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Have the poor always been less likely to migrate? Evidence from inheritance practices during the age of mass migration ☆

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ABSTRACT

Using novel data on 50,000 Norwegian men, we study the effect of wealth on the probability of internal or international migration during the Age of Mass Migration (1850–1913), a time when the US maintained an open border to European immigrants. We do so by exploiting variation in parental wealth and in expected inheritance by birth order, gender composition of siblings, and region. We find that wealth discouraged migration in this era, suggesting that the poor could be more likely to move if migration restrictions were lifted today. We discuss the implications of these historical findings to developing countries.

1. Introduction

Rural-to-urban and international migration offers residents of developing economies a potential strategy for economic advancement. Hanson (2010) and Clemens (2011) forcefully argue that easing national migration restrictions would be one of the most effective policy solutions for addressing disparities in development across countries. Yet, even if explicit barriers to migration were lowered, high migration costs and credit constraints might prevent the world's poor from moving to rich countries.

In the context of today's highly restrictive migration policy, some studies find that Mexican migrants to the US are wealthier and more educated than the typical non-migrant (e.g. Chiquiar and Hanson, 2005; Mishra, 2007), although this conclusion has been challenged by Ibarraran and Lubotsky (2007) and Moraga (2011). McKenzie and Rapoport (2007, 2010) reconcile these contrasting results by showing that the direction of migrant selection depends on access to financing. In particular, wealth has a positive effect on migration in communities with a small migration network, but it becomes a less important determinant of migration in communities with larger networks. This pattern suggests that borrowing through migration networks reduces a liquidity constraint that otherwise prevents the poor from migrating. Nevertheless, whether the poor would migrate in large numbers in the absence of migration restrictions remains an open question.

In this paper, we study the effect of parental wealth on the decision to migrate, either internally or internationally, during the Age of Mass Migration (1850–1913), a period characterized by the absence of government migration restrictions. Parental wealth can affect migration directly by financing the cost of migration or indirectly by providing access to land or to a family business in the source country. We find no evidence that a lack of household wealth posed a barrier to migration when US borders were open to all European migrants, an era when migration costs were relatively low. On the contrary, we show that men growing up in households with assets were significantly *less* likely to leave their municipality of birth. We are also able to match a subset of our individuals to property tax rolls and

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show that men from households with a higher tax bill (and, therefore, more taxable assets) are less likely to migrate. Furthermore, siblings who could expect, by virtue of their birth order or sibling composition, to inherit their family's land were even less likely to migrate. These findings suggest that the poor today might indeed be more likely to migrate if migration restrictions were lifted. Our findings suggest that, during in this era, wealth influenced the migration process through its effect on opportunities in the source country, rather than through the use of family resources to finance migration costs.

Assembling our unique panel dataset of migrants is made possible by the availability of historical public Census files containing the first and last names of individuals. In particular, we link men from the 1865 Norwegian Census to either the 1900 Norwegian Census or the 1900 US Census by first name, last name, age, and place of birth. We note that an inherent limitation of such a linking procedure is that match rates are low at around 26%, mainly because men with common names cannot be linked. A low match rate could result in a sample that is not representative of the general population (although we do show later that the sample we generated is fairly representative of the population on observables). We are nevertheless able to match 50,000 internal migrants, international migrants and non-migrants to their childhood household, from which we can measure variables including the asset holdings of their parents, the number and gender of their siblings, and their rank in the birth order. We know of no large-scale contemporary data that can link migrants to their childhood household.

Our data are particularly well-suited for studying the effect of wealth on migration. Typically, wealth is endogenous to the migration process; individuals may accumulate savings in anticipation of migrating or send money back to their family through remittances after migration. In our setting, we observe whether an individual's parents owned assets when he was still a child (and for a subsample the value of the property tax bill that his parents paid). These assets are pre-determined from the perspective of the individual making the migration decision. Moreover, these assets were accumulated by the parents of the potential migrants before mass migration in Norway began, and therefore are unlikely to have been influenced by the subsequent migration decisions of the children.

To further investigate the effect of wealth on migration, we study the relationship between migration and an individual's expected inheritance. Inheritance varied by birth order and gender composition of siblings and by region. On Norway's western coast and in the far North, two areas where primogeniture was particularly strong, we find that the oldest brothers who stood to inherit family land were less likely to migrate than their younger brothers. In contrast, oldest brothers were actually more likely to migrate in families that did not own land. In the rest of the country, birth order had an insignificant effect on migration, and instead the gender composition of siblings was what mattered. We find that, conditional on family size, men with more brothers (as opposed to sisters) were more likely to migrate in families that owned land. The number of brothers had no effect on migration in landless families. These patterns are consistent with brothers competing for scarce family resources, so that the less a brother expected to inherit, the more likely he was to migrate.

We note that inevitable differences across countries and over time limit the ability to extrapolate from our results to contemporary developing countries. For example, the primogeniture inheritance system used in historical Norway is not shared by all developing countries today. Furthermore, the cost of migration has varied over time with advances in transportation and major changes in US immigration policy. Nevertheless, nineteenth-century Norway is a good setting from which to draw lessons about what the migration process in developing countries could look like in a world of open migration. In 1870, Norway had a poor and primarily agricultural population. GDP per capita in Norway was only $2290 in 2010 dollars, around the level of the contemporary Philippines or Honduras. By moving abroad, Norwegians could expect an average return of 70% (Abramitzky et al., 2012).[1] Furthermore, like many developing countries today, Norway was undergoing processes of rural-to-urban and international migration. Urbanization in Norway doubled from 15% in 1865 to 30% in 1900, principally through internal migration; both the level of urbanization and its rate of change are similar to recent trends in many developing countries, including China, Indonesia and Nigeria.

Because the US maintained an open border at the time, the Norwegian emigration rate was substantially higher than comparable rates today. In the late nineteenth century, an average of 6.3% of Norwegians moved abroad in each decade (Hatton and Williamson, 1998, p. 33). For comparison, the decadal out-migration rate from Mexico was only 1.5% in the 2000s. Our historical setting also sheds light on migrant selection between countries that have relatively open borders today — for example, between poorer and richer countries within the European Union.

Our findings contribute to the literature highlighting the role of household (as opposed to individual) factors in the migration decision. Our paper is among the first to demonstrate that migration can be affected by conditions in one's childhood household (an important exception is Rosenzweig and Stark (1989), which explains the migration of daughters to distant villages at the time of marriage as a household-level risk mitigation strategy). In doing so, this paper complements the previous work that documents that families send migrants to different areas to diversify risks (Stark and Bloom, 1985), that risk-sharing networks within a village restrict migration (Munshi and Rosenzweig, 2009), and that migrants send remittances to family, which can aid development in the source country (Durand et al., 1996; Edwards, 2003; Osili, 2007; Rapoport and Docquier, 2006; Woodruff and Zenteno, 2007; Yang, 2008, 2011).

Other research in development economics documents the relationship between aspects of one's childhood household – including birth order, family size, and gender composition of siblings – and the human capital acquisition and labor force participation of children (Edmonds, 2006; Erjnaes and Portner, 2004; Garg and Morduch, 1998; Psacharopoulos and Patrinos, 1997).[2] We add to this literature by studying the effect of household composition on another outcome, namely migration.

The remainder of the paper proceeds as follows. Section 2 considers the conceptual relationship between household assets and migration in this historical context. Section 3 then describes the data and method we use to match adults to their childhood households in Norway. We present our empirical estimation framework in Section 4. Section 5 contains results relating household assets and expected inheritance to both internal and international migration. Section 6 concludes.

2. Conceptual considerations and historical context

Conceptually, it is unclear how wealth affects migration. Ultimately, the relationship between wealth and migration depends on the relative costs and benefits of migration for men with and without access to wealth (Sjaastad, 1962). On the one hand, wealth facilitates migration because migration requires large up-front costs, including the monetary cost of passage and the foregone earnings during the trip; in the presence of borrowing constraints, access to personal or household assets may lower the cost of the journey. Moreover, to the extent that parental wealth is correlated with individual skills, we could expect a positive

[1] The historical return to migration, although high, is lower than the contemporary return to international migration, most likely because of immigration restrictions in place today that keep migration flows artificially low (Hanson, 2006).

[2] There is also an extensive literature on sibling composition and birth order in developed countries (see, for example, Black et al., 2005; Booth and Kee, 2009; Butcher and Case, 1994).

relationship between wealth and migration if the more talented are more likely to move (Chiswick, 1978).

On the other hand, if wealth is correlated with skills, a Roy model would suggest a positive relationship between wealth and migration only when migrants move from a more equal source country to a less equal destination (Borjas, 1987). In the case of nineteenth-century Norway, the Roy model predicts instead that the poor would have been more likely to move to the US because the relative return to skills was higher in Norway than in the US at the time (Soltow, 1965; Abramitzky et al., 2012).[3]

In general, we expect the rich to be less likely to move if their "inside option" (of staying in their current location) is higher than their outside option (of moving). For example, higher wealth could make it more attractive for people to stay in Norway if the wealthy did not expect to be able to replicate their living standards elsewhere.

