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경제학박사 학위논문

# The Effect of Migration on Trust : Individual- and Country-Level Analyses

이주가 신뢰에 미치는 영향  
: 개인 및 나라 단위 분석을 중심으로

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## **Abstract**

# **The Effect of Migration on Trust : Individual- and Country-Level Analyses**

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Albeit its importance, the relationship between migration/immigration and trust is relatively an unexplored subject in the social capital literature. Using a natural experimental setting of the German reunification, this dissertation sets out to analyze the effects of migration on trust and to address how trust is formed or destroyed. Chapters 1 and 2 investigate the impact of a shock—either positive or negative—on trust, triggered by the German reunification. In these chapters, Germany's individual-level panel data, known as the German Socio-Economic Panel (SOEP), are utilized to examine whether East Germans' trust increases upon exposure to Western environment. The regression results demonstrate that spending time in the West raises East German migrants' trust, which supports the view that trust is molded through contemporaneous shocks or experiences, even for East Germans whose initial stock is low. The self-selection problem of

choosing migration to the West is dealt with by employing the instrumental variable approach, the finding of which suggests the robustness of the aforementioned result.

The second chapter focuses on the West Germans who experienced the aftermath of the fall of the Berlin Wall, investigating the persistence of a historical shock. Whether this mass migration had an impact on West Germans' trust is examined through the use of the net migration rate in the early 1990's as a proxy for the shock. Results using the random effects estimator show that West Germans' trust is negatively affected by the labor supply shock, but the persistent effect is only confined to the labor force participants at the time. The subsequent analysis using various subgroups finds that perceiving migrants as labor market competitors is a possible channel through which trust is negatively affected.

In the final chapter, the impact of migration or immigrants on trust is explored at the country-level with a combined dataset that includes the World Values Surveys and the European Values Surveys, the UN Migration Stock dataset, and the World Bank's World Development Indicators. The impact of migration is proxied by the country's immigrant inflow which is further distinguished by immigrants' countries of origin. In addition, an age-cohort panel is constructed to test whether labor market competition is a channel

through which trust is formed. It is found that the immigrant inflow of unskilled immigrants is negatively associated with trust while the effect of the inflow of skilled immigrants is insignificant. In addition, the immigration shock received at prime-age is negatively correlated with trust, which implies that natives' negative perception from the labor market competition is a possible link that explains the relationship.

**Keywords: Trust, Migration, Immigration, Social Capital, Germany, Natural Experiment, Unification**

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# **Introduction**

## **I. Motivation**

Even though the term “social capital” was proposed four decades ago by Loury (1977), it was not until the late 1990’s—two decades later—that economists started to pay attention to the economic impact of social capital. What led to a wider acceptance of the importance of trust among economists were the seminal works by Knack & Keefer (1997) and La Porta, Lopez-de-Silanes, Shleifer, & Vishny (1997) which provided cross-country evidence that trust promotes growth. Since then, multiple studies have discovered potential channels through which trust triggers economic growth, such as investments (Zak & Knack, 2001), financial development (Guiso, Sapienza, & Zingales, 2004), trade (Guiso, Sapienza, & Zingales, 2008), human capital (Dearmon & Grier, 2011), and entrepreneurship (Kim & Kang, 2014). In the midst of the plethora of studies on the effects of trust, fewer studies have addressed a more important question, how trust is formed or destroyed. For this reason, this project is set out to address the question by providing both individual- and aggregate (country)-level evidence.

Scholars who study trust differentiate the determinants of trust mainly into two branches, both of which are proved to be equally

critical in shaping trust. One is historical or inherited factor, and another is contemporaneous or experiential factor (Dineson & Sønderskov, 2018). So far, more literature has studied the persistent nature of trust in the economics literature. One of the core reasons behind this trend is that proving the changing nature of trust requires a shock that is strong enough to change the environment, which is rare in reality. In this sense, migration or immigration fulfills the criteria—it is a powerful event that brings about changes of environment, which can potentially cause a change in trust as well.

Through migration, an individual is exposed to a new environment that can be quite different from the place of origin. Thus, we can more easily identify the determinants of trust by differentiating between the factors related to the new environment—contemporaneous factors—and those pertaining to the place of origin—herited factors. Migration can also affect natives in the host country or region. From a native's perspective, having migrants in the community can be regarded as an increase in heterogeneity, which is known to affect trust, or an increase in competitors in the labor market, the point mentioned in two of the chapters. By taking advantage of these characteristics of migration, this study examines how migration affects trust from both migrants' and natives' perspectives.

Albeit its importance, the relationship between migration/immigration and trust is relatively an unexplored subject in the social capital literature. Most, like Aguilera & Massey (2003) who examine the effect of migrants' networks on labor market outcomes, have discussed the relationship within the context of immigrants' social networks or connections. Even among the existing literature that does discuss trust, most rarely go beyond correlation studies. In this regard, this project adds values not only by providing more evidence in the migration-trust literature but also by dealing with potential endogeneity issues to contend causality, which is immensely important in proving formation or destruction of trust. Furthermore, this dissertation emphasizes the possible underlying mechanism through which trust is changed—that is, the labor market interactions.

Chapters 1 and 2 investigate trust when it is affected by the shocks triggered by the German reunification. Germany's individual-level panel data, known as the German Socio-Economic Panel (SOEP), are utilized for the analysis at the individual-level. The German reunification is a valuable setting because it qualifies for a natural experiment that brought about intense migration of Germans. A number of previous studies have already treated the German reunification as a natural experiment and have exploited the setting (e.g. Burchardi & Hassan, 2013; Redding & Sturm, 2008). Migration

within Germany has unique characteristics of both internal and international migration. Before the division of Germany into the Federal Republic of Germany and the German Democratic Republic by the World War II, people in Germany are known to have shared the same values and characteristics. The previous literature exploring the effects of division and reunification finds no evidence that the former East and West Germans were different before the division (Alesina & Fuchs-Schundeln, 2007; Easterlin & Plagnol, 2008), in which sense migration between the former East and West states can be seen as internal migration, that is, moving within the same country. However, passing nearly four decades under contrasting political and economic regimes created a considerable gap between the two groups. The related literature finds a significant difference between East Germans and West Germans in terms of political preference (Alesina & Fuchs-Schundeln, 2007), trust (Rainer & Siedler, 2009; Heineck & Sussmuth, 2013) and social participation (Jacob & Tyrell, 2010).

Can East Germans' destroyed social capital be restored by migrating to West Germany, a high-trust society? Although through migration an individual is exposed to a different—often unfamiliar—environment, which in general is a shock that can influence one's trust or values, is this shock effective enough to alter those of East Germans, who had prolonged exposure to socialism? In Chapter 1, the findings

indicate spending time in the West indeed raises East German migrants' trust, which supports the view that trust is molded through contemporaneous shocks or experiences. It is encouraging to discover that contemporaneous (and positive) experience has an impact even for people who had been exposed to the low-trust environment for a significant amount of time. Furthermore, the results show that a positive return from the labor market, measured by the years of employment in the West, raises trust, a finding that emphasizes the quality of experience, or economic assimilation to a high-trust society.

The second chapter focuses on the West Germans who experienced the aftermath of the fall of the Berlin Wall, shedding light on the persistence of a historical shock. Immediately before and after the official reunification in 1989-1990, approximately 785,000 East Germans, estimated at 2.5% of the GDR population, moved to West Germany (Wolff, 2009). From a native (worker)'s perspective, such an increase in the labor supply is bad news. Whether this mass migration had an impact on West Germans' trust is examined through the net migration rate in the early 1990's, the proxy for the migration shock. Results using the random effects estimator show that in general people's trust is negatively affected, but the persistent effect is only confined to the labor force participants at the time. The subsequent analysis by various subgroups implies the possibility that the labor

supply shock negatively affects people who perceive migrants as potential competitors.

In the final chapter, the impact of migration or immigrants on trust is explored at the country-level. A combined dataset that includes the World Values Surveys and European Values Surveys, the UN Migration Stock dataset, and the World Development Indicators by the World Bank is used to examine the impact of migration. The impact of migration is proxied by the net flow of total immigrants and the net flow of immigrants differentiated by their skill-level. In addition, age-cohort panel is constructed to test whether the labor market competition is a channel through which trust is formed. I find that the inflow of low-skill immigrants is negatively associated with trust, and the immigration shock received at prime-age is negatively correlated with trust, which relates to the findings in Chapter 2 that people view immigration as increased labor market competitions.

## **II. Author's Note**

The research on trust has some challenging aspects in terms of availability of data. The widely used measure of trust, based on the responses to the question, “*Would you say that most people can be trusted? Or do you think you need to be very careful in dealing with others?*” is rather difficult to find in publicly available surveys other

than in the countries where the General Social Surveys are conducted on a regular basis. Glaeser, Laibson, Scheinkman, & Soutter (2000), criticizing the measure of trust based on survey questions, propose to conduct experiments for alternative measures of trust, but it is even more limiting in terms of availability, implementability, and practicability for the majority of researchers.

I faced the same problem of data limitations during this project. Although efforts have been made to find the best datasets available, the SOEP dataset, which was used in the first two chapters, includes trust in only three waves, over a decade after the reunification. This limits the applicability of popular estimation methods that can address potential endogeneity issues, such as differences-in-differences. The World Values Surveys and the European Values Surveys, the richest cross-country dataset available—used in Chapter 3—have only six waves available and limited number of countries in the earlier waves.

Another challenge is the binary or ordinal nature of trust, especially when it is used as a dependent variable. Compared to continuous variables, discrete variables reveal restricted information about respondents. Furthermore, trust being perception or attitude, it does not change easily, which can be a problem in dealing with panel data where the within-estimator is prevalently used. Regardless of these difficulties, the conventional measure of trust is used throughout this

project rather than a novel measure or other proxies that have not yet been sufficiently verified.

In Chapters 1 and 2, often the word “former” when referring to the former German States is omitted for convenience. “West Germany,” “Federal Republic of Germany,” or “FRG,” or simply, “the West,” all refer to the former West Germany and “West Germans” refer to people who used to live in the former West German regions. The same rule applies to the former East Germans. In addition, “the East,” “German Democratic Republic,” or “GDR” refers to the former East Germany. “East-West migration” refers to migration of East Germans to West Germany.

Although each chapter is written so it could be read separately, I make a few references to other chapters in order to avoid redundancy.

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# **Chapter 1. The Effect of East-West Migration on East Germans' Trust in Germany's Post-Reunification Era**

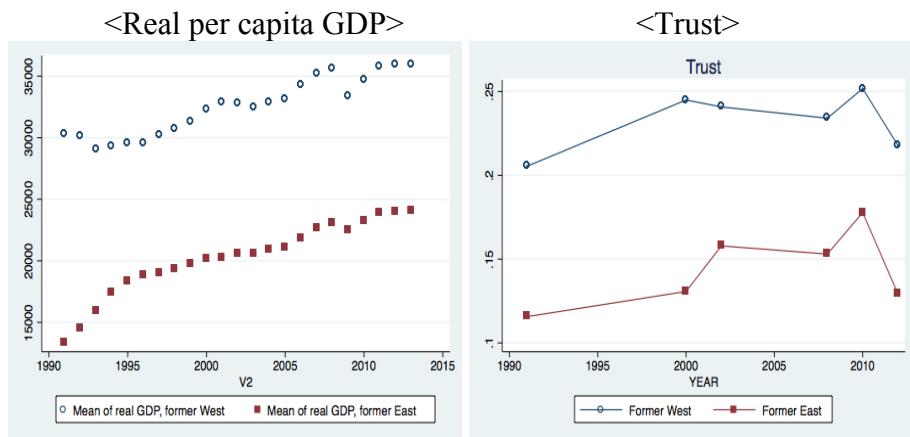
## **1.1 Introduction**

This chapter tests whether trust of individuals originating from a low-trust society increases upon moving to a high-trust society through the case of East German migrants after the German reunification. Internal migration of Germany provides the setting that factors out country-specific influences, such as the differences in the language, institutions, or culture. Leaving individual heterogeneity aside, the effect of migration is simply the outcome of the change of environment, from a post-socialist society to a long-time capitalist society.

Even though it is migration within the same country, the differences between the East and the West are considerable enough to work as a shock to a German migrant. There still exist differences not only in social capital but in economic outcomes between the two regions. In terms of GDP per capita, Wolff (2009) states that the gap between the East and the West remains stagnant since 1999, at 22% to 25%, until two decades after the reunification. In fact, it seems that the differences of both real GDP and trust between the former Eastern states and the former Western states are hardly converging (Figure

1-1).<sup>1</sup> With these similarities and differences between the two regions, East-West migration can be regarded as international migration without the barriers of language, culture, or institutions.

Figure 1-1. The Gap between East and West Germans since the 1990's



Source: Author's calculations based on the data retrieved from the Federal Statistical Office of Germany (GDP) and ALLBUS (trust)

Quite a few studies compare social capital levels between East and West Germans since the reunification, and find that not only East Germans have lower stock of social capital but also the gap is quite persistent. They uniformly report lower social capital stock of East Germans and the slow rate of convergence between the two groups (Rainer & Siedler, 2009; Heineck & Sussmuth, 2013). For instance,

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<sup>1</sup> West includes Baden-Württemberg, Bayern, Brandenburg, Bremen, Hamburg, Hessen, Niedersachsen, Nordrhein-Westfalen, Rheinland-Pfalz, and Schleswig-Holstein, and East includes Berlin, Mecklenburg-Vorpommern, Saarland, Sachsen, Sachsen-Anhalt, and Thüringen. GDP per capita is in real terms (based on the level in 2010). Trust is the percentage of people who answered positively to the question "In general, do you think that most people can be trusted?" from the German General Social Survey (ALLBUS).

Rainer & Siedler (2009) compare the gap of social and institutional trust levels in the early 1990's and in the early 2000's to find that although East Germans' institutional trust tends to converge to the level of West Germans, their level of social trust (or generalized trust) converges so slowly that it would take almost four decades to achieve a zero gap between the East and the West.

Studies like Jacob & Tyrell (2010) and Lichter, Loeffler & Siegloch (2015) attribute the phenomenon to spy surveillance during the socialist era in GDR. In particular, Jacob & Tyrell (2010) run simulations with a model in which people are exposed to the environment that is low-trust for the initial three generations and then switches to high-trust permanently. They find that even after the environment switches to a high-trust democratic society, East Germans' social capital takes at least four generations to reach the level of West Germans.

Given the lower social capital of East Germans, the goal of this project is identifying the impact of moving to West Germany, a society with higher trust, on East Germans' trust. Is the experience of living under the socialist regime an irreversible event? Or is there still room for improvement even for people who went through decades of surveillance? Not enough evidence has been collected to predict how persistent or how changeable trust is. The previous literature on

immigrants' social capital suggests two different consequences. On one strand of literature, scholars emphasize the changing nature of trust. For example, first-generation immigrants' trust shows the sign of convergence to the trust level of the host countries (Dineson, 2012) and social capital is not persistently affected by historical shocks like large population displacements after the World War II (Fidrmuc, 2012). On the contrary, some stress more of the persistent feature, for example, by showing lower trust levels of descendants whose ancestors were forcibly traded as slaves (Nunn & Wantchekon, 2011) or the close association with immigrants' trust and trust of their countries of origin (Guiso, Sapienza, & Zingales, 2006). If the experiential effect is greater, East Germans' trust will increase in time spent in West, and if the inherited effect is greater, their trust will not change in time. The results of this chapter find that the experiential factor is stronger, which is encouraging because the current gap between East and West can narrow down by increasing interactions with the high-trust society.

A challenge lies on the characteristics of migration decisions, which are based on an individual's choice rather than on a random event. Although the East Germans' mass migration in the early 1990's happened quite rapidly and abruptly within a few years before and after reunification, it is difficult—and incorrect—to argue that their migration decisions were random. In fact, the previous studies find that

most of the East German migrants decided to move because of the labor market situations. The characteristics of these individuals, often unobservable, may differ from those of people who choose to stay in the East, which may cause a bias in estimating the true effect of trust. Unlike the previous studies that compare East German migrants and stayers without considering endogeneity, this study uses an instrumental variable approach in an effort to mitigate this problem. In fact, to the best knowledge of the author, it is the first study that focuses on the adaptability of trust and deals with the endogeneity issue at the same time. The instrumental variable estimation results confirm that exposure to the high-trust society improves East Germans' trust. In addition to the proving causality, a possible channel through which trust is increased is suggested with an analysis on the effects of labor force activities on trust.

The German Socio-Economic Panel (SOEP) dataset is used for the analysis. In March 1990, shortly after the fall of the Berlin Wall, the SOEP included the East German households sample. By tracking the individuals' states of residence, I was able to generate the number of moves between the former East and the former West regions for the sample. Whether an individual is from the former East or West Germany is identifiable through a survey question that asks the location of the individual in 1989. The individuals who answered that they were

in the former GDR in 1989 are assumed as East Germans and the respondents who indicated that they were in the former FRG are assumed as West Germans. The individuals who indicated otherwise (i.e. they were abroad in 1989), and the immigrants who migrated to Germany after 1960, approximately the time the Berlin Wall was built, are excluded from the analysis.

The outline of this chapter is as follows. Section 1.2 contains a brief introduction of the historical background of migration after reunification in Germany. In Section 1.3, related literature is discussed, and in Section 1.4 and 1.5, empirical strategy and results are presented. Section 1.6 concludes.

## **1.2 Historical Background: Internal Migration in Germany after Reunification**

Around the time of the German reunification, migration from the East to the West exploded due to political and economic reasons. Although about 30,000 East Germans fled to West Germany each year in the late 1980's, the number of East German migrants jumped to approximately ten times that of the previous year in 1989, as a result of the first opportunity in May through the Hungarian borders, and the second and unequivocal opportunity which rendered migration between the East and the West regions officially possible, the fall of the Berlin Wall in

November (Bauer & Zimmermann, 1997). In 1989, the total outflow of East Germany was equivalent of 3.7% of the East German population, approximately 600,000 East Germans (Heiland, 2004). In 1991 even when the number subsided, 230,000 East Germans migrated to West (Fuchs-Schundeln & Schundeln, 2005).

The unification process was swift and relatively peacefully implemented (Table 1-1). Nevertheless, there were considerable negative consequences, especially for East Germany. The currency conversion ratio of 1:1 resulted in the immediate loss of competitiveness for the enterprises in the East and, to make matters worse, the consumer demand shifted towards Western products. These dire economic situations in the Eastern regions, which Akerlof, Rose, Yellen, & Hessenius (1991) describe as “a depression in East Germany virtually without historic precedent,” aggravated the population drain. The steep decline of output, only 46% of its 1989 level in 1990—Akerlof et al. (1991)’s estimate—accompanied the massive unemployment in East Germany which led to explosive migration of East Germans to the West as people looked for economic opportunities. The East-West migration temporarily appeased when economic incentives of staying in the East were initiated by the governmental acts of moving the capital from Bonn to Berlin in 1993 and rapidly raising East German workers’ wages (Hunt, 2006; Glorius, 2010). Owing to

these efforts, migration from the East to the West started to decline from 1991, and the number of migrants remained stable until 1997 when the Eastern region experienced another recession (Hunt, 2006).

Table 1-1. Time Table of the Unification Process

May 1989	Removal of border controls in Hungary
August 1989	Mass migration of GDR-citizens via Hungary
September 1989	“Monday demonstrations” in Leipzig
November 9, 1989	<i>Opening of the German border</i>
January 12, 1990	Private ownership of production facilities and joint ventures with foreigners permitted
July 1, 1990	The treaty on formation of Economic, Monetary and Social Union comes into effect
August 31, 1990	Signing of the Unification Treaty
October 3, 1990	<i>German unification</i>
October 14, 1990	Elections of East German state parliaments
December 2, 1990	Elections of the Federal Government

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Source: Edited from Smolny (2009)

## 1.3 Literature Review

### *A. Social Capital of East and West Germans after Reunification*

Multiple studies uniformly argue that East Germans demonstrate lower social capital than their Western counterparts. Decades of experience under the socialist/communist regime has proven to be detrimental to social capital because of the experience of living under constant surveillance and monitoring systems. The former GDR had a particularly high number of spies than other socialist regime in history, estimated at 1.6% of the total East German population (Jacob & Tyrell, 2010). Because of living under such circumstances for four decades, East Germans exhibit lower social capital, and even after reunification, the former East Germans still maintain lower level of social capital than West Germans. Heineck & Sussmuth (2013) analyze the time trends of social capital, in terms of trust, fairness and cooperation, between East and West Germans using the two waves—2003 and 2008—of the German SOEP data. They find that the gap of trust between the two groups is narrowing down by 0.45% point annually, while fairness does not show a gap and cooperation gap does not converge. Their findings imply that the trust gap between the two groups needs at least two decades of time in order to converge, while other forms of social capital need even more time. On the other hand,

Rainer & Siedler (2009) find that East Germans' trust have not improved since reunification. Alesina & Fuchs-Schundeln (2007) investigate how communism in East Germany altered people's preferences by comparing East and West Germans using two waves of the SOEP dataset. Specifically, they study the differences of preferences between people from East Germany and people from West Germany on the role of the state regarding financial security in cases of unemployment, illness, old-age, and times of need. They find that East Germans are more likely to agree on state provision of financial security, but the gap is decreasing in time. According to their analysis, the differences between East and West Germans' preferences can be overcome between 20 and 40 years.

### *B. Selection-Bias of Migrants*

In the midst of the plethora of literature that deals with the problem of selection bias, Borjas (1987) is probably one of the most influential work that addresses selection of immigrants. He provides a theoretical framework that measures the selection of immigrants by using the Roy model (1951) which discusses endogenous selection. According to this framework, immigrants to the United States decide whether or not to migrate by comparing the expected wages between the home country and the U.S. Three types of migration can be found from this model: 1)

positive selection—which attracts high-skilled workers to be above average of the distribution of the host country, 2) negative selection—which attracts low-skilled workers to be below-average of the host country distribution, and 3) refugee selection—which attracts low-skilled workers to be above-average of the distribution of the host country. Since Borjas (1987)'s work, many papers followed suit in applying the Roy model in the empirical analysis, ranging from immigration, returns to education (Altonji, Elder, & Taber, 2005), and healthcare (Chandra & Staiger, 2007). The first paper that applies the selection-correction model for East German migrants is Trubswetter & Brucker (2004). Using the fact that inequality rapidly increased since reunification, they test whether the predictions via the Roy model applies in the German case. They compare the determinants of wages of movers and stayers with selection-correction models, and argue that migrants to East Germany were positively selected in terms of unobserved abilities. On the other hand, Arntz, Gregory & Lehmer (2011) argue that East German migrants respond more sensitively to employment chances rather than wage differentials between the regions, supported by the phenomenon of unskilled East German workers' migration to West since 2000.

### *C. Social Capital of Immigrants*

The previous studies analyzing the trust of migrants generally support the view that trust adjusts to the surrounding environment. For example, using the European Social Survey (ESS) data, Dineson (2012) compares the trust level of immigrants and non-migrants from low-trust countries and finds that the trust of immigrants who moved to high-trust countries shows the sign of convergence of trust of people in the host countries. Similarly, using the same dataset, Dineson & Hooghe (2010) compare the first and the second generations of immigrants and find that the latter's trust is more assimilated to natives' trust than that of the first generation. Helliwell, Wang & Xu (2015) use the individual data across 132 countries to find that both the country of origin and the current country affects trust. They estimate that the impact of the country of origin is a third of that of the host country.

On the other hand, while not necessarily denying the adaptability of social capital, some literature emphasizes its persistence by proving or using the close association of parents' and children's trust of immigrants. Ljunge (2012) finds a significant influence of parents' countries' civicness on the second-generation immigrant child's civicness, using the ESS survey data that cover 29 countries. Algan & Cahuc (2010)'s work, an influential study that provides evidence of a causal impact of trust on economic growth, utilizes the variation of

trust that is caused by differences across and within the countries of origin of descendants of immigrants. Unlike the previous studies that observe intergenerational transmissions by comparing country-variables, Jaeger, Dohmen, Falk, & Huffman (2010) examine parents and children's trust and risk attitudes using the SOEP data and find high correlation of attitudes between parents and children of Germans.

## **1.4 Data and Variable Descriptions**

The chapter uses the German Socio-Economic Panel Study (SOEP) dataset which is the longest-running longitudinal survey in Germany. It started in 1984 with 6,000 households in West Germany, added East German households in 1990, and conducts surveys with over 12,000 households annually. The key variables for this analysis are generalized trust, the dependent variable, and variables representing migration from the former East to the former West Germany. The trust variable is constructed from a 4-scale response—strong disagreement, moderate disagreement, moderate agreement, strong agreement—to the survey statement, “In general, you can trust people.” Unfortunately, trust is only observed since the early 2000’s throughout three waves, 2003, 2008, and 2013. Migration-related variables, such as years lived in the West and timing of migration, were generated by tracking the individuals in all waves since 1990. Individual controls include basic

demographic characteristics such as sex, marital status, GDR-education, occupation, urban residence, and the log of per capita household income.<sup>2</sup> State characteristics, such as, proportion of foreigners, and growth rates of per capita real GDP, based on the data from the Federal Statistical Office of Germany, are also controlled.

