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Introduction

Most of the research studying international migration takes an individual level approach abstracting from family ties and the household perspective. However, according to data from a representative survey among long-term emigrants from Denmark (Poutvaara, Munk, and Junge, 2009) 33% of respondents stated to have migrated mainly for family reasons. Among all respondents this is the second largest fraction after own work as a migration motive with 37%. In particular, among female migrants the share of individuals stating that the family was the main reason to migrate is large, with 47%. The importance of family ties for migration decisions has been pointed out early in the literature (Mincer, 1978; Stark, 1985).

There is little evidence, though, on the role of family considerations in the context of international migration. Most of the existing empirical work analyzing migration of families is restricted to within country migration (e.g. Costa and Kahn, 2000; Nivalainen, 2004; Tenn, 2010; Rabe, 2011). One reason for this is a lack of data on family ties of international migrants. On top of this, the understanding of mechanisms which determine household migration decisions in the international context is still incomplete. To this end, micro level analysis that takes a more comprehensive household perspective not only helps to better understand the complex nature of individual migration decisions. It eventually provides insights related to migration flows on the macro level and can establish a basis for policy design also taking into account this perspective. This dissertation contributes both theoretically as well as empirically to this goal. The presented work provides new insights on the role of family considerations for emigration and return decisions of migrants. It studies how partners' motivations, preferences and eventual decisions to migrate are related to individual and family characteristics as well as labor market outcomes in the context of interna-

tional migration.

Previous research has already shown that family ties are an important impediment to migration within national borders. Mincer (1978) finds low migration rates of individuals with family ties, in particular if both partners are employed. Families are most likely to jointly relocate if the wife has weak labor market attachment or low earnings. Thus, family migration often reflects incentives and gains of one partner while the other one is a tied mover. In dual career households the co-location problem can be expected to be most severe and joint migration might go along with one partner sacrificing his or her job opportunities, and becoming a tied mover. In the light of increasing female labor force participation in many countries there is an extensive literature looking at the relationship between female labor market outcomes and family migration decisions. Costa and Kahn (2000) show that couples in which both partners hold a college degree tend to reside in large metropolitan areas to reduce their co-location problems. On the other hand, Tenn (2010) finds that female education and earnings are still a weak determinant for overall migration flows of couples and families in the US. He suspects that it is too difficult to balance two careers for a couple and concludes that women are in the weaker position when it comes to joint labor market decisions. Gemici (2011) also argues that family migration inside the US is primarily a response to male labor market options. Gemici finds that the correlation of married partners' earnings gains between locations is low. Despite increasing female labor force participation these more recent empirical evidence confirm older studies for migration within the US finding significant over-qualification of women after family relocations (Frank, 1978) and low labor force participation rates of married women after migration (Lichter, 1980). Confirming empirical evidence on family migration within the US, Smits et al. (2003) find that for family relocations in the Netherlands between 1977 and 1996 females are persistently tied movers, too.

Potentially conflicting preferences on migration can be expected to be even more important for international migration: Partners do not necessarily share the same language skills, and different types of education vary in the extent to which they are internationally transferable. However, little

is known on how actual preferences towards migration are related to individual labor market characteristics of the partners and how couples decide on emigration given that preferences towards migration might not be the same. There are very few previous studies on international family migration outside the developing country context. Borjas and Bronars (1991) and Cobb-Clark (1993) compared family migrants to the United States with single migrants. Junge et al. (2014) analyze self-selection of singles and self-selection of couples from Denmark, showing that primary earners in dual-earner couples are more strongly self-selected with respect to income than singles. This novel result counters the intuition that family ties weaken self-selection. Nonetheless, none of these papers has information on the partners' preferences.

The first chapter of this dissertation aims at closing this knowledge gap. It analyzes labor force participation and household economies of emigrant couples in the light of their individual motivations to emigrate and their preferences towards the division of labor in the household. The empirical analysis uses survey data on Danish couples that have emigrated together. Nordic countries have exceptionally small gender differences in labor force participation. Migration outside the Nordic countries is in most cases associated with reduced female labor force participation among couples. Answers to the respondents' main motivation to emigrate show that the own job was most important for males while family reasons were the dominant motive to emigrate among female partners. Female labor force participation is particularly low among mothers. In most cases, actual labor force participation is in line with the partners' preferred division of labor. Among couples migrating outside the Nordic countries, 33% prefer that only the male works outside the household and migration is associated with a 23% drop in female labor force participation. Among couples migrating to one of the other Nordic countries, the dual-earner model dominates. The empirical results confirm the theoretical prediction from a household labor supply model which rationalizes reduced female labor supply with high prices and lower availability of daycare services, like in many non-Nordic countries.

The second chapter analyzes the decision-making process on joint migration in a family. Its theo-

retical part builds on previous work by Junge et al. (2014) relating migration decisions to earnings of the partners among dual career couples. This chapter extends the unitary theoretical framework on migration decisions to a bargaining model addressing the fact that partners might have conflicting preferences to emigrate given their individual job opportunities at home and abroad. The chapter develops a decision-making model in which the migration decision and the redistribution of family income depend on both partners' threat points and their outside options. In case partners do not reach an agreement on joint emigration, they can split up and one partner migrates alone. The model yields novel insights for the case in which one partner sacrifices job opportunities to stay with the family. The hypotheses derived from the model are tested empirically using survey data on the preferences of partners who emigrated from Denmark. In line with theory, it can be shown that higher earnings of the male partner are associated with stronger male preferences towards joint emigration, indicating that the female partner is a tied mover. Among dual-earner couples, lower female earnings go along with stronger male migration preferences, also agreeing with the hypotheses derived from theory.

The third chapter studies return migration decisions of immigrant families and investigates, in particular, the role of children in this context. The empirical analysis uses administrative data from Denmark to analyze the determinants of return migration propensities of married or cohabiting immigrant partners from the same country of origin in Denmark. First, it exploits exogenous variation in the gender of the children born abroad to identify a causal effect on return migration of families. The analysis identifies a differential impact of the presence of daughters compared to sons on return probabilities among Turkish immigrant families in Denmark. Having a girl as first born child statistically significantly increases return propensities of families compared to having a son as first born child. Still migration propensities are lower than for couples without children. The chapter also investigates potential channels which might have an impact on return decisions of couples with children. Families are significantly more likely to return when their oldest child was born abroad and is below school age. Moreover, couples from countries where average schooling quality is better are more likely to return. Additionally, the effect of an immigration policy reform

in Denmark is studied which tightened family reunification rules for foreigners in 2002. Results indicate that return propensities for couples from non-Western countries increase after the reform. The increase being statistically significant only for couples with children indicates that marriage considerations for the children might play a role in this context. Furthermore, the chapter studies selection into return migration on primary earners' income among couples with different family characteristics. Primary earner incomes of those returning to the home country are higher than among those who stay in Denmark, in particular for immigrant couples from non-Western countries. This selection pattern is weaker among dual-earner couples and families with children.

Chapter 1

International Family Migration and the Dual-Earner Model*

1.1 Introduction

A couple considering migration might face a difficult trade-off in whose career to prioritize. An important question from a societal perspective is hence whether post-migration changes in labor force participation and intra-household resource allocation reflect both partners' preferences, or whether migration hurts one of the partners. Previous research on internal migration has found that couple migration is typically associated with career gains for men, with women often leaving the labor market, or at least reducing hours worked (Mincer, 1978; Frank, 1978; Costa and Kahn, 2000; Compton and Pollak, 2007). As partners may differ in the international transferability of their education and in their language skills, international migration is likely to impose even more difficult trade-offs. This is of increasing importance in globalized economies, affecting both international allocation of talent and firm competitiveness. However, so far there is no research linking pre-migration and post-migration outcomes in the context of international family migration.

This chapter presents first a theoretical model on how couples with and without children decide on their labor supply. Depending on wage rates, gender identity and, in the presence of children, the

*This chapter is based on joint work with Martin D. Munk and Panu Poutvaara.

price of child care, couples may prefer either a dual-earner model in which both partners work outside the home, or a male breadwinner model in which only the male works outside the home. We then use the predictions of the model to guide our empirical analysis on labor force participation among emigrant couples in different destinations. We use a unique representative survey of Danish emigrants to study why couples emigrated, to what extent emigration was a shared preference, and how labor force participation and household economies abroad differ from the pre-migration situation.¹ The survey data is combined with the full Danish population administrative data to evaluate to what extent our survey respondents are representative of the underlying population.

Denmark has higher female labor force participation rates than most other European countries (75.0%, OECD, 2015) and is seen as a pioneer in gender equality (Klugman, 2011). This makes analyzing Denmark particularly interesting when it comes to international family migration. The patterns among Danish emigrants give insights on what to expect also among emigrants from other developed countries, which are experiencing increasing female labor force participation rates. Goldin (2006) called women's increased labor force participation "the most significant change in labor markets during the past century." Nordic countries have pioneered this change. Increased female labor force participation has been promoted by generously subsidized child care services, but also by heavy income taxation at the individual level, pushing families to adopt a dual-earner model to make the ends meet. Our results shed light on whether couples emigrating from egalitarian Nordic countries pursue the dual-earner model abroad, or if international mobility is associated with adopting a traditional male breadwinner model. It could be the case that women who migrate with their partner are not able to find a job matching their qualifications, suffering a loss as tied movers. On the other hand, there could be Tiebout sorting, with partners preferring a traditional male breadwinner model self-selecting into countries with lower female labor force participation rates. Although the observable labor market outcomes of the two scenarios can be identical, namely the male working and the female being outside the labor force, the welfare implications of changes in labor force participation depend crucially on whether this is in line with the partners' preferences.

¹Analysis of household economies refers to whether or not both partners pool their resources and, in case of joint household economies, to each partner's relative contribution to the household economy.

In order to analyze labor market participation of emigrant couples, we develop a model in which partners jointly choose the optimal allocation of available time for labor supply and household production. If the couple has children, the partners decide whether to buy required child care from the market, or provide it within the household. The model allows both a gender neutral set-up and the possibility of gendered specialization in the household as a preference for the male breadwinner model could result from gender identity norms. For example, Bertrand et al. (2015) conclude that a large fraction of American couples is averse to a situation in which the female earns more than the male. The model's comparative statics allow us to gain insights on the determinants of how time is divided between market work and household production.

Our model predicts that the likelihood that the secondary earner works is decreasing in the secondary earner's relative wage. A revealed preference argumentation suggests that a partner whose job was the main reason for the couple to emigrate must gain, which in turn implies that the labor force participation of the tied mover (who can be generally expected to be the secondary earner) is likely to decrease. Furthermore, having children, especially young children, can be expected to reduce female labor force participation, at least outside the Nordic countries. In the Nordic countries, the effect can be expected to be small or even absent, due to heavily subsidized public child care. Finally, the model suggests that labor force participation rates of women who are tied movers are linked to income differences in various destination countries. Both small income differences and generous child care services in other Nordic countries suggest that female labor force participation there should be highest, being in line with the rates in Denmark. Female labor force participation rates among Danish emigrants are expected to be lower in the United States than in other Western countries, due to wider income differences in the United States, the same holding among emigrants going to non-Western destinations. As female labor force participation rates in the United States are higher than in most non-Nordic Western European countries, and in line with Australia, Canada and New Zealand while income differences are larger in the United States than in those countries, our model generates a testable prediction against an alternative

hypothesis that female emigrants' labor force participation rates would converge to female labor force participation rates in the destination country.

While most of migration research has focused on migration from poor to rich countries, migration flows between rich countries are also substantial. In 2013, 22 million persons born in one of the EU15 countries² live outside their country of origin. Of them, 42% live in another EU15 country and an additional 13% in the United States (United Nations, 2013). The pattern of emigration from Denmark is rather similar. In 2013, over a quarter million Danes lived outside Denmark (corresponding to about 5% of the Danish-born population), with 50% of the migrants living in other EU15 countries and 13% in the United States (United Nations, Department of Economic and Social Affairs 2013). Emigration rates from Denmark are neither exceptionally low nor exceptionally high compared to other European countries. In 2012, the emigration rate was in the age group 25 to 54 among the native-born 0.33% in Denmark, 0.18% in Germany, 1.19% in Ireland, 0.37% in the Netherlands, 0.13% in Spain, and 0.29% in Sweden (Eurostat 2016).

We make three main contributions to the previous literature on couple migration. First, we obtain direct evidence on partners' stated motivations to migrate and on whether migration was a joint preference, or if one partner was a tied mover who would have preferred not to migrate. Second, we have collected data on labor force participation and household economies before and after migration. Third, we analyze international migration. Due to data restrictions, almost all literature on family migration has focused on internal migration. The few papers that have analyzed international migration in the family context have looked at labor force participation or earnings only in the destination (Borjas and Bronars 1991; Cobb-Clark 1993), or only in the country of origin (Junge et al. 2014).³ Junge et al. (2014) show that the likelihood that a dual-earner couple emigrates increases strongly in the earnings of the primary earner. Our main focus is not on the self-selection into emigration, but on partners' motivations to emigrate and preferred and actual

²This country group includes: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

³There is an extensive literature on the effects of temporary migration of family members on those left behind in the home country for example through remittances. For a survey see Docquier and Rapoport (2006)

labor force participation patterns abroad.

We analyze couples that migrated together between 1987 and 2002, stayed together after migration and had not returned to Denmark by the time of the survey in 2008. We find that most male respondents migrated for own work reasons and most females for family reasons. Changes in labor force participation after emigration are in line with stated main motivations. Female labor force participation declined from 86.2% in Denmark to 68.0% abroad in 2008. Male labor force participation, instead, increased from 94.8% to 97.5%. Migration was almost always a shared preference: 6.4% of women and only 0.6% of men are reluctant tied movers in the sense that they would have preferred to stay in Denmark, but migrated due to their partner's superior job opportunities.

There are four potential explanations for lower female labor force participation rates outside Nordic countries: wider wage differences, relatively higher price of child care services than in Denmark, assimilation of emigrants towards prevailing social norms in the destination country, and self-selection of couples in terms of their preference towards male breadwinner model. Empirical analysis confirms that female labor force participation is lower among couples living in countries where incomes are more dispersed, as measured by the GINI coefficient, as well as in countries with less affordable child care. Prevailing female labor force participation rates in the countries of residence, instead, fail to explain the observed differences in female labor force participation among the migrant couples. Our survey also provides tentative evidence supporting self-selection in terms of labor force participation preferences: a sizable minority of women viewed less stressful working life as an argument in favor of emigrating, and a much smaller group against, while the opposite holds among men migrating outside Nordic countries. Furthermore, considerations in favor of children were viewed as an argument in favor of emigration clearly more often by those migrating outside Nordic countries than by those migrating to other Nordic countries.

Our findings raise intriguing questions about family preferences towards the dual-earner and the male breadwinner model, also outside the context of migration. One third of couples that have

emigrated outside the Nordic countries prefer that only the male works, in a stark contrast to the Nordic countries in which only one in sixteen couples prefers that the male works and the female stays at home. Nonetheless, there are no pre-migration differences in female labor participation between couples that subsequently migrated to other Nordic countries and those migrating elsewhere. Furthermore, especially women migrating to the United States and non-Western countries viewed escaping stressful working life as an argument in favor of emigration, and very few against. This suggests that a large fraction of couples emigrating outside the Nordic countries preferred to switch from a dual-earner model to a male breadwinner model. Those preferring a dual-earner model might choose to stay in Denmark or to go to another Nordic country in which generous welfare services, especially child care provision, make combining work and family easy, in order to avoid the female being pushed out of the labor force. Tiebout (1956) already suggests that different policy preferences play a role in the decision where to live. As it is unlikely that all couples preferring a male breadwinner model would go as far as to emigrate, an open question is how many of the dual-earner couples living in egalitarian Nordic countries would actually prefer the traditional male breadwinner model, if wider income differences would allow a high living standard with only one partner working. The big differences in labor force participation and household economies between emigrant couples in different destinations are likely to reflect a joint effect of self-selection and labor supply adjustments as a reaction to different relative wage rates and price and availability of child care services. However, addressing self-selection based on revealed pre-migration preferences we do not find big differences in female labor supply in Denmark between couples subsequently migrating to different destinations.

Some studies, e.g. Antecol (2000), Fernández and Fogli (2009) and Blau et al. (2011), conclude that cultural background plays a major role for migrant families' labor supply decisions in the destination country. In particular, female labor force participation tends to be higher among families coming from countries with historically stronger female labor force attachment. Our analysis indicates that female labor force participation rates among emigrant couples from the same cultural background differ substantially according to the country of residence. Our findings underline the

importance of institutions and prices in this context. We do not find evidence that female labor force participation rates converge to the rates prevailing in the country of residence.

The rest of the chapter is organized as follows. Section 2 presents a theoretical model from which we derive hypotheses to be tested in our empirical analysis. We describe our data in section 3 and summarize stylized facts in section 4. Section 5 presents our econometric analysis. Section 6 concludes.

1.2 Theoretical Framework

Various considerations might play a role when partners decide on their labor supply after having migrated to a foreign country. We assume that families divide working time between labor market activity and the production of a household public good in a simple unitary household economy as proposed by Becker (1974, 1991). According to such a framework, the specialization in household or labor market work arises due to either partner's comparative advantage. However, gender identity might have a large impact on the division of labor in the household as well (John and Shelton, 1996, Bertrand et al. 2015; for a survey see Bertrand, 2011).

We consider a household consisting of two adult partners (and possibly children who do not make any decisions). The time available for work and household production is equal to one for each partner. We write the couple's utility in the Cobb-Douglas form with $0 < \alpha < 1$ being the weight of market good consumption c and $1 - \alpha$ being the weight of household production. The partners take their decision on how much time to spend on household production H_a, H_b and how much time to spend on working in the labor market $(1 - H_a), (1 - H_b)$ in a unitary framework, i.e. they maximize joint household utility.⁴ Couples with children additionally enjoy utility ψ , but have to provide child care $\bar{D} \leq 1$ for the children. They can choose how much of the required child care

⁴Alternatively, collective models recognize that household members have their own preferences, and engage in bargaining. This approach was pioneered by Chiappori (1988, 1992) and Apps and Rees (1988). Our analytical results could be derived also from a collective model, at the cost of more complex notation. The relationship between our model and the richer collective model is discussed at the end of this section. See Browning et al. (2014) for an overview on the unitary, cooperative and non-cooperative models of the family.

to buy on the market (D , $D \leq \bar{D}$) and how much to provide privately ($\bar{D} - D$). The time spent on child care is not available for other household production. For couples without children $\psi = 0$, $\bar{D} = 0$ and thus $D = 0$. The presence of children is given exogenously as we do not focus on fertility decisions in this analysis. Wage rates are w_a for partner a and w_b for partner b . Child care can be bought for p_D per time unit. We write household utility as

$$U = C^\alpha (H_a + H_b - \bar{D} + D)^{1-\alpha} + \psi - \lambda I(H_a > 0 \wedge H_b < 1)$$

with

$$C = (1 - H_a)w_a + (1 - H_b)w_b - p_D D.$$

If the household does not have a preference for partner a specializing in the work on the labor market and b specializing in household production, independently of who earns more, then $\lambda = 0$. In this case the partner with the higher wage specializes in labor market work and the partner with the lower wage in household production. The model allows for the case in which partners may have a preference towards certain family model independent of the partners' earnings potentials reflecting gender identity norms as shown in Akerlof and Kranton (2000). If $\lambda \gg 0$, then partner a will always specialize in the labor market and b in household production, reflecting gender role behavior. If partner a is male and partner b is female, this can be interpreted as a preference for a traditional male breadwinner model, giving priority to male labor market opportunities even if $w_a < w_b$ as long as λ is sufficiently large. In the following analysis we consider the case in which $w_a \geq w_b$ and it is always optimal for a to specialize in working in the labor market. If $\lambda = 0$ or sufficiently small restricting the analysis to $w_a \geq w_b$ is without loss of generality, as the results would hold by reversing indices if $w_b > w_a$.

In case $w_a < w_b$ but $\lambda \gg 0$ specialization patterns in the household are similar as with $w_a \geq w_b$ and $\lambda = 0$. Comparative statics results would be qualitatively similar which means that they are not affected by a gendered role model in the family. The solution of the model for $w_a < w_b$ while $\lambda \gg 0$ is provided in the appendix.

We separately analyze household utility maximization under two mutually exclusive conditions. First, if $w_b < p_D$, the full amount of required child care \bar{D} is produced privately. Second, if $w_b \geq p_D$ all child care $D = \bar{D}$ is bought on the market. For couples without children child care does not enter in the labor supply decision as $\bar{D} = D = 0$. In both cases we proceed similarly to obtain the utility maximizing time allocation of a and b within the household. Solving the model for optimal time allocation of partners a and b always yields at least one corner solution for either H_a^* or H_b^* . It depends on the parameter values whether the model yields an interior solution for one partner or whether both partners fully specialize in different activities. In case there is an interior solution one partner divides time between working in the labor market and in the household while the other partner fully specializes in one of the two activities. If there is no interior solution to the utility maximization problem, both partners fully specialize working either in the labor market or in household production.

Below we present the parameter values that have to hold for each of these solutions ($0 < H_a^* \leq 1, H_b^* = 1$), ($H_a^* = 0, H_b^* = 1$) or ($H_a^* = 0, 0 \leq H_b^* < 1$). The appendix provides a consistency check that the presented time allocations and labor supply decisions yield indeed optimal household utility levels.

In case $w_b < p_D$

$$\left\{ \begin{array}{ll} H_a^{*1} = 1 - 2\alpha + \alpha\bar{D}, H_b^{*1} = 1 & \text{if } \alpha < \frac{1}{2-\bar{D}} \\ H_a^{*1} = 0, H_b^{*1} = 1 & \text{if } \frac{1}{2-\bar{D}} \leq \alpha \leq \frac{w_a}{w_a+w_b-w_b\bar{D}} \\ H_a^{*1} = 0, H_b^{*1} = (1-\alpha)\left(\frac{w_a}{w_b} + 1\right) + \alpha\bar{D} & \text{if } \frac{w_a}{w_a+w_b-w_b\bar{D}} < \alpha. \end{array} \right.$$

In case $w_b \geq p_D$

$$\left\{ \begin{array}{ll} H_a^{*2} = 1 - 2\alpha - (1-\alpha)\frac{p_D}{w_a}\bar{D}, H_b^{*2} = 1 & \text{if } \alpha < \frac{w_a-p_D\bar{D}}{2w_a-p_D\bar{D}} \\ H_a^{*2} = 0, H_b^{*2} = 1 & \text{if } \frac{w_a-p_D\bar{D}}{2w_a-p_D\bar{D}} \leq \alpha \leq \frac{w_a-p_D\bar{D}}{w_a+w_b-p_D\bar{D}} \\ H_a^{*2} = 0, H_b^{*2} = (1-\alpha)\left(\frac{w_a}{w_b} + 1 - \frac{p_D}{w_b}\bar{D}\right) & \text{if } \frac{w_a-p_D\bar{D}}{w_a+w_b-p_D\bar{D}} < \alpha. \end{array} \right.$$

As can be seen from H_b^{*1} and H_b^{*2} , individual labor supply of partner b increases along the intensive margin with w_b and decreases with w_a . Additionally, the labor market participation threshold for b in terms of the couple's utility weight for consumption α decreases with w_b and increases with w_a .

For couples with children, the threshold for which b 's labor supply equals zero also depends on the amount of required child care \bar{D} . Among parents providing $D = \bar{D}$ of own time for child care ($w_b < p_D$), the participation threshold value increases with \bar{D} . Less time is available for household production generating relatively high marginal utility and the minimum relative wage for b to participate in the labor market increases. In families buying $D = \bar{D}$ on the market ($w_b \geq p_D$), the threshold for labor market participation of b decreases with \bar{D} . The relative wage of b needed for labor market participation is lower if required child care increases because financing more expenses for child care makes additional labor supply necessary. These results also hold for the case that $w_a < w_b$ while $\lambda \gg 0$ (Appendix). Figure 1.1 illustrates the relationship between the minimum relative wage for labor market participation of b and the required time \bar{D} for different values of α . The values on the vertical axis ($\bar{D} = 0$) reveal the required relative wage for b to participate in the labor force if the couple has no children.

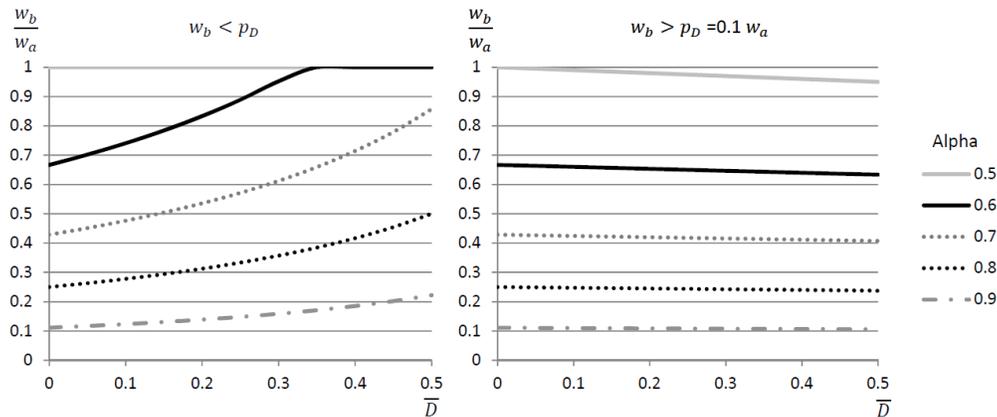


Figure 1.1: Required child care and min. relative wage for labor force participation of partner b .

The theory presents a mechanism relating each partner's earnings potential and required child care to labor supply decisions in the household. The decision on which of the partners specializes in the labor market could either be due to comparative advantage ($\lambda = 0$) or due to preferences for

partner b to specialize in household production ($\lambda \gg 0$). In the data we observe that almost all male partners work full-time before as well as after migration. Female labor supply and labor market participation vary to a larger extent. Given our data the subsequent analysis is going to study the implications of the model for the case that households adjust female labor supply and the male partner works full time on the labor market. Hence, we refer to partner a as the male and partner b as the female partner.

This chapter focuses on household economies and labor supply decisions in the context of international migration. Migration goes along with changes in employment and the partners' income situation. In the light of our theoretical model, we relate potential explanatory factors like the partners' education - as an indicator for their earnings potential - as well as family characteristics to household economies and labor supply abroad.

We can summarize the hypotheses we test as follows:

Hypothesis 1 (tied mover effect). Female labor force participation is lower abroad if the female partner is a tied mover.

Hypothesis 1 follows as if a couple migrates mainly for job opportunities of one partner, we expect by the revealed preference argumentation that the wage rate of that partner increases. This, in turn, makes it likely that the other partner works less, even if the wage rate of the other partner would be the same abroad. If the wage rate of the accompanying spouse is lower abroad, this further reduces his or her expected labor force participation.

Hypothesis 2 (the effects of children). Having children, especially young children, reduces female labor force participation in countries with expensive child care services.

Hypothesis 2 follows from our model if the female partner is more often the one taking care of chil-

dren at home, and child care costs in Denmark and other Nordic countries are heavily subsidized, while child care is rather expensive elsewhere. This suggests that having children reduces female labor force participation more strongly outside the Nordic countries. Figure 1.1 illustrates that the relative wage required for female labor force participation is higher if child care is provided by the female partner in the household.

Hypothesis 3 (cross-country differences). Female labor force participation rate is lower in countries with wider income differences.

According to our model, labor force participation rate of secondary earners (partner b) is decreasing in the wage rate of the primary earners (partner a). We present the hypothesis in terms of what to expect from female tied movers, as our subsequent empirical analysis has too few observations of male tied movers to test the hypothesis for them. The cross-country differences in expected female labor force participation rates follow from combining the theoretical prediction of Hypothesis 1 with the previous empirical results on income differences between different countries and self-selection of emigrants.

Although Denmark has one of the highest female labor force participation rates, females more often work part-time compared to males (OECD 2015). In addition, in terms of hourly wages the OECD still reports an unconditional gender pay gap for Denmark of 11.8% in 2010.⁵ Thus, already before emigration in most couples the male partner earned more than the female and this gap is likely to increase abroad, in particular in destination countries with wider income differences. Income differences in the United States and non-Western countries are larger than income differences in Australia, Canada, New Zealand and Western Europe; see Grogger and Hanson (2010) and Klugman (2011).

Borjas (1987) argues that emigrants from a country with a relatively narrow income distribution

⁵The unconditional gender pay gap is not to be interpreted as evidence for discrimination of women. It is the joint effect of differences in qualifications, career choices and any remaining discrimination. Time allocation which maximizes family resources for consumption depends on the unconditional pay gap.

like Denmark are selected from the upper end of that distribution because they are more likely to gain abroad compared to those at the lower end. Borjas et al. (2015) show that Danes emigrating to other Nordic countries are not as strongly self-selected in terms of their earnings as Danes emigrating to the rest of the world. In the family context, Junge et al. (2014) find that emigrant couples from Denmark are strongly positively selected on the primary earner's income. They show that self-selection into migration of couples is more responsive to the primary earner's income and less responsive to the secondary earner's income than the self-selection of singles with respect to their income.

An increase in earnings differentials between the partners in the country of residence might make it optimal to switch from a dual-earner to a single-earner model. Therefore, we expect labor force participation of tied movers to be highest in Nordic countries and lowest in the United States and non-Western countries, with other Western countries having rates in between. A competing hypothesis could be that couples with a certain preference for division of labor, irrespective of economic incentives, self-select into particular destinations. A further alternative hypothesis unrelated to our model would link differences in female labor force participation among Danish emigrant women in different countries to differences in average female labor force participation in those countries. We compare predictions arising from our model with these alternative hypotheses in section 5.

Moreover, couples with children might not be able to find suitable and affordable child care opportunities abroad. If a couple has to take care of its children at home, the parent doing so, typically the mother, has less time available in the labor market. The threshold for female labor force participation increases and the female partner is more likely not to work. On the other hand, if child care is bought on the market the female is more likely to work. According to the theory the decision whether or not to purchase child care services depends on its relative price. In Denmark and other Nordic countries, child care services are heavily subsidized and comparatively cheap. This allows both partners to combine work and family. In many other countries, child care

is less easily available and more costly than in Denmark.⁶ Our prior is that female labor force participation decreases abroad if the couple has children, in particular for couples children below school age, and that this relationship is less strong for the Nordic countries.

Although we presented our model in a unitary framework, it would be straightforward to extend it to a collective framework. Instead of maximizing household utility function, we would write the two partners' utility functions separately. When the household resource allocation is Pareto efficient, the bargaining outcome is as if the household would maximize the sum of the two partners' utility functions, weighted to reflect their relative bargaining power (Chiappori 1988; Apps and Rees 1988). Cherchye et al. (2012) extended the model to account for more than one domestic good (like parental time and household activities like cleaning), and brought the model to data. We use the simpler unitary model as our data does not allow testing the richer collective model. As Cherchye et al. (2012), we separate between time spent on child care and other household production, but our setting is simpler as we take the time required for child care as exogenous and do not model leisure choice. Instead, we allow child care to be produced either inside the household, or bought from the market, and show that the effects of time required for child care on female labor supply depend crucially on whether the child care cost is more or less than the female wage rate. As a result, female labor force participation is expected to be much lower among couples requiring child care in countries with more expensive child care, but not in the Nordic countries where public day care centers are available and affordable for most parents.