In fact, McKenzie and Rapoport (2007) show that, when the poor are unable to borrow, wealth has a non-linear effect on migration: migration first increases and then decreases with wealth. At low levels of wealth, increasing wealth relaxes the subsistence constraint, thereby increasing migration. At higher levels of wealth, when subsistence constraints do not bind, wealth reduces migration because the wealthy have better opportunities in the source country.

Furthermore, McKenzie and Rapoport (2007) point out that the effect of wealth on migration depends on migration costs. If migration costs are large, migrants will be drawn from households at the upper-middle of the wealth distribution, and if migration costs are low, the lower part of the wealth distribution is also expected to migrate. We estimate that migrating from Norway to the US in the late nineteenth century would have cost around 20% of the annual earnings of a low-skilled Norwegian worker.[4] These costs, while high, are lower than estimates for the cost of migration from Mexico to the US today.[5] We estimate that internal migration was around half as expensive as international migration at the time.[6]

Despite this literature on the effect of wealth on migration in contemporary settings, we know little about whether the poor would migrate in large numbers in the absence of migration restrictions. Our first approach to studying the relationship between wealth and migration is straightforward: we test whether children from families with assets were more or less likely to migrate than children from families without assets.

We next use details of inheritance practices in nineteenth century Norway to test whether children who were more likely to inherit parental wealth were more or less likely to migrate than other children from households with assets. In Norway, inheritance was more likely to be passed to the oldest son in a system of primogeniture. Inheriting wealth has two potentially contrasting effects on migration: on the one hand, older sons were more likely to have the capital necessary to finance a long-distance journey, but on the other hand, ownership of the family farm provided a livelihood that may have deterred migration. In his detailed social history of migration from a community in western Norway, Gjerde (1985) concludes that inheriting the family farm deterred migration among older sons. Instead, migration was a commonly used strategy of advancement used by younger siblings who were otherwise constrained by the "system of primogeniture… [under which] they could be nourished and remain on the farm, but they could not marry until they acquired livelihoods that would sustain new families" (p. 86).[7]

Although customary, primogeniture was not uniformly practiced throughout Norway. In the late nineteenth century, Norway was under Swedish control and, at least in theory, was subject to the Swedish inheritance law of 1845 that required equal treatment of all children (Dribe and Lundh, 2005a). In this system of partible inheritance, men with more brothers would face more competition for operating the family farm and thus, potentially, would find higher returns to moving elsewhere. Households in the West and far North of the country, which were farther from Swedish control, were more likely to practice the native custom of primogeniture.[8]

We note that, even under a system of equal inheritance, sisters did not represent an equal draw of family resources. Women married four years earlier than men on average and left their parental home upon marriage (Gjerde, 1985, p. 67). Furthermore, sisters were also more likely than brothers to leave their childhood home before marriage to act as a servant in another household (Gjerde, 1985, p. 99).

We test for the roles of birth order, number of siblings, and the gender composition of siblings in the migration decision, allowing these relationships to vary by household asset-holdings and by region. We expect that oldest sons are more likely to inherit parental wealth, especially in Norway's North and West, and that men with more brothers may also face more competition over access to family resources. Each of these factors may then play a role in the migration decision.

3. Data and matching

3.1. Matching procedure

Our goal is to create a dataset of Norwegian-born men whom we can observe both in their childhood household and in their chosen location later in life. We rely on three Census sources: the complete digitized Norwegian Censuses of 1865 and 1900 and a dataset containing the full Norwegian-born population residing in the US in 1900 derived from the genealogy website Ancestry.com. The two 1900 sources are combined to create the full universe of Norwegian-born men who lived in either Norway or the US in 1900. We then use an iterative procedure to match men observed in their birth families in Norway in 1865 to men in the full population of Norwegian-born men in 1900 living in either Norway or the US.

Our main matching procedure, described in more detail in the Data appendix, matches individuals by first name, last name, age, and province of birth (for men who remain in Norway). Because individuals do not always report their age correctly, we allow for matches

[3] The return to internal migration also appears to have been higher for the low-skilled. A farm laborer who moved to an urban area in Norway and held an occupation between the 10th and 40th percentile of the urban distribution could expect a 45% return to migration, compared to a 21% return for a farm owner who adopted an urban occupation between the 60th and 90th percentile. These numbers are based on authors' calculations using the urban occupational distribution in the 1900 Norwegian Census and occupation-based earnings in from Statistics Norway (Statistiske Centralbureau, 1900). Average annual income for a farm laborer was $175 (in 1900 US dollars). Farmers earned $305. The average population-weighted earnings between the 10th and 40th percentile in urban areas was $255, while the average earnings between the 60th and 90th percentile was $370.

[4] In 1900, a farm laborer in Norway earned $175 (in 1900 dollars). A steamship ticket to New York cost £5 or $25 (Keeling, 1999). We further assume that the migrant would have lost 20 days of work ($12, assuming a 300-day work year) during the voyage and the resettlement period.

[5] The median fee paid to a *coyote* for assistance with entering the US is around $2000 in 2000 dollars (Borger, 2010). When combined with lost work time, the full cost of migration is around 50% of annual earnings for a low-skilled Mexican worker (Hanson, 2006).

[6] According to advertisements in the newspaper *Bergens Tidende*, the cost of a second-class ticket from central Norway to Bergen in the 1890s was 18 Kroner (around $4.50), while the cost of traveling from the far North was 34 Kroner (around $8.50). Even if the amount of lost work time were equivalent, internal migration would have been half as expensive as traveling abroad.

[7] The relationship between inheritance practices and migration has been explored in other European contexts. Guinnane (1992) considers the relationship between inheritance and migration in Ireland. Wegge (1999) exploits evidence from Hesse-Cassel, a region in Germany with mixed inheritance practices, and shows that emigration rates were higher in villages that used impartible (or single heir) inheritance systems.

[8] The economy in the northern and western regions of Norway was also distinguished for being more dependent on fisheries. 16% of the men in the North and West report being a fisherman (either alone or in combination with farming), compared to only 4% in the East. Perhaps as a result, the occupational distribution in the North and West is also more concentrated than in the East, exhibiting a Herfindahl index of 0.11 relative to 0.07.

in which the subjects' ages are off by one or two years in either direction; we first match those whose ages match exactly, then within a one year band, and finally within a two year band.[9] This process generates a sample of 3050 Norwegian-born men living in the US in 1900 and 47,720 men in Norway. 30,628 of the men in Norway left their municipality of birth by 1900, while 17,092 stayed in the same location. Our overall match rate of 26% is comparable to other historical matched datasets.[10]

We define our outcome variable, migration status, by comparing an individual's location in 1865 and 1900. Specifically, we define four migration categories and present the proportions in Table 1: men who stayed in their municipality (34%), men who moved between municipalities but stayed in the same province (18%), men who moved to a different province (41%), and men who moved to the US (7%). Norway has 20 provinces, which, at the time, each had around 100,000 residents. The typical municipality was a village of 8000 residents.[11]

We propose two alternative matching procedures that address various concerns with the main sample. The first alternative method ignores information on the province of birth (available for those still in Norway in 1900) in order to match those who moved to the US and those who stayed in Norway in the same way. The benefit of this approach is that all men, regardless of location, are given equal chance to enter the dataset. As a result, 13% of this robustness sample moved to the US, a number that is more consistent with aggregate counts.[12] The second alternative method matches only individuals unique within a 5-year band of their birth year instead of iteratively matching the individual with the smallest difference between the implied birth year in 1865 and 1900 (for cases that are not unique within the 5-year band). This approach reduces measurement error that can derive from matching an 1865 observation to the wrong individual in 1900. However, more accurate matches are produced at a cost; both robustness samples are substantially smaller than the full sample and are less representative of the Norwegian population in 1865 because of the stricter uniqueness requirements.[13]

3.2. Our measures of wealth and other household-level variables

We construct two measures of parental wealth from the available historical data. The first is a binary variable of whether an individual's parents held assets of any size during his childhood. Specifically, household assets are defined in the Census as landholdings of any size in a rural area or as owning a business or being a master craftsman of an artisanal shop in an urban area; asset values were not recorded. By this definition, 58% of potential migrants in our sample lived in a childhood household with assets in 1865.

The second is a more continuous measure of wealth, the value of the household's property tax bill, which attempts to distinguish between asset holdings of different sizes. We are able to match a subsample of our data to the property tax rolls in the 1880s. In particular, we match household heads from the 1865 Census to the digitized rural Land Register of 1886, achieving a match rate of 13.1%. We note that failure to match to the records could be due to a lack of taxable assets or to mortality of the household head between 1865 and 1886 (the average household head in our sample would be 62 in 1886, while life expectancy was just over 50 in Norway at this time). Thus, failure to match to the Land Register is another (imperfect) indicator of a lack of assets.