The sample is restricted to the respondents with non-missing information of household income in 1989, to control for factors prior to reunification. This leads to the sample of respondents whose age was at least 16 in 1990—that is, the “new” generation that did not experience socialism at adulthood is not observed. Although this may be problematic because the sample does not represent the East German migrant population, there are benefits; there is a higher probability that it represents *the early phase* migrants who are less exposed to the “capitalist” version of East Germany after reunification that can confound the effect of living in West. Furthermore, the younger

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<sup>2</sup> The education variables I use most of the time are based on the respondents’ level of education obtained in East Germany. The GDR-education variables are coded as 1) Missing (whose majority is the younger generation), 2) Lower or equivalent to 8<sup>th</sup> year completion, 2) 10<sup>th</sup> year completion, 3) Qualified for university (Arbitur), and 4) College degree or higher.

The marital status dummies are 1) Married, 2) Single, and 3) Others (divorced, widowed, and separated).

The job dummies are 1) Labor force retirees (the majority) and people on military/community service or on leave, 2) Students (this category is made to distinguish between retirees and students), 3) the Unemployed, 4) Low-skilled workers (that include people in training), 5) White-collar (high-skilled) workers, 6) the Self-employed and freelancers, and, finally, 7) Civil servants.

generation, whose exposure to socialism is limited, may have different unobserved characteristics.<sup>3</sup>

This study focuses on the respondents who are 65 or younger at the time of each survey wave (the total of 2,676 observations) and who are in the labor force because of the following reasons. First, this group forms the majority of the East-West migrants after reunification.<sup>4</sup> Second, it helps to make the sample more homogeneous and control for the possible unobservable heterogeneity. In migration studies, it is difficult to avoid the bias arising from self-selection of migrants. In order to mitigate this problem, it is important to make the sample as homogeneous as possible. As the previous studies find, migrants' characteristics differ by age and by migration period in Germany. For example, children at the time of reunification migrated with their parents, and the middle-aged were more likely to stay in West temporarily and return to East (Hunt, 2006). On the other hand, individuals at prime working age were most likely to have migrated because of the labor market opportunities, as economic situations in East were unstable especially in the early phase of the post-reunification period. Starting from the year 1997, migrant

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<sup>3</sup> Including the younger respondents by dropping the income variable in 89 also results in the positive relationship between trust and migration, although the magnitude of the coefficients is smaller.

<sup>4</sup> Fuchs-Schulden & Schulden (2009) report that over the period of 1991-2006, 42% of the East-West migrants are 18-30 years old, and another 30% 30-50 years old.

characteristics differ from the early migrants. For example, people who migrated between 1997-2003 are more education-driven and thus, on average younger than the early migrants (Fuchs-Schundeln & Schundeln, 2009).

Figures A1 (in the Appendix) report the destination states by the respondent's state of origin. The East-West migrants are more likely to move to the western states that are closest to their states of origin and have cities with a large population, such as Nordrhein-Westfalen and Bayern (see the Appendix of Chapter 2 for the map of Germany). Table 1-2 reports descriptive statistics of West Germans and East Germans. Even after two decades since the German reunification, the differences between East and West Germans are still noticeable. Compared to West Germans, East Germans have lower socio-economic status although their education levels are similar; they report lower trust, lower proportion of white-collar (skilled) jobs, and considerably lower household income.

Table 1-2. Descriptive Statistics of West Germans and East Germans

	West Germans			East Germans			
	2003	2008	2013	2003	2008	2013	
Trust	0.638 (0.480)	0.637 (0.481)	0.706 (0.456)	0.528 (0.499)	0.546 (0.498)	0.594 (0.491)	
Age	42.66 (12.20)	43.66 (11.97)	45.44 (10.03)	41.82 (12.77)	42.63 (12.39)	44.67 (10.95)	
Male	0.491 (0.500)	0.483 (0.500)	0.441 (0.497)	0.481 (0.500)	0.473 (0.499)	0.435 (0.496)	
Education (years)	12.44 (2.726)	12.59 (2.752)	12.85 (2.818)	12.47 (2.376)	12.65 (2.423)	12.66 (2.421)	
Retired	0.0783 (0.269)	0.0675 (0.251)	0.0570 (0.232)	0.101 (0.301)	0.0818 (0.274)	0.0723 (0.259)	
Students	0.0327 (0.178)	0.0318 (0.175)	0.0118 (0.108)	0.0324 (0.177)	0.0295 (0.169)	0.0125 (0.111)	
Unemployed	0.154 (0.361)	0.126 (0.332)	0.130 (0.336)	0.184 (0.387)	0.148 (0.356)	0.148 (0.355)	
Worker	0.268 (0.443)	0.283 (0.450)	0.252 (0.434)	0.342 (0.474)	0.368 (0.482)	0.345 (0.475)	
Job Status	White-collar	0.306 (0.461)	0.332 (0.471)	0.391 (0.488)	0.253 (0.435)	0.274 (0.446)	0.318 (0.466)
Self-employed	0.0811 (0.273)	0.0814 (0.273)	0.0830 (0.276)	0.0600 (0.238)	0.0673 (0.251)	0.0684 (0.252)	
Civil Servants	0.0794 (0.270)	0.0783 (0.269)	0.0761 (0.265)	0.0281 (0.165)	0.0310 (0.173)	0.0355 (0.185)	
Marital Status	Married	0.641 (0.480)	0.619 (0.486)	0.644 (0.479)	0.567 (0.495)	0.540 (0.499)	0.573 (0.495)
	Single	0.249 (0.432)	0.257 (0.437)	0.182 (0.386)	0.294 (0.456)	0.310 (0.463)	0.257 (0.437)
	Divorced	0.110 (0.313)	0.124 (0.330)	0.174 (0.379)	0.139 (0.346)	0.150 (0.357)	0.170 (0.376)
Household	Per capita income*	16562 (10265)	17826 (11139)	16971 (10932)	12525 (6839)	13649 (7765)	13891 (8313)
	# of members	2.961 (1.290)	2.867 (1.246)	3.136 (1.403)	2.814 (1.135)	2.662 (1.140)	2.892 (1.323)
	Total income*	44422 (24787)	46315 (26662)	46986 (26216)	33019 (17705)	33680 (18313)	36091 (19834)

Observations	9611	7927	10151	3916	3327	4080
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Notes: The summary statistics are based on the respondents of 2003, 2008, 2013 SOEP waves, born in 1985 or after, who have non-missing response for “trust” in all states, excluding Berlin, in Germany. \*Annual income in Euros.

## 1.5 Empirical Strategy

The goal of this chapter is to estimate the effect of living in West Germany, expressed as  $\beta$ , in the following equation.

$$TRUST_{ist} = \alpha + \beta W_{ist} + X'_{ist}\gamma + S'_{st}\delta + Year_t + \varepsilon_{ist} \quad (1)$$

where TRUST is an indicator variable of agreement of the individual i, living in state s at time t, on the statement, “In general, you can trust people,” W is a degree of exposure in the West German society, proxied by the indicator variable of living in West Germany. I convert TRUST, originally a 4-scale ordinal variable, to a binary variable to make interpretations easier after treating both degrees of (dis)agreement, whether strongly or moderately, the same.<sup>5</sup>

The vector  $X'_{ist}$  denotes a set of individual-level covariates, which include age, age-squared, the indicator variable of gender, the indicator variable of urban residence, marital status dummies, and GDR-education dummies. Depending on the specifications, occupation fixed effects, and the log of per capita household income are also

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<sup>5</sup> Conducting the analysis with the original ordinal dependent variable yields similar results.

included as additional covariates. The vector  $S'_{st}$  consists of variables that capture regional (state) characteristics that can affect trust: the percentage of foreigners and the log of real GDP per capita.<sup>6</sup>  $Year_t$  is time-fixed effects and  $\varepsilon_{ist}$  is the error term.

Migration to the West has the following structural system of equations, an extended form of the generalized Roy model (time and state subscripts are suppressed from now on for the sake of simplicity),

$$W_i = \begin{cases} 1 & \text{if } w_i^* \geq 0 \\ 0 & \text{if } w_i^* < 0 \end{cases} \quad (2)$$

$$w_i^* = \eta + q_i \delta + u_i \quad (3)$$

where  $w_i^*$  is the net utility of migration and  $q_i$  is a set of covariates.

Since  $Cov(u_i, \varepsilon_i) \neq 0$ , i.e.  $W_i$  is endogenous,  $\beta$  cannot be consistently estimated by OLS.

$\beta$ , the increase in trust by moving from East to West, can also be expressed in the context of the treatment effect as the following,

$$\beta = Trust_{Wi} - Trust_{Ei}$$

where the subscript W denotes being in West and E denotes being in East. The decision to move to West is non-random, which leads to the possibility of  $E(W_i \varepsilon_i) \neq 0$  and a biased estimate of  $\beta$  if individual

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<sup>6</sup> State fixed effects are not included to avoid multicollinearity. Instead, to take into account state characteristics, I choose these variables that are known to affect trust. The association between trust and wealth is beyond well-known. Regional heterogeneity is controlled with the percentage of foreigners since the previous literature finds negative association of ethnic and linguistic heterogeneity with trust (Knack & Keefer, 1997; Alesina, Devleeschauwer, Easterly, Kurlat, & Wacziarg, 2003; Leigh, 2006).

characteristics are not properly controlled. In that case, instrumental variables ( $Z_i$ ) that are correlated with  $W_i$  but uncorrelated with  $\varepsilon_i$  are necessary. The instrumental variables now become a part of regressors in the first stage, Equation (3), where  $q_i = (X_i, Z_i)$ . Then, simplifying Equation (1) by leaving out other covariates, we have

$$\begin{aligned} Trust_i &= Trust_{Wi} W_i + Trust_{Ei} (1 - W_i) \\ &= Trust_{Ei} + W_i (Trust_{Wi} - Trust_{Ei}) \\ &= Trust_{Ei} + W_i \beta. \end{aligned}$$

Assuming the instruments are not correlated with  $Trust_{Ei}$ , the two-stage least squares yields the unbiased estimate of migration,

$$plim \hat{\beta} = \frac{Cov(Z_i, Trust_i)}{Cov(Z_i, W_i)} = \frac{Cov(Z_i, Trust_{Ei} + W_i \beta)}{Cov(Z_i, W_i)} = \beta.$$

The log differentials of per employee wage in 1991 and the log differentials of unemployment rate in 1991 between the respondent's state of origin and the average of western states are used as instrumental variables.<sup>7</sup> If the respondent had a stable employment, or if the region's economy was stable, he would have less incentive to migrate.

In addition to the two-stage least squares that ignores the binary nature of the dependent variable, I apply an extended instrumental

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<sup>7</sup> Specifically, the instrument is calculated using the following formula,  $Z_i = \log Wage_w - \log Wage_s$ , where w denotes the average of Western states in 1991 and s denotes the respondent's state or origin in 1991. The unemployment difference is also calculated with the same formula.

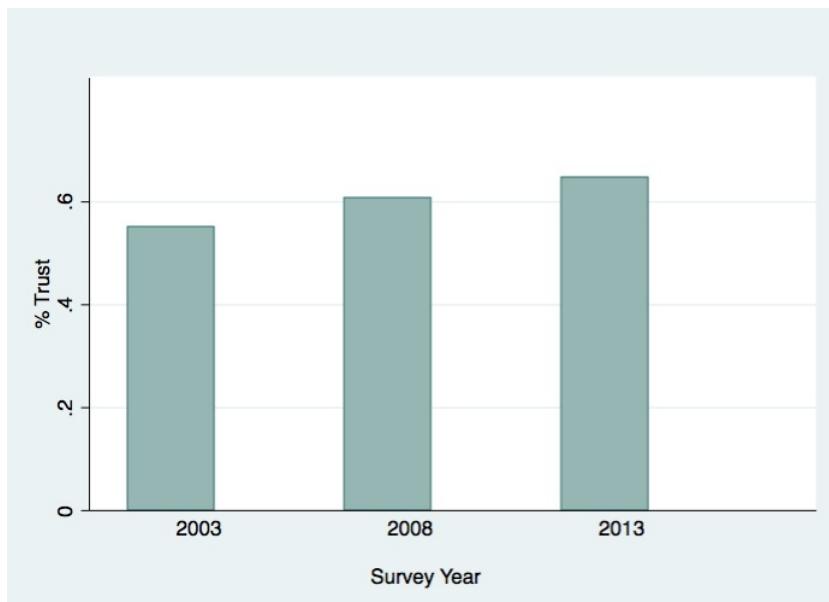
variable approach which takes into account the binary nature, named Probit-2SLS. It uses the predicted probabilities, obtained from the first stage probit model, as instruments for W. It is different from the “pseudo-IV” procedure of running an OLS regression on the fitted probabilities and other covariates, which Angrist and Pischke (2008) dub “the forbidden regression.” The estimation procedure consists of three steps (Cerulli, 2012). First, apply the probit model for Equation (2), and obtain the predicted probability (i.e. propensity scores) of moving to West, denoted as p. Second, run OLS of W on (1, X, p) and obtain the fitted values, denoted as f. Finally, run another OLS of Trust on (1, X, f) and obtain the consistent effect of migration, the coefficient on f.

This procedure has advantages in the following aspects. First, it takes into account the binary nature of the endogenous variable. Second, this procedure is less sensitive to the specifications of the first binary stage model. Third, the standard errors are asymptotically valid even after additional regressors are generated in the first stage (Adams, Almeida, & Ferreira, 2009).

Before presenting the regression results, Figure 1-2 presents trust by survey year of the respondents who migrated to the West before 2003, the year of first observation of trust. As the survey year increases (as their time in the West increase), the percentage of trusting

respondents increases. This hints that spending time in the West has a positive impact for East German migrants.

Figure 1-2. Trust of Migrants who Migrated to West before 2003



Notes: Based on the SOEP data's trust level of respondents aged 18-64 who migrated to the West before the year 2003.

Table 1-3 provides the summary statistics between movers and stayers among East German respondents. According to Table 1-3, the movers report higher trust and generally higher socio-economic status. In fact, excluding job status, movers and stayers are different in almost every aspect. Compared to the stayers, the movers have higher trust by 0.089, have higher annual per capita household income by approximatley 3,600 euros, and have a higher proportion of college qualified people. In addition, movers are more likely to live in urban areas and 95.5% of the movers had friends in West Germany when

surveyed in the early 1990's. It is evident from the descriptive statistics that the two groups, migrants and stayers, have quite different characteristics.

Table 1-3. Summary Statistics and Differences between Stayers and Movers

	Stayers N=2491	Movers N=185	Mean Difference		Stayers N=2491	Movers N=185	Mean Difference
Trust	0.527	0.616	-0.0891* (0.038)		Income (annual)	29377.1	39276.8 (1166.3)
Age	48.62	46.74	1.876** (0.622)	House -hold	Per capita income (annual)	7976.3	11577 (325.2)
Lives in an urban area	0.301	0.649	-0.347*** (0.0351)		No. of HH members	3.803	3.546 (0.0839)
Have friends in West	0.76	0.955	-0.195*** (0.0322)		Unemployed	0.191	0.141 (0.0298)
Married	0.75	0.67	0.0800* (0.0332)		Worker	0.394	0.378 (0.0372)
Marital Status	Single	0.107	0.0703	Job Status	White-collar	0.295	0.341 (0.0349)
	Divorced	0.143	0.259		Self-employed	0.0927	0.0919 (0.0221)
HH income in 89 (monthly)	1927.9	1961.9	-34.01 (61.26)		Civil servant	0.0265	0.0486 (0.0126)
Edu: 8th or lower	0.123	0.0649	0.0580* (0.0246)		Total	0	12.12 (0.111)
GDR-related	Edu: 10th	0.548	0.508	Years in West	Worked	0	10.77 (0.116)
	Edu: College qual.	0.057	0.0973		Unemployed	0	1.568 (0.0461)
	College+	0.272	0.330		In school	0	-0.114*** (0.00867)

As much as migration decision are not random, the timing of migration may attract different types of migrants as well. To examine whether the economic situations in the West and the East affected migrants, I study determinants of migration by migration phase. The first phase is from 1990 to 1992, the period of mass influx of East Germans to West Germany. The second phase is from 1993 to 1996, when migration to West Germany gradually receded after the institutions stabilized in the former East regions. The third phase is from 1997 to 2002, when migration to West Germany started to increase again due to the economic recession in the eastern states, and the final phase starts in 2003, when migration to East again stabilizes (Glorius, 2010). Table 1-4 reports the marginal effects of the probit estimation when the dependent variable is the indicator of being a migrant in the respective phase.

Table 1-4. Determinants of Emigration by Phase

Variables	(1) 90-92	(2) 93-96	(3) 97-02	(4) 03-13
Age-Group Dummies (Ref: 65+)				
Less Than 25	0.070*** (0.017)	0.063*** (0.022)	0.066*** (0.015)	0.039*** (0.013)
25-35	0.053*** (0.015)	0.050** (0.020)	0.052*** (0.013)	0.037*** (0.012)
35-45	0.040*** (0.014)	0.037** (0.019)	0.041*** (0.012)	0.035*** (0.011)
45-55	0.025** (0.012)	0.016 (0.017)	0.033*** (0.009)	0.030*** (0.009)
55-65	0.007 (0.010)	0.000 (0.013)	0.022*** (0.007)	0.019*** (0.006)
Male	-0.003 (0.006)	-0.001 (0.005)	-0.007 (0.005)	-0.011** (0.006)
Marital status dummies (Ref: Married)				
Single	-0.018*** (0.005)	-0.011* (0.006)	0.005 (0.004)	0.017** (0.008)
Divorced	-0.017*** (0.005)	-0.002 (0.008)	0.021** (0.009)	0.021** (0.009)
Have Friends in West Germany	0.051*** (0.013)	0.059*** (0.012)	0.006 (0.005)	-0.002 (0.005)
No. of HH Members	-0.011*** (0.003)	-0.008*** (0.002)	-0.004** (0.002)	-0.000 (0.002)
Job dummies at t-1 (Ref: Retired)				
Student	0.004 (0.007)	0.012 (0.008)	0.007* (0.004)	0.024 (0.015)
Unemployed	0.017*** (0.006)	0.014** (0.005)	0.005* (0.003)	0.000 (0.006)
Worker	0.018*** (0.006)	0.018*** (0.006)	0.008** (0.003)	0.000 (0.006)
White Collar	0.011* (0.006)	0.014*** (0.005)	0.015** (0.006)	0.005 (0.007)
Self-Employed	0.008 (0.007)	0.012 (0.008)	0.009 (0.009)	-0.002 (0.007)
Civil Servant	0.014 (0.016)	0.004 (0.006)	0.009 (0.010)	0.007 (0.014)

GDR-Edu Dummies (Ref: 8 <sup>th</sup> or Lower)				
10th	0.005 (0.006)	-0.001 (0.007)	-0.008 (0.007)	-0.000 (0.006)
College Qual.	0.046** (0.020)	0.001 (0.012)	-0.014 (0.009)	0.020 (0.015)
College +	0.024** (0.010)	0.011 (0.010)	-0.015* (0.008)	0.006 (0.008)
Pseudo-R <sup>2</sup>	0.100	0.067	0.187	0.168
Observations	52,572	52,400	52,483	52,830

Notes: The sample is the East German respondents observed from waves 1990 to 2013. The dependent variable is an indicator variable of moving to West during the respective phase. The figures are the results of the probit regressions (marginal effects when other covariates are fixed). Standard errors adjusted for repeated observations on individuals in parentheses. The reference group consists of people who never migrated. Survey year dummies are included in the analysis but omitted in the table. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

The results demonstrate that age and employment goals are the dominant factors, especially in the early phases of East-West migration (Columns 1 & 2). The first phase is the mass migration period, and the second phase is post-mass migration, when East-West migration is the least prevalent due to the government efforts to revitalize the eastern regions. Compared to the reference group (65+ years), almost all age groups are prone to migration. The unemployed and all types of workers are more likely to migrate than people who do not participate in the labor market. People who have ties to the West are 5% more likely to migrate. In the first and second phase, migrants share similar demographic characteristics: the married and the young. This implies that in the earliest phase migration was family-oriented, which is in accordance with the previous literature (Glorius, 2010; Wolff 2009).

The economic situations in East started to recede in 1997, which increased the number of migrants in this phase. All agegroups are prone to migrate and also the unemployed and both types of workers (Column 3). In this phase, those with a lower level of GDR education compared to those with the higher-education degree are more likely to migrate, which implies that people with less stable employment situations moved to the West.

In the latest phase (Column 4), it is difficult to pinpoint determinants of migration other than age. In this phase, the main driver of East-West migration is educational goals or searching for the first job by young individuals (Glorius, 2010).<sup>8</sup> The dominance of female migrants is in accordance with the previous literature. The regression results above confirm that East Germans' migration to West was largely motivated by labor market-related factors, especially in the first decade of the post-reunification period.

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<sup>8</sup> The regression results in the latest phase may not reflect the trend because of the characteristics of the sample I am using in this analysis. As the sample of this analysis was added in 1990, it is possible that younger individuals (18-25) are not properly represented for the surveys in the 2000's. Because of this, the results may not have captured the dominance of young migrants.

## 1.6 Regression Results

### A. *The Effect of Migration to the West*

The dependent variable being the binary variable, the probit model is adopted for analyses.<sup>9</sup> Column (1) of Table 1-5 reports the baseline results, and (2) reports the results when additional variables, the job dummies and the log of household per capita income, are added. Both specifications report similar results in terms of coefficients' magnitude and significance, especially that of the migration indicator, denoted as "West." Living in the West increases the probability of trust by almost 48% points if migration was a random assignment. Column (3) are the results after adding initial state dummies, if observed first in the East. Column (4) reports results after adding migration cohort dummies, i.e. migration timing dummies. All four columns report similar impact of migration to the West.

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<sup>9</sup> The linear probability model produces similar estimates.

Table 1-5. Marginal Effects of Migration

	(1)	(2)	(3)	(4)
West	0.483*** (0.124)	0.472*** (0.120)	0.448*** (0.127)	0.390* (0.200)
GDR-Edu Dummies (ref: 8 <sup>th</sup> or lower)				
10th	0.053 (0.038)	0.014 (0.039)	0.005 (0.039)	0.003 (0.039)
College Qual.	0.239*** (0.059)	0.163*** (0.062)	0.146** (0.063)	0.151** (0.063)
College +	0.204*** (0.039)	0.106** (0.045)	0.104** (0.045)	0.102** (0.045)
Log of HH Income in 89	0.007 (0.009)	0.004 (0.009)	0.003 (0.009)	0.003 (0.009)
Job Dummies (ref: unemployed)				
Worker	0.040 (0.032)	0.039 (0.032)	0.035 (0.032)	
White Collar	0.100** (0.039)	0.103*** (0.039)	0.098** (0.040)	
Self-Employed	0.030 (0.051)	0.031 (0.051)	0.029 (0.051)	
Civil Servant	0.058 (0.080)	0.047 (0.080)	0.023 (0.079)	
Log of per capita HH income	0.086*** (0.028)	0.090*** (0.028)	0.092*** (0.028)	
Urban	0.024 (0.026)	0.013 (0.025)	0.001 (0.026)	0.011 (0.027)
Marital Status Dummies (ref: married)				
Single	-0.011 (0.043)	-0.005 (0.043)	0.001 (0.042)	-0.001 (0.043)
Divorced	-0.070** (0.033)	-0.054 (0.033)	-0.052 (0.033)	-0.057* (0.034)
Male	0.010 (0.023)	0.009 (0.024)	0.010 (0.024)	0.012 (0.024)
Age	0.014 (0.013)	0.012 (0.014)	0.012 (0.014)	0.013 (0.014)
Age <sup>2</sup>	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Foreigners (%)	-0.061** (0.026)	-0.059** (0.025)	-0.061** (0.029)	-0.060* (0.033)

Log of State GDP	0.116 (0.390)	0.068 (0.380)	0.093 (0.519)	0.165 (0.619)
State of Origin Dummies	N	N	Y	Y
Migration Year Dummies	N	N	N	Y
Pseudo-R <sup>2</sup>	0.03	0.04	0.042	0.046
Observations	2,676	2,609	2,597	2,591

Notes: The results of year fixed effects for all columns, the state of origin and migration year dummies where applicable are not reported. Standard errors adjusted for the individual clusters are in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

West being the strongest determinant, other strong determinants are related to economic stability. Having white-collar jobs raises trust by 10% points, and a 1% increase in the household per capita income leads to a 9% point increase in trust. Income in 89, the proxy for economic status in GDR before reunification, is statistically insignificant with a close to zero impact. On the other hand, the percentage of foreigners in the respondent's state of residence negatively affects trust, by approximately 6% points when a percent point of foreigners increases.

As pointed out earlier, the above results do not take into account potential bias from self-selection of migrants. For example, if more trusting individuals move to the West, then the coefficient of West is overestimating the trust impact of the Western exposure. To correct for this bias, I employ instruments that affect trust only through migration to the West. Table 1-6 reports two-stage least squares results.

