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Topics in Migration Research

Sarah Kups

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Abstract

With respective emigrant and immigrant stocks that are among the largest in the world, Mexico and Germany are affected by migration like few other countries are. They also exemplify that migratory movements need not be permanent, but are also often less temporary than initially assumed. In this dissertation, I explore topics related to the determinants and consequences of migration in these two countries.

In the first paper, I investigated the relationship between unemployment, wage and homicide rates and migration in Mexico's 32 largest urban areas. I found that higher unemployment rates were correlated with higher out-migration but not emigration and that homicide rates were not related to either out-migration or emigration. These results are consistent with the theoretical models of credit constraints in migration and selected empirical results on security-related migration in Latin America.

In the second paper, I studied the selection on observables among emigrants from Germany, with a specific focus on whether there was any evidence of a brain drain among second generation immigrants. I found that emigrants are more likely to be from the lowest- and highest-educated groups, and that individuals with a migration background are in general more likely to emigrate. I failed to find any evidence, however, that among second generation immigrants, the selection into emigration by education background is different than in the population at large. Certain average attitudes towards foreigners in the state of residence are not predictive of emigration, while individual perceptions of discrimination are.

In the third paper, I explored self-employment among Mexican return migrants. I proposed a model that suggests that both voluntarily and involuntary self-employment should be higher among return migrants than among non-migrants. Empirically, I found that return migration was associated with lower- but also with higher-profit forms of self-employment. On the one hand, return migrants are more likely to be self-employed without employees, and to have entered self-employment involuntarily. On the other hand, microenterprises owned by return migrants on average have more capital.

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Estimates put the number of international and internal migrants in 2012/2013 at around 230 (United Nations Department of Economic and Social Affairs, 2013) and 740 million (United Nations Conference on Sustainable Development, 2012), respectively. Hence, around 1 in 7 individuals worldwide is a migrant, and many more are affected by migration, for instance by receiving remittances as a family member of a migrant, or indirectly through migration's impact on labor markets and its fiscal effects.

Of course, the intensity of migration and hence its effects are not distributed equally across the world. Germany and Mexico – the countries that this dissertation focuses on – are particularly affected by being the destination for the third-largest migrant stock in the world and by being the generator of the world's largest bilateral migration flow, respectively (United Nations Department of Economic and Social Affairs, 2013). They moreover share the feature that some of the prior trends that made them such large source or destination countries over the last decades seem to be reversing: Passel et al. (2012) estimate that the Mexico-U.S. net immigration was equal to around zero between 2005 and 2010, compared to around -2.3 million ten years previously; and in 2009, net immigration into Germany was negative for the first time since the early 1980s (although it has since become positive once again) (Meier, 2013).

This dissertation studies different aspects related to migration in Mexico and the United States: The first paper discusses how local economic and security factors are related to out-migration and emigration in Mexico; the second paper investigates whether highly educated second generation immigrants are more likely to emigrate from Germany; and the third paper studies the relationship between return migration and self-employment in Mexico.

The three essays use common analysis methods: Ordinary least squares and logit or probit regressions based in principal on large-scale household and microenterprise surveys.

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In the third paper, I explored self-employment among Mexican return migrants. I proposed a model that suggests that both voluntarily and involuntary self-employment should be higher among return migrants than among non-migrants. Empirically, I found that return migration was associated with lower- but also with higher-profit forms of self-employment. On the one hand, return migrants are more likely to be self-employed without employees, and to have entered self-employment involuntarily. Moreover, they are not more likely to own businesses. On the other hand, microenterprises owned by return migrants on average use higher levels of capital.

Acknowledgements

Chapter 1

Local Economic and Security Factors and Internal and International Migration in Mexico's Urban Areas

Abstract

During the second half of the first decade of this century, Mexico experienced a drastic increase in its homicide rate as well as an economic downturn. In this study, I investigated whether changes in an urban area's homicide, unemployment and wage rate were associated with changes in out-migration and emigration during the 2005-2011 period. The main contribution to the literature is that I am able to control for time-invariant urban area characteristics that influence the strengths of migration flows. I found that a higher unemployment rate is related to a higher chance of out-migration, but is only a factor in the emigration of the highly educated. The effect of a higher homicide rate is not significant for either out-migration or emigration.

One of the key questions in migration research is which factors influence migration decisions. Economic migration models are based on the premise

that people move if it improves their well-being and if they have the means to do so. Since the ability to come up with the required funds and the potential pay-off vary from person to person and are related to characteristics such as education, migrants are not randomly selected from their populations of origin. And since the local economy, amenities and migration networks affect the costs and benefits of moving, migrants are similarly non-randomly selected on their place of origin within a country. In this paper, I seek to contribute to the empirical literature on the relationship between local factors and migration.

In particular, I analyzed the relationship between personal and local factors and out-migration and emigration in Mexico's thirty-two largest urban areas using logistic regressions based on the 2005-2012 National Survey of Employment and Occupation [Encuesta Nacional de Empleo y Ocupación ENOE] (Instituto Nacional de Estadística y Geografía , 2007). I sought to address whether variations in the urban areas' unemployment rate, average wage levels and homicide rates (the 'local' factors) are predictors of out-migration - defined as a move from one Mexican state to another - and emigration - defined as a move abroad.[1] Moreover, I studied whether the relationship between these local economic and security factors and migration varies between different educational groups.

I analyzed the relationship of the local factors with the urban areas' net out-migration/emigration rates using ordinary least squares regressions and with individual out-migration/emigration using logit regressions. The main regressions control for urban area and time fixed effects and, in the case of the individual-level logit regressions, for observed personal characteristics.

Understanding the relationship between these factors is particularly pertinent at the time of writing because there were stark changes in Mexico's security and economic situation as well as its migration patterns during the years studied: After dropping for many decades, the homicide rate saw a strong surge since the mid-2000s in the context of the Mexican drug war (Molzahn et al., 2013); and the geographical distribution of violent crime became less concentrated (Amuedo-Dorantes and Orrenius, 2008). This lead to reports of internal and international displacements (c.f. e.g. McKinley Jr (2010); Fundación MEPI de Periodismo de Investigación (2011); Boehm (2011)). Moreover, unemployment rose by mid-2009 and has not yet receded to its pre-crisis level (Freije et al., 2011). Over the same time period, there has been a drop in emigration flows that is primarily attributed to the economic crisis in the United States and to increased border security

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[1]This standard classification is for instance defined in United Nations (1970).

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(Organisation for Economic Cooperation and Development, 2013).

From a policy perspective, movements that are caused by violence rather than economic factors may have different implications for economic development: If people move away from economically depressed areas, this could at least theoretically improve the allocation of labor across the country and hence increase national income. In contrast, if people move in response to violence, this could reduce GDP. For instance, if parts of the country that are already suffering from increased levels of violence are also losing particularly educated people, these regions will have to overcome a double hurdle: the first-order loss in economic activity through the increased crime, and the second-order loss through people moving away.

As will be shown in the literature review, prior empirical studies on the influence of local factors on migration outcomes in the Mexican context usually either analyzed the influence of country-level (Orrenius and Zavodny, 2005; Acevedo and Espenshade, 1992; Alvarado and Massey, 2010) or state-level factors on migration decisions (McKenzie and Rapoport, 2007; Massey and Espinosa, 1997; Lindstrom and Lauster, 2001; de Janvry et al., 1997; Meza-González and Feil, 2012; Arceo-Gómez, 2012; Rios, 2012). In contrast, I studied the relationship between individual emigration and violence and economic factors at the urban area level. On the one hand, the focus on more local versus state-level factors can provide a more accurate impression of the influence of these factors on migration because there are "(...) significant municipal-level effects on the probability of U.S. migration" (Lindstrom and Lauster, 2001, p. 1233) and because crime rates also vary quite strongly within some states. On the other hand, the focus on individual migration decisions rather than on aggregate flows makes it possible to understand whether local factors are predicting different migration probabilities by education background. Since people with different educational categories tend to have a different earning power and may contribute differently to the local economy, this could have consequences for economic growth. A further contribution of this study is that I am able to control for urban-area level time-invariant factors that influence the magnitude of migration flows, while prior studies used data from a single year and may not have been able to control for all of these factors.

A limitation of this study is that the relationship between migration and unemployment, wage levels and homicide rates can only be interpreted as causal under the conditions that there are no unobserved time-varying factors that are related to both the determining local factors (wages, unemployment and violence) and migration and that there is no endogeneity. Other limitations include that the focus is restricted the largest urban areas,

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and that neither the out-migration of entire households nor the impact of destination characteristics can be studied.

The empirical results show the expected relationships between a variety of personal characteristics and migration, such as a lower emigration likelihood among women, and an inverse u-shaped relationship between migration and age.

In contrast, the local economic and violence factors play a much smaller role in affecting migration decisions: A higher unemployment rate is associated with a higher net out-migration rate while the effect on net emigration is not statistically significant. This is mirrored in the individual-level regressions, where a higher unemployment rate is associated with a higher out-migration likelihood, but not among the unemployed; while there is no statistically significant relationship with emigration. The unemployment rate-education interactions are not statistically significant for the most part, except for the post-secondary educated group in the emigration regression, which is positive and a large effect. The wage rate does not have a statistically significant relationship with the out-migration or emigration rates, but the estimated marginal effects are negative in the first and positive in the second case. The non-significance is again mirrored in the individual-level regressions. The estimated coefficients of the homicide rate in the net out-migration and emigration regressions are negative, but not statistically significant. In the individual-level out-migration regressions, the estimated marginal effects are also not statistically significant; while in the emigration regression, the estimated marginal effect is statistically significant but relatively small: A drastic increase in the homicide rate of .1 percentage points is associated with a .3 percentage points lower emigration likelihood. The education-homicide rate interactions are not statistically significant except for the higher secondary and post-secondary educated individuals in the outmigration regression.

The structure of the paper is as follows: Section 1 contains a review of the related literature. Section 2 describes the empirical approach. Section 3 introduces the data source and summary statistics. Section 4 contains the main empirical results and section 5 the results of various robustness checks. Section 6 concludes the paper.

1.1 Literature Review

According to Borjas (1989), one of the three questions that the economic theory of migration addresses is "What factors determine the direction, size

and composition of immigrant flows?". The analysis in this paper is part of this literature and focuses on the relationship between local economic and security factors and out-migration and emigration in Mexico. Compared to prior research, I am able to analyze the relationship of urban-area rather than state or national unemployment, wage and homicide rates with individual moves rather than aggregate migration rates.

In this literature review, I provide a brief introduction to the theoretical microeconomic literature on migration determinants, followed by a review of the empirical literature with an emphasis on Mexico-focused studies.[2]

Almost all economics models of migration rely on the underlying premise that "Differential characteristics of sending and receiving regions provide potential incentives for moving, and individual and/or family traits help condition the response to utility differences that may arise from these different characteristics." (Greenwood, 1997, p. 658). However, the types of regional characteristics that are taken into account vary across different theories:

In basic neoclassical models, such as presented by Sjaastad (1962), Todaro (1969), and Borjas (1994), the decision to migrate is based on the net value of the expected wage differential, which in turn is related to relative wages and employment and unemployment rates, between the home region and the prospective destination. In these models, individuals who can expect a financial gain from their move that exceeds the (financial and non-financial) migration costs move. According to Greenwood (2014), the focus on the impact of these economic factors however already predates formal microeconomic models and can be traced back to Ravenstein (1985, 1989), who stated that among other reasons, people move to find better paid work, Hicks (1932), Thompson (1936), and Kuznets and Thomas (1957).

More recent models of the "new economics of labor migration" furthermore acknowledge that migration can represent a household's strategy to diversify income streams and overcome credit constraints particularly in developing countries (Stark and Bloom, 1985). In these models, migration decisions are not only based on the wage differential, but also on the correlation between wage variations across regions or countries and on whether there are credit constraints in the region of origin.

Finally, extensions of the neoclassical basic model allow for non-economic factors to be included in the evaluation of the attractiveness of different locations. For example, Morrison (1993) and Morrison and May (1994) argued that the framework of expected income maximization can be replaced

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[2]For a more in-depth discussion of migration theories, please refer for example to Massey et al. (1993) or section 4 of Greenwood (1997).

with one of expected utility maximization, and this utility can then depend on both economic and non-economic characteristics (such as, in their case, safety).

With regards to the theoretical expectations about the influence of unemployment and the local unemployment rate, Greenwood (2014, p. 7) stated that "(...) relatively higher unemployment rates characterize regions with labor markets that should encourage out-migration and discourage in-migration. (...) As a personal characteristic, unemployment reflects a situation in which the individual's opportunity cost of migrating is lower and his incentive to find a job anywhere, importantly in other regions as well as in his current region of residence, is higher." Nonetheless, he also refers to Makower et al. (1939), who stated that "in times of (...) prolonged unemployment, people find it more difficult to raise the money necessary for migration." Moreover, Pissarides and McMaster (1990) point out that when unemployment rates are higher, individuals who have a job may be less inclined to give up a secure position and move. The opposing effects of increased potential pay-offs for migration and decreased ability to bear the costs thus leads to ambiguous predictions on the role of unemployment in determining migration flows from a theoretical perspective.

The expected effect of wages is that higher relative wages in one area would encourage migration to that area (and conversely, lower relative wages would encourage out-migration) (Pissarides and McMaster, 1990). However, very low income levels can also make it difficult for prospective migrants to raise the required funds (Fidrmuc, 2004), and the relationship between average wages and migration may thus be of an inverse u-shape rather than a downward straight line.

Regarding the expected relationship between violence and migration, on the one hand, if utility falls as a result of violence, individuals might wish to move (Morrison, 1993). On the other hand, the move itself may have become more dangerous due to an increased involvement of large criminal organizations in smuggling migrants across the border (Dudley, 2012; Boehm, 2011), thereby raising migration costs. As with the relationship between migration and unemployment, the relationship between violence and migration is therefore ambiguous.

Given the unclear theoretical relationship between the variables of interest and migration, the topic needs to be approached empirically. Empirical studies in this area typically either focus on factors at the country or local level.

In the category of the impact of country-level variables on migration, studies traditionally focused on economic, demographic and policy factors.

Some articles sought to explain international migration flows across multiple countries. Using data from migrants in OECD countries, Mayda (2010) found that per worker GDP was an important factor in determining immigration but not emigration flows, a discrepancy that can be explained by migration quotas; Ortega and Peri (2009) found that earning differentials between countries are positively related to migration flows, and Grogger and Hanson (2011) found that this was also true for education-specific wage rates. Letouzé et al. (2009) found that as long as common borders, a common language and historical ties were not controlled for, origin country GDP was associated with larger emigration flows up to a certain point, after which it decreased again; which is consistent with the idea that liquidity constraints can prevent migration at very low levels of income. Other studies focused on explaining emigration from a single country across time. For Mexico, factors that were studied were for instance the relative rates of economic growth in the US and Mexico, the growth rate of the Mexican labor-age population and border protection efforts (Orrenius and Zavodny, 2005; Acevedo and Espenshade, 1992). The studies in general concluded that improvements in the Mexican economy can reduce emigration; but the article by Orrenius and Zavodny (2005) suggests this is only true for improvements of the rural economy.

More recently, attention has been paid to the impact of violence. In a cross-country study, Melander and Öberg (2007) linked the number of refugees and internally displaced persons to different measures of violence and regime type. They concluded that the number of battle deaths had no influence on the number of displaced people, but that particularly in non-democratic states, a more widespread geographic scope of violence was strongly predictive of their number. Bariagaber (1997) related the number of refugees from Ethiopia to various measures of local conflict and violence, and concluded that a higher number of casualties were associated with higher refugee movements. Alvarado and Massey (2010) analyzed individuals' decision to emigrate from Mexico, Costa Rica, Guatemala and Nicaragua. They concluded that Mexican, Costa Rican and Guatemalan emigration was negatively related with the homicide rate, while the opposite was true for Nicaragua.[3] They speculated that the reason for the different patterns was that in the first three countries, middle-class households did not perceive a challenge to their economic interests through political changes while the opposite was true in Nicaragua; and that violence encourages emigration among middle-class but discourages emigration among lower-class

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[3]They also found that Mexican unemployed individuals are less likely to emigrate.

households. Lundquist and Massey (2005) also concluded that emigration from Nicaragua to the United States and contra war activity were positively correlated, and that it was the middle classes who emigrated there, while the opposite was true for emigration to Costa Rica. Stanley (1987) related the number of monthly apprehended immigrants from El Salvador to the United States to political violence and found that higher levels of violence were predictors of higher levels of migration.

In addition to evaluating how country-level factors affect emigration, there is a second category of the literature which evaluates how local factors affect migration. As in the national-level studies, many of these focused on economic variables and, additionally, on social networks, local amenities and the environment. Examples include McKenzie and Rapoport (2007), Aroca Gonzalez and Maloney (2005), Massey and Espinosa (1997), Lindstrom and Lauster (2001) and de Janvry et al. (1997). In general, more favorable local employment opportunities were found to be associated with less and more favorable local investment opportunities and larger migration networks with more out-migration. Aroca Gonzalez and Maloney (2005) found that unemployment rates and wage levels alone did not explain internal migration, but when relative unemployment was included, it was significant; suggesting credit constraints might prevent some people from moving. In other contexts, empirical studies do not give a clear result whether and how unemployment rates matter for migration (c.f. Greenwood (1997, pp. 682-687) for internal migration in developed and Lucas (1997, pp. 742-743) for migration in developing countries).

Similarly to the literature on country-level factors, recent studies have also explored the impact of crime and violence at the sub-national level. For other countries, prior research in general found that violence increased out-migration (Grun, 2009; Morrison and May, 1994; Mesnard, 2009; Morrison, 1993; Schultz, 1971; Ibáñez and Vélez, 2008). For Mexico, Meza-González and Feil (2012) related the 2005 migration rates of 72 municipalities in the southern border with their 2009 homicide rates. They found that emigration and the homicide rate four years later are positively correlated, and concluded that this could either mean that the crime rate was higher in municipalities with more emigration or that insecurity led to emigration. Arceo-Gómez (2012) investigated how the number of Mexican migrants to the U.S. and business establishments by Mexicans were linked to the municipal homicide rate weighted by the distance to the border. She found that a one percent increase in the homicide rate led to an overall decrease in emigration but an increase in emigration to border states by 0.68 percent. Rios (2012) regressed the unexpected outflows from a municipality in 2010 as

measured by the difference between the CONAPO population predictions and the actual census population figures on the number of drug-related homicides, extortions and kidnappings per 100,000 people (as reported by the Mexican National Security Council) and other control variables (the prior years' CONAPO prediction error, employment rates, general homicide rates and state fixed effects). She found that a one point increase in the homicide rate led to 6.3 additional Mexicans fleeing that county; but that conversely a drop in the homicide rate did not increase immigration into a county.

Compared to the study by Alvarado and Massey (2010), the approach that I used in this paper has the advantage that rather than the national rate, I use local homicide rates. Compared to Rios (2012) and Meza-González and Feil (2012), I can study which population groups are particularly affected; and compared to Arceo-Gómez (2012), I can study outmigration as well as emigration. Finally, unlike all three studies and as will be discussed in more detail below, due to the multi-year nature of the data, I am able to include urban area and year fixed effects.

1.2   Research Approach

This paper falls into the category of analyzing how sub-national factors are related with out-migration and emigration.[4] The level of analysis are the thirty-two largest urban areas in Mexico over the 2005-2011 period, a choice driven by several considerations: First, these urban areas are the smallest geographic unit for which reliable estimates of two key explanatory variables – the unemployment and average wage rates – are available (Instituto Nacional de Estadística y Geografía , 2007). Secondly, urban areas experienced the highest spikes in both violence (Molzahn et al., 2013) and unemployment (Villarreal, 2010) during the period studied. The disadvantage of this focus is that it is impossible to make statements about how these factors are related to out-migration and emigration in rural areas and towns.

The primary estimation strategy is logit regressions at the individual level. The dependent variables of out-migration and emigration are equal to 1 if an individual moves to another state or abroad, respectively, while their household is included in the panel. Intra-state movers are not counted as

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[4]Out-migration (and its reverse, in-migration) refer to the migration from one Mexican state to another from the perspective of the state of origin and destination, respectively, while emigration (and immigration) refer to the movement from Mexico abroad from the perspective of Mexico and of the country of destination, respectively. This classification is for example used in United Nations (1970).

out-migrants because it is impossible to distinguish whether they remains in or leave the urban area. Since they only represent 6% of the combined category with non-migrants, this is unlikely to skew the results even if a substantial percentage of them are genuine out-migrants. The probability of out-migration and emigration is modeled as a function of personal and urban area characteristics and urban area and quarter fixed effects:

$$p_{ijt} = F(PersonalCharacteristics_i, UrbanAreaCharacteristics_j, UrbanArea_j, Quarter_t)$$

The included personal characteristics are age and age squared, sex, educational level (with incomplete primary education as the omitted category), labor force status (with not being in the labor force as the omitted category), type of employment (employee, self-employed without employees, business owner), wages and marital status.

The main variables of interest are the urban area's unemployment, wage and homicide rates. All three of these variables have been used as explanatory factor for migration in prior empirical studies (see for instance DaVanzo (1978); Hooghe et al. (2008); Mendoza (2006) for the effect of unemployment, Acevedo and Espenshade (1992) for the effect of wage variations and Rios (2012); Alvarado and Massey (2010); Engel (2007) for the effect of homicide rates on migration).

In additional analyses, I included the following interaction variables:

- Unemployed x Local unemployment rate
  This interaction makes it possible to test whether unemployed people are more or less likely to migrate when the local unemployment rate is higher.

- Education level x Unemployment rate and Education level x crime rate
  With these interactions, I can test whether the response to adverse local circumstances differs by educational level.

Moreover, I also explored whether local economic and security factors interact with migration in a non-linear way. Firstly, I studied whether the urban area's unemployment growth rate, or its rate relative to the national urban areas' average, may have a relationship with out-migration and emigration. Secondly, I tested whether people only leave areas more frequently once the level of violence surpasses a certain threshold (c.f. Bohra-Mishra and Massey (2011); Morrison and May (1994)) by including indicator variables for different levels of the homicide rate.

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Finally, a concern that one may have with the research approach described above is that the included personal characteristics may be temporarily too far removed from the actual migration act: In the main regressions, the information on an individual's labor force, educational and marital status are taken from their first observation in the panel; but they may not migrate until nearly a year later, by which time their characteristics, in particular with regards to their labor market status, may have changed. To test whether this biases the results, I also ran regressions in which there is an observation for up to the first four quarters that an individual is a panel member. In these regressions, the dependent variable is whether or not someone is recorded as an emigrant or out-migrant in the following quarter's interview. In other respects, these regressions are set up in an equivalent way to the main individual-level regressions described above.

As a secondary estimation strategy, I also regress the urban areas' yearly net out-migration and emigration rates on their prior year's homicide, average wage and unemployment rates:

$$NetEmigrationRate_{jt} = F(UrbanAreaCharacteristics, UrbanArea_j, Year_t)$$

The net out-migration and emigration rates are calculated by first estimating the yearly out-migration and in-migration (across state border) and immigration and emigration rates from each urban area. The net emigration rate is the difference between the emigration and the immigration rate; and the net out-migration rate is the difference between the out-migration and in-migration rates. The use of the prior year's homicide, wage and unemployment variables takes into account the possibility of reverse causality.

For all of the regressions mentioned above, I include urban area and quarter or year fixed effects for what I consider to be the preferred specifications. The urban area fixed effects control for unobserved differences that are not accounted for by the included variables and that are accountable for permanently higher or lower emigration in a given urban area, such as migration networks and close proximity to the United States. The time fixed effects control for differences in emigration intensities across time that are not accounted for by the included variables, such as a changed demand for Mexican workers in the United States and variations in border enforcement efforts. Under the condition that there are no factors that are related to the unemployment, wage and homicide rate as well as to out-migration and/or emigration that vary across both time and urban areas, and that migration does not affect the economic and violence measures during the same period, the inclusion of these fixed effects allows us to interpret the relationship between the local rates and migration as causal.

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I nevertheless also present regressions without fixed effects so that we can compare the results more easily to the existing studies on the Mexican violence-migration link, which relied on single-year data and could thus not include these fixed effects. However, even in this case, the comparability is limited due to the different geographic and time scope.

There are several limitations to this research approach. First, the economic and security factors are potentially endogenous: Chiapa and Viejo (2012) showed that a municipalities' male to female ratio influences the homicide rate; and migration can affect unemployment and wage rates. Secondly, there are likely factors that have an influence on the emigration probability and are not included in the regressions. As mentioned above, the fixed effects are able to control for time-invariant differences across urban areas, and location-invariant differences across years. In the net out-migration/emigration regressions, this may account for the majority of migrant-determining factors. But there may also be location-specific time-varying factors that affect either the economic or security situation as well as migration. Examples of such factors could for example be regional droughts (although the restriction to urban areas makes this less of an issue), the introduction of local social benefits programs, or time-differing U.S. demand for Mexican workers from particular regions. In the individual-level regressions, the coefficients on the personal characteristics can definitely not be interpreted as causal because many unobserved factors, such as a willingness to take risks, are likely correlated with for example an individual's unemployment as well as with their migration status.

1.3 Data Description and Summary Statistics

1.3.1 Data

The principal datasource used for this paper is the 2005-2011 National Survey of Employment and Occupation [Encuesta Nacional de Empleo y Ocupación, ENOE].[5]

In each of the five quarters that a household participates in this rotating panel survey, the household questionnaire elicits a list of all household members and their basic demographic and educational characteristics. From the second quarter of a household's panel membership onwards, if a household member has left or a new one has joined, there are questions about

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[5]A detailed description of the survey's methodology can be found in Instituto Nacional de Estadística y Geografía (2007).

whether the respective destination or origin of this move was within the state, in a different state, or abroad. The identification of out-migrants and the estimation of migration rates hence rely on the second to fifth wave of a household's inclusion into the panel.

Individuals who are 12 or older are asked questions related to their labor force participation and job characteristics, providing information on the individuals' labor force status, type of employment, duration of unemployment[6] and wage. These answers are also used to estimate the yearly urban area-level unemployment rates as the weighted mean of unemployment among 16-65 year old individuals who are in the labor force and the average hourly wage as the weighted mean of inflation-adjusted positive individual wages.[7] Unlike for the estimation of migration rates, data from all five waves of a household's participation in the ENOE are used in estimating these rates.

One of the ENOE's main advantages is that it is nationally representative. A second advantage is that its sample sizes are very large: Overall, there are nearly 1.25 million different individuals aged 16 and older in the 2005-2011 sample. Thirdly, the survey covers a very interesting period during which multiple parts of the country experienced different economic and security shocks.

The main disadvantage of the datasource is that it is not possible to observe the migration movements of entire households. Secondly, we do not know the exact destination or origin of migrants in the ENOE at a more detailed level than whether the move crossed state or country borders. Thirdly, the survey is not designed for being representative for individual smaller municipalities. Hence, the study needed to be restricted to the largest urban areas.

Information on homicides is obtained from INEGI-provided data on the cause of death of individuals by year and municipality of occurrence (Instituto Nacional de Estadística y Geografía , ated). This data is based on coroners' reports rather than information from criminal charges or sentences. It is hence less likely to be subject to measurement error compared to other

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[6]An individual is defined to be unemployed if they were unemployed in the past week and have actively been looking for a job in the past month. An alternative definition would include people who are out of the labor force but available for work. The correlation between the unemployment rate under the definition used in this paper and this expanded definition is 0.65, and a regression of one on the other has a R^2 of 0.42

[7]Inflation is measured by the general national consumer price index with base prices in 2010 as reported by the Mexican Central Bank (Banco de México, ated).

types of crimes.[89]

The homicide rate is estimated by adding all homicides in the municipalities that belong to a given urban area and multiplying it by 100,000/Estimated population of the urban area. The 2005 and 2010 estimated population of each urban area are the sum of the population of the municipalities as reported in the 2005 Conteo and the 2010 Census, respectively. Population figures for other years are estimated assuming a constant population growth rate.