1.3 Data

We study household migration using own survey data on Danes who had emigrated in 1987, 1988, 1992, 1993, 1997, 1998, 2001 or 2002, and had not returned to Denmark by 2007. The survey was

⁶Previous literature has shown that the quality, availability and affordability of child care services has a considerable impact on couples' labor supply decisions. For example, Berger and Black (1992) show that receiving child care subsidies increased employment of mothers in the US. In general, public child care is more easily available and more heavily subsidized in the Nordic countries than in most other countries. This makes it easier and more attractive for both partners to participate in the labor market when having children.

planned by Munk and Poutvaara within the project "Danes Abroad: Economic and Social Motivations for Emigration and Return Migration", financed by the Danish Social Science Research Council. The survey was carried out by Statistics Denmark.

Statistics Denmark used the full population register to identify all Danish citizens who had emigrated, and had not returned by the end of 2007. Emigrants had to be aged 18 or more when they emigrated, and at most 59 in 2007. These restrictions yield a population of 17,309 emigrants during the selected years. For 55% of those emigrants Statistics Denmark found contact information on relatives living in Denmark. They were asked to provide address, telephone number and email address of the person abroad. Statistics Denmark then tried to contact the target persons using this information. The link to the web-based questionnaire could finally be sent out by email to 6,984 emigrants with validated email addresses. When data collection was closed in August 2008 4,257 persons had answered the survey. This makes an overall response rate of 61%.

We can link respondents with the population register data using a unique personal identifier, the social security number. Like other Nordic countries, Denmark collects comprehensive data on residence, wages, tax payments, education and household composition for every individual in the country. Having a social security number is compulsory and necessary for everyday life activities, like visiting a doctor, enrolling at school or opening a bank account. Our main data sources are the individual administrative register and the migration register containing information on age, gender, date of emigration and destination and eventual return migration, educational attainment and household composition in Denmark.

Our survey data contains information on several characteristics like education, household composition and work situation for the respondent and his or her partner before migration in Denmark as well as in 2008 abroad. Survey respondents were also asked about their main motivation to emigrate and their preferences for their own and for their partner's labor force participation. On top of this, they were asked to provide information about their household economies before migration

in Denmark and in 2008 abroad.

This analysis focuses on long-term emigration of couples and we consider only partners who stayed together abroad at least until 2008.⁷ We restrict the sample to individuals who emigrated with their partner and whose partner is a Danish citizen, born in Denmark. The reason for this restriction is that in international couples, emigration from Denmark might imply returning to the home country of one partner, making a migration decision qualitatively different. Our analysis revealed that results on the subsample of respondents with a foreign partner are qualitatively similar but statistically weaker and thus will not be reported here. We furthermore require that the partners lived together in Denmark. In our survey 632 respondents fulfill the above restrictions. Using migration events from the administrative registers we are able to construct the population of individuals who emigrated with their partner during the same years as those considered for the survey. Using the register data restricts attention to joint emigrations where partners migrated to the same destination country in the same year. This is more restrictive than our survey sample as it does not include sequential migrations. However, we cannot distinguish between sequential emigration and split-ups using only the administrative data. The register data yields an overall sample of 1250 couples in which partners were at least 18 when emigrating and at most 59 in 2007, who emigrated jointly and did not return until 2008. As in the survey, both partners are Danes, born in Denmark. The descriptive statistics for migrations according to register data and our survey are reported in columns 1 and 2 of Table 1. For the sample of survey respondents which are going to be analyzed in the remainder of this chapter attention is restricted to partners who reported to have emigrated together and who still live together abroad in 2008, which yields a sample of 522 respondents referred to in column 3. Table 1 shows the distribution of initial destinations and emigration years for the three samples. Furthermore, it reports female labor force participation rates in Denmark before migration.

Data indicates that a slightly lower share of survey respondents emigrated in 1987/88 compared with the register data emigrations. Overall, the shares of migrant couples having emigrated in

⁷Both married and cohabiting couples are included. Cohabitation before or instead of marriage is a common phenomenon in the Scandinavian countries (Kiernan, 2004).

| | Registered joint couple migrations, no return | Survey respondents joint emigration, no return | Survey respondents, joint emigration, live together abroad |
|------------------------|---|--|--|
| Nordic countries | 25.8 | 23.4 | 21.8 |
| United Kingdom | 10.6 | 13.1 | 14.2 |
| Rest of Western Europe | 29.7 | 30.2 | 30.5 |
| United States | 11.0 | 14.1 | 14.0 |
| AUS, CAN, NZ | 7.7 | 5.1 | 5.0 |
| Non-Western countries | 15.2 | 14.1 | 14.6 |
| 1987/88 | 13.3 | 9.7 | 8.2 |
| 1992/93 | 11.8 | 14.6 | 13.2 |
| 1997/98 | 23.4 | 30.2 | 30.5 |
| 2001/02 | 51.5 | 45.5 | 48.1 |
| Female LFP rate in DK | 84.5 | 83.7 | 86.2 |
| Male LFP rate in DK | 92.1 | 90.8 | 94.8 |
| Observations | 1,250 | 632 | 522 |

Source: Survey and register data

Notes: LFP: Labor force participation. Initial destination countries and emigration years reported. Joint emigration according to the register data requires that both partners are Danish nationals, born in Denmark, at least 18 when emigrating and at most 60 in 2008 and emigrated in the same year to the same destination and did not return until 2008. According to survey data both partners are Danish nationals, born in Denmark, the respondent is at least 18 when emigrating and at most 60 in 2008 and reported to have migrated together with the partner.

Table 1.1: Descriptive statistics. Joint emigrations of couples in register data and survey.

the different year-pairs do not vary substantially between the three columns. The same holds for migration to different destination countries and for labor force participation rates before migration. Female labor force participation before migration is high as typical for Denmark: Depending on the sample, 83.7% to 86.2% of female partners are in the labor force before emigration which is almost as high as the corresponding number for males with 90.8% to 94.8%.

Using an identifier for cohabiting or married partners from the population register data we are able to link respondents to their partners in the administrative data. We can identify 60 couples in which both partners answered the survey. The remaining analysis is based on 522 respondents as well as their partners who satisfy the restrictions above and live together in 2008. In the whole analysis, couples having migrated to Greenland or Faroe Islands are excluded because these are

autonomous regions of Denmark. Respondents were asked whether they were married or in a registered partnership or cohabiting. We did not find any same-gender partnerships among our respondents in the register data. Therefore subsequent analysis refers to partners as male and female.

| | Male respondents | Female respondents | All respondents |
|----------------------------|------------------|--------------------|-----------------|
| Low power couples | 16.3 | 16.6 | 16.5 |
| Female power couples | 8.6 | 11.9 | 10.2 |
| Male power couples | 21.2 | 17.4 | 19.4 |
| Power couples | 53.9 | 54.2 | 54.0 |
| Nordic countries | 17.5 | 24.5 | 20.9 |
| United Kingdom | 12.6 | 13.4 | 13.0 |
| Rest of Western Europe | 32.7 | 30.8 | 31.8 |
| United States | 15.6 | 16.6 | 16.1 |
| AUS, CAN, NZ | 7.4 | 3.6 | 5.6 |
| Non-Western countries | 14.1 | 11.1 | 12.6 |
| No children in 2008 | 20.5 | 23.3 | 21.8 |
| Youngest child 0-6 in 2008 | 33.5 | 32.4 | 33.0 |
| Youngest child 7+ in 2008 | 46.0 | 44.3 | 45.2 |
| Female LFP in 2008 | 69.1 | 66.8 | 68.0 |
| Male LFP in 2008 | 98.9 | 96.1 | 97.5 |
| Observations | 269 | 253 | 522 |

Source: Survey data

Notes: Current country of residence, all characteristics reported according to survey data in 2008.

Table 1.2: Descriptive statistics for respondents having migrated with current partner.

The composition of our sample with respect to various characteristics is reported in Table 2.1. Following Costa and Kahn (2000) we distinguish different "power" types of couples reflecting the partners' levels of education. In power couples both partners have at least college education. In male and female power couples, only one partner holds a college degree and in low power couples neither partner has completed college education.⁸ With 54.0%, power couples are the biggest group among the respondents while there are 19.4% male power couples and only 10.2% female power couples. The fraction of 25 to 64 year olds in the Danish population with at least medium

⁸We define college degree as having at least medium tertiary education; however, our results are robust to using university bachelor's degree as cutoff.

tertiary education was 24% in 2008 (Statistics Denmark 2009). Thus compared with the overall Danish population the average level of education among our respondents is high. This is in line with results from Borjas, Kauppinen and Poutvaara (2015) who find that emigrants from Denmark are strongly positively self-selected according to their pre-migration education and earnings. Table 2.1 reports the country of residence of the respondents in 2008. A large fraction of the couples in our sample (20.9%) live in one of the other Nordic countries, Sweden, Norway, Finland or Iceland. 16.1% of the couples live in the US, and 13.0% in the UK. In total 65.7% percent of the couples live in another Western European country.⁹ In 2008, 78.2% of couples have children in the household, with 33.0% of the couples having children below school age. Female labor force participation has decreased considerably in 2008 compared to the situation in Denmark: only 68.0% of females participate in the labor force. Male labor force participation, on the other hand, has even increased to 97.5%. Characteristics presented in Table 2.1 do not reveal any response bias for whether the survey respondent was male or female, with the exception that there are slightly more female than male respondents in other Nordic destination countries. This is the only difference among the reported characteristics which is statistically significant on the 5% level.

1.4 Big Picture

1.4.1 Main Motivation to Emigrate

Our survey provides information about the respondents' main motivation to emigrate. Table 1.3 presents information separately for men and women who emigrated with a Danish partner and live together abroad in 2008.¹⁰ For all residence country groups, own work was the most important motivation to emigrate for a clear majority of men. The majority of women in all non-Nordic

⁹The differences in the shares of country groups between Table 2.1 and 1.1 are due to the fact that some couples migrated from the initial destination country to another country.

¹⁰Due to small numbers of observations when reporting results separately for female and male respondents we group together other Western destination countries apart from the US and the Nordic countries in one category. We keep these country groups throughout the remainder of the analysis and show in the appendix that our findings we describe later do not differ much between the destination groups Australia, Canada and New Zealand, the UK and other Western European countries.

countries migrated due to family reasons. Work reasons dominate especially strongly among men and family reasons among women who live in the US and in non-Western countries. Among women who live in other Nordic countries, about one third emigrated for work, almost one third for family and a little more than one third for other reasons, like studies.

| | Nordic countries | United States | Other Western countries | Non- Western countries | Total |
|------------------------|---------------------|------------------|-------------------------------|------------------------------|-------|
| Male partners | | | | | |
| Own work | 66.0 | 81.0 | 71.1 | 92.1 | 74.7 |
| Family | 10.6 | 0.0 | 7.8 | 0.0 | 6.0 |
| Other reasons | 23.4 | 19.0 | 21.1 | 7.9 | 19.3 |
| Female partners | | | | | |
| Own work | 33.9 | 11.9 | 20.7 | 14.2 | 21.7 |
| Family | 30.7 | 76.2 | 52.9 | 67.9 | 53.0 |
| Other reasons | 35.4 | 11.9 | 26.4 | 17.9 | 25.3 |

Source: Survey data

Table 1.3: Main motivations to emigrate.

Table 1.4 presents evaluations of further factors which had an impact on the decision to emigrate. Two out of five women living outside Nordic countries viewed a less stressful working life as an important or very important reason to emigrate, and one in ten as an argument for staying in Denmark. Among men migrating outside other Nordic countries, a less stressful working life was more often an argument for staying in Denmark. Both men and women living in other Nordic countries view a less stressful working life more often an argument for emigration.

The distribution of preferences in Table 1.4 suggests, furthermore, that most parents viewed considerations related to their children to be neither in favor nor against emigration, but there is also a significant minority which saw considerations related to children as an important or very important reason to emigrate. This is most pronounced among parents migrating to the US. Baker et al. (2008), Havnes and Mogstad (2015) as well as Kottelenberg and Lehrer (2014) show that universal public child care might affect child outcomes negatively.¹¹ Del Boca et al. (2014) find

¹¹Kottelenberg and Lehrer (2014) show that the effects of universal childcare depend strongly on the child's age. The negative effect is stronger when the children gain access at younger age, but turns positive for those that are 3

that parents' time spent with their child is important for the child's cognitive development. One possible explanation for our findings is that the respondents for whom considerations related to children are a reason to emigrate prefer that the children are taken care of at home, typically by the mother. We checked whether fertility decisions of the couples differ according to the country of residence but we did not find any systematic difference.

| | | Nordic countries | United States | Other Western countries | Non- Western countries |
|--|----------|---------------------|------------------|-------------------------------|------------------------------|
| Male partners | | | | | |
| Less stressful working life | in favor | 25.5 | 14.3 | 21.8 | 15.8 |
| | against | 4.3 | 28.6 | 23.2 | 31.6 |
| Considerations for children (couples with children) | in favor | 6.4 | 26.2 | 16.2 | 23.7 |
| | against | 2.1 | 2.4 | 3.5 | 0.0 |
| Female partners | | | | | |
| Less stressful working life | in favor | 19.4 | 42.9 | 36.4 | 46.4 |
| | against | 4.8 | 11.9 | 7.4 | 10.7 |
| Considerations for children (couples with children) | in favor | 11.3 | 31.0 | 19.8 | 14.3 |
| | against | 4.8 | 2.4 | 1.7 | 0.0 |

Source: Survey data

Table 1.4: Selected arguments in favor or against emigration.

With our data we are additionally able to address the question which partner had stronger preferences towards emigration. Respondents were asked whether both had equally strong migration preferences or whether one of the partners was more in favor of emigration. Table 1.5 shows, that in most cases the partners agreed on emigration and in a clear majority emigration was a joint preference of both partners.¹² In every destination country group more than 50% of the respondents stated that they and their partner had equally strong preferences to emigrate. In 39.0% of couples, the male and in 9.1% the female partner was more strongly in favor of emigration. In

years or older. Cornelissen et al. (2015) show for a universal child care program in Germany that attendance rates are higher for children from disadvantaged backgrounds.

¹²A potential concern in Table 1.5 might be a bias due to misreporting of the partners' preferences depending on the characteristics of the partner who answered the questionnaire. Using register data, we were able to identify among our respondents 60 couples in which both the male and the female answered our survey and analyzed both partners' mutual assessment of migration preferences in this subsample. Table A1 shows that in 49 of 60 cases the partners' answers on their respective migration preferences were perfect matches. If there were deviations one partner mostly reported mutual agreement while the other stated stronger migration preferences of the male or female partner. Thus, we can expect joint migration preferences to be correctly assessed by one partner for most of the remaining observations in our sample.

particular, in the non-Nordic countries, a larger share of males had stronger emigration preferences reflecting migration due to male job opportunities as described above. The share of stronger female preferences towards emigration was highest among couples in the Nordic countries. If there was disagreement concerning the emigration decision it was mostly the female partner who disagreed: With 11.0% this share is highest among couples having emigrated to the US.

| | Nordic countries | United States | Other Western countries | Non- Western countries | Total |
|----------------------------|---------------------|------------------|-------------------------------|------------------------------|-------|
| Equal preferences | 53.2 | 51.2 | 51.9 | 51.5 | 52.0 |
| Stronger male preference | 27.5 | 34.2 | 34.4 | 31.8 | 32.6 |
| Stronger female preference | 13.8 | 3.7 | 6.9 | 12.1 | 8.5 |
| Female against emigration | 4.6 | 11.0 | 6.1 | 4.6 | 6.4 |
| Male against emigration | 0.9 | 0.0 | 0.8 | 0.0 | 0.6 |

Source: Survey data

Table 1.5: Partners' agreement or disagreement on emigration.

Overall, Tables 1.3 to 1.5 show that migration was a joint preference of both partners for most of the respondents, even though the migration motives differ: Males migrated mainly for job opportunities while females for family reasons.

1.4.2 Actual and Preferred Labor Force Participation

Table 1.6 shows that the heterogeneity in migration motives is reflected strongly in differences in female labor force participation at different destinations. In Denmark before migration though, the partners' labor force participation rates do not differ much between partners living subsequently in different destinations.¹³ Overall, in only 3.4% of the couples the female partner stayed at home while the male partner was in the labor force. There was no male partner who stayed at home while the female was in the labor force. Abroad, we observe substantially lower female labor force participation: In 28.2% of the couples the female partner stays at home and male partner participates in the labor force. Male labor force participation, on the other hand, even increased slightly.

¹³We consider a partner as being in the labor force at a given time in case of employment, self-employment or unemployment. Couples with at least one student or retiree are reported in a separate category. There are 13.4% of couples with at least one student or retiree before emigration. Apart from one retiree in our sample this share is due to studies before migration.

| | Both in the labor force | Male in the labor force, female home | Female in the labor force, male home | At least one partner retiree or student |
|----------------------------|----------------------------|--|--|--|
| In Denmark | 83.1 | 3.4 | 0.0 | 13.4 |
| Nordic countries | 78.0 | 4.6 | 0.0 | 17.4 |
| Non-Nordic countries | 84.5 | 3.2 | 0.0 | 12.4 |
| United States | 85.7 | 4.8 | 0.0 | 9.5 |
| Other Western countries | 84.4 | 2.7 | 0.0 | 12.9 |
| Non-Western countries | 83.3 | 3.1 | 0.0 | 13.6 |
| Abroad in 2008 | 66.3 | 28.2 | 1.0 | 4.6 |
| Low power couples | 69.8 | 24.4 | 3.5 | 2.3 |
| Female power couples | 69.8 | 18.9 | 3.8 | 7.5 |
| Male power couples | 50.5 | 43.6 | 0.0 | 5.9 |
| Power couples | 70.2 | 25.5 | 0.0 | 4.3 |
| Nordic countries | 87.2 | 5.5 | 1.8 | 5.5 |
| Non-Nordic countries | 60.8 | 34.1 | 0.7 | 4.4 |
| United States | 48.8 | 47.6 | 0.0 | 3.6 |
| Other Western countries | 67.7 | 27.0 | 0.8 | 4.6 |
| Non-Western countries | 48.5 | 45.5 | 1.5 | 4.6 |
| No children in 2008 | 79.8 | 12.3 | 1.8 | 6.1 |
| Youngest child 0-6 in 2008 | 57.0 | 39.5 | 0.6 | 2.9 |
| Youngest child 7+ in 2008 | 66.5 | 27.5 | 0.9 | 5.1 |

Source: Survey and register data

Table 1.6: Percentage shares for actual labor force participation.

Low female labor force participation abroad is most pronounced among male power couples. Most importantly, the data reveal substantial differences in labor force participation in 2008 depending on the country of residence. Female labor force participation rates are particularly low and decreased dramatically among couples having migrated to the US; in this group, in 47.6% of the couples the female stays out of the labor force while the male is in the labor force. In the Nordic countries, on the other hand, this is only the case among 5.5% of the couples. The corresponding shares are 27.0% in other Western countries and 45.5% in the remaining countries. Appendix Table A2 illustrates that female labor force participation between the UK, other Western European countries and Australia, Canada and New Zealand do not differ much. A high share of dual-earner couples in Australia, Canada and New Zealand compared with the US highlights that low female

| | Both in the labor force | Male in the labor force, female home | Female in the labor force, male home | Both at home | No answer |
|-------------------------|----------------------------|--|--|-----------------|------------|
| All | 62.1 | 27.6 | 1.1 | 1.7 | 7.5 |
| Nordic countries | 80.7 | 6.3 | 1.8 | 2.8 | 8.2 |
| Non-Nordic countries | 57.1 | 33.2 | 1.0 | 1.5 | 7.3 |
| United States | 40.5 | 52.4 | 1.2 | 0.0 | 6.0 |
| Other Western countries | 62.7 | 28.1 | 0.8 | 2.3 | 6.1 |
| Non-Western countries | 56.1 | 28.8 | 1.5 | 0.0 | 13.6 |

Source: Survey data

Table 1.7: Percentage shares for preferred labor force participation.

labor force participation cannot be explained by long distance migration. Table 1.6 additionally shows that female labor force participation decreased particularly among couples with children in the household.

Respondents were asked about their preferred division of labor in the household. In their answers they could indicate who of the partners they prefer to participate in the labor market.¹⁴ Table 1.7 reveals that low female labor force participation in 2008 seems to reflect the respondents' preferences towards their own and their partners' participation in the labor market. Respondents who reside in the US are clearly more likely to state that they prefer the male partner to work while the female partner stays at home. In the Nordic countries, on the other hand, most respondents prefer a dual-earner household.

In Table 1.8, we compare female labor force participation rates according to whether the female partner was a tied mover. We derive this information from the respondents' main motivation to emigrate. In all country groups, except for the US, female labor force participation is lowest when the female is a tied mover, i.e. male respondents reported that they migrated for their own job opportunities and female respondents reported to have migrated mainly for family reasons. At the

¹⁴To alleviate the concern that respondents gave self-serving answers concerning their partner's preferred labor force participation we analyze responses among the 60 couples in which both the male and the female answered our survey. The responses are in most cases mutually consistent among both partners as Table A3 shows. Given this subsample of couples we are confident that the responses do not depend on which of the partners answered the survey. In a clear majority of cases, the partners agreed that either both should work, or that the male should work and female should stay at home.

| A: All couples. | Nordic countries | US | Other Western countries | Non Western countries |
|---|------------------|---------------|-------------------------|-----------------------|
| Male tied mover | 100.0% (26) | 40.0% (5) | 94.0% (36) | 75.0% (4) |
| No tied mover | 97.0% (33) | 46.1% (13) | 75.8% (62) | 62.5% (8) |
| Female tied mover | 90.0% (50) | 54.5% (66) | 65.4% (165) | 51.9% (54) |
| B: Couples without pre-school age children. | | | | |
| Male tied mover | 100.0% (14) | 100.0% (2) | 100.0% (25) | 100.0% (1) |
| No tied mover | 100.0% (21) | 57.1% (7) | 86.9% (46) | 80.0% (5) |
| Female tied mover | 90.9% (33) | 59.1% (44) | 66.4% (116) | 66.7% (36) |
| Source: Survey data | | | | |
| Notes: Numbers of observation in parentheses. | | | | |

Table 1.8: Female labor force participation rates and tied mover status.

same time, female labor force participation is highest among couples in which the male partner is a tied mover. Among couples without pre-school-age children, we find that in all considered country groups all women whose male partner is a tied mover participate in the labor force. These findings agree with Hypothesis 1 in our model. Tied mover's partner should gain from migration, suggesting that wage differences abroad are larger than in Denmark. This makes it more likely that the tied mover (typically the female partner) works less, particularly if the couple migrates to a country where the dispersion of income is larger. This leads to lower female labor force participation, especially in the US and non-Western countries where incomes are more dispersed, and less so in other Nordic countries.¹⁵ Table A4 in the appendix shows that the pattern presented for the aggregated group of other Western countries hold separately for the UK, Other Western Europe and Australia, Canada and New Zealand.

¹⁵According to Klugman (2011) the income GINI coefficient or the income quintile ratio 2000-2011 is lowest in Nordic countries. For the US the income inequality measures are higher than for Western Europe and Australia, Canada and New Zealand.

1.4.3 Household Economies

Table 1.9 provides further insights to the organization of household economies beyond the partners' labor force participation. Respondents were asked whether they had separate economies or joint economies before migration as well as at the time of the survey in 2008.¹⁶ In separate economies the partners dispose of their own incomes and share only common expenses while couples with joint economies pool at least part of their individual incomes. Table 1.9 shows the couples' types of household economies and provides information in case of joint household economies on which of the partners contributes more. The survey questions were referring to the situation before migration (Panel A) and in 2008 (Panel B). We present the distribution of responses separately, again by country of residence in 2008.

Before migration, most couples have joint household economies to which both partners contribute labor market income. Table 1.9 also shows that a considerable fraction of couples had separate household economies in Denmark. For 2008 we observe that the overall share of joint household economies is considerably higher and separate economies are less frequent among the couples in all country groups compared to the situation in Denmark. The share of household economies to which both partners contribute equally decreases. In general, we observe more couples in which the male partner is the main income earner. In 66.1% of cases the male partner contributed more in Denmark; this share increased to 76.6% abroad in 2008.

There is substantial heterogeneity between household economies in different countries of residence. The share of females who stay at home is higher in 2008 for all except the Nordic countries. There are pronounced differences between the US and the Nordic countries. None of the couples in

¹⁶A potential concern related to our results might be that household economy dynamics are driven by a time effect which is unrelated to migration. Moreover, the composition of emigrant cohorts might have changed over time. Our findings could then be driven by a subgroup of households in our sample depending on the year of emigration. Table A5 addresses these issues and alleviates our concerns: We present separately the household economies for couples that emigrated before 1999 and in 2001/2002. We do not observe qualitative differences among the cohorts in terms of changes in household economies. For example, the decrease in the share of separate household economies among the 2000/2001 emigration cohorts is almost as high as for the couples that left Denmark in earlier years. Moreover, the composition of the cohorts in terms of countries of residence does not vary substantially over the years of emigration either as Table A6 shows.

| | Nordic | US | Other Western | Non- West. | Total |
|---|--------|------|------------------|---------------|-------|
| A: Household economy in DK | | | | | |
| Separate economies | 15.6 | 10.7 | 12.9 | 9.1 | 12.6 |
| Joint economies, male brings in more | 54.1 | 75.0 | 58.9 | 78.8 | 63.0 |
| Joint economies, female brings in more | 11.0 | 1.2 | 9.1 | 4.6 | 7.7 |
| Joint economies, equal contributions | 11.9 | 10.7 | 14.4 | 7.6 | 12.5 |
| Male brings in all money, female stays home | 6.4 | 1.2 | 3.0 | 0.0 | 3.1 |
| Female brings in all money, male stays home | 0.0 | 1.2 | 0.4 | 0.0 | 0.4 |
| No answer | 0.9 | 0.0 | 1.1 | 0.0 | 0.8 |
| B: Household economy in 2008 | | | | | |
| Separate economies | 7.3 | 0.0 | 1.9 | 0.0 | 2.5 |
| Joint economies, male brings in more | 47.7 | 47.6 | 55.1 | 54.6 | 52.3 |
| Joint economies, female brings in more | 22.9 | 2.4 | 9.5 | 3.0 | 10.3 |
| Joint economies, equal contributions | 14.7 | 6.0 | 8.8 | 3.0 | 8.8 |
| Male brings in all money, female stays home | 5.5 | 44.1 | 22.4 | 37.9 | 24.3 |
| Female brings in all money, male stays home | 1.8 | 0.0 | 1.1 | 1.5 | 1.2 |
| No answer | 0.0 | 0.0 | 1.1 | 0.0 | 0.6 |
| Observations | 109 | 84 | 263 | 66 | 522 |
| Source: Survey data | | | | | |

Table 1.9: Percentage shares of household economies before migration and in 2008.

the US has separate economies or joint economies where the female partner brings in all money. Among 91.7% of the couples having emigrated to the US the male partner contributes the major share to the joint household economy. This fraction has increased from 76.2% before migration for these couples. In the Nordic countries, on the other hand, the male partner contributes most or all income among 53.2% of couples. Compared with the situation before emigration this fraction has even decreased. Moreover, in the Nordic countries the share of female partners who contribute more than the male to joint household economies has more than doubled from 11.0% before migration to 24.7% in 2008. In all other country groups, this share is lower and has not changed much when comparing the situation before emigration with 2008.

At a first glance, our findings suggest that international migration fosters asymmetries in terms of labor market outcomes between male and female partners as many couples adopt a male breadwinner model after migration. Moreover, our results show that migration reflects male job opportunities while females mainly migrate for family reasons. This is especially the case for couples having

migrated to the US but also in other non-Nordic countries. When it comes to the other Nordic countries, own work is a slightly more common main motivation than family for women, and the share of men migrating for own work is somewhat lower than in other destinations (Table 1.3). The observed patterns are also reflected by the couples' household economies in terms of more income pooling and higher male contributions to joint household economies. Low female labor force participation abroad seems to reflect preferred division of labor of male and female partners, taking into account that for the overwhelming majority of couples emigration was a shared preference for all considered destination groups.

The high level of mutual agreement and small differences between the country groups in the distribution of answers in Table 1.5 might be surprising in light of changes in household economies and labor force participation outside the Nordic countries. Tiebout (1956) suggests that not only income but also different policies might be an important determinant in the choice where to live. Policy preferences which play a role for families likely relate to child care, schools and taxation (i.e. individual tax filing or joint tax filing for couples). As shown in Table 1.7 respondents in our sample have very different preferences for the partners' division of labor in different countries of residence, in line with differences in actually observed labor force participation. Before migration in Denmark, though, female labor force participation rates and household economies in Denmark do not differ much between couples migrating to different destinations in the future. This speaks against an alternative hypothesis that our findings are mainly due to the self selection of couples with a certain type of household economy into different destinations.

As discussed in the previous section, several potential channels may play a role in explaining differences in actual and preferred labor force participation and household economies of the couples. First of all, countries differ in their institutional environments. The differences in returns to skills will have an effect on labor supply decisions of partners. In countries with large income differences, like the US, the lower earning partner would be more likely to stay at home. This mechanism is suggested by our theoretical framework. Less stressful working life being an important argument

in favor of emigration for women suggests that other factors also play an important role in explaining low labor force participation rates of females in couples having migrated outside the Nordic countries. Moreover, the public provision of child care services provides incentives for labor market participation of both partners. Our model predicts that a lower price of child care would incentivize higher female labor force participation. Moreover, couples emigrating to a country where the provision of child care is low might be those preferring to spend more time with their children. In order to better understand the observed changes in labor force participation and household economies, we are going to jointly assess the role of various individual- and family characteristics in different countries of residence.

1.5 Econometric Analysis

Female Labor Force Participation

We use a linear probability regression framework to test the hypotheses from our theory with the data. For the subsequent analysis we exclude couples in which the female partner is retiree or student. In Table 2.5, we present factors associated with female labor force participation in the country of residence in 2008. As baseline explanatory variables, we include the couple's power type (reference category: low power couples) and indicator variables for children in the household. We use the GINI coefficient to capture income differences in the country of residence. This coefficient refers to inequality in disposable incomes on the individual level taken from the WIDER WIID database (2016) for the year 2008. In an alternative specification, we include country group dummies (reference category: other Western countries) which additionally control for between country variation in language, culture and other factors which might be related to female labor force participation abroad. We also present separate regressions by country of residence groups.

Estimates in Table 2.5 show that the presence of children is negatively associated with female labor force participation. This is especially the case for young children below the age of 7 which is in

line with Hypothesis 2 from our model. The first column indicates, furthermore, that female labor force participation is lower in countries with wider income differences, which confirms Hypothesis 3. When controlling for country groups and comparing intercepts in the separate regressions we see that female labor force participation in the Nordic countries is more likely than in the US, other Western countries and non-Western countries.¹⁷ Our results do not reveal any significant effect of the presence of young children among couples having migrated to the Nordic countries while there are strong negative effects for the other countries. Female labor force participation is particularly low among couples with children aged 0 to 6 in the US and non-Western countries. In Table A9 we also present results including the "Starting Well Index", an index capturing the availability, affordability and quality of child care services in a subset of countries (The Economist Intelligence Unit, 2012). Results reveal that a higher value of this index is associated with higher female labor force participation which also is in line with our theory. The effect of the GINI coefficient is robust to including the "Starting Well Index".

In Table A10 we additionally include an indicator for the work status of the female in Denmark before migration. If the female worked before migration, we estimate a significantly higher probability for actual labor force participation abroad. Still the size and significance of most coefficient estimates remains unchanged.

