989-GAV data cover around 7 million workers and employees with permanent or temporary work contracts. They include members of producers' cooperative societies (Produktionsgenossenschaften) and law firms (Rechtsanwaltskollegien), retired persons still working, and men performing compulsory military service or alternative civilian service (Dietz and Rudolph, 1990; Rathje, 1996; Gebauer et al., 2004). As most official GDR statistics, the GAV data exclude the so-called "Sector X" which contains persons working for the Ministry of the Interior, the Ministry of State Security, the Socialist Unity Party, the army, or customs authorities. Moreover, separate databases existed for specific subgroups, such as certain types of teachers and childcare workers, which are thus only partially included in the GAV data.[18] Overall, the data cover about 72 percent of the East German labor force in 1989.

For those workers included in the GAV data, rich information on demographic characteristics (e.g., age, gender, place of residence, the number of children under 14, disability status, marital status, nationality), human capital (e.g., high school education, current apprenticeship training, university degree), employment characteristics (e.g., type of employment, place of employment, leave of absence, main job task, job status, work hours, occupation), as well as firm characteristics (e.g., firm type, industry) was elicited.

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[14]A detailed description of the data sources and linkage can be found in (Liepmann and Müller, 2018).

[15]Neither the original GAV data nor analytical results based on these data were made publicly available.

[16]The information reported by establishments was fact-checked and had to be revised when implausible (Rathje, 1996), providing us with high-quality data. Yet, in a few instances, this revision did not take place and resulted in missing information (Dietz and Rudolph, 1990).

[17]Caused by limited computer capacities in the GDR, only data from the current year were kept while data from previous years were deleted (Gebauer et al., 2004).

[18]The data exclude teachers in schools and childcare workers; but include teachers at vocational schools, professors at universities, and employees in nurseries. Moreover, the GAV data exclude the self-employed and their corresponding employees. However, as the majority of craftsmen were members of producers' cooperative societies, most are included in the data. Moreover, the data include apprentices; but only those who started apprenticeship training in the year before December 1989. Foreigners temporarily working in the GDR under the coverage of intergovernmental agreements are excluded, while the data include foreign GDR residents.

B.1.2 IEB data

The GAV data were merged with the "Integrated Employment Biographies" (IEB), which comprises administrative records on the complete employment and earnings histories of all workers covered by the social security system. The IEB data include information from two sources: social security notifications and internal processes of the Federal Employment Agency. The social security notifications include information about the beginning and end of each employment episode subject to social security contributions, as well as corresponding information about gross wages, education, employment status, occupation, and nationality. In addition, there is a mandatory notification for every employer liable for social security contributions at least once a year. The administrative records do not include the self-employed, civil servants, and military personnel.[19] These employment histories were collected for workers in West Germany from 1975 until today and from 1992 onwards for East German workers.[20] The data from internal processes of the Federal Employment Agency are organized in four different history files that contain information on unemployment spells, benefit receipts, active labor market policy measures, and job-seeking histories of individuals.

B.1.3 Linkage Details

To merge the GAV and IEB data, the Federal Archive of Germany provided us with the non-anonymized version of the 1989-GAV data. Information on first names, last names, exact dates of birth, and gender was then used for the merging process.[21] From the data warehouse of the Federal Employment Agency's Statistics Department, we similarly obtained information on names, dates of birth, and gender of persons covered by the IEB data. In addition, we obtained their anonymized personal IDs that allow us to merge further IEB variables.[22] We imposed three restrictions when drawing from the universe of individuals included in the IEB data. First, we focused on persons born between 1929 and 1976, i.e., aged 13 to 70 in 1989. Second, we only included persons for whom the IEB contains at least one (employment) episode between 1990 and 1996 in East or West Germany. Third, we imposed that no such episodes were recorded in West Germany before 1990 for these persons. Because of the third criterion, many West Germans are excluded from the merging procedure, reducing the likelihood of false matches. At the same time, it implies that we neglect individuals who migrated from West to East Germany before the Fall of the Berlin Wall. However, very few West Germans moved to the GDR during this period.