Both of our measures of wealth capture relatively illiquid forms of wealth, which may have been difficult to convert into capital to finance migration. Yet, we note that, in this period, as in many developing countries today, the vast majority of household wealth was held in land, rather than in more liquid investments. Therefore, the relationship between migration and land holdings is the most relevant for the sample in question. Furthermore, land markets were reasonably active in Norway in the late nineteenth century, making it possible to sell or mortgage land to finance migration.[14]

The first column of Table 1 presents characteristics of our matched sample. We glean information about the location of an individual's childhood household from the 1865 Census. Nineteen percent of our matched sample was born in an urban area. We define an indicator variable for whether members of the household have been in the same municipality for multiple generations by comparing the household's current location (in 1865) with the birthplace of the household head. Seventy-four percent of the men in our matched sample grew up in the municipality in which either their mother or their father was born.

We further construct variables for the number of children and number of sons in the household and an indicator for being an oldest brother from the household roster in the 1865 Census. Because we only observe the household at a point in time, the oldest brother indicator will be mis-measured for the children of older mothers, some of whose older children would have already left home. Therefore, throughout the analysis, we restrict our attention to sons whose mothers were 42 or younger in 1865.[15] Members of a household are considered to be a sibling of the potential migrant if both report being a son or daughter of the household head. The oldest brother dummy variable is created by comparing the ages of brothers in the household. On average, matched individuals are one of four siblings and one of 2.5 brothers. 51% of our matches are oldest brothers.[16] Our potential migrants are, on average, 41 years old in 1900. Given the restriction on mother's age, the average mother of men in the sample underlying our analysis is 35 years old in 1865.

[9] Among men whose characteristics (name, age and province of birth) are unique in 1865, 94% of the failure to match to 1900 is due to combinations that cannot be found in that year and the remaining 6% is due to combinations that are not unique in 1900. Expected mortality rates over this 35 year period can account for around half of the "missing" observations in 1900. The remainder can likely be attributed to factors like name changes and Census under-enumeration.

[10] Ferrie and Long (forthcoming) obtain a match rate of 22% between the 1850 and 1880 US Census.

[11] We adjust for changes in municipality boundaries and the creation of new municipalities between 1865 and 1900 using detailed records in the codebook for Norwegian Ecological Data (Aarebrot and Kuhnle, 2009). In particular, we collapse the 596 Norwegian municipalities in 1900 back into the 436 municipalities that existed in 1865 and define migration variables based on these 1865 boundaries.

[12] The vast majority of Norwegian international migrants moved to the US. From official statistics, the annual emigration rate out of Norway was 0.7 per 100 from 1871 to 1900, which would imply that 21% of the sample should be observed in the US (Hatton and Williamson, 1998). However, up to half of these migrants returned to Norway, suggesting that we should find around 11% of our sample in the US (Bandiera et al., 2010; Gould, 1980).

[13] For example, 24% of men in the 5-year age band sample hail from an urban area, compared to 19% in the full matched sample and 14% in the Norwegian population in 1865. Because of this lack of representativeness, we do not use the five-year age band sample as our main sample.

[14] Dribe and Lundh (2005b) document that, by the nineteenth century, an active land market had developed in southern Sweden. Gjerde (1985) reports the same for the Balestrand region of Norway, writing that "the purchase of land…accelerated after 1765" (p. 62). Via these land sales, the share of land held by owner-occupier farmers increased from only 8.7% in 1647, when the majority of land was held by the crown and the church, to 54.5% in 1802.

[15] We select this cutoff according to the following logic: in the 1865 census, 90% of 19-year old males still lived in their parents' household. In 1865, the median age of a mother with only one child who was born in the previous year (a good proxy for first birth) was 26 years old and the 25th percentile of this age distribution was 23 years of age. Therefore, the oldest child of a 42 year old mother will almost always still be in the household (=23 year old mother+19 year old child). Results are robust to using older cutoffs for mother's age (e.g., 45 or 48 years old), which allows us to get closer to using the full sample.

[16] Men in our sample are more likely to be oldest brothers than the family size would suggest. A randomly chosen brother in a family with 2.5 brothers has a 40% likelihood of being the eldest; yet, 51% of men in our sample are oldest sons. The explanation for this pattern is that men in our matched sample must be at least three years old in 1865, although many of these men have brothers younger than three who contribute to overall family size. The Data Appendix provides more details on the matching algorithm.

3.3. Comparing matched sample with the population

Our sample may not be representative of the population because we are more likely to match individuals with uncommon names or who correctly report their age. Exact age reporting, rather than rounding age to the nearest zero or five, is an indication of numeracy (A'Hearn et al., 2009).

The second and third columns of Table 1a demonstrate that our matched sample closely resembles the population on all household characteristics, except urban status. Men in our matched sample are four percentage points (23%) more likely to have been born in an urban area. The over-representation of urban areas likely occurs because urban families used a wider array of given names (Gjerde, 1985, p. 48). In our empirical analysis, we control for urban status and present results separately for the rural population. Given the size of our sample, we also find statistically significant differences between the matched sample and the population on other characteristics, including number of siblings, probability of being the oldest son and age, but these differences are economically small (ranging between 0.3 and 3.3% of the respective means).Table 1b compares the set of matched migrants (both internal and international) to the population of migrants living either in Norway or in the US in 1900. As above, the only characteristic that exhibits a large difference between the matched sample and the population of migrants is urban status. Otherwise, internal migrants in the matched sample had the same occupation-based earnings as their counterparts in the full population, and slightly (around 1%) larger family size and probability of being married. There is a much smaller set of characteristics with which to compare the matched sample of international migrants to the population of Norwegian-born men living in the US in 1900, given the small set of variables that we hand-coded for an earlier project or that were digitized by Ancestry.com. Matched international migrants have slightly higher occupation-based earnings (3%) than the full population of Norwegian-born men living in the US.

Table 1a
Summary statistics in full matched sample and population.

Variable name	Matched sample Mean/SD	Population Mean/SD	Difference
A. Migration, 1865–1900			
Move to US	0.065	–	–
Move between provinces	0.408	–	–
Move in province	0.183	–	–
Stay in municipality	0.344	–	–
B. 1865 characteristics			
Household has assets	0.580	0.605	−0.024
	(0.493)	(0.489)	(0.032)
Parent birthplace	0.737	0.729	0.008
	(0.440)	(0.479)	(0.004)
In urban area	0.192	0.147	0.045
	(0.394)	(0.354)	(0.002)
Number siblings in household[a]	4.029	3.990	0.038
	(1.760)	(1.753)	(0.012)
Number brothers in household[a]	2.551	2.555	−0.004
	(1.271)	(1.256)	(0.008)
Oldest son	0.515	0.497	0.017
	(0.499)	(0.499)	(0.003)
Age in 1900	40.90	40.76	0.141
	(4.429)	(4.880)	(0.032)
Mother's age	35.18	35.05	0.135
	(5.310)	(5.361)	(0.036)

Notes: Match conducted by first name, last name, age, and province of birth. Table includes men whose mothers were less than 43 years old in 1865 (matched = 25,929; population = 157,164).
[a] Including self.

Table 1b
Comparing international and internal migrants in the matched sample and the population.

	Population	Match	Difference: Match − pop
A. Internal migrants, living in Norway in 1900			
Age	43.851	43.842	0.010
			(0.023)
Ln(earnings)	5.772	5.773	0.001
			(0.003)
Married	0.862	0.875	0.012
			(0.002)
Children	2.941	2.971	0.030
			(0.015)
Urban	0.234	0.274	0.040
			(0.003)
N	121,973	34,630	156,603
B. Norwegian-born men living in US in 1900			
Age	43.386	43.290	-0.095
			(0.164)
Ln(earnings)	6.384	6.418	0.035
			(0.014)
N	647	2538	3185

Notes: Samples are restricted to men between the ages of 38 and 50 in 1900. The sample is not restricted by mother's age because mother's age is known only for the matched sample in 1900. The earnings measures reported here are constructed by matching reported occupations to median earnings in the occupation category in either Norway or the US in 1900.

4. Estimation strategy

Our first specification relates the probability of migrating, i.e. of living outside one's childhood municipality, to an indicator of whether one's parents owned assets using a probit framework. This model treats all mobility equally, regardless of distance. We estimate the following probit specification:

$$P(Migrate_{ir}=1) = \Phi(a_r + \beta_1 Assets_i + \beta_2 X_i + \beta_3 X_i \times Assets_i + \beta_4 I(Age_i) + \beta_5 I(Mom's\ \ age_i)) \quad (1)$$

where *i* denotes individual and *r* denotes region. The dependent variable *Migrate* is an indicator equal to one for individuals who moved from their childhood municipality between 1865 and 1900. Region-specific intercepts (α_r), defined either by 20 provinces or 436 municipalities, allow for variation in local economic conditions that affect the return to migration. The first explanatory variable of interest, *Assets*, is an indicator equal to one if an individual grew up in a household with assets.

We next add other individual or household characteristics (X_i) and the interactions of these characteristics with household assets. X_i includes: vectors of dummy variables for the number of siblings or brothers living in the household; an indicator for being the oldest son living in the household; a dummy variable for living in an urban area; and a dummy variable for living in the birthplace of one or both of the individual's parents. All specifications include dummy variables for single years of own age and mother's age in 1865.