One complication of this approach of estimating the homicide rate is that some areas of municipalities that belong to urban areas actually fall outside of the agglomeration. Thus, some homicides that are allocated to an urban area may actually have occurred outside of it. On average, however, more than 92% of people who live in a municipality that belongs at least in part to an urban area also live in the respective urban area. To ensure that this discrepancy did not strongly skew the results, I moreover carried out a robustness check that restricted the sample to urban areas in which at least 90 % of the population of incorporated municipalities live on the territory of the respective urban area.

1.3.2 Homicide, Unemployment, Hourly Wage and Migration Rates

In the introduction, it was stated that Mexico experienced drastic increases in the homicide rate and a smaller increase in the unemployment rate at the national level.

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[8]According to a press release by Instituto Nacional de Estadística y Geografía (2012) based on the 2012 National Survey on Victimization and Perception of Public Security [Encuesta Nacional de Victimización y Percepción sobre Seguridad Pública (ENVIPE)], only 12.8 % of crimes are reported and initial investigations are only launched in 8.4% of all cases.

[9]The database on organized crime-related homicides that was published in 2011 and that was for instance employed in Rios (2012) is no longer available on the website of the presidency (Pachico, 2012); and some have argued that it was error-prone (Hope, Alejandro, 2012). Another possible source would have been the data from Executive Secretariate of the National Public Security System [Secretariado Ejecutivo del Sistema Nacional de Séguridad Pública - SESNSP], which relies on police reports. Data that is disaggregated at the municipality level, however, is currently only available from 2011 forward (Secretariado Ejecutivo del Sistema Nacional de Séguridad Pública, ated). Unfortunately, the figures reported by INEGI and by SESNSP do not coincide. Specifically, before 2007, the INEGI-reported homicides exceed those reported in the SESNSP while afterwards, the opposite is true (Sandoval, 2012; Valle-Jones, 2011). This discrepancy stems in particular from the states of Mexico, Chihuahua, Oaxaca, Baja California and Sinaloa (Valle-Jones, 2011). However, at least at the national level, the overall trend is nonetheless comparable.

As can be seen in figure 1.1, there is substantial variation in the average levels and increases in homicide rates. Graphically, the rate appears relatively stable in many of the areas, with select agglomerations experiencing a sharp increase in homicide rates from 2009 onwards. In some cases, these increases were (partially) reversed in 2012. In 15 out of the 32 urban areas, the difference between the minimum and maximum homicide rate per 100,000 people is less than 10. However, in relative terms, this represents at least 70% of the difference and in all but two urban areas, the rate doubled or increased even more. In the most extreme case of Chihuahua, the 2005 homicide rate of 6.2 per 100,000 inhabitants increased by more than 2,000% to 134.2.

In contrast, the pattern for the unemployment rate is much more uniform across the different urban areas across the country. From 2005 to 2008, some of the rates fell slightly and some increased slightly. In 2009, there was a general increase that in many (but not all) areas was slightly reversed over the following years. Hourly wages similarly rose from 2005 to 2007, started declining in 2008. In most cases, real hourly wages were much lower in 2012 than in 2005 and in the urban areas that are exceptions to this, they are about equal.

Turning to migration rates, with the exception of two urban areas (Cancún and Pachuca), the out-migration rate was lower in 2011 than in 2005. In all cases, the international emigration rate was lower in 2011 than in 2005. The overall decrease is larger for emigration than for out-migration rates. The same uniform pattern cannot be observed for immigration rates. In slightly less than half of urban areas, the in-migration rate decreased over the time period while in two-thirds of the cases, the immigration rate decreased.

When putting the information from different measures together, a clear outlier is Tijuana. This urban area has the highest average emigration and immigration rates (at .8 and .3%, respectively), and the second highest out- and in-migration rates. It also has a very high average homicide rate at 38 homicides per 100,000 inhabitants. Alone its average unemployment rate does not appear remarkable at 5%.

Aside from Tijuana, there are a number of urban areas that have the next-highest emigration rate at .5%: León, Chihuahua, Acapulco, Aguascalientes, Morelia, Durango, Cuernavaca, Colima and Tlaxcala. The majority of people who live in these areas live in areas with high homicide rates (defined as 30 or more homicides per 100,000 inhabitants), but there are also areas with low and intermediate homicide rates. The average unemployment rate ranges from 3.2 to 6.1%.

On the other end of the spectrum - urban areas with low emigration

rates of .1 % - we do not find any urban areas with high homicide rates, only with low and medium homicide rates.

To summarize, this section does not provide much evidence to back up the hypothesis that higher unemployment and insecurity leads to more out-migration: Over a period that saw spikes in these rates, out-migration decreased across the board. Areas with high homicide rates tend to have at least intermediate levels of out-migration, but the reverse - that all areas with high emigration and out-migration rates have high homicide rates - is not true.

In the next sub-section, I present summary statistics at the individual and urban area level.

Figure 1.1: Homicides per 100,000 people for the main Mexican urban areas

Source: Author's estimations based on INEGI ((undated, 2005,2010)). Notes: 1) The homicides per urban area are estimated by summing the number of homicides of municipalities that belong to the urban areas and multiplying it by 100,000 /the municipalities' populations.
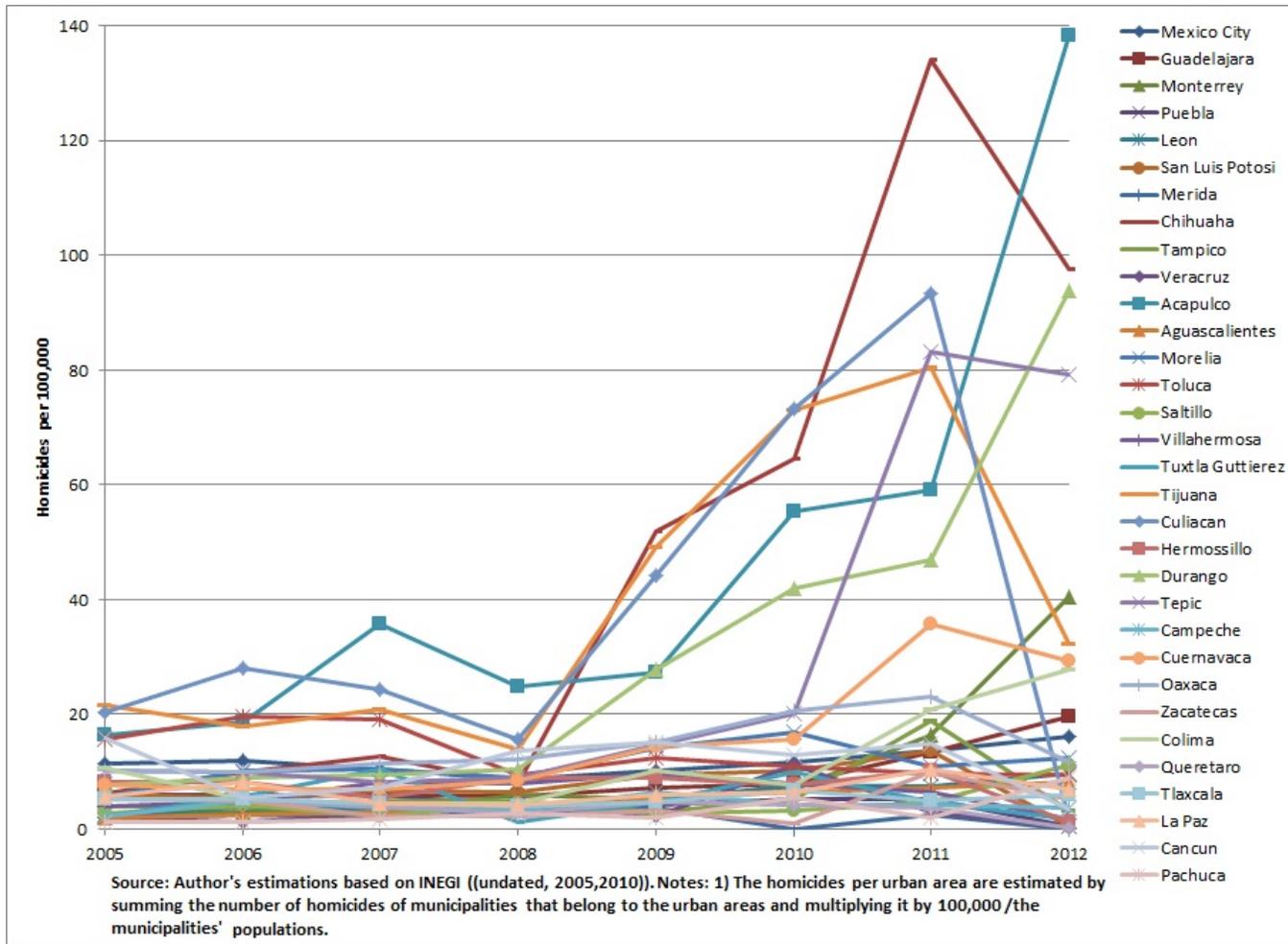
1.3.3 Summary Statistics

Table 1.1 presents summary statistics of individual characteristics by migration status as observed in the 2005-2011 ENOE sample. I restricted the sample to individuals who are 16 years or older for two reasons. The first one is that I assume that most 16-year olds move out of their own agency, while younger children and teenagers do not. Since I am most interested in investigating the impact of the local factors at the individual rather than at the household level, this restriction allows me to do this more clearly. Secondly, it is likely that a higher percentage of children will be moving with their entire household and thus not observed as emigrants in the ENOE. Other studies on Mexican migration, such as by Moraga (2008) and Chiquiar and Hanson (2005) also use the age 16 cut-off (and many others start at age 15 instead).

A non-migrant or intra-state migrant is defined as an individual who does not move outside of their household or state. Internal and international migrants, in contrast, are individuals who are reported to have moved across states or internationally by their remaining household members. There is hence only one observation per person. The information on their labor market and marital status is taken from the first quarter that they are included in the sample.

The weighted sample indicates that around 1.4% of the inhabitants of the urban areas became out-migrants and .4% became emigrants during the time that their household was in the sample. This compares to 1.5% and .8% for the country as a whole, respectively. Migrants are more frequently male, younger, better educated, in the labor force but also unemployed, and if employed on average earn slightly less per hour than non-migrants.

In table 1.2, urban areas are classified by whether they fall in the low (first), middle (second and third) or upper (fourth) quartiles in net out-migration/emigration rates. In the case of the net out-migration rates, the statistically significant differences across the quartiles are that urban areas with middle and high rates of net out-migration have lower unemployment rates than those with low rates; while there are no statistically significant differences in the homicide and average hourly wage rates. In the case of net emigration, the only statistically difference is that urban areas with comparatively high net emigration rates experience more than three times as many homicides than those with low net emigration rates, while there are no statistically significant differences in the unemployment and average hourly wage rates.

Table 1.1: Summary Statistics of the individual characteristics of the ENOE sample of 16 year olds and older in largest urban areas, by migration status

	Non-migrant or intra-state move	**Out-migrant**	**Emigrant**
N	1,227,582	16,324	5,591
Female (%)	55.0 [.1]	44.0 [.8]***	29.6 [1.0]***
Mean age	38.5 [.1]	31.5 [.2]***	32.0 [.4]***
Education (%)			
<Primary	11.8 [.1]	7.5 [.4]***	7.6 [.7]***
Primary	19.4 [.1]	17.0 [.7]***	19.4 [1.0]
Lower Secondary	36.2 [.3]	33.3 [.8]***	35.4 [1.0]***
Upper Secondary	11.2 [.1]	14 [.6]***	14.4 [1.0]***
Post-Secondary	21.2 [.3]	27.9 [.8]***	23.1 [1.0]***
Labor Force Characteristics (16-65 year olds only)			
In labor force (%)	66.8 [.1]	72.8 [.7]***	73.5 [1.0]***
Unemployed (%)	5.6 [.1]	10.5 [.6]***	12.0 [1.0]***
Hourly income (Peso)	36.7 [.3]	33.5 [1.0]***	32.4 [2.0]***

Source: Authors' calculations based on the 2005-2012 ENOE (INEGI, undated).

Notes: 1) ***/**/* indicates that the difference to the non-migrant group for the relevant variable is statistically significant at the 1/5/10% level. 2) The estimates rely on the answers given by each included individual the first time they are interviewed in the survey. Each individual is only counted once. 3) A non-migrant or intra-state migrant is defined as an individual who is not observed to move across state boundaries during their household's inclusion in the panel. An out-migrant/emigrant is defined as an individual who moves across state or national boundaries. 4) The hourly wage is restricted to positive wages, and is inflation-adjusted to 2010 prices by using the consumer-price index reported by BANXICO (undated). 5) The estimates are probability weighted. Standard errors are robust and account for clustering at the level of the primary sampling units.

Table 1.2: Average urban area characteristics by net out-migration and emigration quartiles over the 2005-2011 period

| | Out-migration/emigration rate quartile | | |
	1st	2nd & 3rd	4th
Net out-migration rate			
Labor Force participation rate	66.0 [.8]	66.7 [.5]	67.5 [1.0]
Unemployment rate	5.2 [.3]	4.3 [.3]**	4.6 [.3]**
Mean hourly wage	36.2 [1.3]	36 [1.3]	38.3 [1.6]
Homicide rate (per 100,000)	13.0 [5.7]	14.1 [3.1]	13.2 [5.0]
Net emigration rate			
Labor force participation rate	67.2 [1.1]	67.0 [.4]	65.7 [.8]
Unemployment rate	4.5 [.4]	4.8 [.2]	4.5 [.3]
Mean hourly wage	37.8 [1.9]	37.2 [1.0]	34.4 [1.8]
Homicide rate	6.9 [1.3]	10.6 [5.9]	27.0 [5.9]***

Source: Author's calculations based on the 2005-2012 ENOE (INEGI, undated).

Notes: 1) ***/**/* indicates that the difference to the 1st quartile group is statistically significant at the 1/5/10% level. 2) The average cut-off values for being in the first quartile of the mean out-migration/emigration rate are .78 and .25%, respectively. The average cut-off values for being in the fourth quartile of the mean out-migration/emigration rate are 1.18 and .44%, respectively. 3) A non-migrant or intra-state migrant is defined as an individual who is not observed to move across state boundaries during their household's inclusion in the panel. An out-migrant/emigrant is defined as an individual who moves across state or national boundaries. 4) The hourly wage is restricted to positive wages, and is inflation-adjusted to 2010 prices by using the consumer-price index reported by BANXICO (undated). 5) The estimates are probability weighted. Standard errors are robust and account for clustering at the level of the primary sampling units.

1.4 Empirical Analysis

If there is a relationship between homicide and/or unemployment and wage rates and migration, we would expect to be able to observe this at both the urban area and individual level: Outmigration rates would be expected to be higher in urban areas with high crime and unemployment and low wages, and provided that this is not merely a function of a different socio-demographic composition of the urban area's populations, this would be mirrored in individual-level regressions.

First, I am presenting results from the urban-area level regressions in table 1.3. These focus on net out-migration and international emigration rates and thus provide us with evidence of how unemployment and homicide rates affect the overall attractiveness of urban areas in the sense of not only how they promote or discourage out-migration, but also in-migration and immigration.[10]

The regression results, however, do not suggest that there is a strong relationship between the selected local factors and net emigration.

The inclusion of fixed effects vastly increases the explanatory power of these regressions, raising the R^2 from around .08 to .53 in the net out-migration and from .02 to .37 in the net emigration regressions. When considering the evolution of the urban area's migration rate across time, this is not unexpected: The relative position of urban areas in terms of whether they have comparatively high or low in-migration and out-migration is relatively stable over this period. Emigration also behaved in almost the same way, but immigration followed a much more random pattern. We can conclude that homicides and the unemployment and wage rate are far from being able to account for variations in out-migration rates and emigration rates by themselves. Rather, other urban area-specific factors that are constant over time as well as cross-country time trends in net migration rates account for much more of the variation.

Contrary to what would have been expected based on the summary statistics, the coefficients on the lagged homicide rate are statistically insignificant in almost all specifications for net out-migration and emigration alike. In most of the regressions, the estimated marginal effects are moreover small, with an increase in the homicide rate by 100 per 100,000 people

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[10]In table 1.11 in the appendix, I also present regression results in which the out-migration and emigration rates, rather than the equivalent net rates, are the dependent variables. In these regressions, the estimated coefficients are not statistically significant, and their signs are often not opposite towards each other in the in-migration-outmigration and immigration-emigration pairs.

only being expected to change the net out-migration rate by .02 percentage points; although according to some specifications, it would be expected to decrease net emigration and increase net out-migration by .1 percentage points.

Secondly, a one percentage point higher unemployment rate is associated with a .02-.05 percentage point lower net out-migration rate. This result is in line with the summary statistics presented in table 1.2, since the unemployment rate in cities with middle and high out-migration rates is on average lower. In contrast, the coefficients on the lagged unemployment rate are not statistically significant in the net emigration regressions and the estimated marginal effects are small (around .01).

Thirdly, a one peso increase in the average hourly wage is associated with an around .015 percentage point higher out-migration rate before fixed effects are introduced; but once they are, the estimated coefficients become negative and are no longer statistically significant; which indicates that the effect was driven previously by certain urban areas and/or years with higher average wages having higher net emigration rates as well. In the emigration rate regressions, none of the estimated coefficients are statistically significant, and they turn from being positive at around .01 to negative at around .01 when the fixed effects are included.

It is possible that there is a non-linear link between the variables of interest and migration. I investigated this by substituting indicator variables for different percentiles of homicide rates for the linear homicide rate variable (see table 1.10).[11] In most regressions, there were no statistically significant results. In the net international migration regressions with fixed effects, however, the coefficients on the fourth quartile are equal to .05-.06 and statistically significant. This difference is about one fifth of the mean international emigration rate. This supports the theory that emigration in response to violence only occurs if a high threshold is reached.

To conclude, at least at the urban area level, we cannot discern a strong relationship between all of the variables of interest and migration. Nonetheless, higher unemployment is associated with low net out-migration, and very high homicide rates may be associated with higher net emigration.

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[11]In particular, in some specifications I included indicator variables for the first, third and fourth quartile (with the second quartile as the omitted category), in an alternative one just an indicator for the fourth quartile, and in a final specification an indicator for the top 10 percentile.

Table 1.3: Urban Area Level Regressions based on the 2005-2011 ENOE

	Yearly Net Outmigration Rate of the Urban Area							
Lagged homicide rate	.0002 [.000]***			.001 [.001]	.0002 [.001]**			-.002 [.001]
Lagged unemployment rate		-.048 [.018]***		-.05 [.02]***		-.04 [.02]**		-.024 [.03]
Lagged hourly wage rate			.016 [.004]***	.014 [.004]***			-.006 (.014)	-.015 (.016)
Year fixed effects					x	x	x	x
Urban Area fixed effects					x	x	x	x
Adj. R-Squared	0.0002	0.07	0.08	0.14	0.52	0.52	0.55	0.56
	Yearly Net Emigration Rate of the Urban Area							
Lagged homicide rate	-.0002 [.0007]			.000 [.001]	-.001 [.001]			-.001 [.001]
Lagged Unemployment Rate		-.01 [.01]		-.014 [.01]		-.014 [.01]		-.022 [.02]
Lagged hourly wage rate			-.0001 [.003]	-.001 [.003]			.013 [.011]	.013 [.011]
Year Fixed Effects					x	x	x	x
Urban Area Fixed Effects					x	x	x	x
Adj. R-Squared	0.001	0.02	0.01	0.02	0.36	0.36	0.44	0.45

Source: Author's calculations based on the 2005-2012 ENOE (INEGI, undated).

Notes: 1) ***/**/*: $p < 0.01/0.05/0.1$. 2) Robust standard errors are reported in brackets; and the regression is weighted by probability weights equal to the urban areas' respective populations. The number of observations is equal to 192. 3) Out-migration rate=Outmigration rate - In-migration rate. Net emigration rate = Emigration rate - immigration rate. 4) The homicide rate is reported as the number of homicides per 100,000 people.

Next, I present the results from individual-level out-migration regressions.

The marginal effects of the personal control variables are not shown in tables 1.4 and 1.5 for space considerations. I found that women are less likely to migrate (the marginal effects[12] in the out-migration and emigration regressions are equal to around -.4 to -.3, which is equal to around one half and 1.5 times the mean frequency of any out-migration and emigration movement) and that there is an inverse u-shaped relationship between migration and age. Relative to people with no completed education, people with primary education are no more likely to move, as the estimated marginal effects of these variables are statistically insignificant and very small at .009 and .016. In contrast, people with lower secondary education are less likely to move (the estimated marginal effects are around -.2 and -.04, respectively), and those with upper secondary education and post-secondary education are more likely to move internally (the estimated marginal effect at the mean are equal to .1 and .3) but not internationally (the estimated marginal effect at the mean are equal to -.008, and not statistically significant, and -.1).

Turning to the key explanatory variables, we can first see that unemployed people are more likely to migrate internally and internationally. The estimated marginal effects at the mean are equal to 7-12 and 2.4-2.7, respectively. The unemployment rate appears to have a negative relationship with out-migration when fixed effects are not included (with marginal effects ranging from -2 to -3); but once they are, the estimated marginal effects become positive at 5-8, indicating that if the unemployment rate rises more in a given urban area, more people will on average move to another state. In the case of emigration, in contrast, the relationship also appears to be negative before the fixed effects are included, with large estimated marginal effects at around -7; but once they are, the estimated marginal effects are no longer statistically significant and relatively small at .04-.3. This is easily explainable by the fact that years in which the emigration was lower were also years with elevated unemployment rate. By failing to account for the time trends, therefore, it appeared as if unemployment and migration were negatively related.

With the inclusion of an interaction variable between being unemployed and the unemployment rate, the effect of a higher unemployment rate on out-migration becomes even larger for people who are *not* unemployed. In

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[12]The marginal effects are equal to the estimated change in the probability of out-migration associated with a one-unit increase in the explanatory variable if it is continuous, evaluated at the mean, or the difference in the probability of out-migration between people in the category relative to the reference category for indicator variables.

contrast, the unemployed are less likely to out-migrate in situations where the unemployment rate is higher than in situations where it is lower - the estimated marginal effect of this interaction is very large at around -10. In the emigration regressions, the estimated marginal effect of the interaction is positive and relatively large at .8 once fixed effects are included, but not statistically significant.

Neither the individual hourly wage nor the mean hourly wage of the urban area appear to have an influence on out-migration and emigration: Even though the marginal effects are in some cases statistically significant, they are very small (for example, a one peso increase in the average hourly wage is only associated with a .001-.003 higher out-migration and emigration probability, respectively).

The homicide rate appears to have a negative relationship with out-migration, but the effect only emerges once the fixed effects are included. In that case, the marginal effects at the mean are estimated to be equal to -.002, so that a drastic increase in the homicide rate of 100 is only associated with an increase of out-migration equal to around one-tenth of the mean out-migration probability. For emigration, the estimated marginal effects are equally small - the estimated marginal effect that is largest in absolute terms is -.003, with the other ones being closer to 0. This is at odds with the table 1.2 summary statistics in the case of international immigration, since the homicide rate was nearly four times as high in urban areas with above-average emigration rates in a given year than in urban areas with the lowest emigration rates, and still more than twice as high as in urban areas with mid-levels of emigration. Part of the difference in the results is likely driven by urban areas such as Tijuana that consistently had above-average emigration and homicide rates.

The interactions between the unemployment rate and education reveal that a higher unemployment rate does not have a different relationship with out-migration for different educational groups. However, the estimated effects of the primary, lower and upper secondary education interactions are negative and relatively large at -2 to -3; while the effect of the post-secondary interaction is positive but smaller at .9. In contrast, among international migrants, individuals with post-secondary education are on average much more likely to emigrate once the unemployment rate rises - the estimated marginal effect is equal to 7 and statistically significant. One possible explanation is that people with this education level have the means to move and also may benefit more from moving abroad when local economic circumstances are tough. The interactions between the other education levels and emigration are also positive, but not statistically significant and smaller

(but still not small) at around 1.

The interactions between the homicide rate and education levels have small and negative marginal effects in the out-migration regression (ranging from -.001 to -.01), which are statistically significant for the upper and post-secondary categories. In the emigration regression, in contrast, none of the interactions' marginal effects are statistically significant and are relatively small at .002. This result thus does not lend credence to the notion that the highly educated are particularly encouraged to move to a safer area or abroad.

Table 1.4: Marginal Effects of Logit Regressions of Outmigrant Status based on the 2005-2011 ENOE

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Unemployed	.0891***	.0562*	.7204***	.7249***	1.2295***	1.2570***	1.2472***
	[.0399]	[.0401]	[.0378]	[.0379]	[.1345]	[.1319]	[.1322]
In labor force	.5854**	.6231***	-.0516**	-.0512**	-.0516**	-.0512**	-.0508**
	[.0282]	[.0284]	[.0239]	[.0239]	[.0239]	[.0239]	[.0239]
Unemploym. Rate	-4.5718***	4.1281***	-2.9567***	5.8383***	-2.1102***	6.6965***	7.5533***
	[.4454]	[1.6842]	[.7067]	[1.6489]	[.7386]	[1.6610]	[2.9026]
x Unemployed					-10.302***	-10.752***	-10.553***
					[2.6432]	[2.5864]	[2.5929]
x Primary							-1.9734
							[2.9811]
x Lower Secondary							-3.5031
							[2.7022]
x Upper Secondary							-3.0247
							[3.0051]
x Post-Secondary							.9040
							[2.7258]
Homicide Rate			-.0003	-.0023***	-.0003	-.0024***	.0005
			[.0005]	[.0008]	[.0005]	[.0008]	[.0020]
x Primary							-.0014
							[.0022]
x Lower Secondary							-.0018
							[.0020]
x Upper Secondary							-.0073***
							[.0023]
x Post-Secondary							-.0083***
							[.0021]
Hourly wages	.0000	.0000					
	[.0003]	[.0000]					
Average hourly wage rate	.0054**	-.0021					
	[.0021]	[.0085]					
Quarter & Urban Area FE		x		x		x	x
R-Squared	0.067	0.093	0.067	0.0831	0.0671	0.0832	0.0835
N	1234701	1231244	1234701	1231244	1234701	1231244	1231244

Source: Author's calculations based on the 2005-2012 ENOE (INEGI, undated).
Notes: 1) ***/**/*: Statistically significant at the 0.01/0.05/0.1 level. 2) The sample consists of individuals aged 16 and older. There is one observation per person. An individual is defined as an out-migrant if their household reports that they moved to another Mexican state, and as an emigrant if they are reported to move abroad. 3) The omitted educational category is less than completed primary education, and the omitted work characteristic is being out of the labor force. 4) The marginal effects estimate the change in the probability of out-migration, measured in percentage points, due to a one-unit change of the continuous variables (evaluated at the mean) or of the indicator variable relative to the reference category.