For 77 percent of persons from the GAV data, we found a match in the IEB data. According to experience from previous linkages performed at the Research Data Center of the Federal Employment Agency, this is a good quota. For most matches (88 percent), the information on first and last names, dates of birth, and gender were identical in the GAV and the IEB data. The remaining fraction was matched using record linkage techniques that tolerate a justifiable degree of error while keeping the likelihood of false matches as small as possible. We only kept cases with a unique match. The match rate is considerably lower for individuals older than 60 in 1989. If these older workers are excluded, the match rate increases to 82 percent. Below the age threshold of 50 in 1989, the match rate raises even further to 86 percent. Furthermore, the match rate is considerably lower for women than for men. For women younger than 60 in 1989, it amounts to 77 percent, around ten percentage points lower than their male counterparts.

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[19]In 1995, 79.4 percent of all workers in West Germany were covered by social security and are hence recorded in the data (Bundesagentur für Arbeit, 1996).

[20]Due to the fact that the East German labor market administration had to be integrated into the West German administration, the information from East Germany is only fully available from 1992 onwards.

[21]It would have been possible to rely on additional information regarding occupations, industries, and regions. However, the IEB data are fully available for East Germans only from 1992 onwards. Between 1989 and 1992, a significant fraction of East Germans changed jobs and moved between regions. Hence, using this additional information would have led to oversampling of persons who did not move across regions or did not change jobs.

[22]We conducted the linkage in collaboration with Manfred Antoni, who describes the technical details of the procedure in Antoni (2018).

B.2   Combined Data

The combined data allows us to study the labor market trajectories of East Germans around reunification in much more detail than earlier studies.[23] In particular, we observe each individual's labor market situation (i.e., occupation, industry, establishment, and type of employment), the municipality of residence in 1989, and their employment histories from 1992 onwards.

To utilize the data, we construct a yearly panel in which we observe each individual's labor market status (employed, UI benefit recipient, or unregistered) as of June 30th each year. We define both UI benefit receipt and unregistered spells, i.e., persons not observed in the social security records in a given year but reappearing in another year, as non-employment spells.

B.2.1   Harmonization of variables between GAV and IEB data

In order to study mobility across occupations, industries, and locations, we need to harmonize these key variables across the GAV and IEB data. First, the data sources use different classifications of occupations and industries. Second, extensive local government reorganization after reunification changed the names, boundaries, and the number of counties and municipalities between 1989 (the year of the GAV data) and 2014 (the year of boundaries in the IEB data).

The GAV data reports information about the occupational title of the individual's job using the GDR classification at the 8-digit level, which differentiates between 3,359 occupations. The IEB data includes two occupation variables that are based on different classifications. The first variable reports the occupation of employees according to the "Classification of Occupations 1988" (KldB 1988) on the 3-digit level and comprises 334 occupations. The second variable reports occupations based on the "Classification of Occupations 2010" (KldB 2010) at the 5-digit level with 1286 different occupations. Before December 2011, employers had to encode their employees' jobs following the KldB 1988. After that, employment notifications were reported using the new KldB 2010. In order to receive consistent panel data, the values of the first variable after 2011 are recoded to the KldB 1988 by transferring the key area. The same is done for the second variable for the period before 2011 to recode the KldB 1988 occupations to corresponding values in the KldB 2010. As the new occupation code is considerably more detailed than the old one, this results in substantial inaccuracies, which are larger for the generated KldB 2010 variable before 2011 than for the generated KldB 1988 variable after 2011. Therefore, to convert occupations from the GAV data to those in the IEB, it is more desirable to use the KldB 1988 occupation variable at the 3-digit level. Limited by the availability of conversion tables, we translate the GAV occupations in two steps to express it in terms of KldB 1988. In the first step, we use a conversion table between the GDR classification and KldB 2010 provided by the Federal Employment Agency (Bundesagentur für Arbeit, BA), which assigns each occupation in the GAV data (8 digits) one occupation in the KldB 2010 (5 digits). In the next step, we use another conversion table from the BA to translate these KldB 2010 occupations to the more aggregated categories of the KldB 1988 (3 digits). The harmonization of occupations works considerably well since both conversions reduce the level of detail of the occupational categories.

