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Family Decision-Making on International Migration

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Abstract

We use a unique survey of Danes who have emigrated between 1987 and 2002 to study intra-family decision-making on international migration. Our survey reached 582 respondents with a Danish partner who was the same as before emigration. We model family decision-making in a bargaining framework and derive comparative statics to test with our data. Empirically, we find that family migration decisions are usually a shared preference, but that they are often driven to a larger extent by the male preference, most pronouncedly if the female is not college educated. Moreover, an increase in male wages goes along with relatively stronger male preferences towards joint emigration, which is in line with our theory.

JEL-Classification: F22, J12, D13, J24

Keywords: International migration, Family migration, Intra-household bargaining, Education

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1 Introduction

Previous research has shown that family ties are an important impediment to migration in the national context (Frank 1978; Mincer 1978; Gemici, 2011). This consideration 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 applicable. This is also why family migration is likely to reflect incentives and gains of one partner while the other one is a tied mover. In particular, in dual career households, migration can mean that one partner has to sacrifice his or her job opportunities, and becomes a tied mover.

Yet, little is known about to what extent partners who migrate together share the preference to emigrate, and to what extent one of the partners would have actually preferred not to migrate, but compromised on his or her preferred location to stay with the family. A tied mover would sacrifice earnings and opportunities but, on the other hand, intra-family transfers could compensate these losses. So far, there has only been limited evidence on the decision-making process in emigrant families and the implications for the individual partners. However, this is crucial to understand the welfare gains from family migration.

In this paper we consider migration decisions from Denmark to various destination countries in order to analyze family decision-making on international migration. Using unique survey data we are the first to shed light on the partners' preferences towards joint emigration. We develop a theoretical model for bargaining on migration decisions. From there we derive hypotheses on how individual and family characteristics are correlated with the probability of consumption gains or losses from migration and, thus, migration preferences of the partners.

With 76.1% in 2010 Denmark has one of the highest female labor force participation rates among OECD countries, although many women work only part-time (OECD (2011)). On top of this, Denmark is one of the world leaders in gender equality, having the third place in the 2011 United Nations Human Development Report. Therefore, we expect that family migration from Denmark would be more responsive to female preferences than family migration from less equal societies.

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 the female partner who would have usually preferred to stay in Denmark. This finding is strongest if the male partner has a college degree. But even if the female partner is relatively higher educated, it is more common that the male preferred to emigrate and the female would have preferred to stay than that the female preferred to emigrate and the male would have preferred to stay. Therefore, women seem to be more often tied movers even when being better educated. As predicted by our model we find that stronger male preferences towards emigration increase in male wages. The effect of female wages, however, remains unclear.

The rest of the paper is organized as follows. Section 2 summarizes related literature. In Section 3 we present a theoretical model on family bargaining and derive testable hypotheses from it. Section 4 describes our data and 5 presents stylized facts. In the light of our theoretical bargaining framework we present some empirical evidence on Danish emigrant couples in section 6. Section 7 concludes.

2 Previous Literature

Most of the literature considers migration as an outcome of individual cost-benefit analysis (see e.g. Sjastaad (1962)). In reality, however, relocation is often a joint decision taken with one's partner or other family members. Pingle (2006) mentions, for example, that family ties are the most important reason for the immobility among managers in the US.

Migration rates of families, in general, are much lower than for singles. Mincer (1978) and Mont (1989) theoretically show that conflicting interests of partners lead to higher opportunity costs for couples and families to relocate compared to singles. If only one partner wants to emigrate, the losses from migration for the tied mover have be compensated to make both partners better off. These potential losses, however, might be too high to make migration profitable for the family. For Mincer and Mont this is reflected in lower mobility and lower average gains from migration for families compared to singles. They assume that families

cannot dissolve and do not analyze the impact of migration incentives on family stability or individual preferences. However, considering the household as a stable, decision-making unit is a strong assumption (Becker (1974)). Contributions by Manser and Brown (1980) and McElroy and Horney (1981) explain family decision-making in a bargaining model. Their framework allows to analyze the distribution of income within the family according to the partners' outside options and their bargaining powers. If the partners do not reach an agreement they split up.