Table 1-6. Two-stage Least Squares Results

	(1) (Linear) 2SLS	(2)	(3)
	Second-Stage	First-Stage	Probit-2SLS
West	0.868** (0.413)		0.397*** (0.093)
Log of wage differentials		2.698*** (0.399)	
Log of unemployment diff.		-0.610*** (0.188)	
Log of HH income in 89	0.002 (0.008)	0.002 (0.001)	0.004 (0.007)
GDR-education dummies (ref: 8 <sup>th</sup> or lower)			
10th	0.014 (0.033)	-0.002 (0.004)	0.012 (0.033)
College qual.	0.151*** (0.052)	0.000 (0.009)	0.149*** (0.052)
College +	0.104*** (0.039)	0.006 (0.006)	0.104*** (0.039)
Job dummies (ref: unemployed)			
Worker	0.041 (0.029)	-0.004 (0.005)	0.038 (0.029)
White collar	0.106*** (0.036)	-0.014** (0.007)	0.097*** (0.035)
Self-employed	0.032 (0.042)	-0.000 (0.007)	0.029 (0.042)
Civil servant	0.056 (0.066)	-0.004 (0.013)	0.050 (0.065)
Log of HH per capita income	0.083*** (0.026)	0.012** (0.006)	0.089*** (0.025)
Age	0.011 (0.013)	0.001 (0.002)	0.012 (0.013)
Age-squared	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Observations	2,597	2,597	2,597
R-squared	0.045	0.876	0.045
F-statistic		28.13	

Notes: Robust standard errors in parentheses. Demographic variables (marital status, and sex), year fixed effects, state-characteristics are omitted due to space constraints.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Columns (1) and (2) report the linear two-stage least squares results. As the instruments used are too weak to be used as the sole instrument (F-statistic <10), a pair of two instruments, which pass the joint exogeneity test, are used. Columns (1) and (2) report the second and first-stage results, respectively, when the instruments are the log differences of unemployment rate and wage between the state of origin and the mean of western states in 1991. The coefficient of the log difference of the unemployment rate shows the expected sign; the more negative the difference (the bigger the gap), the higher probability to migrate to the West. When the variable West is instrumented by these variables, the effect of migration raises trust by 87% points.

Column (3) reports the estimates by the Probit-2SLS model, whose procedure was briefly described in Section 1.5.<sup>10</sup> The results present the estimates around 37-40% points increase of trust when one migrates to West, which are similar estimates to the single-equation probit model's. Although Angrist & Pischke (2008) argue that applying the nonlinear model is unnecessary in two-stage least squares, the results of the above non-linear models provide more reasonable estimates of the effect of migration. Altonji,

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<sup>10</sup> This procedure was done by using the STATA command *ivtreatreg*, which estimates the average treatment effect. The treatment group was assigned by the state of being in the mover group or in the stayer group. Assigning the treatment by being in the West does not alter the implication but yields a smaller impact.

Elder, & Taber (2010) also stress the importance of functional forms in case of a binary endogenous treatment claiming that it produces more reasonable estimates than linear models. The next section proposes a possible channel which causes such an increase in trust.

### *B. Possible Channel: Labor Market Returns*

So far, the results tell us that migration to the West has a positive effect on East Germans' trust by 4% points, at the lowest estimate. In this section, a potential channel through which trust stock is built is scrutinized: employment experience. Considering that most of the migrants are labor market-driven, trust may depend on returns at work. I decompose the years spent in the West into three activities—years worked in the West, years unemployed in the West, and years in education in the West—to examine whether the effect of each activity differs. If none of the activities influence trust, then channels outside the labor market would improve trust of East German migrants. The following table reports the effect of respective experience on migrants' trust using the probit model.

Table 1-7. The Effects of Activities in West

	(1)	(2)	(3)
Years in West	0.019*** (0.006)	0.018*** (0.006)	
Years worked in West			0.020*** (0.006)
Years unemployed in West			-0.030* (0.018)
Years in education in West			0.049 (0.103)
Job dummies (ref: unemployed)			
Worker		0.040 (0.032)	
White collar		0.098** (0.039)	
Self-employed		0.029 (0.050)	
Civil servant		0.063 (0.081)	
Log HH income per capita		0.086*** (0.027)	
GDR-edu dummies (ref: 8 <sup>th</sup> or lower)			
10th	0.053 (0.038)	0.014 (0.039)	0.051 (0.038)
College qual.	0.237*** (0.059)	0.161*** (0.062)	0.230*** (0.060)
College +	0.203*** (0.039)	0.105** (0.046)	0.198*** (0.039)
Marital status dummies (ref: married)			
Single	-0.007 (0.043)	-0.001 (0.043)	-0.006 (0.043)
Divorced/separated/widowed	-0.058* (0.033)	-0.042 (0.033)	-0.058* (0.033)
Urban	0.019 (0.025)	0.008 (0.025)	0.016 (0.025)
Observations	2,676	2,609	2,676
Pseudo R-squared	0.028	0.037	0.030

Notes: Marginal effects when other covariates are at a fixed value. Demographic variables (age, age-squared, and sex) and year fixed effects, state-characteristics, the log income in 89 are omitted due to space constraints. The dependent variable is an indicator whether the

respondent trusts most people in general. Reference categories are the unemployed, 8<sup>th</sup> year GDR-education, and the married. Standard errors adjusted for repeated observations of individuals in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

The results from Columns (1) and (2) show that spending a year in the West increases trust by approximately 2% points. The squared-term of years in the West was added as an additional specification to see whether the relationship is non-linear but its coefficient was statistically insignificant, although negative (results not reported).<sup>11</sup> In Column (3), when the years spent in the West are decomposed into three activities, the coefficients indicate that a year spent in the West working leads to 2% points increase in trust, while a year spent in the West unemployed leads to a slightly bigger decrease, 3% points, in trust. On the other hand, being educated in the West has an insignificant effect. This may be due to the small number of migrants moving to study in the West, as the pool of respondents consist of only adults. The regression results reveal that quality of experience in the West is important. Even after migrants move to the West, if the experience, such as returns from the labor market, is negative, their trust may not improve. Therefore, I conclude by stressing assimilation through labor market activities is an important determinant of trust of migrants.

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<sup>11</sup> This can be due to the small number of migrants and the short history of migration.

### *C. Robustness Check: Relaxing Sample Restrictions*

The baseline analysis does not include the respondents who returned back to the East after spending time in the West. In this subsection, the return migrant sample is also included to see whether they alter the results. Table 1-8 reports the regression results when the return migrants are added (Column 1). The results are robust to the included sample. Furthermore, Column (2) presents the effect of returning to East, with the sample of movers and returners only. Although returning back to the East has a negative coefficient, the effect is statistically insignificant. The sample size of returners being only a few dozen, more sample is needed to conduct more accurate assessment of the effect of returning back to the East. Columns (3) and (4) repeat the exercise with the respondents in Berlin as the additional sample. The effect of migration significantly decreases, almost by half the previous estimates (Column 3). A possible reason is the considerably small number of migrants from Berlin. Only 13 cases are observed as East-West migrants, which leads to the downward direction of the coefficient given the majority of the added sample remaining in the East. Besides, all of these 13 cases migrated from West Berlin, leading to the possibility that they were already exposed to the “Western” environment before migration and making the migration to the West ineffective in influencing trust.

Table 1-8. Including Return Migrants and Berliners

Variables	(1)	(2)	(3)	(4)
	Including Returners		Incl. Berliners & Returners	
	East vs. West	Movers vs. Returners	East vs. West	Movers vs. Returners
West	0.453*** (0.118)		0.206** (0.082)	
East		-0.081 (0.152)		-0.120 (0.142)
Log of HH Income				
In 89	0.005 (0.009)	-0.034* (0.019)	-0.003 (0.009)	-0.033* (0.019)
GDR-Edu Dummies (ref: 8 <sup>th</sup> year or lower)				
10th	0.012 (0.038)	0.026 (0.126)	0.018 (0.037)	-0.001 (0.126)
College Qual.	0.157** (0.062)	0.277* (0.150)	0.157** (0.062)	0.150 (0.156)
College +	0.095** (0.044)	0.038 (0.140)	0.100** (0.043)	-0.004 (0.141)
Job Dummies (Ref: Unemployed)				
Worker	0.038 (0.031)	0.202** (0.098)	0.039 (0.030)	0.214** (0.098)
White Collar	0.101*** (0.038)	0.194* (0.109)	0.111*** (0.037)	0.218** (0.107)
Self-Employed	0.035 (0.049)	0.289** (0.115)	0.024 (0.048)	0.299*** (0.115)
Civil Servant	0.079 (0.079)		0.063 (0.075)	
Log of per capita				
HH income	0.083*** (0.027)	0.212*** (0.071)	0.085*** (0.026)	0.205*** (0.071)
Urban	0.014 (0.025)	-0.100 (0.080)	0.018 (0.025)	-0.098 (0.080)
Observations	2,650	213	2,815	215

Notes: Marginal effects when other covariates are at a fixed value. Age, age-squared, gender, year fixed effects and state-characteristics are omitted due to space constraints. Standard errors adjusted for repeated observations of individuals in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

#### *D. Robustness Check: Additional Controls*

The following analysis tests the robustness by controlling additional controls that can affect trust and migration, risk-preference and GDR-related variables. Trusting strangers and migrating to another region accompany a certain degree of risk-taking component. Column (1) adds risk-preference behavior, measured with the 10-scale self-reported willingness to take risks (observed in 2008 and 2013), to test whether the migration effect is due to the omitted variable bias. The coefficient of West still remains statistically significant, and even larger in magnitude, leading to the conclusion that migration effect is not diluted by risk-preference of an individual.<sup>12</sup>

Columns (2)-(4) add GDR-related variables as additional controls. The dummy variable of having had a white-collar job in GDR, having had a second job in GDR, and the subjective standard of living (10-scale) in GDR are added respectively in Columns (2), (3), and (4). Column (5) reports the results when all GDR-controls are added. All of the results lead to the consistently positive effect of migration to the West.

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<sup>12</sup> The large coefficient is due to the sample characteristics, as the variable measuring the risk preference appears in the waves in which the respondents show the higher effect of trust.

Table 1-9. Additional Control Variables

	(1)	(2)	(3)	(4)	(5)
West	0.877*** (0.204)	0.472*** (0.120)	0.468*** (0.119)	0.464*** (0.121)	0.459*** (0.120)
Willingness to Take Risk	0.036*** (0.006)				
White-Collar job in GDR		0.010 (0.044)			0.001 (0.045)
Had a second job in GDR			-0.000** (0.000)		-0.000** (0.000)
Standard of living in GDR				0.026*** (0.008)	0.026*** (0.008)
GDR-edu dummies (ref: 8 <sup>th</sup> or lower)					
10th	0.018 (0.052)	0.013 (0.039)	0.016 (0.039)	0.021 (0.039)	0.024 (0.039)
College Qual.	0.178** (0.076)	0.163*** (0.062)	0.160*** (0.062)	0.177*** (0.063)	0.175*** (0.063)
College +	0.153** (0.062)	0.101** (0.050)	0.106** (0.045)	0.122*** (0.046)	0.121** (0.051)
Log of HH Income in 89	0.004 (0.012)	0.004 (0.009)	0.004 (0.009)	0.004 (0.009)	0.005 (0.009)
Urban	-0.012 (0.033)	0.013 (0.026)	0.012 (0.026)	0.016 (0.025)	0.015 (0.026)
Job dummies (ref: unemployed)					
Worker	0.023 (0.044)	0.041 (0.032)	0.038 (0.032)	0.049 (0.032)	0.046 (0.032)
White Collar	0.086 (0.053)	0.100** (0.039)	0.100** (0.039)	0.104*** (0.039)	0.104*** (0.039)
Self-Employed	-0.047 (0.064)	0.030 (0.051)	0.033 (0.051)	0.027 (0.051)	0.029 (0.051)
Civil Servant	-0.020 (0.101)	0.058 (0.080)	0.064 (0.079)	0.073 (0.080)	0.079 (0.080)
Log of per capita HH income	0.081** (0.035)	0.085*** (0.028)	0.086*** (0.028)	0.082*** (0.028)	0.083*** (0.028)
Marital status dummies (ref: married)					
Single	-0.008	-0.005	-0.002	-0.005	-0.002

	(0.052)	(0.043)	(0.043)	(0.043)	(0.043)
Divorced	-0.072*	-0.054	-0.053	-0.046	-0.045
	(0.041)	(0.033)	(0.033)	(0.033)	(0.033)
Observations	1,348	2,609	2,609	2,580	2,580

Notes: Marginal effects when other covariates are at a fixed value. Year fixed effects and state-characteristics, age, age-squared, and gender dummy are omitted due to space constraints. Standard errors adjusted for repeated observations of individuals in parentheses.  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## **1.7 Conclusion**

This chapter addresses whether trust of East German migrants, who were long exposed to socialism and, thus, have low stock of social capital, is adjustable when the environment changes to a high-trust society. Although there was mass-migration of East Germans in the early 1990's, it is inappropriate to argue that migration to the West was a random decision for East Germans. As migration decisions are non-random, this study uses instruments that are not correlated with trust to estimate the true impact of being in the West. Even after the unobserved heterogeneity is taken into account, migration to the West still has a positive impact on East Germans' trust. This finding is in line with the previous literature that finds convergence of trust among immigrants. More importantly, its implications are encouraging for the current situation of lower stock of East Germans' trust, as more interactions with the West, or more exposure to a high-trust environment, can tighten the gap faster than what the previous literature expects.

Furthermore, this study proposes the possible channel that can improve East German migrants' trust, by studying the impact of different types of labor market-related activities. The results that years employed in the West has a positive impact on trust, while time unemployed in the West has a negative impact, imply that upon migration to the West, the quality of

experience is important to raise the trust level. If the experience is negative, even in the high-trust environment, a migrant's trust may not improve. This finding sheds light on the arguments of Putnam (1995)'s work, that social participation is an important factor of social capital. Employment, being a type of social participation, not only improves economic adjustment of a migrant but also improves her social adjustment.

This study contributes to the related literature by providing evidence that trust can grow even for people who have been exposed to the low-trust environment for a long period of time. Moreover, unlike other studies that examine the gap between East and West Germans, this study addresses the endogeneity issue of migrants' trust. Finally, it uncovers the new channel of increased trust—positive labor market experience.

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## Appendices

### A1. Explanations on the Migration-Related Variables

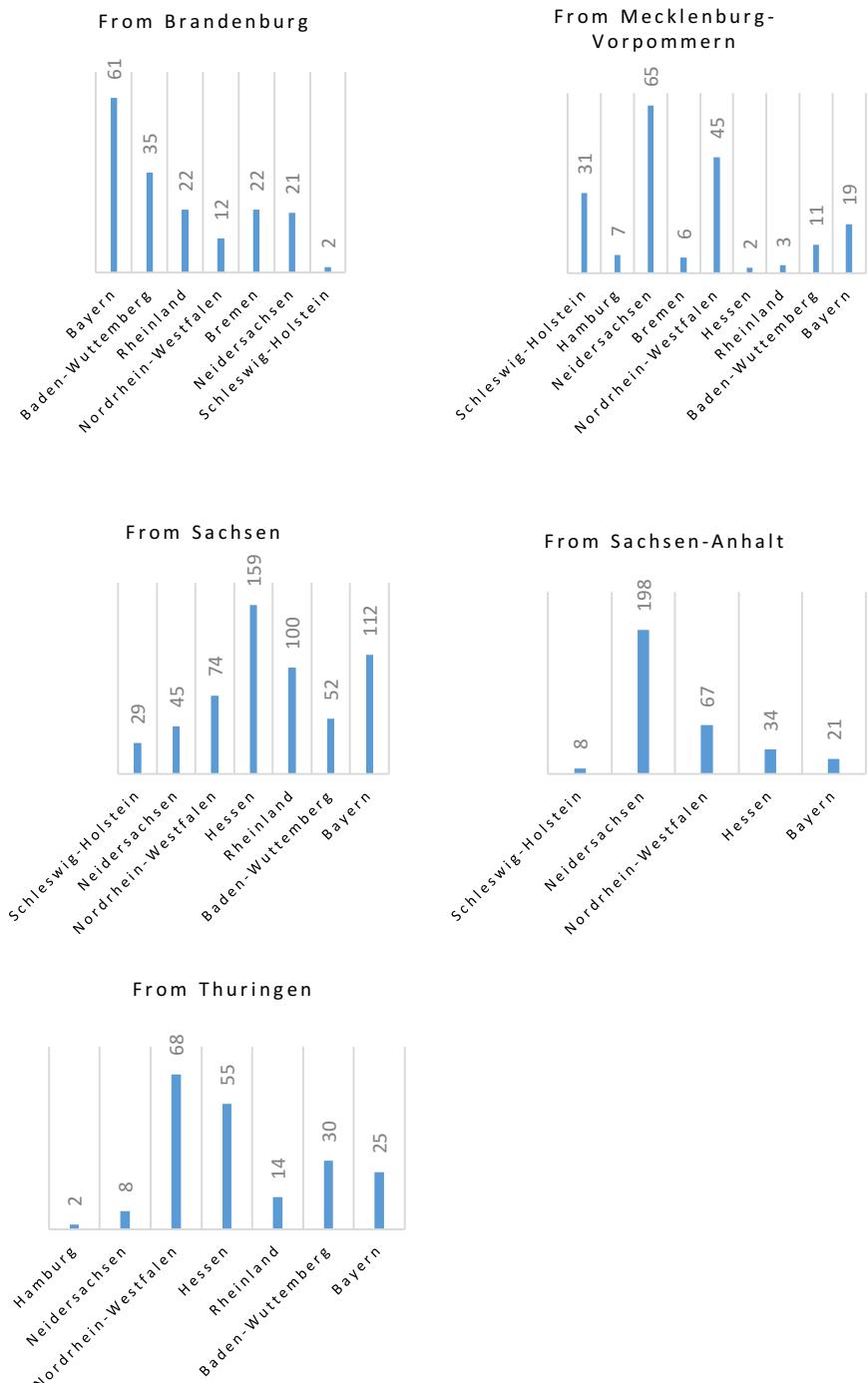
Construction of migration-related variables involved a rather complicated code work. First, I dropped individuals surveyed in Berlin, as it is difficult to distinguish and control the characteristics between the former East and West Berlin in the reunified Germany. Also, since my interest is to observe the effect of migration on Germans, the analysis is based on the respondents who indicated that they were born in Germany or immigrated before the World War II. Identifying whether a respondent was from East or West Germany was done through a variable, *loc1989*, that revealed the location of the respondent in 1989, the year immediately before reunification. I defined East Germans as the respondents who indicated that they were in East Germany in 1989, West Germans as those who answered that they were in West Germany in 1989, and dropped the respondents who indicated that they were abroad in 1989. Also, there are some observations of return-migration, that is, East Germans returning back to home-state or other former East German states after spending some time in the former West German states. I dropped these cases and conducted analyses based on the respondents who migrated to West Germany and stayed in the West until their final observation.

The sample consists of the original East German Household sample added in 1990. Among the respondents, those who were defined as “East Germans” by the standard above was kept for analysis, to avoid the possibility of including West Germans, who may enter the sample by marriage, etc., in the analysis. Not all respondents are first observed in the East. For the individuals first observed in the West, it is impossible to identify whether it is their initial or repeated migration to the West Germany, still less their time of migration. I assume that it was their initial migration to West Germany for East German respondents that were first surveyed in the West.

Constructing the variable on years lived in the West also involved some “guesstimation.” For the cases whose migration years were unidentifiable (e.g. those whose initial survey took place in the West), I assumed that they moved to the West a year before either their year of

moving into the current dwelling (*hgmoveyr*) or the year they were first contacted for the survey (*eintritt*), whichever was the earliest.

Figure A1-1. Destination States by Origin



Notes: The respondent's origins are defined as the state of residence where the respondent was first surveyed. Those who were initially surveyed in the West are not included.

## **Chapter 2. The Impact of Mass Migration on West Germans' Trust in the Reunified Germany**

### **2.1 Introduction**

This chapter switches focus to the West Germans who experienced the mass-migration of East Germans after reunification. While the adaptability of East German's trust, even after decades of negative exposure, is investigated in Chapter 1, this time the question of its persistence is asked—how long does an impact of a historical shock last on trust? A number of studies advocate the persistent nature of trust, some arguing that a detrimental impact on trust has prolonged effects lasting as long as 400 years (Nunn & Wantchekon, 2011). Using the fact that trust is transmitted across generations, Algan & Cahuc (2010) measure the inherited component of trust by variations in trust among different immigrant groups in the US and empirically prove that trust promotes economic growth. If trust has an inherited component that is strong enough to be passed onto next generations as the previous studies acknowledge, a historical event would still have an effect on West Germans' trust as well.

Around the time of the German reunification, migration from the East to the West exploded due to political and economic reasons. Although about 30,000 East Germans fled to West Germany each year

in the late 1980's, the number of East German migrants jumped to approximately ten times that of the previous year in 1989, as a result of the first opportunity in May through the opening of the Hungarian borders and the second—and unequivocal—opportunity in November through the fall of the Berlin Wall, which rendered migration between the East and the West regions officially free (Bauer & Zimmermann, 1997). In 1989 and 1990, the annual total outflow of East Germany is estimated to be equivalent of 2.5% of the East German population (Hunt, 2006). In 1991, when the mass movement subsided compared to the previous years, a total of 230,000 East Germans entered into the West (Fuchs-Schundeln & Schundeln, 2009).

This mass-migration was the source of fear among West German workers at the time. The literature describing the situations in Germany after reunification conveys negative perceptions of West Germans towards East German migrants. For example, the labor unions in the West pressured to raise the wage level in the East because of the fear of migration of East German workers. The fear of continuing large-scale emigration was quite substantial enough to influence the decision to enter into a monetary and economic union with the GDR in February 1990 (Akerlof et al., 1991). Considering the situations in which many workers felt against the mass migration of East German workers, I conjecture that if determinants of trust have persistent

factors, West Germans' trust would be affected by the event in the early 1990's. Whether this historical "shock" affects the trust levels of individuals living in West Germany is tested, with the variation of net migration rates across the West German states immediately after reunification as the proxy of the shock.

Despite mixed results among scholars, there is evidence that fears about the negative impact of immigration on wages and employment generate anti-immigrant attitudes (Scheve & Slaughter, 2001; Mayda, 2006). Also, trust and positive attitudes towards immigration are known to have a positive association (Herreros & Criado, 2009). The following hypothesis can be proposed by linking these works. If West Germans perceived East Germans as "immigrants," and if their fear was substantial, then the East-West migration in the early 1990's would affect their trust. A possible explanation is that natives—the West Germans—perceived East German migrants as potential labor market competitors, which negatively affected people's trust in general public. As many scholars have proven that there is a persistent nature of trust, the expectation that the impact of the migration shock would still remain among people who were old enough to be affected at the time of reunification is not far-fetched.

A way to check this hypothesis is to show that whether the migration rate in the early 1990's, when outmigration from East Germany was the most severe, still affects trust of people who were in the labor market at the time, but affects less people who were too young at the time. The regression results of the age-group analysis demonstrate that trust of those who were of prime-age at the time still responds to the migration shock in the early 1990's. Thus, this study provides evidence of the persistent effect of the mass-migration shock on trust on affected individuals. Furthermore, the subsequent analyses with occupation and relative-income subgroups serve as evidence that perception of labor market competition is the likely culprit of the shock's negative impact.

The outline of this chapter is as follows. In Section 2.2, related literature is discussed. In Section 2.3 and 2.4, data and empirical strategy are explained. Section 2.5 reports regression results and Section 2.6 concludes.

## 2.2 Literature Review

### *A. Literature on Migration and Social Capital*

The number of studies finding the links between social capital and migration are relatively small in the economics literature. Although

some studies argue otherwise (Citrin, Green, Muste, & Wong, 1997; Hainmuller, Hiscox, & Magalit, 2015), there are two exemplary works, Scheve & Slaughter (2001) and Mayda (2006), which examine the relationship between immigration and people's values and perception, rooted from economic theories of immigration, the Hecksher-Ohlin (HO) model and the Factor-Proportions Analysis model.<sup>1</sup> These models predict that attitudes towards immigration are dependent upon one's evaluation of labor market competitiveness. According to the HO model, if a country is small so its output does not affect the world prices, then wage does not respond to the shock, i.e. wage is insensitive to factor price. For a country that is big enough to influence the world prices, upon an increase in the labor supply shock, the relative price of non skill-intensive products declines, which lowers wages for unskilled workers. In this setting, unskilled workers prefer policies against immigration inflows. The factor-proportions analysis model, which assumes no factor price insensitivity, naturally predicts the same. Upon an increase in immigrant workers, firms hire relatively more unskilled workers because of lower relative wages.

Scheve & Slaughter (2001), measuring immigration-policy preferences by a survey response reflecting the degree of acceptance of

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<sup>1</sup> An important assumption of these models is that natives view immigrants as non-skilled workers.

immigrants, examine the determinants of individual preferences over immigration policy using the three-waves of National Election Studies data in the United States. Their results support theoretical predictions above—less-skilled workers are significantly more likely to prefer closed borders. Mayda (2006), in order to overcome the limitations from single-country studies, uses the cross-country datasets, the International Social Survey Programme and the World Values Survey to test the relationship. She finds that both economic and non-economic factors explain immigration attitudes and that there exists cross-country variation in the relationship between skill and preferences. According to her analysis, skill and pro-immigration preferences are positively correlated in countries with economic prosperity, and negatively correlated in countries with low per capita GDP. These works imply that individuals' economic standings affect perceived competition in the labor market, which leads to a change in trust.