Table 1.5: Marginal Effects of Logit Regressions of Emigration Status based on the 2005-2011 ENOE

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Unemployed	.0113***	.0088	.2694***	.2731***	2.4074***	.2326***	.2353***
	[.0231]	[.0232]	[.0222]	[.0222]	[.0789]	[.0790]	[.0791]
In labor force	.1990***	.1978***	-.0599***	-.0681***	-.0599**	-.0681***	-.0690***
	[.0166]	[.0168]	[.0145]	[.0145]	[.0145]	[.0145]	[.0145]
Unemploym. Rate	-7.208***	-.5580	-6.676***	.2826	-6.722***	.2097	-1.930
	[.4406]	[1.0266]	[.4378]	[1.0391]	[.4549]	[1.0482]	[1.8223]
x Unemployed					.5934	.8418	.8074
					[1.5670]	[1.5678]	[1.5712]
x Primary							.7227
							[1.8000]
x Lower Secondary							1.3803
							[1.6740]
x Upper Secondary							.9875
							[1.8900]
x Post-Secondary							7.3054***
							[1.7965]
Homicide Rate			.0006**	-.0004	.0006**	-.0004	-.0026*
			[.0003]	[.0005]	[.0003]	[.0005]	[.0006]
x Primary							.0020
							[.0015]
x Lower Secondary							.0002
							[.0014]
x Upper Secondary							.00018
							[.0015]
x Post-Secondary							.0006
							[.0015]
Hourly wages	.0000	-.0006**					
	[.0000]	[.0003]					
Average hourly wage rate	.0025**	-.0068					
	[.0012]	[.0057]					
Quarter & Urban Area FE		x		x		x	x
R-Squared	0.0446	0.084	0.0447	0.073	0.0447	0.073	0.0739
N	1234467	1231011	1234467	1231011	1234467	1231011	1231011

Source: Author's calculations based on the 2005-2012 ENOE (INEGI, undated). Notes: 1) ***/**/*: Statistically significant at the 0.01/0.05/0.1 level. 2) The sample consists of individuals aged 16 and older. There is one observation per person. An individual is defined as an international emigrant if their household reports that they moved abroad. 3) The omitted educational category is less than completed primary education, and the omitted work characteristic is being out of the labor force. 4) The marginal effects estimate the change in the probability of emigration, measured in percentage points, due to a one-unit change of the continuous variables (evaluated at the mean) or of the indicator variable relative to the reference category.

Besides unemployment status and rate and the wage rate, other economic factors clearly may also have a relationship with emigration decisions. Results from these additional regressions are presented in tables 1.6 and 1.7.

Firstly, the duration that someone has been unemployed may also influence whether they wish to and have the means to move. Before fixed effects are introduced, it appears that those with medium-length unemployment durations (1-3 and 4-12 months) are less like to move to another state than those who just recently started to look for a job - the estimated marginal effect is around -.3 - while the marginal effect on the unemployment duration of a year or longer is only equal to -.01 and not statistically significant. Once the fixed effects are included, the estimated marginal effects are of a similar size, but are no longer statistically significant. There is no such statistically significant relationship between the unemployment duration and emigration before fixed effects are included. In contrast, the introduction of the fixed effects generates the result that people who indicated that they had been looking for a job for more than 4 but less than 12 months at the time of their first interview were less likely to move abroad at some point (the estimated marginal effect is -.12, which negates about one half of the 'positive' effect of unemployment on emigration, and it is significant at the 10% level). When additional interactions between the unemployment duration and the local unemployment rate are included, their marginal effects are similarly not statistically significant in the out-migration regression, even though they are very large at 6 to 28. In the emigration regression, the marginal effect of the interaction between being a long-term unemployed person and the unemployment rate is very large at 28, but it is relatively imprecisely estimated and is barely statistically significant at the 10% level.

Another possibility is that the relevant unemployment rate is the mean unemployment among one's educational group. I therefore estimated separate unemployment rates for individuals who have less than a high school education or at least a high school education. In regressions in which the unemployment rate (and its interactions) are replaced with the education-specific unemployment rate, the results are however very similar compared to the regressions with the not education-specific unemployment rate.

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Table 1.6: Marginal effects of Logit Regressions of Migration on Selected Local Economic Characteristics

	Outmigration				Emigration	
Unemployed	.7483***	.7515***	1.3333***	.2844***	.2933***	.2531***
	[.0401]	[.0402]	[.1399]	[.0236]	[.0237]	[.0839]
Unemployment Rate	-2.9386***	5.8462***	6.7484***	-6.6851***	.2868	.2111
	[.7113]	[1.6488]	[1.6613]	[.4378]	[1.0390]	[1.0486]
Unemployed x Unemployment Rate			-11.7177***			.8283
			[2.7380]			[1.6567]
Unemployment Duration 1-3 months	-.2715**	-.1847	-.4895	-.0992	-.1197*	-.1753
	[.1274]	[.1285]	[.4587]	[.0721]	[.0726]	[.2734]
x Unemployment Rate			5.9191			1.2161
			[9.4698]			[5.5638]
Unemployment Duration 4-12 months	-.3261	-.2685	-1.0067	-.1115	-.1587	.4969
	[.1863]	[.1873]	[.7234]	[.1061]	[.1066]	[.4463]
x Unemployment Rate			14.7371			-1.1545
			[13.7149]			[9.8231]
Unemployment Duration 1 year +	-.0131	.0660	1.3775	-.0658	-.1164	-1.6652
	[.4399]	[.4413]	[1.5990]	[.2754]	[.2762]	[1.1075]
x Unemployment Rate			-28.3601			27.7442*
			[34.4041]			[16.6785]
Quarter and Urban Area Fixed Effects		x	x		x	x

Source: Author's estimations based on the 2005-2011 ENOE (INEGI, undated).

Notes: 1) ***/**/*: Statistically significant at the 0.01/0.05/0.1 level. 2) The sample consists of individuals aged 16 and older. There is one observation per person. An individual is defined as an international emigrant if their household reports that they moved abroad. 3) Additional control variables in the regressions include age, age squared, sex, education, marital status, position in household, number of children and homicide rate. 4) The omitted educational category is less than completed primary education, and the omitted work characteristic is being out of the labor force. The education-specific unemployment rates are for lower secondary education or less, or upper secondary education or more. 5) The marginal effects estimate the change in the probability of out-migration/emigration, measured in percentage points, due to a one-unit change of the continuous variables (evaluated at the mean) or of the indicator variable relative to the reference category.

Table 1.7: Marginal effects of Logit Regressions of Migration on Selected Local Economic Characteristics

	Outmigration			Emigration		
Unemployed	.7216***	.7268***	1.1297***	.2668***	.2762***	.2856***
	[.0378]	[.0379]	[.1003]	[.0222]	[.0223]	[.0588]
Education-Specific Unemployment Rate	-7.5710***	4.1614*	18.3763***	-14.1069***	-6.6892***	-5.7907*
	[1.6489]	[2.5030]	[5.1181]	[1.0194]	[1.6681]	[3.3044]
x Unemployed			-23.6624***			-.5456
			[5.5732]			[3.206]
x Primary Education			-9.9602*			-2.4186
			[5.8852]			[3.6285]
x Lower Secondary Education			-18.3545***			-1.9218
			[5.3395]			[3.3503]
x Upper Secondary Education			-13.8550*			-3.5565
			[7.9274]			[5.1179]
x Post-secondary Education			-10.8547			9.1713*
			[6.8313]			[4.7842]
Year and Urban Area Fixed Effects		x	x		x	x

Source: Author's estimations based on the 2005-2011 ENOE (INEGI, undated).
Notes: 1) ***/**/*: Statistically significant at the 0.01/0.05/0.1 level. 2) The sample consists of individuals aged 16 and older. There is one observation per person. An individual is defined as an international emigrant if their household reports that they moved abroad. 3) Additional control variables in the regressions include age, age squared, sex, education, marital status, position in household, number of children and homicide rate. 4) The omitted educational category is less than completed primary education, and the omitted work characteristic is being out of the labor force. The education-specific unemployment rates are for lower secondary education or less, or upper secondary education or more. 5) The marginal effects estimate the change in the probability of out-migration, measured in percentage points, due to a one-unit change of the continuous variables (evaluated at the mean) or of the indicator variable relative to the reference category.

1.5 Robustness Checks

1.5.1 Quarterly Regressions

The results of these regressions (that contain fixed effects) are largely in accordance with the results from the basic regressions: An above-average unemployment rate in a given urban area is associated with a higher level of out-migration but not emigration; and once an interaction variable with the individual unemployment status is introduced, the estimated marginal effect in the out-migration regression is equal to -3.9 (so that for unemployed people, a higher unemployment rate is associated with less out-migration compared to a lower unemployment rate). Again, this is not the case for international emigration. The homicide rate has a statistically significant relationship with out-migration, but the marginal effect is low at -.0009 so that the practical importance is very small. There is no such relationship with emigration (see table 1.8).

1.5.2 Influence of Violence

In the initial regressions, the local violence measure is the linear homicide rate. Just as in the urban area-level regression, it is possible that the actual relationship is non-linear. To test this, I ran various regressions with different indicator variables (in one form, there were indicators for the 2nd, 3rd and 4th quartile of homicide rates; in the others for the 2nd, 3rd, 75th-90th and 90th-100th percentile), and with the linear as well as a squared homicide rate term. Once the fixed effects are included, however, the estimated logit coefficients are not statistically significant in the international emigration regression (see table 1.8).

1.5.3 Influence of Local Economic Factors

In the main section, I investigated whether the urban area's unemployment rate is related to outmigration. However, it is possible that individuals do not (only) take into account the level of the unemployment rate, but also its growth rate or its relative level compared to the urban area average.

First, I tested whether the unemployment growth rate and the growth of the average wage rate is associated with outmigration (see table 1.9). This specification also included the unemployment rate level, as well as the average wage rate. The unemployment rate continues to be positively associated with out-migration, while it has no statistically significant association with emigration. The average wage and the wage growth rate also are

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not correlated with outmigration. Secondly, I tested whether the relative unemployment and wage rates (as measured by the urban area's unemployment divided by the average of all urban areas' unemployment rates, and respectively for average wages) was associated with outmigration. It once again reveals a similar pattern to the results of the main regressions: A relatively higher unemployment rate is associated with a higher probability of out-migration but not emigration, and the interaction between the unemployment growth rate and the individual's unemployment status is again associated with a lower probability of international migration. The one difference is that in the international migration regression, the coefficient on this interaction is now statistically significant at the 10% level, with estimated marginal effects of .19. For the first time, this regression thus shows that in situations where the unemployment rate is relatively high, unemployed people are slightly more likely to move abroad. In general, it is not surprising that the results of these regressions are similar to the ones in the main section, since the inclusion of the urban area and quarter fixed effects likely already accounts for much of the variation in relative unemployment rates. The relative wage rates do not have an influence, except a small negative association (a one peso increase of the wage rate is associated with a -.4 percentage points lower emigration rate that is statistically significant at the 10% level) in the international migration regression that also includes the interaction term between unemployment status and relative unemployment rates.

1.5.4   Sample Restrictions

As mentioned in the data description section, the borders of municipalities that make up an urban do not always fit entirely within that urban area, so that parts of the municipalities will be outside of them (see table 1.9). As a result, the estimated homicide rates that are based on municipal homicide reports does not in fact correspond completely to the urban areas' actual homicide rate. To investigate how much this is an actual issue, I re-estimated the basic regressions using a sample of urban areas in which at least 90% of the inhabitants of constituting municipalities actually live in the urban area.[13]

   The results in these regressions are again comparable to those found for the entire sample: There continues to be no statistically significant relation-

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[13]These are Mexico City, Guadalajara, Monterrey, Puebla, San Luis Potosi, Merida, Chihuahua, Veracruz, Morelia, Saltillo, Tuxtla Gutierrez, Tijuana, Oaxaca, Colima, Cancun and Pachuca.

ship between the main effect of the homicide rate and both out-migration and emigration, while none of the homicide-related coefficients in the emigration regressions is statistically significant. Some of the unemployment-related variable coefficients change, most drastically the main effect in the out-migration regression which is no longer statistically significant; but most of the results stay the same.

Table 1.8: Marginal effects of Logit Regressions of Out-migration and Emigration on Selected Local Characteristics

	Quarterly Regressions		Homicide Categories	
	Internal	Internat.	Internal	Internat.
Unemployed	.4861***	.1291***	1.2535***	.2305***
	[.0514]***	[.0309]	[.1314]	[.0787]
Unemployment Rate	2.2994***	.3486	6.7376***	.3375
	[.6621]	[.4257]	[1.7145]	[1.0962]
Unemployment Rate x Unemployed	-3.9376***	-.2738		
	[1.0123]	[.6265]		
Homicide Rate	-.0009***	-.00002		
	[-.0003]	[.0002]		
Homicide Rate in 2nd quartile			.0491**	.0009
			[.0336]	[.0207]
Homicide Rate in 3rd quartile			.0245**	.0059
			[.0411]	[.0272]
Homicide Rate in 4th quartile			.0344***	.0149
			[.0504]	[.0358]
Pseudo R^2	0.08	0.07	0.08	0.07
N	2521946	2521532	1231244	1231011

Source: Author's estimates based on the 2005-2012 ENOE (INEGI, undated).
Notes: 1) The other control variables are age, age squared, sex, education categories, marital status, status in household, number of children, being in the labor force and urban area and time (year or quarter, as appropriate) fixed effects. 2) In the quarterly regressions, the person-level variables including the unemployment status and the unemployment and labor force rate are from the prior quarter. 3) The relative unemployment and wage rates are equal to the urban area's unemployment/wage rate divided by the weighted average of these rates for all urban areas in a given year. 4) The omitted educational category is less than completed primary education, and the omitted work characteristic is being out of the labor force. 5) The marginal effects estimate the change in the probability of out-migration/emigration, measured in percentage points, due to a one-unit change of the continuous variables (evaluated at the mean) or of the indicator variable relative to the reference category.

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Table 1.9: Marginal Effects of Logit Regressions of Out-migration and Emigration on Selected Local Characteristics

	Relative Economic Situation		Growth		Restricted Sample	
	Internal	Internat.	Internal	Internat.	Internal	Internat.
Unemployed	1.3218***	.1025	1.2641***	.2194***	1.2286***	.1195***
	[.1643]	[.1016]	[.1540]		[.1802]	[.1029]
Unemployment Rate			5.3458**	.1400	2.7891	.8454
			[2.1290]	[.5000]	[2.3321]	[1.3977]
Unemployment Rate x Unemployed			-9.866***	.6263	-10.5062***	2.5660
			[2.9326]	[1.6369]	[3.4646]	[1.9421]
Homicide Rate	-.0024***	-.0003	-.0032***	-.0007	.0014	-.0007
	[.0008]	[.0005]	[.0009]	[.0012]	[.0016]	[.0007]
Relative unemployment rate	.2770**	-.0550				
	[.1012]	[.0632]				
Relative monthly wage rate	-.3770	-.3952*				
	[.3164]	[.2125]				
Relative unemployment rate x unemployed	-.6590***	.1846*				
Relative unemployment rate x unemployed	[.1723]	[.1065]*				
Unemployment rate growth			.1505	.2347***		
Unemployment rate growth			[.0936]	[.0351]***		
Pseudo R2	0.08	0.07	0.07	0.07	0.08	0.07
N	1231244	1231011	973058	969442	65888	658749

Source: Author's estimates based on the 2005-2012 ENOE (INEGI, undated).
Notes: 1) The other control variables are age, age squared, sex, education categories, marital status, status in household, number of children, being in the labor force and urban area and time (year or quarter) fixed effects. 2) In the quarterly regressions, the person-level variables including the unemployment status and the unemployment and labor force rate are from the prior quarter. 3) The relative unemployment and wage rates are equal to the urban area's unemployment/wage rate divided by the weighted average of these rates for all urban areas in a given year. 4) The marginal effects estimate the change in the probability of out-migration/emigration, measured in percentage points, due to a one-unit change of the continuous variables (evaluated at the mean) or of the indicator variable relative to the reference category.

1.6 Conclusion

This study has several implications regarding the relationship between out-migration and emigration and local economic and security factors in Mexico.

The first finding is that a one percentage point higher unemployment rate is associated with a seven percentage points higher out-migration likelihood, while the relationship with emigration is not statistically significant. When interactions between the individual's unemployment status and the local unemployment rate are introduced, I found that while unemployed people are on average around 1.2 percentage points more likely to move to another state and .2 percentage points more likely to emigrate, a higher unemployment rate is associated with lower out-migration and emigration for this group.

Prior research on internal and international migration in Mexico in principal focused on other economic indicators than the unemployment rate and direct comparisons are therefore not possible. Internationally, however, the lack of a relationship between the local unemployment rate and emigration is not unprecedented in the empirical literature (c.f. Greenwood (2014)). A possible explanation for the differing results regarding the relationship between the unemployment rate and internal and international migration on the one hand and for unemployed versus not unemployed persons are liquidity constraints (Fidrmuc, 2004): Increased unemployment rates may be associated with an increased wish to move to an economically more dynamic area, but individuals may only be able to afford a move within the country and not abroad; and unemployed people in economically depressed areas may not be able to afford to move at all. This explanation is further backed up by the result that the marginal effect of the interaction between a post-secondary education and the local unemployment rate is positive and large at 7 percentage points – the highly educated are less likely to be subject to the liquidity constraints due to their higher wages. Aside from this explanation, it can also not be dismissed that the lack of a relationship between the unemployment rate and emigration may be a reflection of this particular time period: During years that were marked by higher unemployment in Mexico, unemployment was also high in the United States (United States Department of Labor, 2012) and the number of deportations was increasing (U.S. Immigration and Customs Enforcement, 2014). The potentially decreased attractiveness of the US as a migrant destination may therefore have contributed to this result.

From a policy perspective, the positive relationship between the unemployment rate and out-migration can be viewed as positive, since it may

indicate that the population re-allocates itself across the country in response to economic shocks and that unemployment in certain regions may thus be kept lower than it would otherwise have been. However, before this conclusion can be drawn, further research in particular on the relationship between the unemployment rate and in-migration and on the employment prospects of internal migrants is needed.

The second finding is that the average wage rate does not have a significant relationship with either out-migration or emigration. This is somewhat at odds with the result presented Aroca Gonzalez and Maloney (2005), but they investigated the importance of a state's average wages relative to the destination's wages. As argued above, the reason for a lack of a significant relationship might be the existence of liquidity constraints.

The third finding is that there is no statistically significant relationship between the local homicide rate and out-migration or emigration. A similar result was found by Melander and Öberg (2007) in a cross-country study, Alvarado and Massey (2010) for Mexico, Costa Rica and Guatemala (but not Nicaragua), and Arceo-Gómez (2012) for Mexico. Opposing results are found by Bariagaber (1997) for Ethiopia, Lundquist and Massey (2005) for Nicaragua, Stanley (1987) for El Salvador, Schultz (1971), Grun (2009), and Mesnard (2009) for Colombia, Morrison (1993) and Morrison and May (1994) for Guatemala, and Meza-González and Feil (2012) and Rios (2012) for Mexico.

What explains these different results?

Firstly, the context may matter greatly. For example, it may matter whether there is other political and social upheaval at the same time as rising violence (Alvarado and Massey, 2010), how widespread the violence is and whether a country is a democracy (Melander and Öberg, 2007), and whether some of the violence some cases might have been perpetrated with the express purpose of creating displacement (c.f. Morrison and May (1994)). The situation in Mexico may thus be one where there are none of the additional 'facilitating' factors for violence-causing migration.

However, even in the Mexican context, Meza-González and Feil (2012) and Rios (2012) came to different conclusions. There are several possible explanations for this: Firstly, their studies cover different areas than the largest urban areas that I studied. Secondly, unlike their studies, I was not able to study population movements of entire households. Since people who flee from violence may frequently move with their entire household, the effect may be under-estimated. However, an analysis of household drop-outs (i.e. of households who are not in the panel until the fifth quarter) reveals that homicide rates and drop-outs are in fact negatively related. While this does

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not prove that there would be no effect of the homicide rate on the migration if the movements of entire households could be studied as well, this result nonetheless makes it less likely. Thirdly, prior to the introduction of fixed effects, I also found a positive relationship between the homicide rate and migration in certain specifications. Given that the prior studies are not able to include fixed effects because they were based on single-year data, there may thus appeared to have been a positive relationship when in fact, it just happens to be the case that municipalities with generally higher levels of emigration have higher levels of violence in a particular year. It may even be speculated whether areas with large migration flows have attributes that make them attractive for organized crime and correspondingly high levels of violence, but more research would be needed to study this possibility.

Future research should address some of the above-raised limitations. Among these, understanding the role of economic and security factors across the entire country rather than just for urban areas would provide a more complete picture; especially as past research has shown that the links between economic factors and migration is different in rural than in urban settings (Orrenius and Zavodny, 2005). Secondly, studying migration at the household rather than the individual level would likely be very beneficial in this particular context, since it is possible that people who flee from high levels of violence move with their entire household.

1.A   Additional tables

Table 1.10: Urban Area Level Regressions based on the 2005-2011 ENOE

	Yearly Net Internal Outmigration Rate of the Urban Area					
Homicide rate in 1st quartile	-.12 [.07]*	-.10 [.06]				
Homicide rate in 3rd quartile	-.19 [.08]**	.01 [.08]				
Homicide rate in 4th quartile	.07 [.05]	-.05 [.06]	-.02 [.05]	-.04 [.05]		
Homicide rate in top 10th percentile					.00 [.05]	.01 [.05]
Lagged Unemployment Rate	-.05 [.02]	-.01 [.03]	-.05 [.02]***	-.03 [.03]	-.05 [.02]	-.03 [.02]
Year Fixed Effects		x		x		x
Community Fixed Effects		x		x		x
R-Squared	0.09	0.55	0.07	0.55	0.07	0.55
	Yearly Net International Emigration Rate of the Urban Area					
Homicide rate in 1st quartile	.03 [.03]	.01 [.03]				
Homicide rate in 3rd quartile	-.04 [.03]	-.02 [.04]				
Homicide rate in 4th quartile	.05 [.03]	.06 [.03]**	.03 [.03]	.05 [.03]*		
Homicide rate in top 10th percentile					.04 [.03]	.06 [.02]**
Lagged Unemployment Rate	-.02 [.01]**	.02 [.02]	-.02 [.01]	.01 [.03]	-.02 [.01]	.01 [.03]
Urban Area & Year Fixed Effects		x		x		x
R-Squared	0.05	0.45	0.03	0.44	0.04	0.45

Source: Authors' calculations based on the 2005-2012 ENOE (INEGI, undated).
Notes: 1) ***/**/*: Statistically significant at the 0.01/0.05/0.1 level. 2) Robust standard errors are reported in brackets; and the regression is weighted by probability weights equal to the urban areas' respective populations. The number of observations is equal to 192. 3) Net internal outmigration rate=Internal outmigration rate - internal immigration rate. Net international emigration rate = International emigration rate - international immigration rate.

Table 1.11: Urban Area Level Regressions based on the 2005-2011 ENOE

	In-migration	Out-migration	Immigration	Emigration
Unemployment Rate	0.043	0.019	-0.026	0.006
	[.029]	[.04]	[.02]	[.02]
Hourly wage rate	-0.002	-0.017	-0.003	0.01
	[.011]	[.019]	[.008]	[.01]
Homicide Rate	0.0004	-0.001	-0.0002	-0.001
	[.0009]	[.001]	[.0007]	[.001]
Adjusted R^2	0.83	0.8	0.88	0.89
Year & Urban Area Fixed Effects	x	x	x	x

Source: Author's calculations based on the 2005-2012 ENOE (INEGI, undated). Notes: 1) ***/**/*: p <0.01/0.05/0.1. 2) Robust standard errors are reported in brackets; and the regression is weighted by probability weights equal to the urban areas' respective populations. The number of observations is equal to 192. 3) The homicide rate is reported as the number of homicides per 100,000 people.

Chapter 2

Brain Drain among Second Generation Immigrants to Germany - Anecdotes or Reality?

Abstract

I studied the selection on observables among emigrants from Germany, with a specific focus on whether there was any evidence of a 'brain drain' among second generation immigrants. I found that emigrants are more likely to be from the lowest- and highest-educated groups, and that individuals with a migration background are in general more likely to emigrate. I failed to find any evidence, however, that among second generation immigrants, the selection into emigration by education background is different than in the population at large. Moreover, during the 2000-2010 period, the emigration likelihood of second generation immigrants actually decreased compared to earlier decades. Selected attitudes towards foreigners in the state of residence are not predictive of emigration, while individual perceptions of discrimination are.

Germany has long been an immigration country: In 2011, out of a population of around 82 million, 10.7 million were immigrants and a further 5.3 million were (grand-)children of immigrants (Bundesanstalt für politische Bildung, 2012). Nowadays, however, large immigration waves appear to be a thing of the past; and in 2009, net immigration was even negative (Statistisches Bundesamt, 2013). In this context, media reports have suggested that well-educated German-born children of immigrants (also called second generation immigrants, as opposed to first-generation immigrants who were born abroad) are choosing to return to their parents' countries of origin, and that failed integration policies in Germany and a general climate of hostility towards immigrants are to blame (see for instance Holzmüller (2010); Jacobson (2009); Rebeggiani (2011); and Wetzel (2013)). However, these articles are based on anecdotes. Currently, there is no empirical evidence on whether an abnormally high share of highly educated second generation immigrants emigrates or on whether attitudes towards foreigners have an impact on the out-migration probability of this group.

I seek to close this gap by analyzing data from the 1984-2011 German Socio-Economic Panel (GSOEP) (Frick et al., 2007). Thanks in part to comprehensive drop-out studies, this household survey makes it possible to observe emigration movements directly rather than having to infer out-migration from panel drop-outs as has been done in some past studies (c.f. Bellemare (2004)).

First, the paper aims to establish whether adult second generation immigrants are more likely to emigrate than people whose parents were born in the country. I study this question by presenting summary statistics on the percentage of emigrants by type of migration background and by regressing a variable that indicates whether an individual emigrates during the following year on migration background variables, personal characteristics, and year and state fixed effects in logistic regressions. Secondly, I investigate whether the educational selection into emigration follows a different pattern among second generation immigrants than among people without a migration background. I study this by introducing interaction variables between being a second generation immigrant and different educational degree variables into the logit regressions. Thirdly, I aim to understand whether variations in state-level economic factors and attitudes towards foreigners are associated with emigration movements, particularly among the second generation. I study this by introducing state-and-year specific unemployment rates and average attitudes concerning the integration efforts and labor market rights of foreigners in the logistic regressions. Fourthly, I also investigated how personal characteristics are related to emigration intentions. Finally, I analyzed

two different measures of panel drop-out on the same personal characteristics as described above in order to understand whether differences in these drop-outs might drive some of the selection results.

There are several limitations of the proposed research approach. The first is that because emigration is a rare event, we only observe 1,708 emigration events over the 1984-2011 period. This can make it difficult to study detailed emigration selection patterns due to insufficient sample sizes. Therefore, it is for example possible to study whether or not individuals with a migration background are more likely to emigrate than others; but the power is not sufficient to study whether the educational selectivity among second generation immigrants varies across time. Secondly, even though the follow-up studies manage to identify the whereabouts of around three-quarters of individuals who dropped out between 1984 to 2006 (Goebel, undated) this nonetheless leaves a relatively large margin of error in the sense that the emigration probability of certain groups could be significantly under-reported, which could bias estimates. I address this in part by analyzing drop-out patterns by migration background and personal characteristics. The third main limitation is that the analysis of the link between attitudes towards foreigners and emigration does not provide causal estimates of their effect on emigration. The reason for this is that immigrants are unlikely to settle randomly across the country when they arrive, but that their decision may be influenced by job prospects as well as the degree of openness of a particular state. Furthermore, they may react to negative attitudes towards foreigners by moving within the country rather than abroad. Finally, omitted factors that vary differently across states over time (and that are hence not controlled for by state and year fixed effects) may also influence emigration and bias results.

The article is part of the general literature on the self-selection patterns among migrants. In the German context, it complements studies that have sought to identify the characteristics of emigrants (or of people who intend to emigrate) in the general population (Sauer and Ette, 2007; Uebelmesser, 2005; Erlinghagen et al., 2009) and in the population of first-generation immigrants (Constant and Massey, 2002; Kuhlenkasper and Steinhardt, 2012; Yahirun, 2009), as well as studies that have documented the interest in and motivation for emigration by highly-skilled second generation immigrants (Aydin, 2010, 2013; Sezer and Daglar, 2009). Its contribution to this literature is that it shows for the first time whether second generation immigrants are more likely to emigrate than those without a migration background, whether university-educated individuals are over-represented among this group, and whether the perception of discrimination as well as

attitudes towards foreigners in the respondents' state of residence are related to out-migration probabilities. Moreover, as has been studied in other contexts (Van Dalen and Henkens, 2008; Creighton, 2012; De Jong et al., 1985), it provides evidence on whether emigration intentions are reliable indicators of future emigration events in the GSOEP, providing additional information when considering the results of emigration intention studies such as by Uebelmesser (2005).