Several empirical analyses study how family ties affect migration outcomes. Most of this literature refers to intra-country relocation of families in the US. There is an extensive literature also looking at the impact of female characteristics on joint family relocations in the light of increasing female labor force participation.

Mincer (1978) finds that family ties decrease migration rates in the US, in particular if both partners are employed. Families are most likely to jointly relocate if the wife has weak labor market attachment, low earnings and accompanies the husband as a tied mover. Family migration rates decrease with higher earnings of the wife, showing potential conflicts of interest among the partners on relocation decisions. If families decide to move and both partners are attached to the labor market they tend to choose destinations where both male and female earnings are highest (DaVanzo (1978)). This is also confirmed by Costa and Kahn (2000) who show that couples with high earnings potential 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, persistence of the tied mover phenomenon is confirmed by Smits et al. (2003) who compare family relocations between 1977 and 1996 in the Netherlands. Tenn (2010) also 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.

Family migration inside the US being a response to male labor market options is also found by Gemici (2011). Gemici finds that the correlation of married partners' earnings gains between locations is low. He finds lower migration rates of married couples compared

to single persons and also higher divorce rates among couples with joint location constraints.

There is further empirical work referring to the partners' labor market gains from migration: Frank (1978) finds significant over-qualification of women after family relocations. Labor market participation of married women after migration is analyzed by Lichter (1980). Migration seems to have a disruptive effect on employment for wives who worked at the initial location, according to his results. This is not the case, though, if the woman is the main income earner in the family.

Empirical evidence, thus, suggests that the female partner often benefits less from migration than the male. Costa and Kahn (2000) and Lichter (1980) suggest that education and earnings potential of the partners play an important role for family migration decisions. However, there is little evidence on the partners individual migration preferences among family migrants. Moreover, it is unclear how individual and family characteristics are related to individual migration preferences among migrating families.

3 The Model

We consider family decision-making on migration as a bargaining game. In our framework we compute migration probabilities of 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.

3.1 Utility of a Single

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

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

We model individual gains from migration as in Junge, Munk and Poutvaara (2013). They argue that home- and destination country wage are related through the labor market characteristics of an individual. Moreover, the variation of absolute gains from migration increases with the pre-migration wage. Each individual that emigrates has to pay fixed migration

costs, in addition. If a single person i emigrates to country m he or she would earn the home country wage w_i plus some realization $x_i w_i$ net of migration costs:

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

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

$$x_i w_i - c > 0.$$

3.2 Utilities in a Couple

In a couple both partners, a and b, earn an individual wage w_a, 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 both partners emigrate together to the same destination, they each earn a wage abroad and also pay individual migration costs as defined above for singles. For simplicity we assume $c_a = c_b = c$. Staying together, the partners can still share h in the foreign country. At the time of decision-making both partners know their wage realization abroad. The partners can commit to future compensations by costless up-front utility transfers. Furthermore, we assume that the couple is able to coordinate on locating efficiently on the utility possibility frontier. This means both partners maximize the sum of individual incomes and redistribute afterwards. Hence, with linear, additively separable utilities, joint emigration requires that the sum of both partners' gains from migration is positive, i.e.

$$x_a w_a + x_b w_b - 2c > 0. \tag{1}$$

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

$$u_a^{ch} + u_b^{ch} = w_a + w_b + h. \tag{2}$$

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

$$u_a^{cm} + u_b^{cm} = (1 + x_a)w_a + (1 + x_b)w_b - 2c + h. \tag{3}$$

We consider a divorce-threat Nash bargaining framework in which each partner's outside option is his or her income at the optimal location in the single state. If (1) holds the couples maximizes a Nash bargaining function s.t. (3). The threat point of each partner is determined by his or her 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 no partner has a migration incentive, or in the absence of migration possibilities, the Nash solution to the bargaining problem maximizes

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

s.t. (2). This yields individual utilities of

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

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

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

s.t. (3). The solution to the bargaining problem is then

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

If (1) holds and partner a has a migration incentive but b not, the Nash solution of the Bargaining Problem maximizes

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

s.t. (3) if the couple emigrates.