#### *B. The Impact of Exogenous Shocks on Social Capital Outcomes*

Since this paper is in line with a branch of literature that supports persistence of exogenous shocks on people's perceptions, notable literature that utilizes natural experiment settings to study outcomes on social capital or values is introduced in this section. Fernandez, Fogli, & Olivetti (2004) use the mobilization rate of men across the United

States during the World War II as an exogenous shock on women's labor supply. Because of the shortage of male workers caused by the war, women's labor supply increased at the time. They find that the sudden increase in women's participation in the labor market resulted in not only the higher labor force participation of women at the time, but also the change of norms of the future generation who were raised by working mothers. Nunn & Wantchekon (2011) find that the extent of transatlantic slave export still affects trust levels of ethnic groups whose ancestors were forcibly traded 400 years ago. Licher, Löffler, & Siegloch (2015) use the regional spy density variation to find a negative impact of surveillance on interpersonal trust, institutional trust, and entrepreneurial activities. Finally, Giuliano & Spilimbergo (2013) use macroeconomic shocks as a natural experiment and reveal that people who experienced recession in their teens tend to support redistributive government policies, vote for the left-wing parties, and believe that luck is more important than effort in determining economic success in life.

However, not all literature supports the persistent nature of social capital. For example, Fidrmuc (2012), finding no difference of social capital between the regions affected and not affected by large-scale population displacements after the World War II, attributes some regions' persistently lower social capital to other factors that influence

social capital. He argues that low social capital merely reflects the poor institutional environment or factors that invalidates institutions, such as corruption and crime.

### *C. The German Reunification as a Natural Experiment*

An important assumption in this study is that the mass migration of East Germans after reunification in Germany is an exogenous event. Fortunately, many of the previous studies consider that the German reunification in 1990 is a natural experiment because of its abrupt nature. A few studies that take advantage of this setting are discussed. Burchardi & Hassan (2013) examine West German households who had East German friends or family before the reunification and find that their income growth rates after reunification are higher than the income growth rates of people without ties. Redding & Sturm (2008) investigate the effects of border changes due to the Second World War and the reunification in Germany on the West German cities and find that the loss of trading partners caused by the division of Germany after the WWII had a negative impact on the cities' population growth, and that the reunification that took place decades later also contributed to the relative decline of border cities' population growth compared to that of the western cities.

Fuchs-Schundeln & Schundeln (2005) use the unique situation in the former East Germany in which people's choice of occupations was independent of risk aversion. Although in general civil servants tend to be risk averse, Fuchs-Schundeln & Schundeln (2005) argue that there was no self-selection of risk-averse East German civil servants because of political restrictions that made occupation choices more or less exogenous in the former GDR. By comparing the amount of precautionary savings between the civil servants and other job holders in the reunified Germany, they estimate the proportion of precautionary wealth without the selection-bias.

## **2.3 Data and Variable Descriptions**

As in Chapter 1, the German Socio-Economic Panel Study (SOEP) data which is the longest-running longitudinal survey in Germany are used. It started in 1984 with 6,000 households in West Germany, added East German households in 1990, and conducts surveys with over 12,000 households annually. The measure of trust, contained in the waves in 2003, 2008, and 2013, is a 4-scale response, from strong disagreement to strong agreement, to the survey statement, "In general, you can trust people." All available SOEP samples from the initial sample of West German Households that were added in 1984 are used. Thus, the sample in this chapter consists of non-immigrant respondents identified

as West Germans who are living in Western states and are born in 1985 or before.<sup>2</sup> The sample size is 10,954 for 2003 wave, 9,671 for 2008 wave, and 13,312 for 2013 wave.<sup>3</sup> The summary statistics are reported in Appendix.

In this chapter, often distinctions between age-groups are made because of the conjecture that a labor market shock can affect individuals heterogeneously depending on their standings in the labor market. Based on the age at the time of reunification, age-cohorts of five-year intervals are generated. These cohorts are grouped into three which are named as the Young, the Prime-age, and the Middle-age (details in the Appendix). Here, the distinction between the Young and the Prime is based on whether the respondent was an adult (18 or older) in 1990. The Prime group is designed to contain individuals who are less than retirement age until the year 2013. Although these distinctions may seem quite arbitrary, interesting and different results between these three groups are found.

The Federal Statistical Office of Germany provides migration-related statistics that include those of East Germany starting from October 1990. The statistics on net migration which take into account both inflows and outflows of individuals of each state, and as East

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<sup>2</sup> This age restriction is to ensure that the youngest individuals in the sample reach adulthood by 2003.

<sup>3</sup> The increase in the sample size is caused by the refreshment sample added in 2011.

German migrants are of primary interest, the number of internal migrants that move within Germany, rather than that of migrants from foreign countries, are used. By dividing net migrants by mid-population of the year, which was calculated as the mean value between the population at the end of the previous year and the end of the current year, I construct annual net migration rates of each German state since 1990.<sup>4</sup>

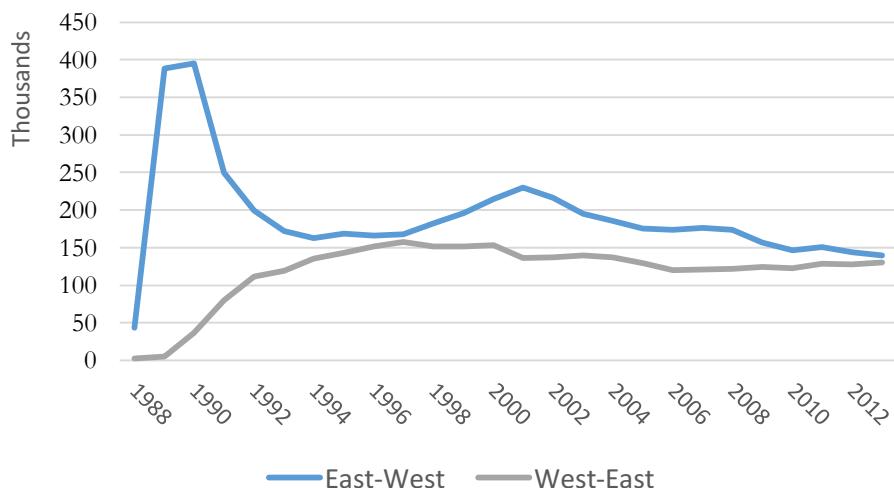
Figure 2-1 demonstrates that mass-migration occurred immediately before and after the official reunification. The flow from the East and that from the West are in stark contrast. In the early 1990's, the population of Germany shifted to the Western regions. In 1989, when the political climate was unstable, migrants from East Germany spiked to approximately 390,000 from 43,000 in 1988 (The Statistical Office of Germany). The internal migration in Germany around the time of reunification is dominated by East German migrants around the time of reunification. After the peak in 1991, the flow from the East to the West drops until the second peak in 2001. On the other hand, the flow from the West to the East gradually increases during the 1990's until it reaches the peak in 1997. It remains stagnant throughout the 2000's and the 2010's. Although the East-West flow and the West-

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<sup>4</sup> For convenience, I use the population statistic as of the first day of the year after instead of using the statistics as of the last day of that year. For example, the mid-population of 1990 is calculated by taking the average of the population as of January 1, 1990 and the population as of January 1, 1991.

East flow are almost balanced in the 2010's, the East-West flow dominates the West-East flow during the entire period of the observed 25 years.

Figure 2-1. Migration between Eastern and Western States of Germany (1988-2013)



Source: The Federal Statistical Office of Germany

Since the peak East-West migration occurred in the early 1990's, West German states' mean net migration rates in 1990-1991 are used as the proxy for the shock. I link the state's 1990-91 net migration rate to each individual's state of residence to examine its impact on the respondents' trust.<sup>5</sup> Although mass-migration occurred

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<sup>5</sup> Although ideally the migration rate should be assigned by the respondent's state of residence in year of 1990, because I use the waves in the 2000's and 2010's for the analysis, many of the respondents are not observed in the 1990 wave. Including only the initial survey sample (started in 1984) results in too much loss of the sample size and a total loss of respondents observed in certain states. I check interstate migration cases and find that over 93% of the respondents still stay in the state they were

prevalently between 1989 and 1990 (Figure 2-1), unfortunately, statistics on inter-state migration rates that take account of flows between East and West are available only since October 1990. Thus, the net migration rate in 1990 is obtained through multiplying the migration rate in the 4<sup>th</sup> quarter (from October to the end of the year) by four.<sup>6</sup> Table 2-1 reports net migration rates by state in 1990 and 1991.

Table 2-1. Net Migration by State in West Germany in 1990-1991

State	Net Flow 1990	Net Flow 1991	Net Migration Rate (%) 1990	Net Migration Rate (%) 1991	Shock (90-91 average)
1. Schleswig-Holstein	-44852	-17803	-1.718226	-0.6750389	-1.196633
2. Hamburg	4684	4729	0.2857332	0.2847835	.2852583
3. Niedersachsen	-29096	-654	-0.3972186	-0.0088004	-.2030095
4. Bremen	-636	-539	-0.0938504	-0.0789542	-.0864023
5. Nordrhein-Westfalen	54620	47934	0.3173437	0.2750124	.2961781
6. Hessen	26524	22476	0.4643587	0.3874959	.4259273
7. Rheinland-Pfalz	26368	26338	0.7064272	0.6944993	.7004633
8. Baden-Württemberg	47932	38176	0.4931138	-0.0749443	.4391328
9. Bayern (Bavaria)	61952	51125	0.5465658	0.4437011	.4951335
10. Saarland	1052	-405	0.0984158	-0.0376772	.0303693

Notes: Figures obtained from the Statistical Yearbook published by the Federal Statistical Office of Germany. Net migration rate (%) = 100 x (Net flow/Mid-population).

initially surveyed in the 2003 wave. Thus I consider the assumption that people are affected by the shock of the state of residence valid.

<sup>6</sup> The 1990's net migration rates are likely to be underestimated, as many East Germans started to migrate even before the official mark of reunification, starting from late 1989. The peak migration period was between the 1989 and early 1990 (Akerlof et al., 1991). Therefore, the proxy I use in this analysis underrepresents the true impact of the shock.

From the above table, the states with the positive net migration rates tend to be the home states of the most populated cities in Germany: Hamburg, Bavaria (home to Munich), Hessen (Frankfurt), Baden-Wuttemberg (Stuttgart), and Nordrhein-Westfalen (Cologne and Dusseldorf).<sup>7</sup> However, the inflow is not exactly proportional to the population. The state with the highest relative inflow of East Germans is Rheinland-Pfalz, the 7<sup>th</sup> biggest state in terms of population in Germany before reunification (based on the 1987 census).

Table A2-1 in the Appendix reports the annual average migration rates by state. Although the SOEP dataset does have a region code that distinguish between East and West Berlin, I decide not to include observations in Berlin because of its unique situations of sharing characteristics of both East and West Germany, and, more importantly, some official statistics exclude migration from and to Berlin. According to the statistics in Table A2-1, in 1990, population in the western states excluding Berlin increased by 0.25%. In the East, on the other hand, more than 5% of the population exited. Considerable outmigration continued until 1993, appeased for a brief period afterwards and restarted in 1999 when the economy in the East went into a recession. West's net migration rates in 1990 and 1991 were well

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<sup>7</sup> See Appendix for the map of Germany.

above its average rate in the period of 1990-2013, so it would be acceptable to argue that there was a sufficient impact of migration inflow to the western states, especially during the early 1990's.

## 2.4 Empirical Strategy

The goal of this chapter is to run the following regression,

$$TRUST_{ist} = \beta Mig90_s + X'_{ist}\gamma + S'_{st}\delta + State_s + Year_t + \varepsilon_{ist}$$

where TRUST is the indication of trust of i in state s at year t, and

$Mig90_s$  is the average net migration rate of the respondent's state in 1990-91. The vector  $X'_{ist}$  denotes a set of individual-level covariates, which include age, age-squared, an indicator variable of gender, marital status dummies, GDR-education dummies, occupation fixed effects, and the log of per capita household income.<sup>8</sup>  $S'_{st}$  is the vector of state characteristics—growth rate, percentage of foreigners, and the mean net migration rates for the past 5 years—of year t,  $State_s$  is the state fixed effects,  $Year_t$  is the year fixed effects and  $\varepsilon_{ist}$  is the error term.

The coefficient of interest is  $\beta$ , which captures the impact of the

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<sup>8</sup> The education variables denote the following levels: 1) 8<sup>th</sup> year competition or lower, 2) 10<sup>th</sup> year completion, 3) Qualified for university (Arbitur), and 4) College degree or higher. The marital status dummies are 1) Married, 2) Single, and 3) Others (divorced, widowed, and separated). The job dummies are 1) Labor force retirees (the majority) and people on military/community service or on leave, 2) Students, 3) the Unemployed, 4) Low-skilled workers (that include people in training), 5) White-collar (high-skilled) workers, 6) the Self-employed and freelancers, and, finally, 7) Civil servants.

migration shock. The random effects model is used to take advantage of the panel setup of the dataset.

## 2.5 Regression Results

### A. Baseline Regressions

Table 2-2 reports the probit marginal effects (with other covariates at the fixed level) when the dependent variable is an indicator whether the respondent trusts most people in general. Column (1) presents the results based on all respondents, and Columns (2)-(4) present the results by subgroup. The subgroup is generated based on the age at reunification, in 1990 (Appendix Table A2-3). In Column (1), the marginal effects of a percent point increase in 90-91 net migration rate leads to a decrease in trust by 12.8% points. The impact is quite substantial, considering the average net migration rate in 1990 in West, 0.25%, the migration by East Germans results in a 3.2% points decrease in trust. Trust is also affected by recent migration rates, the average net migration rate over the past 5 years. A percent increase in the recent migration rate leads to a 5.7% point decrease in trust. However, considering the magnitude of net migration in recent years, its real impact on trust minimal. Trust of West Germans increases with education levels, stability of job (the positive coefficient of being a

white-collar or a civil servant), and income. Female respondents have higher trust than male respondents, and married individuals have higher trust than single or divorced respondents.

Table 2-2. Migration Shock and Trust

VARIABLES	(1) All	(2) Young	(3) Prime	(4) Middle-age	(5) Retirees
Net migration 90-91 (%)	-0.128*** (0.034)	-0.119 (0.076)	-0.147*** (0.051)	-0.109* (0.058)	-0.082 (0.077)
Recent migration (%)	-0.057** (0.026)	-0.104* (0.061)	-0.020 (0.039)	-0.084* (0.044)	-0.037 (0.063)
Male	-0.042*** (0.008)	-0.016 (0.016)	-0.051*** (0.011)	-0.034** (0.014)	-0.001 (0.017)
Age	-0.000 (0.002)	-0.040*** (0.013)	0.008 (0.008)	0.025* (0.013)	0.055** (0.025)
Age-sq.	0.000 (0.000)	0.001*** (0.000)	-0.000 (0.000)	-0.000* (0.000)	-0.000** (0.000)
Education dummies					
10th	0.088*** (0.011)	0.114*** (0.024)	0.094*** (0.016)	0.075*** (0.018)	0.065*** (0.022)
Univ. qualified	0.203*** (0.014)	0.248*** (0.027)	0.215*** (0.021)	0.132*** (0.036)	0.150*** (0.046)
College +	0.235*** (0.011)	0.320*** (0.027)	0.248*** (0.017)	0.162*** (0.018)	0.122*** (0.024)
Job dummies					
Student	0.066** (0.027)	0.084 (0.069)	0.214*** (0.058)	-0.236 (0.187)	
Unemployed	-0.011 (0.016)	0.038 (0.068)	0.020 (0.036)	0.027 (0.021)	
Worker	-0.001 (0.015)	0.048 (0.065)	0.051 (0.034)	0.004 (0.023)	
White collar	0.047*** (0.015)	0.068 (0.066)	0.113*** (0.034)	0.022 (0.023)	
Self-employed	0.020 (0.018)	0.074 (0.074)	0.082** (0.037)	-0.002 (0.028)	
Civil servant	0.042** (0.019)	0.085 (0.074)	0.091** (0.039)	0.066** (0.029)	
Marital status					
Single	-0.054*** (0.012)	-0.012 (0.019)	-0.074*** (0.017)	-0.082** (0.037)	-0.105** (0.047)
Divorced	-0.076*** (0.010)	-0.106*** (0.034)	-0.066*** (0.014)	-0.086*** (0.017)	-0.094*** (0.020)
Log of HH income	0.034*** (0.007)	0.009 (0.014)	0.023** (0.010)	0.081*** (0.015)	0.126*** (0.019)
Foreigners (%)	0.008 (0.007)	-0.008 (0.018)	0.017 (0.011)	0.005 (0.011)	0.006 (0.017)

Growth rate (%)	-0.014*** (0.005)	-0.007 (0.012)	-0.018** (0.007)	-0.014* (0.008)	-0.009 (0.012)
Observations	32,225	6,047	15,457	10,721	6,282

Notes: The dependent variable is an indicator whether the respondent trusts most people in general. The state-fixed effects, year fixed effects and the constant are included in the regression but are not reported in the table. The omitted categories are the married, 8<sup>th</sup>-year education, and the retired (not in labor force for the Young). Standard errors adjusted for repeated observations of individuals in parentheses. Recent migration is the five-year average net migration of the respondent's state. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

The subgroup analysis demonstrates that not all respondents are affected by the 90-91 shock when broken down by group (Columns 2-4). The Young, who were 5 to 12 years-old at the time of shock, are unaffected, while the Prime group, who were 18 to 37 years-old, are significantly affected (Columns 2-3). The Middle-age, who were 38 to 57 years-old in 1990, are also affected although less so than the Prime group (Column 4).<sup>9</sup>

While the Young are unaffected by the migration shock in the early 1990's, their trust is affected by a more recent migration shock, proxied by the state's net migration rate over the past 5 years (significant at the 10% level).<sup>10</sup> For a percentage point increase in the past 5 years' average net migration rate, the predicted probability of the young's trust decreases by 10.4% points. On the other hand, the Prime group is not affected by the recent migration shock. What is interesting

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<sup>9</sup> The results are consistent when the sample is restricted to the respondents who participated more than once in 2003, 2008, and 2013 waves.

<sup>10</sup> For example, the average net migration rate for the 2003 wave is based on the average net migration rates in 1998-2002 for the respondent's state.

is the Middle-age group, who are affected by the contemporaneous migration shocks. This group perhaps regards that current migrants are competitors and is more sensitive to the risk of unemployment as it is generally difficult for the older individuals to find new employment opportunities once they are unemployed. To verify this, the same analysis is conducted with the retirees only (Column 5). Among the retired people in the Middle-age group, both current and past shocks are ineffective.

The above results indicate that the historical shock in the early 1990's only affects those who were directly influenced by the shock through the labor market. If the impact was passed down to generations, the Young would also demonstrate a negative coefficient on the 90-91 migration variable. Fortunately, this is not the case for the generation of the post-reunification period.

In order to more accurately reflect the degree of labor market competition, I take into account the age compositions of migrants to generate an adjusted proxy of the shock, assuming that only migrants around the same age are perceived as competitors. Since the East-West migration was generally labor market-driven at the time, naturally young migrants were the majority. The shock would be bigger for these individuals. Using the multiplier, calculated with the percentage of the migrants in the respective agegroup among total migrants, a proxy for

“diluted” migration shock is generated. Conducting the same set of analyses produces results in the following table (more explanations on percentages of migrants by age are available in the Appendix A2). The coefficient of 90-91 migration now reflects the effect of agegroup-specific shock on trust.

Table 2-3. Adjusted Migration Shock and Trust

VARIABLES	(1) Young	(2) Prime	(3) Middle-Age	(4) Retirees
90-91 Migration (adjusted)	-0.630 (0.402)	-0.749*** (0.269)	0.154 (0.358)	0.563 (0.488)
Recent migration (adjusted)	-0.414 (0.254)	-0.004 (0.110)	-1.306* (0.735)	0.003 (1.201)
Male	-0.016 (0.016)	-0.051*** (0.011)	-0.036** (0.015)	0.002 (0.021)
Age	-0.041*** (0.013)	0.008 (0.008)	0.007 (0.019)	0.028 (0.039)
Age-sq.	0.001*** (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Education dummies				
10th	0.114*** (0.024)	0.094*** (0.016)	0.076*** (0.020)	0.073*** (0.027)
Univ. qualified	0.247*** (0.027)	0.215*** (0.021)	0.112*** (0.042)	0.137** (0.058)
College +	0.320*** (0.027)	0.248*** (0.017)	0.166*** (0.019)	0.138*** (0.028)
Job dummies				
Student	0.083 (0.069)	0.215*** (0.058)	-0.131 (0.226)	
Unemployed	0.038 (0.068)	0.020 (0.036)	0.028 (0.022)	
Worker	0.048 (0.065)	0.051 (0.034)	0.009 (0.024)	
White collar	0.068 (0.066)	0.113*** (0.034)	0.020 (0.024)	
Self-employed	0.074 (0.074)	0.082** (0.037)	0.000 (0.030)	
Civil servant	0.085 (0.074)	0.092** (0.039)	0.065** (0.030)	
Marital status				
Single	-0.013 (0.019)	-0.074*** (0.017)	-0.054 (0.040)	-0.065 (0.054)
Divorced	-0.106*** (0.034)	-0.066*** (0.014)	-0.096*** (0.020)	-0.109*** (0.026)
Log of HH income	0.009 (0.014)	0.023** (0.010)	0.084*** (0.015)	0.124*** (0.023)
Observations	6,047	15,457	8,617	4,342

Notes: The dependent variable is an indicator whether the respondent trusts most people in general. The state-fixed effects and characteristics, year fixed effects and the constant are included in the regression but are not reported in the table. The omitted categories are the married, 8<sup>th</sup>-year education, and the retired (not in labor force for the Young). Standard errors adjusted for repeated observations of individuals in parentheses. Recent migration is the five-year average net migration of the respondent's state. Migration-related variables are adjusted based on age. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

From Table 2-3, we can see that the effect of migration is vastly inflated compared to its magnitude in Table 2-2. A percent increase in the net migration rate results in a 75 percent point decrease in trust for Prime Group, and a percent increase in the current net migration rate results in a 131% decrease in Middle-Age Group. If hypothetically the shock was as big as a 1% point increase of the migrants from the *particular agegroup*, the trust of affected West Germans would have been significantly reduced. These seemingly unrealistic figures are due to the size of the actual shock, which is a fraction of the original migration shock. As opposed to the mean 90-91 migration shock, 0.234%, the adjusted migration shock for the Prime group is only 0.044%. Therefore, its actual impact on trust is a 3.3% point decrease in trust. For the Middle-age Group, the adjusted recent migration shock is 0.004%, which leads to a 0.52% decrease in trust.

## *B. Subgroup Analyses*

From the baseline regression results, we can observe that individuals who are more exposed to labor market risks are more likely to be negatively affected by the migration inflow. The previous literature that examine native's preference over immigration policies also supports this. If trust is influenced by labor market risks, those who are in the lower income group, or those who have less job security would also be more affected by the labor supply shock. As a robustness check, whether heterogeneity is observed across different groups based on the level of relative income and the occupation type is tested.

Dummies for each category of income quartiles, calculated with the respondent's annual per capita household income, are used. The interaction terms with the migration rates measure differences in the magnitude of the shock by income group. The adjusted migration rates are used for analyses by age group. The results are reported in Table 2-4.

Table 2-4. Migration Shock by Income Group

VARIABLES	(1) All	(2) Young	(3) Prime-age	(4) Middle-age
Migration x Bottom 25%	-0.140*** (0.037)	-0.469 (0.425)	-0.888*** (0.295)	-0.016 (0.399)
Migration x 25-50%	-0.137*** (0.037)	-0.779* (0.455)	-0.857*** (0.291)	0.034 (0.377)
Migration x 50-75%	-0.129*** (0.037)	-0.630 (0.439)	-0.682** (0.292)	0.188 (0.370)
Migration x Top 25%	-0.107*** (0.038)	-0.718 (0.454)	-0.531* (0.311)	0.296 (0.382)
Income quartile				
25-50%	0.018 (0.012)	-0.010 (0.025)	0.014 (0.017)	0.061** (0.024)
50-75%	0.050*** (0.012)	0.026 (0.024)	0.044*** (0.017)	0.081*** (0.024)
Top 25%	0.051*** (0.013)	0.018 (0.025)	0.027 (0.019)	0.116*** (0.026)
Recent migration (%)	-0.057** (0.027)	-0.417 (0.254)	-0.009 (0.110)	-1.238* (0.735)
Education dummies				
10 <sup>th</sup>	0.102*** (0.010)	0.123*** (0.024)	0.120*** (0.016)	0.077*** (0.020)
Univ. qualified	0.222*** (0.013)	0.263*** (0.026)	0.247*** (0.020)	0.116*** (0.042)
College +	0.255*** (0.010)	0.336*** (0.025)	0.281*** (0.015)	0.176*** (0.018)
Male	-0.038*** (0.008)	-0.015 (0.016)	-0.040*** (0.011)	-0.039*** (0.015)
Age	0.001 (0.002)	-0.041*** (0.013)	0.011 (0.008)	0.004 (0.018)
Age-squared	0.000 (0.000)	0.001*** (0.000)	-0.000 (0.000)	-0.000 (0.000)
Marital status				
Single	-0.054*** (0.012)	-0.012 (0.019)	-0.073*** (0.017)	-0.059 (0.040)
Divorced	-0.076*** (0.010)	-0.108*** (0.035)	-0.063*** (0.014)	-0.099*** (0.020)
Observations	32,225	6,047	15,457	8,617

Notes: The dependent variable is an indicator whether the respondent trusts most people in general. The state-fixed effects, year fixed effects and the constant are included in the regression but are not reported in the table. The omitted categories are

the married, 8<sup>th</sup>-year education, and Bottom 25% group. Standard errors adjusted for repeated observations of individuals in parentheses. Recent migration is the five-year average net migration of the respondent's state. For analyses by agegroup (Columns 2-4), adjusted migration rates were used. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

From Column (1), we observe that all income groups are negatively interacting with the migration shock in 1990. The most affected group is the lowest income group, although the bottom 25-50% is similarly affected by magnitude. For this group, a percentage increase in the net migration rate in 1990-91 leads to a 0.14 decrease in the predicted probability of trust. The trust of West Germans increases with association to higher income groups, consistent with the previous findings. In Column (2), the Young group is unaffected by the migration shock, regardless of income. On the other hand, all income groups of the prime-aged group are negatively affected by the shock (Column 3), of which impact is inversely proportionate to relative-income. The bottom 25 % is the most affected, resulting in a 0.39% point decrease in trust, estimated with the 0.044% point increase in the adjusted historical migration shock. For the Middle-age group, as in the Young group, the impact is nonexistent.