We next model location choice with a multinomial logit estimation framework. We allow the dependent variable Y to take four values for the four destinations, denoted by *m*: the choice to stay in one's childhood municipality; to make a short-distance move to another municipality in the same province; to move across provinces in Norway; or to move to the United States.[17] In an alternative specification for men born in rural areas, we also distinguish between internal migration to rural or urban places within Norway. In all cases,

[17] Before 1920, over 95% of Norwegians who moved abroad settled in the United States. Norwegian migration to Canada increased after 1920.

Table 2
Household assets and migration, marginal effects from probit estimation.

Dependent variable = 1 if leave childhood municipality is between 1865 and 1900						
	Full sample			Equal match sample		
	(1)	(2)	(3)	(4)	(5)	(6)
Assets	−0.073**	−0.071**	−0.052**	−0.115**	−0.104**	−0.089**
	(0.008)	(0.008)	(0.009)	(0.011)	(0.013)	(0.013)
Parent birthplace			−0.134**			−0.127**
			(0.012)			(0.012)
Urban			0.025			0.056**
			(0.022)			(0.022)
Urban × assets			0.0004			0.019
			(0.018)			(0.033)
Fixed effects	Province	Municipality	Province	Province	Municipality	Province

Notes: The first three columns contain all men in the full matched sample whose mothers were less than 43 years old in 1865 (N = 25,822). The second three columns contain all men in the 'equal match' sample, which uses the same matching criteria (first name, last name and age) for men in both the US and Norway in 1900, whose mothers were less than 43 years old in 1865 (N = 9946). All regressions contain dummy variables for single years of own age and mother's age.
* = statistically significant at the 10% level. ** = statistically significant at the 5% level.

the reference category (Y = 1) is the decision to remain in one's childhood municipality.[18]

Our multinomial logit consists of a set of three equations:

$$\ln[p(Y_i = m)/p(Y_i = 1)] = \alpha_m + \Sigma_{k=1..K}\beta_{mk}X_{ik} \quad (2)$$

where *i* indexes individuals and *m* refers to the three alternate migration choices. In this framework, the coefficients β_{mk} can be interpreted as the change in the odds of choosing migration option *m* relative to staying in one's childhood municipality associated with a one-unit change in the k^{th} independent variable. We present these results using odds ratios.

5. The effect of wealth on migration: Results

5.1. Probit estimation

Table 2 estimates the basic relationship between the presence of wealth in one's childhood household (our first measure of wealth) and subsequent migration. Column 1 controls for regional differences with twenty province fixed effects while column 2 instead includes 436 municipality fixed effects. In both specifications, we find that parental wealth reduces the probability of migration by 7 percentage points (from a base probability of 66%). This pattern is in contrast to the positive relationship between wealth and Mexico-to-US migration today documented by McKenzie and Rapoport (2007).[19]

Column 3 demonstrates that the effect of parental assets on migration is persistent, albeit somewhat smaller, after controlling for urban residence and for living in the birth municipality of either the household head or his spouse. We find no evidence that residents of urban areas are more (or less) likely to migrate than are their rural counterparts (although we show below that migrants from rural and urban areas do select different migration destinations). Furthermore, we find that household wealth influences the decision to migrate among residents of urban and rural areas to the same degree. This pattern is consistent with the presence of fluid land markets in rural areas in nineteenth century Norway, which would have allowed urban and rural residents to convert land into capital to an equal degree (either to finance the journey or to invest in their new location). However, this symmetry between urban and rural areas could simply reflect the fact that migrants had other means of borrowing to finance their journey beyond personal or household wealth. Columns 4–6 run these three specifications for our "equal match" sample and results are qualitatively similar, although larger in magnitude.

Residents with strong ties to the local area through either their mother or their father are substantially less likely to migrate between 1865 and 1900. One interpretation of this relationship could be that living in a parental birthplace was associated with the strength of the household's social networks in the local area, which can confer benefits on its members through institutions such as informal insurance arrangements.[20] This pattern is consistent with Munshi and Rosenzweig (2009), who find that informal social insurance networks hinder mobility in contemporary India.

Table 3 estimates the relationship between the value of the property tax bill in one's childhood household (our second measure of wealth) and subsequent migration. Specifically, we use an indicator for matching to the tax rolls and, conditional on matching, a continuous measure of the household's property tax bill.

For comparison, the first column of Table 3 includes the Census (binary) measure of parental assets in a specification containing family size, gender composition of siblings and other controls. As before, men whose parents reported some assets to the Census were 5 percentage points less likely to migrate. Matching to the Land Register is a stronger deterrent to migration; men from these households are 11 percentage points less likely to migrate. Conditional on matching to the tax records (N = 2726), men from households with a higher tax bill (and, therefore, more taxable assets) are also less likely to migrate. The mean tax bill is 1.75 *speciedaler*, as is the standard deviation (one *speciedaler* was equal to four Norwegian *kroner*). According to the linear specification in column 2, a standard deviation increase in tax bill is associated with a 1.6 percentage point decline in the likelihood of migration. The effect of a standard deviation increase in tax burden on migration doubles when

[18] We note that multinomial logit estimation relies on the assumption of the Independence of Irrelevant Alternatives (IIA). The IIA assumption requires that the relative odds of selecting location A over location B would not be influenced by the addition of a third alternative to the choice set. However, imagine that another trans-Atlantic location (say, Canada) is added to the set of migration destinations. It is reasonable to expect that the option of migrating to Canada would be a closer substitute for migrating to the US than for migrating to a neighboring municipality. Therefore, adding Canada to the choice set could potentially change the relative odds of selecting one of these two options.

[19] McKenzie and Rapoport (2007) estimate that for men leaving from communities with no migration network, a doubling in household wealth (as measured by non-durable consumption) increases the likelihood of migration by 2.6 percentage points. At the mean migration network prevalence, as measured by the share of men in the municipality who have migrated to the US, doubling household assets only increases the probability of migration by 1.4 points. Only at a network prevalence of 60%, which is out of sample, would the effect of wealth on migration disappear. These calculations rely on the coefficients in Table 3, column 2 of McKenzie and Rapoport (2007), and compare non-durable consumption of 100,000 or 200,000 Mexican pesos (around $7,500 or $15,000).

[20] Among households with some land, living in the birthplace of the household head could be an indicator that the head inherited his family's farm and therefore has larger landholdings. Contrary to this view, we find no evidence that living in one's father's birthplace has a stronger effect on migration than does living in the birthplace of one's mother. Furthermore, parental birthplace has an equal effect on migration in households with and without land.

Table 3
Household assets and migration using alternative measures of household assets, Marginal effects from probit estimation.

	(1)	(2)	(3)	(4)
Assets	−0.053**			
	(0.008)			
Match to property tax bill		−0.117**	−0.105**	−0.111**
		(0.015)	(0.017)	(0.016)
Property tax bill		−0.009*	−0.018**	
		(0.005)	(0.009)	
(Property tax bill)^2			0.0008	
			(0.0006)	
Burden above median				−0.041**
				(0.019)

Notes: Sample includes matched men whose mothers were less than 43 years old in 1865 (N = 25,822). All regressions contain province fixed effects, dummy variables for own age and mother's age, indicators for urban residence and living in a parent's municipality of birth in 1865; and dummy variables for number of siblings and number of brothers. Match to property tax bill is an indicator equal to one if the household head in the 1865 Census matches to the 1886 Land Register. Conditional on matching to the Land Register, information is available on the size of the household's property tax bill (N = 2725). This data is coded in the variable "property tax bill."
* = statistically significant at the 10% level. ** = statistically significant at the 5% level.

Table 4
Expected inheritance and migration, birth order and sibling composition, Marginal effects from probit estimation.

Dependent variable = 1 if leave childhood municipality is between 1865 and 1900					
	Full sample	Equal match sample	Age band sample	Full sample East	Full sample North/West
Assets	−0.060**	−0.059	−0.055**	−0.097**	−0.075**
	(0.028)	(0.055)	(0.036)	(0.033)	(0.022)
Oldest	0.021*	0.039**	0.052**	0.004	0.048**
	(0.012)	(0.018)	(0.017)	(0.015)	(0.018)
Oldest × assets	−0.030**	−0.084**	−0.074**	−0.001	−0.073**
	(0.013)	(0.022)	(0.019)	(0.016)	(0.023)
Coeff. on # sibs	Fig. 1	–	–	Fig. 1	Fig. 1
Coeff. on # bros	Fig. 2	–	–	Fig. 2	Fig. 2
N	25,822	9946	14,440	14,677	11,134

Notes: Sample includes matched men whose mothers were less than 43 years old in 1865. All regressions contain province fixed effects, dummy variables for own age and mother's age, indicators for urban residence and living in a parents' municipality of birth in 1865; and dummy variables for number of siblings, number of brothers and their interactions with assets. Coefficients on the dummy variables for number of siblings and number of brothers are reported in Figs. 1 and 2. The equal match sample uses the same matching criteria (first name, last name and age) for men in both the US and Norway in 1900. The age band sample requires that matched individuals are unique by first and last name within a five year age band (see text for details). We code all provinces with a western coastline that do not border on Sweden as being part of the North and West. These are: Bergen; Finnmark; Hordaland; Møre and Romsdal; Nordland; Rogaland; Sogn and Fjordane; Troms and Vest-Agder. The other 12 provinces are included in the category 'East.'
* = statistically significant at the 10% level. ** = statistically significant at the 5% level.

we instead allow for a quadratic in the size of the household's tax bill. Similarly, having a tax bill above the median value is associated with a 4.1 percentage point reduction in the probability of migration.[21]

Table 4 considers the relationship between one's own expected inheritance and the probability of migration. We proxy for expected inheritance using information on family assets, birth order, family size, the gender composition of siblings, and region. Coefficients on household assets, birth order and their interactions are reported in the table, while coefficients on dummy variables for number of siblings and number of brothers (and their interactions with household assets) are presented in Figs. 1 and 2.