Moreover, we find that actual labor force participation reflects the preferred division of labor among the partners. In a similar framework to Table 2.5, we relate the explanatory variables to an indicator for whether the respondent prefers that either both partners work or only the female partner works. Results are reported in Table 1.11. In general, most coefficient estimates are similar in sign and size to the specifications in Table 2.5. The presence of children is negatively correlated with positive attitudes towards female labor force participation. Again, this relationship is weak and statistically insignificant for the Nordic countries. For the remaining countries, we observe

¹⁷We do not include the GINI coefficient in these regressions as most of the variation in the GINI is between the country groups rather than within them. Including the coefficient for the other Western destinations its estimate has a negative sign but is not statistically significant. Within the group of non-Western countries the estimated effect is negative and statistically significant at the 5% level.

| | All countries | Nordic countries | US | Other West. countries | Non-Western countries | |
|-----------------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|----------------------|
| Power couple | -0.00310 (0.0534) | 0.0140 (0.0512) | 0.0155 (0.0483) | -0.0984 (0.190) | 0.0423 (0.0788) | 0.222 (0.154) |
| Female power couple | 0.0531 (0.0699) | 0.0314 (0.0657) | 0.0390 (0.0442) | 0.0101 (0.272) | 0.0111 (0.114) | 0.277 (0.188) |
| Male power couple | -0.161** (0.0727) | -0.146** (0.0685) | -0.324* (0.178) | -0.0834 (0.195) | -0.135 (0.102) | -0.0565 (0.175) |
| Youngest child 0-6 | -0.233*** (0.0506) | -0.240*** (0.0483) | -0.0696* (0.0376) | -0.367** (0.173) | -0.239*** (0.0755) | -0.454*** (0.170) |
| Youngest child 7+ | -0.130*** (0.0468) | -0.106** (0.0445) | -0.0761 (0.0461) | -0.200 (0.160) | -0.132** (0.0639) | -0.00737 (0.158) |
| GINI | -2.234*** (0.437) | | | | | |
| Nordic countries | | 0.214*** (0.0375) | | | | |
| United States | | -0.178*** (0.0623) | | | | |
| Non-Western countries | | -0.152** (0.0660) | | | | |
| Constant | 1.575*** (0.137) | 0.850*** (0.0526) | 1.003*** (0.0401) | 0.817*** (0.183) | 0.846*** (0.0718) | 0.619*** (0.147) |
| R-squared | 0.136 | 0.160 | 0.179 | 0.071 | 0.056 | 0.205 |
| Observations | 465 | 505 | 105 | 81 | 255 | 64 |

Notes: OLS estimation. Robust standard errors in parentheses.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 1.10: Linear probability regressions: Female labor force participation abroad in 2008.

| | All countries | Nordic countries | US | Other West. countries | Non-Western countries | |
|-----------------------|-----------------------|-----------------------|---------------------|-----------------------|-----------------------|----------------------|
| Power couple | 0.0780 (0.0587) | 0.091 (0.0557) | 0.0854 (0.0806) | 0.0371 (0.186) | 0.0771 (0.0841) | 0.312 (0.143) |
| Female power couple | -0.00404 (0.0843) | -0.0242 (0.0791) | 0.0548 (0.0881) | 0.119 (0.263) | -0.169 (0.131) | 0.35 (0.238) |
| Male power couple | -0.153* (0.0780) | -0.124* (0.0738) | -0.290 (0.202) | -0.177 (0.183) | -0.149 (0.107) | 0.138 (0.18) |
| Youngest child 0-6 | -0.227*** (0.0525) | -0.231*** (0.0498) | -0.052 (0.054) | -0.384** (0.189) | -0.246*** (0.077) | -0.514*** (0.148) |
| Youngest child 7+ | -0.210*** (0.0503) | -0.192*** (0.0471) | -0.129* (0.0717) | -0.382** (0.179) | -0.168** (0.0672) | -0.317** (0.132) |
| GINI | -2.148*** (0.481) | | | | | |
| Nordic countries | | 0.189*** (0.0431) | | | | |
| United States | | -0.226*** (0.0635) | | | | |
| Non-Western countries | | 0.0102 (0.0683) | | | | |
| Constant | 1.518*** (0.153) | 0.829*** (0.0578) | 0.932*** (0.188) | 0.787*** (0.188) | 0.847*** (0.0836) | 0.816*** (0.116) |
| R-squared | 0.141 | 0.154 | 0.139 | 0.089 | 0.080 | 0.153 |
| Observations | 434 | 467 | 97 | 76 | 239 | 55 |

Notes: OLS estimation. Robust standard errors in parentheses.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 1.11: Linear probability regressions: Preference for female labor force participation.

that the presence of children is negatively related to positive attitudes towards the female partner participating in the labor market.

Coefficient estimates for the GINI variable indicate that larger income differences in the country of residence are associated with lower preferences towards the female partner being in the labor market, as reflected in actual labor force participation outcomes. The dummy variables for Nordic countries and the US are similar in sign and size as in Table 2.5. The same holds for the constants when comparing separate estimations for different groups of Western countries. We interpret these findings as evidence that the differences in labor force participation between the US, the Nordic countries and other Western countries reflect actual preferences and are to a lesser extent driven by legal work restrictions for family migrants, in particular in the US, even though this could potentially play an important role. On the other hand, we observe that actual labor force participation of the female partner is lower than preferred labor force participation in non-Western countries. This suggests that other restrictions or the lack of employment opportunities for the female partner might play a role in explaining low female labor force participation among couples in these countries.

As discussed above, the differences between the Nordic and the other countries may be related to various explanations. Labor market and social policies shape self-selection and labor supply decisions of the emigrant couples. Child care programs in the Nordic countries are far more generous compared to other countries. This could explain why having young children does not seem to be a strong impediment to female labor force participation among couples living in other Nordic countries and why preference towards female labor force participation among the emigrant couples is higher there. The provision of subsidies in the Nordic countries lowers the price for child care services and increases incentives for female labor force participation. Table A9 in the appendix shows that a higher value of the "Starting Well Index" described above is also associated with stronger preferences towards the female partner being in the labor market.

| | Preference for female labor force participation | | Actual female labor force participation | |
|---|---|-----------------------|---|-----------------------|
| Power couple | 0.0797 (0.0570) | 0.0948* (0.0546) | -0.00367 (0.0525) | 0.0144 (0.0512) |
| Female power couple | 0.00378 (0.0834) | -0.0157 (0.0787) | 0.0572 (0.0698) | 0.0884 (0.0660) |
| Male power couple | -0.147* (0.0777) | -0.117 (0.0739) | -0.160** (0.0725) | -0.144** (0.0688) |
| Youngest child 0-6 | -0.241*** (0.0537) | -0.245*** (0.0512) | -0.241*** (0.0511) | -0.243*** (0.0492) |
| Youngest child 7+ | -0.202*** (0.0504) | -0.188*** (0.0471) | -0.122*** (0.0471) | -0.104** (0.0446) |
| Mother out of LF at respondent's age 12 | -0.0880* (0.0491) | -0.0796* (0.0474) | -0.0635 (0.0455) | -0.0224 (0.0445) |
| GINI | -2.187*** (0.474) | | -2.271*** (0.434) | |
| Nordic countries | | 0.184*** (0.0430) | | 0.213*** (0.0375) |
| United States | | -0.228*** (0.0639) | | -0.179*** (0.0624) |
| Non-Western countries | | 0.0109 (0.0675) | | -0.152** (0.0662) |
| Constant | 1.554*** (0.150) | 0.851*** (0.0574) | 1.603*** (0.135) | 0.856*** (0.0527) |
| R-squared | 0.148 | 0.159 | 0.140 | 0.160 |
| Observations | 434 | 467 | 465 | 505 |

Notes: OLS estimation. Robust standard errors in parentheses.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 1.12: Linear probability regressions: Inter-generational transmission and female labor force participation.

Overall, the results are in line with what our theory predicts. Differences in child care prices and in wage distribution can rationalize differences in female labor force participation between different countries of residence. In addition to the price mechanism, differences between couples living in different destinations could reflect Tiebout sorting. To evaluate whether couples differ in their behavior already in Denmark, so that couples with lower female labor force participation would self-select into destinations with wider wage differences and less generous child care provision, we analyzed female labor force participation in Denmark, parallel to the analysis abroad in Table A11. The results suggest that there are no statistically significant differences between couples migrating to different destinations before emigration, once power type and the presence of children are controlled for. Furthermore, the effect of having young children in Denmark is very similar to the effect of having young children in other Nordic countries, which is again in line with what our theoretical model suggests. This does not exclude the possibility of Tiebout sorting in terms of preferences toward male breadwinner or dual-earner model, but it also shows that if there is such sorting, it is in terms of preferences whose realizations are not observable in Denmark.

Fernández et al. (2004) find evidence for the US that wives of men whose mothers worked are themselves significantly more likely to work. Along the same lines, Moen et al. (1997) provide evidence that daughters' and mothers' gender role identities are closely related, including preferences towards the division of labor in the household. For Table 1.12, we take the first two specifications from Table 2.5 and Table 1.11 and add an additional regressor capturing labor force participation of the mother of the respondent at the age of 12. The idea is, first, to test whether preferences towards the division of labor are transmitted to the children. Columns 1 and 2 of Table 1.12 confirm that the respondent is more likely to prefer a male breadwinner model if the parents' household economy was more traditional - after including the same covariates as in Table 1.11. Robustness analysis confirms that these results do not depend on whether the respondent was male or female. However, when explaining actual female labor force participation abroad, the coefficient estimate for labor force participation of the respondent's mother becomes insignificant. As an additional test of Tiebout sorting, we analyze the effects of mother's labor force participation on subsequent

choice of the destination country. Table A12 relates labor force participation of the respondent's mother to the likelihood of living in one of the considered country groups. We do not find evidence for sorting according to this indicator into different destinations. Preferences towards the division of labor which were transmitted from the parents to the respondents do not help to explain much of the variation in female labor force participation abroad, indicating that labor supply decisions and the division of labor among the partners abroad are rather shaped by economic incentives.

| | All Countries | | Non-Nordic countries | |
|-----------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Power couple | 0.0136 (0.0541) | 0.0774 (0.0586) | -0.0485 (0.0668) | 0.100 (0.0738) |
| Female power couple | 0.0690 (0.0691) | -0.00529 (0.0845) | 0.0607 (0.0933) | -0.0251 (0.116) |
| Male power couple | -0.184*** (0.0694) | -0.149* (0.0782) | -0.113 (0.0791) | -0.115 (0.0878) |
| Youngest child 0-6 | -0.271*** (0.0504) | -0.230*** (0.0523) | -0.321*** (0.0644) | -0.295*** (0.0687) |
| Youngest child 7+ | -0.137*** (0.0450) | -0.207*** (0.0503) | -0.139** (0.0573) | -0.234*** (0.0623) |
| FLFP rate in country of residence | 0.318 (0.340) | 0.422 (0.405) | -0.3730 (0.3886) | 0.0379 (0.577) |
| GINI | | -2.161*** (0.488) | | -1.544** (0.727) |
| Constant | 0.697*** (0.207) | 1.285*** (0.277) | 1.009*** (0.229) | 1.296*** (0.285) |
| R-squared | 0.082 | 0.144 | 0.077 | 0.099 |
| Observations | 504 | 434 | 399 | 337 |

Notes: OLS estimation. Robust standard errors in parentheses.

FLFP rate according to estimates by International Labour Organization for 2008.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 1.13: Linear probability regressions: Actual female labor force participation of emigrants and female labor force participation rates in the country of residence.

A potential alternative explanation for our findings might be that labor force participation among females in our sample converges systematically to average female labor force participation rates in the destination countries. Among the native population female labor force participation rates are generally higher in the Nordic countries while they are lower in other Western countries and the

US (OECD, 2015). In Table 1.13 we additionally include female labor force participation rates in the country of residence instead of the GINI coefficient to explain female labor force participation in our sample abroad. Column 1 shows that the probability for the female partner participating in the labor force seems to be higher when labor force participation rates in the country of residence population is high. However, this relationship is statistically not significant and breaks down when excluding the Nordic countries from the sample: Then a higher female labor force participation rate in the country of residence is associated not statistically significant with only a very slightly increasing propensity for the female partner participating in the labor force among the couples. When including additionally the GINI coefficient in the regressions increases the R-squared showing that this measure explains a significant part of the variation in female labor force participation. These results go against the alternative explanation and underlines that the price mechanisms we describe with our model are more important to explain the observed outcomes.

Table A13 provides sensitivity analysis for the results with respect to the emigration years in our data. We do not find differences between the results for couples having emigrated in the earlier years 1987/88, 1992/93, 1997/98 compared with the later cohorts having emigrated in 2001/02. This additionally confirms that our results do not seem to be driven by an assimilation process towards average labor force participation rates in the destination countries.

Relative Contributions to Household Economies

Table 1.14 presents regression results for the binary dependent variable "male partner contributes more to the joint household economy". We include similar control variables as in Table 2.5 and 1.11. Results show that a higher male contribution is more likely in all countries among male power couples. Moreover, in couples with children the male partner more often contributes a higher share to the joint household economy. This effect is statistically significant for all Western countries. Furthermore, the intercept estimates indicate that a higher male contribution to joint household economies is more likely in the US and the non-Western countries. Again, the correlation between

the GINI coefficient and the dependent variable indicates that income differences between the countries of residence might be driving these differences.

| | All countries | | Nordic countries | US | Other West. countries | Non-Western countries |
|-----------------------|---------------|-----------|------------------|----------|-----------------------|-----------------------|
| Power couple | 0.0987* | 0.0873 | -0.0775 | 0.131 | 0.187** | 0.0711 |
| | (0.0580) | (0.0549) | (0.134) | (0.116) | (0.0842) | (0.0838) |
| Female power couple | 0.0261 | 0.0281 | 0.0109 | 0.0250 | 0.116 | -0.217 |
| | (0.0838) | (0.0805) | (0.165) | (0.175) | (0.124) | (0.209) |
| Male power couple | 0.218*** | 0.197*** | 0.236 | 0.204 | 0.277*** | 0.116 |
| | (0.0599) | (0.0550) | (0.160) | (0.124) | (0.0873) | (0.0796) |
| Youngest child 0-6 | 0.286*** | 0.273*** | 0.282** | 0.339*** | 0.303*** | 0.0336 |
| | (0.0568) | (0.0535) | (0.115) | (0.126) | (0.0818) | (0.0933) |
| Youngest child 7+ | 0.320*** | 0.296*** | 0.371*** | 0.258** | 0.333*** | 0.0919 |
| | (0.0536) | (0.0507) | (0.117) | (0.130) | (0.0760) | (0.0895) |
| GINI | 1.915*** | | | | | |
| | (0.327) | | | | | |
| Nordic countries | | -0.202*** | | | | |
| | | (0.0532) | | | | |
| United States | | 0.104*** | | | | |
| | | (0.0368) | | | | |
| Non-Western countries | | 0.149*** | | | | |
| | | (0.0424) | | | | |
| Constant | 0.178 | 0.466*** | 0.324** | 0.536*** | 0.357*** | 0.836*** |
| | (0.123) | (0.0657) | (0.139) | (0.173) | (0.0904) | (0.100) |
| Observations | 477 | 519 | 109 | 84 | 260 | 66 |
| R-squared | 0.196 | 0.213 | 0.115 | 0.198 | 0.166 | 0.14 |

Notes: OLS estimation. Robust standard errors in parentheses.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 1.14: Linear probability regressions: Male partner contributes more to joint household economy in 2008.

For Table 1.15 we re-estimate the specifications from Table 1.14 for couples in which both partners are in the labor force. The estimated effect for being male power couple on the dependent variable is statistically significantly positive. Child presence also has a strong positive effect on the likelihood of a joint household economy with a higher male income share.

Again, we estimate a positive statistically significant relationship between the GINI index and the

| | All countries | Nordic countries | US | Other West. countries | Non-Western countries | |
|-----------------------|----------------------|-----------------------|---------------------|-----------------------|-----------------------|---------------------|
| Power couple | 0.0772 (0.0722) | 0.0761 (0.0687) | -0.144 (0.143) | 0.103 (0.161) | 0.195* (0.100) | 0.115 (0.155) |
| Female power couple | 0.0269 (0.0987) | 0.0417 (0.0743) | -0.0147 (0.175) | 0.0174 (0.205) | 0.0743 (0.143) | -0.0650 (0.269) |
| Male power couple | 0.240*** (0.0776) | 0.227*** (0.0723) | 0.270 (0.169) | 0.317* (0.166) | 0.279** (0.107) | 0.195 (0.145) |
| Youngest child 0-6 | 0.304*** (0.0680) | 0.295*** (0.0651) | 0.215* (0.120) | 0.569*** (0.189) | 0.306*** (0.100) | 0.0599 (0.152) |
| Youngest child 7+ | 0.378*** (0.0620) | 0.350*** (0.0600) | 0.319** (0.125) | 0.399** (0.182) | 0.411*** (0.0871) | 0.127 (0.149) |
| GINI | 1.593*** (0.422) | | | | | |
| Nordic countries | | -0.153*** (0.0591) | | | | |
| United States | | 0.0957* (0.0560) | | | | |
| Non-Western countries | | 0.176*** (0.0563) | | | | |
| Constant | 0.138 (0.148) | 0.387*** (0.0762) | 0.404*** (0.149) | 0.326* (0.179) | 0.269*** (0.0989) | 0.737*** (0.158) |
| Observations | 351 | 379 | 99 | 47 | 193 | 40 |
| R-squared | 0.186 | 0.201 | 0.109 | 0.308 | 0.201 | 0.116 |

Notes: OLS estimation. Robust standard errors in parentheses.

Sample: Both partners work abroad

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 1.15: Linear probability regressions: Male partner contributes more to joint household economy in 2008 among dual-earner couples.

dependent variable. Country dummies indicate a difference between the other Nordic countries, the US and the remaining Western countries. Dual-earner couples in the Nordic countries are less likely to have joint household economies where the male partner contributes more. Dual-earner couples in the US are slightly more likely to have joint household economies where the male partner contributes more, although the effect is only statistically significant at the 10% level. A separate estimation for the different country groups reveals that the presence of children is related to a higher male contribution to joint household economies among dual-earner couples in all Western countries. In non-Western countries, the presence of children is not related to higher male household economy contributions; however, the intercept estimate indicates that a higher male contribution in these countries is generally more frequent.

Tables A14 and A15 show that our results still hold when including an indicator variable for whether the male partner contributed more to joint family income in Denmark before migration. If this was the case in Denmark, it is significantly more likely that the male contributes more in 2008, too.

1.6 Conclusion

We analyzed motivations to emigrate, labor market participation and household economies of Danish couples who have emigrated between 1987 and 2002 and stayed abroad at least until 2008. Denmark is one of the most gender-equal countries worldwide, with a high female labor force participation rate. Despite this, we found big gender differences in main motivations to emigrate and in labor force participation abroad. Own work was the main reason to emigrate for 74.7% of men and 21.7% of women, partner's job or other family reasons for 6.0% of men and 53.0% of women. Accordingly, Danish emigrant couples often adopt more traditional gender roles in non-Nordic countries abroad with a male breadwinner and the female staying at home. In the United States, the male works in almost all couples and the female in half. In the other Western countries, both partners work in two thirds of couples, and the male works while the female stays at home in one quarter of couples. The male stays at home and the female works in less than one

percent of couples that have emigrated. As a result of reduced female labor force participation, couples increasingly pool their earnings: the share of couples with separate economies declined from 12.6% before migration to 2.5% abroad, and the share of couples in which the male brings in all the money increased from 3.1% to 24.3%.

Lower female labor force participation could reflect both, demand and supply side effects. Potential legal constraints or a lack of labor market opportunities could force the female partner out of the labor force, but it could also be that lower female labor supply is an adjustment to wider wage differences abroad and couples preferring a traditional male breadwinner model would be more likely to self-select into emigration. Our results suggest that both demand and supply side mechanisms are important. Demand side restrictions appear to play a role especially in non-Western countries, where the share of couples in which only the male works is considerably larger than the share of couples stating that they prefer such a situation. In the Western countries, preferred and actual female labor force participation are closely in line, suggesting the primacy of labor supply decisions. Our theoretical framework illustrates the role of incentives in this context: Wider income differences as well as higher prices for child care can economically rationalize that the female partner reduces labor supply or stays out of the labor force. The empirical findings for female labor force participation abroad confirm the hypotheses derived from our model. After migration we observe decreased female labor force participation in countries with wider income differences. Female labor force participation is lower in the non-Nordic countries where incomes are more dispersed, like in the US. Reduced female labor force participation in the US and non-Western countries is particularly evident among couples with pre-school age children.

We do not find direct evidence for Tiebout sorting in terms of differences in pre-migration behavior. There are no big differences in female labor force participation rates in Denmark before emigration for couples living later in different countries. However, we observe that a significant fraction of couples with children migrating outside other Nordic countries viewed considerations related to children as a reason to emigrate, and very few as a reason against emigration. Among couples

migrating to other Nordic countries, very few viewed considerations related to children being either in favor or against emigration. One possible explanation for this is that those parents who think that it is better for children that one of the parents, almost always the mother, would take care of them at home, would be more likely to emigrate outside other Nordic countries, and switch abroad from dual-earner model to the male breadwinner model. This explanation is in line with the observation that the presence of young children significantly reduces female labor force participation outside other Nordic countries, while its effect in other Nordic countries is small and statistically insignificant.

Chapter 2

Family Decision-Making on International Migration*

2.1 Introduction

Already Frank (1978), Mincer (1978) and DaVanzo (1978) showed that family ties are an important impediment to migration within national borders. Subsequent literature has confirmed that migration decisions appear to be driven primarily by the male partner's job opportunities.¹ However, little is known about how partners make their migration decision. To what extent do partners who migrate together share the preference to migrate, and to what extent would one of the partners have actually preferred not to migrate, but compromised on his or her preferred location to stay together? Also, little is known about international migration of families, especially outside the context of developing countries.² Does the extent to which partners agree on migration differ between destinations, for example when comparing more and less gender egalitarian destination countries? We address both knowledge gaps. We develop a theoretical model for bargaining on migration decisions. From there we derive and test hypotheses on how individual and family characteristics are correlated with the partners' gains or losses from migration and, thus, their

*This chapter is based on joint work with Panu Poutvaara.

¹Recent studies include Compton and Pollak (2007), Blackburn (2010), Tenn (2010), and Gemici (2011) for the United States, Rabe (2011) for the United Kingdom and Nivalainen (2004) for Finland.

²See Docquier and Rapoport (2006) for a survey on literature related to family migration and remittances in the developing country context.

migration preferences. Using unique survey data we are the first to provide empirical evidence on the partners' preferences towards joint emigration.

Our empirical analysis uses survey data on Danish emigrants, restricting the attention to 522 respondents who had the same partner at the time of the survey as at the time of emigration. Denmark has one of the highest female labor force participation rates among OECD countries reaching 76% in 2010 (OECD 2011), although many women work only part-time. On top of this, the country is one of the world leaders in gender equality, having the third place in the United Nations Human Development Report (Klugman 2011). Therefore, we expect that family migration from Denmark would be more responsive to female preferences than family migration from less equal societies.

Our model analyzes migration probabilities of singles and dual-earner couples in which both partners work. Job offers abroad depends on wage at home and an individual-specific component which may obtain positive or negative values. Our model predicts that in dual-earner couples, a higher own wage decreases the own probability of becoming a tied mover, but increases the partner's probability of becoming a tied mover. Higher household surplus increases both partners' probabilities of becoming a tied mover. The reason is that if household surplus increases, it becomes more likely that the partner who would gain privately from migration is willing to compensate the partner who would lose. Despite compensation, it is possible that the accompanying spouse is left worse off after migration (but never worse off than the outside option of staying and splitting up).

We find that emigration is typically a shared family preference among the Danish emigrant couples. Nonetheless, men are usually more strongly in favor of emigrating. If there is disagreement on emigration, it is usually the female partner who would have preferred to stay in Denmark. The emphasis on the male's preference is strongest if the male partner has a college degree. However, even among couples in which the female partner is relatively higher educated, it is more common that the male rather than the female preferred to emigrate. Therefore, women seem to be more

often "tied movers" even when being better educated. This finding is most pronounced among male power couples with children. When comparing different destinations, the share of couples with the male having the stronger preference to emigrate is somewhat lower and the share of couples with the female having the stronger preference to emigrate is somewhat higher to other Nordic countries than to the United States, the other Western countries or the non-Western countries, but even among couples migrating to other Nordic countries the male partner's preference was about three times more often stronger than the female partner's. We test our model's hypotheses among dual-earner couples in which both partners work more than 60% of full working time in the year before emigration. Our results confirm that the likelihood for the male partner being in favor of emigration while the female partner had less strong preferences or was even against emigration decreases with earnings of the female partner. This is in line with predictions from the model.

Theoretically, already Mincer (1978) and Mont (1989) showed that conflicting location preferences among partners lead to higher opportunity costs for relocation compared to single households. They abstracted from the possibility of separation and assumed that both partners agree to maximize joint family income. Guler et al. (2012) analyze couples' location constraints by developing a joint search theory. In their framework an external job offer to one partner changes the reservation wage of the other partner who might become a tied mover and search for a job at the new location if his or her initial earnings were sufficiently low. The model also builds on a unitary household in which both partners pool their incomes. Individual earnings losses of a "tied mover" would always be fully compensated in such a framework. Becker (1974) argues, however, that considering the household as a unitary decision-making agent imposes strong assumptions on individual preferences.

Contributions by Manser and Brown (1980) and McElroy and Horney (1981) explain family decision-making in a cooperative Nash bargaining model. Their framework allows to analyze the distribution of income within the family according to the partners' outside options and their bargaining powers. Assuming full commitment, e.g. through the possibility of ex-ante transfers, the

cooperative Nash bargaining model always implies efficient bargaining outcomes. The cooperative bargaining approach was conceptualized generalized further by Chiappori (1988, 1992) and Apps and Rees (1988) as the collective family model. In a dynamic context though, where commitment is not possible, Lundberg and Pollack (2003) argue that bargaining family bargaining might also lead to inefficient outcomes. A comprehensive overview on cooperative and non-cooperative bargaining in the household can be found in Browning, Chiappori and Weiss (2014). In the context of long term international migration we will formalize individual preferences and decision-making on migration among couples using a cooperative Nash bargaining model. The derived hypotheses are then tested with the survey data on Danish emigrant couples, confirming the theoretical predictions. We restrict our analysis to one-time decision on whether to migrate. While there are a few papers that have analyzed repeated migration decisions (e.g. Gemici, 2011), a challenge in our context is that we cannot observe how potential job offers abroad would change over time. We refrain from presenting a dynamic model of repeated decisions as our data would not allow testing it.

The rest of the chapter is organized as follows. Section 2 presents a theoretical model on family bargaining and derives testable hypotheses from it. Section 3 describes our data and 4 presents stylized facts. In the light of our theoretical bargaining framework we present some empirical evidence on Danish emigrant couples in section 5. Section 6 concludes.

2.2 The Model

We consider family decision-making on migration as a Nash bargaining game in which both partners face individual-specific job opportunities at home and abroad. We model household decisions on permanent emigration as a one-shot-game without taking a dynamic perspective.³ While our modelling of migration costs and job opportunities is borrowed from Junge et al. (2014), the modelling of partners' decision-making is richer. Junge et al. (2014) assumed that the couple always stays together or migrates together, while we allow the partners to split. Furthermore, we model household surplus from being together as a couple and study how this is related to migration decisions. We compute migration probabilities first for a single person and then for a couple without and with a tied mover. We analyze how these probabilities respond to a change in the partners' wages, migration costs and the couple's household surplus. After deriving predictions from the theory we formulate hypotheses which we are going to test with data on Danish emigrant families.

2.2.1 Utility of a Single

The wage for an individual i in the home country 0 is denoted by w_i . For an individual as single wage equals utility,

$$u_i^{s0} = w_i.$$

The wage abroad, in country indexed by 1, depends on wage at home and an individual-specific random variable x_i . Individual-specific random variable and productivity at home are combined in a multiplicative fashion, so that the wage abroad equals $(1 + x_i)w_i$. Positive values of x_i are associated with superior job opportunities abroad, negative values with job offer abroad falling below what is available at home. We also assume that $x_i \in [\underline{x}, \bar{x}]$ with $-1 < \underline{x} < 0 < \bar{x}$. This guarantees that wage abroad cannot be negative. In addition, individual has to pay fixed migration cost c_i in case of emigration. If a single person i emigrates to country 1 he or she would have utility that depends on wage abroad net of migration costs:

³see e.g. Lundberg and Pollack (1996) who develop a household bargaining model in a dynamic, and non-cooperative setting.

$$u_i^{s1} = (1 + x_i)w_i - c_i.$$

i migrates if net migration gains are positive, i.e.

$$x_i w_i - c > 0.$$

Setting the left-hand side equal to zero allows solving for cut-off level of random variable \tilde{x}_i so that if $x_i > \tilde{x}_i$, individual i migrates:

$$\tilde{x}_i = \frac{c_i}{w_i}.$$

The probability that a single person migrates is $P_i = 1 - F(\tilde{x}_i)$, $F(\cdot)$ being the cumulative density function for the distribution of x_i . As $\frac{\partial \tilde{x}_i}{\partial c_i} > 0$ and $\frac{\partial \tilde{x}_i}{\partial w_i} < 0$, the probability of emigration is decreasing in migration costs and increasing in the wage rate.

2.2.2 Utilities in a Couple

In a couple both partners, a and b , earn individual wages w_a and w_b in the home country. Without loss of generality we set $w_a \geq w_b$. Additionally, the partners can consume a joint household surplus $h > 0$ in case they stay together, either in the home country or abroad. In case partners emigrate together to the same destination, they each face an individual-specific random term related to earnings abroad and also pay individual migration costs as defined above for singles. For simplicity we assume from now on $c_a = c_b = c$. At the time of decision-making both partners know their wage realization abroad in case of migration. We assume that the partners engage in Nash bargaining, either with a possibility of committing to future transfers, or making a transfer ex ante. The outside option of each partner is the choice he or she would make as single. The assumption that partners can commit to future transfers, or carry out ex ante transfers without liquidity constraints, implies that the couple is able to coordinate on locating efficiently on the

utility possibility frontier. This means that the migration decision is made to maximize the sum of individual incomes, net of eventual migration costs, and household surplus. Hence, with linear, additively separable utilities, joint emigration requires that the sum of both partners' gains from migration is positive, i.e.

$$x_a w_a + x_b w_b - 2c > 0. \quad (2.1)$$

Staying in the home country, without migration incentives for neither partner the couple bargains under the following resource constraint:

$$u_a^{c0} + u_b^{c0} = w_a + w_b + h. \quad (2.2)$$

If (2.1) holds and joint migration to 1 can be Pareto improving for both partners the resource constraint for bargaining is

$$u_a^{c1} + u_b^{c1} = (1 + x_a)w_a + (1 + x_b)w_b - 2c + h. \quad (2.3)$$

We consider a divorce-threat Nash bargaining framework. If (2.1) holds the couple maximizes a Nash bargaining function s.t. (2.3). The threat point of each partner is determined by his or her outside option, i.e. the individual migration incentive and optimal location choice as single. The partners' exogenous bargaining powers are α for a and $1 - \alpha$ for b with $\alpha \in [0, 1]$.

In case neither partner has a migration incentive, or in the absence of migration possibilities, the Nash bargaining solution maximizes

$$(u_a^{c0} - w_a)^\alpha (u_b^{c0} - w_b)^{1-\alpha}$$

s.t. (2.2). This yields individual utilities of

$$\begin{aligned} u_a^{c0} &= w_a + \alpha h, \\ u_b^{c0} &= w_b + (1 - \alpha)h. \end{aligned}$$

If both partners have an individual incentive to emigrate, there is no conflict of interest on the location and the Nash bargaining solution maximizes

$$(u_a^{c1} - (1 + x_a)w_a + c)^\alpha (u_b^{c1} - (1 + x_b)w_b + c)^{1-\alpha}$$

s.t. (2.3). The solution to the bargaining problem is then

$$\begin{aligned} u_a^{c1} &= (1 + x_a)w_a - c + \alpha h, \\ u_b^{c1} &= (1 + x_b)w_b - c + (1 - \alpha)h. \end{aligned}$$

If (2.1) holds and partner a has a migration incentive but b not, the Nash solution maximizes

$$(u_a^{c1} - (1 + x_a)w_a + c)^\alpha (u_b^{c1} - w_b)^{1-\alpha}$$

s.t. (2.3) if the couple emigrates.