Industries in the GAV data are provided at the 5-digit level according to the "Classification of the Economic Sectors of the GDR" (SVWZ), comprising 722 economic sectors. The IEB data include again two variables based on different industry classifications–the "Classification of Economic Activities" from 1973 and 1993 (WZ73 and WZ93, respectively). We use the variable based on the WZ73 classification,

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[23]Earlier studies on the labor market trajectories of East Germans used, for example, the BASiD data (Emmler and Fitzenberger, 2019), Microcensus (Fuchs-Schündeln and Schündeln, 2009), aggregated unemployment or migration data (Fuchs-Schündeln and Izem, 2012), or the GSOEP (Stauder, 2018; Fuchs-Schündeln and Izem, 2012; Fuchs-Schündeln and Schündeln, 2009; Emmler and Fitzenberger, 2019; Burda and Hunt, 2001; Hunt, 2006). The main advantages of our data are the large sample size and the rich information on the employment situation in 1989 in combination with the employment history after 1992. In our study, individual-level information on transitions between geographical locations, occupations, industries, and establishments was essential.

which indicates the economic activity of establishments at the 3-digit level and distinguishes between 269 classes of economic activity. To harmonize both classifications, we follow Dietz (1990), which proposes a conversion table that assigns one (or more) WZ73 industry class to each industry class of the SVWZ.

Finally, both data sets include information about the place of residence or place of work. The GAV data reports the county and municipality of residence according to 1989 boundaries and the location codes used in the GDR. On the contrary, the IEB data include variables indicating the county and municipality where the employee's establishment is located. To guarantee consistent regional allocations across the entire observation period, this information is provided at the territorial boundaries of December 31st, 2014. As there have been several reforms of local government structures, the number of municipalities and counties decreased significantly over the 1990s and 2000s. For instance, while there were 303 counties in the GDR in 1989, in 2014, the number was 77. Hence, we had to reassign municipalities and counties in the GAV data to their corresponding municipalities and counties in 2014. We have done that by hand for counties. For municipalities, we used a conversion matrix from IWH Halle (Kauffmann, 2017).

Merging adminstrative data sources from two systems:

GDR

GAV

Datenspeicher Gesellschaftliches Arbeitsvermögen ('Data Fund of Societal Work Power')

data set covering:
- near-universe of GDR workers, excluding Sector X[1]
- demographic information
- labor market characteristics

7 mio.

workers of
GDR

year covered:

1989

Germany

IEB

Integrated Employment Biographies by the Institute for Employment Research (IAB) in Germany

data set covering:
- all workers of Germany covered by the social security system in Germany[2]
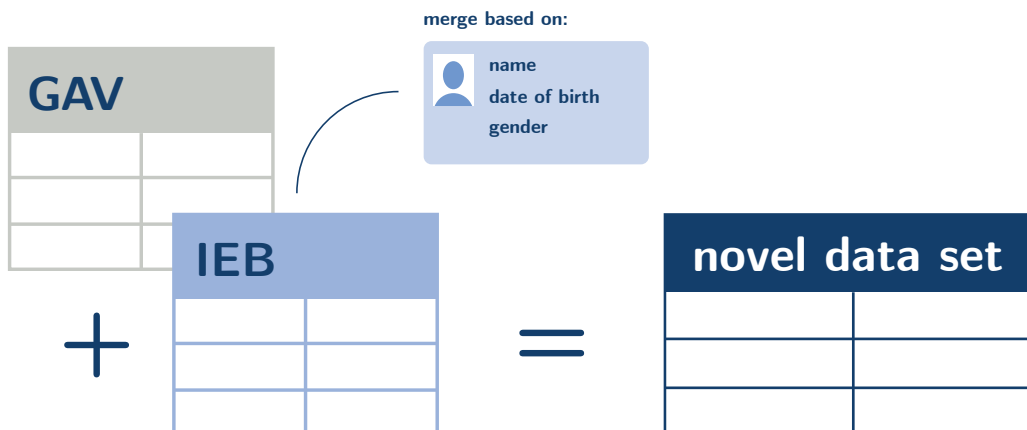- full employment and earning histories

5,4 mio.

matches with GAV

workers of
reunited Germany

with a match rate of 92% for the 20 - 50 year olds

years covered (for East Germans[3]):

1992–2005

merge based on:

name
date of birth
gender

GAV

+ ## IEB

= ## novel data set

1) people working for the Ministry of the Interior, the Ministry of StateSecurity, the Socialist Unity Party, the army, or customs authorities. further excludes school teachers, childcare workers, and self-employed individuals.

2) excluding civil servants, self-employed workers, and regular students

3) East Germans only from 1992 on due to the complex integration process of the East German labor market administration into the West German system.