Column 1 considers the relationship between expected inheritance and migration for the whole country using the main matched sample. The difference-in-differences analysis suggests that oldest sons, who under a primogeniture system expected to inherit their parents' wealth (land or business), were particularly discouraged from migrating in households with assets. Specifically, controlling for the direct effects of birth order, wealth discouraged oldest sons from migrating by three percentage points more for their younger siblings.[22] The two robustness samples in columns 2 and 3 present similar patterns, although the magnitudes of the effects are larger in both.

When we break the data down by region, the relationship between birth order and migration is only found in the North and West, areas in which the culture of primogeniture was more strongly maintained. In these provinces, after controlling directly for parental assets and for being the oldest son, the difference-in-differences suggest that oldest sons in households with assets were 7.3 percentage points less likely than their younger brothers to leave their childhood municipality. In contrast, there is no significant relationship in eastern Norway between birth order and migration.[23]

In addition to birth order, expected inheritance could vary with family size or the gender composition of siblings. In the absence of strict primogeniture norms, having brothers can create competition over scarce family resources. Sisters, on the other hand, moved away from the family home upon marriage; it was uncommon for household wealth to pass to sisters and their husbands.

Figs. 1 and 2 present coefficients on indicators for the number of siblings and the number of brothers in the household and their interactions with the presence of parental assets; these coefficients are from the regressions in Table 4, in which the dependent variable is leaving one's childhood municipality.[24] Coefficients that are significantly different from zero are represented with larger dots. On their own, the coefficients on number of siblings in Fig. 1 can be interpreted as the effect of the number of sisters in the household (because the regression also controls for the number of brothers). We find no effect of having sisters on the likelihood of migration in either the East or the North/West, which is consistent with the concentration of inheritance among male offspring.[25]

[21] We experimented with other non-parametric specifications, and we do not find evidence for the non-linear relationship between wealth and migration documented for Mexico today by McKenzie and Rapoport (2010). Conditional on matching to the property tax records, the main distinction is between the first quartile and the rest of the wealth distribution. Men in the first quartile had a mean migration rate of 58%, compared to a migration rate of 52% for men in the other three quartiles. Overall, there appears to be a negative, log-linear relationship between wealth and migration: men raised in households with no assets had the highest migration rate, followed by men in the first quartile of the wealth distribution, and then by men in the top three quartiles of the wealth distribution.

[22] Oldest sons in households without assets were actually 2.1 percentage points *more* likely to migrate than their younger brothers, suggesting that there were other social or biological factors associated with birth order that affected migration. Modern evidence shows that first-born children have more education and better labor market outcomes than their later-born siblings (Black et al., 2005). An often-cited mechanism for this advantage is that first-born children spend more individual time with parents before their younger siblings are born (Price, 2008). It is unclear whether this pattern would have been true in our historical context, given nineteenth century parenting practices, or whether time with adults would have translated into labor market returns at the time. The difference-in-differences comparison allows us to control for any such factors that are associated with birth order in a manner that is common to families with and without assets.

[23] In the 'equal match' sample, we find a negative and statistically-significant relationship between being an oldest brother in a household with assets and the probability of migration in both regions, with a larger association (in absolute value) in the North/West.

[24] In the 1865 Census, the distribution of family sizes is as follows: only child (6.0 percent); 2 siblings (14.7 percent); 3 siblings (20.4%); 4 siblings (21.5%); 5 siblings (17.6%); 6 siblings (10.9%); 7 siblings (5.8%); 8 or more siblings (3.2%).

[25] Given the restriction we impose on mother's age, family size in 1865 is more accurately measured for the older men in the sample who are more likely to be observed living with their complete set of siblings. When we split the sample in two groups by age, the effect of number of brothers is stronger and more statistically significant for the older men.

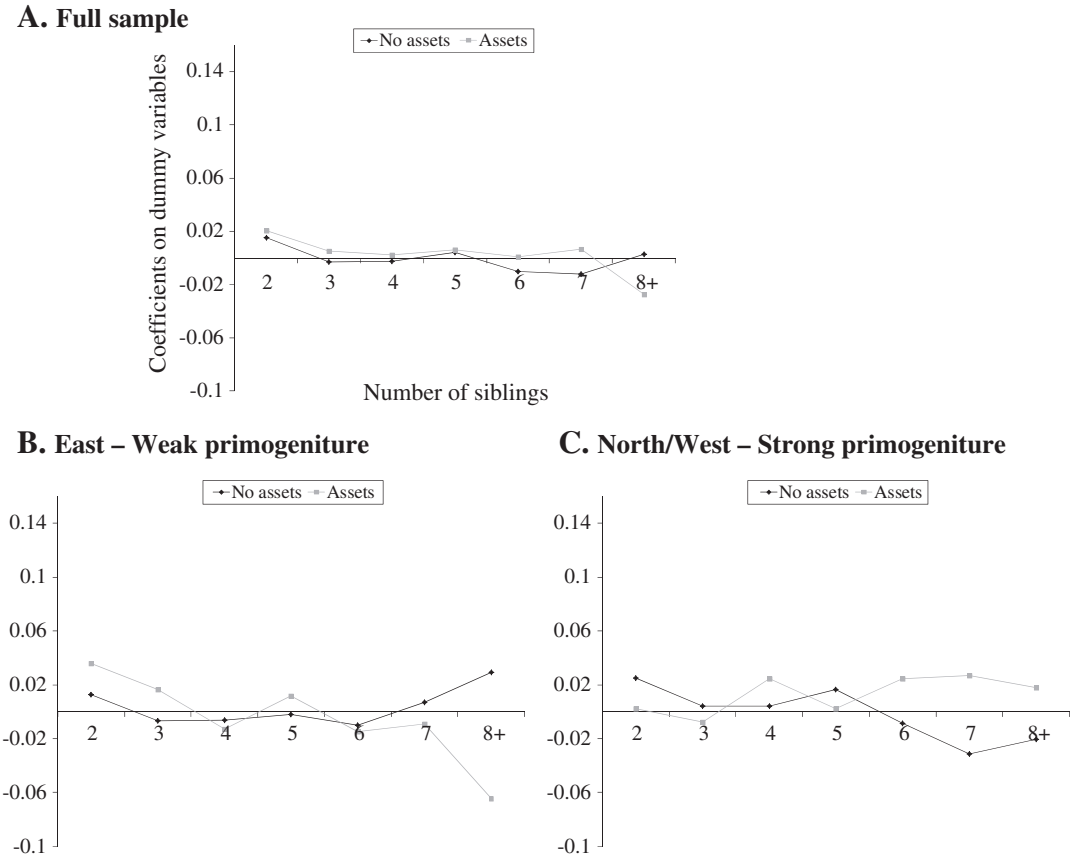

Fig. 1. Coefficients on number of siblings from probit regression with dependent variable equal to 'any migration'. Notes: Graphs report coefficients from the regressions in panel A of Table 3. The 'no assets' lines report coefficients on a vector of dummy variables for number of siblings. The 'assets' lines report the sum of coefficients on the main effect of number of siblings and interactions between number of siblings and household assets. The omitted category is households with only one child. Dots are enlarged if either the main effect is significantly different from zero ('no assets') or the interaction is significantly different from the main effect ('assets').

The coefficients in Fig. 2 reveal the extra effect of adding a brother to the household (beyond any effect of simply adding a sibling, as indicated in Fig. 1). In the East, adding a brother (relative to a sister) has no effect on migration for men from households without assets. However, each additional brother (up to households with five brothers) raises the probability of migration monotonically for men from households with assets. Men with four brothers, for example, are 15 percentage points more likely to migrate than are only sons. The relationship between number of brothers and migration in the East is consistent with a more equitable distribution of family resources, rather than a concentration of inheritance in the hands of the oldest brother. In the North and West, additional brothers enhance the likelihood of migration for all men with no significant difference by parental asset holdings.

Overall, our findings are consistent with the role of wealth in the migration process being driven by the effect of family resources on opportunities in the source country, rather than the use of family resources to pay for the cost of the journey.