Table 2-5 reports the results when the shock is interacted with job dummies. The interaction terms with the migration rates measure differences in the magnitude of the shock by occupation group. People who are not in the labor force are dropped for this exercise. Almost all groups are affected by the shock, with the exception of the respondents who likely face the lowest labor market competition when there is a labor supply shock, civil servants. Both types of workers are the most negatively affected, more than the unemployed or the self-employed. The most affected group is the lower-skilled, whose probability of trust decreases by 16.3% points with a percentage point increase in the shock.

Table 2-5. Migration Shock by Occupation Status

VARIABLES	(1) by Job
90-91 Migration x Unemployed	-0.118*** (0.044)
90-91 Migration x Worker	-0.163*** (0.041)
90-91 Migration x White-Collar	-0.154*** (0.042)
90-91 Migration x Self-Employed	-0.081 (0.051)
90-91 Migration x Civil Servant	-0.048 (0.057)
Education dummies	
10 <sup>th</sup>	0.096*** (0.012)
Univ. qualified	0.215*** (0.016)
College +	0.260*** (0.012)
Job dummies	
Worker	0.036** (0.014)
White collar	0.087*** (0.015)
Self-employed	0.048** (0.020)
Civil servant	0.061*** (0.023)
Recent migration (%)	-0.062** (0.030)
Observations	24,935

Notes: The dependent variable is an indicator whether the respondent trusts most people in general. The demographic variables, state variables, year fixed effects, age, age-squared and the constant are included in the regression but are not reported in the table. The omitted categories are 8<sup>th</sup> year education and the unemployed. Standard errors adjusted for repeated observations of individuals in parentheses. Recent migration is the five-year average net migration of the respondent's state. Z-statistics in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

The results of the baseline specification applied to the East German respondents living in the West are reported in Table 2-6 as an additional check. If they are affected by migration rates, then explanations from the labor market competition would not be plausible. The results demonstrate that the migration rates, both historical and recent ones, do not have an impact on East Germans' trust. This supports my hypothesis that the 90-91 migration shock negatively affects West Germans' trust potentially through channels in the labor market.

Table 2-6. Migration Shock for East Germans Living in West

VARIABLES	(1) East Germans in West
Net migration 90-91 (%)	-0.208 (0.284)
Recent migration (%)	0.106 (0.112)
Job dummies	
Student	0.117 (0.119)
Unemployed	-0.026 (0.087)
Worker	0.055 (0.078)
White collar	0.038 (0.083)
Self-employed	0.186* (0.098)
Civil servant	-0.015 (0.117)
Education dummies	
10 <sup>th</sup>	-0.042 (0.051)
Univ. qualified	0.117* (0.067)
College +	0.159*** (0.059)
Log HH per capita income	0.121*** (0.032)
Observations	1,789

Notes: Demographic, state variables, year fixed effects, and the constant are in the equation but the coefficients are not reported. The omitted categories are the 8<sup>th</sup> year education and the retired. Standard errors adjusted for repeated observations of individuals in parentheses. Recent migration is the five-year average net migration of the respondent's state. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

### *C. A Cross-Sectional Approach*

The previous analyses have taken advantage of the panel-setting of the dataset. As a robustness check, this subsection reports the results of the cross-sectional approach for each wave, for the sample of respondents who participated more than once among the three waves.<sup>11</sup> The cohort dummies are based on the year at reunification for convenience and grouped in ten-year age-intervals.<sup>12</sup> The results are robust even when the youngest cohort includes the respondents younger than those who were 5-12 in 1990. In general, the impact of the 90's migration shock lasts until 2008. An interesting trend is that the impact of the net migration rate in the early 1990's is even stronger in 2008 than in 2003. This could be due to effect of the global crisis which started in 2008. The impact of the recent migration shock is more unstable, although it has a negative impact on trust for the youngest in the year 2013. While the cross-sectional approach is meaningful in the sense that it allows us to observe the impact by time, one of the crucial disadvantages is that time-effects cannot be controlled. Because of the possibility of the migration impact being intertwined with the year effects, the demonstrated results should be interpreted with caution.

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<sup>11</sup> This condition is imposed to prevent the newly added sample between 2008 and 2013 driving the results. However, the results are robust to relaxing this condition.

<sup>12</sup> The results are robust to grouping age cohorts in five-year intervals.

Table 2-7. Interaction Effects between Age and Migration Shocks

VARIABLES	(1) 2003	(2) 2008	(3) 2013
90-91 Migration x Age 5-17	-0.024 (0.039)	-0.002 (0.030)	-0.075 (0.059)
90-91 Migration x Age 18-27	-0.069*** (0.014)	-0.114*** (0.027)	-0.083 (0.052)
90-91 Migration x Age 28-37	0.009 (0.022)	-0.088*** (0.026)	-0.064 (0.039)
90-91 Migration x Age 38-47	-0.008 (0.017)	-0.103*** (0.028)	-0.106*** (0.036)
90-91 Migration x Age 48-57	0.040** (0.016)	-0.095*** (0.025)	-0.138*** (0.049)
Recent Migration x Age 5-17	0.085* (0.047)	-0.046 (0.078)	-0.237* (0.138)
Recent Migration x Age 18-27	0.201*** (0.045)	0.199** (0.077)	-0.069 (0.133)
Recent Migration x Age 28-37	0.094* (0.049)	0.062 (0.070)	-0.054 (0.119)
Recent Migration x Age 38-47	0.074 (0.049)	0.031 (0.074)	-0.219** (0.099)
Recent Migration x Age 48-57	0.034 (0.050)	0.097 (0.076)	0.084 (0.131)
Education dummies (ref: 8 <sup>th</sup> )			
10th	0.043*** (0.013)	0.057*** (0.011)	0.061*** (0.013)
Univ. qualified	0.141*** (0.020)	0.138*** (0.027)	0.173*** (0.019)
College +	0.148*** (0.019)	0.187*** (0.018)	0.198*** (0.019)
Job dummies (ref: retired)			
Student	0.084** (0.041)	0.142*** (0.050)	0.100 (0.102)
Unemployed	-0.008 (0.029)	-0.020 (0.029)	0.005 (0.029)
Worker	0.014 (0.030)	-0.009 (0.026)	-0.002 (0.029)
White collar	0.052 (0.032)	0.045* (0.023)	0.081*** (0.024)
Self-employed	0.004 (0.039)	0.040* (0.024)	0.054* (0.029)
Civil servant	0.055* (0.032)	0.041 (0.036)	0.059 (0.037)

Observations	7,632	8,634	6,017
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Notes: The OLS estimates when the dependent variable is an indicator variable of trust. The reference category is “agegroup 5-12.” The coefficients of age-cohort dummies, gender, and marital status dummies, the log of household income, the respondent’s state’s unemployment rate and dummies are not reported. Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

#### D. Effects by Skill and by Gender

This subsection observes whether the impact of migration shock is heterogeneous depending on skill-level and gender of the respondents. The skill-level of occupation is distinguished by the 1988 International Standard Classification of Occupations code. The skilled job is defined as having a job belonging to the first three major categories—managers, professionals, and technicians in various industries.<sup>13</sup> The results in Table 2-8 report a less negative impact of the migration shock for the affected—prime-age—skilled group, from the positive coefficient of the interaction variable, *Skilled x Net migration 90-91*. This supports the labor market competition hypothesis. For recent migration variables, the interaction effect is insignificant, implying the lack of heterogeneity in terms of impact between the skilled and the less-skilled.

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<sup>13</sup> For specific occupation within the category, see document in the following address (<http://ec.europa.eu/eurostat/documents/1978984/6037342/ISCO-88-COM.pdf>).

Table 2-8. Effects by Skill

VARIABLES	(1) Young	(2) Prime	(3) Middle
Net migration 90-91 (%)	-0.122 (0.082)	-0.113** (0.049)	-0.050 (0.088)
Skilled x Net migration 90-91	-0.021 (0.037)	0.075*** (0.023)	0.035 (0.038)
Recent migration (%)	-0.015 (0.070)	0.010 (0.039)	-0.034 (0.071)
Skilled x Recent migration	-0.024 (0.078)	0.022 (0.041)	-0.030 (0.062)
Observations	4,199	13,046	4,307

Notes: Marginal Effects when the covariates are at a fixed value. The sample consists of the employed respondents. The results of the demographic variables, job, education, state, and year dummies, the log of household income, state characteristics (% foreigners, unemployment rate, and log GDP) are not reported. Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

The effects of migration shocks by gender are reported in Table 2-9. The effect of the migration shock in the 1990's is insignificant when the sample is divided by gender. On the other hand, the recent migration shock seems to have heterogeneous impact by gender and age, reflected by the statistically significant coefficients of the interaction effect between the recent migration rate and gender indicator (Columns 1 and 3).

Table 2-9. Effects by Gender

VARIABLES	(1) Young	(2) Prime	(3) Middle
Net migration 90-91 (%)	-0.115 (0.074)	-0.056 (0.045)	-0.029 (0.073)
Male x Net migration 90-91	-0.002 (0.033)	-0.034 (0.022)	-0.012 (0.034)
Recent migration (%)	-0.105 (0.068)	0.011 (0.036)	0.003 (0.060)
Male x Recent migration	0.162** (0.069)	-0.002 (0.040)	-0.102* (0.056)
Observations	5,024	14,940	5,592

Notes: Marginal Effects when the covariates are at a fixed value. The results of the demographic variables, job, education, state, and year dummies, the log of household income, state characteristics (% foreigners, unemployment rate, and log GDP) are not reported. Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

#### *E. Distinguishing between the Influx of Germans and that of Foreigners*

While this chapter utilizes the net migration rate as the proxy for the shock, trust may respond differently to inflows and outflows of migrants. Unfortunately, the correlations between inflows and outflows and between foreigner flows in the early 1990's and in the recent years are extremely high ( $\rho > 0.9$ ), leading to the multicollinearity problem when the set of inflows and outflows of migrants, or the set of foreigner inflows in the early 90's and recent foreigner inflows is included at the same time. Assuming that people are more sensitive to inflows than outflows, the following regression present the results

when the recent migration shock is proxied by the influx of German migrants and the influx of foreigners over the past 5 years.

Table 2-10. The Impact of Inflows of Germans and Foreigners

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Prime	Young	Middle	Prime	Young	Middle
	Labor Force Participants			Labor Force Non-Participants		
Net migration 90-91 (%)	-0.098** (0.049)	-0.086 (0.084)	0.032 (0.079)	-0.264 (0.242)	-0.226 (0.219)	-0.020 (0.056)
Recent inflow: Germans (%)	-0.057 (0.041)	0.012 (0.080)	0.091 (0.072)	-0.191 (0.257)	-0.199 (0.220)	-0.094* (0.052)
Recent inflow: foreigners (%)	-0.177 (0.127)	-0.105 (0.234)	0.029 (0.215)	-1.695** (0.783)	-0.333 (0.672)	-0.421*** (0.156)
Education Dummies (ref: less than 10 <sup>th</sup> )						
10 <sup>th</sup>	0.071*** (0.012)	0.077*** (0.020)	0.059*** (0.019)	0.060 (0.054)	0.168** (0.068)	0.042*** (0.014)
Univ. qualified	0.187*** (0.013)	0.238*** (0.022)	0.130*** (0.022)	0.223*** (0.065)	0.269*** (0.068)	0.066*** (0.019)
Log HH per capita income	0.025*** (0.009)	0.019 (0.015)	0.054*** (0.014)	0.002 (0.040)	0.015 (0.020)	0.093*** (0.013)
Job Dummies						
Worker	0.013 (0.014)	0.030 (0.021)	0.024 (0.021)			
White collar	0.084*** (0.014)	0.052** (0.023)	0.053** (0.022)			
Self-employed	0.049** (0.019)	0.053 (0.039)	0.033 (0.028)			
Civil servant	0.066*** (0.021)	0.084** (0.038)	0.090*** (0.029)			
Student					0.084 (0.054)	
Observations	14,940	5,024	5,592	481	726	9,158

Notes: The marginal effects with other covariates at a fixed value. The dependent variable is an indicator variable of trust. Recent inflows are the mean inflow of Germans or foreigners over the past five years before the survey year. The reference category of Columns (1)-(3) is the unemployed. The reference category of Column (4) is non-students. The coefficients of age, age-squared, marital status, gender, year, and state dummies and characteristics (% foreigners, unemployment rate, and log GDP) are not reported. Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

The results in Table 2-10 indicate different responses by group. The first three columns report the results for the respondents in the labor force while the last three columns report the results for the respondents not in the labor force. When the net variables are replaced with the inflow variables, the impact is insignificant with the exception of the historical shock for the Prime group. Rather than the inflow itself, labor force participants seem to be more sensitive to the net impact.

The labor force non-participants are in general more affected by the migration shock variables, except for the Young group. The Prime and Middle groups are affected by the recent influx of foreigners. Given that the influx of foreigners steeply increased in the 2010's in the West (see Appendix Figure A2-2 for the trend), the negative impact of foreign inflow is more likely to be due to aversion to heterogeneity, since the labor market competition is not a possible channel given the sample characteristics. In addition to the foreign inflow, the Middle group is also negatively affected by the German inflow. When the inflow variables are replaced with the outflow variables, the effects become insignificant. A possibility is that this group has aversion to the influx of population regardless of ethnicity or nationality. Further research is needed to uncover the underlying reason.

## 2.6 Conclusion

This chapter investigates whether West Germans were affected by the mass-migration of East Germans immediately after reunification in the early 1990's. The situations at the time were severe enough to make researchers wonder whether consequences in people's trust are present from the migration shock. This chapter provides evidence that the migration shock negatively impacted West Germans' trust. To the best of the author's knowledge, this is the first study that examines the impact of a migration shock on trust with a proxy for the migration flows. Fidrmuc (2012), although asking a similar question, measures the shock with an indicator variable that represents affected-regions.

As migration is mostly labor-market driven (at least in Germany in the early 1990's), analyses are conducted by dividing the sample into various subgroups to look for possible channels through which the shock affects trust, the labor market competition or the perception of it. The regression results of the sample that is divided based on the respondent's age in 1990 present that the trust of prime-age individuals at the time is indeed harmed by the migration shock. On the other hand, people who did not reach adulthood at the time are not affected by the shock. Additional analyses by income group and occupation serve as evidence that the decrease in trust is caused through the channels in the

labor market, possibly through the perception of increased competition. Meticulously proving the exact channel calls for a further research.

This study finds that a historical shock can last over two or three decades to affect trust, which leads to the conclusion that determinants of trust do contain persistent components. However, the impact of the shock does not survive to younger generations, at least for this particular shock of Germany. This study has a mixed stance in persistence, that the shock is persistent for a long period—three decades—of time, but not persistent enough to be passed onto younger generations. This may be due to the relatively temporary characteristics of the labor shock. Fidrmuc (2012) also finds no significant differences between the regions affected by population displacements after World War II and the regions not affected by the shock. For younger generations, contemporaneous factors seem to be more important, at least from the labor market perspective, in shaping trust. If this also applies to the younger generations of East Germans that are born after reunification, the current gap between East and West would narrow down faster for new generations than estimated by the previous literature.

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## Appendices

Table A2-1. Annual Average Migration Rates in Germany after Reunification

Year	Total	German	Foreign	Total	German	Foreign
	West excl. West Berlin			East excl. East Berlin		
1990	0.249	N/A	N/A	-5.346	N/A	N/A
1991	0.167	0.171	-0.004	-1.203	-1.182	-0.020
1992	0.056	0.054	0.003	-0.672	-0.658	-0.014
1993	0.035	0.030	0.005	-0.385	-0.368	-0.017
1994	0.000	-0.002	0.002	-0.184	-0.167	-0.017
1995	0.003	-0.004	0.006	-0.134	-0.120	-0.014
1996	0.021	0.010	0.011	-0.037	-0.002	-0.035
1997	0.008	0.003	0.004	-0.009	0.032	-0.041
1998	-0.006	-0.009	0.002	-0.135	-0.092	-0.043
1999	0.024	0.019	0.005	-0.266	-0.214	-0.053
2000	0.068	0.062	0.006	-0.590	-0.510	-0.080
2001	0.111	0.099	0.012	-0.670	-0.600	-0.070
2002	0.140	0.125	0.016	-0.573	-0.527	-0.046
2003	0.106	0.094	0.012	-0.399	-0.358	-0.040
2004	0.119	0.105	0.015	-0.353	-0.314	-0.039
2005	0.088	0.079	0.008	-0.353	-0.302	-0.050
2006	0.114	0.106	0.008	-0.441	-0.386	-0.056
2007	0.102	0.098	0.004	-0.469	-0.407	-0.063
2008	0.097	0.091	0.007	-0.461	-0.396	-0.065
2009	0.073	0.066	0.007	-0.317	-0.267	-0.050
2010	0.057	0.050	0.007	-0.247	-0.202	-0.045
2011	0.014	0.009	0.005	-0.225	-0.173	-0.052
2012	0.005	-0.005	0.010	-0.163	-0.109	-0.053
2013	-0.001	-0.013	0.012	-0.090	-0.034	-0.056
2014	-0.030	-0.042	0.012	0.007	0.061	-0.054
2015	-0.040	-0.051	0.010	0.021	0.102	-0.082
Mean	0.065	0.046*	0.007*	-0.647	-0.288*	-0.046*

Notes: The figures are expressed in the percentage of each state's net migrants divided by mid-population (the average between the population at the beginning and the end of each year). Berlin is omitted. West includes Baden-Württemberg, Bayern, Brandenburg, Bremen, Hamburg, Hessen, Niedersachsen, Nordrhein-Westfalen, Rheinland-Pfalz, and Schleswig-Holstein, and East includes Mecklenburg-

Vorpommern, Saarland, Sachsen, Sachsen-Anhalt, and Thüringen. Since the statistics for the year 1990 exist only for the 4<sup>th</sup> quarter (from October 1st to the end of the year), 1990's migration rates are generated by multiplying the migration rate during the period by four.

\*Averages from 1991 to 2015.

Source: The Federal Statistical Office of Germany. Figures calculated and compiled by the author.

Table A2-2. Summary Statistics

Variable	N	Mean	SD	Min	Max
Trusts most people	32225	0.67	0.47	0.00	1.00
Age	32225	49.02	14.11	18.00	80.00
Male	32225	0.47	0.50	0.00	1.00
Net migration 90-91 (%)	32225	0.23	0.38	-1.20	0.70
Recent net migration (t-5)	32225	0.07	0.22	-0.65	0.42
Education: Less than 10 <sup>th</sup>	32225	0.38	0.49	0.00	1.00
Education: 10 <sup>th</sup>	32225	0.31	0.46	0.00	1.00
Education: Univ. qualified	32225	0.08	0.27	0.00	1.00
Education: College +	32225	0.23	0.42	0.00	1.00
Job: Not in labor force	32225	0.21	0.41	0.00	1.00
Job: In school	32225	0.02	0.13	0.00	1.00
Job: Unemployed	32225	0.12	0.32	0.00	1.00
Job: Worker	32225	0.22	0.42	0.00	1.00
Job: White collar	32225	0.29	0.45	0.00	1.00
Job: Self-employed & family biz	32225	0.08	0.26	0.00	1.00
Job: Civil servant	32225	0.07	0.25	0.00	1.00
Married	32225	0.66	0.47	0.00	1.00
Single	32225	0.18	0.38	0.00	1.00
Divorced/widowed	32225	0.16	0.37	0.00	1.00
Household per capita income*	32225	17399	10872	0.00	169460
No. of HH members	32225	2.80	1.29	1.00	13.00
Household income*	32225	43894	25525	0.00	198083

\*Annual income in Euros

Table A2-3. The Birth Years and Ages at Reunification and the Time of Survey by Group

Group	Age Cohort	Age in 1990	Age in 2003	Age in 2008	Age in 2013
Young	Born 1978-1985	5-12	18-25	23-30	28-35
	Born 1973-1977	13-17	26-30	31-35	36-40
Prime-age	Born 1968-1972	18-22	31-35	36-40	41-45
	Born 1963-1967	23-27	36-40	41-45	46-50
	Born 1958-1962	28-32	41-45	46-50	51-55
	Born 1953-1957	33-37	46-50	51-55	56-60
Middle-age	Born 1948-1952	38-42	51-55	56-60	61-65
	Born 1943-1947	43-47	56-60	61-65	66-70
	Born 1938-1942	48-52	61-65	66-70	71-75
	Born 1933-1937	53-57	66-70	71-75	76-80

Table A2-4. Summary Statistics by Group

	Young			Prime-Age			Middle-Age		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Trusts most people	6047	0.65	0.48	15457	0.66	0.47	10721	0.68	0.47
Age	6047	30.23	5.76	15457	45.36	6.6	10721	64.89	6.84
Male	6047	0.44	0.5	15457	0.47	0.5	10721	0.49	0.5
Net migration 90-91 (%)	6047	0.24	0.37	15457	0.24	0.37	10721	0.22	0.39
Recent migration (%)	6047	0.07	0.21	15457	0.07	0.21	10721	0.07	0.23
<b>Education</b>									
Less than 10 <sup>th</sup> year	6047	0.24	0.43	15457	0.32	0.47	10721	0.55	0.5
10 <sup>th</sup> year completion	6047	0.38	0.49	15457	0.36	0.48	10721	0.21	0.41
College qualified	6047	0.18	0.38	15457	0.08	0.27	10721	0.02	0.15
College +	6047	0.2	0.4	15457	0.24	0.43	10721	0.22	0.41
<b>Job Status</b>									
Not in labor force (retired)	6047	0.01	0.11	15457	0.03	0.16	10721	0.59	0.49
Student	6047	0.08	0.27	15457	0	0.06	10721	0	0.03
Unemployed	6047	0.15	0.36	15457	0.12	0.33	10721	0.1	0.3
Worker	6047	0.32	0.47	15457	0.27	0.45	10721	0.09	0.29
White collar	6047	0.34	0.47	15457	0.4	0.49	10721	0.11	0.31
Self-employed	6047	0.04	0.2	15457	0.1	0.3	10721	0.06	0.24
Civil servant	6047	0.05	0.22	15457	0.08	0.27	10721	0.05	0.22
<b>Marital Status</b>									
Married	6047	0.41	0.49	15457	0.7	0.46	10721	0.75	0.43
Single	6047	0.53	0.5	15457	0.14	0.34	10721	0.04	0.19
Divorced/widowed	6047	0.06	0.23	15457	0.17	0.37	10721	0.21	0.41
<b>Household</b>									
Per capita income*	6047	14525	8606	15457	16998	10660	10721	19599	11830
# of HH members	6047	3.11	1.39	15457	3.18	1.32	10721	2.08	0.8
Income*	6047	40921	23114	15457	48007	25761	10721	39641	25550

\*Annual income in Euros.