The results of the emigration event analysis reveal that emigrants appear to be selected particularly from the least but also from the highest educated individuals - high school drop-outs on the one hand and graduates of higher secondary school without a vocational degree and university graduates on the other hand. Second generation immigrants are more likely to emigrate than people without a migration background even after adjusting for individual characteristics. However, I did not find that it is particularly among the highly educated second generation immigrants that moves abroad occur, and the selection of emigrants towards those with an immigration background also appears to be slightly decreasing over time. Moreover, while I concluded that emigration intentions are predictors of future emigration events, intention-based regressions indicate different emigration selection patterns than actual events, showing that in the German context, intentions are not ideal for studying emigrant selection patterns. Finally, personal discrimination experience is associated with a higher likelihood of emigration among immigrants, while average attitudes towards foreigners in the state of residence are not associated with emigration.

The paper is structured as follows: Section 1 contains a literature review, section 2 a description of the data and the research approach, section 3 summary statistics, section 4 the main empirical analysis, and section 5 the conclusion.

2.1   Literature Review

The question whether second-generation emigrants are more likely to emigrate and whether the emigrants among this group are positively selected on their educational characteristics falls within the scope of the literature on migrant selection. Figuring out which types of people migrate is one of the core questions in economic migration research (Borjas, 1989). It is of intrinsic interest because both countries of origin and of destination likely care about the characteristics of those who move, and important in studying the impact of migration on the migrants' outcomes. The characteristics that are

studied can vary depending on studies' intentions and context (Sauer and Ette, 2007), but in many cases, the focus is on whether emigrants are more or less educated and/or more or less productive than non-migrants. This article focuses on the selection by migration background and by educational qualification.

One theoretical model on selection of migrants was proposed by Borjas (1987) based on the Roy model (Roy, 1951). This model suggests that the selection of migrants depends on the relative rates of return to the individuals' skills in the countries of origin and of destination as well as on the correlation between expected earnings in the home and destination country. According to this model, German emigrants would be positively selected from the population of origin when migrating to countries in which higher skills are relatively more remunerated, and negatively selected when migrating to countries in which they are relatively less remunerated. Given that among the main countries of destination for German emigrants are some with less, more and comparable rates of inequality (measured here by the Gini coefficient), this model provides no clear predictions whether the average German emigrant will be positively or negatively selected on skills (Organisation for Economic Co-operation and Development, 2013; Statistisches Bundesamt, 2013). In an extension of this model, Borjas and Bratsberg (1996) argued that emigrants who return to their home countries will be intermediately selected from the population of emigrants. Given that the income inequality in many of the main countries of origin of immigrants to Germany is higher than in Germany, this would suggest that emigrants would be positively selected from the population of first-generation immigrants.

Other theories, however, come to a different conclusion than the Borjas model. For example, Chiswick (1999) contended that emigrants are in general positively selected on abilities, particularly so if migration costs are very high. Since certain migration costs, such as the "costs of (...) adjusting both consumption and labor market activities from the origin to the destination" (Chiswick, 1999, p. 181) are presumably lower for former emigrants and potentially also their children, this could suggest that there is less of a push toward positive emigrant selection among the second generation immigrants. Chiswick also pointed out that positive selection could be less stark when migrants move for non-economic reasons (such as family migrants and refuges). If second generation migrants are thought to move not only for economic reasons, but also for example because of a desire to learn more about their parents' country of origin, this could further attenuate tendencies toward positive selection among this group according to this model.

This theoretical ambiguity has generated a large body of empirical research that is based on both single- as well as multi-country studies. These studies have however has not yet resolved the ambiguity either since for example research on the selection of Mexican migrants has come to competing conclusions (c.f. Ambrosini and Peri (2012); Chiquiar and Hanson (2005); Ibarraran and Lubotsky (2005); Kaestner and Malamud (2013); McKenzie and Rapoport (2010); Moraga (2011)). As will be discussed next, in the German contexts, studies on the selection of emigrants are carried out for the population at large, as well as for the population of first-generation immigrants. For the population of second-generation immigrants, no specific quantitative studies exist so far, but a few studies explore the motivations and potential interests of this group in emigration.

In the category of studies on the selection of emigrants in the general population, Sauer and Ette (2007) found that emigrants are slightly positively selected on educational characteristics based on aggregate data from the Organisation for Economic Co-operation and Development (2008)'s database on immigrants in OECD countries. Based on GSOEP emigration data, Erlinghagen et al. (2009) concluded that native-born emigrants are more likely to have a tertiary degree, while first generation immigrants tend to emigrate at retirement or if they aren't well integrated into the labor market. Based on emigration intentions data from the GSOEP, Uebelmesser (2005) found that more educated individuals as well as foreigners express more interest in emigrating; and Niefert et al. (2001) also found positive selection on education.

In the category of studies on the selection of emigrants among first-generation immigrants, most of the studies are based on the GSOEP. Yahirun (2009) found negative selection of elderly return migrants in terms of their educational level and labor market attachment. Constant and Massey (2002) concluded that most personal characteristics had no influence on the re-migration probability of guest workers, while the strength of the attachment to Germany versus their home country did; but migrants who remit are positively selected on the years of education in their home country. Kuhlenkasper and Steinhardt (2012) concluded that Turkish return migrants were positively selected based on their educational characteristics, while among immigrants with a different background, the relationship is u-shaped.

There is a small number of studies on the phenomenon of emigration among second-generation immigrants in Germany, with a specific focus on the population of Turkish descent. One study by Aydin (2013) was based on thirty-six interviews. Based on these interviews, he concluded that: "(...) the emigration of highly qualified individuals with Turkish descent from

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Germany is not at all an expression of 'failed integration' or 'missing identification' with Germany. It is on the contrary the result of an adaption to the majority society as well as of a transnational way of life." (Aydin, 2013, pp. 14-15)[1] Another study by Sezer and Daglar (2009) attempts to provide some quantification of the emigration probability among the same population by interviewing 254 students or university graduates of Turkish descent. They found that one-third of their sample was interested in emigrating, but only 40% of them were thinking about moving in the next five years. 40% indicated that their most important reason for wanting to move was that they did not feel at home in Germany, one quarter cited professional and 9% economic reasons.

The relative paucity of research on the emigration of second generation immigrants is not singular to Germany: There are only a few studies on emigration movements among adult second generation immigrants,[2] and they in general focus on the integration of this group into their parents' country of origin (see for instance Wessendorf (2007) on the 'return' of Italians in Switzerland and King and Christou (2010) on the 'return' of Greek-Americans to Greece). I can only speculate about the reasons, but it is likely that the limited quantitative importance of this phenomenon in many immigration countries as well as data limitations play a role.

My paper is similar to the studies on the emigration of first generation immigrants in terms of structure (in particular to Constant and Massey (2002)), but with a focus on the adult children of immigrants. An additional contribution will be that I will explicitly investigate the impact of attitudes towards foreigners on the emigration probability.

2.2   Data and Research Approach

2.2.1   Data

Empirical studies on the selection of migrants rely either on data from the countries of origin and/or of destination. The latter approach is difficult to carry out in situations where emigrant populations are spread out across a larger variety of countries, as is the case in Germany (Statistisches Bundesamt, 2011, pp. 77–79). Datasources that are commonly used to study emigration in other countries are also not suitable, because the (micro-)census does not contain questions about emigration and registry data provides no

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[1]Translation by the author.

[2]See Rendall and Torr (2008) for a study on the emigration of second-generation Mexican minors in the United States.

information about the emigrants' educational and migration backgrounds (Sauer and Ette, 2007). The German Socio-Economic Panel (GSOEP) is hence the most reliable datasource to study the selection of emigrants in Germany.

The GSOEP[3] was launched in 1984 and has been carried out yearly since then. It contains information on a variety of household and personal characteristics for all adult household members[4] (Haisken-DeNew and Frick, 2005). The two original samples (of the West-German population in 1984 that either did or did not have a household head who was from one of the traditional 'guest-worker' originating countries) were later augmented by additional samples that represented the Eastern German population, new immigrant groups and high earners as well as several refresher samples that compensated for sample attrition (Haisken-DeNew and Frick, 2005).

The GSOEP has three features that make it particularly suitable for studying the out-migration of individuals with a migration background. Firstly, immigrant groups are over-sampled, which yields more precise estimates for the migrant population's characteristics than would have been the case otherwise. Secondly, people who move out of the household in which they were originally sampled continue to be interviewed as long as their residence in Germany can be established and they don't voluntarily drop out. Therefore, it is possible to continue to obtain information about the children of immigrants as they establish their own households. Thirdly, once individuals drop out of the sample, there are attempts to find out why this happened, including contacting registry offices if a household cannot be located anymore. If people follow the German registration laws, this makes it possible to identify whether they moved within the country or abroad. Therefore, it is possible to directly identify moves abroad.

A secondary data source used is a representative study on attitudes in Germany. The ALLBUS survey is carried out every two years and in 1980, 1984, 1990, 1994, 1996, 2000, 2002 and 2006 included a number of questions on attitudes towards foreigners (Terwey, 2011). Specifically, the questions that I used in this study are 'How much do you agree that foreigners should

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[3]The data used in this publication were made available to me by the German Socio-Economic Panel Study (SOEP) at the German Institute for Economic Research (DIW), Berlin. The international version of this dataset used in this analysis was prepared and distributed by the Department of Policy Analysis and Management, Cornell University, Ithaca, New York (Cornell University Department of Policy Analysis and Management, ated).

[4]Some information is gathered on children of the household, but they are not included in this study. The original cut-off for inclusion into the adult category used to be 17, but is now 18, so the sample is restricted to people who are at least 18 years old throughout.

adapt a bit more?' and 'How much do you agree that foreigners should leave when jobs are scarce?'. The hypothesis is that second-generation immigrants may be more likely to emigrate from states where they feel like there is pressure to adapt more or where they feel like second-class citizens who are expected to leave when the job market sours.

2.2.2   Empirical Approach

I attempt to identify selection in terms of migration and education background through a number of logistic regressions in which the dependent variable indicates whether a survey respondent emigrates during the following year:

$p_{ij} = F(PersonalCharacteristics, DiscriminationExperience)$

All regressions include person-level control variables – age, sex and employment status – and the main variables of interest – education level,[5] and migration background. Positive and statistically significant marginal effect estimates on a particular education or migration background variable would suggest that individuals who have this characteristic are more likely to emigrate than similar individuals who do not have it.

In additional regressions, I included interaction variables between education levels and migration background. If the estimated coefficients of these interactions are non-zero and significant, this would suggest that the educational selection of emigrants is different among second generation immigrants than among people who do not have a migration background. I also included interaction variables between decade and migration and education background indicators to investigate whether there were changes in the selection patterns over time.

In addition to investigating these selection patterns, I furthermore wanted to analyze whether experiences of discrimination or of a simple feeling of a 'lack of belonging' were a factor in the emigration of people with a migration background, as has been suggested by media reports as well as prior research (Holzmüller, 2010; Jacobson, 2009; Rebeggiani, 2011; Wetzel, 2013;

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[5]The educational level is measured by their type of degree. The omitted category is not having finished mandatory schooling. The included categories are currently being in school without having completed any degree yet, missing educational information, secondary education (mandatory education equivalent to the German 'Hauptschule' or 'Realschule') separately for individuals with and without an additional vocational degree, upper secondary education ('Abitur' - the general qualification for university admission) separately by whether the individual has a vocational degree or not, and tertiary education. The classification is based on the GSOEP's 'casmin' variable.

Sezer and Daglar, 2009). To do this, I included both self-reported measures of feelings of belonging and exclusion as well as state-level attitudes towards foreigners into some regressions. The self-reported measures, which were for instance also used in Constant and Massey (2002), are how frequently individuals felt discriminated due to their origin and how German they feel. Since these variables are only available for survey respondents with a migration background, these regressions are restricted to this population. As mentioned in the data section, the state-level attitudes were constructed based on the ALLBUS survey. The precise questions that I used are whether foreigners should adapt more and whether they should leave when jobs are scarce. The omitted categories is the neutral category, while there are two variables each that indicate the proportion of people surveyed in the state who (strongly) agree and (strongly) disagree with the statements. Since these attitude variables are only available in a select number of years, the regressions are restricted to those years.

I also analyzed emigration intentions and panel drop-outs in similar logit regressions as described above. The analysis of the intentions can reveal whether the analysis of intentions versus events yields similar insights into emigrant selection patterns. The analysis of drop-outs, on the other hand, is necessary because emigration events may be under-reported due to a failure of individuals to notify their local registry offices when they move abroad (Sauer and Ette, 2007). Since the follow-up studies rely in principal on this registry data (Goebel, undated), some individuals who are in fact emigrants are not identified as such in the survey.

I used two different measures of potential emigrant drop-outs: Under the first definition, a survey respondent is classified as a drop-out if they are a non-respondent in the next wave of the survey for reasons other than (temporary or final) refusal, death or known emigration, and if later drop-out studies were not able to ascertain their address. Under the second definition, the definition is relaxed to include people who drop out for reasons other than refusal, death or emigration, but for whom the follow-up studies seemed to determine that they were living in Germany subsequent to their panel drop-out. This second definition once again takes into account that someone who emigrated might have failed to register this move.

In some regressions, I included state and year fixed effects. These account for different emigration intensities in different states that may for instance be due to a closer proximity to other countries with favorable job opportunities, and for different emigration intensities in different years that for instance may come about through changes in migration policy regimes. A failure to include these factors could bias results if, for example, a state

in which migrants are over-represented has some permanent characteristics that make emigration more attractive to its inhabitants; in which case part of the effect of that factor would be (falsely) attributed to the migration background variables. If such factors vary differently between states across time, however, the fixed effects cannot resolve the bias. These potential biases are of more concern in the state attitude regressions than in the emigrant selection regressions, because the latter have the main purpose of giving us descriptive evidence whether second-generation immigrants are more prone to move abroad than other people.

2.3   Summary Statistics

2.3.1   Migration Background Classifications

In order to classify people according to their migration background, I relied on the GSOEP-provided variable 'migback' (Goebel, undated).

The category of 'no migration background' consists of people who were born in Germany to parents who are not known to be immigrants. The category of 'direct migration background', which I refer to as 'first generation immigrants', consists of people who immigrated to Germany. They represent about 15% of the GSOEP's adult respondents. The category of 'indirect migration background', which I refer to as 'second generation immigrants', consists of people who were born in Germany but who have at least one parent who is not a German citizen or who immigrated to Germany. They represent 5% of adult survey respondents. The category of 'migration background, type unknown' consists of individuals who have at least one immigrant parent, but whose own immigration status is unknown. They represent about .4% of survey respondents. Finally, for 1.6% of the survey respondents, the migration background is completely unknown.

2.3.2   Characteristics by migration background

Table 2.1 reports personal characteristics by migration background.

Sample members who don't have a migration background are on average 3 years older than first-generation immigrants and more than 11 years older than second-generation immigrants. There are slightly fewer women among first-generation immigrants than among those without a migration background. People without a migration background have German nationality about 50% and 30% more frequently than immigrants and second-generation

immigrants, respectively. Among immigrants who have German nationality in 1996, an estimated 70% are of German heritage.[6]

Compared to people without a migration background, first- and second-generation migrants more frequently left school without a degree or obtained lower or mid-level secondary schooling without a vocational degree, and less frequently obtained a vocational degree along with lower- or mid-level secondary education, an upper secondary degree or a tertiary degree. For second-generation migrants, the gap in educational attainment compared to individuals without a migration background is narrower, but the percentage among them who have at most an intermediary secondary but not vocational degree is still higher. Most notably, the percentage with a lower or mid-level secondary as well as a vocational degree is around 40% among first and second generation immigrants compared to 57% among people without a migration background.

The percentage of those who are not working (excluding unemployed individuals) is 4-5 percentage points lower among first- and second-generation immigrants than among those without a migration background, while the percentage who are unemployed is around 4 and 1.5 percentage points higher among first and second generation immigrants, respectively. Net labor income is 70/140 euros lower among first and second generation immigrants. Labor income on average is lower (by around 70 euros or 6% for direct migrants and 140 euros or 11% for indirect migrants) compared to non-migrants.

People with a (direct and indirect) migration background are under-represented in the populations of Schleswig-Holstein, Lower Saxony[7], pre-reunification Rhineland-Palatinate, Saarland, Brandenburg, Saxony, Saxony-Anhalt, and Thuringia. They are hence under-represented in all of the states that formerly were part of the German Democratic Republic. In contrast, they are over-represented in Hessen, Baden-Wuerttemberg, and North Rhine-Westphalia post-1990. The differences are not statistically significant for Bremen, Hamburg[8], North Rhine-Westphalia pre-1990, Saarland, and post-reunification Rhineland-Palatinate and Berlin.

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[6]This estimation is based on the question "If yes [Do you have German citizenship], are you an ethnic German from one of the East European countries?".

[7]The difference for second-generation immigrants is not statistically significant post-1991.

[8]The exception is that for the post-1990 average, second generation immigrants live less frequently in Hamburg than the non-migrant population

Table 2.1: Demographic, educational and labor market characteristics of adult active SOEP panel members, by migration background

	No migration background	1st generation immigrants	2nd generation immigrants	Migration background, unknown type	Migration status unknown
Demographic Characteristics					
Age	49.3 [.24]	46.4 [.4]***	37.8 [.95]***	44.1 [4.7]	43.7 [4.1]
Female (%)	52.6 [.33]	49.7 [.92]***	50.3 [2.18]	60.5 [8.05]	53.6 [8.4]
German Nationality (%)	93.8 [.1]	40.7 [2]***	63.5 [2]***	31.8 [15]***	99.8 [.1]***
Educational Characteristics (%)					
Currently in school without degree	.9 [.0]	.8 [.1]*	4.0 [.4]***	.1 [.0]***	.3 [.2]***
Did not complete mandatory schooling	2.1 [.1]	12.6 [.7]***	7.4 [.7]***	11.5 [6]	.3 [.2]***
Lower or mid-secondary w/o vocational degree	17.6 [.4]	27.6 [1]***	24 [2]***	27.2 [10]	9.1 [3]**
Lower or mid-secondary w vocational degree	57 [.5]	38.9 [1]***	40.9 [2]***	32.2 [8]***	66.4 [7]
Upper secondary w/o vocational degree	3.1 [.1]	2.2 [.4]	7 [.8]	5.8 [2.7]	.9 [.6]
Upper secondary w vocational degree	5.5 [.2]	3.1 [.4]***	4.9 [.9]	6 [4]	6.8 [4.8]
Tertiary	13.8 [.41]	11.5 [.79]***	10.6 [1.4]**	8.2 [3.4]	10.3 [3.7]
Job Characteristics					
Not working (excluding unemployed) (%)	41.1 [.5]	36.5 [.9]**	36.8 [1.8]***	40.3 [9.6]	24.3 [8.0]**
Unemployed (%)	4.3 [.1]	8.5 [.4]*	5.7 [.6]**	4.2 [2.7]	2.5 [1.1]*
Working (%)	54.6 [.5]	55.0 [1.0]	57.5 [1.7]	55.5 [9.1]	73.2 [8.1]*
Net labor income (in euro)	1308.5 [10.4]	1226.0 [22.6]***	1168.0 [42.3]***	971.9 [73.5]***	1202.5 [75.0]
Observations and emigration events					
Person-years	326,126	62,768	16,870	590	1,072
Respondents	36,766	6,954	2,417	233	828
Emigration events	403	1,095	128	38	24
...among which: Temporary emigrants	28	26	6	0	0

Source: Author's calculations based on the German Socio-Economic Panel (International 1984-2011 Database)
Notes: 1) Standard errors adjust for sample design (stratification, primary sampling units and probability weights).
2) ***/**/* indicates that the estimated mean is statistically different at the 1/5/10 % level from the estimated mean for the population without a migration background as determined by an adjusted Wald test.
3) The excluded education and labor force characteristics are education and labor force status missing, respectively.

As a next step, it is informative to look into how the characteristics of those who choose to leave Germany differ from those who do not. I show the results of this analysis in table 2.2. As above, the unit of observation is a person-year.

Starting first with people without a migration background, individuals who emigrate during the following year are on average nearly thirteen years younger than people who did not move in the following year. They less frequently have a lower or mid-level secondary in combination with a vocational degree and more frequently have an upper secondary without a vocational degree, and are more frequently unemployed and working. There are no statistically significant differences in the percentage of women, the average net labor income and in the other education categories between emigrants and non-emigrants.

Turning to people who immigrated to Germany, emigrants more frequently dropped out of school and less frequently completed lower or mid-secondary education with a vocational degree. They are more frequently unemployed and less frequently working. There are no statistically significant differences in the average age, percentage of women, other educational categories and in the average net labor income between the emigrant and non-emigrant groups.

For the group of second-generation immigrates, emigrants are on average more than eight to ten years younger, and 66 % are women compared to 50% of non-emigrants. There are no statistically significant differences in the frequency of different educational categories and in work status, but the net labor income is on average nearly 300 euros lower among those who emigrate during the coming year than among those who don't. Despite the failure to find statistically significant differences, however, some of the raw differences are rather large: For example, the percent of university graduates is more than seven percentage points larger among emigrants than among non-emigrants.

Based on tables 2.1 and 2.2, we can conclude that people with a migration background are over-represented among emigrants, and that even though not all of the differences are statistically significant, the percentage of university graduates is higher among those who emigrate within the next year than among those who do not. In absolute terms, therefore, the emigrant population is skewed towards people with a migration and a higher education background. Based on the logistic regressions, we will be able to see whether this is due to other personal characteristics that also predict emigration or not.

We can furthermore look at how specific characteristics of immigrants

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Table 2.2: Characteristics of adult SOEP panel members, by migration background and emigration status

No Migration Background	Non-emigration	Emigration
Age	49.2 [.2]	36.3 [2]***
Female (%)	52.7 [.3]	55.9 [3.5]
Did not complete mandatory schooling (%)	2.1 [.1]	1.7 [.7]
Lower or mid-secondary w/o vocational degree (%)	17.9 [.4]	14.5 [4.0]
Lower or mid-secondary w vocational degree (%)	56.2 [.5]	39.9 [4.5]***
Upper secondary w/o vocational degree (%)	3.0 [.1]	16.9 [3.6]***
Upper secondary w vocational degree (%)	5.5 [.2]	6.7 [1.9]
University (%)	13.5 [.4]	16.7 [2.9]
Unemployed (%)	4.3 [.1]	6.2 [2.1]***
Working (%)	54.5 [.5]	64.5 [4.8]**
Net labor income (in euro)	1293.1 [10.5]	1266.2 [104.4]
1st generation immigrants	Non-emigration	Emigration
Age	46.2 [.5]	45.4 [1]
Female (%)	49.6 [1.0]	47.5 [2.0]
Did not complete mandatory schooling (%)	12.7 [.7]	21.7 [2.0]***
Lower or mid-secondary w/o vocational degree (%)	27.7 [1.1]	30.5 [2.4]
Lower or mid-secondary w vocational degree (%)	39.0 [1.1]	24.0 [2.2]***
Upper secondary w/o vocational degree (%)	2.2 [.4]	1.7 [.5]
Upper secondary w vocational degree (%)	3.1 [0.4]	2.1 [1.3]
University (%)	11.2 [.8]	16.1 [2.4]**
Unemployed (%)	8.5 [.4]	13.7 [1.4]***
Working (%)	55.3 [1.0]	43.3 [2.4]***
Net labor income (in euro)	1215.0 [23.1]	1222.8 [76.4]
2nd generation immigrants	Non-emigration	Emigration
Age	37.9 [1]	26.6 [1.9]***
Female (%)	50.0 [2.2]	65.8 [8.3]**
Did not complete mandatory schooling (%)	7.4 [.7]	15.5 [6.8]
Lower or mid-secondary w/o vocational degree (%)	24.6 [1.8]	21.8 [5.6]
Lower or mid-secondary w vocational degree (%)	41.1 [2.1]	17.4 [5.7]***
Upper secondary w/o vocational degree (%)	6.9 [.8]	11.5 [8.4]
Upper secondary w vocational degree (%)	4.9 [.9]	5.7 [2.8]
University (%)	10.3 [1.4]	17.5 [6.9]
Unemployed (%)	5.8 [.6]	7.9 [3.6]
Working (%)	57.1 [1.8]	55.6 [9.0]
Net labor income (in euro)	1148.2 [42.9]	886.3 [155.3]

Source: Author's calculations based on the German Socio-Economic Panel (International 1984-2011 Database). Notes: 1) Standard errors adjust for sample design (stratification, primary sampling units and probability weights). 2) ***/**/* indicates that the estimated mean is statistically different at the 1/5/10 % level from the estimated mean for non-migrants as determined by an adjusted Wald test.

are related to emigration (see table 2.3).[9]

Among first generation immigrants, the percentage of individuals with German citizenship is less than 10% of people who emigrate versus 42% among those who don't; and the percentage of those who speak German well or very well is 40% versus 63% among emigrants and non-emigrants, and fewer of the emigrants predominantly speak German in their daily lives and feel completely or predominantly German. There is no statistically significant difference in the percentage of those who feel discriminated based on their origin.

Among second generation immigrants, emigrants are also less frequently German citizens and less frequently feel completely German. There are no statistically significant differences in how often they feel discriminated, in their spoken language ability, and how frequently they speak German versus another language.

In addition to actual migration movements, we also have information on the international migration intentions of individuals for select year (1993, 1996, 1997, 1998 and 2009).[10] In table 2.4, I present how the answers vary between people by their migration background.

We can see that both in the 1990s as well as in the late 2000s, first and second generation immigrants express a higher interest in moving abroad: The percentage who could definitely imagine moving abroad for an extended period of time is more than double (12-13%) for this group than for people who do not have a migration background (5%); and in addition, immigrants of the second generation are 50% more likely to express that they could possibly imagine living abroad (24% versus 16% for non-migrants and immigrants). In 2009, the percentage who has recently seriously considered moving abroad is also larger for those with a migration background. But in all cases, the percentage of individuals who are thinking about moving within the next year is very small, amounting to only 5-8% of respondents who indicated that they would seriously consider moving abroad. More than 90% would only want to move for a few months.

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[9]Most of these questions are not asked in every wave, and sample sizes are therefore smaller than in the entire sample.

[10]Similar questions are available for foreigners/immigrants during additional years.

Table 2.3: Migrant-specific characteristics of adult active SOEP panel members, by migration background and migration status

1st generation immigrants	No emigration	Emigration
German citizen (%)	41.6 [1.9]	9.2 [2.3]***
Often discriminated based on origin (%)	7.7 [.6]	8.9 [1.4]
Rarely discriminated based on origin (%)	37.2 [1.1]	38.4 [4.1]
Never discriminated based on origin (%)	55.1 [1.3]	52.7 [4.2]
Good or very good German spoken fluency (%)	63.4 [1.1]	39.5 [4.2]***
Medium German spoken fluency (%)	25.0 [.8]	31.6 [3.6]*
Bad German spoken fluency (%)	10.0 [.6]	24.3 [3.6]***
Doesn't speak German (%)	1.6 [.2]	4.7 [1.1]***
Mostly speaks German (%)	42.0 [1.4]	15.4 [2.3]***
Mostly speaks other language (%)	20.2 [1.1]	43.5 [4.3]***
Both languages frequently spoken (%)	37.8 [1.1]	41.1 [3.9]
Feels completely German (%)	14.1 [1.1]	.4 [.2]***
Feels mostly German	17.2 [.8]	8.0 [1.3]***
Feels German in some respects	29.0 [.9]	24.0 [3.3]
Feels barely German (%)	18.7 [.7]	26.6 [3.8]**
Doesn't feel at all German (%)	20.1 [9.9]	41.0 [4.8]***
2nd generation immigrant	No emigration	Emigration
German citizen (%)	67.0 [2.5]	45.1 [12.4]*
Often discriminated based on origin (%)	7.0 [1.3]	7.4 [5.5]
Rarely discriminated based on origin (%)	28.1 [2.2]	41.0 [12.5]
Never discriminated based on origin (%)	64.8 [2.6]	51.6 [12.8]
Good or very good German spoken fluency (%)	97.1 [.5]	94.9 [4.3]
Medium German spoken fluency (%)	2.4 [.5]	4.9 [4.3]
Bad German spoken fluency (%)	.3 [.1]	.2 [.3]
Doesn't speak German (%)	.3 [.2]	-
Mostly speaks German (%)	67.4 [2.5]	61.9 [13.8]
Mostly speaks other language (%)	4.5 [1.0]	13.9 [8.6]
Both languages frequently spoken (%)	28.1 [2.3]	24.1 [11.6]
Feels completely German (%)	23.0 [2.5]	4.4 [4.7]***
Feels mostly German	25.9 [1.8]	34.3 [12.6]
Feels German in some respects	29.9 [2.1]	23.7 [8.6]
Feels barely German (%)	11.1 [1.4]	17.5 [8.2]
Doesn't feel at all German (%)	10.1 [1.2]	20.1 [9.9]

Source: Author's calculations based on the German Socio-Economic Panel (International 1984-2011 Database). Notes: 1) Standard errors adjust for sample design (stratification, primary sampling units and probability weights). 2) ***/**/* indicates that the estimated mean is statistically different at the 1/5/10 % level from the estimated mean for non-migrants as determined by an adjusted Wald test.