If (2.1) holds and partner b has a migration incentive but a not, the Nash solution maximizes

$$(u_a^{c1} - w_a)^\alpha (u_b^{c1} - (1 + x_b)w_b + c)^{1-\alpha}$$

s.t. (2.3) if the couple emigrates.

This yields

$$\begin{aligned} u_a^{c1} &= (1 + x_a)w_a - c + \alpha(h + x_b w_b - c), \\ u_b^{c1} &= w_b + (1 - \alpha)(h + x_b w_b - c). \end{aligned}$$

The corresponding result for a as a tied mover is

$$\begin{aligned} u_a^{c1} &= w_a - c + \alpha(h + x_a w_a - c), \\ u_b^{c1} &= (1 + x_b)w_b + (1 - \alpha)(h + x_a w_a - c). \end{aligned}$$

These results yield that income losses of the tied mover are shared among the partners according to the bargaining powers. In this framework the tied mover is always worse off in terms of utility, compared to the situation before migration. He/she receives his/her outside option plus the remaining share of the household surplus net of own income losses. In case both partners would also migrate as singles, i.e. neither of them is a tied mover, there are no intra-family transfers. The partners divide the household surplus as in the home country according to the sharing rule derived above.

From this bargaining solution we can also derive the sufficient conditions for joint emigration and household stability: The losses of a potential tied mover must be smaller than joint household surplus. In case b would face individual income losses, i.e. $x_b w_b - c < 0$, it has to hold

$$h + x_b w_b - c > 0. \tag{2.4}$$

The corresponding condition for a as a tied mover is

$$h + x_a w_a - c > 0. \tag{2.5}$$

If (2.1) is satisfied but (2.4) or (2.5) is not, the partner who wants to emigrate could improve by migrating alone and the tied mover would be better off staying behind than migrating. Then, the couple would dissolve and give up joint household surplus h . This illustrates that unequal gains from migration can cause relationship instability, as pointed out by Mincer (1978) and Gemici (2011). Note that these conditions are independent of the partners' bargaining powers, if coordination on an efficient outcome and ex-ante transfers are possible.

2.2.3 Migration Probabilities

In the following, we assume that x_a and x_b are both uniformly distributed and independent. Allowing for positive correlation between x_a and x_b would alleviate potential conflict and make joint migration more likely. x_a and $x_b \in [\underline{x}, \bar{x}]$ with $\bar{x} - \underline{x} = 1$ for simplicity. Furthermore, $0 \leq c \leq \bar{x}w_{a,b}$.

Recall that a single person i would emigrate if net migration surplus from migration is positive, i.e. $x_i > \frac{c}{w_i}$. If x_i is uniformly distributed, as described above, the probability for emigration of i is

$$\int_{\frac{c}{w_i}}^{\bar{x}} \frac{1}{\bar{x} - \underline{x}} dx_i = \int_{\frac{c}{w_i}}^{\bar{x}} 1 dx_i = \bar{x} - \frac{c}{w_i}.$$

For migration probabilities of a couple we integrate over the bivariate probability distribution of possible realizations and analyze the outcomes. As we showed above the necessary condition for joint emigration is a positive sum of net migration surplus of a and b (2.1). Moreover, the sufficient conditions for household stability, (2.4) and (2.5), must hold if the couple emigrates together. Under these conditions Figure 2.1 illustrates the different migration scenarios in the x_a, x_b space. We distinguish three cases in which both partners emigrate jointly: one without a tied mover and two with a tied mover.

Joint Emigration without a Tied Mover

In the first case both partners would have own migration incentives as singles, i.e. $x_a > \frac{c}{w_a}$ and $x_b > \frac{c}{w_b}$. This can be written as

$$\int_{\frac{c}{w_a}}^{\bar{x}} \int_{\frac{c}{w_b}}^{\bar{x}} \frac{1}{\bar{x} - \underline{x}} dx_b dx_a = \int_{\frac{c}{w_b}}^{\bar{x}} \bar{x} - \frac{c}{w_a} dx_b = (\bar{x} - \frac{c}{w_a})(\bar{x} - \frac{c}{w_b}) = P_1(\text{joint migration w/o tied mover}).$$

Joint Emigration with a Tied Mover

We call $j = [a; b]$ a tied mover if $x_j < \frac{c}{w_j}$. As shown in (2.4) and (2.5) the loss that j faces in terms of lower earnings and migration costs abroad cannot exceed total household surplus h . The partner with migration incentives will compensate j as long as the necessary transfers to j do not exceed total household surplus h (conditions (2.4) and (2.5)). The pattern of compensation payments will depend on the weights of the underlying Nash bargaining process.

We calculate the probability that b is a tied mover (case 2). From the conditions derived above we obtain bounds for the random variables x_a and x_b that describe the situation in which b is a tied mover: As a has to have a migration incentive and both partners migrate together we know from (2.1) that $x_a > \frac{2c - x_b w_b}{w_a}$. Using condition (2.4), we know that $x_b > \frac{c - h}{w_b}$. Moreover, we require b to be a tied mover without own migration incentive, $x_b < \frac{c}{w_b}$. Integrating over possible values of x_a and x_b yields

$$\begin{aligned}
 \int_{\frac{c-h}{w_b}}^{\frac{c}{w_b}} \left(\int_{\frac{2c-x_b w_b}{w_a}}^{\bar{x}} \frac{1}{\bar{x} - \underline{x}} dx_a \right) dx_b &= \int_{\frac{c-h}{w_b}}^{\frac{c}{w_b}} \left(\int_{\frac{2c-x_b w_b}{w_a}}^{\bar{x}} 1 dx_a \right) dx_b \\
 &= \int_{\frac{c-h}{w_b}}^{\frac{c}{w_b}} \left(\bar{x} - \frac{2c - x_b w_b}{w_a} \right) dx_b \\
 &= \frac{h(w_a \bar{x} - c - \frac{1}{2}h)}{w_a w_b} \\
 &= P_2(b \text{ is tied mover}).
 \end{aligned}$$

For case 3, a is a tied mover, the problem is symmetric and yields

$$\int_{\frac{c-h}{w_a}}^{\frac{c}{w_a}} \left(\int_{\frac{2c-x_a w_a}{w_b}}^{\bar{x}} \frac{1}{\bar{x} - \underline{x}} dx_b \right) dx_a = \frac{h(w_b \bar{x} - c - \frac{1}{2}h)}{w_a w_b} = P_3(a \text{ is tied mover}).$$

These calculations require that $\bar{x} w_b - c - h \geq 0$ (under the assumption $w_b \leq w_a$). The Appendix

provides calculations for different corner solutions with $\bar{x}w_b - c - h < 0$ (and $\bar{x}w_a - c - h < 0$), including a distinction between the case of relatively small and large wage differences between a and b which becomes relevant then.

Total Joint Emigration Probability

The three cases together describe all possible events in which the couple emigrates: Without a tied mover, with a as a tied mover and with b as a tied mover. The probability of joint migration for the couple is, thus

$$P_4(\text{joint emigration}) = P_1 + P_2 + P_3 = \frac{h(w_a\bar{x} + w_b\bar{x} - 2c - h)}{w_a w_b} + \left(\bar{x} - \frac{c}{w_a}\right)\left(\bar{x} - \frac{c}{w_b}\right).$$

Figures 2.1 and 2.2 illustrate the different cases in which joint migration occurs. They plot partner a 's job opportunities abroad on the horizontal and partner b 's job opportunities abroad on the vertical axis. As the distribution of x_a and x_b is uniform over the interval \underline{x} to \bar{x} the surface indicated with P_1 , P_2 and P_3 corresponds to the migration probabilities derived above. The illustration in Figure 2.1 refers to the case in which $w_a = w_b$ and $h > c$; Figure 2.2 provides an example for a situation in which $w_a > w_b$ and $h < c$.

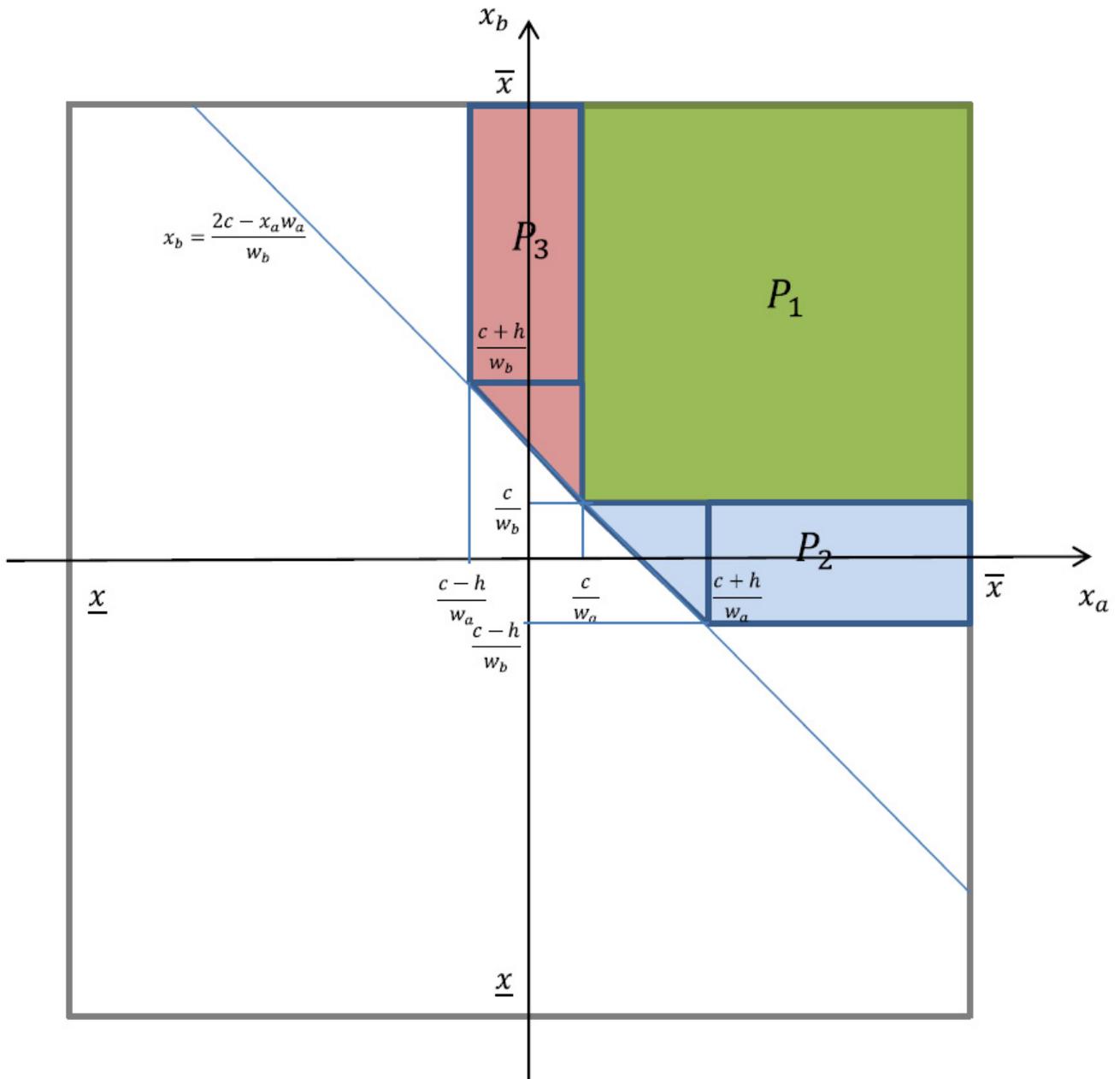


Figure 2.1: Conditions for joint emigration of a couple (illustration for $w_a = w_b$ and $h > c$).

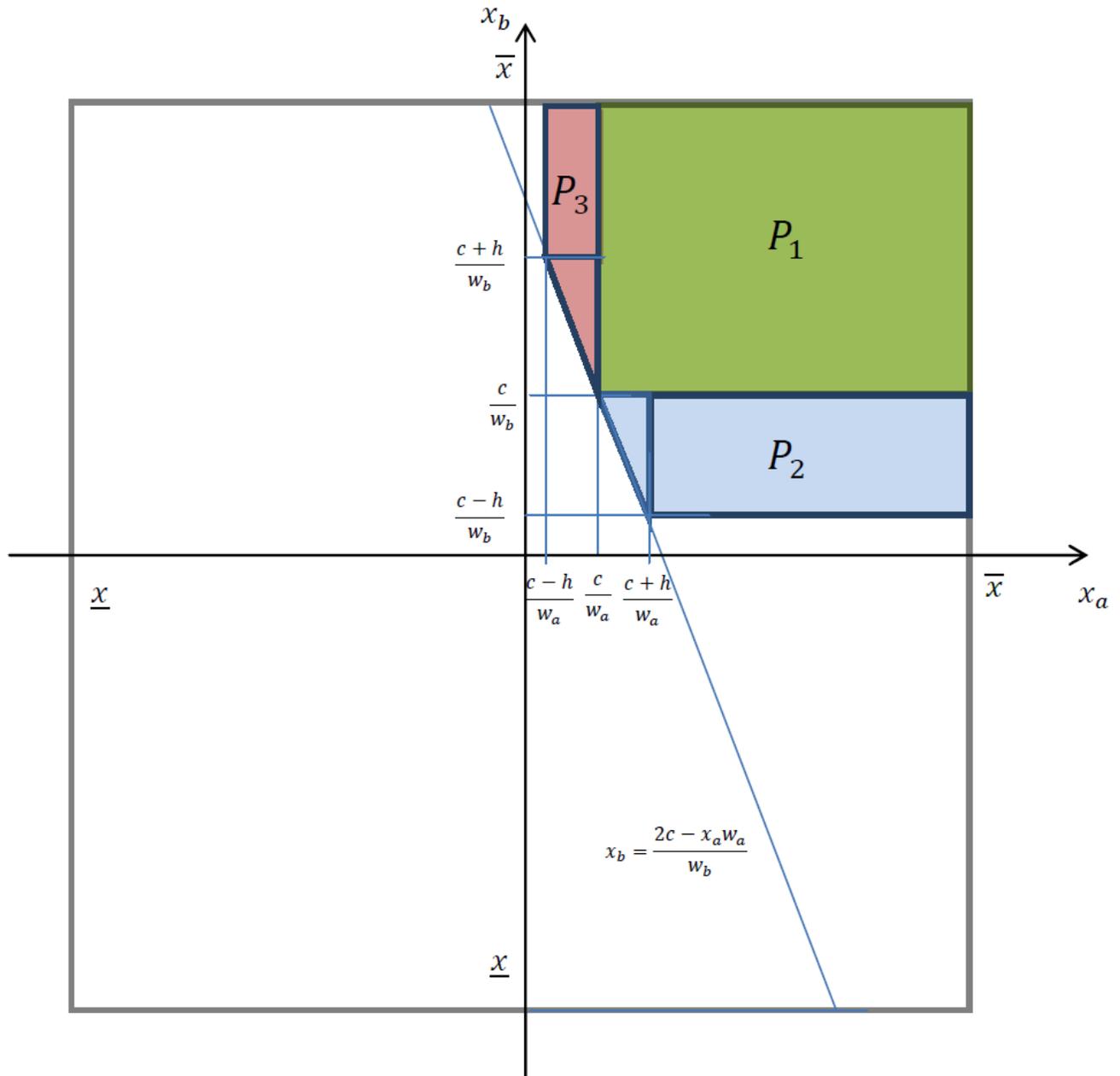


Figure 2.2: Conditions for joint emigration of a couple (illustration for $w_a > w_b$ and $h < c$).

2.2.4 Comparative Statics

The following derivatives provide useful insights into the effects of changes of w_a , w_b , c and h on the probabilities above.

$$\frac{\partial P_4}{\partial w_a} \begin{cases} > 0 & \text{if } c > h \\ \text{ambiguous} & \text{if } c < h \end{cases}, \frac{\partial P_4}{\partial w_b} \begin{cases} > 0 & \text{if } c > h \\ \text{ambiguous} & \text{if } c < h \end{cases}, \frac{\partial P_4}{\partial c} < 0, \frac{\partial P_4}{\partial h} > 0.$$

$$\frac{\partial P_2}{\partial w_a} > 0, \frac{\partial P_2}{\partial w_b} < 0, \frac{\partial P_2}{\partial c} < 0, \frac{\partial P_2}{\partial h} > 0.$$

(Corresponding Results for P_3)

The comparative statics with respect to P_1 tell that the likelihood of joint emigration without a tied mover is increasing in both partners' incomes, and decreasing in migration costs. Household surplus has no effect on joint migration without a tied mover. The comparative statics with respect to P_2 and P_3 show that the likelihood of being a tied mover is decreasing in own income and in the migration cost, and increasing in the partner's income and in the household surplus. The intuition with respect to own income and partner's income is that if the partners have diverging preferences, the magnitude of both potential gains and losses is increasing in own income, making it more likely to be able to compensate the partner if he or she is a tied mover, and less likely to be able to be compensated. An increase in household surplus, instead, increases the cost of breakup and makes it more likely that a compensation can be agreed upon, in case of diverging migration preferences. Note that if there would be no household surplus ($h = 0$), there would be no tied movers and both P_2 and P_3 would equal zero.

The most surprising result is that if $c < h$, the effect of the primary earner's income on the probability that a couple emigrates is ambiguous. A priori, one could expect that the effect would be always positive, as higher income of the primary earner means that potential gains from emigration increase. Furthermore, Junge et al. (2014) concluded, in a model in which couples always stay

together of migrate together, that the probability of emigration always increases in the primary earner's income. This conclusion no longer holds if the couple can break up, and total household surplus is larger than individual migration cost.

Furthermore, we can compute conditional probabilities for emigrating as a tied mover in a couple conditional on emigration. The probability that b is a tied mover conditional on joint emigration is

$$\frac{P_2}{P_4} = \frac{h(w_a x_a - c - \frac{1}{2}h)}{h(w_a \bar{x} + w_b \bar{x} - 2c - h) + w_a w_b \bar{x}^2 - w_a \bar{x}c - w_b \bar{x}c + c^2}$$

The results for a as a tied mover are straight forward and derived in a similar way.

The corresponding derivatives w.r.t. w_a , w_b , c and h can be computed and yield the following results:

$$\frac{\partial \frac{P_2}{P_4}}{\partial w_a} > 0, \frac{\partial \frac{P_2}{P_4}}{\partial w_b} < 0, \frac{\partial \frac{P_2}{P_4}}{\partial c} : \text{ambiguous}, \frac{\partial \frac{P_2}{P_4}}{\partial h} > 0.$$

(Corresponding results for $\frac{P_3}{P_4}$)

Based on these conditional probabilities of couple migration with a tied mover and the presented comparative statics results we can derive hypotheses to test with our data.

1. A higher own wage in the home country decreases the probability for being a tied mover, unconditional and conditional on joint emigration.
2. A higher wage of the partner in the home country increases the probability for being a tied mover, unconditional and conditional on joint emigration.
3. Higher household surplus increases the probability that either partner is a tied mover (unconditional and conditional on joint emigration).

4. The impact of an increase in migration costs for both partners, for example, due to the presence of children, is unclear for the conditional probability of being a tied mover. Higher migration costs reduce the unconditional probability for being a tied mover.

2.3 Data

We study household decision-making using unique survey data on Danish emigrants who had emigrated in 1987, 1988, 1992, 1993, 1997, 1998, 2001 or 2002, and had not returned to Denmark by 2008. The survey was planned by Munk and Poutvaara within the project "Danes Abroad: Economic and Social Motivations for Emigration and Return Migration", financed by the Danish Social Science Research Council. The survey was carried out by Statistics Denmark. A detailed description on the data collection can be found in Poutvaara et al. (2009) for details on the sample used in the following analysis, see Munk, Nikolka and Poutvaara (2014).

We focus on long-term emigration decisions of couples. The survey data provides information on several pre-migration characteristics of the respondents like household composition, education and work situation in Denmark. Most importantly, the survey respondents were asked about their motives and preferences for emigration. We restrict our sample to respondents in a long-term relationship being together with their partner since the time of emigration until the survey took place in 2008. The reason for this restriction is that if the couple would have separated between the time of emigration and survey conduction, the respondent might interpret the partner's preferences and an eventual conflict at the time of emigration in the hindsight of the relationship having ended. We also require that the respondent and the partner had lived together before emigration to focus on joint migration decision-making in the household as modeled above. Furthermore, we restrict the analysis to partners who are Danish citizens. The reason for this restriction is that in international couples, emigration from Denmark might imply returning to the home country of the partner, making a migration decision qualitatively different. Finally, we link respondents and their partners with the Danish full population register data on age, gender and earnings before migration. The remaining analysis is based on 522 respondents, as well as their partners, who

satisfied all the above restrictions.

In the subsequent analysis, we recoded the answers the survey respondents gave on their own and their partners' situation and preferences. The recoded answers then refer to the male or female partner. For example, if a male answered that "I was in favor of migration, while my partner would have preferred to stay in Denmark", this is recoded as "Disagreement, female would have preferred to stay".

2.4 Descriptive Statistics

Our data allow us to gain important insights into intra-family decision-making on migration of Danish emigrant couples and to test the predictions derived from the theoretical bargaining model. We are able to link the partners' preferences to their individual characteristics, in particular their pre-migration earnings in Denmark. To our knowledge there is no empirical evidence on intra-household bargaining on international migration decisions so far.

As a starting point for analyzing the complexity of household decision-making this section provides some descriptive statistics presenting the data and the variable used in subsequent econometric analysis. Our first question of interest is to what extent emigration was a shared preference among the partners. We group migration preferences in five categories. There are three categories containing joint migration preferences: equal migration preferences among the partners, agreement but stronger male preference, agreement but stronger female preference towards emigration. In two categories, there are couples having disagreed on emigration and either the female or the male partner would have preferred to stay. Table 2.1 provides an overview on the distribution of migration preferences among the partners in our sample.

A majority of 52.0% of respondents said they had equal preferences towards migration. In the case of unequal preferences it was mostly the male partner who was in favor of emigration (39.0%).

| | No child in DK | Children in DK | Total |
|---|----------------|----------------|-------|
| Equal preferences | 52.8% | 51.1% | 52.0% |
| Agreement, stronger male preference | 29.6% | 34.9% | 32.6% |
| Agreement, stronger female preference | 9.0% | 6.5% | 8.5% |
| Disagreement, female would have preferred to stay | 7.9% | 6.2% | 6.4% |
| Disagreement, male would have preferred to stay | 0.7% | 0.3% | 0.6% |
| Observations | 244 | 278 | 522 |

Source: Survey data.

Table 2.1: Migration preferences and child presence.

6.4% stated that only the male wanted to emigrate while the female disagreed on migration. The female wanted to emigrate while the male disagreed in only 0.6% of the cases. Stronger female migration preferences were more frequent among couples without children compared to couples with children. For couples with children stronger male migration preferences were relatively more frequent. Most couples, however, reported that migration was a shared preference. 93.1% of respondents report joint agreement on migration. Moreover, in Table 2.1 we do not observe a big difference in relative migration preferences between couples with and without children in Denmark. In the following, we analyze the partners' migration preferences in the light of their pre-migration characteristics, as motivated by the theoretical model. We will emphasize especially migration decision of dual-earner couples in which partners potentially face more divergent preferences on international migration.

Table 2.2 relates migration preferences of the partners to the power type of the couple. Following Costa and Kahn (2000) we will refer to different "power" types of couples in our analysis according to their level of education and earnings potential. Power couples are characterized by a college educated male and female partner. We refer to male or female power couples if only one partner holds a college degree. Low power couples are those where neither partner has completed a higher education.

Among 38.9% of the low power couples the male partner preferred more to emigrate than the female, compared to a higher female migration preference for only 4.2%. For power couples and

female power couples the shares are similar but stronger female migration preferences are slightly more frequent (9.0% for power couples and 9.1% for female power couples). With 36.4% the share of stronger male migration preferences is lowest for female power couples, but it is still around three times higher than that of stronger female preferences. The highest share of stronger migration preferences of the male partner (50.9%) can be observed for male power couples. At the same time, with 39.3% the share of equal migration preferences is particularly low for male power couples. Male migration preferences, thus, are least dominant among female power couples and most dominant for male power couples. In general, however, male preferences clearly stand out for all education groups if migration was not an equal preference of both partners.

Table 2.2 also reports the shares in the preference categories for the different power types accounting for child presence in the household before migration. Children in the household do not seem to be strongly related to relative migration preferences; this holds for low power couples, female power couples and power couples. The higher share of stronger male migration preferences in male power couples seems to be driven by those couples that had a child when leaving Denmark: The share of stronger male migration preferences is 33.3% for male power couples without children, but 60.2% for those with children at the time of migration. For male power couples with children equal migration preferences can only be observed in 32.9% of the cases. Hence, stronger male emigration preferences are particularly frequent for male power couples if there were children in the household before migration.

We were concerned about a bias due to misreporting of the partners' preferences depending on the characteristics of the partner who answered the questionnaire. Among our respondents we identified a subsample of 60 couples where both partners answered the questionnaire. We analyzed those partners' mutual assessment of migration preferences. Table B1 shows that in 47 of 60 cases the partners' answers on their respective migration preferences were perfect matches. If there were deviations, one partner mostly reported mutual agreement, while the other stated stronger migration preferences of the male or female partner. Thus, we can expect joint migration pref-

| | No child in DK | Children in DK | Total |
|---|----------------|----------------|-------|
| Low power couples | | | |
| Equal preferences | 54.2% | 59.6% | 56.8% |
| Agreement, stronger male preference | 35.4% | 29.8% | 32.6% |
| Agreement, stronger female preference | 6.3% | 2.1% | 4.2% |
| Disagreement, female would have preferred to stay | 4.2% | 8.5% | 6.3% |
| Disagreement, male would have preferred to stay | 0.0% | 0.0% | 0.0% |
| Observations | 42 | 44 | 86 |
| Female power couples | | | |
| Equal preferences | 55.9% | 52.4% | 54.5% |
| Agreement, stronger male preference | 23.5% | 28.6% | 25.5% |
| Agreement, stronger female preference | 8.8% | 9.5% | 9.1% |
| Disagreement, female would have preferred to stay | 11.8% | 9.5% | 10.9% |
| Disagreement, male would have preferred to stay | 0.0% | 0.0% | 0.0% |
| Observations | 33 | 20 | 53 |
| Male power couples | | | |
| Equal preferences | 51.3% | 32.9% | 39.3% |
| Agreement, stronger male preference | 25.6% | 53.4% | 43.8% |
| Agreement, stronger female preference | 12.8% | 6.8% | 8.9% |
| Disagreement, female would have preferred to stay | 7.7% | 6.8% | 7.1% |
| Disagreement, male would have preferred to stay | 2.6% | 0.0% | 0.9% |
| Observations | 34 | 67 | 101 |
| Power couples | | | |
| Equal preferences | 52.1% | 56.3% | 54.4% |
| Agreement, stronger male preference | 30.1% | 29.3% | 29.7% |
| Agreement, stronger female preference | 8.9% | 8.0% | 8.4% |
| Disagreement, female would have preferred to stay | 8.2% | 5.7% | 6.9% |
| Disagreement, male would have preferred to stay | 0.7% | 0.6% | 0.6% |
| Observations | 135 | 147 | 282 |

Source: Survey data.

Table 2.2: Power types, child presence and migration preferences.

ferences to be correctly assessed by one partner for most of the remaining observations in our sample.

| | Median male income (monthly, DKK) | Median female income (monthly, DKK) |
|--|--------------------------------------|--|
| Equal preferences | 27,734 | 15,152 |
| Agreement, stronger male preference | 28,538 | 16,434 |
| Agreement, stronger female preference | 25,501 | 12,254 |
| Disagreement, female would have preferred to stay | 32,584 | 13,929 |
| Disagreement, male would have preferred to stay | 26,265 | 24,299 |

Source: Survey data.

Table 2.3: Income and migration preferences.

Our theoretical framework presented above relates joint migration probabilities and the partners' migration preferences to their pre-migration earnings. In Table 2.3 we present the median of monthly incomes in Danish Krone before emigration of the male and female partners according to migration preferences in our sample.⁴ We find that median male income is particularly high in couples where the male partner has stronger preferences towards emigration. This pattern does not seem to hold for female median income. A high female median income stands out only among the very few cases in which the male partner disagreed while the female partner had a strong preference towards emigration.

Table 2.4 provides insights into the partners' migration preferences for different destinations: the United States, Nordic countries, other Western countries and non-Western countries. Stronger male migration preferences are slightly more frequent among couples that emigrated to the US, and less frequent among couples that emigrated to other Nordic countries. Among couples having migrated to one of the other Nordic countries the share of stronger migration preferences of the female partner is relatively higher, 13.2%, compared to the 5.1% for the US. It is 7.0% for the other Western countries and 11.8% for the non-Western destination countries. On the other hand, the share of stronger male migration preferences is smallest among couples having migrated to the

⁴Earnings presented are annual earnings divided by 12 months from the Danish administrative register data. Annual earnings are labor income plus non-negative values for freelance income in the year before the couple has left Denmark. Earnings are deflated using the year 2000 as the reference year.

| | Nordic countries | US | Other Western countries | Non- Western countries | Total |
|---|---------------------|-------|-------------------------------|------------------------------|-------|
| Equal preferences | 52.1% | 51.3% | 52.5% | 51.3% | 52.0% |
| Agreement, stronger male preference | 28.1% | 34.6% | 33.8% | 31.5% | 32.6% |
| Agreement, stronger female preference | 12.4% | 5.1% | 6.2% | 11.8% | 8.5% |
| Disagreement, female would have preferred to stay | 6.6% | 7.7% | 6.6% | 5.3% | 6.4% |
| Disagreement, male would have preferred to stay | 0.8% | 0.0% | 0.8% | 0.0% | 0.6% |
| Observations | 114 | 73 | 259 | 76 | 522 |

Source: Survey data.

Table 2.4: Migration preferences by destination country.

Nordic countries. However, we would have expected gender differences with respect to migration preferences to be even smaller to the Nordic countries compared to the US and other destinations. In general, labor market policies in the Nordic countries, in particular for dual-earner couples, are more family friendly, for example due to the provision of public day care services. However, even among couples having migrated to the Nordic countries stronger male migration preferences are clearly more frequent than stronger female preferences. Still, for all destination countries a clear majority of couples emigrated in joint agreement, to all destination country groups 51.3% to 52.5% of both partners had even equally strong migration preferences.

2.5 Econometric Analysis

Based on our theoretical framework and the descriptive analysis, we expect attitudes towards migration to be related to family characteristics and earnings potentials of the partners, in particular in dual career couples. As we observe only very few couples where the female partner has stronger preferences towards joint emigration, we focus on stronger male migration preferences in the econometric analysis.

In Table 2.5 we estimate a linear probability model for all couples for which we retrieve labor market information from the register data. Compared to the descriptive analysis the estimation results provide a more detailed insight on the relationship between pre-migration characteristics, in particular earnings potential of the partners, and the binary dependent variable for stronger male preferences towards joint emigration. Table 2.5 reports the regression results on a reduced sample of 449 observations. The reason for this is that we were not able to find administrative labor market data for partners in the sample. Our model predicted that the probability of being a tied mover conditional on joint emigration increases with the partner's wage and decreases with the own wage. We include log earnings for both partners adding 1 to all values and thus also including log earnings of partners without any income in the year before emigration. We find that the probability for stronger male migration preferences in our sample increases with log male earnings. This finding is robust and statistically significant across all specifications in Table 2.5. However, we do not find any significant effect of female wages on stronger male migration preferences.