This yields

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

The corresponding result for a as a tied mover is

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

From these results we see 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. none 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 not exceed joint household surplus. In case b would face individual income losses, i.e. $x_b w_b - c < 0$, it has to hold

$$h + x_b w_b - c > 0. \tag{4}$$

The corresponding condition for a as a tied mover is

$$h + x_a w_a - c > 0. \tag{5}$$

If (1) is satisfied but (4) or (5) not, the partner who wants to emigrate could improve by migrating alone and the tied mover would be better off staying behind under the Nash compensation scheme. Then, the couple would dissolve and give up joint household surplus

h. This illustrates that unequal gains from migration can cause relationship instability which is already mentioned by Mincer (1978). Note that these conditions are independent of the partners' bargaining powers, if coordination on an efficient outcome and ex-ante transfers are possible.

Figure (1) illustrates the different cases in which joint migration occurs.

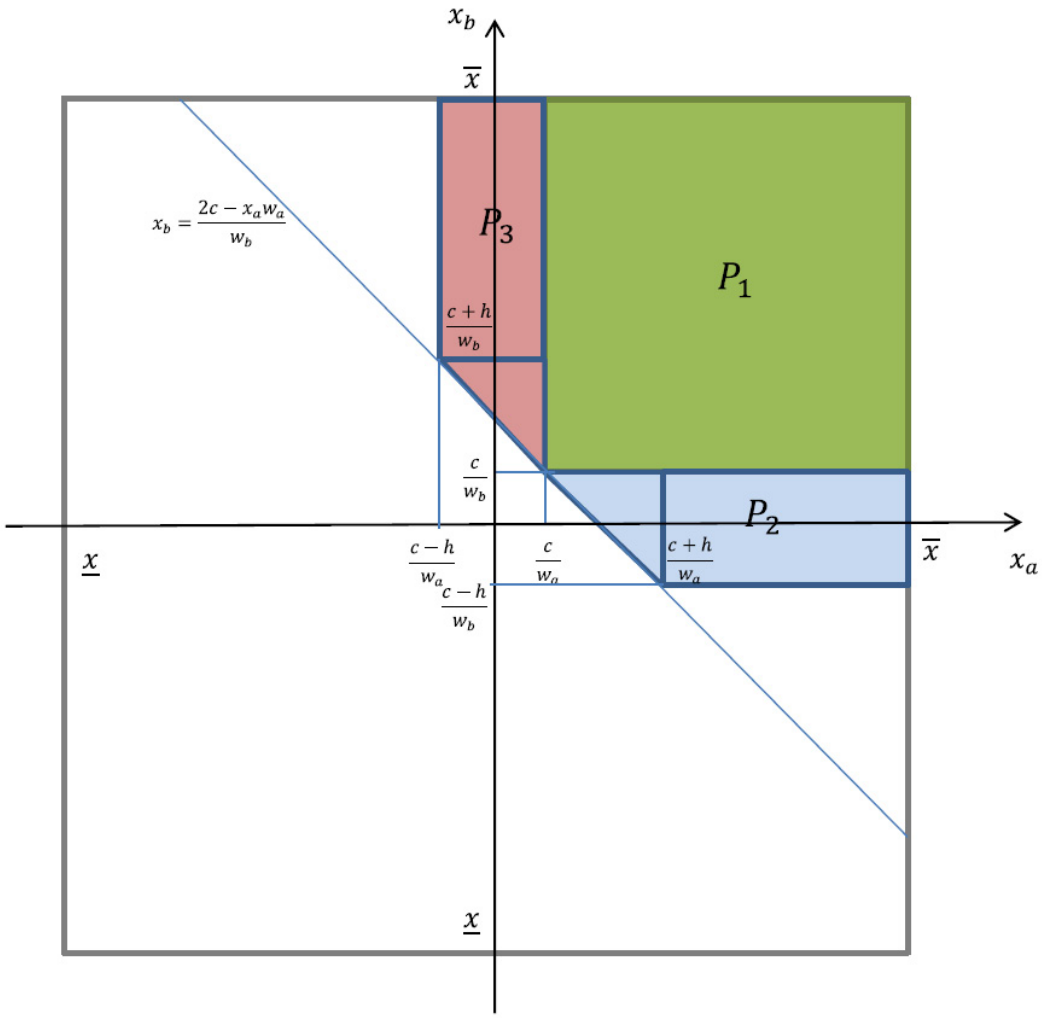

Figure 1: Conditions for joint emigration of a couple (in this illustration $w_a = w_b$).

3.3 Probabilities

In the following x_a and x_b are both uniformly distributed and independent. x_a and x_b $\in [\underline{x}, \bar{x}]$ with $\bar{x} - \underline{x} = 1$ for simplicity and $\underline{x} \in [-1, -0.5]$ such that the majority of the population would not migrate even without migration costs. 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 (1). Moreover, the sufficient conditions for household stability must hold if the couple emigrates together, (4) and (5). Under these conditions Figure 1 illustrates the different migration scenarios in the x_a,x_b space. We distinguish three cases in which both partners emigrate jointly.

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

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

Joint Emigration with a Tied Mover

We call $j = [a; b]$ a tied mover if $x_j < \frac{c}{w_j}$. As shown in (4) and (5) the loss that j faces in terms of lower earnings 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 (4) and (5)). The pattern of compensation payments will depend on the underlying bargaining process.

We calculate the probability that b is a tied mover (case 2). From the conditions derived

above 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 (1) that $x_a > \frac{2c-x_b w_b}{w_a}$. Using condition (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

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

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

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