Table 2.4: Emigration intentions for adults in the 1984-2011 German Socio-Economic Panel

	No migration background	Direct Migration background	Indirect migration background	Migration background, unknown type	Migration status unknown
1993, 1996, 1997, 1998: Could you imagine moving abroad for a longer period of time or forever?					
Yes, definitely (%)	5.2 [.3]	12.4 [.8]***	12.9 [2]***	4.4 [3]	
Yes, possibly (%)	16.1 [.5]	16 [.8]	24 [2]***	15.7 [7]	13.8 [14]
Probably not (%)	14.3 [.4]	11.4 [.7]***	13.7 [1]	12.6 [7]	16 [13]
No (%)	52 [.6]	37.6 [1]***	34 [2]	34 [15]	66 [20]
2009: Have you, in recent times, seriously considered moving abroad for an extended period or forever?					
Yes (%)	9 [.4]	21.5 [2]***	17.5 [2]***		12.5 [14]
Yes, within the next 12 months (%)	.6 [.1]	1.7 [.5]**	.9 [.4]		
2009: How long would you like to live abroad? [Among those who want to move abroad)					
For a few months (%)	96.7 [.2]	92.2 [.8]***	91.9 [.1]***		
For a few years (%)	1.8 [.1]	1.8 [.3]	5 [.9]***		
Forever (%)	1.5 [.1]	6 [.7]***	3 [.7]**		

Source: Author's calculations based on the German Socio-Economic Panel (International 1984-2011 Database)

Notes: 1) Standard errors adjust for sample design (stratification, primary sampling units and probability weights).

2) ***/**/* indicates that the estimated mean is statistically different at the 1/5/10 % level from the estimated mean for non-migrants as determined by an adjusted Wald test.

2.4 Empirical Analysis

2.4.1 Main Results

Through logistic regressions, I investigated what type of educational selectivity into emigration there is and whether the higher emigration likelihood among second generation emigrants is due to their different observable personal characteristics, or whether it persists once I have controlled for these characteristics. The estimated marginal effects[11] are reported in table 2.5.

First, we observe that individuals who are currently still in school and have not yet obtained a degree and who have attained almost any type of degree are less likely to emigrate than individuals who have dropped out of school before completing a degree. The effects are also large: Many are relatively large at around -.1 (compared to the mean probability of emigrating in the following year of .25). The exceptions are the categories of individuals who have obtained upper secondary schooling but no subsequent vocational degree or who have completed tertiary education: These estimated marginal effects are not statistically significant at the 10% level.

The results overall do not suggest that there is unequivocal positive selection on educational characteristics: Individuals who did not complete mandatory education appear to be the most likely to emigrate. Individuals who have completed upper secondary education without a vocational degree – some of whom may be students heading to universities abroad – and those with university degrees are either have the next-highest likelihood of emigrating (in fact, in some specifications it cannot be rejected that they have equal odds as school drop-outs), followed by individuals who have lower secondary education. Having a vocational degree lowers one's odds of emigrating relative to people who have the same secondary degree. To conclude, there appears to be both negative and positive selection of emigrants, which is consistent with the Borjas (1987) model provided that those with the lowest levels of education emigrate to countries with less and those with the highest levels of education emigrate to countries with more inequality (which cannot be tested since the country to which the individuals emigrate is not known).

Compared to those who are not in the labor force, people who are unemployed are .1 percentage points more likely to emigrate during the following

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[11]The marginal effects measure the estimated change in the probability of emigration (measured in percentage points) due to a one-unit change of a continuous variables, evaluated at the mean, or the difference in probability of emigration between someone who belongs to a category measured by an indicator variable relative to the reference category.

year. This effect is stable to the inclusion of state and year fixed effects and of educational and immigrant background interaction variables.

The estimated marginal effects by migration background suggest that both immigrants as well as their children are more likely to emigrate than people without a migration background: The estimated marginal effect of being an immigrant compared to people who do not have a migration background on the emigration probability is .9-1.7. The inclusion of further control variables decreases the estimated effect. For second generation immigrants relative to people who do not have a migration background, the estimated marginal effects range from .6-.9. The inclusion of the educational category variables lowers the estimated marginal effect.

In addition to knowing that second generation immigrants are more likely to emigrate than people without a migration background, it is furthermore of interest whether they have different patterns of educational selectivity than individuals without a migration background. However, the results do not back up the hypothesis that there is such a positive selection among this group. In regressions that include interaction variables between second generation background and different educational categories (in which not having completed a mandatory school degree is the omitted variable), the estimated marginal effects of almost all of the interaction variables are small and statistically insignificant, with the exception of the estimated marginal effect on having upper secondary without a vocational degree, which is equal to -.001. Interestingly, the estimated marginal effect of having an upper secondary as well as a vocational degree is larger and positive than the estimated marginal effect of having an upper secondary but no vocational degree, suggesting that among second generation immigrants, the emigrant selection towards people who do not have a vocational degree is less pronounced than in the population as a whole. However, this effect cannot be precisely estimated

While we can conclude that second generation immigrants are more likely to emigrate than the average person without a migration background even after controlling for personal characteristics, there is no evidence that among second generation immigrants, individuals with tertiary education are particularly selected towards emigration. Hence, there may be a higher brain drain among second generation immigrants than among the people without a migration background simply due the fact that the entire group of second-generation immigrants is more likely to emigrate, but this does not come about through a specific selection of tertiary-educated (or even upper secondary-educated) second generation immigrants.

Table 2.5: Estimated marginal effects of the emigration logit regression for adult members of the German Socio-Economic Panel

	(1)	(2)	(3)	(4)
Age		-.002 [.000]***	-.002 [.000]***	-.001 [.000]***
Female		-.012 [.008]	-.021 [.009]**	-.016 [.007]**
Education (Omitted category: Did not complete mandatory schooling)				
In school w/o degree		-.093 [.020]***	-.101 [.000]	-.028 [.045]
Education Missing		.272 [.041]***	-.061 [.015]	-.003 [.036]
Lower of middle secondary w/o a vocational degree		-.081 [.010]***	-.072 [.009]***	-.094 [.019]***
Lower of middle secondary w a vocational degree		-.184 [.016]***	-.150 [.015]***	-.130 [.031]***
Upper secondary w/o a vocational degree		-.023 [.020]	-.006 [.021]	.117 [.057]**
Upper secondary w a vocational degree		-.103 [.013]***	-.090 [.014]***	-.065 [.012]***
Tertiary degree		-.062 [.013]***	-.035 [.013]***	-.013 [.026]
Migration Background (Omitted category: No migration background)				
First generation immigrant	1.738 [.058]***	1.220 [.055]***	1.203 [.054]***	1.269 [.253]***
Second generation immigrant	.987 [.104]***	.580 [.071]***	.585 [.242]**	.742 [.350]**
*In school			-.044 [.119]	-.035 [.063]
*Education missing			-.081 [.116]	.012 [.076]
*Lower or mid-secondary w/o vocational degree			.016 [.064]	.089 [.095]
*Lower or mid-secondary w vocational degree			.005 [.062]	.010 [.059]
*Upper secondary w/o vocational degree			-.073 [.039]***	-.089 [.019]***
*Upper secondary w vocational degree			.091 [.131]	.067 [.102]
*Tertiary			-.042 [.054]	-.052 [.038]
State and year fixed effects				x
Pseudo R^2	0.12	0.15	0.21	0.21
N	407,424	407,424	407,424	398,132

Source: Author's estimates based on the 1984-2011 German Socio-Economic Panel.
Notes: 1) ***/**/* indicates that the estimated marginal effects are statistically significant at the 1/5/10% level. 2) The marginal effects are estimated at the variables' means using Stata's mfx command. They estimate the change in the probability of emigration, measured in percentage points, due to a one-unit change of the continuous variables or of the indicator variable relative to the reference category. 3) The regressions that control for the second-generation immigrant x education interactions also control for first-generation immigration x education interactions, as well as interactions between work status and migration background.

2.4.2 Changes over time

Since there are almost three decades of data, we can also look at trends over time by carrying out regressions that include interactions of first and second generation status or of the educational category with the decades (defined as 1984-1990, 1991-2000 and 2001-2010) (see table 2.6).

The first interesting observation is that the difference in the emigration likelihood of first and second generation immigrants relative to people who do not have a migration background falls over time: The marginal effect of being a first generation immigrant of 1.6 is decreased by -.04 and -.1 in the 1990s and 2000s; and the marginal effect of being a second generation immigrant of 1.69 is reduced by -.07 and -.11 in the 1990s and 2000s.

Secondly, over time, the likelihood of emigration fall for people who have obtained a lower or middle secondary or a tertiary degree relative to that of people who dropped out of school. For people with upper secondary education, in contrast, the decade-to-decade changes are not statistically significant. These changes are larger than the ones reported for the migration background variables: For instance, while a university graduate was on average .05 percentage points more likely to emigrate than a similar school drop-out during the 1980s, in the 1990s and 2000s the graduate would be .01 percentage points less likely to emigrate.

These results suggest that recent emigration flows have not started to be more selective in terms of higher education or migration background.

2.4.3 Emigration intentions

Turning to emigration intentions, I created two variables that either indicate that an individual is definitely interested in emigrating (definite emigration intention) or definitely or possibly interested in emigrating (possible emigration intention). Individuals who answer in the affirmative to the 2009 question whether they have seriously considered moving abroad in recent times are classified as having definite emigration intentions (see tables 2.7 and 2.8).

First, emigration intentions are predictive of future emigration events: In regressions that either included only the emigration intentions or a full set of control variables, the estimated marginal effects of an emigration intention on actual out-migration in the next 5 or 10 years are equal to 2.88/3.69 and 1.77/2.42 for definite and potential emigration intentions. These effects are large, since the survey weight-adjusted means for emigration within 5 or 10 years are equal to .8 and 1.1; and their pattern makes sense because inten-

Table 2.6: Estimated marginal effects of logit regression with decade-specific variables for adult members of the German Socio-Economic Panel

	(1)	(2)	(3)	(4)
Education (Omitted category: Did not complete mandatory schooling)				
In school w/o degree	-.058 [.027]**	-.050 [.026]*	-.068 [.046]	-.067 [.038]*
Education Missing	.461 [.063]***	.412 [.059]***	-.101 [.]***	-.074 [.032]**
Lower of middle secondary w/o a vocational degree*	-.063 [.010]***	-.054 [.010]***	-.034 [.013]***	-.046 [.012]***
x 1991-2000			-.028 [.014]**	.005 [.023]
x 2001-2010			-.087 [.011]***	-.046 [.021]
Lower of middle secondary w a vocational degree	-.140 [.016]***	-.117 [.014]***	-.052 [.016]***	-.067 [.017]***
x 1991-2000			-.082 [.012]***	-.047 [.018]**
x 2001-2010			-.114 [.011]***	-.064 [.022]**
Upper secondary w/o a vocational degree	.029 [.026]	.029 [.025]	-.042 [.034]	-.048 [.029]*
x 1991-2000			-.004 [.054]	.025 [.063]
x 2001-2010			.067 [.074]	.131 [.103]
Upper secondary w a vocational degree	-.076 [.017]***	-.068 [.016]***	-.095 [.028]***	-.093 [.023]
x 1991-2000			.031 [.093]	.078 [.113]
x 2001-2010			.047 [.09e]	.113 [.125]
Tertiary degree	-.018 [.016]	-.008 [.015]	.077 [.034]**	.050 [.030]*
x 1991-2000			-.085 [.015]***	-.057 [.020]***
x 2001-2010			-.092 [.014]***	-.055 [.023]**
1st generation immigrant	1.951 [.116]***	1.553 [.175]***	1.094 [.050]***	.892 [.052]***
x 1991-2000	-.061 [.008]***	-.035 [.019]*		
x 2001-2010	-.114 [.007]***	-.103 [.010]***		
2nd generation immigrant	1.686 [.321]***	.795 [.0033]***	.593 [.073]***	.497 [.065]***
x 1991-2000	-.081 [.020]***	.070 [.020]***		
x 2001-2010	-.131 [.011]***	-.129 [.010]***		
State and year fixed effects		x		x
Pseudo R^2	.15	.16	.21	.22
N	407,424	398,132	407,424	398,132

Source: Author's estimates based on the 1984-2011 German Socio-Economic Panel.
Notes: 1) ***/**/* indicates that the estimated marginal effects are statistically significant at the 1/5/10% level. 2) Other control variables are labor force status missing, working, unemployed, age and sex; and interactions of the decade with missing and in school educational statuses (in decade-specific education regressions). 3) The marginal effects estimate the change in the probability of emigration, measured in percentage points, due to a one-unit change of the continuous variables (evaluated at the mean) or of the indicator variable relative to the reference category.

tions are better at predicting any emigration events over a longer time frame and since stronger intentions are better predictors than weaker intentions. The adjusted R^2s, however, are not very large at around .04-.05.

The results of these regressions are somewhat different from the ones based on actual emigration events. For example, individuals with upper secondary and tertiary education are more likely to state that they might possibly be interested in moving abroad than people who dropped out of school, although they are not more likely to express a very strong interest. However, first and second generation immigrants are much more likely to want to move abroad.

2.4.4 Migrant characteristics and attitudes towards migrants

We would like to understand what the causes of the higher emigration among second-generation immigrants are. Aydin (2010) identifies three reasons that are often cited for why highly qualified individuals of Turkish descent (many of whom are second generation immigrants) choose to leave Germany: First, a lack of suitable job perspectives, secondly, a lack of feeling at home, and thirdly, discrimination. Moreover, networks and economic growth are identified as pull factors that can attract people to move to Turkey. In the following, I test whether the second and third of the push-factor explanations are backed up by the data by including measures of how 'German' someone feels, their language use and ability and citizenship status as measures of a feeling of belonging, and both individual reports on discrimination experiences as well as state-level attitudes towards foreigners as measures of discrimination (see table 2.9).

There appears to be little relationship between average attitudes toward foreigners and emigration. Most of the estimated effects are negative whether or not they indicate a higher or lower openness towards foreigners. The exception is that before the fixed effects are included, the percentage in the state who agree that foreigners should leave if jobs are scarce is associated with a marginal effect of .33. This is a very large effect: the mean emigration probability is .25, so that just a one percentage point increase in the frequency of this answer would be associated with an effect that exceeds the mean. However, once the fixed effects are introduced, this is no longer the case.

Self-reported characteristics of people with a migration background have the expected association with emigration (see table 2.10 for the estimated marginal effects of key variables): Individuals who have German citizenship are .9 percentage points less likely to emigrate. Relative to people who of-

Table 2.7: Estimated marginal effects of the definite emigration intention logit regression for adult members of the German Socio-Economic Panel

	(1)	(2)
Age	-.187 [.012]***	-.163 [.009]***
Female	-1.03 [.313]***	-.449 [.237]*
Education (Omitted category: Did not complete mandatory schooling)		
In school w/o degree	6.07 [1.540]***	.989 [.888]
Education Missing	3.370 [1.354]**	-3.042 [.532]***
Lower of middle secondary w/o a vocational degree	-5.737 [.558]***	-3.983 [.348]***
Lower of middle secondary w a vocational degree	-8.435 [.736]***	-6.276 [.520]***
Upper secondary w/o a vocational degree	7.119 [1.328]***	-.496 [.636]
Upper secondary w a vocational degree	-1.284 [.859]	-3.144 [.425]***
Tertiary degree	-1.421 [.717]**	-3.222 [.392]*** [.0039]***
Migration Background (Omitted category: No migration background)		
First generation immigrant	20.692 [19.828]	99.018 [.198]***
Second generation immigrant	3.889 [13.915]	.95.77 [.283]***
*In school	1.250 [3.745]	.395 [2.474]
*Education missing	9.686 [6.598]	3.639 [4.758]
*Lower or mid-secondary w/o vocational degree	14.565 [5.458]***	8.120 [3.864]***
*Lower or mid-secondary w vocational degree	15.201 [5.535]***	7.689 [3.820]**
*Upper secondary w/o vocational degree	6.797 [4.701]	7.604 [4.212]***
*Upper secondary w vocational degree	21.88 [7.560]***	16.297 [6.717]***
*Tertiary	17.479 [6.492]***	6.291 [4.342]***
State and year fixed effects		x
Pseudo R^2	0.08	0.11
N	59,123	57,490

Source: Author's estimates based on the 1984-2011 German Socio-Economic Panel. Notes: 1) ***/**/* indicates that the estimated odds ratios are statistically significant at the 1/5/10% level. 2) Other control variables are labor force status missing, unknown migration background, and migration background of unknown type. 3) The marginal effects estimate the change in the probability of emigration, measured in percentage points, due to a one-unit change of the continuous variables (evaluated at the mean) or of the indicator variable relative to the reference category.

Table 2.8: Estimated marginal effects of the possible emigration intention logit regression for adult members of the German Socio-Economic Panel

	(1)	(2)
Age	-.725 [.017]***	-.740 [.018]***
Female	-3.813 [.486]***	-3.360 [.484]***
Education (Omitted category: Did not complete mandatory schooling)		
In school w/o degree	9.799 [2.364]***	5.580 [2.337]**
Education Missing	4.365 [2.233]*	-6.743 [1.810]***
Lower of middle secondary w/o a vocational degree	-.1152 [.0132]***	-11.107 [1.098]***
Lower of middle secondary w a vocational degree	-11.523 [1.323]***	-10.986 [1.269]***
Upper secondary w/o a vocational degree	18.808 [2.089]***	10.800 [2.114]***
Upper secondary w a vocational degree	6.265 [1.783]***	1.168 [1.643]
Tertiary degree	5.042 [1.491]***	3.480 [1.443]**
Migration Background (Omitted category: No migration background)		
First generation immigrant	38.390 [17.756]**	34.853 [23.99]*
Second generation immigrant	14.444 [20.734]**	21.790 [28.267]
*In school	-.203 [6.134]	-1.361 [5.864]
*Education missing	16.402 [9.023]*	13.233 [9.667]
*Lower or mid-secondary w/o vocational degree	17.405 [5.817]***	13.867 [5.984]**
*Lower or mid-secondary w vocational degree	22.000 [5.730]***	17.861 [6.076]**
*Upper secondary w/o vocational degree	14.137 [6.938]**	15.331 [7.280]**
*Upper secondary w vocational degree	35.299 [6.882]***	34.815 [7.782]***
*Tertiary	28.717 [6.428]***	21.894 [7.365]***
State and year fixed effects		x
Pseudo R^2	0.1	0.16
N	59,123	57,501

Source: Author's estimates based on the 1984-2011 German Socio-Economic Panel. Notes: 1) ***/**/* indicates that the estimated odds ratios are statistically significant at the 1/5/10% level. 2) Other control variables are labor force status missing, unknown migration background, and migration background of unknown type. 3) The marginal effects estimate the change in the probability of emigration, measured in percentage points, due to a one-unit change of the continuous variables (evaluated at the mean) or of the indicator variable relative to the reference category.

Table 2.9: Estimated marginal effects of the emigration logit regression for adult members of the German Socio-Economic Panel

	(1)	(2)
Migration Background (Omitted category: No migration background)		
First generation immigrant	1.149 [.094]***	.807 [.086]***
Second generation immigrant	.505 [.123]***	.373 [.098]***
Foreigners should adapt more		
% in state (strongly) agree	-.207 [.154]	-.166 [.226]
% in state (strongly) disagree	-.180 [.201]	-.165 [.276]
Foreigners should leave if jobs are scarce		
% in state (strongly) agree	.330 [.179]*	-.214 [.264]
% in state (strongly) disagree	-.181 [.162]	-.234 [.230]
State and year fixed effects		x
Pseudo R^2	0.21	0.23
N	124,000	122,946

Source: Author's estimates based on the 1984-2011 German Socio-Economic Panel.

Notes: 1) ***/**/* indicates that the estimated marginal effects are statistically significant at the 1/5/10% level. 2) Other control variables are age, gender, education background, labor force status, unknown migration background, and migration background of unknown type. 3) The marginal effects estimate the change in the probability of emigration, measured in percentage points, due to a one-unit change of the continuous variables (evaluated at the mean) or of the indicator variable relative to the reference category.

ten feel discriminated against, those who never or rarely feel discriminated against are .24 and .55 percentage points less likely to emigrate. Compared to people who predominantly feel German, feeling completely German, feeling German in certain respects, hardly feeling German and not feeling German at all increase the likelihood of emigrating, with the largest increases due to hardly feeling German and not feeling German at all. Speaking German badly curiously raises the probability of emigrating relative to not speaking it at all. Compared to people who mostly speak language, those who mostly speak German are .06 percentage points less likely to emigrate and those who speak two languages on a regular basis are .55 percentage points more likely to emigrate.

Table 2.10: Estimated marginal effects in migrant-specific emigration logit regression for adult members of the German Socio-Economic Panel

	(1)	(2)	(3)	(4)	(5)
Second-generation immigrant	-.200 [.070]***	-.250 [.123]**	-.0034 [.240]	-.062 [.187]	.113 [.291]
German citizenship	-.924 [.085]***				
Rarely feels discriminated against		-.239 [.140]*			
Never feels discriminated against		-.545 [.171]***			
Speaks German well			-.994 [.194]***		
Speaks German ok			-.345 [.140]**		
Speaks German badly			-.555 [.215]**		
Language most used is German				-.768 [.135]***	
Speaks German and other language equally often				.524 [.184]***	
Feels completely German					2.653 [1.289]**
Feels German in certain respects					3.433 [1.105]***
Hardly feels German					6.279 [1.962]***
Doesn't feel German at all					5.361 [1.386]***
Pseudo R^2	.08	.06	.06	.06	.07
N	44,542	32,731	34,766	24,206	28,251

Source: Author's estimation based on the 1984-2011 German Socio-Economic Panel.
Notes: 1) ***/**/* indicates that the estimated odds ratios are statistically significant at the 1/5/10% level. 2) The control variables are age, sex, educational background, and state and year fixed effects. 3) The sample in this regression is restricted to individuals with a migration background.

2.4.5 Analysis of drop-outs

As described previously, of the concerns with analyzing emigration in the GSOEP is that it the number of emigrants may be under-reported (Constant and Massey, 2002). In order to address whether this could lead to biases in the estimates of emigration selection, I analyzed the selection into the two different types of non-refusal drop-outs as described in the section 2 (see table 2.11). This analysis leads me to conclude that it is unlikely that a potentially under-reporting of emigration events substantially alters the results.

First, the number of adult individuals who permanently drop out of the sample due to reasons other than emigration, death and refusal to participate is surprisingly small: There are 130 and 310 observations of category 1 and 2 drop-outs, respectively. These smaller figures make it less likely that even if selection into drop-outs were different from selection into emigration, it would potentially overwhelm the effect of selection into emigration. Secondly, the selection patterns into drop-outs are for the most part not opposite the emigration selection patterns. For example, first generation immigrants are very slightly more likely to drop out than people without a migration background, and individuals with almost any degree are slightly less likely to drop out of the sample than people who did not finish school (although the effects are not necessarily statistically significant). The exception is that in most of the regressions, the marginal effect on being a second generation immigrant is negative. However, they are for the most part not statistically significant, and the absolute effect sizes of -.01-.02 is far smaller than the marginal effects in the emigration regressions of around .7. Hence, even if the additional .01-.02 percentage point of individuals without a migration background who drop out compared to second generation immigrants all move abroad, this would hardly alter the estimated marginal effect in the emigration regression.

Table 2.11: Estimated marginal effects of drop-out regression for adult members of the German Socio-Economic Panel

	Dropout 1 (1)	Dropout 2 (2)
Education (Omitted category: Did not complete mandatory schooling)		
In school w/o degree	.	-.015 [.011]
Education Missing	-.031 [.020]	.018 [.020]
Lower of middle secondary w/o a vocational degree	-.0004 [.004]	-.003 [.010]
Lower of middle secondary w a vocational degree	-.010 [.0005]***	-.027 [.011]**
Upper secondary w/o a vocational degree	-.010 [.004]***	.001 [.013]
Upper secondary w a vocational degree	-.002 [.006]	-.016 [.010]
Tertiary degree	-.008 [.004]***	-.024 [.008]***
Migration Background (Omitted category: No migration background)		
First generation immigrant	.0006 [.003]	.014 [.008]*
Second generation immigrant	-.007 [.004]***	.009 [.013]
State and year fixed effects	x	x
Pseudo R2	.1647	.0965
N	281,878	383,381

Source: Author's estimation based on the 1984-2011 German Socio-Economic Panel.
Notes: 1) ***/**/* indicates that the estimated log-odds are statistically significant at the 1/5/10% level. 2) Other control variables are age, gender, labor force status, unknown migration background, and migration background of unknown type. 3) The marginal effects estimate the change in the probability of emigration, measured in percentage points, due to a one-unit change of the continuous variables (evaluated at the mean) or of the indicator variable relative to the reference category.

2.5 Conclusion

This study sought to investigate whether concerns of a brain drain among second generation immigrants in Germany were justified. I came to the following conclusions:

First, emigrants from Germany are more frequently either in the least or most educated category than the population at large. This was expected: Prior studies, such as by Erlinghagen et al. (2009), also found that people with academic degrees as well as those without vocational training were more likely to emigrate. The result is moreover potentially consistent with Borjas's 1987 model of emigrant selection. Compared to the 1980s, the likelihood of emigration rose for individuals with upper secondary education relative to high school drop-outs, and decreased for people with lower and middle secondary education and with tertiary education in recent years.

Secondly, even once personal characteristics are controlled for, first and second generation immigrants are significantly more likely to emigrate. More specifically, first and second generation immigrants are 1.2 and .6 percentage points more likely to emigrate in a given year, which is large compared to the mean emigration probability of around .3. The higher emigration probability of first generation immigrants was already known through prior research (c.f. Erlinghagen et al. (2009); Uebelmesser (2005)). In contrast, the higher emigration propensity of second generation was suspected but not demonstrated previously. However, in more recent years, this higher emigration likelihood has been slightly decreasing for first and second generation immigrants alike.

Thirdly, the average attitudes towards foreigner in a given state and year for the most part do not have a statistically significant relationship with emigration. However, for several reasons, this result does not imply that we can confidently conclude that attitudes towards foreigners have no influence on migration. One reason for the lack of a significant relationship may be that attitudes vary strongly within one state and state-level attitudes might therefore not reflect the individuals' experiences. Another reason may be that people move within the country rather than abroad if faced with hostile attitudes. A third reason might be that the measures of attitudes that I used are not the relevant ones.

Fourthly, self-reported discrimination experiences are associated with a higher emigration probability, as is a very low (but also a very high) identification with being German, and a bilingual everyday life. Constant and Massey (2002) had found a similar effect of German citizenship. The fact that bilingual individuals and people with a very high degree of identification

with Germany are more likely to emigrate than others is also in accordance with the results presented by Aydin (2013), who suggest that emigration of the second generation is often not a testimony to failed integration, but that it on the contrary may be the well-integrated individuals who move.