Figure A 2-1. Map of German Cities

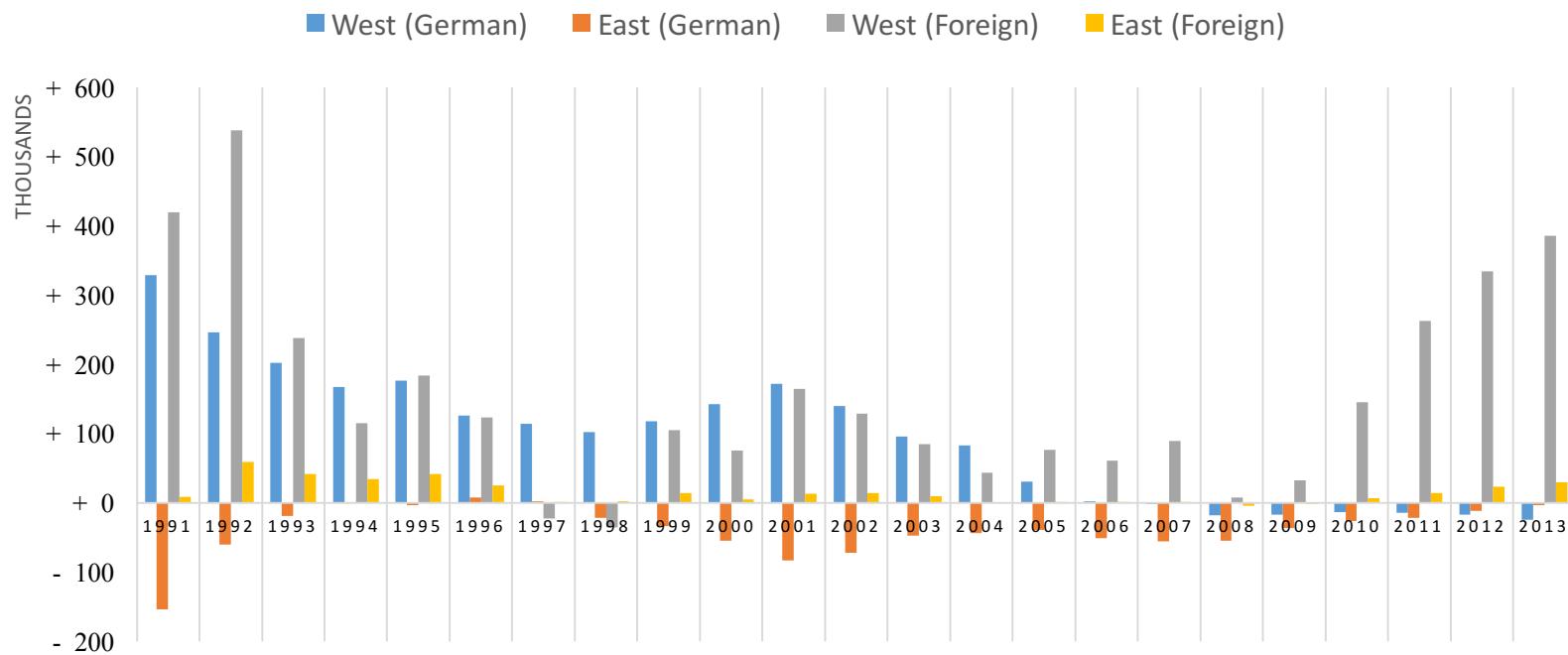


Source: Retrieved from <http://www.citypopulation.de/Deutschland-Cities.html>

## A2. Adjusted Net Migration Rates

The Statistical Yearbook annually reports the number of people that moved within German territory by age group. Unfortunately, the number is not grouped by state, so I use the aggregate number of migrants that moved within Germany in 1991 (the earlier years' statistics only include migration within FRG, which are not appropriate for this study). The age-categories are the following: under 18, 18-25, 25-30, 30-50, 50 and older. I calculate the percentage of migrants for respective category and use it as the multiplier for the age-cohort it belongs to. I apply the fraction of "under 18" for the Young, the fraction of 18-25 for the first two cohorts in "Prime," the fraction 25-30 for the third cohort in "Prime," the fraction of 30-50 for the last cohort of "Prime" and the first two cohorts of "Middle-age," and the fraction of 50+ for the last two cohorts of "Middle-age."

Figure A2-2. Net Migration between the East and the West by Group (1991-2013)



Notes: West (German) denotes the number of German migrants from the Eastern states to the West. East (German) denotes the number of German migrants from the Western states to the East. West (foreign) denotes the number of foreign migrants from the Eastern states to the West. East (foreign) denotes the number of foreign migrants from the Western states to the East. All numbers are net of inflows and outflows. Numbers from the Statistical Office of Germany.

## **Chapter 3. Immigrants and Trust: A Country-Panel Data Analysis**

### **3.1 Introduction**

The previous two chapters examined the impact of migration on trust at the individual level using the German case. This chapter investigates whether migration, or now more specifically, immigration, has an impact on trust at the country-level. Amid the ever-growing number of migrants globally—estimated at 244 million in 2015 by International Organization for Migration—expanding the research scope to the cross-country setting would provide richer empirical evidence which applies beyond one country.

According to the existing literature, the impact of immigration on trust is both positive and negative. A dominant approach of the research on immigrants' effect on trust has been examining the impact of ethnic or racial heterogeneity on trust (Alesina et al., 2003; Knack & Keefer, 1997), which stresses the negative side. However, immigration do not always bring about negative consequences in the society. Studies like Dolado, Goria, & Ichino (1994) and Kang & Kim (2018) contend that immigrants promote economic growth by bringing human capital or skills to host countries. From this perspective, trust increases through accumulation of human capital. In a like manner, immigration

can affect trust through various channels that makes it difficult to predict the consequences for researchers.

This chapter explores another crucial yet relatively under-researched channel, the labor market competition. In the core of most immigration-policy debates, policy-makers and voters are concerned whether immigrants take away jobs from the natives. Despite the evidence that the actual impact of immigrant influx is limited (e.g. Card, 1990; Friedberg & Hunt, 1995), whether the natives *perceive* that there is an impact is a different question. The recent growing anti-immigrant sentiment in the developed states, especially since the global economic crisis in the late 2000's, hints that attitudes towards immigrants may be related to economic circumstances. Goldin (1994) states that the United States' abrupt initiation of restrictive immigration policies through literacy and financial tests in the early 1920's was mainly the result of the decreased wage-levels of low-skilled workers and of some skilled-workers, spurred by the considerable influx of immigrants. She conjectures that even those in rural America, who were not directly affected by the impact of immigration, voted for restrictive immigration in fear of the potential competition of their children who would work in the cities. In fact, multiple studies empirically prove that labor market competition is a crucial

determinant of attitudes towards immigrants (Scheve & Slaugter, 2001; Mayda, 2006; Ortega & Polavieja, 2012).

In order to investigate the labor market competition channel, one needs to identify the skill-level of immigrants. This study distinguishes the skills of immigrants by immigrants' countries of origin, an indirect measure, and by education level, a direct measure. This approach hinges on the assumption that higher education level leads to higher skill-level and that immigrants from the developed (developing) countries consist of relatively skilled (unskilled) people. These assumptions are not far-fetched, as the previous studies like Mayda (2006) find that the countries with higher per capita GDP are more likely to receive immigrants who are less skilled than natives. Therefore, the richer the country, the lower probability of labor market competition concerns caused by the influx of immigrants. How trust is affected depending on the types of immigrants and host countries is examined throughout this chapter. To the best of the author's knowledge, this is the first study that examines the impact of immigration on trust based on the labor market competition hypothesis.

Unlike the previous chapters that examine trust at the individual-level, this chapter provides a country-level analysis. One of the advantages of the aggregate-level analysis is that individual heterogeneity that can affect perceptions, in particular the unobserved

one such as personality, can be canceled out by aggregating the variable. The country panel dataset used in this analysis is constructed with the Values Surveys (referring to both World Values Surveys and European Values Surveys) as the basis. As the Values Surveys have been conducted since the 1980's approximately every five years, a country panel dataset based on five-year unit is constructed by aggregating the variables. Other datasets are linked so that the constructed panel consists of economic, institutional and immigration-related variables that reflect the countries' characteristics.

Rather than a country-unit, this study utilizes a country-age-cohort unit as in Kim & Kang (2014). By taking the mean of each age-cohort variable based on the five-year age interval in each country, we can take advantage of the pseudo-panel setting which enables us to track age-cohorts over time. This approach not only provides a larger sample size compared to the simple country-panel but also allows us to compare different effects of immigrants on trust by age, an important determinant of labor force activities.

Overall, the results are consistent with the expectations that the trust of natives is negatively associated with the influx of immigrants whose skill-level is low. On the other hand, the net inflow of immigrants from the industrialized countries is positively associated with trust. Moreover, compared to the youngest or the oldest cohorts,

the middle-cohorts—that is, cohorts at the prime-working age—are more strongly affected by the flow of immigrants.

The rest of this chapter consists of the following sections. In Section 3.2, related literature is introduced and in Section 3.3, variables and data used for the analysis are explained. In Section 3.4, regression results are presented and Section 3.5 concludes.

## 3.2 Related Literature

From the labor market competition perspective, studies that find links between trust and migration are scarce. Nevertheless, quite a few studies address the relationship between attitudes towards immigration, which is associated with social trust, and economic/occupational stability. In this section, I discuss several notable works that empirically test the predictions of the Hecksher-Ohlin model without factor price insensitivity and the Factor-Proportions Analysis model (see Scheve & Slaughter (2001) and Section 2.3 for the detailed discussions of these models). According to the predictions of these models, unskilled workers prefer policies against immigration inflows because an increase in immigrant workers lowers relative wages. On the other hand, skilled workers benefit from the rise in real wages upon the inflows of low-skilled labor.

Although multiple political science studies previously examined the determinants of immigrant attitudes, the study by Scheve and Slaughter (2001) is the first economics literature that empirically tests the above theoretical models with the attitudes towards immigrants as the outcome variable. Measuring immigration-policy preferences with a survey response reflecting the desired number of immigrants relative to the current-level, they examine the determinants of individual preferences over immigration policy using the three-waves of National Election Studies data of the United States. They measure skills with the average market wages of each occupation classified by the Census Occupation Code and the respondent's education years. Their results support theoretical predictions—they find that less-skilled workers are significantly more likely to prefer closed borders. Mayda (2006) attempts to overcome the limitations from single-country studies by using the cross-country datasets, the International Social Survey Programme and the World Values Survey. She finds that both economic and non-economic factors explain immigration attitudes and that there exists cross-country variation in the relationship between skill and preferences. According to her analysis, workers' skills and pro-immigration preferences are positively correlated in countries with economic prosperity, and negatively correlated in countries with low per capita GDP. In her later study, Mayda (2008) examines pro-trade

attitudes among workers in non-trade and trade sectors. She finds that non-trade sector workers are more likely to be pro-trade compared to the trade-sector workers, interpreting that non-trade sector workers, protected from foreign competition, are more likely to support trade that makes the country better off. Furthermore, she finds that the skilled workers from the countries with higher GDP are more likely to be pro-trade. While the aforementioned studies define skilled workers as people with higher education qualifications, Ortega & Polavieja (2012) utilize more specific measures, such as required job-learning time and tasks—manual- or communication-intensive—used in the individual’s occupation. Using the 2004-2005 European Social Survey data, they find that higher human capital is associated with preferring higher level of immigration, while manual intensity in the current occupation is negatively associated and communication intensity is positively associated. Given that native workers have comparative advantage in communication-intensive occupations, they support the labor market competition hypothesis. Job-learning time, on the other hand, is positively correlated only for the respondents with 12 or more years of education.

Not all studies support the theoretical predictions by these models. For instance, Citrin et al. (1997) argue that rather than an individual’s economic status, political preferences or perceptions of the

government policies' performances are more important determinants of attitudes towards immigrants. More specifically, they find that more conservative and more pessimistic evaluators of the government performance are likely to support restrictive immigration policies.

However, their results suffer from the endogeneity issue.

Acknowledging the previous studies' lack of distinction between skilled and unskilled immigrants in the survey question, Hainmueller, Hiscox, & Margalit (2015) use more accurate distinctions of skills and occupations. Using the survey data of employees spanning both manufacturing and service sectors, they find that regardless of personal economic status, skilled-immigrants are always preferred to low-skilled immigrants, and that skilled workers have positive evaluations towards the influx of both skilled and unskilled immigrants. Facchini & Mayda (2012) also re-examine the labor market competition hypothesis with the same measure of attitude towards skilled immigrants. They find that education level is negatively associated with pro-immigration attitudes when immigrants are skilled, attributing the results with the fear of competition of skilled natives.

Labor market competition is not the only mechanism through which natives in the host country can oppose immigrants, especially low-skilled immigrants. Hanson, Scheve & Slaughter (2007) and Facchini & Mayda (2009) point out that immigrants may impose

greater fiscal burdens to natives if they take advantage of the welfare programs geared towards the lower-income earners in the host country. Hanson, Scheve, & Slaughter (2007), using the regional (state) variation within the United States, find that fiscal exposure to immigrants is associated with an increase in support for immigration restrictions, and this effect outweighs the competition effect for the skilled natives who would otherwise be pro-immigration. Facchini & Mayda (2009) provide two types of theoretical models in which low-income and high-income natives negatively respond to an inflow of immigrants. The tax adjustment model, the welfare-state model that keeps per capita benefits fixed, explains high-income natives' opposition to an immigrant inflow, and the benefit adjustment model, which keeps tax rates constant, explains low-income natives' opposition to an immigrant inflow. Empirically, they find that in richer countries, fiscal burdens and labor market competition mechanisms are both at work. Natives' real income is negatively associated with pro-immigration attitudes, which supports the tax adjustment model, although the skill of natives is positively associated with pro-immigration attitudes, supporting the labor competition hypothesis.

### **3.3 Data and Variable Descriptions**

For the analysis in this chapter, variables from different cross-country datasets to capture economic and institutional characteristics are retrieved and formed into a five-year average country-panel. The social capital variables are obtained from the cumulative file of World Values Surveys and the European Values Surveys which contains cross-country data over six waves from the early 1980's to the early 2010's. Economic and education variables are from the World Development Indicators published by the World Bank, and institutional variables are sourced from the Polity Project and the Fraser Institute. Most importantly, the immigration statistics used in this study are the United Nations' estimates of international migrant stock, for the years 1990, 1995, 2000, 2005, and 2010. The UN publishes the number of individuals identified as foreign-born based on the population census records in 232 countries. With the immigrant statistics, as defined in Kang & Kim (2018), I generate the net flow of immigrants who are from the major industrialized countries (hereafter MIC), which represents the inflow of high-skilled immigrants (refer to Table A3-1 for the list of the countries).<sup>1</sup> Similarly, the inflow of low-skilled

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<sup>1</sup> The MIC countries are slightly different from those in Kang & Kim (2018), whose analysis is based on the economic growth in the 1960's. Since this study utilizes the

immigrants is proxied by the net flow of immigrants who are from the countries that do not belong to the MICs.

Although defining skill with the country of origin does not exactly match an immigrant's skill-level (e.g. an immigrant without a high school diploma from Sweden), previous studies like Mayda (2006) and Facchini & Mayda (2009) use the host country's GDP per capita as an indirect measure of the relative skill ratio between the high-skilled and the low-skilled, assuming that the average skill-level is higher in richer countries, and find that the indirect measure yields the same results as the direct measure, the ratio of high-skilled population to low-skilled population of the host country. In this study, a country has to meet the following conditions to be regarded as industrialized; it has to be in the OECD and have GDP per capita sufficiently high enough—at least \$10,000—in terms of nominal US Dollars in 1990 (see Appendix A3-2 for each country's GDP per capita in 1990). For this reason, despite being OECD countries, the countries that demonstrate a significant labor productivity gap with the highest income countries—whose average GDP per capita is approximately \$23,000—are excluded from the MIC group. The excluded countries

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immigrant statistics from the 1990's, there are several additions to the MIC's to reflect the economic situations in the 1990's.

are Greece (whose nominal GDP per capita in 1990 is \$9,681), Portugal (\$7,941), and Turkey (\$3,747).

This study, instead of observing the impact of immigrant stock itself, focuses on the flow of immigrants. While immigrant stock can reflect the degree of heterogeneity of the society, it offers little implications in terms of labor market competition. Immigrant flow variables are adjusted for the total population in the host country. Table A3-3 in the Appendix presents stock and flow variables of immigrants by country.

Following the method in Kim & Kang (2014), this study adopts a pseudo-panel approach. Variables are aggregated at the level of age-cohort, grouped within the same five-year category, based on the age variable in the Values Survey data. Individuals younger than 18 and older than 62 are dropped from the analysis, which leaves me with the total of 9 age-cohorts for each country that participated in the Values Survey. This setting allows to trace each age-cohort over time. For example, the 18-22 cohort in the 1990 wave can be regarded as the 23-27 cohort in the 1995 wave. The variables, collapsed to the mean values by the age-cohort unit, are linked with other five-year-mean of economic, institutional, and immigrant variables. The age-cohorts containing less than 25 observations are dropped to lower the risk of

misrepresenting the characteristics of the cohort.<sup>2</sup> The average number of individuals within the cohort is 152. As the migrant stock data are available from 1990, the merged dataset has the total of five waves—1990-1994 (hereafter 1990), 1995-1999 (hereafter 1995), 2000-2004 (hereafter 2000), 2005-2010 (hereafter 2005), and 2010-2014 (hereafter 2010)—covering the total of 64 countries.

The measure of trust is based on the question in the Values Survey, “Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?” The percentage of people in the same age-cohort who answered that “most people can be trusted” is the measure of trust. Another attitude variable that can affect trust from the Values Surveys is the attitude towards immigrants. It takes the value zero when the respondent agrees with the statement, “When jobs are scarce, employers should give priority to people of this country over immigrants,” and the value one otherwise. The following table reports the summary statistics and the correlation matrix of the variables used for the analysis. “Trust” denotes the percentage of people who trust in the cohort, “University” denotes the percentage of people with higher-education degree in the cohort, “Subjective income” denotes the cohort mean of self-evaluation of

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<sup>2</sup> The dropped observations are one cohort from Dominican Republic in 1995, two from Finland in 1990, one from Morocco in 2000, two from Nigeria in 1990 and one from Nigeria in 2000.

income, “Attitude towards immigrants” denote the percentage of people in the cohort who have immigrant-friendly attitudes, and the net flow variables indicate the net flow of immigrants whose skill is distinguished by countries of origin. Detailed descriptions of the variables can be found in the Appendix A3-4.

At a first glance, the correlation between trust and some immigration variables contradicts the expected relationship (Panel B). For example, all of the net flow variables are positively correlated with trust. When the sample is divided by the country group, different correlation patterns can be observed between the two groups. While the MIC group exhibits similar correlation patterns (Panel C), the non-MIC group demonstrates the opposite signs of some of the variables (Panel D). These results call for a more meticulous approach which extends beyond simple correlation analyses in addressing the relationship between trust and immigration.

Table 3-1. Descriptive Statistics and Correlation Matrices of the Variables

Panel A. Summary Statistics

Variable	N	Mean	SD	Min	Max
Most people can be trusted (%)	1526	28.82	16.18	0.91	78.52
University (%)	1526	13.53	11.81	0	80.6
Subjective income (0-10)	1526	3.88	1.02	1.11	7.87
Attitude towards immigrants (%)	1526	11.53	8.66	0	51.75
School enrollment, primary (% gross)	1526	103.17	7.17	67.79	136.27
Proportion of men (among total respondents)	1526	0.47	0.06	0.25	0.81
Trade (% of GDP)	1526	71.21	35.68	15.57	268.53
Hiring and firing regulations	1526	4.61	1.48	1	8.1
Executive constraints	1526	5.62	4.03	-31	7
GDP per capita (constant 2005 US\$)	1526	17997.12	16468.15	424.65	74804.03
Immigrants (% population)	1526	6.82	7.49	0.06	37.32
MIC immigrants (% total migrants)	1526	21.42	17.61	0	92.65
Immigrant net flow (% of total population)	1280	0.81	1.57	-4.67	7.37
Net flow of immigrants from MIC (% of total population)	1280	0.11	0.28	-0.36	1.86
Net flow of immigrants from non-MIC (% of total population)	1280	0.70	1.43	-4.72	7.34

Panel B. All Countries

	Trust	Prime	University	Income	Male	Trade	Executive	Regulations	Log of GDP	Attitude	Immigrant flow	MIC flow
Trust	1											
Prime	-0.17***	1										
University	0.093***	0.012	1									
Income	0.43***	-0.21***	0.08***	1								
Male	-0.01	-0.09***	-0.13***	0.02	1							
Trade	0.09***	-0.15***	0.04	0.11***	-0.02	1						
Executive	0.11***	-0.14***	-0.08***	0.12***	0.07***	0.04	1					
Regulations	-0.02	-0.19*	0.03	0.14***	0.02	-0.04	-0.01***	1				
Log of p.c. GDP	0.51***	-0.05*	0.02	0.34***	-0.07***	0.02	0.39***	-0.15***	1			
Attitude	0.24***	0.20***	0.28***	0.15***	-0.06**	-0.04	-0.02	-0.14***	0.23***	1		
Immigrant flow	0.25***	-0.10***	0.05	0.25***	-0.01	0.16***	0.14***	-0.11***	0.39***	0.13***	1	
MIC flow	0.17***	-0.08***	0.10***	0.21***	-0.03	0.23***	0.16***	0.01	0.36***	0.09***	0.57***	1
Non-MIC flow	0.24***	-0.09***	0.03	0.23***	-0.01	0.13***	0.12***	-0.12***	0.36***	0.13***	0.99***	0.43***

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Panel C: MIC countries

	Trust	Prime	Univ	Income	Male	Trade	Executive	Regulations	Log of GDP	Attitude	Immigrant flow	MIC flow
Trust	1											
Prime	-0.035	1										
Univ	0.15***	-0.048	1									
Income	0.43***	-0.18***	0.11***	1								
Male	-0.0086	0.042	-0.12***	-0.09***	1							
Trade	0.082**	-0.053	-0.02	0.083**	-0.007	1						
Executive	0.21***	-0.31***	-0.021	0.23***	-0.15***	0.16***	1					
Regulations	-0.03	-0.28***	-0.12***	0.22***	0.022	-0.18***	0.073**	1				
Log of p.c. GDP	0.64***	-0.046	0.19***	0.42***	-0.10***	0.19***	0.35***	-0.13***	1			
Attitude	0.22***	-0.037	0.37***	0.084**	-0.11***	-0.071**	0.070**	-0.22***	0.27***	1		
Immigrant flow	0.30***	0.016	0.17***	0.31***	-0.16***	0.086**	0.30***	-0.045	0.53***	0.20***	1	
MIC flow	0.23***	0.063*	0.065*	0.20***	-0.028	0.32***	0.16***	0.042	0.29***	-0.0087	0.64***	1
Non-MIC flow	0.28***	0.0021	0.18***	0.31***	-0.17***	0.015	0.30***	-0.063*	0.53***	0.23***	0.98***	0.47***

Panel D: Non-MIC countries

	Trust	Prime	Univ	Income	Male	Trade	Executive	Regulations	Log of GDP	Attitude	Immigrant flow	MIC flow
Trust	1											
Prime	-0.19***	1										
Univ	0.11***	0.031	1									
Income	0.28***	-0.22***	0.071*	1								
Male	-0.014	-0.16***	-0.16***	0.078*	1							
Trade	0.24***	-0.26***	0.15***	0.21***	-0.024	1						
Executive	-0.17***	-0.070*	-0.100**	0.053	0.12***	0.086**	1					
Regulations	0.062	-0.21***	0.35***	-0.00	0.014	0.23***	-0.11***	1				
Log of p.c. GDP	-0.42***	0.29***	-0.016	0.10**	-0.13***	-0.0018	0.22***	-0.32***	1			
Attitude	0.087**	-0.35***	0.098**	0.19***	0.016	0.068*	-0.19***	0.090**	-0.066	1		
Immigrant flow	-0.017	-0.075*	-0.11***	0.13***	0.084**	0.27***	0.013	-0.11***	0.15***	-0.092**	1	
MIC flow	-0.16***	-0.097**	0.11***	0.14***	-0.017	0.15***	0.11***	0.024	0.40***	0.098**	0.49***	1
Non-MIC flow	0.0076	-0.065	-0.14***	0.12***	0.093**	0.26***	-0.004	-0.12***	0.10**	-0.11***	0.99***	0.36***

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Thus, the regression equation takes the following form:

$$Trust_{ijt} = \alpha + \beta imm_{jt} + X'_{ijt}\gamma + C'_{jt}\delta + Country_c + Year_t + e_{ijt}$$

where  $Trust_{ijt}$  denotes the percentage of respondents who trust in cohort i in country j in year t,  $imm_{jt}$  is the immigrant shock,  $X'_{ijt}$  is the vector of cohort characteristics,  $C'_{jt}$  is the vector of country characteristics,  $Country_c$  is the country fixed effects,  $Year_t$  is the time fixed effects, and  $e_{ijt}$  is the error term. For immigrant shock proxies, the net flow of immigrant stock, the net flow of MIC immigrant stock, and the net flow of non-MIC immigrant stock are used.<sup>3</sup> For the cohort controls, the percentage of respondents who have higher education degree, attitudes towards immigrants, and subjective income are used. The country controls include the log of real GDP per capita, the size of trade (in terms percentage of total GDP), the executive constraint variable to proxy for accountability of political systems, the hiring and firing regulation variable to proxy for labor market flexibility, the gross enrollment rate of primary education, and the proportion of immigrants among the total population.

For estimation, the ordinary least squares (OLS), the fixed effects estimator, and the population averaged generalized estimating estimator (GEE) are used. The advantage of using the fixed effects estimator is that

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<sup>3</sup>The net flow (or the net migration rate) variables are generated with the following formula:  $100 \times (Stock_t - Stock_{t-1}) / Population$

unobserved time-invariant cohort-specific characteristics, which cannot be controlled with the OLS estimator, can be removed. The advantage of using the GEE estimator is that it works well with unbalanced panel data, time invariant variables can be controlled for, and the within-group correlation structure can be specified.