We additionally include the power type of the family as a dummy variable in our regressions. Stronger male migration preferences are more likely among male power couples. We saw in our descriptive analysis that this seems to be driven to a large extent by the presence of children in the household. There are no clear results on the effect of female power couples and power couples on migration preferences in these specifications. Furthermore, estimation results do not reveal a clear effect for the presence of children in the household on stronger preferences of the male partner towards emigration. In the last specification, we include a dummy variable for la-

bor force attachment of the female partner in Denmark. In 24 cases the female partner did not work in Denmark. The male partner, on the other hand, did not work in only three of the couples. Our results show that labor force attachment of the female partner seems to go along with stronger male migration preferences, even though the effect is not significant. This finding is in line with the literature describing the co-location problem of couples more severe if both partners work.

| | (1) | (2) | (3) | (4) |
|-------------------------|---------------------|---------------------|---------------------|---------------------|
| Log Female Income in DK | -0.0113 (0.0568) | -0.0179 (0.0561) | -0.0149 (0.0561) | -0.0284 (0.0570) |
| Log Male Income in DK | 0.124** (0.0544) | 0.109** (0.0537) | 0.0982* (0.0550) | 0.0931* (0.0558) |
| Power couple | | -0.0345 (0.0709) | -0.0368 (0.0708) | -0.0487 (0.0731) |
| Female power couple | | 0.00139 (0.114) | 0.00431 (0.114) | 0.00431 (0.114) |
| Male power couple | | 0.169** (0.0825) | 0.162* (0.0829) | 0.151* (0.0855) |
| Child in DK | | | 0.0470 (0.0536) | 0.0572 (0.0537) |
| Female worked in DK | | | | 0.244 (0.164) |
| Observations | 449 | 449 | 449 | 449 |

Notes: OLS estimation. Constant included.

Robust standard errors in parentheses.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 2.5: Linear probability regressions: Stronger male preferences towards joint emigration.

The sample at hand allows to test some predictions from the theoretical model directly. Theory focuses on partners' job opportunities among dual career couples. Referring to this, we restrict the sample in the subsequent analysis to dual-earner couples⁵. The model yields predictions on the probability for a partner being a tied mover conditional on joint emigration. We observe only couples that emigrated together and interpret the stated preferences of the survey respondents as an indicator for the tied mover status of a partner. Again, we focus on stronger male preferences

⁵In dual-earner couples, both partners work in the labor market more than 60% of the full working time in the year before emigration.

towards emigration as an indicator for female tied mover status.

Results regarding migration preferences among dual-earner couples are in line with the model predictions. Relatively stronger preferences towards emigration of the male partner are more frequent in case female income is lower; in contrast to Table 2.5 there are no statistically significant results for male income among dual-earner couples. We also include a regressor for the presence of children distinguishing between families with the youngest child below the age of 7 and those in which the youngest child is 7 or older. Results show that stronger preferences of the male partner to emigrate are slightly more frequent if the youngest child was older than 6 before emigration. Related to the theoretical model the presence of children, on the one hand might increase migration cost (Mincer, 1978). From the model we were not able to derive a clear prediction on how an increase in migration costs for both partners would affect the probability for one partner to become a tied mover conditional on joint emigration. On the other hand, the presence of children could also be interpreted as an indicator for higher household surplus, making separation more costly for both partners. In this case, we would expect children in the household to increase the probability of one partner becoming a tied mover, given that the couple emigrates. Another possible proxy variable for household surplus h in the model could be relationship length. We include an indicator variable for whether the couple lived together already 5 years prior to migration in Denmark. Results show that including this variable goes along with relatively stronger male preferences towards emigration after controlling for earnings and children in the household. The effect of the child dummy variable becomes insignificant in the last column. Table B2 in the appendix provides an alternative specification restricting the sample of dual-earner couples to male primary earners. That model includes log household income and log earnings difference between primary and secondary earner confirming the estimation results presented in Table 2.5.

| | (1) | (2) | (3) |
|---------------------------|----------------------|----------------------|-----------------------|
| Log female income in DK | -0.126** (0.0523) | -0.103** (0.0546) | -0.110*** (0.0544) |
| Log male income in DK | 0.00883 (0.0475) | 0.0314 (0.0500) | 0.0514 (0.0506) |
| Child 0-6 in DK | | 0.0339 (0.0358) | 0.0153 (0.0375) |
| Child 7+ in DK | | 0.104* (0.0639) | 0.0664 (0.0662) |
| Cohabiting 5+ years in DK | | | 0.0771** (0.0332) |
| Observations | 235 | 235 | 235 |
| R-squared | 0.031 | 0.027 | 0.040 |

Notes: OLS estimation. Constant included.

Robust standard errors in parentheses.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 2.6: Linear probability regressions: Stronger male preferences towards joint emigration, dual-earner couples.

2.6 Conclusion

To shed more light on the determinants of relative migration preferences among the partners in migrating dual career couples, we developed a model for family bargaining on international migration. Most of the previous literature has only considered unitary decision-making of households in the context of migration. Our model endogenizes family stability and explains why a tied mover might face utility losses through migration, but still migrate with the family. From this framework we derive predictions on how the probability of becoming a tied mover, and thus rather preferring not to migrate, is related to earnings of partners in dual-earner couples. We are able to test the hypotheses with survey data on Danish couples having jointly emigrated.

Empirically, we found that among the partners emigration is mostly a shared preference. However, in many couples the partners did have different preferences towards joint emigration. Despite Denmark being one of the most gender-equal countries worldwide, with a high female labor force participation rate, we found that family migration is more often driven by the male partner. If

there was disagreement on the migration decision, it was mostly the male who preferred to emigrate and the female who would have rather stayed in Denmark. Gender differences in migration preferences were less strong among couples having migrated to one of the Nordic countries.

Regression analysis shows that an increase in earnings of the male partner in Denmark is associated with higher probability that the male has the stronger preference towards emigration in the couple. This supports our theoretical predictions. Furthermore, we considered the partners emigration preferences in the light of the couples' power types in our analysis, i.e. their levels of education. Our analysis revealed that stronger male preferences towards migration are more frequent among male power couples, in which only the male partner is college educated. Low power couples, female power couples and power couples do not differ much from each other in terms of migration preferences.

For the sample of dual-earner couples we are able to directly test the hypotheses derived from the theoretical bargaining framework. Among these couples, lower female earnings are associated with stronger preferences of the male partner towards emigration. This is in line with theory. Moreover, we find that stronger male preferences to emigration are more likely in case the couple was cohabiting for more than 5 years in Denmark, indicating that family migration with a tied mover is more likely if household surplus is large. Our study provides novel insights on couples' migration decisions in case both partners have divergent individual labor market opportunities from migration. Our empirical analysis is able to confirm theoretical implications from a bargaining model on migration decisions, a more general framework compared to a unitary household model.

Chapter 3

Family Return Migration

3.1 Introduction

This chapter investigates the role of family ties for return migration of immigrant couples. A major part of migration flows to OECD countries is of temporary nature (Dustmann 1995, 1997; Dustmann and Görlach, 2016). The effect of family ties on migration decision has been studied both theoretically as well as empirically (Mincer, 1978; Mont, 1989; Borjas and Bronars, 1992; Tenn, 2010; Gemici, 2011; Junge et al., 2014). As for the initial emigration decision in the first place, family ties can be expected to also play an important role for the decision to return home (Dustmann, 2003). However, the role of the family for temporary migration decisions has only received limited attention so far. There exists an extensive literature focusing on migrants' ties to the home country when family members were left behind (For a survey see Docquier and Rapoport, 2006). In contrast to this literature, this chapter analyzes joint migration decisions of partners who immigrate together and decide whether to jointly return to the country of origin. In this context there is only little evidence on family related considerations for return migration so far. The present analysis is going to use administrative data from 1973 to 2010 to study return decisions of immigrant couples living in Denmark. Return plans are likely to affect outcomes on the family level like fertility and labor market attachment of partners challenging empirical identification of causal mechanisms. Many observable characteristics that potentially influence family return decisions are endogenously determined.

This study's contribution is threefold. First, it improves on causally identifying family related considerations, in particular towards children in the household for the decision of immigrant couples to return home. The analysis restricts attention to partners having jointly immigrated from the same country of origin to Denmark. Building on an analysis by Dustmann (2003), who studies out-migration of guest workers from Germany, the empirical strategy exploits variation in return propensities between couples with sons versus daughters. Using administrative data for Denmark and linking information on both partners as well as their children on the household level, this study adds to the analysis by Dustmann in two ways: First, it confirms findings for the case of Denmark, and second, it identifies an effect of gender of the first born child in the family. Dustmann analyzed differences in immigrants' return propensities according to the share of daughters in the household. Addressing the concern that the overall number of daughters compared to sons living in the household might be affected by endogenous fertility decisions, my results reveal that couples from non-Western countries exhibit relatively higher return propensities when having a girl compared to a son as a first born child in Denmark. In line with findings by Dustmann (2003) for return migrants from Germany, this effect is statistically significant for the subsample of Turkish immigrants.

In a further step, the present analysis investigates the effect of a policy change in Denmark in 2002 on return migration of immigrant couples. The Danish government tightened rules for family reunification impeding immigration on the grounds of marriage to a person residing in Denmark below the age of 24. Even though not affected by the policy change themselves, couples from non-Western countries are more likely to return after family reunification rules were tightened. Being statistically significant only for those couples with children this finding suggests that considerations related to home country ties through marriage prospects of children might influence the return decisions of these couples.

The second contribution relates to potential explanatory channels driving the return decisions of families. The analysis disentangles heterogeneity in family return rates along different dimen-

sions and relates this to potential explanatory factors. Descriptive evidence shows that return propensities of families are very heterogeneous depending on the immigrant couples' countries of origin. Coming from one of the other Nordic countries goes along with higher return rates while return rates are lower in case of the other Western countries and lowest for the non-Western origin countries. This confirms findings by Jensen and Pedersen (2007) who study out-migration of immigrants in Denmark and also report large differences for individuals from different sending country groups. Moreover, the data show that the presence of children is related to return rates for couples from different countries in a very heterogeneous way. In general, having children and also the number of children is negatively associated with return propensities, but only statistically significant for families from the non-Western countries. Couples from all origin countries are less likely to return with children born in Denmark compared to children born in the country of origin, controlling for years since immigration.

Further analysis reveals, that families are statistically significantly more likely to return before school age of the oldest child, if born outside Denmark. This holds for couples from the Nordic countries, the other Western countries and the non-Western countries. Dustmann (2003) and Djadjic (2008) argue that labor market perspectives of children have an influence on the parents' decision whether or not to return. Related to this, schooling considerations might play an important role, too. Even though the quality of schooling in Denmark is high compared to many non-Western countries, families might be relatively more likely to return to a country of origin where education perspectives for the children are better. Tiebout (1956) already suggests that individuals choose where to live depending on their policy preferences; the provision and quality of public schools might be one factor associated with location preferences of families. Results reveal that return migration when the oldest child is below the age of 7 is more likely to countries where average schooling quality is better, measured along the PISA test score scale. However, variation in log GDP per capita contributes even more to explaining relatively higher return propensities of couples with young children. This suggests that other factors correlated with the income level and institutional quality in the country of origin play a role for return decisions of couples with

children, too. Overall, the timing of family return decisions suggests an association with the children's schooling. Nevertheless, robust evidence for the link between schooling quality and return migration of families cannot be established here.

Factors related to home country ties, e.g. cultural identity might also have an effect on the decisions of families to return even among migrants that migrated together with their partner and children to Denmark. Fernandez (2007) and Fernandez and Fogli (2009) study the impact of cultural identity among immigrants as well as their descendants and find that economic decisions of first and even second generation immigrants in the host society are strongly associated with cultural background. This is likely to also affect the propensity to return. Sajons (2015) studies children's eligibility to citizenship and return migration of families from Germany. Eligibility to host country citizenship is found to reduce return rates possibly through considerations related to the identity. The present analysis provides evidence that factors related to culture and identity are likely to be relevant for return decisions among subgroups of immigrant couples from Denmark as well: Relatively higher return probabilities for Turkish immigrants with a girl compared to those with a boy as the oldest child suggest an effect of considerations related to parents' preferences towards gender roles and identity. Given that Denmark is a host country with high female labor force participation rates and high quality of schooling and a gender equal society, it seems unlikely that the differences in relative return propensities are due to labor market or schooling considerations concerning daughters in the family. Moreover, the effect of a policy change regarding family reunification rules also suggests that arguments related to cultural identity and ties to the home country which are not related to education or institutional quality are relevant for return decisions of families.

The third contribution of this study links to the literature on temporary migration studying immigrants' self-selection into return migration on labor market characteristics. The present analysis studies self-selection into return on observable characteristics of the partners, in particular labor income, separately for all couples, for dual-earner couples, for couples with children and by different

countries of origin. First of all, results reveal strong self-selection into return migration on primary earner's income for couples with male as well as female primary earner. Self-selection patterns are strongest for non-Western countries. These results are in line with the literature on return migration, in general, without addressing the role of family ties. Borjas and Bratsberg (1996) argue that the self-selection into return-migration accentuates selection patterns of the initial migration flow between two countries. Along these lines, Denmark, with a narrow income distribution would attract relatively more immigrants at the low end of the income distribution (Pedersen, 2005). In line with theory, self-selection patterns of returning migrant couples according to primary earner income is strongly positive to non-Western countries where incomes are often more unequally distributed. Positive self-selection of immigrants into out-migration has also been shown for the case of Norway (Longva, 2001). For Sweden, Nekby (2006) finds U-shaped selection patterns with positive self-selection of immigrants into return migration at the upper end of the income distribution.

Extending the literature regarding individual self-selection into return migration with a household level perspective can provide additional insights on how family ties shape decision making on return migration. In general, families migrating together often have to overcome co-location problems due to different individual migration incentives between the partners. Thus partners experience unequal labor market gains from migration and one partner often becomes a tied mover (Mincer, 1978). While family ties have generally been found to reduce mobility (Mincer, 1978; Frank, 1978), the effect of family ties on self-selection patterns regarding individual characteristics of the partners are less clear. Junge et al. (2014) show that self-selection for emigrant couples from Denmark according to primary earner's income is stronger than self-selection patterns for singles. Borjas and Bronars (1992), on the other hand, find weaker self-selection of immigrants with family ties into the US. They argue that family migrants are selected more randomly as they are more likely not to migrate primarily due to own income incentives. Co-location problems and divergent individual gains from migration might also affect return decisions from the host country. The effects to expect related to family ties of migrants and the partners' self-selection into return migration on labor market characteristics are not clear ex-ante though.

Analysis shows that individual and family characteristics of both partners contribute to explaining joint return propensities. Either partner being out of the labor force is associated with higher joint return propensities for immigrant couples from the Nordic, the other Western as well as the non-Western countries. Moreover, the positive correlation between higher propensity to return and higher income of the primary earner is lower among dual-earner couples in which both partners work more than 60% of full working time in the labor market. This finding is driven by immigrant couples from the non-Western countries. On top of this, the presence of children also seems to affect self-selection on primary earner's income into return migration. Results, which are again driven by the non-Western sending countries, show that the children in the household weaken self-selection into return migration on primary earner income. A possible explanation for this is that other factors that play a role for return migration of families with children, which are uncorrelated with primary earner income, reduce selection patterns compared to singles and to couples without children.

As outlined, the following analysis is going to show along different dimensions how family considerations are related to return migration decisions of immigrant couples. For policy makers it is of utmost importance to understand return decisions of immigrants in order to design policies aiming at attracting and retaining immigrants to overcome skill shortages, demographic challenges and to foster economic growth. To this, the present analysis shows that considerations related to the family play an important role and have to be taken into account in this context. The rest of the chapter is organized as follows. Section 2 provides background information on immigration to Denmark and introduces the data used in the empirical analysis. Section 3 presents stylized facts and descriptive statistics, section 4 econometric analysis and section 5 concludes.

3.2 Data

The Danish administrative data contains information on all registered immigrants living in Denmark in a given year. According to the definition of Statistics Denmark a person is considered as

immigrant if he or she was born outside Denmark and none of the parents has Danish citizenship. The same applies in case the citizenship status of the parents is unknown to the authorities.¹ According to this definition the total number of immigrants living in Denmark in 2005 was 542,738, corresponding to 9.8% of the resident population. Table 3.1 shows that 7.5% of immigrants living in Denmark in year 2005 originate from another Nordic country, mostly from Sweden (3.5%) and Norway (3.2%); a minor share of migrants comes from Finland (0.6%) and Iceland (0.2%). During the whole analysis migrants from Faroe Islands or Greenland will be excluded as these are autonomous regions of Denmark. In particular, Sweden and Denmark have a long history of high bilateral migration flows as migration costs between these countries are low given the geographic as well as cultural proximity. Formally, there has been free mobility between the Nordic countries since 1954 (Nannestad, 2004). Since 1993 individuals from countries that are part of the European common market, like Denmark, can move freely between these countries without having to apply for visa or work permits. As for citizens from these countries working and living in Denmark became possible without any legal restrictions, immigration to Denmark increased subsequently (Jensen and Pedersen, 2007). Table 3.1 shows that 13.1% of immigrants living in Denmark in 2005 are from a Western European sending country. There are 2.2% of immigrants from Australia, Canada, New Zealand or the United States.

Immigration to Denmark from many non-EU countries is very restricted. Major immigration channels from non-Western countries are due to asylum policies and family reunification. The major sending countries for asylum seekers in Denmark over the considered time period were Afghanistan, Iran, Iraq, Somalia, Lebanon and the Balkan countries. These major refugee sending countries make up in total 34.6% of the immigrant population in 2005, but will be excluded in the subsequent analysis as migration and return considerations are likely to be different compared with other countries. Excluding the refugee sending countries, migrants from non-Western countries account for the remaining 42.6% of the immigrant population in 2005; the biggest group among them are Turkish immigrants with a share of 12.2%. Most immigrants from Turkey entered Denmark as so-

¹Further information is available at <https://cpr.dk/in-english/moving-from-denmark/>, <https://cpr.dk/in-english/moving-to-denmark/>.

called guest workers before the 1980s or later through family reunification programs (Nannestad, 2004). Even though many of the initial guest workers returned home after the recruitment policies had ended, many also stayed and made use of the possibility for family reunification in Denmark (Böhning, 1984).

| Origin | |
|---------------------------------|---------|
| Nordic countries | 7.5% |
| Other Western countries | 15.3% |
| Other W.European countries | 13.1% |
| AUS, CAN, NZ, US | 2.2% |
| Non-Western countries | 77.2% |
| Turkey | 12.2 % |
| Major refugee sending countries | 34.6 % |
| Remaining countries | 30.4 % |
| Total | 542,738 |

Table 3.1: Immigrant population in Denmark, 2005.

The data used in the subsequent analysis come from the Danish administrative population, tax, and migration registers. For a given year the records contain basic demographic characteristics, and labor market related information, as well as data on immigration and emigration events for each individual. The analysis is going to pool data on individual characteristics from these sources for immigrants in Denmark over the cross section years from 1981 to 2005. Individual characteristics are linked with migration data for each year indicating whether an individual enters or leaves the country as well as from or to which respective sending or destination country. Registering immigration and emigration is compulsory in Denmark. As soon as a person leaves the country for more than six months he or she is required by law to report the emigration country and the date of emigration to the authorities in Denmark. These officially registered migration events are going to be used throughout the following analysis. The migration register contains information on immigrations and emigrations from 1973 to 2010 for all individuals in the population at any point in time since 1981. For the most part of the analysis attention will be restricted to immigrants who came to Denmark at earliest in 1973 and at latest in 2005, are in the population data in any year between 1981 and 2005 and stayed for at least one year.

The sample will be restricted to individuals who are between 25 and 59 in order to capture the working age immigrant population. Furthermore, individuals have to be at least 18 when immigrating; this ensures that they most probably migrated for own reasons to Denmark and did not come as children with the family. The major part of the empirical analysis restricts attention to a sub-sample of immigrants with a partner from the same country both fulfilling the age restriction above. Return behavior of couples with partners from different countries of origin is likely to be qualitatively different and should be analyzed separately, which is beyond the scope of this study. Unique individual and family identifiers make it possible to combine data for cohabiting partners as well as their children while they reside in Denmark.² In order to allow for the possibility of sequential immigration of spouses (Borjas and Bronars, 1992), both partners do not necessarily need to have immigrated in the same year to Denmark. However, to be included in the analysis the partners have to cohabit immediately after the second mover immigrated.

A return event in the subsequent analysis is defined as emigrating from Denmark to the country of origin. A couple returns if both partners migrate to their country of origin within the same year. Couples and singles are observed in the administrative registers over the observation period every year as long as their cohabitation status remains the same and as long as they reside in Denmark. Return migration patterns of couple households will be studied with respect to partner- and family characteristics and also be compared to single migrants. Returners and non-returners will be compared based on observable characteristics in the year before the potential return migration event. Results for returning to the country of origin in the following analysis are reported for returners not re-entering Denmark for the subsequent 5 years.

²Immigrants linked with a partner are either cohabiting at the same address, married or in a registered partnership according to the administrative registers. Individuals in registered same-sex partnerships will be excluded because the number of observations is low in the immigrant population.

3.3 Descriptive Statistics

Table 3.2 presents the data of the analyzed sample with the mentioned restrictions according to the origin countries of the migrants, separately for couples and singles. There are 318,377 individual-year pairs for male single migrants and 231,571 individual-year pairs for female single migrants in the data. There are 358,920 observations for individuals with a partner from the same country of origin. According to the restrictions above in total 9,214 return events of couples can be observed. There are differences between the shares of the sending countries for singles and partners presented in Table 3.2. For Western countries the share of migrants in single households is higher than for migrants with a partner from the same country of origin. 5.2% of couples are from another Nordic country and 16.5% from one of the remaining Western countries. Among single males and females the corresponding shares are considerably higher. On the other hand, 78.3% of couple migrants are from the non-Western origin countries, compared to 47.2% among single males and 54.0% among single female. In particular for couple households in this group excluding the major refugee sending countries the most important sending country is Turkey (share of 29.6%).

| | Singles | | Partners from |
|-------------------------|---------|---------|---------------------|
| | males | females | same origin country |
| Other Nordic countries | 14.2 | 19.9 | 5.2 |
| Other Western countries | 38.5 | 26.0 | 16.5 |
| Western Europe | 33.8 | 22.1 | 14.8 |
| US, NZ, CAN, AUS | 4.7 | 3.9 | 1.7 |
| Non Western countries | 47.2 | 54.0 | 78.3 |
| Turkey | 7.6 | 5.7 | 29.6 |
| Remaining countries | 39.6 | 48.3 | 48.7 |
| Observations | 318,377 | 231,571 | 358,920 |

Source: Administrative data.

Table 3.2: Origin countries.

Table 3.3 reveals that return propensities of single and couple migrants differ considerably according to the country of origin. Among singles as well as couples from the non-Western countries returns to the home country are least frequent (2% for couples, 4% for single females and 7% for single males) while they are more likely for those from other Western countries (10% among all

groups) and most likely for those from other Nordic countries (18% for couples, 10% for female singles and 13% for male singles). In particular for couples returns are most frequent to the other Nordic countries while much less frequent among those from the non-Western countries. Of course, the average duration of stay varies between the different origin country groups, with migrant singles as well as couples from Western European countries having on average shorter duration of stay than those from the non-Western countries. Potential reasons which might in general explain differences in temporary migration patterns between immigrants from the considered sending country groups are going to be addressed later. Due to the heterogeneity between the different countries of origin, much of the subsequent analysis is going to distinguish three groups of sending and return countries of migrants: The first group are other Nordic countries, the second group other Western countries consisting of the non-Nordic, Western European countries as well as Australia, Canada, New Zealand and the United States. Non-Western countries are the third group accounting according to observations in the data for a majority among couples as well as single migrants.

Table 3.3 presents further average sample characteristics separately for singles and couples in the data. Females in couples are on average slightly younger while males are slightly older than in the corresponding sample of singles. Table 3.3 also reports the share of couples with children. With 78% a large fraction of couples has children below the age of 16 in the household.³ Children are also present in 33% of single female and 10% of single male migrant households. The income and tax register data provide information on labor market activity of the immigrant population in Denmark. Table 3.3 shows that 23% of single men and women are out of the labor force in the sample. This share is higher among females in couples (33%), but lower among male partners (14%). The share of self-employed is relatively small in all groups. 44% of single men and 46% of single women work in the labor market, 30% of males and 31% of females in full-time employment.⁴ The share of employed is lower among females in couples (32%, full-time: 21%) and higher among males (49%, full-time: 38%). The share of couples in which both partners work full-time in the labor market is only 15%. The income register data reports annual gross labor and freelance income

³Older children are not directly recorded as household members and thus left out of the analysis.

⁴Full-time employment is defined as working more than 60% of the full-time equivalent working time in a given year.

| | Singles | | Couples, partners from same origin country | |
|-----------------------------------|---------|---------|--|---------|
| | males | females | males | females |
| Age | 37.4 | 38.3 | 40.6 | 37.2 |
| Children in household | 0.10 | 0.33 | | 0.78 |
| Out of labor force | 0.23 | 0.23 | 0.14 | 0.33 |
| Self employed | 0.06 | 0.03 | 0.12 | 0.06 |
| Employment | 0.44 | 0.46 | 0.49 | 0.32 |
| Full time employment | 0.30 | 0.31 | 0.38 | 0.21 |
| Dual-earner couples | | | | 0.15 |
| Full-time average annual earnings | 237,724 | 212,792 | 244,325 | 237,724 |
| Returns events: | | | | |
| Other Nordic countries | 0.13 | 0.10 | | 0.18 |
| Other Western countries | 0.10 | 0.10 | | 0.10 |
| Western Europe | 0.09 | 0.09 | | 0.08 |
| US, NZ, CAN, AUS | 0.14 | 0.13 | | 0.18 |
| Non Western countries | 0.07 | 0.04 | | 0.02 |
| Turkey | 0.02 | 0.01 | | 0.01 |
| Remaining countries | 0.08 | 0.05 | | 0.02 |

Source: Administrative data.

Table 3.3: Descriptive statistics.

for each individual. Table 3.3 shows average values in Danish Krone for the sum of both earnings from employment and non-negative freelance income. These are calculated only for individuals who work full-time. Average earnings are higher among males as well as females in the group of couples compared with single households.

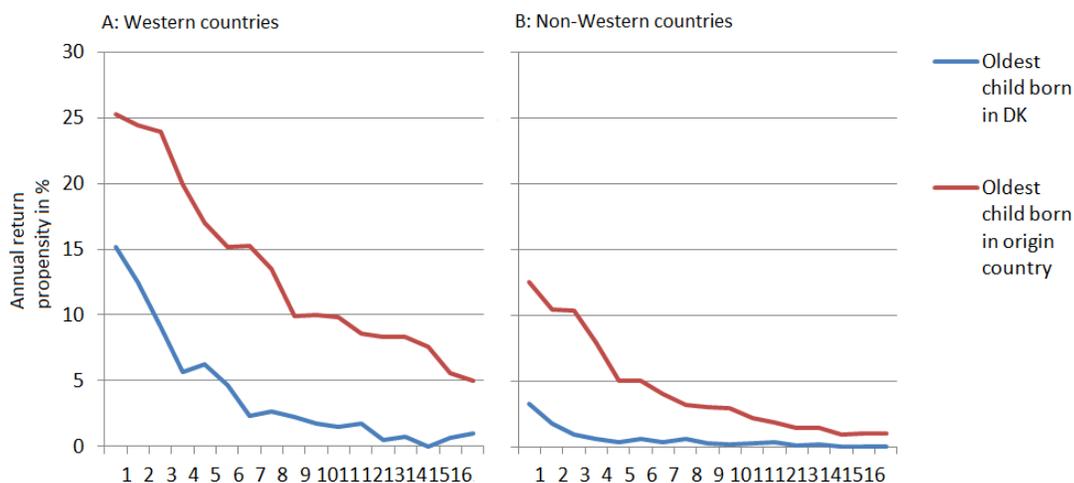


Figure 3.1: Return migration propensities in percent according to age of oldest child.

Among the immigrant couples Table 3.3 has revealed a high share of households in which children are present. For these couples Figure 3.1 illustrates the relationship between the age of the oldest child under 16 and the return propensity to the country of origin. The illustration distinguishes between the case in which the oldest child was born abroad or in Denmark. Data for singles with children are not presented and analyzed further as migration decisions of single individuals with children might very likely be related to family members or a partner living abroad, e.g. in long-distance relationships. To account for some of the heterogeneity between the return rates of migrants from the origin country groups described above, which might also be related to the presence of children in the household, the graphs in Panel A refer to couples from Western countries and in Panel B to non-Western countries. Figure 3.1 shows that couples from Western as well as from non-Western countries are more likely to return at any age of the oldest child in case it was not born in Denmark. The graphs provide descriptive evidence that couples with young children in the household are more likely to return than couples with older children. In general, as seen from Table 3.3, couples from Western countries have much higher return propensities than couples

from the non-Western countries. Returns are most likely either when the children are very young, or are shortly before school age which starts at the age of 7 in Denmark.⁵ In particular, for children born before immigration, the graphs show a kink and sharply decreasing return propensities between the ages 5 to 7. Of course, omitted variables are likely to influence these patterns, too. Analysis in the following section will additionally control for confounding factors like the years since immigration and further characteristics of the parents and will as well consider differences between return countries in more detail. Moreover, fertility decisions are likely to be linked to return plans. Subsequent regression analysis will address the question of causality between the presence of children and return migration.

Another question of interest when analyzing return migration in the family context is whether and how partners' individual characteristics are related to the probability to self-select into return migration. As for the relationship between earnings and return migration, Figure 3.2 shows standardized annual earnings of the primary earner among couples in which the primary earner works more than 60% of full working time in the labor market. The other partner is either employed, out of the labor force or unemployed. Self-employed are excluded as the income data does not provide reliable earnings information for self-employed persons. Log-standardized earnings are calculated by taking logs of a standardized earnings measure which is constructed following Borjas et al. (2015): An individual's annual gross labor income is divided by the average gross earnings of the whole population also working 60% or more in the same age and gender group during a given calendar year. Put differently, comparing standardized earnings accounts for the composition effects in the considered immigrant population with respect to age and year separately for males and females. Log-standardized earnings distributions in Figure 3.2 are only presented for the primary earner working more than 60% of full working time in a given year, in Panel A for male primary earners and in Panel B for female primary earners.

The top row compares primary earners' annual log-standardized earnings for returning and non-returning couples. For male as well as for female primary earners the returners' distributions

⁵For further information see <https://www.retsinformation.dk/forms/r0710.aspx?id=133039#K2>

almost first order dominate the distributions of the non-returners showing a strong positive self-selection into return-migration on the income of the primary earner. Figure C1 in the appendix reveals that positive selection is stronger for immigrants from the non-Western countries than for those from the Western countries. An interesting question is whether the presence of children in the household is related to these selection patterns on primary earner's income. The second row restricts the sample to couples with children below the age of 16 in the household. The distributional dominance appears to be slightly weaker, but, overall, no strong differences to the distribution functions above can be observed neither for male nor for female primary earners. At the bottom row the distribution functions for dual-earner couples are shown.⁶ Here, selection on primary earner's standardized earnings is still positive, at least for the upper part of the distribution. However, the patterns are weaker compared with the graphs in the top row. Of course the presented differences between primary earners' incomes of returning and non-returning couples as well as the differences when restricting to dual-earner couples might be due to other omitted characteristics. For example, underlying heterogeneity in the duration of stay and the composition of the considered groups, e.g. with regard to countries of origin could play an important role. These issues will be addressed in the regression analysis.