Fifthly, I found that emigration intentions were predictors of actual emigration within the following five and ten years; but that the predicted patterns of emigrant selection are somewhat different when actual emigration events rather than intentions are studied. For example, emigration intentions would over-state emigration among highly educated individuals.

To conclude, as had been speculated in the German press, second generation immigrants are indeed more likely to emigrate from Germany than people with similar characteristics who do not have a migration background. However, I did not find that a disproportionately large number of university graduates are emigrating from among this group. Rather, it appears that the percentage of emigrants who have tertiary education is similar between the group without a migration background and second generation immigrants. This last piece of evidence as well as the fact that the increased likelihood of emigration among second generation immigrants is not that large and has recently even declined suggest that fears about a brain drain among second generation immigrants may be over-blown.

Nonetheless, the higher likelihood of emigration among second generation immigrants may be a concern for some, in particular if there are fears that these individuals are driven away from Germany by discrimination experiences. Future research should attempt to further understand whether it is for example discrimination in the labor market or everyday life and/or the increased knowledge about another country and better language skills that make second generation migrants more prone to emigrate.

Chapter 3

Self-Employment and Business Ownership among Mexican Return Migrants

Abstract

Mexico's economy has long been characterized by large migration flows, while its self-employment rate is sizable but comparable to that of other countries in the region. Up to now, little is known about how these two phenomena are linked. Based on household and microenterprise surveys, I studied the association between return migration and self-employment outcomes. I found that return migration was associated with lower- but also with higher-profit forms of self-employment. On the one hand, return migrants are more likely to be self-employed without employees, and to have entered self-employment out of a lack of other options, than non-migrants who have similar characteristics in terms of age, sex, education and location of residence. Moreover, they are not more likely to own businesses. On the other hand, microenterprises owned by return migrants on average use higher levels of capital. These results suggest that for a subset of return migrants, help with the re-integration into the paid employment sector could be beneficial, while other return migrants can help contribute to Mexico's economic growth through becoming self-employed.

In Mexico, jobs in the formal economy are relatively scarce and income inequality is stark (Organisation for Economic Co-operation and Development, 2011, 2012). Faced with this situation, many people choose to either move abroad, albeit often only temporarily, or to become self-employed: In 2010, the emigration rate was 11%, more than twice the Latin American average, while the 2008 self-employment rate of 27% was comparable to those in Argentina, Brazil and Chile (World Bank (2012); International Labor Organization (undated)). Both self-employment and migration can be tremendous sources for economic development. However, people often move abroad or become self-employed out of necessity rather than choice. Those cases are unlikely to be as conducive to supporting long-term economic growth as 'opportunity' forms of migration and entrepreneurship (cf. Acs and Amorós (2008); Wong et al. (2005); Van Stel et al. (2005)).

There is a wide body of research investigating how migration affects home countries.[1] Among the mechanisms through which this effect can take place are that it can lead to a loss of valuable skills in the labor market (brain drain), but potentially alter the skills distribution through the return of emigrants who gained skills while abroad (brain gain) (Gmelch, 1980; Dustmann and Weiss, 2007) or though changed labor force participation rates and changed investments in human capital (Beine et al., 2008). Moreover, remittances (Taylor, 1999; Rapoport and Docquier, 2006)[2] and return migrant savings can boost consumption and investment in the country of origin.

One potential mechanism that has not yet been investigated very intensively is the self-employment of return migrants. In the Mexican context, Thom and Xu (2010), Massey and Parrado (1998), and Papail (2002) focused primarily on the relative likelihood of self-employment among return migrants compared to non-migrants. Studies on other countries focus either on the same question or on whether the migration duration and savings were different between return migrants who chose to become self-employed compared to those who didn't (Mesnard, 2004; Ilahi, 1999; Piracha and Vadean, 2010; Dustmann and Kirchkamp, 2002; McCormick and Wahba, 2001; Démurger and Xu, 2011; Zhao, 2002; Black et al., 2003). With the exception of Piracha and Vadean (2010), who distinguished between self-employment with and without employees, there is relatively little emphasis placed on distinguishing the type and quality of self-employment.

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[1] For concise introductions, consult for instance Hanson (2010, pp. 4386-4396) and Katseli et al. (2006).

[2] See Hanson (2007), Durand et al. (1996), Woodruff and Zenteno (2007) and Canales and Armas (2004) for empirical research in the Mexican context.

In this paper, I therefore seek to close this gap and to investigate whether Mexican return migration is linked with opportunity forms of entrepreneurship. In light of the currently increasing number of people who return from the United States to Mexico (Passel et al., 2012), the issue is of particular relevance today. In particular, I first investigated whether the likelihood of self-employment (without employees) and business ownership (with at least one employee) is different for returnees than for others. Moreover, I also looked at whether self-employment gets entered into voluntarily, whether migrant-owned businesses have different characteristics in terms of for instance profits, and which mechanisms are behind these different outcomes.

In order to address these questions, I first suggest a simple model of the choice between self-employment and paid employment. The aim of the model is to show how differences in human, social and financial capital may translate to differences in the rates and types of self-employment between migrants and non-migrants. Based on this model, I expect return migrants to be more likely to be self-employed voluntarily due to higher levels of financial capital, and also more likely to be self-employed involuntarily due to lower levels of social capital.

Secondly, I analyze representative Mexican household and microenterprise surveys (the 2002 National Employment Survey's[3] migration module (Instituto Nacional de Estadística y Geografía , 2004) and the National Microenterprise Survey[4] (Instituto Nacional de Estadística y Geografía , 2010)). With the exception of Woodruff (2007) and Woodruff and Zenteno (2007), who investigated how migration networks affect self-employment outcomes, the microenterprise survey has to my knowledge not yet been used in migration research. Based on the household survey ENE, I compared the frequency of self-employment and business ownership between migrants and non-migrants using summary statistics and regression analyses that control for personal characteristics (age, sex and education level) and location characteristics (size of locality and state). Based on the microenterprise survey, I also investigated how selected business characteristics such as the number of employees, revenues, expenditures, capital and income differ between the two groups. Together, this provides us with evidence about how the likelihood and the quality of self-employment and business ownership are different for return migrants compared to non-migrants.

Thirdly, using regression analysis of ENAMIN data of characteristics such as motive for starting the business and sources of start-up funding as

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[3]Encuesta Nacional de Empleo – National Employment Survey.

[4]Encuesta Nacional de Micronegocios - National Survey on Microcompanies

well as an analysis of the existing literature on return migrant selection, I aim to determine whether differences in personal characteristics, human, social and financial capital are responsible for the differences in self-employment and business outcomes that are cited above.

The main limitation of the study is that the results on the link between return migration and self-employment are descriptive rather than causal. First, I did not control for selection into emigration and return migration, despite the fact that it is likely that factors that affect the emigration and return migration decisions also affect decisions about whether to become self-employed and business outcomes. For example, in terms of the characteristics that are discussed in my model, return migrants may already have higher levels of financial wealth than non-migrants prior to emigrating; which will affect their probability of becoming self-employed and their business outcomes in ways that have nothing to do with their emigration experience. Other characteristics that may be correlated with both migration and self-employment outcomes are human and social capital and risk aversion. Secondly, savings, and human and social capital, which play a role in my model, are only observed by proxy. Thirdly, neither the model nor the empirical part control for outside factors such as regulations, which likely also affect self-employment outcomes.

The empirical results suggest that while self-employment is indeed around 2.5 percentage points more likely among returnees, owning a business is not. This is in contrast to Thom and Xu's 2010 result, but this is probably due to a different definition of business ownership which in contrast to their definition requires that a business has least one employee. Moreover, return migrants are five percentage points more likely to be self-employed out of necessity. I also found that return migrant-owned operations tended to have thirty percent more capital, but that given their capital level, they were not more profitable than other microenterprises.

Based on descriptive results, it appears that the return migrants' above-average self-employment rate is at least in part driven by necessity rather than choice. Higher capital levels, rather than newly acquired skills, appear to be the main mechanism by which the average migrant-owned operation differs from that of a non-migrant. Hence, helping returnees who would rather be employees re-integrate into the labor market and making their savings available to others through an efficient credit market system might lead to better outcomes for both return migrants and non-migrants and might ultimately encourage growth.

The structure of the paper is as follows: Section 1 contains the model sketch. Section 2 describes the empirical approach. In section 3, there is

a description of the data source including summary statistics. Section 4 contains the empirical estimates, and section 5 concludes the paper with a summary and a discussion of the policy implications.

3.1 Model

3.1.1 Model Introduction

The purpose of the following model is to outline the mechanisms I believe to lie behind differences in self-employment outcomes between migrants and non-migrants. Its purpose is distinctly not to provide a comprehensive account of why and which type of individuals choose to move abroad and return and the implications of this choice on economic outcomes.[5]

3.1.2 Model

There are two periods in the model. During the first period, individuals were able to choose between moving abroad and staying in Mexico.[6] However, I take this first-period decision, as well as the decision whether or not to be in Mexico in the second period, as a given and focus solely on the second-period decision between pursuing paid or self-employment. This focus mirrors the analysis in the empirical part, in which the emigration and return migration selectivity are also not accounted for.

The model does not distinguish between self-employment, i.e. being an own-account worker without any employees, and business ownership, i.e. self-employment with at least one paid employee. The implicit assumption is that individuals will be business owners if they have access to the required threshold level of capital, which is higher for business ownership than for self-employment[7] and if their business, given their industry, personal characteristics and level of capital would yield a higher profit if they had employees than if they didn't. In the empirical part, I nevertheless modeled these two outcomes, which I defined as mutually exclusive, separately.

I assume that the individuals' utility depends on their consumption level Y_i. I furthermore assume that all individuals have the same utility function, and that individuals can only pursue one activity A_i, where A_i equals either

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[5]For such a comprehensive model, consult for instance Dustmann and Kirchkamp's 2002 model on optimal migration duration and activity choice after re-migration.

[6]For the sake of simplicity, I did not discuss internal migration separately in the model.

[7]The median level of capital for companies of self-employed workers is less than one tenth of the median capital level for companies of business owners.

E_i (for paid employment) or S_i (for self-employment), at a time.

$$U_i = U(Y_i) \tag{3.1}$$

Utility U_i rises in consumption ($\partial U_i/\partial Y_i > 0$). The individuals' consumption is equal to their income from the current period I_i and their savings Sav_i, minus the (financial) capital invested in their company if they are self-employed, k_i:

$$Y_i = I_i + Sav_i - S_i k_i \tag{3.2}$$

Their income is either equal to their profits if they are self-employed or to their wages if they are employed. There is no uncertainty about the wages or profits they would make from either activity at the time that they take the decision which activity to pursue. However, not all individuals receive a job offer (i.e. have the option of pursuing paid employment at a positive wage rate).

$$I_i = \begin{cases} w_i & \text{if } A_i = E \\ \pi_i = \pi(k_i, h_i) & \text{if } A_i = S \end{cases} \tag{3.3}$$

and

$$w_i = \begin{cases} \omega & \text{with probability } p(s_i) \\ 0 & \text{with probability } (1 - p(s_i)) \end{cases} \tag{3.4}$$

The individual is faced with a wage rate that is either fixed at level ω or equal to zero. The probability of being offered paid employment at wage ω rises with the individual's level of social capital s_i ($\partial p(s_i)/\partial s_i > 0$). For the purpose of this paper, I define social capital as the number and strength of the social contacts an individual has access to, and understand this social capital to be "appropriable for productive use by an actor in the pursuit of her interests" (Sandefur and Laumann (1998), paraphrasing Coleman (1990)).[8] While Mouw's 2006 elaboration on the reasons why it is difficult to causally prove that higher levels of social capital are associated with particular economic outcomes holds, it nonetheless is reasonable that someone with more contacts may hear about more job opportunities and that personal recommendations may lead to job offers. In fact, the concept has been so accepted in international migration research that social capital (in the form of social networks in countries of destination) is seen as a major driver of migration and "can readily convert into jobs and earnings" (Massey (1987), cited in Aguilera and Massey (2003)).

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[8]For a broader discussion and definition of the concept, see for instance Sandefur and Laumann (1998).

The level of profit the individual can expect to receive if he chooses to be self-employed is a function of his financial and human capital. I assume that it rises in both ($\partial \pi_i(k_i, h_i)/\partial h_i > 0$ and $\partial \pi_i(k_i, h_i)/\partial k_i > 0$). The limited evidence for this in the data is that a company's profit rises in observable human capital (their education level) and slightly in the company's capital.

The individual will compare the net income under both paid and self-employment, and will pick the activity which yields the higher net income. From this, there emerge several possible types:

- Type 1 are individuals for whom

$$\omega + Sav_i < \pi_i + Sav_i - k_i \tag{3.5}$$

  This group always takes up self-employment because their net profits exceed the fixed wage rate thanks to the individuals' higher financial or human capital. I define this group as 'voluntary' or 'opportunity' entrepreneurs since they would rather be self-employed even if they receive a job offer. Empirically, about 85% of the microenterprise sample appear to have started their business voluntarily because it would yield immaterial or material benefits for them compared to other activities; and more than a quarter specifically state that they chose self-employment because they thought they would make more money than as employees.

- Type 2 consists of individuals who are made a job offer at wage rate ω and for whom

$$\omega + Sav_i > \pi_i + Sav_i - k_i \tag{3.6}$$

  These individuals will choose to become employees because the wage rate is higher than their profits would be.

- Finally, there is a third type for whom (3.6) holds as well, but for whom $w_i = 0$, i.e., they are not able to find a job. These individuals will become self-employed. However, they do so involuntarily in the sense that they would not have chosen to do so if they had had a job offer. I define this group as 'involuntary' or 'necessity' entrepreneurs. Empirically, around 15% of the microentrepreneurs in the sample are in this category.

Everything else being equal and ignoring general equilibrium effects, rising levels of human and financial capital would move more individuals from types 2 and 3 into type 1: The prevalence of voluntary self-employment will

increase, and this is thanks to people moving out of both paid employment and involuntary self-employment into voluntary self-employment. In contrast, a rising level of social capital will move individuals from type 3 into type 2: there will be fewer involuntary entrepreneurs because fewer people will not receive a job offer.

I make the following assumptions about how financial, human and social capital are determined:

I assume that financial capital is equal to an individual's savings, which are a function of their initial (pre-first period) wealth endowment that they may have for instance acquired through an inheritance or a monetary gift, as well as their savings rate times their period 1 income. Their period 1 income, in turn, depends on whether they were living in Mexico or the United States. I assume that the income is higher in the United States than in Mexico, so that return migrants would have higher levels of financial capital, provided that their initial endowments are on average as high as of non-migrants and that their savings rate is not lower than among those who stayed in Mexico. Empirically, I found that return migrant-owned companies have higher capital levels and are more likely to have been started using the owner's savings.

I assume that at the start of their working life, individuals have an initial endowment with human capital. In period 1, this is changed at different rates by working in the US or in Mexico, but I do not make any assumptions about whether on or the other increases human capital more, since existing theoretical and empirical research on the topic yield ambiguous answers: While some models of return migration (e.g. Dustmann and Weiss (2007)) make the assumption that return migrants have higher levels of human capital than prior to their emigration and Reinhold and Thom (2009) and Zahniser and Greenwood (1998) found Mexican emigrants experienced increases in human capital while abroad that are remunerated in the Mexican labor market, the model by Dustmann et al. (2011) shows that this is only true under certain circumstances; and Lacuesta (2006) does not agree that observed earnings advantages of return migrants are due to human capital gains while abroad.

Finally, I assume that the individuals' social capital is equal to their original endowment for non-migrants; but that for return migrants, this initial endowment is decreased. There are several reasons why we might believe that migration can reduce local social capital. The first one is that individuals who moved abroad might lose some contacts during that time. Moreover, they might already have invested less in social capital than non-migrants prior to emigration (cf. Glaeser et al. (2002)).

3.1.3 Model Implications

Based on the model's assumption, I expect the following differences in the likelihood and type of self-employment:

1. Provided that the original endowments in human, social and financial capital are similarly distributed between migrants and non-migrants and that being a migrant is at least not harmful to human capital, self-employment would be more common among return than among non-migrants. This would occur for two different reasons:

   - Lower levels of social capital s_i among migrants makes it more likely that no job offer ($w_i = 0$) is made and that more return migrants are 'forced' into self-employment (more 'involuntary'/'necessity' entrepreneurs).

   - Higher prospective profit levels, thanks to more financial capital k_i and possibly more human capital h_i make self-employment more attractive than paid employment at wage ω for a larger share of people (more 'voluntary'/'opportunity' entrepreneurs).

2. Return migrant–enterprises would on average have more capital. Moreover, in general, the capital level k_i among necessity entrepreneurs will be lower than among voluntary entrepreneurs.

Obviously, the assumptions of equal distribution of pre-emigration characteristics and of an equal savings rate between migrants and non-migrants are quite strong, given that prior research has shown that migrants differ from non-migrants in many ways (e.g. Caponi (2010); Chiquiar and Hanson (2005); Durand et al. (2001); Moraga (2011); McKenzie and Rapoport (2010)), although there is no consensus on how exactly they are different. If the original endowment with social capital is higher among return migrants than among non-migrants, the differences in the prevalence of necessity entrepreneurship would decrease and potentially reverse; while a lower initial endowment in that group would have the opposite effect. Higher initial endowments with human and/or financial capital and a higher savings rate among return migrants would increase the gap in the frequency of voluntary self-employment, and the reverse would have the opposite effect.

In the next part, I describe the empirical approach used to test the model's implications.

3.2   Empirical Approach

I based the majority of the empirical analysis presented in this paper on summary statistics as well as on regression analysis. Depending on the outcome measure used, the analysis is carried out using ordinary least squares and probit regressions. For example, I analyzed the outcomes of self-employment and business ownership, whether or not an individual used a certain type of start-up funding, whether or not their company uses professional or another type of accounting and whether they are registered with private or public entities using probit regressions, and profits, income, revenues and expenditures using ordinary least squares.

The difference in outcomes between non-migrants and internal and return migrants is identified by including explanatory variables that indicate the migrant status. I added a number of further control variables to the regressions that account for the fact that migrants on average have basic demographic and educational characteristics that are different from those of non-migrants, and that their distribution across types of localities (in terms of their size) and across states differs. Due to these differences in characteristics, the raw differences in outcomes between non-migrants and migrants over-states how different the outcomes really are for individuals who are similar to each other except for their migration background. In some of the business outcome regressions, I moreover controlled for company characteristics such as economic sector and capital levels.

The model sketch predicts that there are different types of entrepreneurs – those that are 'forced' into it by a lack of other options, and those who enter voluntarily. Since the links between the outcomes and the explanatory variables may differ for these groups, I also ran separate regressions by the stated motive for starting the business, as well as by educational background.

The estimated coefficients on the return migrant variable in the regressions do not present a causal estimate of the effect of return migration on the probability of becoming self-employed or a business owner and on the business outcomes. Instead, they only control for certain observable characteristics such as age, gender and education. They cannot account for pre-emigration differences for example in savings, social and human capital, but also in prior self-employment and risk aversion, as would be required to estimate causal effects. Moreover, even though I am interested in understanding the mechanisms that lie behind different business outcomes of non-migrants and return migrants, I am also not able to directly measure post-emigration differences in savings, social and human capital. Instead, I use proxies in order to measure these outcomes: As will be described in more

detail in section 4.2, I use information on the firm's capital and the source of their start-up funding, on the type of activity pursued while abroad and on the companies' return on assets, and on the motive for starting a business and the probability of obtaining further funding to make inferences about the individuals' financial, human and social capital, respectively.

3.3   Data and Descriptives

I based the empirical analysis in this paper on household and microenterprise surveys carried out by the Mexican National Institute for Statistics and Geography (Instituto Nacional de Estadística y Geografía – INEGI). The household survey ENE (Instituto Nacional de Estadística y Geografía , 2004) reveals whether the relative frequency of self-employment and business ownership is higher among returnees than among internal migrants and non-migrants, while the microenterprise surveys ENAMIN (Instituto Nacional de Estadística y Geografía , 2010) provide information on their company characteristics. These data sources have several strengths for studying the topic at hand. First, the microenterprise surveys are representative of urban areas, and the household as well as the 2008 microenterprise surveys are nationally representative. Secondly, the microenterprise survey has rich information on company characteristics, which allows an in-depth view at how migrant-owned companies differ from others, and what some of the mechanisms behind different outcomes are. The main disadvantages are that there is no data on pre-emigration outcomes nor on the individuals' complete migration histories.

Table 3.1 provides an overview of the key variables used in this paper, their definitions or proxy measures, and their equivalent in the model sketch, if available.

The household survey is a migration module added to a general household survey (the ENE[9]) in the second quarter of 2001 (Instituto Nacional de Estadística y Geografía , 2004).[10] Based on these data, we can draw the fol-

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[9]Encuesta Nacional de Empleo – National Employment Survey.

[10]In order to ascertain that the results presented in this paper are not time-dependent, I also studied the likelihood of self-employment and business ownership using the 1997, 2006 and 2009 National Survey of Demographic Dynamics (Encuesta Nacional de la Dinámica Demográfica – ENADID). Given that the ENAMIN sampling is based on the ENE and its successor survey, and that the definition of a return migrant varies between the ENE migration module and most of the ENADID surveys, I chose to report only the results from the migration module. Overall, the results based on the different surveys are qualitatively similar.

lowing conclusions about people who used to work in the United States and returned to Mexico (see table 3.2): They are on average 4.5 years older, more frequently male and married, tend to have less education and more frequently live in rural areas than individuals who either moved across state borders or who never moved. 3.7% of the sample has worked in the U.S. On average, they returned about eight years ago, and their last migration spell lasted one and a half years. While the average number of moves was 10, about 50% of the migrants moved to the U.S. only once. Three-quarters had no documentation during their last migration spell.

Return migrants are thus quite different from non-migrants. But how does this translate to their labor market outcomes? Most notably, the labor market participation and percentage working is much higher among return migrants than among non-migrants – 84 versus 60 and 82 versus 59%, respectively. Secondly, at 25% the self-employment rate is almost double for return migrants, whether we compare them to non- or internal migrants. Thirdly, 5% of return migrants are business owners compared to 2% of non-migrants and 3% of internal migrants.

In order to study company characteristics in more detail, I used the microenterprise survey ENAMIN[11]. It was carried out in 1992, 1994, 1996, 1998, 2002, 2008 and 2010, of which I analyzed all but the first and last waves.[12] A sample of individuals who indicated in their ENE or ENOE interviews that they were self-employed or business owners of companies with less than 6 employees[13] was asked to reply to this additional survey. Since in 2009, around 95% of Mexican enterprises had 10 employees or less, this represents a large majority of companies (Instituto Nacional de Estadística y Geografía , 2011). Up to and including the 2008 wave, interviewees were asked to name their last place of residence, so that internal and return migrants could be identified. Across all ENAMIN years, roughly 2% of interviewees are identified as international and 31% as internal (across state-boundary) migrants.[14]

Around one-fifth of the return migrants observed in the ENAMIN are business owners, while this is only the case for 15% of people who still live

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[11]Encuesta Nacional de Micronegocios - National Survey on Microcompanies

[12]I did not use the 1992 data because I was not able to find a codebook that would have allowed me to determine who the international return migrants were. I did not use the 2010 data because they did not contain any migration information.

[13]15 in the case of manufacturing companies.

[14]During the 1990s, this question was not asked of people who live in their place of birth. Moreover, it is not possible to identify individuals as return migrants who have moved within Mexico since their return from abroad. In the appendix, I provide evidence that return migration is nonetheless relatively precisely measured.

Table 3.1: Key variables and their definitions or proxy measures

Variable	Definition/Measures	Model Equivalent
Migration		
Non-migrant	ENE: Never lived in another state or in the United States ENAMIN: Still lives in town of birth (1994-1998)/Never lived in another state or the US (2002-2008)	$M_i=0$
Internal Migrant	ENE: Ever lived in another state ENAMIN: Someone who moved across state boundaries. Before 2002, people who returned to their hometown were not part of this category.	–
Return Migrant	ENE: Ever worked in the United States ENAMIN: Someone who lived in the United States before living in the current municipality. Before 2002, people who returned to their hometown were not part of this category.	$M_i=1$
Type of Employment		
Self-Employed	Own-account worker without any employees	
Business Owner	Self-employed individual with at least one employee	$S_i = 1$
Business Outcomes		
Income	Answer to question: "What does your business leave you at the end of the month?"/"What do you obtain in earnings after discounting costs?"	I_i (if self-employed)
Expenditures	Expenditures over the past month	-
Revenues	Revenues over the past month	-
Profit	Revenues-Expenditures	π_i
Return on assets	Income/Financial Capital	-
Types of Capital		
Financial Capital	Value of firm's equipment (including location and cars)	k_i
Social Capital	Proxy: Reason for starting business – Voluntary vs. involuntary	s_i
Human Capital	Proxy: Return on assets/Profit given capital level	h_i

Table 3.2: Summary Statistics of Characteristics of Migrants and Non-migrants aged 16-65, 2002 ENE Migration Module

	Non-migrant	*Internal Migrant*	*Return Migrant*
Demographics			
Age	34.0 [.00]***	37.9 [.00]***	38.6 [.01]
Female (%)	54.6 [.01]***	53.3 [.01]***	16.4 [.02]
Married (%)	49.1 [.01]***	57.2 [.01]***	68.4 [.03]
Live in rural areas (%)	25.8 [.01]***	9.5 [.01]***	32.9 [.03]
Live in cities (%)	45.7 [.01]***	72.3 [.01]***	35.8 [.03]
Education			
<primary school (%)	24.0 [.01]***	18.3 [.01]***	29.7 [.03]
Primary school (%)	23.8 [.01]***	23.4 [.01]***	31.9 [.03]
Lower secondary (%)	27.3 [.01]***	25.8 [.01]**	23.2 [.03]
Upper secondary (%)	14.8 [.01]***	17.3 [.01]***	9.4 [.02]
Post-secondary (%)	10.1 [.00]***	15.2 [.01]***	5.7 [.01]
Labor Market Characteristics			
Average hourly income	19.3 [.01]***	25.2 [.01]***	22.9 [.02]
In labor force (%)	60.0 [.01]***	63.1 [.01]***	84.0 [.03]
Working (%)	58.6 [.01]***	61.6 [.01]***	81.6 [.03]
Self-employed (%)	13.8 [.01]***	13.5 [.09]***	25.1 [.03]
Business owners (%)	2.1 [.00]***	3.4 [00]***	5.1 [.00]
N	121,554	43,785	6,028

Notes: 1) Standard Errors in brackets. 2) ***/**/* indicate that the mean values for individuals who never migrated or who lived in another state are significantly different for the mean values for international migrants at the 0.01/0.05/0.1 significance level. 3) Rural areas have less than 2,500 inhabitants and cities have more than 100,000 inhabitants. 4) The average income is restricted to positive wages. 5) Non-migrants are defined as individuals who never lived in another state, internal migrants as those who did, and return migrants are those that worked in the United States.

in their home town and 17% of internal migrants. As seen in table 3.3, the distribution across sectors is very similar for non-migrants and migrants - the only statistically significant difference is that internal migrants appear to more frequently work in the manufacturing sector than international migrants.

Table 3.3 also shows that migrant-owned enterprises are on average larger than those owned by non-migrants in terms of the number of employees, revenues, expenditures, net income, capital and profit. When looking at kernel density estimates (not shown), the main consistent observation that can be made is that these higher averages in revenues, expenses, net income and capital are in large part due to fewer migrants having very low levels of revenues, expenses, net income and financial capital. The differences that stand out most are that the average net income is around 4,900 pesos for return migrants versus 3,400 pesos for non-migrants, and that the average capital level that their companies have access to is 52,000 versus 31,700 pesos, respectively.