### 3.4 Regression Results

The following table reports the baseline regression results. I find that the OLS and the GEE estimators produce very similar estimates throughout the analysis, so only the GEE estimator results along with the FE results are reported. The first three columns present the fixed effects (FE) estimation results and the last three report the GEE estimation results. Columns (1) and (4) use the net flow of immigrants as the proxy for immigrant shock, and Columns (2) and (5) distinguish the immigrant shock by the country of origin, whether the originating countries of immigrants belong to the MIC group or not. Columns (3) and (6) use the net flow variables with non-MIC originating countries further divided into more specific categories used by the World Bank—High-Income, Upper-Middle Income, Lower-Middle Income, and Low-Income Countries (refer to Appendix 3-5 for the details on income categories).

Table 3-2. Baseline Regressions

VARIABLES	(1)	(2) FE	(3)	(4)	(5) GEE	(6)
Net immigrant flow	-0.664 (0.475)			-0.234 (0.418)		
Net MIC flow		6.859*** (1.558)			6.253*** (1.387)	
Net non-MIC flow		-1.741*** (0.512)			-1.165** (0.453)	
Low income flow			-1.251*** (0.379)			-1.226*** (0.347)
Lower-middle inc. flow			-0.257 (0.222)			-0.051 (0.200)
Upper-middle inc. flow			0.209 (0.396)			0.429 (0.368)
High-income flow			1.305* (0.731)			1.123* (0.658)
University	0.161*** (0.030)	0.157*** (0.029)	0.152*** (0.029)	0.067*** (0.019)	0.061*** (0.019)	0.062*** (0.019)
Attitude towards immigrants	0.130*** (0.030)	0.160*** (0.030)	0.151*** (0.030)	0.116*** (0.026)	0.141*** (0.026)	0.130*** (0.025)
Male	2.717 (4.634)	2.497 (4.544)	3.316 (4.594)	1.431 (2.761)	1.182 (2.740)	1.639 (2.742)
Subjective income	1.324*** (0.321)	1.460*** (0.316)	1.415*** (0.319)	1.293*** (0.240)	1.364*** (0.238)	1.371*** (0.239)
Primary enrollment (% gross)	0.098 (0.071)	0.119* (0.070)	0.126* (0.071)	0.083 (0.062)	0.098 (0.061)	0.110* (0.062)
Log of GDP per capita	3.705 (3.971)	4.660 (3.898)	-0.008 (4.044)	2.505 (3.490)	3.335 (3.444)	-0.468 (3.563)
Hiring and firing regulations	-0.711** (0.302)	-0.694** (0.296)	-0.946*** (0.338)	-0.466* (0.270)	-0.433 (0.266)	-0.639** (0.303)
Executive constraints	-0.004 (0.101)	0.005 (0.099)	-0.005 (0.100)	0.040 (0.091)	0.047 (0.090)	0.038 (0.090)
Trade (% of GDP)	0.075** (0.030)	0.073** (0.030)	0.092*** (0.031)	0.096*** (0.027)	0.094*** (0.027)	0.116*** (0.027)

Immigrants (% population)	0.938*** (0.301)	0.990*** (0.295)	0.587** (0.265)	0.781*** (0.261)	0.827*** (0.258)	0.544** (0.233)
Observations	1,280	1,280	1,280	1,280	1,280	1,280
R-squared	0.188	0.221	0.208			
Number of clusters	654	654	654	654	654	654

Notes: The dependent variable is the percentage of respondents in the cohort who trust. All standard-errors, in the parentheses, are calculated with the Huber/White/sandwich estimator clustered at the country-cohort level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

According to the regression results, the impact of net flow of immigrants (adjusted for the total population of the host country) on trust is insignificant (Columns 1 & 4). However, the net flow of immigrants from the industrialized countries is positively associated with trust and the net flow of immigrants from non-MIC countries is negatively associated with trust (Columns 2 & 5). This finding implies that competition is not the sole channel through which trust is associated with immigrant shock. If the competition mechanism took place, assuming that the average skill of immigrants is lower than that of natives, net immigrant inflow should be negatively associated with trust. The fact that only the net inflow of immigrants from lower income countries is negatively associated with trust reveals that the competition mechanism works against the low-skill immigrants, and other mechanisms, such as improving labor productivity through innovation activities (Kerr & Lincoln, 2010), may apply for high-skilled immigrant inflows.

Among the net inflows of immigrants from the non-MIC countries, the net flow of immigrants from the low-income countries has a statistically significant and negative coefficient, while that of the high-income countries has a statistically significant and positive coefficient (Columns 3 & 6). Thus, when the skill of immigrants is defined by their countries of origin, the net flow of low-skill immigrants is negatively associated with trust, while the net flow of high-skill immigrants is positively associated with trust.

The baseline results imply that the effect of immigrant shock may depend on the skill type of immigrants. Furthermore, it is necessary to distinguish the overall skill-level of the host countries as well for more accurate depiction of labor market competition mechanism. Since the immigrant characteristics may depend on destinations, the results of the same exercise are reported for the sample of MICs only in the following table. For example, immigrants to the richer countries may be positively selected compared to the population from the originating countries. Or, on the contrary, countries with higher ratios of skilled to unskilled labor may attract lower-skilled immigrants with higher rates of return to unskilled labor. Unfortunately, it is impossible to see which way the immigrants are selected from the current data because of the lack of information on immigrants' education or occupation. I assume that the richer the countries, the higher the natives' relative skill-level than that of

the immigrants. Table 3-3 reports the replication results of the baseline exercise.

Table 3-3. Regressions Results with the Sample of Most Industrialized Countries

VARIABLES	(1)	(2) FE	(3)	(4)	(5) GEE	(6)
Net immigrant flow	-0.092 (0.639)			0.045 (0.588)		
Net MIC flow		6.243*** (1.768)			5.094*** (1.662)	
Net non-MIC flow		-1.123* (0.676)			-0.793 (0.630)	
Low income flow			-2.909*** (0.972)			-2.717*** (0.900)
Lower-middle income flow			-3.434*** (0.859)			-2.561*** (0.796)
Upper-middle income flow			-3.208*** (1.185)			-2.246** (1.099)
High-income flow			-1.336 (1.721)			-1.002 (1.530)
University	0.130*** (0.042)	0.114*** (0.041)	0.180*** (0.045)	0.107*** (0.033)	0.096*** (0.033)	0.138*** (0.034)
Male	-5.663 (7.995)	-6.887 (7.759)	-8.528 (7.914)	-1.053 (5.808)	-1.984 (5.741)	-2.277 (5.801)
Attitude towards immigrants	0.068 (0.043)	0.089** (0.043)	0.066 (0.042)	0.082** (0.039)	0.101*** (0.039)	0.078** (0.038)
Subjective income	1.741*** (0.542)	1.877*** (0.527)	1.635*** (0.598)	2.148*** (0.409)	2.173*** (0.404)	2.155*** (0.436)
Primary enrollment	0.536** (0.216)	0.424** (0.212)	0.803*** (0.213)	0.601*** (0.200)	0.498** (0.198)	0.784*** (0.199)
Log of GDP per capita	29.022 (17.592)	35.911** (17.152)	51.957** (20.623)	16.404 (15.970)	22.945 (15.771)	35.132* (18.258)
Hiring and firing regulations	-0.550 (0.604)	-0.214 (0.592)	-0.806 (0.641)	-0.245 (0.565)	0.029 (0.560)	-0.333 (0.593)

Trade (% of GDP)	0.141*	0.089	0.073	0.220***	0.177***	0.148**
	(0.072)	(0.071)	(0.078)	(0.066)	(0.065)	(0.072)
Executive constraints				40.571** *	35.052** *	26.948***
				(5.588)	(5.752)	(6.052)
Immigrants (% population)	-1.164** (0.534)	-0.947* (0.521)	0.522 (0.619)	-1.045** (0.482)	-0.858* (0.477)	0.216 (0.563)
Observations	440	440	440	440	440	440
R-squared	0.434	0.470	0.483			
Number of clusters	213	213	213	213	213	213

Notes: The dependent variable is the percentage of respondents in the cohort who trust. All standard-errors, in the parentheses, are calculated with the Huber/White/sandwich estimator clustered at the country-cohort level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

As in the previous table, the two estimators produce similar results, although the GEE results report an insignificant coefficient for the net flow of immigrants from the non-MICs. The coefficient of the net immigrant flow variable is statistically insignificant (Columns 1 & 4), but that of the net flow of MIC immigrants is positive and statistically significant (Columns 2 & 5), yielding the same implications from the results in Table 3-2. In particular, the positive and significant coefficient for the MIC net flow variable indicates that the competition mechanism may not apply for the highly skilled immigrants, given that the ratio of skilled to unskilled is higher for natives when the host countries are among the most industrialized. On the other hand, the results in Columns (3) and (6) confirm the competition hypothesis when observing the net flow of non-MIC

immigrants. The net flow variables from all countries except for the “high-income” countries are negatively associated with trust (Columns 3 & 6).

Since all of these countries, from low-income to high-income, have lower GDP per capita than the MICs, they can be considered low-skill immigrants compared to natives on average.<sup>4</sup>

As in Chapter 2, the following analysis presents the impact of immigration variables by age-cohort. Whether the cohorts’ responses to the impact of immigrant shocks differ by age is examined through the interaction terms between age dummies and immigrant variables.

Specifically, the nine age-cohort categories are assigned to three age-groups which are interacted with the flow variables.<sup>5</sup> Columns (1)-(3) present results with all destination countries, while Columns (4)-(6) present results with the sample of MICs.

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<sup>4</sup> The countries that have high GDP per capita but do not belong to the OECD are the exception (e.g., the oil-rich countries in the Middle East). This may explain statistical insignificance of the net flow of immigrants from the high-income countries.

<sup>5</sup> Each age-group consists of three age-cohorts, yielding the youngest group (the youngest three cohorts), the middle group (the middle three cohorts), and the oldest group (the oldest three cohorts). Instead of using age-group categories, interacting cohort dummies with immigrant variables yields similar results.

Table 3-4. Interaction Effects between Age and Immigrant Shock

VARIABLES	(1)	(2) All Countries	(3)	(4)	(5) MICs	(6)
Group 1 x immigrant flow	-0.695 (0.432)			-0.302 (0.481)		
Group 2 x immigrant flow	-0.215 (0.432)			-0.144 (0.935)		
Group 3 x immigrant flow	-0.219 (0.418)			0.373 (0.720)		
Group 1 x net MIC flow		5.969*** (1.309)			4.257** (1.860)	
Group 2 x net MIC flow		7.364*** (0.820)			5.522*** (1.522)	
Group 3 x net MIC flow		5.834*** (1.515)			4.723* (2.183)	
Group 1 x non-MIC flow		-1.633** (0.529)			-1.039 (0.614)	
Group 2 x non-MIC flow		-1.271** (0.417)			-1.084 (1.041)	
Group 3 x non-MIC flow		-1.108* (0.520)			-0.315 (0.789)	
Group 1 x Low-inc. flow			-1.345*** (0.390)			-2.670** (0.960)
Group 2 x Low-inc. flow			-1.446*** (0.244)			-1.941 (1.279)
Group 3 x Low-inc. flow			-1.063*** (0.331)			-2.123 (1.192)
Group 1 x net L-M flow			-0.258 (0.288)			-3.345*** (0.886)
Group 2 x net L-M flow			-0.177 (0.139)			-2.851** (0.918)
Group 3 x net L-M flow			0.060 (0.238)			-2.170** (0.872)
Group 1 x net U-M flow			0.294 (0.593)			-1.819 (1.030)
Group 2 x net U-M flow			0.164 (0.340)			-2.991** (1.271)
Group 3 x net U-M flow			0.621* (0.328)			-2.207* (1.118)

Group 1 x High inc. flow		0.194		-1.343
		(0.966)		(1.983)
Group 2 x High inc. flow		1.488**		-1.997
		(0.510)		(1.616)
Group 3 x High inc. flow		1.443***		-0.346
		(0.352)		(1.413)
Observations	1,280	1,280	1,280	440
R-squared	0.890	0.893	0.892	0.860
				440
				0.866

Notes: OLS estimation results. The dependent variable is the percentage of respondents in the cohort who trust. The title of each column represents the variables used to interact with the cohort dummies. The reference group is the cohort aged 20-25. The results of controls, cohort dummies, country fixed effects, time fixed effects, % of university degrees, subjective income, primary school enrollment, attitude towards immigrants, log of per capital GDP, hiring and firing regulations, trade, and executive constraints are not reported. All standard-errors, in the parentheses, are calculated with the Huber/White/sandwich estimator clustered at the cohort-level.

The interaction effects with the net flow of total immigrants are insignificant for all age-groups, which is consistent with the previous findings. For the rest of the net flow variables, the younger age-groups have the bigger interaction coefficients. For example, the interaction effect between the MIC net flow and age-groups are the largest for the middle age-group, and the interaction effect between the non-MIC net flow and age-groups are the largest for the youngest group (Column 2). Similarly, the interaction effects of both high-income and low-income net flows are the biggest for the middle group (Column 3). This implies that the group that is most active in the labor market reacts most sensitively to the immigrant shock, which supports the competition hypothesis.

When the destination countries are restricted to the MICs (Columns 4-6), the results are similar for the inflow of immigrants from the industrialized countries (Column 5). When it comes to the inflow of immigrants from the less-industrialized origins, the youngest age-group generally exhibits the biggest interaction effect (Column 6). For example, the interaction effects with the low-income net flow and the lower-middle income net flow are the largest for the youngest group, implying that the age-group that is most likely to be unexperienced in the labor market is the most affected by the labor supply shock caused by immigrants.

### 3.5 Robustness Checks

#### *A. Controlling for Immigrants' Countries of Origin*

The baseline regressions in the previous section do not take into account the characteristics of the immigrants' countries of origin. Since immigrants' decision to move to other countries depend not only on the situations in the destination countries but also on the origin, omitting variables pertaining to these characteristics lead to the omitted variable bias. A set of control variables reflecting differences in religious population, social norms, corruption, and political system's maturity, denoted as  $A_{j,t}$ , was generated

using the following formula,  $A_{j,t} = \sum_m \omega_{c,m,t} Diff_{c,m,t}$ , where  $Diff_{c,m,t}$  is a difference between the originating country m and the destination country c at time t, and  $\omega_{c,m,t}$  is the share of immigrants from country m among the total number of immigrants in country c at time t. Specifically,  $Diff_{c,m,t} = \sum_i (x_{i,c,t} - x_{i,m,t})^2$ , where x denotes the level of religious population, social norms, corruption, or political maturity of category i of the respective country (see Appendix A3-6 for details).

Table 3-5. Robustness Check: Including the Characteristics of the Country of Origin

VARIABLES	(1)	(2) All Countries	(3)	(4)	(5) MICs	(6)
Net immigrant flow	-0.609 (0.473)			-0.149 (0.661)		
Net MIC flow		6.398*** (1.575)			8.226*** (1.802)	
Net non-MIC flow		-1.618*** (0.513)			-1.944*** (0.724)	
Low income flow			-1.580*** (0.397)			-3.272*** (0.980)
Lower-middle income flow			-0.237 (0.223)			-3.390*** (0.892)
Upper-middle income flow			0.108 (0.394)			-3.331** (1.309)
High-income flow			1.974** (0.805)			-0.298 (2.051)
Diff_religion	1.045 (1.245)	0.150 (1.239)	1.589 (1.243)	9.280* (5.084)	3.682 (4.951)	9.444* (4.872)
Diff_political	-3.108 (1.954)	-1.982 (1.937)	-6.919*** (2.211)	- (5.443)	18.000*** (5.281)	23.554*** (5.301)
Diff_norms	1.064*** (0.351)	0.931*** (0.347)	0.899** (0.351)	1.470 (1.262)	1.089 (1.199)	0.228 (1.292)
Diff_corruption	-1.681** (0.726)	-1.438** (0.716)	-1.846** (0.729)	-1.828 (1.491)	-0.800 (1.429)	-0.799 (1.536)
Observations	1,280	1,280	1,280	440	440	440
R-squared	0.198	0.228	0.225	0.442	0.481	0.502
Number of clusters	654	654	654	213	213	213

Notes: The results of the country and cohort controls are omitted from the table.

Including the originating countries' characteristics yields similar results to the baseline's (GEE results are omitted as they offer same

implications). The interaction effects with age-groups also yield similar results in Table 3-6.

Table 3-6. Robustness Check: Age-Immigrant Shock

VARIABLES	(1) All Countries	(2)	(3)	(4) MICs	(5)	(6)
Group 1 x immigrant flow	-0.279 (0.448)			-0.508 (0.420)		
Group 2 x immigrant flow	-0.117 (0.883)			-0.030 (0.422)		
Group 3 x immigrant flow	0.385 (0.653)			-0.033 (0.400)		
Group 1 x net MIC flow		6.120*** (1.367)			4.378* (2.043)	
Group 2 x net MIC flow		7.535*** (0.775)			5.615** (1.885)	
Group 3 x net MIC flow		6.031*** (1.464)			4.765* (2.346)	
Group 1 x non-MIC flow		-1.465** (0.511)			-1.046 (0.612)	
Group 2 x non-MIC flow		-1.107** (0.398)			-1.075 (1.000)	
Group 3 x non-MIC flow		-0.947* (0.489)			-0.304 (0.792)	
Group 1 x Low-inc. flow			-1.519*** (0.404)			-3.597*** (0.817)
Group 2 x Low-inc. flow			-1.623*** (0.219)			-2.919** (1.040)
Group 3 x Low-inc. flow			-1.242*** (0.330)			-3.112** (1.142)
Group 1 x net L-M flow			-0.333 (0.296)			-3.225*** (0.794)

Group 2 x net L-M flow		-0.255*		-2.712**
		(0.134)		(0.916)
Group 3 x net L-M flow		-0.016		-2.041**
		(0.237)		(0.859)
Group 1 x net U-M flow		0.226		-1.901
		(0.615)		(1.268)
Group 2 x net U-M flow		0.086		-3.037*
		(0.322)		(1.436)
Group 3 x net U-M flow		0.539		-2.255
		(0.314)		(1.258)
Group 1 x High inc. flow		0.561		-1.229
		(0.907)		(1.974)
Group 2 x High inc. flow		1.851***		-1.809
		(0.524)		(1.840)
Group 3 x High inc. flow		1.810***		-0.216
		(0.554)		(1.732)
Observations	440	1,280	1,280	1,280
R-squared	0.861	0.894	0.894	0.891
				440
				440
				0.867

Notes: The results of the country and age-cohort controls and originating countries are omitted from the table.

### B. Alternative Proxy for Immigrants' Skills

In the baseline regressions, the immigrants originating from the industrialized counties were considered "high-skill." However, this assumption may not hold in reality. In order to mitigate the problem arising from the crude measure of skill, using a new dataset which has information on immigrants' skills is a better approach. The Brain-drain dataset offered by

the Institute for Employment Research contains skill-levels of immigrants (aged 25 or older) by countries of origin and of destination from 1980 to 2010 with five-year intervals. Skill is equivalent to education-level in this dataset. Immigrants with primary or lower education are defined as low-skill, immigrants with secondary education are defined as medium-skill, and immigrants with higher-education degree are defined as high-skill. Unfortunately, the destination countries only consist of twenty selected countries from the OECD.<sup>6</sup>

Applying the same procedure described in Section 3.3 to the Brain-drain dataset, I construct the age-cohort country panel dataset and run the same set of exercises from the baseline's. In this exercise, the variable of interest is the net inflow of low-skill and high-skill immigrants, and also the net inflow of high- and low-skill immigrants who come from the same language zone. For example, a high-skill immigrant from France is assumed to be considered high-skill in Belgium, Canada, Luxembourg, and Switzerland (among the twenty destination countries in the dataset).<sup>7</sup> A justifying reason is that even if immigrants are highly skilled, their skill

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<sup>6</sup> These countries are Austria, Belgium, Canada, Chile, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and the United States.

<sup>7</sup> Refer to Table A3-7 for the languages spoken in these countries.

would not be fully valued in the host country in the presence of the language barrier.

The importance of fluency in the host country's language among immigrants is addressed in the empirical literature, for example, in Chiswick & Miller (1995) who find the positive relationship between the immigrants' language skills and earnings. The results in Table 3-7 demonstrate larger coefficients for the flow of immigrants sharing the same language with the host countries for both high- and low-skilled immigrants. However, the high-skill net inflow is no longer statistically significant when the new dataset is used. This implies that the competition mechanism applies even for the high-skilled immigrants, a finding that was not revealed with the indirect measure of skill from the baseline regressions. Assuming that people with the same education level compete with each other, highly skilled natives also face the risk of competition with high-skill immigrants. In fact, Borjas (2005) finds that high-skill natives are affected by an increase in doctoral degree recipients with foreign nationality in the US labor market. The positive effect of the inflow of high-skilled immigrants may be canceled out by the negative effect from competition. This conjecture is further supported by the stronger association when the supply shock is measured with the inflow of immigrants who come from the countries sharing the same language as the host country. Assuming that the competition between natives and

immigrants are fiercer when the immigrants do not face the language barrier, this serves as evidence that supports the competition hypothesis.

Table 3-7. Robustness Check: Using Direct Measure of Immigrants' Skill

	(1)	(2)
High-skilled flow	-1.120 (1.219)	
Low-skilled flow	-2.097** (1.050)	
High-skilled (same language) flow		-2.908 (1.950)
Low-skilled (same language) flow		-4.700* (2.632)
University	0.145*** (0.053)	0.133** (0.055)
Male	0.027 (0.072)	0.027 (0.072)
Attitude towards immigrants	0.162*** (0.056)	0.145** (0.059)
Subjective income	1.371*** (0.448)	1.588*** (0.450)
Primary school enrollment (% gross)	0.606*** (0.167)	0.580*** (0.177)
Log of GDP per capita	-6.026 (6.981)	-8.864 (6.866)
Hiring and firing regulations	0.275 (0.586)	-0.360 (0.565)
Trade (% of GDP)	0.049 (0.059)	0.090 (0.061)
Immigrants (% of pop.)	-2.103*** (0.542)	-2.009*** (0.527)
Observations	528	528
R-squared	0.383	0.382
Number of clusters	227	227

Notes: Fixed-effects estimation results. Time dummies are included as controls. All standard-errors, in the parentheses, are calculated with the Huber/White/sandwich estimator clustered at the cohort-level.

### **3.6 Conclusion**

This chapter examines the impact of immigrant shocks on trust from the labor market competition perspective, using the country-panel dataset covering the period from the 1990's to the 2010's. This study contributes to the related literature by providing cross-country evidence that trust is affected by immigrant shocks from the channels in the labor market, which has been scarcely dealt with in the social capital literature.

The findings in this chapter support the labor market competition hypothesis in general. The net inflow of low-skill immigrants has a negative association with trust, and the positive association between trust and the skilled immigrant inflow is canceled out by the negative competition effect. Another important finding is that the response to the immigrant shock depends on age. In general, the cohorts from their mid-30's to mid-50's—the prime-working age—are more negatively affected by the net flow of immigrants, especially that of the non-MIC immigrants. On the other hand, the net flow of high-skill immigrants has a stronger positive association with the prime-working age cohorts.

This study is the first country-panel analysis that tests the labor market competition channel in addressing the relationship between trust and immigration. While the findings of this study generally support the labor market competition hypothesis and efforts have been made to distinguish the

characteristics of immigrants by their countries of origin and education-level, making a more meticulous distinction between the skill composition of immigrants—by occupation, expertise or industry—as an additional research project is necessary to make the claim more definitive. Also, exploiting a good instrument or a natural experiment setting can result in proving a causal channel from an immigrant shock to trust.

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## **Appendices**

Table A3-1. The Country Categories

<b>Destination Countries (20)</b>
Australia, Austria, Canada, Chile, Denmark, Germany, Greece, Finland, France, Ireland, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.
<b>OECD Countries as of 1990 (N=24)</b>
Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States.
<b>The Major Industrialized Countries (N=21)</b>
Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, United Kingdom, United States.
<b>Other Countries* (N=43)</b>
Albania, Algeria, Azerbaijan, Argentina, Brazil, Bulgaria, Burkina Faso, Chile, Colombia, Croatia, Cyprus, Czech Rep., Egypt, Georgia, Greece, Hungary, Indonesia, Iran, Israel, Jordan, South Korea, Kyrgyzstan, Latvia, Lithuania, Macedonia, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Peru, Philippines, Poland, Romania, Russia, Slovenia, South Africa, Thailand, Trinidad and Tobago, Turkey, Ukraine, Uruguay, Vietnam.

\*The list consists of the countries that have information in the Values Surveys.