The role of birth order and gender composition of siblings on the migration decision is consistent with the likely effect of these characteristics on expected inheritance. Table 5 provides some direct evidence of the relationship between these attributes and asset holding in adulthood, a sign of having received a bequest (among the subsample of men who live in Norway in 1900).[26] In the full sample, we see no association between birth order and the probability of owning assets in the 1900 Norwegian Census. But, as with migration, birth order and asset holding are significantly related in the North and West. In these regions, the difference-in-differences estimate suggests that oldest sons in households with assets are 4.2 percentage points more likely to hold assets in adulthood than are their younger brothers.

The relationship between the gender composition of siblings and assets in adulthood is presented in Figs. 3 and 4. The number of siblings, whether sisters or brothers, has no effect on asset holdings in the North and West, consistent with the "winner take all" feature of primogeniture. In the East, having at least one sibling (relative to being an only child) increases the probability of holding assets later in life. However, if the additional sibling is a brother, the positive effect of siblings on wealth disappears and becomes increasingly negative with each added brother. Taken together, these patterns suggest that inheritance patterns, either competition between brothers for scarce family resources in the East or limited resources for higher-order brothers in the North and West, is a likely explanation for the presented effects on migration.[27]

5.2. Multinomial logit estimation

Wealth may have a differential effect on internal versus international migration. The first panel of Table 6 reports odds ratios from

[26] Given that men who receive an inheritance are more likely to stay in Norway than those who do not, this subsample is more likely than the population average to hold assets in adulthood.

[27] Wealthy households with only one child could be idiosyncratic in other ways; for example, the small family size could be a sign of early parental mortality.

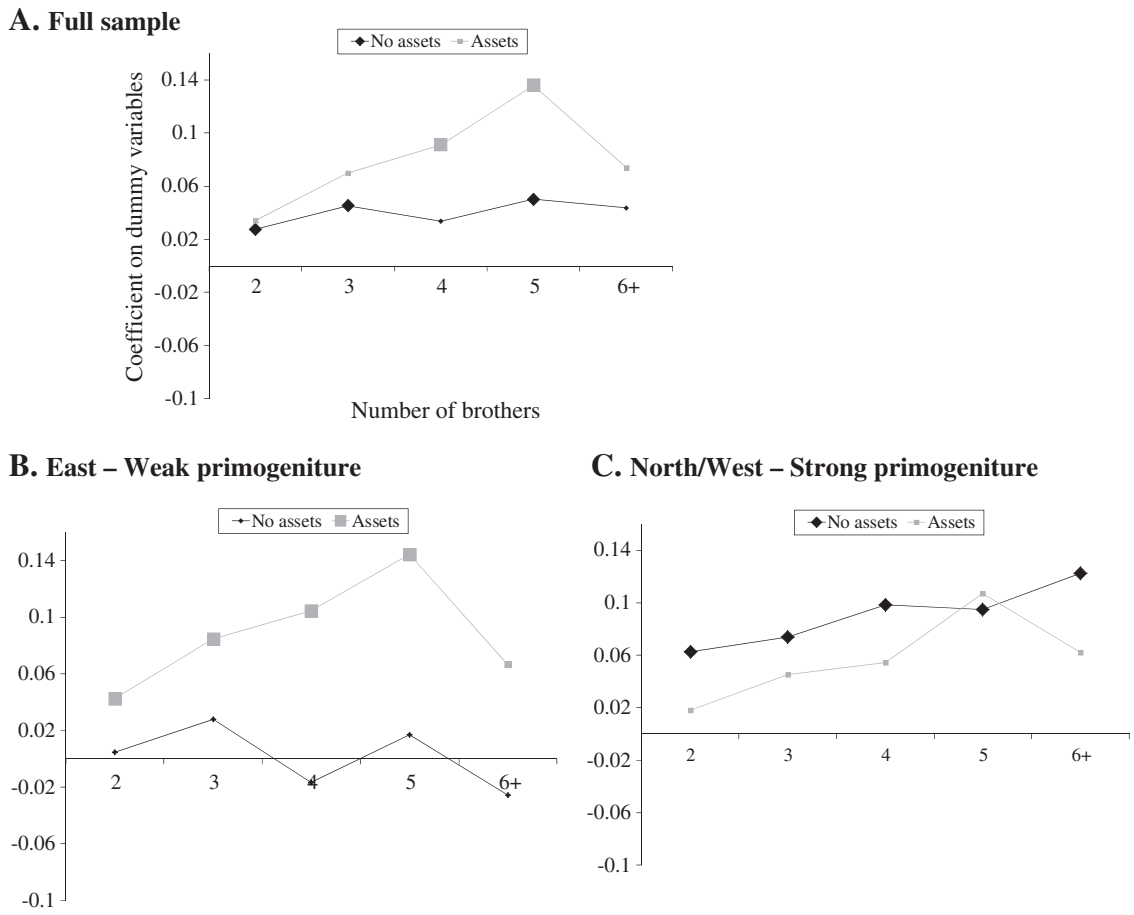

Fig. 2. Coefficients on number of brothers from probit regression with dependent variable equal to 'any migration'. Notes: Graphs report coefficients from the regressions in panel A of Table 3. The 'no assets' lines report coefficients on a vector of dummy variables for number of brothers. The 'assets' lines report the sum of coefficients on the main effect of number of brothers and interactions between number of brothers and household assets. The omitted category is households with only one brother. Dots are enlarged if either the main effect is significantly different from zero ('no assets') or the interaction is significantly different from the main effect ('assets').

multinomial logit estimation allowing individuals to select freely between four options: stay in childhood municipality, move elsewhere in the same province, move to another province in Norway, or migrate to the US. An odds ratio greater than one implies that the migration option is relatively more likely than remaining in one's childhood municipality (the base category), while an odds ratio less than one implies that the migration option is less likely.[28]

Moving to the US requires a larger up-front investment than moving elsewhere in Norway. If household wealth were necessary for financing this high cost, we would expect to find a positive effect of household assets on migration to the US. In contrast, we find that growing up in a household with assets reduces the odds of internal migration by 25% and reduces the odds of international migration by even more (50%). This pattern is instead consistent with the dominant effect being the higher return to migration to the New World for the landless. Similarly, for men from households with assets, facing competition with brothers for use of household land is a stronger predictor of international, rather than internal, migration.[29]

Table 5
Expected inheritance and asset-holding in adulthood, marginal effects from probit estimation.

Dependent variable = 1 if own assets in 1900 (for subsample living in Norway)			
	Full sample	East	North/West
Assets	0.069**	0.066*	0.075
	(0.027)	(0.035)	(0.047)
Oldest	−0.005	0.011	−0.028
	(0.013)	(0.018)	(0.021)
Oldest × assets	0.006	−0.019	0.042*
	(0.015)	(0.019)	(0.024)
Coeff. on # siblings	Fig. 3	Fig. 3	Fig. 3
Coeff. on # brothers	Fig. 4	Fig. 4	Fig. 4
N	24,127	13,607	10,520

Notes: Sample includes matched men whose mothers were less than 43 years old in 1865 and who lived in Norway in 1900. All regressions contain province fixed effects, dummy variables for own age and mother's age, indicators for urban residence and living in a parent's municipality of birth in 1865; and dummy variables for number of siblings, number of brothers and their interactions with assets. Coefficients on the dummy variables for number of siblings and number of brothers are reported in Figs. 3 and 4. See the notes to Table 3 for the definition of East and North/West.
* = statistically significant at the 10% level. ** = statistically significant at the 5% level.

[28] For brevity, we report results from a parsimonious specification that enters the number of siblings and number of brothers in the household linearly. Results are qualitatively similar when we instead include vectors of dummy variables for these household attributes.

[29] As above, we find differential effects of birth order and number of brothers by region (results not presented). Being an oldest brother has no effect on migration in the East; rather, migration behavior is influenced by the number of brothers in households with assets. In contrast, in the North and West, oldest brothers in households with assets are less likely to migrate, especially to internal destinations.