The only measure which has a lower average value for international migrant-owned enterprises than for others is the return on assets, defined here as the ratio of net income to total capital, but the differences are not statistically significant. At averages around 3, the returns on assets are surprisingly large: This means that every month, the income to the owner from the business is about three times as large as the value of their capital. McKenzie and Woodruff (2008), in contrast, found returns of around 20% for investments below US $200 (roughly 2000 pesos) and 5% for investments between $400 and $800. However, unlike McKenzie and Woodruff's estimate, my return of asset measure does not take into account that the most expensive input in most of the micro-enterprises is likely to be the owner's own labor. Indeed, if we subtract the individuals' reservation wage - the wage offer for which they would stop being self-employed - from their net income as is possible in the 2008 ENAMIN, the value of the return on assets actually becomes negative.[15]

One of the predictions of the model was that companies that were established because the individual could not find paid employment had less financial capital than those established voluntarily. This is borne out by the data: Companies started for necessity reasons (because people could not find another job or were fired) on average have access to 22,524 pesos

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[15]Interestingly, many individuals name reservation wages that are on the order of ten times their current net income, suggesting that they either value being self-employed very highly for reasons beyond monetary returns or that the wording of the question was not clear enough.

Table 3.3: Characteristics of Companies by 16-65 year olds in the 1994-2008 ENAMIN

	Non-Migrant	Internal Migrant	Return Migrant
Sector			
Manufacturing (%)	15.6 [.01]	13.1 [.01]	15.4 [.06]
Construction (%)	6.8 [.01]	8.2 [.01]**	7.7 [.05]
Retail (%)	36.3 [.01]	35.2 [.02]	34.5 [.08]
Services (%)	35.5 [.01]	37.1 [.02]	38.0 [.08]
Financial Characteristics			
Net income	3,422 [44]**	3,194 [54]***	4,938 [648]
Revenue	11,730 [18]***	9098 [1143] ***	13,499 [998]
Expenditures	8,815 [166]***	10,485 [258]	11,149 [45]
Profit	2,116 [31]**	2,116 [55] *	2,606 [371]
Value of capital	31,738 [565]***	33,313 [1047]***	52,308 [4480]
Return on assets	2.9 [.1]	2.7 [.1]	2.1 [.6]
% w/o salaried employees	85.8 [.1]***	82.8 [.3]***	77.5 [1]
# workers	0.51 [.03]***	0.62 [.1]*	0.72 [.2]
# salaried employees	0.27 [.004]***	0.32 [.008]**	0.44 [.04]
N	36,096	16,358	1,043

Source: Author's calculations based on the 1994, 1996, 1998, 2002, 2008 ENAMIN (Instituto Nacional de Estadística y Geografía , 2010).

Notes: 1) Standard Errors are in brackets. ***/**/* indicates a statistical significant difference to the mean for international migrant at the 1/5/10% significance level. 2) Non-migrants are individuals who are living in their town of birth (1994-1998) or who did not live outside of their state of birth (2002-2008). Internal migrants previously lived in a state outside of their current one and return migrants previously lived in the United States. 3) "Net income" is the answer to the question 'What does your activity or business leave you at the end of the average month?'(2008) or 'What do you obtain in earnings (approximately) after discounting costs?'. The capital level is trimmed at the 99th percentile. The return on assets is calculated as net income over capital, and profit as revenue minus costs.

of capital, while those started for opportunity reasons have access to 51,270 pesos of capital. Companies that were started for flexibility or 'other' reasons - considerations that are not included in the model - have 47,468 and 30,914 pesos of capital, respectively.

Table 3.4 reports the main source of financing when starting the business. The omitted possibilities, such as credits from credit unions, banks or pawn shops, or assistance from government programs, account for less than 2% of cases each. It is less common for migrants to not need any start-up financing, which in around 85-90% of cases is because the business needs no financing and only in 10% of cases because they inherited it. Returnees state about ten percentage points more frequently that their main source of start-up financing was from their own savings.

Table 3.4 furthermore shows the motivation for starting a business. The main difference between migrants and non-migrants is that a lower percentage of returnees (18 versus 31% among non-migrants) start a business to supplement their family income. Since this is a reason that is predominantly given by women and since there are more male return migrants, this is not surprising. Returnees also state more frequently than non-migrants, though not than internal migrants, that they started because they identified a good business opportunity and out of necessity (the percentages are 34 and 17 for return migrants and 28 and 12 percent for non-migrants).

Finally, table 3.4 shows indicators of the formality of businesses. The measures I used include whether or not the business is registered with a public and/or private entity (such as a chamber of commerce) and whether they do not keep any accounts at all or whether they have a professional accountant. International migrant-owned businesses are about 20% more frequently registered with public and private entities. They also don't have any accounting but use professional accountants 7-10 percentage points more frequently than non-migrants. Compared to internal migrants, they less frequently use a professional accountant.

Table 3.4: Additional characteristics of companies owned by 16-65 year olds in the 1994-2008 ENAMIN

	Non-migrant	Internal migrant	Return migrant
Source of initial financing			
No need for finance (%)	17 [.2]***	18 [.3]***	11 [1]
Savings (%)	50.2 [.2]***	55.9 [.4]***	63.2 [1.5]
Private loan (%)	18.8 [.2]***	15.7 [.3]***	12.30 [1]
Reason for starting the business			
Independence (%)	16.1 [.2]***	19 [.3]	20 [1]
Supplement family income (%)	31.3 [.2]***	31.8 [.4]***	18.3 [1]
Out of family tradition (%)	7.8 [.1]	6.1 [.2]***	8.4 [.9]
Flexibility (%)	19.4 [.2]	23.3 [.3]	21.3 [1]
Out of necessity (%)	11.9 [.1]***	16.7 [.3]	16.7 [1]
Business opportunity (%)	27.8 [.2]***	35.4 [.4]	33.7 [2]
Registration			
With public entity (%)	27*** [.2]	34 [.4]	34 [1]
With private entity (%)	11.5 [.2]***	15.3 [.3]	14.9 [1]
Type of accounting			
No accounting (%)	48*** [.2]	54.7 [.4]	54.7 [2]
Professional accountant (%)	19.7 [.2]***	26.3 [.3]**	29.3

Source: Author's calculations based on the 1994, 1996, 1998, 2002, 2008 ENAMIN (Instituto Nacional de Estadística y Geografía , 2010).

1)*/**/*** indicates a statistical significant difference to the mean for international migrant at the 1/5/10% significance level. 2) Non-migrants are individuals who are living in their town of birth (1994-1998) or who did not live outside of their state of birth (2002-2008). Internal migrants previously lived in a state outside of their current one and return migrants previously lived in the United States.

3.4 Empirical Results

3.4.1 Self-employment rates and company characteristics

As was shown in the previous section, a higher percentage of the recent returnees are self-employed without employees and own businesses with employees than is true for non-migrants and internal migrants. In this section, I show that the observed differences become much smaller when controlling for observed personal characteristics in logit regressions.

First, while the unconditional prevalence of self-employment is about 11 percentage points higher among return migrants than among internal or non-migrants, once the personal characteristics (age, sex and educational attainment) and community characteristics (size of locality and state fixed effects) are controlled for, it is only 2.5 percentage points higher for return migrants (see table 3.5). Controlling for the gender distribution alone reduces the difference by one half, and the age, education and location size variables contribute about equally to reducing the difference further. The state controls, in contrast, do not contribute to reducing the difference between migrant and non-migrant self-employment rates. Secondly, differences in business ownership rates completely disappear once I added the control variables, while the unconditional mean was also more than twice as high as for non-migrants (5.1 versus 2.1%). Here, controlling for the gender distribution alone accounts for making the difference between migrants and non-migrants go away.

The model's prediction that more return migrants would be in the combined category of self-employed people without employees and business owners with employees is thus fulfilled.

In columns 2 of tables 3.5 and 3.6, I included selected migration characteristics into the regressions. In the self-employment regression, the estimated marginal effect of being an international returnee decreases slightly but remains positive and statistically significant. The probability of being self-employed is neither related to the number of moves nor to the duration of the last migration spell when they are defined continuously – the estimated coefficients are not statistically significant and are relatively small at around .001 – and an additional year since the return increases the probability of self-employment by .1 percentage points. None of the three factors are related to the probability of business ownership in a statistically significant way; and the estimated coefficients are very small.

The lack of evidence of an influence of these factors obscures underlying differences that emerge when I used categorical variables instead. For re-

turn migrants only, if the duration of the last migration was more than one year long, the probability of being self-employed is raised by around 7-10 percentage points compared to those who left for a shorter time period (although the estimated coefficient on the variable that indicates that someone left for 10 years or more is not statistically significant). No such statistically significant effect is found for business owners, even though the estimated marginal effects are positive, relatively large and rise with duration from around 1.5 to 5.5 percentage points. If the years since return are in between 1 to 4 years, both self-employment and business ownership is less likely than among those who returned less than one year ago, and the estimated coefficients are large at -.047 and -.025. The coefficients on the other duration variables are not statistically significant. In regressions restricted to return migrants only, I found that neither the receipt of remittances, nor the visa status during the last stay in the US, are correlated with the probability of being self-employed; although it should be noted that the estimated coefficients except for the 'other document' variable are negative. Having a work visa raises the probability of being a business owner, but only in one specification, and having another form of documentation besides a work visa or a green card (such as a student visa) lowers it compared to undocumented migrants.

Based on separate education-specific regressions (see table 3.11 in the appendix), I found that there is no statistically significant link between being a return migrants and being self-employed for people with a primary or less than a primary education, while among those with secondary education or higher, return migrants are 3.5-4 percentage points more likely to be self-employed than similar non-migrants. There is however still no statistically significant effect of being a return migrant on being a business owner for any education group.

In all regressions, other demographic and community characteristics have the expected effects: Depending on the precise specification, men are found to be 9 to 13 percentage points more likely to be self-employed and 2.5-4.5 percentage points more likely to own businesses than women who are otherwise similar in their characteristics, as are older individuals. Each higher education level is in general associated with a lower probability of being self-employed (for example, the estimated marginal effects range from -.01 to -.02 for primary school education and from -.06 to -.07 for post-secondary education), but a higher probability of owning a business (the estimated marginal effects range from .005 to .019 for primary school education and from .025 to .056 for post-secondary education). Similarly, self-employment rates fall with the size of the city an individual lives in (the estimated coef-

Table 3.5: Marginal effect estimates of self-employment probit regressions of 16-65 year olds, ENE Migration Module

	(1)	(2)	(3)	(4)
Ever worked in the US	.0244***	.0255***		
	(.0041)	(.0043)		
Ever lived outside state	.0009	.0001		
	(.0017)	(.0017)		
Years since return		.0009***	.0012	
		(.0003)	(.0011)	
1-4 years since return				-.0470***
				(.0169)
5-9 years since return				-.0176
				(.0165)
10+ years since return				-.0107
				(.0180)
Migration years		-.0010	-.0007	
		(.0011)	(.0035)	
Last migration 1-4 years				.0785**
				(.0313)
Last migration 5-9 years				.0979**
				(.0402)
Last migration 10+ years				.0774
				(.0625)
Number of moves		.0013	.0028*	
		(.0009)	(.0017)	
Receives remittances			-.0005	-.0005
			(.0240)	(.0240)
Work authorization			-.0203	-.0203
			(.0178)	(.0178)
Green card			-.0406	-.0406
			(.0271)	(.0271)
Other document			.0200	.0200
			(.0296)	(.0296)
Observed Probability	.155	.155	.305	.305
Pseudo R^2	.1452	.1456	.091	.0954
Observations	171,367	170,989	5,649	5,649

Source: Author's estimates based on the 2002 ENE (Instituto Nacional de Estadística y Geografía , 2004).
1) Standard errors are in brackets. *** p<0.01, **p<0.05, * p<0.1 2) The included control variables are age and age squared, sex, education level, size of locality and state; and variables for missing duration and frequency information in the duration regressions. 3) The regressions whose results are shown in columns 3-4 are restricted to return migrants.

Table 3.6: Marginal effect estimates of business ownership probit regressions of 16-65 year olds, ENE Migration Module

	(5)	(6)	(7)	(8)
Ever worked in the US	.0015	.0021*		
	(.0011)	(.0012)		
Ever lived outside state	.0025***	.0025***		
	(.0005)	(.0005)		
Years since return		-.0000	.0007*	
		(.0000)	(.0000)	
1-4 years since return				-.0250***
				(.0071)
5-9 years since return				-.0042
				(.0073)
10+ years since return				-.0019
				(.0079)
Migration years		.0000	.0005	
		(.0003)	(.0008)	
Last migration 1-4 years				.0152
				(.0184)
Last migration 5-9 years				.0290
				(.0277)
Last migration 10+ years				.0533
				(.0441)
Number of moves		.0000	.0000	
		(.0002)	(.0007)	
Receives remittances			-.0008	-.0019
			(.0121)	(.0117)
Work authorization			.0139	.0158*
			(.0093)	(.0096)
Green card			.0140	.0142
			(.0153)	(.0153)
Other document			-.0203**	-.0190*
			(.0097)	(.0098)
Observed Probability	.028	.028	.058	.058
Pseudo R^2	.1582	.1587	.0755	.0821
Observations	171,367	170,989	5,649	5,649

Source: Author's estimates based on the 2002 ENE (Instituto Nacional de Estadística y Geografía , 2004).
1) Standard errors are in brackets. *** p<0.01, **p<0.05, * p<0.1 2) The included control variables are age and age squared, sex, education level, size of locality and state; and variables for missing duration and frequency information in the duration regressions. 3) The regressions whose results are shown in columns 3-4 are restricted to return migrants.

ficients on the small town, large town and urban area variables, with rural areas as the omitted category, are equal to -.02, -.04 and -.05 in the basic specification), while business ownership rates rise with size and then drop again in large cities (the estimated coefficients on the three community size variables are equal to .008, .011 and .007).

The results that return migration and business ownership are not related are in conflict with those of Thom and Xu (2010). Since the results are stable to the exclusion of large urban areas, the restriction to rural areas only or the weighting of observations to mimic the distribution across states and community sizes of the version of the Mexican Migration Project (MMP) that was used by Thom and Xu[16], this conflict does not appear to be due to the different sample composition of the MMP and the ENE. Moreover, differences in timing do not appear to be an issue, as the result holds when using ENADID data for different years separately. Instead, the definition of business ownership is the likely explanation: I restricted the definition of business owners to having a business with at least one employee, while Thom and Xu and Massey and Parrado used the MMP business ownership variable, which is equal to 1 if individuals reply in the affirmative to the question of whether they own a business without specifying a minimum number of employees.

At surface value, the result of a lack of a relationship between return migration and business ownership is consistent with the findings of Massey and Parrado (1998), who found no relationship between the number of years spent in the United States and business ownership. However, since they used the same MMP data and their definition of business ownership may thus encompass self-employment as defined in this paper, they are in fact at odds. However, Massey and Parrado controlled for many more variables such as repatriated savings and remittances, other household assets and community factors. In particular the repatriated household savings are a major reason why in the model, self-employment is more common among return migrants than among others; and their inclusion is therefore expected to lower the effect.

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[16]Using appendix A of MMP (undated), I counted the sample sizes for each state and community type (using the community size as reported by the MMP of the census year closest to the interview year to determine whether the community was in a rural area, small or large town or city). I calculated the share of selected samples of the total sample size in the MMP124. In the ENE migration module, I then calculated the share of observations of each category. An adjustment factor for was calculated that was equal to (Observed share of category in ENE migration module/Share of category in MMP124 sample). The logit regression was then re-run with probabilistic weights.

These results somewhat undermine the hypothesis that return migration occurs because individuals go abroad for a certain period of time in order to accumulate skills or financial resources that allow them to start a business, as is for example suggested by Dustmann and Kirchkamp (2002). However, it is still possible that for many people, wanting to start a business is an important driver, and that the accumulated human and financial capital allows them to start a different type of business. This is what I investigated next.

Prior research on earnings premiums for return migrants in Mexico concluded that return migrants earn more than comparable non-migrants (c.f. e.g. Zahniser and Greenwood (1998), Lacuesta (2006), and Reinhold and Thom (2009, 2011)), leading to estimates of up to a ten percent wage premium for every year spent abroad. They disagree, however, about the reason behind this observed wage difference: For instance, Lacuesta argues that migrants already earn more before they emigrate, so that the earnings advantage does not represent a gain in human capital through the migration process, while Reinhold and Thom disagree.

In the ENAMIN, income is defined as what the business leaves the self-employed individual or business owner at the end of the month. As can be seen in 3.7, columns 1 and 6, the income of self-employed and business-owning return migrants are on average 4-5% higher than for similar non-migrants, but the difference is not statistically significant. Log income is negatively correlated with the number of years since return for both self-employed and business-owning individuals, but the estimated effects are small: Income is predicted to drop by around .2% for each year since return for self-employed individuals and .1% per year for business owners. Several explanations can account for this: For instance, any skills updating may disperse over time, and the savings that may have allowed more capital investment may have been used up. Another possibility is that there is some signaling value to being a recent returnee that leads to higher earnings, but that this advantage also dissipates over time. However, the influence is very small. When I carried out separate analysis by education group (results shown in appendix table 3.12), I found that only among self-employed individuals with less than a primary education does return migration appear to imply an earnings advantage of around 11%. The estimated marginal effects in the primary, upper secondary and post-secondary education are positive, and the latter even equal to .205, but not statistically significant. In the income regression for business owners, the estimated marginal effects of being a return migrant in the regressions among individuals with less than primary or primary education is equal to around .19, in the lower

secondary education is equal to -.19 and are much smaller in the upper secondary education and post-secondary education regressions; but none of these estimates are statistically significant.

When I disaggregated the analysis by motive for starting the business (see table 3.13 in the appendix), among self-employed individuals, return migration is only associated with an statistically significant earnings advantage for the category of individuals who started a business for 'other' (out of family tradition, to increase the family income and for other reasons not having to do with necessity or opportunity) reasons: their income appears to be 10% higher than for similar non-migrants. The other estimates are not statistically significant, although positive among the category of those who started it for flexibility or opportunity reasons (with estimated marginal effects of .07 and .04, respectively), and negative in the case of necessity reasons (the estimated marginal effect is -.04). For business owners, we find that while starting the business for 'other' or flexibility reasons is not associated with statistically significant higher or lower income (although both marginal effects are negative, and in particular in the case of people who started their business out of flexibility is relatively large at -.11), return migrant business owners who started the business out of necessity (because they were not able to find other work) have a net income that is more than a quarter lower than for comparable non-migrants, while in contrast returnees who start it for opportunity reasons (because they believe that they can make more money than if they were employed or because they identified a good business opportunity) have an income that is around a quarter higher than that of similar non-migrants.

For the population of self-employed and business owners as a whole, we can see that the income of individuals who started their business for flexibility and in particular for opportunity reasons is higher and the income of individuals who started their business for necessity reasons is equal or only slightly higher than for people who started out of 'other' reasons (see table 3.15 in the appendix).

To summarize, I found that on average, self-employed and business-owning migrants do not have a higher income than non-migrants. This is not necessarily at odds with the model's prediction, since the frequency of both necessity as well as opportunity entrepreneurship is predicted to increase among return migrants and the effects of these two countervailing trends on income may balance out. In fact, the results of the motive-disaggregated regressions for business owners appear to back this hypothesis up.

Another prediction of the model is that necessity entrepreneurs have lower levels of capital than opportunity entrepreneurs. I tested this by run-

Table 3.7: Regressions of financial characteristics of microenterprises owned by 16-65 year old individuals in the 1994-2008 ENAMIN data

	Self-employed				
	(1)	(2)	(3)	(4)	(5)
	Income	ROA	Revenue	Expenditure	Capital
Return from US	.0529	-.33***	.14***	.26***	.36***
	(.035)	(.08)	(.045)	(.058)	(.08)
Internal Migrant	.0249**	.0047	.0427***	.0428**	.0183
	(.0105)	(.0234)	(.0127)	(.0178)	(.0245)
Time since return	-.002***	.0010**	-.002***	-.001***	-.003***
	(.0002)	(.0004)	(.0002)	(.0003)	(.0005)
Constant	8.078***	-.128	8.621***	7.321***	8.789***
	(.0400)	(.0818)	(.0445)	(.0720)	(.0916)
N	45,269	35,891	43,232	43,703	37,364
R^2	.369	.131	.274	.299	.222

	Business Owner					
	(6)	(7)	(8)	(9)	(10)	(11)
	Income	ROA	Revenue	Expenditure	Capital	Employees
Return from US	.0411	-.287**	.0437	.0794	.303**	.0642
	(.0673)	(.133)	(.0835)	(.0851)	(.127)	(.1491)
Internal Migrant	.0312	.0367	.0393	.0723***	-.0108	.0516
	(.0203)	(.0388)	(.0249)	(.0273)	(.0387)	(.0422)
Time since return	-.001**	.0008	-.001*	-.001**	-.001	.0001
	(.0005)	(.0009)	(.0006)	(.0006)	(.0009)	.0001
Constant	8.44***	-.81***	8.81***	8.32***	10.05***	
	(.0767)	(.164)	(.103)	(.105)	(.146)	
N	8,751	7,779	8,548	9,128	8,265	10,252
R^2	.374	.287	.266	.309	.309	.031

Source: Author's estimates based on the 1994, 1996, 1998, 2002, 2008 ENAMIN (Instituto Nacional de Estadística y Geografía , 2010).
Notes: 1) All regressions control for sex, age, education category, size of locality, state and sector of economic activity. Standard errors are robust. 2) Income, Revenues and Expenditures above the 99th percentile are excluded. The dependent variables are the natural logarithm of each of their values. 3) 'Income' refers to the value given by the self-employed person or business owner to the question of "What does the business leave you over at the end of the month". 4) Return on assets – ROA – is defined as income over capital stock.

ning regressions that included variables for the start-up reason: opportunity (to earn more money or because they identified a good business opportunity), necessity (because they were fired or couldn't find work), and flexibility (because of the independence or flexibility that it offered), with other reasons as the omitted category. The results can be found in 3.14 of the appendix. I found that among the self-employed, necessity entrepreneurs had about one third less and flexibility and opportunity entrepreneurs about one third more capital. Among business owners, in contrast, necessity entrepreneurs have almost 50% less and flexibility entrepreneurs have around 10% more capital. The coefficient on having started for opportunity reasons is small (-.02) and not statistically significant.

Turning to other business outcomes, in section 2, it was seen that revenues, expenditures and capital levels of migrant-run self-employment operations were much higher than of those run by non-migrants, and that their return on assets was slightly lower. These results continue to hold in the regression analysis: Among all the self-employed, revenues were on average 14% and expenditures 26% higher than among non-migrants; while for business owners, the estimates are positive, but relative small (at 4 and 7%, respectively) and not statistically significant. For both self-employed and business owners, the capital that their business used was on average 30-35% higher. When I dis-aggregated the analysis by the motive that the company was started for, I found that opportunity entrepreneurs are the ones where we see the starkest differences the capital level: It is 55-64% higher than for similar non-migrants. In addition, return migrants who became self-employed for other reasons or business owners who started for flexibility reasons have higher capital levels, while the other estimated marginal effects are all positive but not statistically significant. The lowest estimated marginal effect is that for necessity business owners, which is only equal to .08. For the return on assets, the differences are even larger than the summary statistics had suggested: It is about one third lower than for non-migrants. The difference is even larger for individuals with a primary education or less, while for individuals with upper or post-secondary education, the difference is no longer statistically significant. When I introduced capital and capital squared as additional control variables (results not shown), this percentage difference is halved but does not disappear. Hence, even for companies that are operated by similar owners and in the same sector and at a comparable capital level, the returns on assets are lower than among non-migrants.

In addition to the financial characteristics, it is also of interest whether migrant-owned businesses generate more or less employment than others.

Former migrant businesses are estimated to employ around 0.06 more people than those of similar other owners, which is small relative to the average number of 2 employees, and the marginal effect is not statistically significant.

Finally, I investigated whether businesses were more likely to be part of the formal economy (see table 3.15 in the appendix). I found that return migrant-owned microenterprises are 4-9 percentage points more likely to be registered with public entities. There are, however, no statistically significant differences in the registration rates with private entities nor in the use of professional accountants; and the absolute values of the estimated marginal effects are small at around .01.

The empirical evidence thus suggests that return migration is associated with more frequent and more capital-intensive self-employment. However, they are not more profitable given their capital levels. As was argued in the model, though, it is to be expected that while migration leads to the accumulation of certain resources - financial, and possibly human, capital - that would support productive self-employment, it also leads to the depletion of other resources - namely, social connections – and that this loss forces some individuals into self-employment that would prefer not to be. It is thus possible that these two developments counteract each other. In the following section, I hence discuss the empirical evidence on the influence of human, financial and social capital on the self-employment outcomes of migrants.

3.4.2 Investigating possible mechanisms behind differences in entrepreneurship outcomes

As I argued in the model, possible reasons for different outcomes of migrants and non-migrants are different personal characteristics (in the model, different initial (pre-emigration) capital endowments) on the one hand and changes to their financial, human and social capital due to the migration process on the other hand.

Personal Characteristics

Observed differences in personal characteristics are an important contributor to different self-employment outcomes between migrants and non-migrants. This explains why in the summary statistics, the difference between migrants and non-migrants was in general much larger than in the estimated marginal effect of being a return migrant in the regressions. As one example, both the self-employment and the return migration rates are more elevated among

men than among women. It is therefore not surprising that we observe a higher self-employment rate among return migrants.

What, however, about unobserved characteristics? Ideally, we would like to disentangle which of the remaining, rather small, differences in migrant and non-migrant entrepreneurship outcomes are due to the migration spell and how much of it is due to differences in such factors as their unobserved ability. Given the difficulty of convincingly accounting for not only one but two selection steps - first the decision to emigrate and secondly the decision to return - in the absence of panel data that covers both the pre- and post-emigration period, this paper is descriptive and does not account for selection of unobservables.

Nevertheless, there is some prior research that can help us understand whether migrants are positively or negatively selected on unobservables. Moraga (2008) studied the selection of emigration on observables and unobservables in the 2001-2004 ENE. He compared the hourly wage distribution of emigrants one quarter prior to emigration with the wage distribution of non-migrants. He concluded that emigrants are negatively selected on both observables and unobservables, and that the selection on unobservables accounts for around 40% of the total negative selection. The main drawback of this approach is that he could not distinguish between short- and long-term migrants or control for prior migration spells, and that emigrants may experience a dip in income that makes the pre-emigration quarter unrepresentative of their usual income level. Ambrosini and Peri (2012) and Kaestner and Malamud (2013) based their analysis on the MxFLS, which collected data on the same individuals in 2002 and 2005-2006. Kaestner and Malamud did not find any evidence on selection on cognitive ability, as measured by the number of correct answers to a 12 logical reasoning questions, nor on other unobservables. In contrast, Ambrosini and Peri concluded that emigrants are negatively selected on both observables and unobservables, while return migrants are in fact positively selected. In contrast to Kaestner and Malamud, however, they did not control directly for cognitive skills, and instead defined negative selection solely based on observed differences in pre-emigration wages.

Given these conflicting results, it is not possible to come to a definite conclusion on whether positive or negative selection on unobservables exist. Moreover, with the exception of Ambrosini and Peri, the selection of return migrants is not discussed, and in their case, the conclusions are based on very few observations. Unfortunately, this implies that in the discussion below on the importance in difference of financial, human and social capital, we cannot be sure whether differences are due to differences in pre-emigration

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characteristics or changes due to the migration process.

Financial Capital

One mechanism that was identified in the model as potentially having an impact on migrant outcomes is a change in the migrants' financial capital. The empirical evidence suggests that this mechanism does indeed play a role.

The first piece of evidence is the on average higher level of capital held by migrant-owned self-employment enterprises: As was seen in the prior section (see table 3.7), return migrant-owned operations have around 30-35 percent more capital than those owned by similar non-migrants. In additional regressions, it emerges that it is particular return migrants who used their savings or a private loan to start a company, who have a primary education or less or who identified a good business opportunity whose companies have higher capital levels than those of similar non-migrants.