Table A3-2. Nominal GDP per capita (in USD) in 1990

Non-MIC Countries	MIC Countries
Albania	671.661
Algeria	2,473.51
Argentina	4,709.66
Brazil	3,241.07
Bulgaria	2,266.36
Burkina Faso	352.027
Chile	2,492.74
Colombia	1,653.13
Comoros	541.682
Cyprus	10,346.64
Egypt	1,870.85
Greece	9,680.90
Hungary	3,296.12
Indonesia	770.757
Iran	10,878.15
Israel	12,462.31
Jordan	1,238.84
Korea	6,513.16
Malaysia	2,549.61
Mexico	3,423.16
Morocco	1,255.25
Nigeria	686.475
Pakistan	496.018
Peru	1,301.89
Philippines	805.632
Poland	1,625.84
Romania	1,652.37
South Africa	3,140.34
Thailand	1,571.26
Trinidad and Tobago	4,147.68
Turkey	3,857.05
Uruguay	3,319.18
Australia	18,826.00
Austria	21,778.67
Belgium	20,229.10
Canada	21,495.15
Denmark	26,922.44
Finland	23,775.45
France	22,600.46
Germany	20,098.30
Iceland	25,577.21
Ireland	13,707.01
Italy	20,691.00
Japan	25,149.27
Luxembourg	33,378.44
Netherlands	21,001.57
New Zealand	13,362.89
Norway	28,188.52
Spain	13,748.38
Sweden	29,794.08
Switzerland	38,589.18
United Kingdom	20,668.04
United States	23,913.76

Non-MIC Countries	MIC Countries		
Vietnam	98.032		
Mean	3333.25	Mean	23,023.57

Notes: Estimates by the IMF and the World Bank. The statistics for the former USSR countries (Croatia, Czech Republic, Kyrgyz Republic, Latvia, Lithuania, Macedonia, Russia, Slovenia, and Ukraine) are not available.

Table A3-3. Immigrant Statistics by Country

Country	Immigrants (% pop.)	MIC (%pop.)	Non- MIC (% pop.)	MIC (% imm.)	Non- MIC (% imm.)	Immigrant flow	MIC flow	Non-MIC flow	Years observed
Albania	2.51	0.59	1.92	23.40	76.60	0.175	0.041	0.134	1995, 2000
Algeria	0.72	0.02	0.70	2.27	97.73	-0.022	-0.009	-0.013	2000, 2010
Azerbaijan	2.98	0.00	2.98	0.11	99.89	-0.272	0.000	-0.272	1995, 2010
Argentina	4.47	0.89	3.58	19.64	80.36	-0.149	-0.320	0.171	1990, 1995, 2000
Australia	23.86	10.93	12.93	46.05	53.95	2.612	0.402	2.210	1995, 2005, 2010
Austria	11.23	2.26	8.97	20.10	79.90	1.257	0.259	0.998	1990, 2000
Belgium	8.57	4.69	3.88	54.78	45.22	-0.309	-0.040	-0.269	1990, 2000
Brazil	0.40	0.07	0.33	17.26	82.74	-0.024	-0.011	-0.013	1990, 2005
Bulgaria	0.68	0.08	0.60	11.01	88.99	0.186	0.035	0.152	1990, 1995, 2000, 2005
Burkina Faso	4.18	0.00	4.18	0.00	100.00	0.539	0.000	0.539	2005
Canada	17.08	5.55	11.53	32.95	67.05	1.892	-0.136	2.028	1990, 2000, 2005
Chile	1.34	0.19	1.15	15.85	84.15	0.400	0.005	0.394	1990, 1995, 2000, 2005, 2010
Colombia	0.26	0.06	0.20	23.33	76.67	0.013	0.003	0.010	1995, 2005, 2010
Croatia	13.19	0.34	12.85	2.56	97.44	-2.001	0.003	-2.004	1995, 2000
Cyprus	13.80	4.09	9.71	29.64	70.36	4.865	1.449	3.415	2005, 2010
Czech Rep.	1.61	0.10	1.51	6.35	93.65	0.538	0.035	0.503	1990, 1995, 2000
Denmark	5.73	1.88	3.84	33.36	66.64	1.264	0.324	0.940	1990, 2000
Egypt	0.31	0.03	0.28	10.50	89.50	0.053	0.000	0.053	2000, 2005, 2010
Finland	2.43	0.79	1.64	36.66	63.34	0.823	0.078	0.745	1990, 1995, 2000, 2005

Country	Immigrants (% pop.)	MIC (%pop.)	Non- MIC (% pop.)	MIC (% imm.)	Non- MIC (% imm.)	Immigrant flow	MIC flow	Non-MIC flow	Years observed
France	10.24	1.88	8.35	18.41	81.59	0.513	-0.138	0.651	1990, 2000, 2005
Georgia	4.89	0.06	4.83	1.21	98.79	-0.460	-0.019	-0.441	1995, 2005
Germany	10.86	1.59	9.26	15.34	84.66	1.731	0.046	1.685	1990, 1995, 2000, 2005, 2010
Greece	10.21	1.87	8.34	18.32	81.68	2.331	0.074	2.256	2000
Hungary	3.31	0.47	2.83	14.34	85.66	0.223	0.112	0.111	1990, 2000, 2005
Indonesia	0.13	0.01	0.12	7.81	92.19	-0.021	0.002	-0.023	2000, 2005
Iran	3.57	0.00	3.57	0.00	100.00	-0.326	0.000	-0.326	2000, 2005
Ireland	7.66	5.28	2.38	72.23	27.77	3.143	0.766	2.377	1990, 2000
Israel	28.22	2.59	25.63	9.17	90.83	0.901	0.169	0.732	2000
Italy	4.33	0.68	3.65	17.77	82.23	1.870	0.171	1.699	1990, 2000, 2005
Japan	1.36	0.08	1.28	5.86	94.14	0.197	0.008	0.189	1990, 2000, 2005, 2010
Jordan	35.91	0.17	35.75	0.47	99.53	6.241	0.044	6.197	2000, 2005, 2010
South Korea	0.74	0.08	0.66	16.84	83.16	0.447	0.041	0.406	1990, 1995, 2000, 2005, 2010
Kyrgyzstan	4.12	0.04	4.08	0.95	99.05	-1.447	-0.034	-1.413	2000, 2010
Latvia	18.60	0.27	18.33	1.43	98.57	-4.665	0.050	-4.716	1990, 1995, 2000
Lithuania	6.23	0.11	6.12	1.74	98.26	-1.723	-0.036	-1.686	1990, 1995, 2000
Luxembourg	31.28	15.21	16.07	48.64	51.36	3.054	0.874	2.180	2000
Macedonia	6.14	0.00	6.13	0.06	99.94	0.797	0.000	0.797	1995, 2000
Malaysia	6.47	0.04	6.42	0.68	99.32	1.672	0.025	1.647	2005
Mexico	0.64	0.42	0.23	65.78	34.22	0.050	0.125	-0.075	1990, 1995, 2000, 2005, 2010
Morocco	0.19	0.08	0.11	40.21	59.79	0.021	0.015	0.006	2000, 2005, 2010

Country	Immigrants (% pop.)	MIC (%pop.)	Non- MIC (% pop.)	MIC (% imm.)	Non- MIC (% imm.)	Immigrant flow	MIC flow	Non-MIC flow	Years observed
Netherlands	9.74	1.96	7.78	20.39	79.61	0.980	0.091	0.888	1990, 2000, 2005, 2010
New Zealand	18.99	8.82	10.17	47.27	52.73	2.708	0.542	2.166	1995, 2005, 2010
Nigeria	0.47	0.00	0.47	0.00	100.00	0.095	0.000	0.095	1990, 1995, 2000, 2010
Norway	5.81	2.40	3.41	42.86	57.14	1.190	0.084	1.106	1990, 1995, 2005
Pakistan	2.57	0.00	2.57	0.00	100.00	0.394	0.000	0.394	2000, 2010
Peru	0.26	0.07	0.19	27.73	72.27	0.016	0.006	0.010	1995, 2000, 2005, 2010
Philippines	0.39	0.10	0.29	26.05	73.95	0.136	0.045	0.091	2000
Poland	2.24	0.51	1.72	23.57	76.43	-0.317	-0.022	-0.295	1990, 1995, 2000, 2005, 2010
Romania	0.68	0.07	0.61	10.57	89.43	0.035	0.035	0.000	1990, 1995, 2000, 2005, 2010
Russia	8.00	0.11	7.88	1.42	98.58	-0.060	-0.001	-0.059	1990, 1995, 2000, 2005, 2010
Slovenia	10.23	1.15	9.08	11.08	88.92	1.293	0.205	1.088	2000, 2005, 2010
South Africa	2.81	0.54	2.27	19.08	80.92	0.462	0.094	0.369	1990, 1995, 2000, 2010
Spain	6.24	1.57	4.67	32.86	67.14	3.029	0.431	2.598	1990, 1995, 2000, 2005, 2010
Sweden	12.16	4.11	8.06	34.23	65.77	1.619	0.280	1.339	1995, 2000, 2005, 2010
Switzerland	21.66	9.31	12.35	42.99	57.01	2.160	0.875	1.285	1990, 1995, 2005
Thailand	4.01	0.02	3.99	0.64	99.36	1.466	-0.002	1.468	2005, 2010
Trinidad and Tobago	3.50	0.63	2.87	18.06	81.94	0.244	0.119	0.125	2005, 2010
Turkey	1.96	0.52	1.44	26.67	73.33	0.076	0.059	0.017	1990, 1995, 2000, 2005, 2010
Ukraine	11.27	0.01	11.26	0.08	99.92	-1.073	0.000	-1.073	1995, 2000, 2005, 2010
United Kingdom	7.77	2.48	5.29	32.70	67.30	1.261	0.089	1.173	1990, 1995, 2000, 2005

Country	Immigrants (% pop.)	MIC (%pop.)	Non- MIC (% pop.)	MIC (% imm.)	Non- MIC (% imm.)	Immigrant flow	MIC flow	Non-MIC flow	Years observed
United States	11.74	1.18	10.56	10.46	89.54	1.791	-0.010	1.801	1990, 1995, 2000, 2005, 2010
Uruguay	2.35	0.47	1.88	20.11	79.89	-0.187	-0.149	-0.038	1995, 2005, 2010
Vietnam	0.07	0.01	0.06	9.87	90.13	0.000	0.002	-0.002	2000, 2005
Average	6.82	1.53	5.28	21.42	78.58	0.808	0.108	0.701	

Notes: % immigrants is the percentage of immigrants out of the total population in the country, % MIC (pop.) is the percentage of MIC-immigrants out of the total population in the country, % non-MIC (pop.) is the percentage of non-MIC immigrants out of the total population in the country, % MIC is the proportion of MIC immigrants among the total immigrants in the country, % Non-MIC is the proportion of non-MIC immigrants among the total immigrants in the country, immigrant net flow is the net flow of total immigrants in the country adjusted for the host country's population, MIC flow is the net flow of MIC immigrants in the country, and non-MIC flow is the net flow of non-MIC immigrants in the country. All statistics are author's calculations based on the UN Migration Stock Database. Years observed is the years that the respective country was observed in the dataset with the full set of variables used in the analysis.

Table A3-4. Variable Descriptions

Variable	Generation/Calculation	Source
Age-cohorts	Age 18-22, Age 23-27, Age 28-32, Age 33-37, Age 38-42, Age 43-47, Age 48-52, Age 53-57, Age 58-62	Values Surveys
Trust	The percentage of respondents in the cohort who answered “most people can be trusted” when asked, “Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?”	Values Surveys
Attitude towards Immigrants	The percentage of people in the cohort who does not agree with the statement, “When jobs are scarce, employers should give priority to people of this country over immigrants.”	Values Surveys
University	The percentage of respondents in the cohort who have university or higher education degrees	Values Surveys
Subjective Income	The cohort-mean of self-evaluation of income-level in 10 scales (0: the lowest, 10: the highest)	Values Surveys
Hiring and Firing Regulations	The extent of labor market flexibility (scale 1-7) of hiring and firing regulations, assessed in the Global Competitiveness Report.	Fraser Institute
Log of GDP per capita	The real per capita GDP of the country in terms of USD in 2005.	World Development Indicators
Trade	Trade values in terms of the proportion of the country’s GDP	World Development Indicators

Variable	Generation/Calculation	Source
Primary Education	Gross enrollment rate of primary education (%)	World Development Indicators
Executive Constraints	The degree of institutional constraints on the decision-making powers of the chief (either individual or collective) executive of the country. The accountability of the executive is represented with a 7-scale score, from 1 (unlimited executive authority) to 7 (executive parity or subordination). Negative values (-66, -77, -88) represent the state of anarchy, foreign occupation, or transition.	Polity IV Project
MIC-immigrants	The percentage of immigrants originating from the MIC countries out of the total immigrant population	UN Migration Stock Database
Immigrant net flow	The net flow of total immigrants, calculated with the immigrant stock at t-1 and the stock at t. (the distance between t and t-1 is 5 years) $\text{Net flow} = 100 \times (Stock_t - Stock_{t-1}) / Population$	UN Migration Stock Database
Net flow of immigrants from the MICs	The net flow of immigrants from the most industrialized countries, calculated with the formula above.	UN Migration Stock Database
Net flow of immigrants from the non-MICs	The net flow of immigrants from the other countries, calculated with the formula above. This variable is further divided into the flow of immigrants from the high-income countries, the upper-middle income countries, the lower-middle income countries, and the low-income countries as defined by the World Bank (see Table A3-5 below).	UN Migration Stock Database

Table A3-5. World Bank's Classifications

	1990	1995	2000	2005	2010
<i>Low income</i>	<= 610	<= 765	<= 755	<= 875	<= 1,005
<i>Lower middle income</i>	611-2,465	766-3,035	756-2,995	876-3,465	1,006-3,975
<i>Upper middle income</i>	2,466-7,620	3,036-9,385	2,996-9,265	3,466-10,725	3,976-12,275
<i>High income</i>	> 7,620	> 9,385	> 9,265	> 10,725	> 12,275

Notes: The numbers represent the thresholds in terms of per capita GDP in USD applied for each income category.

Table A3-6. Variables on Country of Origin

Variable	Generation/Calculation	Source
Differences in religion	Using the Religious Characteristics of States Dataset (ver. 2.0), the differences between the destination and originating countries' proportion of religious population for each religion was generated, squared, aggregated across destination countries (weighted by the share of immigrants from each destination country) and then standardized to a z-score. The religions considered for calculations are the following: Protestants, Roman Catholics, Eastern Orthodox, Anglican Christianity, Orthodox Judaism, Conservative Judaism, Reform Judaism, Sunni Islam, Shia Islam, Ibadhi Islam, Nation of Islam, Alawite Islam, Ahmadiyya Islam, Mahayana Buddhism, Theravada Buddhism, Zoroastrian, Hindu, Sikh, Shinto, Bahai, Taoism, Jain, Confucianism, Syncretic religions, and Non-religious.	Association of Religion Data Archives

Variable	Generation/Calculation	Source
Differences in political maturity	The differences between the destination and originating countries' political score for each category was generated, squared, aggregated across destination countries (weighted by the share of immigrants from each destination country) and then standardized to a z-score. Political scores considered are the following: democracy, autocracy, and executive constraints. The higher the score, the more mature the political system.	Polity IV
Differences in norms	The differences between the destination and originating countries' social norms for each category was generated, squared, aggregated across destination countries (weighted by the share of immigrants from each destination country) and then standardized to a z-score. Social norms are civic norms defined as in Knack & Keefer (1997): the inverse level of social acceptance towards cheating behavior including tax avoidance, free public transportation riding, dishonestly claiming government benefits, and bribing. The higher the score, the less tolerant the society.	Values Surveys
Differences in corruption	The differences between the destination and originating countries' corruption index was generated, squared, aggregated across destination countries (weighted by the share of immigrants from each destination country) and then standardized to a z-score. The higher corruption index, the less corrupted.	Heritage Foundation

Table A3-7. Country Groups by Language

Language	Countries
Dutch	Belgium, Netherlands, Suriname
English	Antigua and Barbuda, Australia, Bahamas, Barbados, Belize, Bermuda, Botswana, Cameroon, Canada, Dominica, Fiji, Gambia, Ghana, Grenada, Guyana, Hong Kong, India, Ireland, Israel, Jamaica, Jordan, Kenya, Kiribati, Kuwait, Lebanon, Lesotho, Liberia, Libya, Malawi, Maldives, Malta, Mauritius, Namibia, New Zealand, Pakistan, Philippines, Qatar, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, South Africa, Swaziland, Tanzania, Thailand, Trinidad and Tobago, Uganda, United Kingdom, United States, Vanuatu, Zambia, Zimbabwe
French	Belgium, Benin, Burkina Faso, Burundi, Cameroon, Canada, Central African Republic, Chad, Comoros, Congo, Cote d'Ivoire, Democratic Republic of Congo, Djibouti, France, Equatorial Guinea, Gabon, Haiti, Lebanon, Luxembourg, Madagascar, Mali, Morocco, Niger, Reunion, Rwanda, Senegal, Seychelles, Switzerland, Togo, Vanuatu
German	Austria, Germany, Luxembourg, Namibia, Switzerland
Italian	Italy, Switzerland
Portuguese	Angola, Brazil, Cape Verde, Guinea-Bissau, Mozambique, Portugal, Sao Tome and Principe
Spanish	Argentina, Bolivia, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Equatorial Guinea, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, Venezuela
Swedish	Denmark, Sweden

## **Conclusion and Discussions**

Throughout the previous three chapters, the relationship between trust and migration has been examined with particular considerations on the labor market channels. Chapter 1 and Chapter 2 explored the relationship at the individual-level, based on the German panel data. Studying the German case has multiple interesting aspects because of its unique historical background of the abrupt reunification between the former West Germany and the former East Germany after four decades of the separation-period under the contrasting political and economic regimes. The long period of separation resulted in the different characteristics between the two regions and, more importantly, between the peoples from the two regions.

Amid the differences between the two regions and peoples, Chapter 1 examined whether the trust of East Germans, conspicuously lower than that of the Western counterparts even in the post-reunification period, increases upon migration to the Western region. According to the estimation, it does indeed increase, which is consistent with Heineck & Sussmuth (2013)'s findings that migrating to the West and generalized trust are positively associated. The contribution of this study, however, is beyond confirming the previous study's results—it proves the causal relationship through the use of

instrumental variables and searches for the underlying mechanism. As most of the migration decisions are driven by labor market motivations, this chapter hypothesizes and confirms that a positive change in migrants' trust is occurred by the experience in the Western labor market. The results reveal the new channel through which trust is formed and highlights the importance of assimilation in the high-trust society as the growth mechanism of trust. Trust, while conventionally known to be increasing in social participation, positively responds to labor market activities, the most common and productive form of social participation.

Chapter 2 and 3 examined whether trust is affected by labor supply shocks, empirically testing the labor market competition hypothesis, the perspective that has been rarely—if at all—adopted in the literature addressing trust formation. The findings in general are in support of the hypothesis.<sup>1</sup> Chapter 2 investigated the impact of the mass-migration shock brought about the German reunification. Trust of the workers at prime-age in the early 1990's is negatively affected by the state's net migration shock in the early 1990's. Unaffected generations, who were not yet in the labor force at the time, are instead

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<sup>1</sup> However, the author does not intend to make normative statements on whether immigration policies should be more open or closed. In fact, as multiple studies argue, labor shocks caused by the influx of immigrants often do not cause economic consequences on the natives' side. The change in trust is more likely through the change in perception and the long-term consequences of migration are more likely to be positive.

affected by the recent net migration rate, supporting the hypothesis. The usage of an exogenous shock results in proving the causality from the labor market shock to trust, revealing a new channel in the social capital literature.

Chapter 3 extended the scope to multiple countries, based on the constructed country-cohort panel data. The impact of immigration shock, proxied by the net migration rate of each host country, was differentiated by the immigrants' level of education or their countries of origin. Whether the immigration shock is associated with trust has been examined, especially with respect to the skill-level of immigrants. Theories predict a negative impact of low-skill immigrants mainly due to two channels: increased competition and tax burdens by the natives (Scheve and Slaughter, 2001; Mayda, 2006; Mayda & Facchini, 2009). The estimation results revealed that the flow of low-skill immigrants is negatively associated with trust, which supports both the labor market competition hypothesis and the welfare burden hypothesis. The insignificant effect of the flow of high-skill immigrants implies that the competition mechanism, rather than welfare burden, is taking place. If the welfare burden was the cause of the negative association between trust and unskilled immigrant inflows, the inflow of skilled immigrants would be positively associated with trust. The lack of association between skilled immigrant inflow and trust imply that their positive

impact on the host countries, through increased productivity or innovation, is potentially canceled out by the negative impact of the competition mechanism. In addition, prime-age cohorts are more affected by the immigration shocks than younger or older cohorts, which is in accordance with the findings in Chapter 2.

The main objective of this dissertation has been dissecting the factors that form or destroy trust through the labor market channel. Trust increases with the exposure to the high-trust society when it is accompanied by the labor market activities. On the other hand, it decreases when the individual is faced with the increased probability of labor market competition risks. Another objective has been assessing the degree of persistence of trust. At the individual-level, trust changes relatively sensitively to the contemporaneous shock, whether positive—exposure to high-trust environment—or negative—the influx of migrants. At the aggregate-level, it is more persistent, judging from the prolonged gap between East and West Germans, and the positive correlation between immigrants' trust and their countries' trust demonstrated in the previous literature. This could be due to the long-lasting effect of the shock received in the past, as seen by the effect of the 1990's migration shock on West Germans' trust.

In addition, the findings of this dissertation have implications for currently divided Korea. If reunification is to take place—even if it

may be in the distant future—meticulous preparations well ahead of time are necessary in the social capital aspect in order to reduce the risks of social conflicts between the two regions and peoples. The gap of trust, or any other economic or social capital variable, between North Koreans and South Koreans would almost certainly be much larger than the gap between the former East and West Germans, given the length of separation and the current economic gap. Negative consequences in the short-run—which may last through the period of affected generations given the persistent nature of trust—would be inevitable, even more so than Germany. The way to minimize the gap is to increase the exposure to the high-trust—in this case, South Korean—society, by increasing social or labor market interaction. For North Korean defectors, this can be done through economic adjustment (Kim & Kim, 2016). For North Korean migrants in the future's reunified Korea, this can be done through realizing positive returns in the South Korean labor market. In order for them to achieve this, accumulating enough human capital to adjust in the capitalist society is essential, as was the education level of East Germans which was on par with that of West Germans an important determinant of trust. The current prevalence of market informalization in North Korea would help increase social capital in this aspect. Furthermore, if reunification does take place, efforts to eliminate prejudice, especially on the South

Korean side, by increasing interactions between the two parties in the pre-reunification transition period would significantly reduce the potential conflicts upon reunification.

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## 국문초록

### 이주가 신뢰에 미치는 영향 : 개인 및 나라 단위 분석을 중심으로

사회적 자본 관련 문헌 중 신뢰와 이주의 관계를 살펴본 연구는 그 중요성에도 불구하고 수가 많지 않은 실정이다. 본 논문에서는 독일통일이라는 자연실험을 통하여 이주가 신뢰에 미치는 영향을 분석하고, 더 나아가 신뢰의 형성 이유에 관하여 살펴본다. 1장과 2장에서는 독일통일로 인해 발생된 긍정적이거나 부정적인 외생적 충격이 신뢰에 어떠한 영향을 주는지 분석한다. 먼저, 독일의 개인 및 가구 단위 데이터인 SOEP를 바탕으로 동독출신주민이 서독의 환경에 노출되었을 때 신뢰가 증가하는지 살펴본다. 회귀분석 결과 서독지역에서 거주함으로 인하여 동독출신주민의 신뢰가 증가하는 것으로 분석되며, 이는 사회주의 체제를 오랜 시간 겪어서 사회적 자본의 축적정도가 낮은 동독주민의 신뢰도 현재의 상황이나 경험 등을 통해 변할 수 있음을 시사한다. 서독으로 이주한다는 것의 선택편의는 도구변수를 활용함으로써 제거하였고, 도구변수추정 결과도 앞서 언급한 결과와 일치한다.

두번째 장에서는 통일을 경험한 서독출신주민의 신뢰를 살펴보면서 신뢰의 지속성을 중심으로 연구를 전개한다. 통일로 인한 동독주민들의 집단이주가 서독주민의 신뢰에 미친 영향을 살펴보기 위해 1990년대 초의 순 이주율을 이주충격의 대리변수로 사용한다. 변량효과모형으로 추정된 회귀결과에 따르면, 서독주민의 신뢰는 노동공급충격에 부정적으로 영향을 받았으나 그 충격의 지속성은 통일 당시 노동시장참여자에게서만 관찰되었다. 설문 응답자들을 다양한 집단으로 분류하여 회귀분석한 결과를 바탕으로 이주민들을 노동시장에서의 경쟁자로 인식하는 것이 신뢰 감소의 경로임을 추론 가능하다.

마지막 장에서는 세계가치관조사, 유럽가치관조사, UN 이민데이터 및 세계은행의 세계개발지수데이터를 병합한 국가단위 데이터를 구축하여 이민자와 신뢰의 관계를 살펴본다. 국가의 순 이민자 유입율을 이민충격의 대리변수로 사용하고, 국가들을 소득수준으로 분류하여 이민충격의 구분도 세분화하였다. 또한, 노동시장경쟁 메커니즘을 살펴보기 위하여 연령별 집단 단위 패널을 구축하여 분석에 활용하였다.

분석결과, 저숙련이민자의 유입은 신뢰와 음의 관계에 있으며 고숙련이민자의 유입은 신뢰와 유의미한 관계가 없는 것으로 나타난다. 더불어 노동활동이 가장 활발한 연령대에 받은 이민충격은 신뢰와 음의 관계에 있다는 결과를 바탕으로 이민자 유입이 노동시장경쟁을 통해 원주민들의 인식에 부정적인 영향을 미치는 것으로 추론할 수 있다.

**주요어:** 신뢰, 이주, 이민, 사회적 자본, 독일, 자연실험, 통일

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