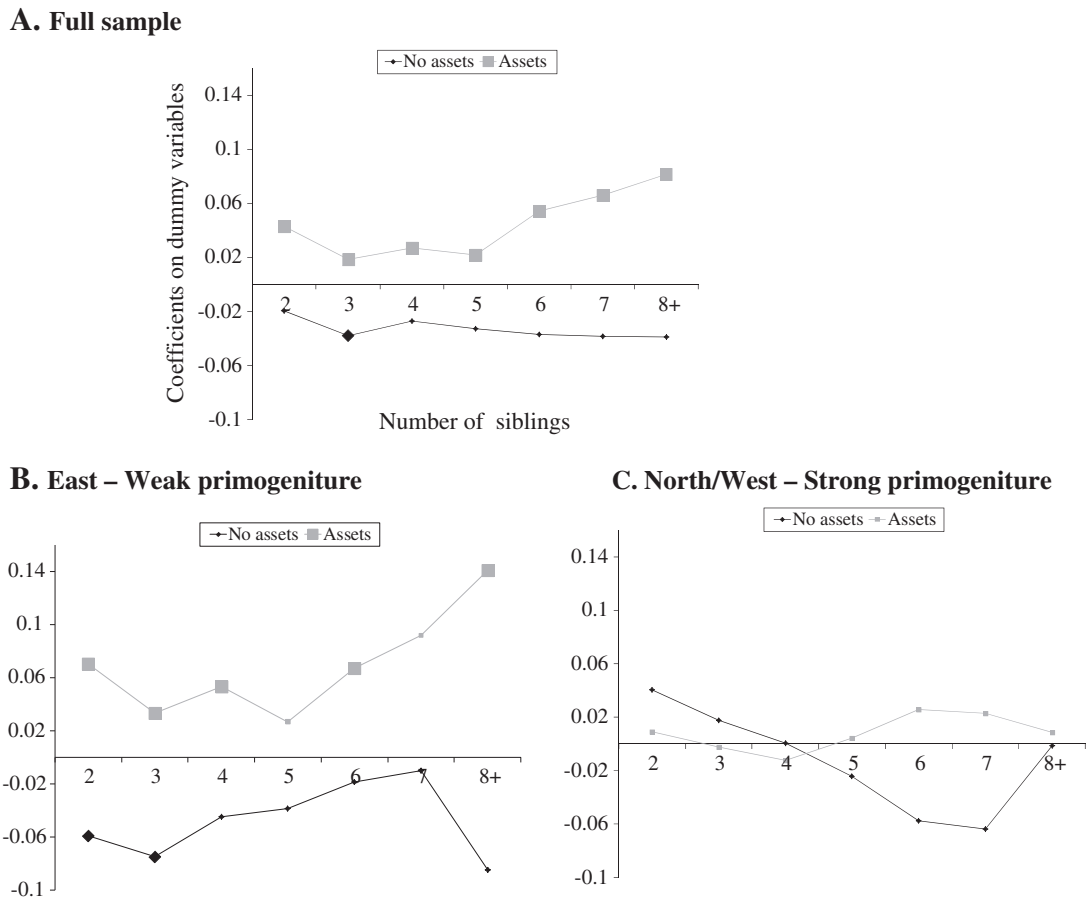

Fig. 3. Coefficients on number of siblings from probit regression with dependent variable equal to 'assets in adulthood'. Notes: Graphs report coefficients from the regressions in panel B of Table 3. For other details, see the notes to Fig. 1.

Growing up in an urban area also has a differential effect on migration behavior by destination. Urban residence reduces the odds of moving to other (often rural) locations within the province by 27%. That urban residents are less likely to engage in short-distance moves is consistent with one of Ravenstein's "laws of migration," first enumerated in the 1880s, that "the natives of towns are less migratory than those of the rural parts of the country" (Ravenstein, 1885). In contrast, urban residence has a positive effect on both long-distance migration within Norway and on overseas migration. Results for the multi-nomial logit analysis are qualitatively similar in the "equal match" sample, and are presented in Appendix Table A1. In particular, assets have a stronger negative effect on the probability of moving overseas and urban residents, while less likely to move at short distance, are more likely to engage in longer migratory trips.

Urban residence could be associated with long-distance migration because rural dwellers engage in a process of stage migration, first moving to urban areas in their home country before moving on to a foreign country (Hatton and Williamson, 1998). Table 7 tests for the presence of stage migration by interacting urban residence with an indicator for living outside of one's parents' birthplace. Urban households whose heads were born elsewhere may be stage migrants, whereas households that have been urban for multiple generations cannot be engaged in stage migration. In the presence of stage migration, then, we would expect urban households living outside of a parental birthplace to be highly mobile. In contrast, we find that urban dwellers whose household head moved to the city from elsewhere are far *less* likely than their multi-generational urban counterparts to move internally or abroad. In other words, urban locations in Norway appear to be substitutes for, rather than complements to, overseas destinations.

The right hand panel of Table 6 concentrates on the sub-sample of men growing up in rural areas. We consider three migration destinations: moving to another rural area in Norway, moving to an urban area in Norway, or moving to the US, and not migrating. We find similar determinants of both rural-to-urban migration in Norway and international migration to the US. Growing up in a household with land reduces the odds of rural-to-urban or international migration by 50 percent, relative to staying in one's childhood municipality, as does living in a parent's birthplace. For men in landed households, additional brothers reduce the odds of moving overseas.

6. Conclusion

We construct a novel dataset of over 50,000 men during the Age of Mass Migration (1850–1913) to study the relationship between parental wealth and the probability of migration during an era of open borders. We do so by linking individuals across population censuses and achieve a fairly low (but standard in this literature) match rate of 26%. Today, household wealth enables migration from Mexico to the US, especially in the absence of strong migration networks (McKenzie and Rapoport, 2007, 2010). Furthermore, migrants are more educated than the typical resident for almost every sending

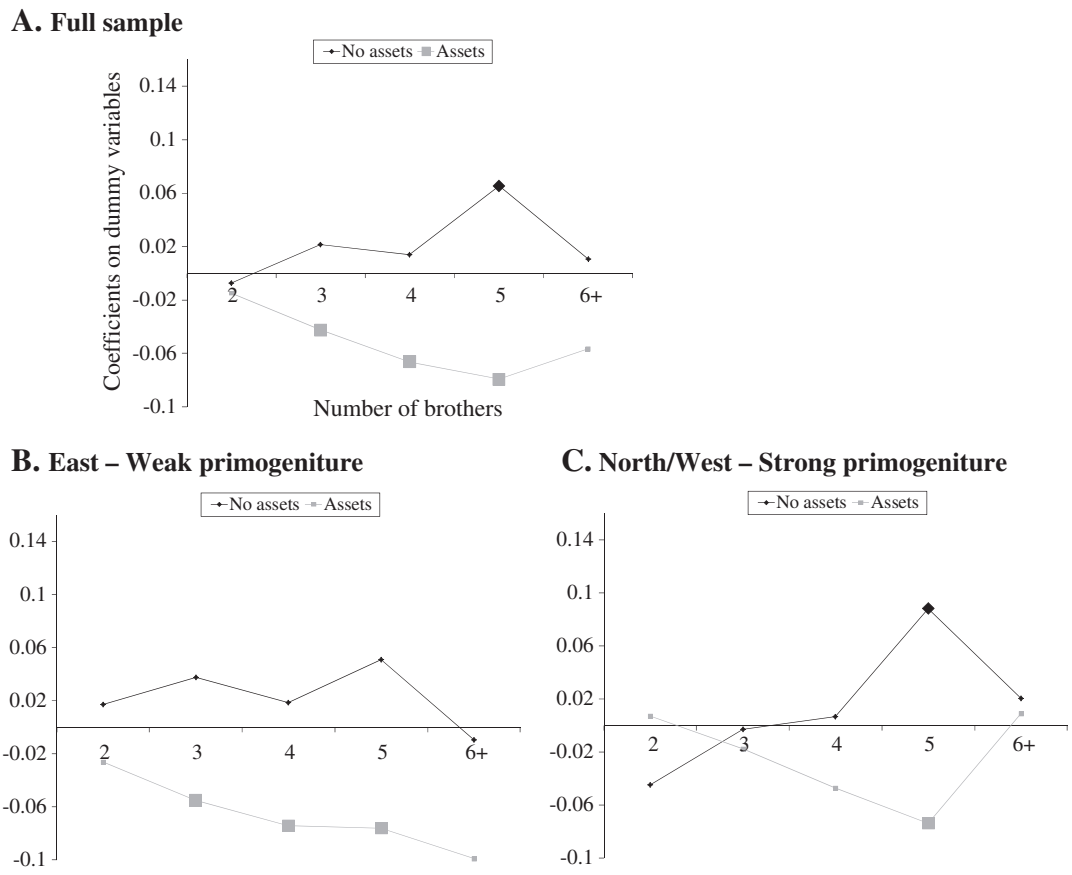

Fig. 4. Coefficients on number of brothers from probit regression with dependent variable equal to 'assets in adulthood'. Notes: Graphs report coefficients from the regressions in panel B of Table 3. For other details, see the notes to Fig. 2.

country in the world (Feliciano, 2005; Grogger and Hanson, 2011). In contrast, we find that, in the past, parental wealth (measured by whether a man's parents owned assets when he was still a child and the value of the property tax bill that his parents paid) discouraged migration. This pattern is consistent with the low cost of migration in the late nineteenth century, equal only to the cost of a trans-Atlantic ticket and a few weeks of foregone earnings, and the presence of strong networks through which migrants could borrow to finance their journey.[30] This combination of low migration costs and access to migrant networks allowed the poor to gain from the high returns to migration available at the time. Despite equal (or greater) returns to migration today, the cost of migration, which is artificially increased by strict migration quotas, prices out much of the world's poor. Beyond the direct effect of migration quotas in reducing the number of entrants, these restrictions also appear to have shifted the selection of *who* migrates from members of poor and landless households in the past to individuals with access to household wealth in the present.

