The Cream of the Crop? Inequality and Migrant Selectivity in Ireland during the Age of Mass Migration

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Abstract

During the Age of Mass Migration (1850-1913), over 30 million people moved from Europe to North America. European policy-makers feared that migration would attract the "best and brightest" workers. I study the selectivity of migration from Ireland, the European country with the highest emigration rate, using a new longitudinal dataset of 300,000 migrants and non-migrants. I find that migrants tended to come from mid-status, farming families ("intermediately selected"). Yet migration *within* Ireland drew from both lower and higher status families. Children who were more likely to inherit valuable land were less likely to leave their home county.

1. Introduction

During the Age of Mass Migration (1850-1913), almost thirty million Europeans moved to the United States. Up to four and half million of these migrants came from Ireland. Emigration from Ireland was driven by growing overseas demand for labor, coupled with sluggish urban and rural development. From 1845 to 1911, this migration flow contributed to a decline in the Irish population from over eight million to less than four and a half. Ireland's annual emigration rate of 13 per 1,000 was double any other major European source-country.

Official reports frequently expressed concern that highly skilled migrants were leaving Ireland. The Royal Commission on Labor emphasized the high rate of rural unemployment and argued that this resulted in the loss of Ireland's "best men" to emigration (B.P.P., 1893-4, p. 49). Over half a century later, the Commission on Emigration and Other Population Problems (1955) arrived at similar conclusions, suggesting that rural and industrial development policy could reduce excessive emigration. Others rejected this prescription. Instead, arguing that the loss of the most able and "gifted" people was the outcome of a society that stifled self-development, along with high overseas wages and a liberal migration policy (Carter et al., 1956, p. 6-12; Geary, 1935).

On the other side of the Atlantic, emigration from Ireland may have benefited the American economy. The benefits of mass migration are highlighted by recent historical studies showing positive long-run effects from immigration (Ager & Brückner, 2013; Glaeser, 2005; Glaeser, La Porta, Lopez-de-Silanes, & Shleifer, 2004; Rodríguez-Pose & von Berlepsch, 2014). Specifically, immigration tends to benefit the receiving economy when the skills of immigrants compare favorably to natives (Borjas, 2014). Thus, migration from Ireland would likely have benefited the American economy if Ireland did, in fact, lose its most highly skilled people to emigration.

In this paper, I ask two questions related to these discussions. Was it the 'best and brightest' that left Ireland to cross the Atlantic? Did access to local economic opportunities in Ireland affect who migrated? I address the first of these questions by comparing the occupational profiles and literacy levels of emigrants and their fathers to the Irish labor force as a whole. I then study

whether domestic opportunities influenced migration decisions. I do this by comparing emigrants to internal migrants, and further, by analyzing whether opportunities to acquire land influenced individuals' decisions to leave their place of childhood.

I find that migrants from Ireland to the USA were more likely to be drawn from the middle of the wealth and skill distribution. Migrants tended to have fathers who were poor landholders (rather than wealthy farmers or landless laborers). The sons of landholders were 31 percent more likely to leave Ireland than laborers' sons. Moreover, the sons of poorer landholders were up to 45 percent more likely to emigrate than their wealthier landholding counterparts. As such, I conclude that migrants were intermediately selected into international migration.

Selection into internal migration was quite different from selection abroad: sons of laborers, on the one hand, and of white-collar or skilled blue-collar workers on the other were more likely to move within Ireland, either to another rural county or to an urban area. Thus, internal migration exhibited bimodal selection (both positive and negative). Overall, the sons of farmers were *less* likely to leave their home counties, even though, conditional on moving, they were more likely to move to the United States. This preference for longer distance moves among the sons of farmers was alluded to by the Royal Commission on Labor in Ireland (B.P.P., 1893).

Access to land played a role in out-migration from rural areas. In Ireland at the time, first and last sons were more likely to inherit family land. I find that middle sons were thus more likely to leave their home county, particularly from households with land. The middle sons of landholders were 15 percent more likely to move than their first and last born counterparts. Further, they were 40 percent more likely to migrate than the sole heirs of landholders. These non-inheriting sons (as inferred by birth order) migrated at similar rates to sons without land.

Local economic conditions also influenced the likelihood of migration. Sons of farmers were particularly unlikely to leave areas where land values and inequality levels were high, perhaps because these areas offered the best opportunity to inherit family land. Sons of white-collar or

blue-collar workers were the most likely to leave their home areas, but this probability of migration increased in poor, unequal areas which may have lacked opportunities for non-agricultural employment.

Intermediate selection of migration to the United States is not consistent with standard economic models of migrant selection (Borjas, 1987, 1991; Grogger and Hanson, 2011). These models assume that migrants have two choices – stay in home country or move abroad – and that they then compare returns to skill in each place, either in relative or absolute terms, generating predictions of either negative or positive selection from Ireland. My results suggest that landholding status and the opportunity for internal migration may influence the direction of selection abroad.

The emigration of landholders' sons to the United States could reflect more widely observed household migration strategies. I find that non-inheriting sons of landholders were as likely to leave their home areas as the sons of landless laborers, but more likely to move to the United States.[1] This proclivity for overseas migration may have been motivated by farming households' dependence on cash transfers sent by family members in America. Strategies among farming families to finance investment and diversify risk through migration are common in accounts of Irish emigration and in the New Economics of Labor Migration (NELM) literature (Arensberg & Kimball, 1940; Rosenzweig & Stark, 1989; Taylor, Rozelle, & De Brauw, 2003; Turner, 2002).