Secondly, the ENAMIN provides evidence that there are systematic differences in start-up financing between return migrants and non-migrants (see table 3.8). Self-employed return migrants are slightly (around 4 percentage points) less likely to not need any start-up financing than non-migrants, but the same is not true for business owners, for whom the difference is small at around 1 percentage point and not statistically significant. For uncommon forms of financing, i.e. forms that are used by less than 2% of microenterprises, such as credits from banks, credit unions, pawn shops, client or supplier credits, or government programs, the estimated effect of being a return migrant is small and not statistically significant (results not shown). Returnees are 3-8 percentage points less likely to obtain their funding from private loans through friends and family, and about 2 percentage points less likely to have used severance payments for their start-up funding. In contrast, they are 10-13 percentage points more likely to start their business with their savings. Internal migrants, in contrast, were only 1.5-2.5 percentage points more likely to start their business this way.

The evidence thus suggests that return migrants are more likely to use their savings to start their own companies, and that it is this group, as well as among those that started because they identified a business opportunity, where return migrants have an advantage in having more capital. Other groups of return migrants do not appear to have more capital.

Obviously, this does not proof that savings accumulated while abroad are the main drivers behind this result. Return migrants may have already had more savings before they moved or they could have accumulated more than

Table 3.8: Marginal effects of company start-up and further financing probit regression for 16-65 year olds based on the 1994-2008 ENAMIN

	Self-employed					
	Initial funding source				Additional funding	
	Private loan	Savings	Severance	No need	Applied	Received
	(1)	(2)	(3)	(4)	(5)	(6)
Worked in US	-.03***	.0997**	-.022**	-.037***	.012	.007
	(.0127)	(.0178)	(.0037)	(.0135)	(.0112)	(.0214)
Internal Migrant	-.01***	.013**	-.0000	-.007*	.0235***	-.002
	(.0038)	(.0053)	(.0018)	(.0040)	(.0036)	(.0083)
Pseudo R^2	0.024	0.015	0.0789	0.0332	0.0468	0.0481
N	52,748	52,748	52,748	52,748	52,748	6,783

	Business owner					
	Initial funding source				Additional funding	
	Private loan	Savings	Severance	No need	Applied	Received
	(7)	(8)	(9)	(10)	(11)	(12)
Worked in US	-0.08***	0.13***	-0.015	-0.008	-0.012	-0.023
	(0.0205)	(0.0322)	(0.0132)	(0.0201)	(0.0286)	(0.0409)
Internal Migrant	-0.012	0.025**	-0.0044	-0.03***	0.031***	0.0099
	(0.00842)	(0.0112)	(0.00464)	(0.00629)	(0.00992)	(-0.0117)
Pseudo R^2	0.0305	0.0185	0.0465	0.0365	0.0405	0.0463
N	10,252	10,252	10,252	10,252	10,252	2,619

Source: Author's estimates based on the 1994, 1996, 1998, 2002, 2008 ENAMIN (Instituto Nacional de Estadística y Geografía , 2010).

Notes: 1) All regressions control for sex, age, age squared, education, state, year and sector of economic activity. 2) ***/**/* indicates that the marginal effect is statistically significant at the 1/5/10% level. Standard errors are robust.

others even if they had stayed in Mexico because they would have earned more or have a higher propensity to save. Ideally, what we would like to know is what the emigrants' savings were before leaving and after they came back, and compare them to those who chose not to move - something that is not possible with this data. Wong et al. (2007), based on data from the Mexican Health and Aging study, found that male return migrants who were 50 years or older in 2000 were significantly more likely to belong to a high-net wealth category and had higher average net total wealth than their non-migrant peers. Most importantly, they found that those who stayed abroad longer had a higher probability to belong to the high-wealth category. This last fact led them to conclude that wealth prior to emigration was not a driving factor leading to higher wealth among return migrants. Ambrisioni and Peri used the Mexican Family Life Survey, which as a panel contains information on pre-emigration wages and assets for some individuals. They concluded that the emigration probability rises with assets. However, these higher assets could in themselves be an outcome of prior migration spells. This same caveat applies to the results presented by Moraga (2008), who constructed a household wealth index based on building characteristics as reported in the ENOE that while in rural areas the emigration possibility increased with wealth for low wealth individuals, while in urban areas there was no such relationship. Once again, the evidence is contradictory, but in balance, based on the results by Wong et al. (2007) and Moraga (2008), we may cautiously conclude that selection on pre-emigration wealth is at least not the sole driver behind higher levels of post-migration self-employment capital, in particular given the largely urban nature of the sample - unless return migrants are specifically selected among emigrants on pre-emigration wealth.

Together, these pieces of evidence suggest financial capital accumulation plays a role in allowing return migrants to build larger self-employment and business operations than non-migrants with similar demographic characteristics, even if conclusive proof is unfortunately not possible.

Human Capital

The second channel through which migration may affect self-employment outcomes are changes in human capital. When investigating the importance of this mechanism, the same caveat that we cannot directly observe whether moving allows individuals to accumulate more human capital than they would have otherwise done, or whether they already had more to begin with, applies. In addition, while wealth could not be directly observed but

capital was a more reliable proxy for it, the measurement of the component of human capital that is not tied to formal education is even more difficult. Nonetheless, based on the evidence, I believe that we can conclude that return migrants do not have a strong advantage in self-employment related human capital compared to non-migrants.

The first piece of evidence comes from considering the activities return migrants pursued while abroad. The 2008 ENAMIN contains a question on the activity in the prior location: only 4% of international compared to 20% of internal migrants were self-employed in their prior location. Hence, it appears that international migration offers little opportunity to learn entrepreneurial skills.

Secondly, information from the 2010 ACS suggests that most of the 16-65 year old Mexican-born individuals in the U.S. do not work in jobs that allow them to build much additional human capital: When classifying occupations into low, medium and high education and training occupations based on information on the typical education needed for entry, work experience and typical on-the-job training needed as reported by the Bureau of Labor Statistics (undated), around 56% work in low-education occupations and 31% in medium-education jobs.[17] Obviously, the particular occupations may have been highly valued in Mexico, but given the relatively small difference in earnings among all employed return migrants versus non-migrants, this does not appear to be the case.

Thirdly, migrants are asked why they moved from their prior location in the 2002 and 2008 ENAMIN: Fifty percent of return migrants state that they returned for family/personal reasons, which is a rate that is twice as high as among internal migrants.

Fourthly and most importantly, if migrants had acquired human capital that was useful in running their business while abroad, we would have ex-

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[17]I classified an occupation as a low-education one if it typically required either no high school degree or a high school degree but no work experience and less than moderate-term on the job training. A medium-education profession is one which requires a high school diploma or equivalent and some work experience and/or moderate or more on-the-job training, or a post-secondary diploma with no work experience or on-the-job training. A high-education profession is one that typically requires a post-secondary diploma with at least 1 year work experience and/or at least moderate on-the-job training, or an associate's degree or higher with any level of work experience or on-the-job training. Given some differences in the occupation categories as used by the 2010 ACS and the BLS, I was not able to classify all occupations some professions were in the ACS that were not in the BLS, and some occupations in the ACS had several categories with different education categories in the BLS. Overall, the professions of around 8% of the sample were not assigned to any category.

pected that their businesses have a higher return on assets than those run by non-migrants who are otherwise similar in their observable characteristics, but this is not the case whether or not the sector is controlled for (see table 3.7). Interestingly, this result remains valid if the sample is restricted to all self-employed individuals who became so because they identified a good business opportunity.

Finally, there is also no evidence that migrants are more likely to choose sectors in which the mean return on assets is on average higher than in others (see table 3.9). The estimated marginal effects on being a return migrant are in most cases not statistically significant, often less than .01 and at most .05 large.

In summary, it does not appear that return migrants have a higher human capital level for their given level of education that would make their businesses more productive.

Table 3.9: Marginal effects in sector regressions and mean capital and return on assets by sector for 16-65 year olds based on the 1994-2008 ENAMIN

	Self-employed				
	Agriculture	Service	Manufacture	Sales	Construction
	(1)	(2)	(3)	(4)	(5)
Worked in US	.0035	-.0056	.0184	.0094	-.026**
	(.0038)	(.0175)	(.0131)	(.0167)	(.0105)
Internal Migrant	-.0000	.0083	-.01***	.0047	.0037
	(.0009)	(.0051)	(.0037)	(.0050)	(.0029)
Mean ROA	3.5	2.7	4.05	4.35	3.59
Mean capital	8,293	26,695	19,168	21,340	8,507
Pseudo R^2	.006	.060	.018	.076	.100
N	48,033	48,033	48,033	48,033	48,033
	Business owner				
	Agriculture	Service	Manufacture	Sales	Construction
	(6)	(7)	(8)	(9)	(10)
Worked in US	.0055	-.0076	.0501*	-.0076	-.053**
	(.0066)	(.0332)	(.0291)	(.0295)	(.0217)
Internal Migrant	-.003*	-.0050	-.0164*	.0252**	.0042
	(.0018)	(.0110)	(.0089)	(.0099)	(.0073)
Mean ROA	3.47	.86	1.2	1.53	2.98
Mean capital	92,570	84,787	104,325	92,557	35,244
Pseudo R^2	.006	.079	.027	.039	.127
N	9,461	9,461	9,461	9,461	9,461

Source: Author's estimates based on the 1994, 1996, 1998, 2002, 2008 ENAMIN (Instituto Nacional de Estadística y Geografía , 2010).
Notes: 1) All regressions control for sex, age, age squared, education, state and year. 2) ***/**/* indicates that the marginal effect is statistically significant at the 1/5/10% level. Standard errors are robust. 3) For the calculation of the mean return on assets and mean capital, the lowest and highest 1% are excluded.

Social Capital

Theoretically, we would expect higher financial and human capital levels to yield better self-employment outcomes for return migrants; although empirically, only the difference in financial capital appears to play a role. In contrast, we would expect the migration process to deteriorate people's local social capital - that is, the contacts in the labor market as well as their knowledge about the local economy. This might make it harder for them to find paid employment, to gain access to capital, and to operate profitable enterprises.

The first indication of a deterioration of local social capital is whether or not self-employment is more frequently a stop-gap measure taken by people who cannot find other work. This does indeed appear to be the case: Self-employed return migrants are around 5 percentage points more likely to state that they started their business out of necessity (i.e. because they were not able to find paid employment) than non-migrants. This is not true for business owners, where the estimated marginal effect is very small at .0006 and not statistically significant. Surprisingly, opportunity entrepreneurship is not a more common occurrence among return migrants than among non-migrants – the respective marginal effects for self-employed people and business owners are equal to -.006 and -.002 and not statistically significant. For the population of self-employed and business owners as a whole, the most striking difference in predictors of the various motives for starting a business is that while the probability of starting out of flexibility or opportunity relative to starting for 'other' reasons rises with education level, the probability of starting out of necessity reasons sinks with each additional educational degree.

When I restricted the analysis to return migrants only and included variables on the migration characteristics, I found that with the time since return, necessity-driven migration becomes less likely and opportunity-driven migration becomes more likely. There is no effect on starting a business for reasons of flexibility. This evidence is clearly in line with the story that being abroad does lower some individuals' chances on the labor market; but over time, their local social capital recovers and allows them to find paid employment if they want to. Return migrants who own business are also around 8 percentage points less likely to state that they started the business to gain more flexibility or independence.

Secondly, we might expect that if there is a loss of social capital, access to financing also becomes more difficult. There is mixed evidence on this score: Return migrants are around three percentage points less likely to

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Table 3.10: Marginal effects in motivation regressions for 16-65 year olds based on the 1994-2008 ENAMIN

	Self-employed			Business owner		
	Flexibility	Necessity	Opportunity	Flexibility	Necessity	Opportunity
	(1)	(2)	(3)	(4)	(5)	(6)
Worked in US	.0189	.0502***	-.0059	-.08***	.0006	-.0020
	(.0149)	(.0141)	(.0161)	(.0287)	(.0193)	(.0351)
Internal Migrant	-.0023	.0088**	.0078	.0220**	-.0006	.0007
	(.0041)	(.0035)	(.0048)	(.0102)	(.0057)	(.0114)
Pseudo R^2	.0754	.0906	.0785	.0967	.0562	.0528
N	52,748	52,748	52,748	10,252	10,252	10,252

Source: Author's estimates based on the 1994, 1996, 1998, 2002, 2008 ENAMIN (Instituto Nacional de Estadística y Geografía , 2010).

Notes: 1) All regressions control for sex, age, age squared, education, state and year. 2) ***/**/* indicates that the marginal effect is statistically significant at the 1/5/10% level. Standard errors are robust. 4) The starting for flexibility reasons category includes increased independence and flexibility. The starting for opportunity reasons includes the answers that the respondent expects to earn more money or that they identified a good business opportunity. The starting for necessity reasons includes becoming self-employed or starting a business because the respondent got fired or because they were not able to find any other work.

have received their main start-up capital through a private loan, and this continues to hold for the surveys of 1998 where multiple answers can be given on the source of start-up financing; but when it comes to acquiring more capital, which return migrants are slightly more likely to apply for, there is no difference in whether or not they are likely to receive it than comparable non-migrants. Hence, overall, there appears to a small to no effect in this regard. Given that formal credits are only rarely applied to and received, this is also not very surprising.

3.5   Conclusion

The model that I proposed predicted that under certain assumptions about saving rates and pre-emigration characteristics, return migration would be associated with increased levels of self-employment. Moreover, it predicted that this increase occurred both because more return migrants would be pushed into self-employment out of a lack of other opportunities on the one hand, but also because of increased levels of profit due to higher levels of financial (and potentially human) capital. These predictions are partially backed up by the empirical results.

First, I found that return migrants were more likely to be self-employed without employees, but not more likely to be business owners with employees. This result is partially in line with prior evidence: Thom and Xu (2010) found that the probability of starting a business in a given year was higher for return migrants than for others. The MMP data used in their research has a different definition of business ownership that encompasses both self-employment and business ownership as defined in this paper. The difference to Thom and Xu's result hence likely derives from their different definition of business ownership that potentially also encompasses self-employed individuals without employees. In other countries, Piracha and Vadean (2010) and Zhao (2002) determined that return migrants were more likely to be self-employed in Albania and rural China, while Démurger and Xu (2011) did not find such an effect part of the Anhui province in China.

Secondly, prior research on the literature of the link between return migration and entrepreneurship focused on how savings and migration duration are related to the probability of self-employment (Ilahi, 1999; Dustmann and Kirchkamp, 2002; McCormick and Wahba, 2001; Mesnard, 2004; Black et al., 2003). For Mexico, Massey and Parrado (1998) failed to find a relationship between the number of years spent in the United States and business ownership as defined in the MMP; but since they also control for current and past

remittances and repatriated savings, they control for a major mechanism by which additional years in the US would be expected to affect the outcome. I found no statistically significant relationship between the duration of the last migration spell and self-employment and business ownership when the duration is entered linearly in the regression, but when it is controlled for in the form of indicator variables, there is evidence for a positive relationship between the two.

Thirdly, I found that return migrants were much more likely to state that they entered self-employment because they could not find a job or were laid off. This suggests that on some return migrants may indeed have a tougher time gaining a foothold in the Mexican economy, which is consistent with the model's prediction that a decline in social capital leads to a decline in employment opportunities. They are not more likely to state that they entered because they identified a good business opportunity or expected to earn more money. However, on average, the companies that they own have higher capital levels and generate more profits. This is consistent with the model's prediction that migrants may more frequently become self-employed due to higher financial capital levels (and accordingly higher profit levels). Whether they are self-employed or business owners, they are also more likely to be registered with public agencies.

Fourthly, I did not find that the return on assets (defined as net income over financial capital) is higher for return migrants than for others. One possible interpretation of this result is that there are no higher levels of human capital among return migrants that would be reflected in higher levels of profit for a given level of capital.

Together, this evidence suggests that it is a possibility that return migration can provide additional impulses to Mexico's economic development through participation in the self-employment sector, since return migrants are more likely to have businesses with access to more capital, to employ more people, and to be registered with public agencies. However, this impulse is more limited in scope than the higher percentage of self-employed and business owners implies, because once observed personal characteristics are controlled for, the difference shrinks drastically. Furthermore, for a small group of migrants, the migration process might have lowered their chances of finding paid employment. Since being self-employed for necessity reasons is on average associated with worse financial outcomes, it may be worthwhile to investigate whether there could be policy interventions that address the re-integration of this group of return migrants into the Mexican labor market. Overall, however, further research is needed to fully understand how return migration and microentrepreneurship outcomes are related and in

order to adjust employment and entrepreneurship policies accordingly.

One important extension of the research presented here would be to account for the self-selection into emigration and return migration. Another important extension would be to investigate firm dynamics over time. For example, how long do self-employed individuals of different types remain in the sector, and how do their firms evolve over time? Finally, further research should account for the role of local economic factors and regulations.

3.A   Miss-Classification of Return Migrants as Non-Migrants in ENAMIN

As I indicated in the data description section, the ENAMIN has a number of disadvantages when trying to identify return migrants in the data. The first shortcoming is that up to the 2002 survey, information on the last residence is not asked of people who are currently living in their town of birth. The second shortcoming is that since interviewees are only asked about their last move, people who lived abroad and then moved within Mexico will be identified as non-migrants. In the following, I am going to show that the number of people who are miss-classified as non-migrants is likely to be relatively small.

The more severe shortcoming is the first. In the 2002 ENAMIN, 15% of individuals who are currently living in their home town have lived abroad. This is not an unsubstantial amount of miss-classification; but luckily it means that if any significant differences are found in comparisons between migrants and non-migrants, these estimates are biased towards zero. Moreover, results based on the 2002 and 2008 surveys alone are not substantially different from results based on all survey years.

The second shortcoming does not appear to be as severe. Since the shortcoming applies to all years of the survey, it cannot be tested using any of the survey years. Instead, the Rural Household Survey in Mexico (Encuesta de Hogares Rural den Mexico) of 2002 is used. This survey has the disadvantage that it applies to rural households only, rather than to urban areas (1992-2002 ENAMIN) or the entire country (2008 ENAMIN). However, it has the advantage of containing U.S. and Mexican labor histories from 1980 and 2002, which makes it very suitable to study how frequently people move not only in between Mexico and the United States, but also within the country. Of the 798 observations of people with any work experience in the United States, 129 (16%) also moved within Mexico. Of these 16%, one quarter moved within Mexico after their return. In total, there-

fore, only 4% of return migrants would not be identified as international return migrants in the sample. Again, this will lead to a downward bias of the estimates.

3.B   Additional tables

Table 3.11: Marginal effect estimates of self-employment and business ownership probit regressions of 16-65 year olds by education background, ENE Migration Module

			Self-employed		
	Less than primary	Primary	Lower Secondary	Upper Secondary	Post-secondary
Ever worked in the US	.0131	.0067	.0303***	.0295***	.0408***
	(.0113)	(.0082)	(.0071)	(.0097)	(.0144)
Ever lived outside state	.0088	.0052	-.0016	.0093***	-.0061
	(.0060)	(.0043)	(.0026)	(.0031)	(.0038)
			Business Owner		
	Less than primary	Primary	Lower Secondary	Upper Secondary	Post-secondary
Ever worked in the US	-.0014	.0007	.0024	.0051	-.0063
	(.0015)	(.0017)	(.0017)	(.0033)	(.0067)
Ever lived outside state	.0035***	.0036***	.0002	-.0006	.0113***
	(.0012)	(.0011)	(.0008)	(.0011)	(.0028)
Observations	32,391	38,629	46,833	30,025	23,489

*** p<0.01, ** p<0.05, * p<0.1

Source: Author's estimates based on the 2002 ENE (Instituto Nacional de Estadística y Geografía , 2004).

Notes: 1) Standard errors are in brackets. 2) Control variables used in all regressions are age, age squared, sex, education level (less than primary, primary, lower secondary, upper secondary, post secondary), size of locality (rural, small town, large town, city) and state. The continuous age and duration variables are de-meaned.

Table 3.12: Log net income regressions of 16-65 year olds by education background, ENAMIN

	Self-employed				
	Less than primary	Primary	Lower Secondary	Upper Secondary	Post-secondary
Ever worked in the US	.111**	.0628	-.103	.0454	.205
	(0.0557)	(.0565)	(.0783)	(.142)	(.181)
Ever lived outside state	.0298*	.0195	.0136	.0424	.0193
	(.0176)	(.0178)	(.0219)	(.0365)	(.0398)
Observations	16271	15218	10761	4084	3498
R^2	0.343	0.346	0.394	0.282	0.209
	Business Owner				
	Less than primary	Primary	Lower Secondary	Upper Secondary	Post-secondary
Ever worked in the US	.185	.187	-.187*	.0191	.0026
	(.117)	(.154)	(.109)	(.174)	(.210)
Ever lived outside state	.0567	-.0089	.0502	.0435	-.0206
	(.0426)	(.0407)	(.0392)	(.0602)	(0.0495)
Observations	1911	2282	2434	1135	1749
R^2	0.417	0.369	0.426	0.246	0.202

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Source: Author's estimates based on the 1994, 1996, 1998, 2002, 2008 ENAMIN (Instituto Nacional de Estadística y Geografía , 2010).

Notes: 1) Log monthly income above the 99th percentile are excluded. 2) Robust standard errors in brackets. 3) Control variables used in all regressions are age, age squared, sex, education level (less than primary, primary, lower secondary, upper secondary, post secondary), size of locality (rural, small town, large town, city), state fixed effects and economic sector. The continous age and duration variables are de-meaned.

Table 3.13: Log net income regressions of 16-65 year olds by motive for having started the business, 1994-2008 ENAMIN

	Self-employed			
	Other	Flexibility	Necessity	Opportunity
Ever worked in the US	.110*	.0737	-.0382	.0410
	(.0624)	(.0738)	(.0810)	(.0525)
Ever lived outside state	-.0081	-.0088	.0573**	.0282*
	(.0168)	(.0224)	(.0231)	(.0164)
Observations	21,520	9,190	6,805	13,282
R^2	.330	.399	.369	.368
	Business Owner			
	Other	Flexibility	Necessity	Opportunity
Ever worked in the US	-.0364	-.112	-.267*	.248**
	(.0984)	(.106)	(.144)	(.120)
Ever lived outside state	.0430	.0022	.128*	-.0117
	(.0378)	(.0363)	(.0711)	(.0288)
Observations	3,044	2,414	777	4,021
R^2	.342	.400	.462	.385

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Source: Author's estimates based on the 1994, 1996, 1998, 2002, 2008 ENAMIN (Instituto Nacional de Estadística y Geografía , 2010).

Notes: 1) Log monthly income above the 99th percentile are excluded. 2) Robust standard errors in brackets. 3) Control variables used in all regressions are age, age squared, sex, education level (less than primary, primary, lower secondary, upper secondary, post secondary), size of locality (rural, small town, large town, city), state fixed effects and economic sector. The continuous age and duration variables are de-meaned. 4) The 'other' reason for starting a business includes the reasons of starting out of family tradition, to increase the family income, and other reasons. The starting for flexibility reasons category includes increased independence and flexibility. The starting for opportunity reasons includes the answers that the respondent expects to earn more money or that they identified a good business opportunity. The starting for necessity reasons includes becoming self-employed or starting a business because the respondent got fired or because they were not able to find any other work.

Table 3.14: Log capital regressions of 16-65 year olds by motive for having started the business, 1994-2008 ENAMIN

	Self-employed			
Motive	Other	Flexibility	Necessity	Opportunity
Ever worked in the US	.361**	.253	.230	.635***
	(.143)	(.170)	(.195)	(.123)
Ever lived outside state	.0109	-.0405	.0514	-.0204
	(.0375)	(.0501)	(.0583)	(.0390)
Observations	23,661	10,347	8,978	18,446
R^2	.312	.384	.185	.185
	Business Owner			
	Other	Flexibility	Necessity	Opportunity
Ever worked in the US	.166	.554*	.0786	.554***
	(.235)	(.288)	(.397)	(.192)
Ever lived outside state	.0025	-.130*	.0391	.0162
	(.0696)	(.0719)	(.139)	(.0561)
Observations	3,298	2,701	2,592	3,110
R^2	.315	.375	.216	.222

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Source: Author's estimates based on the 1994, 1996, 1998, 2002, 2008 ENAMIN (Instituto Nacional de Estadística y Geografía , 2010).

Notes: 1) Log capital above the 99th percentile are excluded. Capital is measured by the amount of capital that is used in the company. 2) Robust standard errors in brackets. 3) Control variables used in all regressions are age, age squared, sex, education level (less than primary, primary, lower secondary, upper secondary, post secondary), size of locality (rural, small town, large town, city), state fixed effects and economic sector. The continuous age and duration variables are de-meaned. 4) The 'other' reason for starting a business includes the reasons of starting out of family tradition, to increase the family income, and other reasons. The starting for flexibility reasons category includes increased independence and flexibility. The starting for opportunity reasons includes the answers that the respondent expects to earn more money or that they identified a good business opportunity. The starting for necessity reasons includes becoming self-employed or starting a business because the respondent got fired or because they were not able to find any other work.

Table 3.15: Financial characteristic regressions by motive for having started the business, 1994-2008 ENAMIN

	Log Capital		Log Income		Log ROA	
	Self-employed	**Business owner**	**Self-employed**	**Business owner**	**Self-employed**	**Business owner**
Necessity	-.3687***	-.4758***	.0342***	.0083	.3550***	.3770***
	(.0304)	(.0668)	(.0128)	(.0316)	(.0303)	(.0636)
Opportunity	.3789***	-.0191	.2770***	.1440***	-.0870***	.123***
	(.0232)	(.0373)	(.0103)	(.0194)	(-.0870***)	(.123***)
Flexibility	.2999***	.1026**	.1160***	.0795***	-.1360***	-.0110
	(.0252)	(.0409)	(.0113)	(.0207)	(.0251)	(.0408)
Observations	41,151	9,034	35,891	7,779	35,891	7,779
R^2	.2116	.2275	.472	.448	.136	.290

*** p<0.01, ** p<0.05, * p<0.1

Notes: 1) Log capital, income and return on assets above the 99th percentile are excluded. Capital is measured by the amount of capital that is used in the company, income refers to the self-reported money that the business leaves to the self-employed at the end of the month, and return on assets is equal to income over capital. 2) Robust standard errors in brackets. 3) Control variables used in all regressions are internal and international migrant background, age, age squared, sex, education level (less than primary, primary, lower secondary, upper secondary, post secondary), size of locality (rural, small town, large town, city), state fixed effects and economic sector. The continuous age and duration variables are de-meaned. The income regressions control for the level of capital. 4) The omitted 'other' reason for starting a business includes the reasons of starting out of family tradition, to increase the family income, and other reasons. The starting for flexibility reasons category includes increased independence and flexibility. The starting for opportunity reasons includes the answers that the respondent expects to earn more money or that they identified a good business opportunity. The starting for necessity reasons includes becoming self-employed or starting a business because the respondent got fired or because they were not able to find any other work.

Table 3.16: Marginal effects of types of registration of 16-65 year olds, 1994-2008 ENAMIN

	Self-employed			**Business Owner**		
	With private agency	With public agency	Not registered	With private agency	With public agency	Not registered
Ever worked in the US	.0131	.0482***	-.0066***	-.0101	.0879**	.0010
	(.0114)	(.0173)	(.0020)	(.0301)	(.0380)	(.0032)
Ever lived outside state	.0036	-.0090**	-.0002	-.0088	-.0104	.00051
	(.0031)	(.0045)	(.0007)	(.0092)	(.0130)	(.0007)
Observations		52,748			10,252	

*** p<0.01, ** p<0.05, * p<0.1

Notes: 1)) Robust standard errors in brackets. 2) Control variables used in all regressions are age, age squared, sex, education level (less than primary, primary, lower secondary, upper secondary, post secondary),size of locality (rural, small town, large town, city), state fixed effects and economic sector. The continuous age and duration variables are de-meaned.

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