Borjas (1987) argues that immigrants from origin countries with a more unequal distribution of incomes migrating to destinations where incomes are distributed more equally tend to earn less, on average, than the native population in the destination country. This is because those from the lower end of a dispersed income distribution gain most and have the strongest incentives to migrate to a country with a more narrow distribution of incomes, given that returns to skills between the two countries are to a sufficient extent positively correlated. Referring to couple migrants, Figure C1 reveals relatively lower standardized earnings for male and female primary earners when comparing immigrant couples from non-Western countries where incomes are generally distributed more unequally with those from the Nordic countries and from other Western countries with narrower income distributions.⁷ This is in line with theoretical predictions.

⁶Among dual-earner couples the sample restriction requires that both partners are employed and work more than 60%.

⁷Klugman (2011) presents a ranking of countries showing that Western and in particular Nordic countries have

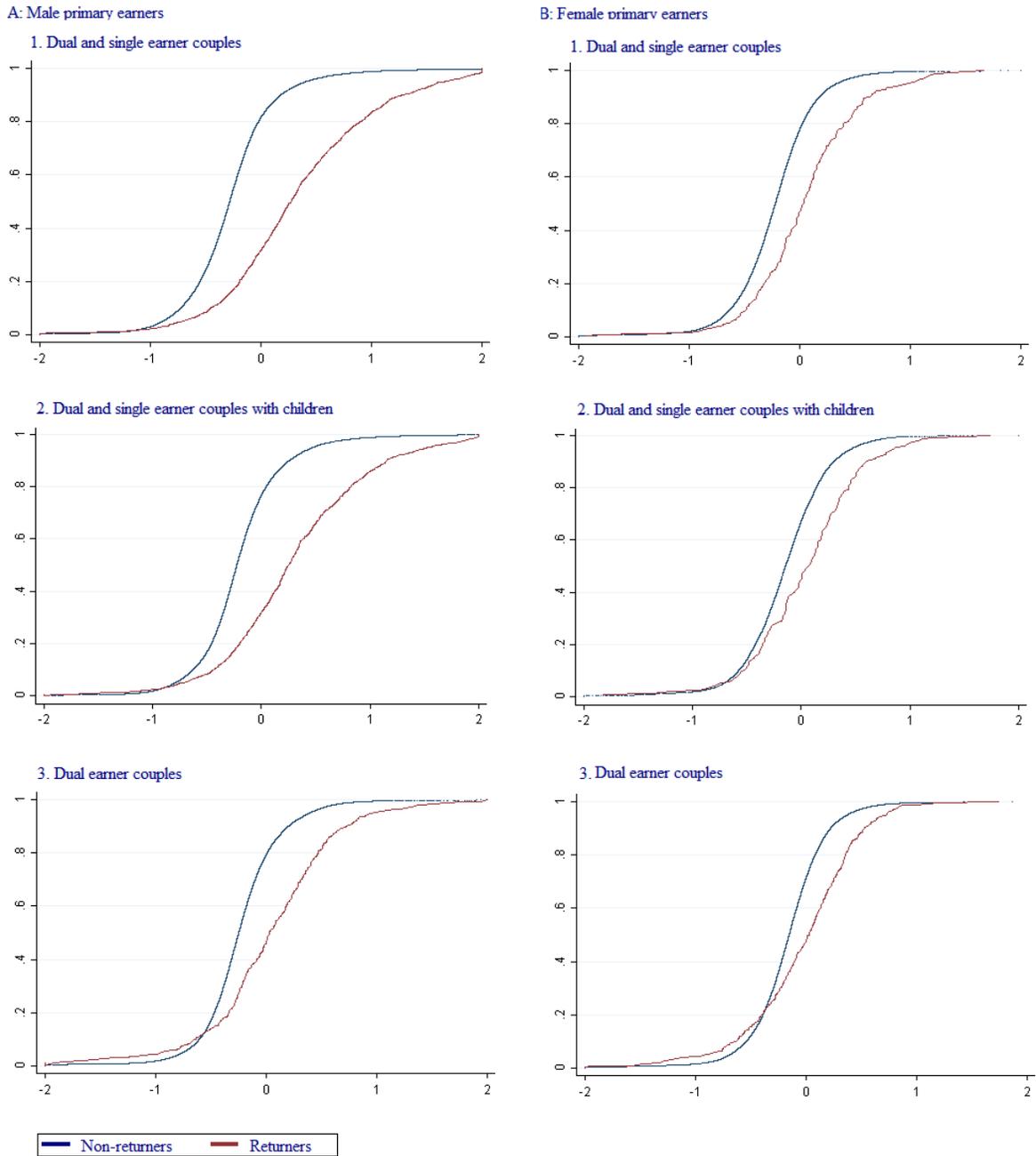


Figure 3.2: Cumulative distribution functions for log-standardized earnings.

Along the same lines the findings regarding selection into return migration shown in Figure 3.2 and C1 confirm considerations outlined by Borjas and Bratsberg (1996) regarding the self-selection of immigrants into return migration. Borjas and Bratsberg argue that temporary migration, and the self-selection into return migration, accentuates the initial selection of immigrants migrating from one country to another with respect to the distribution of earnings. Return migration incentives are driven by the same mechanism as in Borjas (1987) working in the opposite direction and intensifying the selection of the migrants having arrived from a particular destination country. Among migrants from countries where there is negative selection with respect to earnings in the host country, those with relatively higher earnings are more likely to return. According to this, immigrants in Denmark with a relatively high level of education and high earnings potential would be most likely to leave. Theory would predict this selection into return migration to be particularly strong among immigrants coming from countries with a relatively wide income distribution which is also in line with descriptive evidence presented in Figure C1. An alternative hypothesis to which immigrants who have lower earnings due to a bad job realization would return to their country of origin, cannot be confirmed with the data.

At the family level Figure 3.2 indicates a weaker selection on primary earner's income into return migration for dual-earner couples, in which both partners work in the labor market more than 60%. Borjas and Bronars (1992) argue that family ties weaken self-selection into migration on individual earnings as the labor market characteristics of an accompanying family member are different from those of the one who initiates the move. A potential explanation for a weaker self-selection on the primary earner's income might be conflicting individual migration interests resulting in a co-location problem if both spouses are in the labor market. This argument has been applied and empirically confirmed for internal migration in the United States (Costa and Kahn, 2000) as well as in the international context for emigration decisions of couples (Borjas and Bronars, 1992); a priori it is an open question how self-selection into joint return migration of partners will be affected by labor market considerations on the household level. The co-location problem outlined in the family

relatively low levels of inequality in the distribution of disposable incomes as indicated by the GINI coefficient.

migration literature might as well apply to return migration. Coordination on whether and when to return becomes more difficult if both partners' incentives are not perfectly correlated across locations. And selection on primary earner's income might be stronger if the migration decision in a couple has to take into account career opportunities and location preferences of the secondary earner to a lesser extent than reflecting the optimal decision from the primary earner's perspective.

Along the same lines also the presence of children could weaken self-selection into return migration according to primary earner's income: Factors related to children might be important for the return decision of parents as suggestive evidence in Figure 3.1 indicates. This would explain slightly weaker self-selection pattern related to income of the primary earner. However, there is not strong evidence confirming this conjecture in Figure 3.2.

3.4 Econometric Analysis

In the econometric analysis different versions of the following linear probability model are estimated on the sample described above.

$$M_{ab,t+1} = \beta_0 + \beta_1 X_{ab,t} + \beta_2 YSM_{a,t} + \beta_3 YSM_{b,t} + D.Imm.Age_a + D.Imm.Age_b + D.t + u_{ab,t},$$

where each observation in year t refers to a couple ab with partners a and b . $M_{ab,t+1}$ is a binary indicator for a joint return event in the following period. Moreover, it is required that neither partner re-migrates to Denmark during the subsequent five years. Non-parametric controls for life- and business-cycle effects are included with dummy variables for age at immigration of each individual and for the corresponding cross-section calendar years. Furthermore, the regressors $YSM_{a,t}$ and $YSM_{b,t}$ capture the years since immigration for each individual. The vector $X_{ab,t}$ summarizes observable individual and family related characteristics which will be introduced in more detail later. The above equation is also estimated for single households to compare the response of return propensities to observable characteristics between singles and couples. Naturally, in that speci-

fication only the corresponding individual level control variables for one single person are included.

The analysis covers return events of immigrants who reside in Denmark between 1981 and 2005. As immigrants are included who entered Denmark between 1973 and 2005 the sample year 1981 already contains a stock of migrants living in Denmark up to eight years. Starting with a stock of immigrants oversamples those in the population who stay longer in the host country (see Ridder , 1984). On the other hand, however, this allows to also to include migrants having entered Denmark between 1973 and 1981 into the analysis. Moreover, a potential estimation bias might arise due to censoring of the data because some couples drop out of the sample as time passes by due to separation. Analysis addressing this concern will be part of a future extension to the presented results. The main estimation results from the regression models will be reported for the pooled sample of immigrants as well as separately for the three main country-of-origin groups described above: Immigrants from other Nordic countries, those from the other Western countries, and those from the non-Western countries. Results presented in this section are estimated with OLS, standard errors being clustered at the household level.

3.4.1 Children and Return Migration

Descriptive statistics presented in Table 3.3 showed that there is a large fraction of immigrant couples with children in the household. Moreover, Figure 3.1 illustrated that most couples who return to the home country and have children seem to do so while the oldest child is relatively young, in particular while still being below school age. Return rates for couples with the first child born abroad are considerably higher than in case the child was born in Denmark.

However, the descriptive patterns might be affected by unobserved factors which are not controlled for so far. Regression analysis in Table 3.4 studies in more detail the relationship between the number of children in immigrant couples' households and return migration propensities controlling for the set of characteristics described above. Additionally, information on whether both partners participate in the labor force are included in the specifications. The results as presented in Table

3.4 are comparable to the analysis in Dustmann (2003) studying return decisions of migrant guest worker families from Germany. Estimations for the pooled sample as well as separately by immigrant country groups show that both partners' years since migration are negatively associated with the probability to leave Denmark. Moreover, being out of the labor force goes along with higher return propensities for both partners. Controlling linearly for the number of children below the age of 16 in the household indicates that having more children in the household is correlated with lower return propensities. This is in line with results found by Dustmann for return migrants from Germany. In general, the literature on family migration argues that children in the household reduce mobility of couples because of higher costs to migrate (e.g. Mincer, 1978; Gemici, 2011). The relationship between the number of children and returning to the home country is statistically insignificant for the Nordic sending countries and other Western countries, though. A negative coefficient sign is estimated statistically significant for non-Western countries.

However, migration and fertility choices are likely to be jointly determined. A potential solution to this endogeneity problem is proposed by Dustmann (2003): Parents' preferences towards their offspring's future labor market activity might depend on the gender of the child and they might thus invest differently in human capital for boys than for girls. This could then also affect return propensities being related to the earnings perspectives of the children in the destination and home country. Comparing different return propensities between families with daughters and sons is used to present evidence for a causal effect on return migration arguing that the share of sons and daughters in the household is exogenously determined. Dustmann finds that more daughters given the total number of children in the family increase out-migration propensities among Turkish immigrant families. The Danish data show, in line with those results, that families from Turkey having more daughters than sons are statistically significantly more likely to return. The coefficient for the number of daughters is statistically significant at the 5% level for the Turkish couples. In terms of coefficient size couples with more daughters than sons are overall less likely to return than couples without children, but return propensities with a given number of daughters in the family are estimated to be relatively higher compared to parents having the same number of sons.

| | All countries | All countries | Nordic countries | Other Western countries | Non-Western countries | |
|-----------------------|------------------------|------------------------|------------------------|-------------------------------|--------------------------|--------------------------|
| | | | | | Turkey | Remaining countries |
| Number of children | -0.0046*** (0.0003) | -0.0050*** (0.0004) | -0.0064 (0.0074) | -0.0034 (0.0032) | -0.0011*** (0.0003) | -0.0038*** (0.0005) |
| Number of daughters | | 0.0009 (0.0006) | -0.0003 (0.0112) | -0.0019 (0.0022) | 0.0007** (0.0003) | 0.0008 (0.0007) |
| Male out of LF | 0.0440*** (0.0020) | 0.0446*** (0.0022) | 0.0547*** (0.0115) | 0.0870*** (0.0072) | 0.0254*** (0.0030) | 0.0272*** (0.0014) |
| Female out of LF | 0.0254*** (0.0013) | 0.0264*** (0.0011) | 0.0495*** (0.0141) | 0.0562*** (0.0047) | 0.0053*** (0.0008) | 0.0245*** (0.0025) |
| Yrs since imm. male | -0.0022*** (0.0001) | -0.0023*** (0.0001) | -0.0056*** (0.0017) | -0.0025*** (0.0006) | -0.0004*** (8.54e-05) | -0.0017*** (9.49e-05) |
| Yrs since imm. female | -0.0008*** (0.0001) | -0.0008*** (0.0001) | -0.0082*** (0.0017) | -0.0022*** (0.0006) | -0.0001* (7.77e-05) | -0.0005*** (8.27e-05) |
| Dummy variables | | | | | | |
| Female age at imm. | Yes | Yes | Yes | Yes | Yes | Yes |
| Male age at imm. | Yes | Yes | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 141,046 | 141,046 | 6,034 | 19,417 | 45,871 | 69,724 |
| R-squared | 0.0553 | 0.0553 | 0.0976 | 0.0553 | 0.03 | 0.043 |

Notes: OLS estimation. Standard errors clustered on household level. Constant included.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 3.4: Linear probability regressions: Family return to origin country.

The corresponding coefficient estimate for the number of daughters is statistically insignificant for couples from the other country groups, with a positive sign for the remaining non-Western countries and a negative sign for other Nordic and Western countries.

A potential threat to causal identification in the analysis using the number of children and daughters in Table 3.4 might be that having more daughters than sons could already be an endogenous outcome. Earlier literature has documented economic effects of a so-called son-preference in countries like India (Tarozzi, 2012; Hu and Schlosser, 2012), China (Ebenstein, 2007) and Turkey (Arnold and Kuo, 1984). Cultures in these countries might treat sons differently from daughters when it comes to marriage arrangements and inheritances, for example (Das Gupta et al., 2010). Affecting parents' preferences towards having a son or a daughter, this has eventually an effect on fertility rates, too. Even though immigrants in Denmark are not exposed to the formal and informal institutional environment of their home countries, potential return plans or cultural background (Fernandez, 2007) might still have an impact on fertility decisions. In case having more daughters than sons is directly related to return plans or omitted characteristics affecting return propensities, the previously presented results might not provide evidence for a causal effect of children on family returns in the subsample of Turkish immigrants. Further disentangling fertility decisions and the timing of migration could yield more insights into a causal effect of children on return migration of families. In the next step, families that immigrated with children born abroad and those having the first child only when living in Denmark are going to be analyzed separately. Couples without children are the reference group in the following baseline regression specifications.

Table C1 restricts the sample to parents only. To analyze exogenous variation related to return propensities depending on exogenous variation of the child's gender the regression only includes covariates related to the oldest child apart from the control variables also included in Table 3.4. A dummy controls for whether the oldest child is born in Denmark and an additional dummy for whether the child is a girl. Data indicate indeed that for the subsample of Turkish couples having a girl as the first born child in Denmark is associated with slightly, but statistically significant on

the 10% level, higher return propensities compared to families in which the first born child is a boy. Still the overall effect of having a child in Denmark on return propensities is negative also for girls. There is no empirical evidence for an effect of having a boy or a girl as first child in Denmark among couples from the other sending country groups. The presented results support the hypothesis that considerations related to children affect family return decisions from Denmark. For the subgroup of Turkish immigrant couples causal evidence for gender of the first born child on return decisions can be established.

Table 3.5 addresses in more detail the timing of return decisions of families in order to explore potential explanatory factors for return migration with children more closely. To account for the heterogeneity between families with children born in the home country or in Denmark, the regressions include separate dummy variables for whether the oldest child below 16 in the household was born in Denmark or abroad. The reference group are couples without children while an additional control variable captures whether further children still live in the household in case the oldest child is above 16.

The first specification again indicates for the pooled sample that having children goes along with lower return propensities compared with the reference group, couples without children. It controls separately for the oldest child being born in Denmark or born abroad and reveals lower migration probabilities of couples in both cases. The subsequent specifications control for whether the oldest child is at most 6 years old or older than 6, capturing the important heterogeneity illustrated in Figure 3.1. Estimation results for all country groups together reveal that parents with the oldest child below 7, born abroad are more likely to return than parents whose oldest child was born in Denmark. The estimated effect on the likelihood to return is statistically significantly positive on the 1% level even compared to couples without children. The estimated marginal effect on return probabilities for older children and for children below the age of 7 born in Denmark are statistically significant negative on the 1% level relative to the reference category, couples without children. According to the estimation results return probabilities are lowest for children between 7 and 16,

born in Denmark. Table 3.5 shows that the patterns described above hold very similarly for all the considered country groups separately. The largest marginal effect for higher return propensities with children born abroad below the age of 7 is estimated for the group of other Nordic countries. Table C2 provides more detail on the relationship between age of the oldest child and return propensities by including a full set of child age dummy variables. As seen from results in Table 3.5 and descriptive evidence given before in Figure 3.1 family return rates are highest for children born outside Denmark and fall substantially around the time when the oldest child reaches school age. This indicates that the timing of return for these families might be driven by schooling considerations. For the oldest child born in Denmark, however, no systematic pattern related to family return propensities can be established.

Tiebout (1956) already suggests that individuals choose where to live based on their policy preferences. For parents with children about to enter school the quality of public education in a country might be an argument in favor or against returning. Analysis presented in Table 3.6 addresses the question whether schooling quality might influence return decisions of parents. Specification 1 includes standardized average PISA 2012 test score for math in the country of origin as regressor, interacted with the dummy variable referring to the oldest child as introduced above.⁸ Results indicate that parents with children born in the origin country tend to return more frequently to countries with a higher average score, which can be cautiously interpreted as a proxy for schooling quality. The model interacts the standardized PISA test score with the dummy variables for the oldest child born abroad and in Denmark, separately by age group. In line with the argument that schooling considerations matter most for the returning families with young children, the average PISA score in the country of origin is positively associated with return propensities in particular for families in which the oldest child is below 7. These families might view schooling considerations for

⁸The scaling unit of the PISA 2012 variable are standard deviations from the OECD average PISA score. The covered OECD and non-OECD countries are Albania, Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Croatia, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Kazakhstan, Korea, Latvia, Liechtenstein, Lithuania, Luxembourg, Malaysia, Mexico, Montenegro, the Netherlands, New Zealand, Norway, Peru, Poland, Portugal, Qatar, Romania, Russian Federation, Serbia, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Thailand, Tunisia, Turkey, United Arab Emirates, United Kingdom, United States, Uruguay, Vietnam. For more information on the PISA 2012 test see OECD (2014) and <https://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-i.htm>

| | All countries | All countr. | Nordic countries | Other West. countries | Non- West. countr. |
|---|--------------------------|--------------------------|------------------------|-----------------------------|---------------------------|
| First child born abr. 0-16 | -0.00492*** (0.00161) | | | | |
| First child born abr. 0-6 | | 0.0221*** (0.00368) | 0.0698*** (0.0218) | 0.0222** (0.00885) | 0.0131*** (0.00354) |
| First child born abr. 7-16 | | -0.0109*** (0.00159) | -0.00916 (0.0130) | -0.00470 (0.00518) | -0.00617*** (0.00140) |
| First child born in DK 0-16 | -0.00586*** (0.00141) | | | | |
| First child born in DK 0-6 | | -0.00712*** (0.00174) | 0.0174 (0.0213) | 0.00618 (0.00645) | -0.00447*** (0.00144) |
| First child born in DK 7-16 | | -0.00418*** (0.00125) | -0.0581*** (0.0159) | -0.000912 (0.00590) | -0.00153 (0.00107) |
| Children <16 in HH when oldest Child >16 | -0.00688*** (0.00104) | -0.00756*** (0.00102) | -0.0112 (0.0132) | -0.00215 (0.00542) | -0.00452*** (0.000848) |
| Male out of LF | 0.0249*** (0.00215) | 0.0247*** (0.00215) | 0.0339*** (0.0141) | 0.0799*** (0.00703) | 0.0118*** (0.00195) |
| Female out of LF | 0.0164*** (0.00105) | 0.0156*** (0.00105) | 0.0352*** (0.0116) | 0.0447*** (0.00469) | 0.0127*** (0.000809) |
| Dummy variables: | | | | | |
| Years since imm. male | Yes | Yes | Yes | Yes | Yes |
| Years since imm. female | Yes | Yes | Yes | Yes | Yes |
| Female age at imm. | Yes | Yes | Yes | Yes | Yes |
| Male age at imm. | Yes | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes | Yes |
| Observations | 141,046 | 141,046 | 6,034 | 19,417 | 115,595 |
| R-squared | 0.077 | 0.079 | 0.144 | 0.081 | 0.060 |

Notes: OLS estimation. Standard errors clustered on household level. Constant included.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 3.5: Linear probability regressions: Children and family return to origin country.

their children as most relevant with regard to the return decision. However, the described relationships break down when including the regressor into the country subgroup analysis, indicating that they are driven by a difference in PISA scores between Western and non-Western sending countries.

Alternatively, and also in line with Tiebout sorting, parents with children could also be more likely to return rather to wealthier countries in which both schooling and many other public services are of better quality. Instead of the average PISA score specifications in the second column in Table 3.6 include log GDP per capita in the otherwise similar specification as in the first column. A higher R-squared value suggests that GDP per capita seems to explain more of the variation than the first specification. Thus higher return rates of couples with pre-school age children to countries with better schooling quality seem to be driven by higher per capita income in the destination countries which is potentially correlated with the quality of many public services of importance for parents with young children. This makes drawing conclusions from the estimation results in Table 3.6 regarding higher return propensities to countries with higher average school performance difficult.

Regression analysis reveals a further interesting insight in family related considerations influencing return decisions of couples. Table 3.7 presents the coefficient estimates for dummy variables of a given calendar year from 1998 to 2005. For immigrant couples from non-Western countries estimates show a statistically significant increase in return propensities for the years after 2002 (reference year: 2001). In 2002, the Danish government implemented an amendment to the Danish Aliens Act requiring that spouses have to be at least 24 years old in order to apply for spousal reunification if one of the partners holds a permanent residence permit in Denmark. This so-called 24 year rule was announced in January 2002, passed in June and implemented in July 2002 in order to reduce incentives for forced marriages. Other research has shown that the introduction of the law changed immigration of singles from Denmark to Sweden (Bratu, Dahlberg and Engdahl, 2016). According to Swedish administrative data foreign singles living in Denmark and being between 18 and 24, and thus affected by the new rule, were more likely to move to and settle in

| | PISA countries | | PISA countries |
|---|--------------------------|----------------------------------|---------------------------|
| First child born abroad 0-6 | 0.0238*** (0.00507) | | 0.0331*** (0.00698) |
| First child born abroad 7-16 | -0.0111*** (0.00197) | | -0.0180*** (0.00259) |
| First child born in DK 0-6 | -0.00757*** (0.00232) | | -0.0187*** (0.00299) |
| First child born in DK 7-16 | -0.00470*** (0.00164) | | -0.00598*** (0.00215) |
| PISA | 0.00424*** (0.00126) | Log GDP per capita (GDP) | 1.10e-06*** (7.12e-08) |
| PISA*First child born abroad 0-6 | 0.0114* (0.00591) | GDP*First child born abroad 0-6 | 1.99e-06*** (2.31e-07) |
| PISA*First child born abroad 7-16 | -0.00123 (0.00211) | GDP*First child born abroad 7-16 | 3.92e-07*** (1.17e-07) |
| PISA*First child born in DK 0-6 | 0.00288 (0.00198) | GDP*First child born in DK 0-6 | 5.67e-07*** (1.55e-07) |
| PISA*First child born in DK 7-16 | 0.00122 (0.00201) | GDP*First child born in DK 7-16 | 7.28e-07** (1.09e-07) |
| Children <16 in HH when oldest child >16 | -0.00656*** (0.00134) | | -0.00346*** (0.00130) |
| Male out of LF | 0.0283*** (0.00282) | | 0.0307*** (0.00284) |
| Female out of LF | 0.0206*** (0.00153) | | 0.0219*** (0.00155) |
| Dummy variables: | | | |
| Years since imm. male | Yes | | Yes |
| Years since imm. female | Yes | | Yes |
| Female age at imm. | Yes | | Yes |
| Male age at imm. | Yes | | Yes |
| Year | Yes | | Yes |
| Observations | 98,916 | | 98,916 |
| R-squared | 0.092 | | 0.144 |

Notes: OLS estimation. Standard errors clustered on household level. Constant included.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 3.6: Linear probability regressions: Schooling considerations and family return to origin.

Sweden. Nielsen et al. (2007) find that the implementation of the law reduced school dropouts among immigrant males between the age of 18 and 23 in Denmark.

| Year (Base 2001) | All countries | Nordic countries | Other West. ctr. | Non- West. ctr. | Non- West. ctr. with children | Non- West. ctr. no children |
|---------------------|-----------------------|-----------------------|-----------------------|------------------------|-------------------------------------|-----------------------------------|
| 1998 | 0.00251 (0.00245) | 0.0161 (0.0309) | 0.00597 (0.00986) | 0.000727 (0.00177) | 0.00221 (0.00182) | -0.00461 (0.00481) |
| 1999 | 0.000249 (0.00232) | -0.0333 (0.0285) | 0.00287 (0.00939) | 0.000818 (0.00172) | 0.000461 (0.00166) | 0.00262 (0.00502) |
| 2000 | 0.00338 (0.00234) | 0.0445 (0.0294) | 0.0150 (0.00955) | -0.000834 (0.00161) | 0.00501 (0.00162) | -0.00478 (0.00438) |
| 2002 | -0.00170 (0.00213) | -0.000557 (0.0289) | -0.0170* (0.00798) | 0.00128 (0.00164) | 0.00132 (0.00163) | 0.000634 (0.00446) |
| 2003 | 0.00145 (0.00217) | -0.0216 (0.0286) | -0.00596 (0.00819) | 0.00426** (0.00175) | 0.00534*** (0.00185) | 0.00112 (0.00430) |
| 2004 | 0.00379* (0.00222) | 0.0101 (0.0285) | -0.00103 (0.00831) | 0.00397** (0.00174) | 0.00461*** (0.00179) | 0.00221 (0.00444) |
| 2005 | 0.00152 (0.00219) | -0.0164 (0.0281) | 0.00525 (0.00831) | 0.00227 (0.00172) | 0.00235 (0.00173) | 0.00191 (0.00449) |

Notes: OLS estimation. Standard errors clustered on household level.

Dummy variables: Yrs since imm. male, Yrs since imm. female, Female age at imm., Male age at imm., Male out of LF, Female out of LF, Year, Children in HH. (Col.1-4). Constant included.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 3.7: Linear probability regressions: Year dummy coefficient estimates for return migration.

The results reported in Table 3.7 indicate higher return propensities of couples from non-Western countries after 2002 when the new law was passed and implemented. This seems surprising at first hand sight as the analyzed group, cohabiting couples where both partners are between 25 and 59 holding a residence permit in Denmark, is not directly affected by the rule. Two explanations could be possible in this context. First, the perception of stricter policies towards foreigners might be an argument to return even for couples in which both partners already reside in Denmark. Or second, partners might take into account marriage prospects of their children in Denmark. Results in the last two columns in Table 3.7 reveal, that the increase in return propensities for couples after 2002 is indeed driven by families with children to non-Western countries. This points into the direction that considerations related to marriage prospects of these families' children might be

relevant in this context.

3.4.2 Earnings, Family Ties and Return Migration

The following analysis restricts attention to couples in which the primary earner works more than 60% of the full working time in the labor market and the other partner is either employed, unemployed or out of the labor force, excluding the self-employed where no reliable information on earnings is available. Descriptive evidence suggested that couples returning from Denmark are positively selected on the primary earner's log standardized earnings. Figure 3.2 showed that this relationship is weaker when considering primary earner incomes in dual-earner couples, though. Controlling for more heterogeneity in the data, estimation results in Tables 3.8 and 3.9 confirm the descriptive evidence: The tables present coefficient estimates for log earnings for singles as well as for primary earners in couples, Table 3.8 for males and 3.9 for females. When pooling single-earner and dual-earner couples together selection on the primary earner's log annual income is positive for males and females, but becomes weaker for dual-earner couples only. Furthermore, specification 1 in both tables shows that the estimated marginal effects of log income on return propensities of single males and females who work more than 60% are very similar to those for primary earners in couples. Figure 3.2 did not provide strong evidence for different selection patterns according to primary earner's income for couples with children. The size of the coefficient estimates indicates that for couples with children positive selection into return migration on primary earner's income seems to become weaker. This holds for all couples as well as for dual-earner couples separately. The estimates for female primary earners in dual-earner couples are statistically insignificant, though.