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.

Joint Emigration and Comparative Statics

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

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

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

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

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

(Corresponding Results for P_3)

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, c, h can be computed and yield the following results:

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

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

Based on these conditional probabilities of a tied mover we can derive hypotheses to test with our data.

Thus, we formulate the following 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 ambiguous and unclear.

4 Data Description

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 2007. The survey was planned by Munk and Poutvaara within the project "Danes Abroad: Economic and Social Motivations for Emigration and Re-turn Migration", financed by the Danish Social Science Research Council. The survey was carried out by Statistics Denmark. A detailed description on sampling and data collection can be found in Munk, Nikolka and Poutvaara (2013).

We focus on long-term emigration decisions of couples. Our survey data provides information on several pre-migration characteristics like the respondents' education, household composition and work situation in Denmark. Survey respondents were also asked about their motives and preferences for emigration. For our sample we require that the respondents were in a long-term relationship with their partner since the time of emigration until 2008. The reason for this restriction is that if the couple would have separated between emigration and survey, 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 lived together before emigration to focus on joint migration decisions. 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 those respondents and their partners with the Danish full population register data on age, gender and earnings before migration. The remaining analysis is based on 582 respondents as well as their partners who satisfied all these restrictions.

In the subsequent analysis, we recoded the answers of 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 or migration, while my partner would have preferred to stay in Denmark", this is recoded as "Disagreement, female would have preferred to stay".

5 Descriptive Statistics

Our data allow us to gain important insights into intra-family decision making on migration of Danish emigrant couples. Moreover, we can relate the partners' preferences to their individual characteristics in Denmark. To our knowledge there is no empirical evidence on family decision-making in the context of international migration so far.