We find that wealth influences the migration decision by affecting the available opportunities in the source country. Birth order and gender composition of siblings provide useful sources of variation in expected inheritance. In households that owned assets, we find that the oldest son who stood to inherit the farm was less likely than his siblings to migrate, especially in provinces with stronger customs of primogeniture. Men with more brothers (but not those with more sisters) who expected more competition to farm the family land were also more likely to migrate. We confirm that birth order and sibling composition are associated with asset holdings later in life, lending support to our interpretation of the relationships between these characteristics and migration patterns.

More broadly, our paper adds to the literature exploiting historical episodes to learn about issues of current development concern. Bleakley (2007), for example, studies the effect of public health interventions combating hookworm infestation in the US South in the early twentieth century on children's educational attainment and then on income later in life. The value of learning about economic development from history is threefold: first, because historical events occurred long in the past, it is possible to determine their long-run effects, which can differ quite substantially from their immediate consequences. In our case, we observe location choice over a 35-year period, far longer than most studies that examine annual migration patterns. Second, history offers variation in institutions and policies that allow researchers to identify parameters of interest for development today. In our context, we take advantage of a large upsurge in migration activity, which was associated with a shift in ocean technology from sail to steam that substantially shortened the trans-Atlantic trip. Furthermore, we are able to learn about migration behavior under a very different policy regime (open borders) that cannot be replicated with contemporary data. Third, historical data

[30] 40% of Norwegian migrants travelled abroad on a pre-paid steamship ticket purchased by a friend or relative already living in the US (Hvidt, 1975, p. 129). See Wegge (1998) for an analysis of the effect of migrant networks on the out-migration rate from Germany.

Table 6
Parental assets, expected inheritance and destination choice, odds ratios from multinomial logit estimation.

	Full sample			Live in rural area in 1865		
	Move within province	Move to another province	Move to US	Move to rural area in Norway	Move to urban area in Norway	Move to US
Assets	0.736**	0.751**	0.517**	0.814*	0.505**	0.589**
	(2.23)	(2.73)	(3.35)	(1.69)	(4.44)	(2.05)
Parent birthplace	0.579**	0.525**	0.442**	0.547**	0.391**	0.314**
	(7.08)	(9.09)	(7.34)	(7.79)	(12.84)	(10.75)
Urban	0.709**	1.210**	2.338**	–	–	–
	(2.56)	(1.93)	(8.24)			
Number siblings	0.976	0.984	1.049	0.992	0.952	1.091*
	(0.88)	(0.88)	(1.47)	(0.30)	(1.52)	(1.73)
Number brothers	1.085**	1.048	0.981	1.069*	1.085*	0.949
	(2.00)	(1.52)	(0.98)	(1.74)	(1.75)	(0.79)
Oldest	1.159**	1.044	1.073	1.051	0.903	1.004
	(2.19)	(0.86)	(0.55)	(0.75)	(1.34)	(0.03)
# siblings × assets	1.007	0.997	0.981	0.993	1.029	0.924
	(0.22)	(0.11)	(0.46)	(0.25)	(0.83)	(1.32)
# brothers × assets	1.041	1.058	1.207**	1.037	1.091	1.271**
	(0.86)	(1.44)	(3.16)	(0.77)	(1.52)	(3.04)
Oldest × assets	0.858*	0.872**	0.871	0.928	0.984	0.872
	(1.88)	(2.12)	(0.98)	(0.98)	(0.16)	(0.85)

Notes: The first three columns contain all matched men whose mothers were less than 43 years old in 1865 (N = 25,929). The second three columns contain the subset of these men who lived in a rural area in 1865 (N = 20,934). An odds ratio greater than one implies that the migration option is relatively more likely than remaining in one's childhood municipality (the base category) for greater values of the independent variable, while an odds ratio less than one implies that the migration option is relatively less likely. Z-scores are reported in parentheses.
* = statistically significant at the 10% level. ** = statistically significant at the 5% level.

often has advantages over contemporary sources – for example, because of relaxation of privacy restrictions set by the Census Bureau or the Social Security Administration.

Data appendix. Matching between the 1865 and 1900 Censuses

Our goal is to match Norwegian-born men in 1900 to their childhood households in the 1865 Norwegian Census. We use two sources in 1900: the Norwegian Census, which is archived by the North Atlantic Population Project (NAPP), and a complete roster of Norwegian immigrants living in the US, which we compiled from the genealogy website Ancestry.com. Because over 95% of emigrants from Norway settled in the United States, these two sources contain nearly all Norwegian-born men who survived to 1900 (Ferenczi and Willcox, 1929).

Table 7
Testing for stage migration, odds ratios from multinomial logit estimation.

	Full sample		
	Move within province	Move to another province	Move to US
Not parent birthplace	1.806**	2.145**	3.139**
	(6.83)	(10.42)	(10.67)
Urban	0.678**	1.406**	3.352**
	(2.44)	(2.92)	(10.69)
Not birthplace × urban	0.989	0.677**	0.429**
	(0.157)	(3.19)	(6.04)

Notes: Table contains all matched men whose mothers were less than 43 years old in 1865 (N = 25,929). Regressions contain all right-hand side variables included in Table 6 (coefficients not shown). An odds ratio greater than one implies that the migration option is relatively more likely than remaining in one's childhood municipality (the base category) for greater values of the independent variable, while an odds ratio less than one implies that the migration option is relatively less likely. Z-scores are reported in parentheses.
* = statistically significant at the 10% level. ** = statistically significant at the 5% level.

Our baseline method uses an iterative matching strategy pioneered by Ferrie (1996). We describe this procedure in detail here:

(1) We identify 257,767 Norwegian men between the ages of 3 and 15 in 1865. 147,491 of these men are unique by first name, last name, birth year, and province of birth in 1865. We discard all men that are not unique at this stage.
(2) We standardize all first and last names in both datasets to address orthographic differences between phonetically equivalent names using the NYSIIS algorithm (see Atack and Bateman, 1992).
(3) We match unique observations in 1865 forward to 1900 using an iterative procedure. We start by looking for a match by name, birth province, and exact birth year in Norway. If we find a *unique* match here, we look for potential matches by name and exact birth year in the US. If no US matches are found, we stop and consider the observation "matched." If instead we find multiple matches for the same birth year in Norway, the observation is thrown out. If we do not find a match in Norway, we look for potential matches by name and exact birth year in the US.
(4) If we do not find a match at this step in either the US or in Norway, we implement the same procedure, first by matching within a one-year band (older and younger) and then within a two-year band around the reported birth year. If neither of these attempts produces a match, the observation is considered to be "unmatched."[31]

This procedure generates a sample of 3050 migrants to the US and 47,720 non-migrants. We achieve a forward match rate of 26%, which is comparable to Ferrie and Long's (forthcoming) forward

[31] We restrict our attention to men who are at least three years old in 1865 to ensure that all observations can match to a two-year age band around the reported age.

match rate of 22% within the United States over a similar 30-year period (1850–80).

Appendix Table A1
Comparing odds ratios from multinomial logit in full sample and equal matching sample.

	Full sample			Equal match sample		
	Move within province	Move to another province	Move to US	Move within province	Move to another province	Move to US
Assets	0.736**	0.751**	0.517**	0.584**	0.908	0.389**
	(2.23)	(2.73)	(3.35)	(1.96)	(0.56)	(3.78)
Parent birthplace	0.579**	0.525**	0.442**	0.552**	0.534**	0.531**
	(7.08)	(9.09)	(7.34)	(6.84)	(9.54)	(7.28)
Urban	0.709**	1.210**	2.338**	0.559**	1.689**	1.634**
	(2.56)	(1.93)	(8.24)	(4.61)	(5.30)	(4.55)
Number siblings	0.976	0.984	1.049	0.985	1.002	1.011
	(0.88)	(0.88)	(1.47)	(0.31)	(0.07)	(0.27)
Number brothers	1.085**	1.048	0.981	0.982	1.077	0.955
	(2.00)	(1.52)	(0.98)	(0.26)	(1.52)	(0.71)
Oldest	1.159**	1.044	1.073	1.022	1.247**	1.056
	(2.19)	(0.86)	(0.55)	(0.17)	(2.65)	(0.31)
# siblings × assets	1.007	0.997	0.981	0.973	0.987	1.001
	(0.22)	(0.11)	(0.46)	(0.49)	(0.31)	(0.03)
# brothers × assets	1.041	1.058	1.207**	1.137	1.021	1.243**
	(0.86)	(1.44)	(3.16)	(1.52)	(0.36)	(2.48)
Oldest × assets	0.858*	0.872**	0.871	0.800	0.621**	0.847
	(1.88)	(2.12)	(0.98)	(1.38)	(4.60)	(0.96)

Notes: The first three columns contain the multinomial logit estimates reported in Table 6 for the full matched sample. The last three columns instead use the matched sample that uses the same matching criteria (first name, last name, age) for men living in both the US and Norway in 1900.
* = statistically significant at the 10% level. ** = statistically significant at the 5% level.

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