Table 3.10 presents estimation results for all couples, separately for male and female primary earners and by return country group. The regressions are estimated pooling couples with and without children. As above the specifications include a regressor for log annual earnings of the primary earner. Additionally, an interaction term between primary earner's log annual earnings and the presence of children in the household accounts for potential heterogeneity in the selection patterns

| | Singles | All couples | | Dual-earner couples | |
|-----------------------------|---------------------------|----------------------------|----------------------------|---------------------------|----------------------------|
| | All | All | With children | All | With children |
| Children <16 in HH | -0.0117*** (0.00303) | -0.00946*** (0.00158) | - | -0.0167*** (0.00240) | - |
| Prim.earner log annual inc. | 0.0232*** (0.00140) | 0.0331*** (0.00143) | 0.0305*** (0.00156) | 0.0185*** (0.00322) | 0.0110*** (0.00340) |
| Sec.earner log annual inc. | | | | -0.00281 (0.00338) | -0.00559 (0.00345) |
| Partner out of labor force | | 0.0156*** (0.00145) | 0.0166*** (0.00149) | | |
| Yrs since imm. female | | -0.000581*** (0.000155) | -0.00150*** (0.000151) | -0.00110*** (0.000272) | -0.000979*** (0.000287) |
| Yrs since imm. male | -0.00320*** (0.000100) | -0.00186*** (0.000144) | -0.000752*** (0.000166) | -0.00153*** (0.000259) | -0.001178*** (0.000267) |
| Dummy variables: | | | | | |
| Female age at imm. | - | Yes | Yes | Yes | Yes |
| Male age at imm. | Yes | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes | Yes |
| Observations | 65,530 | 46,897 | 35,664 | 13,259 | 9,158 |
| R-squared | 0.022 | 0.045 | 0.040 | 0.040 | 0.030 |

Notes: OLS estimation. Standard errors clustered on household level. Constant included.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 3.8: Linear probability regressions: Earnings and return migration, all countries, male singles and primary earners.

| | Singles | All couples | | Dual-earner couples | |
|-----------------------------|----------------------------|---------------------------|----------------------------|---------------------------|---------------------------|
| | All | All | With children | All | With children |
| Children <16 in HH | -0.0176*** (0.00129) | -0.0180*** (0.00249) | - | -0.0241*** (0.00384) | - |
| Prim.earner log annual inc. | 0.0118*** (0.00143) | 0.0159*** (0.00269) | 0.00897*** (0.00272) | 0.0114 (0.00714) | 0.00692 (0.00606) |
| Sec.earner log annual inc. | | | | 0.00296 (0.00637) | 0.00175 (0.00520) |
| Partner out of labor force | | 0.0216*** (0.00325) | 0.0231*** (0.00334) | | |
| Yrs since imm. female | -0.00262*** (0.0000917) | -0.00169*** (0.000263) | -0.000798*** (0.000235) | -0.000922** (0.000431) | -0.000483 (0.000338) |
| Yrs since imm. male | | -0.00105*** (0.000234) | -0.000776*** (0.000275) | -0.00163*** (0.000398) | -0.00109*** (0.000341) |
| Dummy variables: | | | | | |
| Female age at imm. | Yes | Yes | Yes | Yes | Yes |
| Male age at imm. | - | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes | Yes |
| Observations | 49,602 | 12,005 | 8,036 | 3,768 | 2,482 |
| R-squared | 0.021 | 0.044 | 0.027 | 0.063 | 0.050 |

Notes: OLS estimation. Standard errors clustered on household level. Constant included.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 3.9: Linear probability regressions: Earnings and return migration, all countries, female singles and primary earners.

on income for couples with and without children. For all country groups the selection on primary earner's income for couples without children, the reference group, is estimated with a positive coefficient sign. The positive selection on primary earner's income for couples without children is statistically significant for male and female primary earners from the non-Western countries, for female primary earners from the Nordic countries and for male primary earners from the other Western countries. The coefficient estimate for the interaction is negative for all country groups, indicating weaker self-selection on primary earner's income in the presence of children. The estimates are statistically insignificant for the other Nordic and the other Western countries. Weaker self-selection in log earnings of male as well as female primary earner in the presence of children is statistically significant at the 1% level only for the non-Western countries.

| | Nordic countries | | Other Western countries | | Non-Western countries | |
|--------------------------|------------------------|-------------------------|-------------------------|--------------------------|----------------------------|----------------------------|
| | Female primary earner | Male primary earner | Female primary earner | Male primary earner | Female primary earner | Male primary earner |
| Children <16 in HH | -0.0324 (0.0327) | -0.0148 (0.0157) | -0.0254** (0.0107) | -0.0147** (0.00652) | -0.0209*** (0.00257) | -0.0107*** (0.00165) |
| Prim.earner log ann.inc. | 0.0944** (0.0441) | 0.0258 (0.0171) | 0.00848 (0.0125) | 0.0326*** (0.00755) | 0.0119*** (0.00332) | 0.0297*** (0.00241) |
| Log annual inc.*children | -0.000645 (0.0794) | -0.0259 (0.0213) | -0.0114 (0.0166) | -0.00534 (0.0100) | -0.0179*** (0.00542) | -0.0112*** (0.00300) |
| Yrs since imm. female | -0.0158** (0.00653) | -0.00421 (0.00297) | -0.00290* (0.00158) | -0.00331*** (0.00104) | -0.000559*** (0.000159) | -0.000451*** (0.000104) |
| Yrs since imm. male | 0.00584 (0.00632) | -0.00619** (0.00297) | -0.00236 (0.00154) | -0.00246** (0.000999) | -0.000410*** (0.000139) | -0.000881*** (9.96e-05) |
| Dummy variables: | | | | | | |
| Female age at imm. | Yes | Yes | Yes | Yes | Yes | Yes |
| Male age at imm. | Yes | Yes | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 650 | 2,459 | 1,520 | 6,438 | 9,835 | 38,000 |
| R-squared | 0.288 | 0.103 | 0.082 | 0.057 | 0.030 | 0.032 |

Notes: OLS estimation. Standard errors clustered on household level. Constant included.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table 3.10: Linear probability regressions: Earnings, children and return migration.

In line with descriptive evidence, regression analysis revealed that those with higher earnings are more likely to return from Denmark. This holds for singles as well as primary earners in couples and confirms theoretical predictions by Borjas and Bratsbers (1996). It goes against an alternative hypothesis that immigrants with low earnings return because of having a bad job realization. Both partners in a couple are attached to the labor force seems to weaken self-selection on the primary earner's income. The presence of children also seems to weaken self-selection patterns. Theory and former empirical evidence on the self-selection of outmigration of emigrants (Borjas and Bratsberg, 1996) suggest that return migration accentuates the selection of the initial migration flow. The presented findings for primary earners in couples are in line with these previous results and theoretical arguments. Moreover, results for return migration of couples from Denmark suggest that self-selection on primary earner's income is weaker in couples where both partners are attached to the labor market. An explanation for these findings might be that potential co-location problems for couples weaken self-selection due to the partners' conflicting interests and the challenge to coordinate on an optimal joint return migration decision. The analysis has also addressed the role of children in return migration decisions. The presence of children also seems to reduce positive self-selection on primary earner's income. The presented results are driven by immigrant couples from the non-Western origin countries. In the presence of children other factors might be important for families returning with children which could weaken selection patterns on parents labor market characteristics. E.g. results in the first subsection revealed that schooling considerations might be relevant when it comes to return migration decisions of immigrant families from Denmark.

3.5 Conclusion

This chapter has analyzed the role of family ties for return migration of migrant couples. Using Danish administrative data from 1981 to 2005 different considerations have been studied which might affect return migration in the family context. Restricting attention to couples in which both partners have immigrated from the same country of origin, living together in Denmark, returning is defined as partners jointly emigrating in the same year to their country of origin according to

the official migration register. Return propensities vary considerably depending to the country of origin. Both couples and single migrants are most likely to return when coming from another Nordic country. Return propensities are lower for those from other Western countries and lowest for migrants from non-Western countries.

The presence of children in the household plays a role for the return decision of migrant couples. Having children is associated with lower return propensities, which is statistically significant for the non-Western countries. Regression analysis reveals that return migration to non-Western countries is more likely among families with a higher share of daughters. This effect is driven by Turkish immigrant couples. Identifying a causal link more clearly and disentangling endogenous return migration from fertility decisions, it can be shown that there is a significantly different effect of having a girl compared to a boy as the first child in the family for the subsample of Turkish immigrant couples.

From a policy perspective it is of interest though, through which channels the presence of children affects return decisions of families: A possible factor that might play a role here could be schooling considerations. Altruistic parents might evaluate differences in labor market and schooling prospects between the host and the home country. Then, return propensities should be higher for couples with children at an age where these considerations can be expected to be most relevant. In line with Tiebout sorting, return propensities could be expected to be positively related to schooling quality in the return countries. This can be confirmed with the data: Couples are significantly more likely to return if their child is below school age. Moreover, results suggest that return migration probabilities for couples with young children are higher to countries with higher average PISA test scores. However, as an explanatory variable, GDP per capita in the country of origin has a larger explanatory power for relatively higher return propensities of couples with children.

Another potentially important argument playing a role for return decisions for families could be

preferences related to cultural background. If parents want their children to grow up in the home country instead of abroad because of considerations related to cultural identity, this can as well influence return decisions. The differential effect of having a boy or a girl provides some support for this channel. Return propensities of couples with daughters are particularly high for Turkish immigrants while labor market perspectives for women can be expected to be better in the egalitarian Nordic countries. Another argument in favor of cultural reasons for return migration is the response of return rates among immigrant couples with children from non-Western countries to a tightening of family reunification laws in Denmark in 2002.

This chapter has also investigated how family ties and the presence of children are associated with the selection into return migration on partners' labor market income. Analyzing earnings and return migration of couples in which the primary earner works more than 60% in the labor market revealed that those couples returning are positively selected on the income of the primary earner. In line with theory, selection patterns to non-Western countries with mostly more dispersed income distributions are stronger than for the Nordic or Western return countries. Analysis reveals that positive selection on primary earner's income is less strong in couples in which both partners are closely attached to the labor market. These findings hold for male as well as female primary earners. When analyzing country groups separately, statistically significant results are only obtained for immigrant couples from the non-Western origin countries. Results suggest that among couples with children, selection on primary earner's income is weaker, too. Again this is statistically significant only for immigrant couples from the non-Western countries. The findings can be explained by the argument that if the secondary earner's labor market attachment or considerations related to children play an important role in the couple's return migration decision, the selection according to labor market characteristics of the primary earner might drive return migration to a lesser extent.

Appendix A

International Family Migration and the Dual-Earner Model

Household utility maximization in the model

Consider the utility function presented in section 2 with $0 \leq H_a \leq 1$, $0 \leq H_b \leq 1$, $0 \leq \bar{D} \leq 1$, $w_a > 0$, $w_b > 0$ and $P_D > 0$.

There are two possibilities for an interior solution of the utility maximization problem in the gender neutral model when $w_a > w_b$ (in case $w_a < w_b$ we can just exchange indices):

Either $H_a = H_a^*, H_b = 1$ (given that $0 < H_a^* < 1$) or $H_a = 0, H_b = H_b^*$ (given that $0 < H_b^* < 1$) are feasible interior solutions. Full specialization is only optimal if no interior solution exists because $H_a^* < 0$ and $H_b^* > 1$. We show formally that full specialization of the partners never yields highest utility if a feasible interior solution exists.

We show that 1. $U(H_a^*, H_b = 1) \geq U(H_a = 0, H_b = 1)$ and 2. $U(H_a = 0, H_b^*) \geq U(H_a = 0, H_b = 1)$.

1. $U(H_a^*, H_b = 1) \geq U(H_a = 0, H_b = 1)$

- **If** $w_b < P_D$

$$\Rightarrow ((2 - \bar{D})\alpha w_a)^\alpha ((2 - \bar{D})(1 - \alpha))^{1-\alpha} \geq w_a^\alpha (1 - \bar{D})^{1-\alpha}$$

$$\Leftrightarrow ((2 - \bar{D})\alpha)^\alpha \left(\frac{2 - \bar{D}}{1 - \bar{D}} (1 - \alpha) \right)^{1-\alpha} \geq 1$$

which is strictly greater for all $\alpha \neq \frac{1}{2-\bar{D}}$.

In general, one can show that for any $0 < \alpha < 1$, $k \geq 1$ an expression of the form

$$(k\alpha)^\alpha \left(\frac{k}{k-1} (1 - \alpha) \right)^{1-\alpha}$$

obtains its minimum value at $(k\alpha)^\alpha \left(\frac{k}{k-1} (1 - \alpha) \right)^{1-\alpha} = 1$ with $\alpha = \frac{1}{k}$. We can apply this insight to the above and following inequalities.

- **If $w_b \geq P_D$**

$$\begin{aligned} \Rightarrow (\alpha(2w_a - p_D \bar{D}))^\alpha \left(2 - \frac{p_D \bar{D}}{w_a} (1 - \alpha) \right)^{1-\alpha} &\geq (w_a - p_D \bar{D})^\alpha \\ \Leftrightarrow \left(\alpha \frac{2w_a - p_D \bar{D}}{w_a - p_D \bar{D}} \right)^\alpha \left(2 - \frac{p_D \bar{D}}{w_a} (1 - \alpha) \right)^{1-\alpha} &\geq 1 \end{aligned}$$

which is strictly greater for all $\alpha \neq \frac{w_a - p_D \bar{D}}{2w_a - p_D \bar{D}}$.

2. $U(H_a = 0, H_b^*) \geq U(H_a = 0, H_b = 1)$

- **If $w_b < P_D$**

$$\begin{aligned} \Rightarrow (\alpha(w_a + w_b - \bar{D}w_b))^\alpha \left((1 - \alpha) \left(\frac{w_a}{w_b} + 1 - \bar{D} \right) \right)^{1-\alpha} &\geq w_a^\alpha (1 - \bar{D})^{1-\alpha} \\ \Leftrightarrow \left(\alpha \frac{w_a + w_b - \bar{D}w_b}{w_a} \right)^\alpha \left((1 - \alpha) \frac{\frac{w_a}{w_b} + 1 - \bar{D}}{1 - \bar{D}} \right)^{1-\alpha} &\geq 1 \end{aligned}$$

which is strictly greater for all $\alpha \neq \frac{w_a}{w_a + w_b - w_b \bar{D}}$.

- **If $w_b \geq P_D$**

$$\begin{aligned} \Rightarrow (\alpha(w_a + w_b - p_D \bar{D}))^\alpha \left(\frac{1}{w_b} (w_a + w_b - p_D \bar{D}) (1 - \alpha) \right)^{1-\alpha} &\geq (w_a - p_D \bar{D})^\alpha \\ \Leftrightarrow \left(\alpha \frac{w_a + w_b - p_D \bar{D}}{w_a - p_D \bar{D}} \right)^\alpha \left(\frac{1}{w_b} (w_a + w_b - p_D \bar{D}) (1 - \alpha) \right)^{1-\alpha} &\geq 1 \end{aligned}$$

which is strictly greater for all $\alpha \neq \frac{w_a - p_D \bar{D}}{w_a + w_b - p_D \bar{D}}$.

Model solution for $w_a < w_b$ and $\lambda \gg 0$

If $w_a < w_b$ and $\frac{w_a}{w_a+w_b} < \alpha < \frac{1}{2}$ full specialization is never optimal. Either $H_a = H_a^*$, $H_b = 1$ or $H_a = 0$, $H_b = H_b^*$ are feasible solutions. The optimal division of labor and the threshold above which b participates in the labor market is now:

In case $w_b < p_D$

$$\left\{ \begin{array}{ll} H_a^{*1} = 1 - 2\alpha + \alpha\bar{D}, H_b^{*1} = 1 & \text{if } \alpha < \frac{\ln\left(\frac{w_a+w_b-w_b\bar{D}}{(2-\bar{D})w_b}\right)}{\ln\left(\frac{w_a}{w_b}\right)} \\ H_a^{*1} = 0, H_b^{*1} = (1-\alpha)\left(\frac{w_a}{w_b} + 1\right) + \alpha\bar{D} & \text{if } \frac{\ln\left(\frac{w_a+w_b-w_b\bar{D}}{(2-\bar{D})w_b}\right)}{\ln\left(\frac{w_a}{w_b}\right)} < \alpha \end{array} \right.$$

In case $w_b \geq p_D$

$$\left\{ \begin{array}{ll} H_a^{*2} = 1 - 2\alpha - (1-\alpha)\frac{p_D}{w_a}\bar{D}, H_b^{*2} = 1 & \text{if } \alpha < \frac{\ln\left(\frac{w_a^2+w_a w_b-w_a p_D \bar{D}}{2w_a w_b-w_b p_D \bar{D}}\right)}{\ln\left(\frac{w_a}{w_b}\right)} \\ H_a^{*2} = 0, H_b^{*2} = (1-\alpha)\left(\frac{w_a}{w_b} + 1 - \frac{p_D}{w_b}\bar{D}\right) & \text{if } \frac{\ln\left(\frac{w_a^2+w_a w_b-w_a p_D \bar{D}}{2w_a w_b-w_b p_D \bar{D}}\right)}{\ln\left(\frac{w_a}{w_b}\right)} < \alpha \end{array} \right.$$

Differentiating the threshold value for labor market participation with respect to w_a , w_b and \bar{D} yields similar results as for the case $w_a > w_b$ described in section 2.

| | | Female respondents | | | | |
|------------------|--------------------------------|--------------------|--------------------------|----------------------------|---------------------|-------------------|
| | | Equal preferences | Stronger male preference | Stronger female preference | Female disagreement | Male disagreement |
| Male respondents | Equal pref. | 29 | 6 | | | |
| | Stronger male preference | 3 | 13 | | 1 | |
| | Stronger female preference | 1 | | 7 | | |
| | Female disagr. Male disagr. | | | | | |

Source: Survey data.

Table A1. Migration preferences of couples with both partners as survey respondents.

| | Both in the labor force | Male in the labor force, female home | Female in the labor force, male home | At least one partner retiree or student |
|------------------------|-------------------------|--------------------------------------|--------------------------------------|---|
| In Denmark | | | | |
| United Kingdom | 80.9 | 2.9 | 0.0 | 16.2 |
| Other Western Europe | 84.9 | 3.0 | 0.0 | 12.1 |
| AUS, CAN, NZ | 89.7 | 0.0 | 0.0 | 10.3 |
| Abroad, in 2008 | | | | |
| United Kingdom | 67.6 | 27.9 | 0.0 | 4.4 |
| Other Western Europe | 66.3 | 27.7 | 1.2 | 4.8 |
| AUS, CAN, NZ | 75.9 | 20.7 | 0.0 | 3.5 |

Source: Survey and register data

Table A2a. Percentage shares for actual labor force participation in other Western countries (without Nordic countries and the US).

| | Both in the labor force | Male in the labor force, female home | Female in the labor force, male home | Both at home | No answer |
|----------------------|-------------------------|--------------------------------------|--------------------------------------|--------------|-----------|
| United Kingdom | 57.4 | 35.3 | 0.0 | 1.5 | 5.9 |
| Other Western Europe | 62.7 | 27.1 | 0.6 | 2.4 | 7.2 |
| AUS, CAN, NZ | 75.9 | 17.1 | 3.5 | 3.5 | 0.0 |

Source: Survey data

Table A2b. Percentage shares for preferred labor force participation in other Western countries (without Nordic countries and the US).

| | | Male preferences | | | | |
|--------------------|----------------------|------------------|----------------------|--------------------|-------------------|-----------|
| | | Both work | Female stays at home | Male stays at home | Both stay at home | No answer |
| Female preferences | Both work | 30 | 5 | | 3 | |
| | Female stays at home | 7 | 7 | | | 2 |
| | Male stays at home | 1 | | | | |
| | Both stay at home | | | | | |
| | No answer | 5 | | | | |

Source: Survey data.

Table A3: Respondents' answers towards labor market participation preferences for couples in which both partners answered the survey.

| A: All couples. | UK | Other Western Europe | AUS, CAN, NZ |
|---|-----------------|----------------------|---------------|
| | Male tied mover | 100.0% (5) | 92.0% (25) |
| No tied mover | 82.4% (17) | 74.2% (31) | 71.4% (14) |
| Female tied mover | 65.2% (46) | 64.5% (110) | 77.8% (9) |
| B: Couples without pre-school age children. | | | |
| Male tied mover | 100.0% (4) | 100.0% (16) | 100.0% (5) |
| No tied mover | 100.0% (10) | 80.7% (26) | 90.0% (10) |
| Female tied mover | 69.0% (29) | 64.2% (81) | 83.3% (6) |

Source: Survey data

Notes: Numbers of observation in parentheses.

Table A4. Female labor force participation and tied mover status among emigrant couples in other Western countries (without other Nordic countries and the US) in 2008.

| Household economy before emigration | Emigration 1987-1998 | Emigration 2001, 2002 |
|---|----------------------|-----------------------|
| Separate economies | 12.6 | 12.8 |
| Joint economies, the man brings in more money | 63.1 | 63.0 |
| Joint economies, the woman brings in more money | 8.1 | 7.2 |
| Joint economies, both partners bring in the same amount | 12.2 | 12.8 |
| Man brings in all money, woman stays home | 2.2 | 4.0 |
| Woman brings in all money, man stays home | 0.4 | 0.4 |
| No answer | 1.5 | 0.0 |
| Household economy in 2008 | | |
| Separate economies | 1.5 | 3.6 |
| Joint economies, the man brings in more money | 56.1 | 48.2 |
| Joint economies, the woman brings in more money | 10.0 | 10.8 |
| Joint economies, both partners bring in the same amount | 9.2 | 8.4 |
| Man brings in all money, woman stays home | 21.0 | 27.9 |
| Woman brings in all money, man stays home | 1.1 | 1.2 |
| No answer | 1.1 | 0.0 |
| Total observations | 271 | 251 |
| Source: Survey data | | |

Table A5. Percentage shares of household economies before migration and 2008 by year of emigration.

| | 1987/1988 | 1992/1993 | 1997/1998 | 2001/2002 |
|-------------------------|-----------|-----------|-----------|-----------|
| Nordic countries | 23.3 | 14.5 | 14.5 | 26.3 |
| United Kingdom | 2.3 | 11.6 | 12.6 | 15.5 |
| Rest of Western Europe | 37.2 | 44.9 | 34.6 | 25.5 |
| US | 18.7 | 16.0 | 20.1 | 13.2 |
| Other Western countries | 9.3 | 4.3 | 4.4 | 6.0 |
| Non-Western countries | 9.3 | 8.7 | 13.9 | 13.5 |
| Observations | 43 | 69 | 159 | 251 |
| Source: Survey data | | | | |

Table A6. Percentage shares of countries of residence by emigration years.

| | Low power couples | Female power couples | Male power couples | Power couples |
|---|-------------------------|----------------------------|--------------------------|------------------|
| A: Household economy before emigration | | | | |
| Separate economies | 11.6 | 15.1 | 9.9 | 13.5 |
| Joint economies, the man brings in more money | 59.3 | 56.6 | 74.3 | 61.4 |
| Joint economies, the woman brings in more money | 8.1 | 17.0 | 4.0 | 7.1 |
| Joint economies, equal contributions | 11.6 | 7.6 | 8.9 | 14.9 |
| Man brings in all money, woman stays home | 7.0 | 1.9 | 2.0 | 2.5 |
| Woman brings in all money, man stays home | 0.0 | 0.0 | 0.0 | 0.7 |
| No answer | 2.3 | 1.9 | 1.0 | 0.0 |
| B: Household economy in 2008 | | | | |
| Separate economies | 2.3 | 1.9 | 1.0 | 3.2 |
| Joint economies, the man brings in more money | 43.0 | 49.1 | 54.5 | 55.0 |
| Joint economies, the woman brings in more money | 19.8 | 17.0 | 3.0 | 8.9 |
| Joint economies, equal contributions | 10.5 | 11.3 | 3.0 | 9.9 |
| Man brings in all money, woman stays home | 20.9 | 15.1 | 36.6 | 22.7 |
| Woman brings in all money, man stays home | 2.3 | 5.7 | 0.0 | 0.4 |
| No answer | 1.2 | 0.0 | 2.0 | 0.0 |
| Observations | 86 | 53 | 101 | 282 |
| Source: Survey data | | | | |

Table A7. Percentage shares of household economies before migration and in 2008, by power type.

| | No child in DK, no child in 2008 | No child in DK, children in 2008 | Children in DK, no child 2008 | Children in DK, children in 2008 |
|---|---|---|--|---|
| A: Household economy before emigration | | | | |
| Separate economies | 18.4 | 25.5 | 3.7 | 3.6 |
| Joint economies, man brings in more money | 51.7 | 48.4 | 63.0 | 76.1 |
| Joint economies, woman brings in more money | 11.5 | 11.5 | 0.0 | 4.8 |
| Joint economies, equal contributions | 12.6 | 12.7 | 25.9 | 10.8 |
| Man brings in all money, woman stays home | 4.6 | 0.0 | 3.7 | 4.4 |
| Woman brings in all money, man stays home | 0.0 | 0.6 | 0.0 | 0.4 |
| No answer | 1.2 | 1.3 | 3.7 | 0.0 |
| B: Household economy in 2008 | | | | |
| Separate economies | 8.1 | 1.9 | 3.7 | 0.8 |
| Joint economies, man brings in more money | 33.3 | 52.2 | 40.7 | 60.2 |
| Joint economies, woman brings in more money | 20.7 | 10.2 | 7.4 | 7.2 |
| Joint economies, equal contributions | 18.4 | 7.6 | 29.6 | 4.0 |
| Man brings in all money, woman stays home | 16.1 | 26.1 | 14.8 | 27.1 |
| Woman brings in all money, man stays home | 3.5 | 0.6 | 0.0 | 0.8 |
| No answer | 0.0 | 1.3 | 3.7 | 0.0 |
| Observations | 87 | 157 | 27 | 251 |
| Source: Survey data | | | | |

Table A8. Percentage shares of household economies before migration and in 2008, by children in the household.

| | Preference for female labor force participation | Actual female labor force participation |
|---------------------|---|---|
| Power couple | 0.0502 (0.0620) | -0.0281 (0.0533) |
| Female power couple | -0.0273 (0.0865) | 0.0238 (0.0684) |
| Male power couple | -0.131 (0.0834) | -0.167** (0.0748) |
| Youngest child 0-6 | -0.409 (0.252) | -0.930*** (0.185) |
| Youngest child 7+ | -0.196*** (0.0526) | -0.128*** (0.0468) |
| GINI | -2.150*** (0.578) | -1.754*** (0.485) |
| Starting Well Index | 0.251 (0.309) | 0.899*** (0.223) |
| Constant | 1.541*** (0.180) | 1.464*** (0.147) |
| R-squared | 0.138 | 0.176 |
| Observations | 393 | 423 |

Notes: OLS estimation. Robust standard errors in parentheses.

FLFP rate according to estimates by International Labour Organization for 2008.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table A9. Linear probability regressions: Actual and preferred female labor force participation and "Starting Well" Index.

| | All countries | Nordic countries | US | Other West. countries | Non-Western countries | |
|-----------------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|----------------------|
| Power couple | -0.0144 (0.0533) | 0.0138 (0.0502) | -0.00836 (0.0199) | -0.110 (0.199) | -0.00190 (0.0772) | 0.235 (0.0667) |
| Female power couple | 0.0462 (0.0694) | 0.00783 (0.0649) | 0.0428 (0.0385) | -0.0327 (0.272) | -0.0396 (0.113) | 0.290 (0.193) |
| Male power couple | -0.213*** (0.0686) | -0.162** (0.0683) | -0.359** (0.177) | -0.0780 (0.196) | -0.178* (0.0997) | -0.0527 (0.0789) |
| Youngest child 0-6 | -0.258*** (0.0498) | -0.235** (0.0495) | -0.0511 (0.0312) | -0.312* (0.101) | -0.187*** (0.0509) | -0.465** (0.0650) |
| Youngest child 7+ | -0.123*** (0.0445) | -0.0959** (0.0437) | -0.0345 (0.0414) | -0.175 (0.167) | -0.115*** (0.0442) | -0.0147 (0.0556) |
| Female worked in DK | 0.365*** (0.129) | 0.363*** (0.129) | 0.655** (0.265) | 0.127 (0.287) | 0.526*** (0.144) | -0.152 (0.248) |
| Nordic countries | | 0.215*** (0.0347) | | | | |
| United States | | -0.174** (0.0613) | | | | |
| Non-Western countries | | -0.154** (0.0666) | | | | |
| Constant | 0.533*** (0.131) | 0.511*** (0.138) | 0.363 (0.258) | 0.689** (0.321) | 0.402** (0.183) | 0.766*** (0.276) |
| R-squared | 0.098 | 0.172 | 0.392 | 0.077 | 0.112 | 0.208 |
| Observations | 505 | 505 | 105 | 81 | 255 | 64 |

Notes: OLS estimation. Robust standard errors in parentheses.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table A10. Linear probability regressions: Female labor force participation abroad in 2008.

| | All countries | Nordic countries | US | Other West. countries | Non-Western countries | |
|--------------------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|----------------------|
| Power couple | 0.0625** (0 0309) | 0.0639** (0.0322) | 0.000845 (0.0589) | 0.134 (0.133) | 0.0930* (0.0515) | 0.0520 (0.0551) |
| Female power couple | 0.0523 (0.0358) | 0.0558 (0.0351) | -0.0200 (0 0720) | 0.113 (0.121) | 0.100** (0.0484) | 0.0806 (0.0703) |
| Male power couple | 0.0356 (0.0386) | 0.0341 (0.0396) | -0 0463 (0 120) | 0 0212 (0138) | 0.0929 (0.0570) | -0.00494 (0.0813) |
| Youngest child in DK 0-6 | -0 0466** (0 0194) | -0.0455** (0.0188) | -0.0912* (0.0484) | -0.0855* (0.0438) | -0.0395 (0.0248) | 0.0722 (0.0515) |
| Youngest child in DK 7+ | -0.0332 (0.0380) | -0.0316 (0.0391) | -0.202 (0.189) | 0.0752 (0.0577) | -0.0506 (0.0507) | 0.0809 (0.0590) |
| Nordic countries | | -0.0227 (0.0264) | | | | |
| United States | | -0.0219 (0.0275) | | | | |
| Non-Western countries | | 0.00539 (0.0266) | | | | |
| Constant | 0.941*** (0.0270) | 0.947*** (0.0306) | 1.006*** (0.0418) | 0.890*** (0.125) | 0.914*** (0.0429) | 0.907*** (0.0761) |
| R-squared | 0.032 | 0.029 | 0.071 | 0.105 | 0.054 | 0.063 |
| Observations | 468 | 468 | 95 | 76 | 238 | 59 |

Notes: OLS estimation. Robust standard errors in parentheses.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table A11. Linear probability regressions: Female labor force participation in Denmark.

| | Nordic countries | US | Non-Western countries |
|---|------------------|-----------|-----------------------|
| Power couple | -0.328 | 0.503 | -1.138*** |
| | 0.322 | 0.420 | 0.367 |
| Female power couple | 0.395 | 0.108 | -0.599 |
| | 0.419 | 0.632 | 0.537 |
| Male power couple | -1.174*** | 0.552 | -0.263 |
| | 0.452 | 0.473 | 0.396 |
| Youngest child in DK 0-6 | 0.171 | 0.262 | -0.0665 |
| | 0.265 | 0.285 | 0.324 |
| Youngest child in DK 7+ | -0.213 | 0.895** | -0.39 |
| | 0.507 | 0.433 | 0.592 |
| Mother out of labor force at resp. age 12 | -0.299 | -0.343 | -0.184 |
| | 0.268 | 0.298 | 0.326 |
| Constant | -0.463 | -1.752*** | -0.641** |
| | (0.302) | (0.393) | (0.322) |
| Observations | 522 | 522 | 522 |

Notes: Multinomial logit estimation. Reference category: Other Western countries.