As a starting point for analyzing the complexity of household decision-making this section provides some descriptive statistics to indicate relationships in the data and to motivate subsequent econometric analysis. Our first question of interest is to what extent emigration was a shared preference among the partners. We group migration preferences to 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 we group couples where there was disagreement on emigration and either the female or the male partner would have preferred to stay. Table 1 provides an overview on the distribution of migration preferences among the partners in our sample.

A majority of 51.9% said they had equal preferences towards migration. In the case of divergent preferences it was mostly the male partner who was in favor of emigration (39.7% of the couples). 7.2% of the respondents 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 0.5% 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,

	No child in DK	Children in DK	Total
Equal preferences	52.8%	51.1%	51.9%
Agreement, stronger male preference	29.6%	34.9%	32.5%
Agreement, stronger female preference	9.0%	7.0%	7.9%
Disagreement, female would have preferred to stay	7.9%	6.7%	7.2%
Disagreement, male would have preferred to stay	0.7%	0.3%	0.5%
Observations	267	315	582

Source: Survey data.

Table 1: Migration preferences and child presence.

however, reported that migration was a shared pref-erence. Among 92.3% of the couples we observe joint agreement on migration. Moreover, in Table 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.

Table 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 higher 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 mi-gration 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 prefer-ences. 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 mi-gration preferences is particularly low for male power cou-ples. Male migration preferences, thus, are lowest among female power couples and highest 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.

	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	48	47	95
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	34	21	55
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	39	73	112
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	146	174	320

Source: Survey data.

Table 2: Power types, child presence and migration preferences.

Table 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 much related to a change in relative migration preferences for low power couples, female power couples and power couples. For male power couples, however, stronger male migration preferences are more frequent with a share of 50.9%. 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 64 couples where both partners answered the questionnaire. We analyzed those partners' mutual assessment of migration preferences. Table A1 shows that in 49 of 64 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.

	Median male income (monthly, DKR)	Median female income (monthly, DKR)
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 3: Income and migration preferences.

In Table 3 we present the median of monthly incomes of the male and female partners among couples with certain migration preferences. 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 where the male partner disagreed while the female partner had a strong preference towards emigration.

Table 4 provides insights into the partners' migration preferences for different destinations: the United States, Nordic countries and the rest of the world. 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. The share of higher female migration preferences is 13.2% for the Nordic countries, compared to the 5.1% for the US

	Nordic countries	US	Rest of the world	Total
Equal preferences	52.1%	51.3%	52.0%	51.9%
Agreement, stronger male preference	28.1%	34.6%	33.4%	32.5%
Agreement, stronger female preference	12.4%	5.1%	7.0%	7.9%
Disagreement, female would have preferred to stay	6.6%	7.7%	6.0%	7.2%
Disagreement, male would have preferred to stay	0.8%	0.0%	0.5%	0.5%
Observations	121	78	383	582

Source: Survey data.

Table 4: Migration preferences by destination country.

and 7.5% for the rest of the world.

However, we would have expected gender differences with respect to migration preferences to be even smaller in the Nordic countries compared to the US and other destinations. In general, labor market policies in the Nordic countries are more family friendly, for example the provision of public day care possibilities. However, this seems to reduce the gender gap in migration preferences only marginally.

6 Econometric Analysis

Based on our theoretical framework and the descriptive analysis we expect attitudes towards migration have to be related with several socio-economic characteristics of a couple. We suspect education, labor market status, earnings, thus, career opportunities of the partners to play a major role here. As we observe only very few couples where the female partner has strong preferences towards joint emigration we focus on stronger male migration preferences in the last part of our analysis.

We estimate a Probit model in order to analyze the determinants of migration preferences among Danish emigrant families in more detail. We are interested in the impact of several pre-migration characteristics on the binary dependent variable for stronger male preferences towards emigration. Here we also refer to the predictions derived in the theory part of this paper. Table 5 reports the regression results on a reduced sample of 449 observations. The reason for this is that we were not able to link all respondents with labor market information of their partner in the register data.