Coefficient estimates reported.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table A12. Sorting into different countries of residence conditional on observable characteristics.

| | Emigration 87/88, 92/93, 97/98 | | Emigration 01/02 | |
|-----------------------|---|---|---|---|
| | Preference for female labor force participation | Actual female labor force participation | Preference for female labor force participation | Actual female labor force participation |
| Power couple | 0.0666 (0.0848) | 0.0149 (0.0793) | 0.1178 (0.0777) | 0.0182 (0.0694) |
| Female power couple | -0.0713 (0.1274) | -0.0120 (0.1049) | 0.0381 (0.1011) | 0.0761 (0.0822) |
| Male power couple | -0.1515 (0.1025) | -0.0985 (0.0954) | -0.0885 (0.1105) | -0.2258** (0.1017) |
| Youngest child 0-6 | -0.3165*** (0.0839) | -0.2946*** (0.0813) | -0.1757*** (0.0646) | -0.1919*** (0.0627) |
| Youngest child 7+ | -0.2173*** (0.0646) | -0.1826*** (0.0596) | -0.2079*** (0.0768) | -0.0208 (0.0698) |
| Nordic countries | 0.2705*** (0.0576) | 0.1894*** (0.0546) | 0.2000*** (0.0667) | 0.2377*** (0.0999) |
| United States | -0.1822*** (0.0812) | -0.1975** (0.0804) | -0.1937* (0.1063) | -0.1628 (0.0551) |
| Non-Western countries | -0.0080 (0.0971) | -0.1237 (0.0921) | 0.0492 (0.0967) | -0.1742* (0.0951) |
| Constant | 0.9157*** (0.0838) | 0.9161*** (0.0759) | 0.7511*** (0.0850) | 0.7905*** (0.0753) |
| R-squared | 0.16 | 0.13 | 0.14 | 0.20 |
| Observations | 238 | 259 | 229 | 246 |

Notes: OLS estimation. Robust standard errors in parentheses.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table A13. Preferred and actual female labor force participation separately for earlier and later emigration cohorts.

| | All countries | Nordic countries | US | Other West. countries | Non-Western countries | |
|-----------------------------|----------------------|-----------------------|---------------------|-----------------------|-----------------------|---------------------|
| Power couple | 0.103* (0.0560) | 0.0917* (0.0523) | 0.0945 (0.133) | 0.101 (0.117) | 0.163** (0.0813) | 0.054 (0.0852) |
| Female power couple | 0.0327 (0.0817) | 0.0399 (0.0782) | 0.0766 (0.153) | 0.0234 (0.190) | 0.114 (0.122) | -0.189 (0.217) |
| Male power couple | 0.203*** (0.0580) | 0.183*** (0.0528) | 0.328** (0.164) | 0.156 (0.124) | 0.250*** (0.0836) | 0.0993 (0.0771) |
| Youngest child 0-6 | 0.293*** (0.0549) | 0.283*** (0.0512) | 0.265** (0.109) | 0.378*** (0.123) | 0.315*** (0.0808) | 0.0598 (0.0931) |
| Youngest child 7+ | 0.284*** (0.0527) | 0.261*** (0.0496) | 0.266** (0.123) | 0.255** (0.121) | 0.304*** (0.0759) | 0.100 (0.0914) |
| Male contributed more in DK | 0.191*** (0.0428) | 0.201*** (0.0398) | 0.328*** (0.103) | 0.183* (0.0965) | 0.146** (0.0567) | 0.136 (0.1146) |
| GINI | 1.713*** (0.328) | | | | | |
| Nordic countries | | -0.208*** (0.0513) | | | | |
| United States | | 0.0757** (0.0364) | | | | |
| Non-Western countries | | 0.114*** (0.0418) | | | | |
| Constant | 0.225* (0.118) | 0.354*** (0.0648) | 0.0546 (0.140) | 0.413*** (0.180) | 0.297*** (0.0891) | 0.724*** (0.152) |
| R-squared | 0.238 | 0.260 | 0.194 | 0.269 | 0.193 | 0.18 |
| Observations | 477 | 519 | 109 | 84 | 260 | 66 |

Notes: OLS estimation. Robust standard errors in parentheses.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table A14. Linear probability regressions: Male partner contributes more to joint household economy in 2008.

| | All countries | Nordic countries | US | Other West. countries | Non-Western countries | |
|-----------------------------|----------------------|-----------------------|---------------------|-----------------------|-----------------------|--------------------|
| Power couple | 0.0857 (0.0697) | 0.0825 (0.0656) | -0.0311 (0.141) | -0.0199 (0.193) | 0.170* (0.0995) | 0.0979 (0.158) |
| Female power couple | 0.0287 (0.0963) | 0.0456 (0.0921) | 0.00981 (0.167) | -0.0704 (0.266) | 0.0809 (0.143) | -0.0551 (0.292) |
| Male power couple | 0.224*** (0.0744) | 0.213*** (0.0689) | 0.325** (0.147) | 0.180 (0.190) | 0.248** (0.105) | 0.194 (0.144) |
| Youngest child 0-6 | 0.299*** (0.0666) | 0.291*** (0.0633) | 0.203* (0.112) | 0.640*** (0.208) | 0.311*** (0.101) | 0.0629 (0.150) |
| Youngest child 7+ | 0.325*** (0.0633) | 0.297*** (0.0609) | 0.229* (0.129) | 0.385** (0.177) | 0.377*** (0.0910) | 0.125 (0.152) |
| Male contributed more in DK | 0.200*** (0.0527) | 0.213*** (0.0498) | 0.299*** (0.108) | 0.294** (0.146) | 0.124* (0.0724) | 0.213 (0.187) |
| GINI | 1.396*** (0.420) | | | | | |
| Nordic destination | | -0.161*** (0.0576) | | | | |
| US destination | | 0.0619 (0.0548) | | | | |
| Non-Western dest. | | 0.125** (0.0557) | | | | |
| Constant | 0.178 (0.140) | 0.287*** (0.0741) | 0.146 (0.150) | 0.203 (0.197) | 0.231* (0.0972) | 0.567** (0.236) |
| R-squared | 0.227 | 0.248 | 0.181 | 0.413 | 0.218 | 0.187 |
| Observations | 351 | 379 | 99 | 47 | 193 | 40 |

Notes: OLS estimation. Robust standard errors in parentheses.

Sample: Both partners work abroad

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table A15. Linear probability regressions: Male partner contributes more to joint household economy in 2008 among dual-earner couples.

Appendix B

Family Decision-Making on International Migration

Analysis of corner solutions

For our analysis we required that

$$\bar{x}w_b - c - h > 0 \tag{B.1}$$

$$\bar{x}w_a - c - h > 0 \tag{B.2}$$

$$\underline{x} < \frac{2c - \bar{x}w_a}{w_b} \quad \text{or} \quad \underline{x} < \frac{c - h}{w_b} \tag{B.3}$$

B.1 is the most restrictive assumption if we assume that $w_a \leq w_b$ and that migration costs are the same for a and b . (B.3) requires that wage differences between a and b are sufficiently small. It becomes binding only if $\underline{x} > \frac{c-h}{w_b}$. In the following we will relax the three assumptions and go then through our comparative statics for migration probabilities.

Relaxing Assumption (B.1)

If $\bar{x}w_b - c - h < 0$ but (B.2) and (B.3) hold this changes P_3 :

$$P_3 = \int_{\frac{2c-\bar{x}w_b}{w_a}}^{\frac{c}{w_a}} \left(\int_{\frac{2c-x_a w_a}{w_b}}^{\bar{x}} \frac{1}{\bar{x}-x} dx_b \right) dx_a = \int_{\frac{2c-\bar{x}w_b}{w_a}}^{\frac{c}{w_a}} \left(\bar{x} - \frac{2c-x_a w_a}{w_b} \right) dx_a = \frac{1}{2} \frac{(\bar{x}w_b - c)^2}{w_a w_b}$$

$$\frac{\partial P_3}{\partial w_a} < 0, \frac{\partial P_3}{\partial w_b} > 0, \frac{\partial P_3}{\partial h} < 0.$$

Relaxing Assumption (B.1) and (B.2)

Keeping (B.3) and having $\bar{x}w_a - c - h < 0$ also changes P_2 :

$$P_2 = \int_{\frac{2c-\bar{x}w_a}{w_b}}^{\frac{c}{w_b}} \left(\int_{\frac{2c-x_b w_b}{w_a}}^{\bar{x}} \frac{1}{\bar{x}-x} dx_a \right) dx_b = \int_{\frac{2c-\bar{x}w_a}{w_b}}^{\frac{c}{w_b}} \left(\bar{x} - \frac{2c-x_b w_b}{w_a} \right) dx_b = \frac{1}{2} \frac{(\bar{x}w_a - c)^2}{w_a w_b}$$

$$\begin{aligned} P_4 = P_1 + P_2 + P_3 &= \frac{\frac{1}{2}(\bar{x}w_a - c)^2 + \frac{1}{2}(\bar{x}w_b - c)^2 + (\bar{x}w_a - c)(\bar{x}w_b - c)}{w_a w_b} \\ &= \frac{\frac{1}{2}(\bar{x}w_a + \bar{x}w_b - 2c)^2}{w_a w_b} \end{aligned}$$

$$\frac{\partial P_2}{\partial w_a} > 0, \frac{\partial P_2}{\partial w_b} < 0, \frac{\partial P_2}{\partial h} = 0.$$

$$\frac{\partial P_3}{\partial w_a} < 0, \frac{\partial P_3}{\partial w_b} > 0, \frac{\partial P_3}{\partial h} = 0.$$

If (B.1) and (B.2) do not hold, the joint migration probability P_4 is the same as in a model where both partners maximize joint household income and never split up. In this case wage differences are small ((B.3) holds).

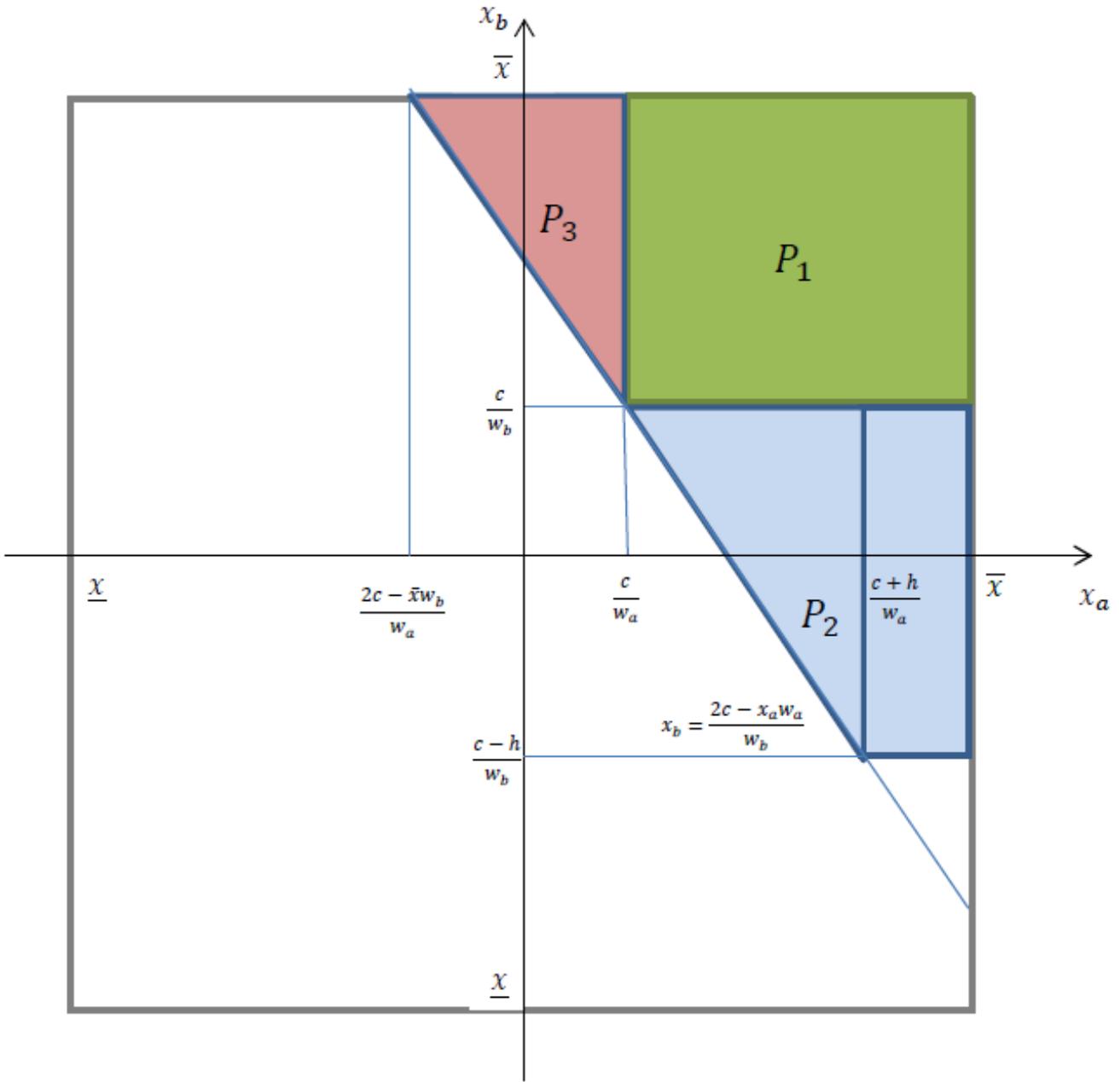


Illustration for probabilities when relaxing Assumption (B.1).

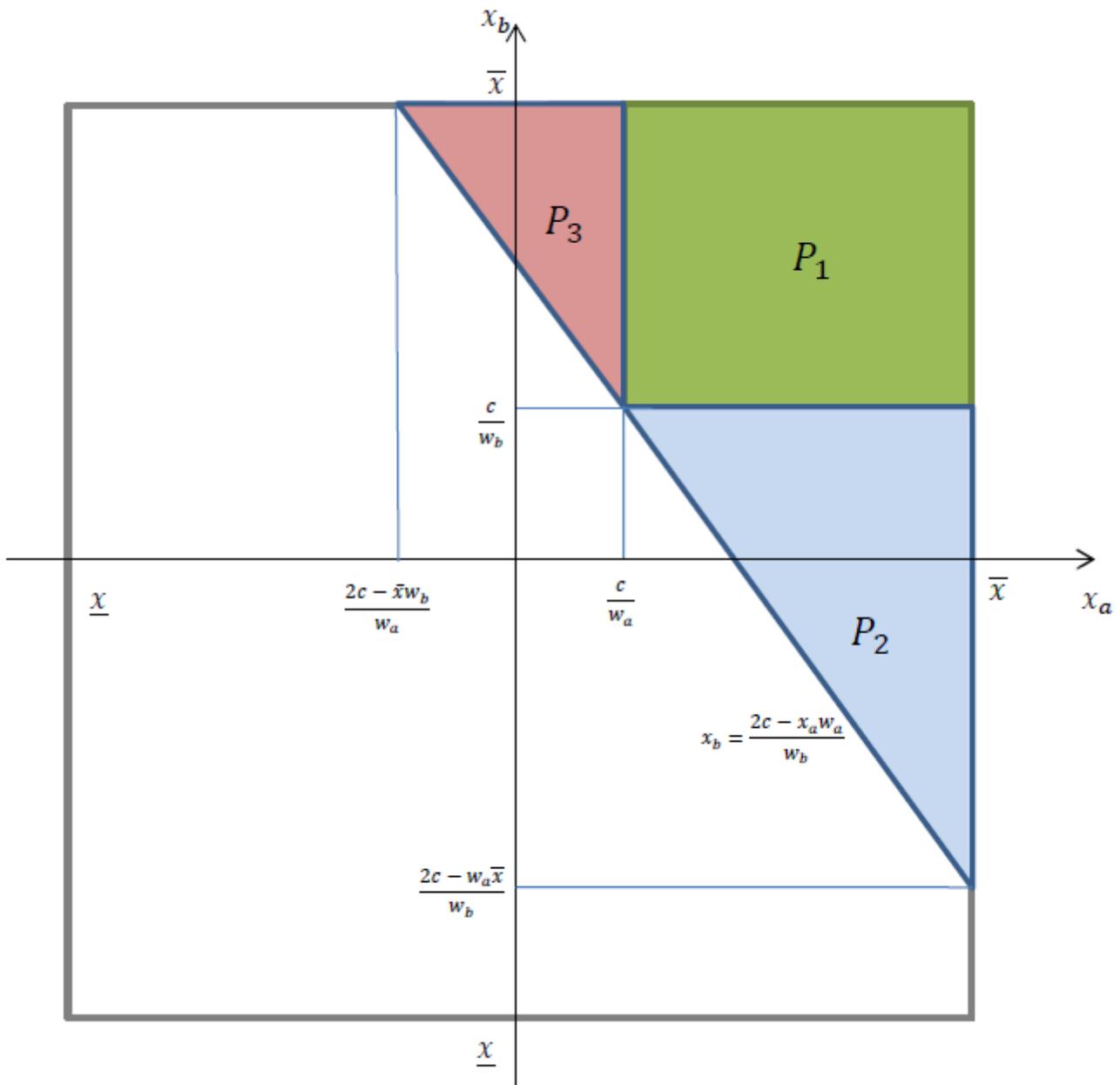


Illustration for probabilities when relaxing Assumptions (B.1) and (B.2).

Relaxing Assumption (B.3), and therefore (B.1)

If wage differences between a and b are relatively large we have $\frac{2c-\bar{x}w_a}{w_b} < \underline{x}$. If additionally $\underline{x} > \frac{c-h}{w_b}$, this changes P_2 once more to:

$$\begin{aligned} P_2 &= \int_{\bar{x}-1}^{\frac{c}{w_b}} \left(\int_{\frac{2c-x_b w_b}{w_a}}^{\bar{x}} \frac{1}{\bar{x}-\underline{x}} dx_a \right) dx_b = \int_{\bar{x}-1}^{\frac{c}{w_b}} \left(\bar{x} - \frac{2c-x_b w_b}{w_a} \right) dx_b \\ &= \bar{x} - \bar{x}^2 + \frac{-\frac{1}{2}(\bar{x}-1)^2 w_b^2 + 2w_b c(\bar{x}-1) + \bar{x} w_a c - \frac{3}{2}c^2}{w_a w_b} \end{aligned}$$

$$\begin{aligned} P_4 &= \bar{x} - \bar{x}^2 + \frac{-\frac{1}{2}(\bar{x}-1)^2 w_b^2 + 2w_b c(\bar{x}-1) + \bar{x} w_a c - \frac{3}{2}c^2}{w_a w_b} + \frac{\frac{1}{2}(\bar{x}w_b - c)^2}{w_a w_b} + \frac{(\bar{x}w_a - c)(\bar{x}w_b - c)}{w_a w_b} \\ &= \bar{x} - \frac{2c}{w_a} + \frac{\bar{x}w_b}{w_a} - \frac{w_b}{2w_a} \end{aligned}$$

$$\frac{P_2}{P_4} = \frac{w_a w_b (\bar{x} - \bar{x}^2) - \frac{1}{2}(\bar{x}-1)^2 w_b^2 + 2w_b c(\bar{x}-1) + \bar{x} w_a c - \frac{3}{2}c^2}{(\bar{x} - \bar{x}^2) w_a w_b - \frac{1}{2}(\bar{x}-1)^2 w_b^2 + 2w_b c(\bar{x}-1) + \bar{x} w_a c - \frac{3}{2}c^2 + \frac{1}{2}(\bar{x}w_b - c)^2 + (\bar{x}w_a - c)(\bar{x}w_b - c)}$$

$$\frac{P_3}{P_4} = \frac{\frac{1}{2}(\bar{x}w_b - c)^2}{(\bar{x} - \bar{x}^2) w_a w_b - \frac{1}{2}(\bar{x}-1)^2 w_b^2 + 2w_b c(\bar{x}-1) + \bar{x} w_a c - \frac{3}{2}c^2 + \frac{1}{2}(\bar{x}w_b - c)^2 + (\bar{x}w_a - c)(\bar{x}w_b - c)}$$

$$\frac{\partial \frac{P_2}{P_4}}{\partial w_a} > 0, \quad \frac{\partial \frac{P_2}{P_4}}{\partial w_b} < 0, \quad \frac{\partial \frac{P_2}{P_4}}{\partial h} = 0.$$

$$\frac{\partial \frac{P_3}{P_4}}{\partial w_a} < 0, \quad \frac{\partial \frac{P_3}{P_4}}{\partial w_b} > 0, \quad \frac{\partial \frac{P_3}{P_4}}{\partial h} = 0.$$

If (B.1) and (B.3) do not hold, the joint migration probability P_4 is the same as in a model where both partners maximize joint household income and never split up. In this case wage differences are large.

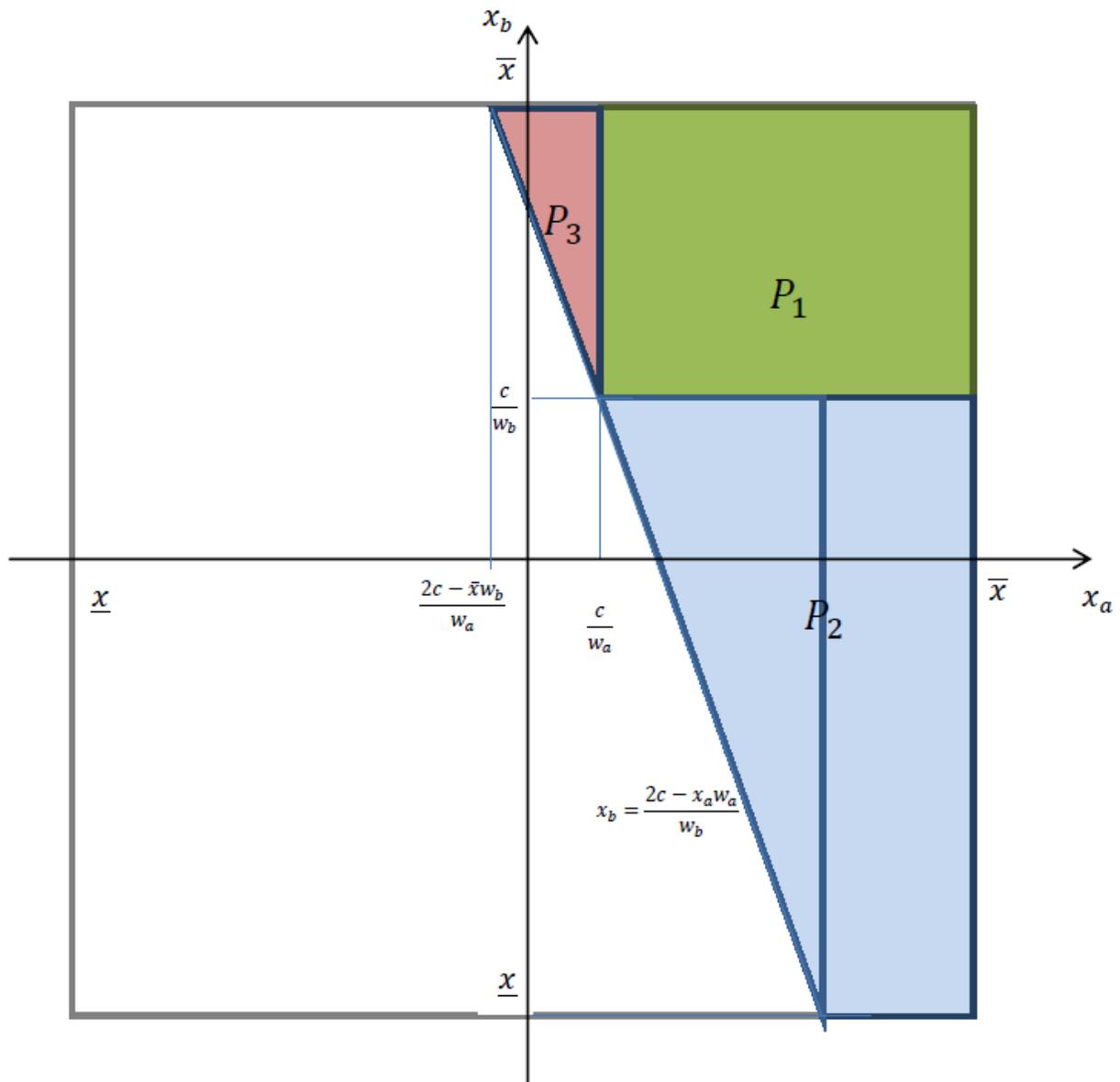


Illustration for probabilities when relaxing Assumption (B.3).

| | | Female respondents | | | | |
|------------------|----------------------------|--------------------|--------------------------|----------------------------|---------------------|-------------------|
| | | Equal preferences | Stronger male preference | Stronger female preference | Female disagreement | Male disagreement |
| Male respondents | Equal pref. | 27 | 6 | | 1 | |
| | Stronger male preference | 2 | 13 | | 2 | |
| | Stronger female preference | 2 | | 7 | | |
| | Female disagr. | | | | | |
| | Male disagr. | | | | | |

Source: Survey data.

Table B1. Migration preferences of couples with both partners as survey respondents

| | (1) | (2) | (3) |
|---|-----------------------|-----------------------|-----------------------|
| Log household income | -0.171*** (0.0500) | -0.160*** (0.0500) | -0.170*** (0.0500) |
| Log income difference primary - secondary earner | 0.120*** (0.0410) | 0.0969** (0.0432) | 0.0862** (0.0434) |
| Child in DK 0-6 | | 0.0374 (0.0354) | 0.0147 (0.0374) |
| Child in DK 7+ | | 0.184** (0.0840) | 0.152* (0.0855) |
| Cohabiting 5+ years in DK | | | 0.0656* (0.0370) |
| Observations | 201 | 201 | 201 |
| R-squared | 0.070 | 0.095 | 0.110 |

Notes: OLS estimation. Constant included.

Robust standard errors in parentheses.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table B2. Linear probability regressions: Stronger male preferences towards joint emigration, male primary earner couples. Alternative specification with log household income and log income differences between primary and secondary earner.

Appendix C

Family Return Migration

| | All countries | Nordic countries | Other Western | Remaining countries | Turkey |
|------------------------------|------------------------|---------------------------|---------------------------|----------------------------|----------------------------|
| Oldest child born in DK | -0.0164*** (0.0013) | -0.0665** (0.0259) | -0.0136* (0.00736) | -0.00992*** (0.00100) | -0.00541*** (0.000978) |
| Oldest child born in DK*girl | -0.0012 (0.0010) | 0.0117 (0.0351) | -0.00327 (0.00701) | -0.000463 (0.000716) | 0.00114* (0.000647) |
| Oldest child left household | -0.0159*** (0.0186) | -0.0155 (0.0186) | -0.0157** (0.00664) | -0.0101*** (0.00102) | -0.00448*** (0.000952) |
| Years since migration male | -0.0022 (9.50e-05) | -0.0124*** (0.000751) | -0.00358*** (7.50e-05) | -0.00119*** (0.000101) | -0.000487*** (8.54e-5) |
| Years since migration female | -0.0008 (9.34e-05) | -0.00806*** (0.000812) | -0.00366*** (7.09e-05) | -0.000418*** (8.65e-05) | -0.000129*** (7.77e-05) |
| Female age at imm. dummies | Yes | Yes | Yes | Yes | Yes |
| Male age at imm. dummies | Yes | Yes | Yes | Yes | Yes |
| Year dummies | Yes | Yes | Yes | Yes | Yes |
| Observations | 107,748 | 3,242 | 12,706 | 91,800 | 39,244 |
| R-squared | 0.041 | 0.117 | 0.050 | 0.025 | 0.021 |

Notes: Coefficients from linear probability model estimation. Only couples with children.

Robust standard errors in parentheses clustered on household level. Constant included.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Table C1. Linear probability regressions: Family return to origin country. Couples with children.

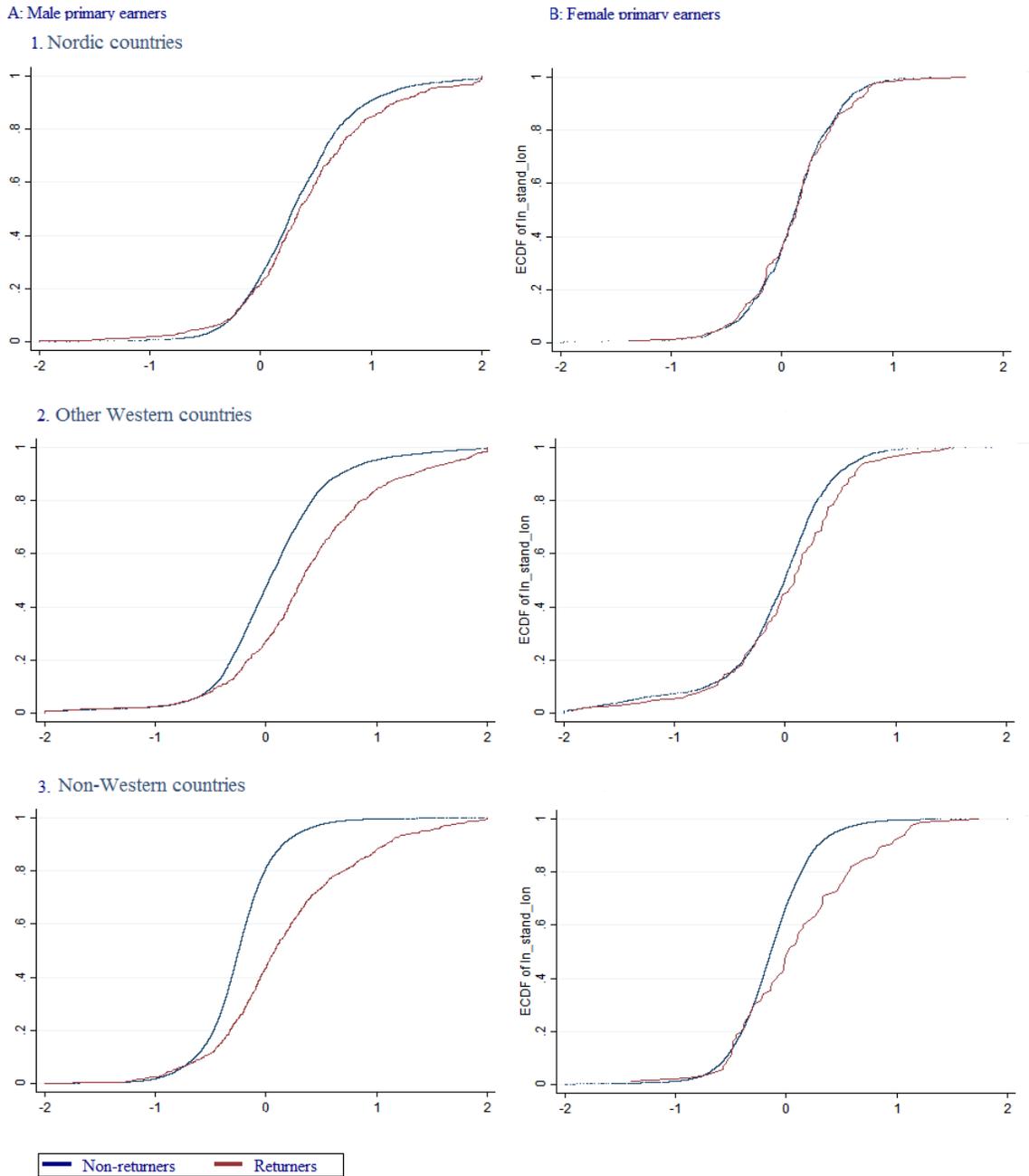


Figure C1. Cumulative distribution functions for log-standardized earnings, by country of origin group.

| | Only families w. oldest child born abroad | Only families w. oldest child born in DK |
|-----------------------|--|---|
| Age oldest child | | |
| 1 | -0.0236 (0.0322) | -0.00419 (0.00545) |
| 2 | -0.0179 (0.0318) | -0.0130** (0.00512) |
| 3 | -0.0408 (0.0316) | -0.00506 (0.00544) |
| 4 | -0.0510 (0.0360) | 0.00358 (0.00600) |
| 5 | -0.109*** (0.0299) | -0.00137 (0.00535) |
| 6 | -0.101*** (0.0300) | 0.0128* (0.00767) |
| 7 | -0.103*** (0.0299) | 0.00188 (0.00621) |
| 8 | -0.119*** (0.0293) | 0.000265 (0.00589) |
| 9 | -0.109*** (0.0297) | -0.00266 (0.00501) |
| 10 | -0.113*** (0.0296) | 0.000645 (0.00504) |
| 11 | -0.125*** (0.0293) | 0.00166 (0.00507) |
| 12 | -0.133*** (0.0290) | 0.00992 (0.00969) |
| 13 | -0.119*** (0.0296) | -0.00256 (0.00557) |
| 14 | -0.133*** (0.0291) | 0.00805 (0.00893) |
| 15 | -0.129*** (0.0292) | -0.00215 (0.00551) |
| 16 | -0.130*** (0.0293) | 0.0137 (0.0119) |
| Male out of LF | 0.0203*** (0.00581) | 0.0134*** (0.00371) |
| Female out of LF | 0.0163** (0.00782) | 0.00566 (0.00696) |
| Dummy variables | | |
| Yrs since imm. male | Yes | Yes |
| Yrs since imm. female | Yes | Yes |
| Female age at imm. | Yes | Yes |
| Male age at imm. | Yes | Yes |
| Year | Yes | Yes |
| Observations | 9,246 | 12,037 |
| R-squared | 0.092 | 0.051 |

Notes: Coefficients from linear probability model estimation. Only couples with children. Robust standard errors in parentheses clustered on household level. Constant included.

Table C2. Linear probability regressions: Couples with children. Return according to age of oldest child.

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