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

Notes: Average marginal effects. Constant included.
Standard errors in parentheses.

Table 5: Probit regressions: Stronger male preferences towards joint emigration.

Our model predicted that the probability of being a tied mover conditional on joint em-

igration increases with the partner's wage and decreases with the own wage. We find that the probability for stronger male migration preferences in our sample increases with log male wages. This finding is robust and statistically significant across all specifications in Table 5. However, we do not find any significant effect of female wages on stronger male migration preferences.

Mincer (1978) argues that children can increase the cost of migration in families. Our results do not show a clear effect of presence of children in the household in Denmark on the relative migration preferences of the partners. From the model we were also 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.

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.

In the last specification we include a dummy variable for labor 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 parter 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.

7 Conclusion

Our analysis of Danish emigrant couples provides insights into family decision-making on migration in an international context. We analyzed the partners' preferences towards emigration in the light of their individual and household characteristics.

We found that emigration among Danish emigrant couples is mostly a shared preference. However, in many couples the partners did not have the same attitudes towards joint migration. Denmark is one of the most gender-equal countries worldwide, with a high female labor force participation rate. Despite this, 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.

To shed more light on the determinants of relative migration preferences of the partners 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. We can explain why a tied mover might face utility losses after migration. Moreover, we are able to derive predictions on how the probability of becoming a tied mover is related to individual characteristics like the earnings of the partners.

Empirically, we find that higher income of the male partner in Denmark increases the probability that the male has the stronger preference towards emigration in the couple. This is in line with our theory.

Furthermore, we considered in our analysis the couples' power types, i.e. their levels of education. Our analysis revealed that male preferences drive migration most strikingly among male power couples. This seems to be related to the presence of children in those couples. Low power couples, female power couples and power couples do not differ much from each other in terms of migration preferences.

Our study provides first results on emigrant families' attitudes in the context of international migration from a highly gender-equal welfare state. Our empirical findings reveal that

intra-family transfers do not always fully compensate expected losses from migration for the tied mover. This can be motivated with the theoretical framework we provide. Still, further research has to be conducted to sharpen our understanding of family ties in the context of international migration decisions.

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Appendix

Analysis of corner solutions

For our analysis we required that

$$\bar{x}w_b - c - h > 0 \tag{6}$$

$$\bar{x}w_a - c - h > 0 \tag{7}$$

$$\underline{x} < \frac{2c - \bar{x}w_a}{w_b} \quad \text{or} \quad \underline{x} < \frac{c-h}{w_b} \tag{8}$$

6 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. (8) 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 (6)

If $\bar{x}w_b - c - h < 0$ but (7) and (8) hold this changes P_3:

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

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

$$\frac{\partial P_4}{\partial w_a} \text{ (to be computed)}, \frac{\partial P_4}{\partial w_b} \text{ (to be computed)}, \frac{\partial P_4}{\partial c} \text{ (to be computed)}, \frac{\partial P_4}{\partial h} \text{ (to be computed)}.$$

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

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

Relaxing Assumption (6) and (7)

Keeping (8) and having $\bar{x}w_a - c - h < 0$ also changes P_2:

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

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

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

$$\frac{\partial P_4}{\partial w_a} > 0, \frac{\partial P_4}{\partial w_b} \text{ (ambiguous)}, \frac{\partial P_4}{\partial h} = 0.$$

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

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

If (6) and (7) 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 ((8) holds).

Relaxing Assumption (8), and therefore (6)

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:

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

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

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

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

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

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

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

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

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

If (6) and (8) 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.

		Female respondents				
		Equal preferences	Stronger male preference	Stronger female preference	Female disagreement	Male disagreement
Male respondents	Equal pref.	29	6		1	
	Stronger male preference	4	13		2	
	Stronger female preference	2		7		
	Female disagr.					
	Male disagr.					

Source: Survey data.

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