I draw these conclusions from a novel dataset of over 300,000 Irish males who decided to either stay in Ireland or move to America in the early twentieth century. I built this data by linking individuals between the 1901 and 1911 censuses of Ireland and to the 1910 American decennial census with the methods pioneered by Abramitzky, Boustan and Eriksson (2012) and earlier by Ferrie (1996). I linked this new sample to high quality data on the value and distribution of land wealth across 158 local areas (Poor Law Unions), which I digitized from the Irish land census.

[1] Contrary to many contemporary studies (e.g. Garip, 2012; Jones, 1998; McKenzie & Rapoport, 2007), Abramitzky, Boustan and Eriksson (2013) show that access to wealth discouraged migration from nineteenth century Norway.

Using this data, I analyze whether selection into rural outmigration varied with inequality and land values.

These data are particularly well suited to studying how inequality and (land) wealth influence selection. Typically, wealth is endogenous to the migration process: wealth affects the costs and returns of migration but remittances and migrant networks also influence wealth holdings (Garip, 2012; McKenzie & Rapoport, 2007). However, in this context, I observe source area wealth and parents' landholding status for individuals in childhood. Thus, these characteristics are pre-determined for the men deciding to move.

This unique data allows for a number of important contributions to the literature on migrant selection. This is the first dataset to link migrants back to their homes in Ireland and to compare selection into emigration and internal migration within Ireland. Even though studies increasingly show that detailed data are needed to correctly gauge selection (Moraga, 2013; Rendall & Parker, 2014), data of this quality are still rare. In addition, my source area analysis of land values and inequality contribute to a new literature concerned with subnational patterns of selection (Juif, 2015; Spitzer & Zimran, 2015).

There are two reasons why studying migration from Ireland is helpful for understanding migration today. First, international migration from low-income to high-income countries is now heavily regulated and costly. The liberal migration policy operated by the United States in the early twentieth century provides a unique opportunity to observe migration behaviors in the absence of the current restrictions imposed on labor mobility. Moreover, the cost of transatlantic travel was quite low in this period (Ó Gráda & O'Rourke, 1997). Thus, travel costs may have been less of a deterrent to migration compared with today.[2]

Second, the scale and scope of Irish migration make Ireland a valuable laboratory from which to

[2] The cost of transportation from Ireland were commensurate with roughly one month of wages for a laborer. It is difficult to measure migration costs today but we believe that Coyote fees are commensurate with about 9 months of average Mexican wages.

study selectivity. In the early twentieth century, Ireland's GDP per capita (around 3,000 present day dollars) and its sectoral employment in agriculture (47 percent), services (31 percent) and industrial occupations (22 percent) were similar to present-day Guatemala, the Dominican Republic, El Salvador and to a lesser extent, Mexico.[3] Only migrant sending countries in South Asia such as the Philippines or India have urban shares as low as historical Ireland (32 percent).

The Irish immigrant flow is also one the largest in American history. The Irish share of the foreign-born population in 1880 – 28 percent – was identical to the Mexican-born share in 2013. Moreover, in 1980, 40 million Americans claimed Irish ancestry. As such, the Irish migration provides a case of historic importance to European and North American economic history. At the same time, migration from Ireland over five decades after the Great Famine (1845-1852) was not so atypical as to thwart comparisons with contemporary migrant flows.

2. Migrant Selection and the Age of Mass Migration

2.1. Skill and the Roy Model

Who decides to migrate from one country to another? Neoclassical approaches model migration as a decision made by individuals in response to differences in returns to skill between locations. This approach can be used to generate predictions of the skill-level of migrants, as in Borjas' (1987) canonical mode of selection, which was derived originally from the Roy (1950) model of occupational choice. If, for example, the returns to skill were relatively higher in the migrant-receiving country compared to the sending country, the Borjas model would predict migrants to be higher skilled relative to the source population ("positive selection"). By extension, if the returns to skill were lower in the receiving country than the sending country, the model would predict migrants to be less-skilled ("negative selection").

Support for the predictions of the Borjas model are mixed. A number of studies find evidence of positive selection in the contemporary era, irrespective of the earnings gap between countries

[3] The historical data come from Geary & Stark (2002) and the contemporary data come from the World Bank website: http://data.worldbank.org/

(Feliciano, 2005; Grogger & Hanson, 2011). Grogger and Hanson propose an alternate model of "Generalized Positive Selection". This model follows a logic similar to Borjas but instead assumes that individuals respond to absolute, rather than relative returns to migration. The absolute returns to migration tend to be greater for highly skilled workers, thus, the Grogger and Hanson model usually predicts positive selection for most scenarios of migration from poor to wealthy countries (Borjas, 2014).

Studies of the Age of Mass Migration provide more support for Borjas model predictions than contemporary studies. Findings of intermediate and positive selection from historical Mexico and Britain are consistent with model predictions (Kosack & Ward, 2014; Long & Ferrie, 2013), as are the findings of negative selection from historical Norway, Italy and Spain (Abramitzky, Boustan and Eriksson, 2012; Juif, 2015; Spitzer & Zimran, 2015). One reason historical migration flows may conform better to Borjas model predictions is because international borders imposed lower costs on migrants in the past (Boustan & Abramitzky, 2016). Thus, the international migration of poorer and less skilled individuals was likely less constrained than it is today.

The Borjas model predicts negative selection from Ireland to the US, while the Grogger and Hanson model predicts positive selection: laborers stood to gain more than skilled workers in relative earnings but less in absolute terms. These opposing predictions are illustrated by the earnings differences of Carpenters and Farm Laborers in Panel A and Panel B of Figure 1. In relative terms (Panel A), the wages of carpenters and laborers in 1901 were roughly similar in being 60 percent of their American levels. When considered along with the relatively higher returns to migration for building laborers, and the lower returns for skilled fitters, the Borjas model would predict higher rates of low skilled migration from Ireland to the USA ("negative selection"). In contrast, in absolute terms (Panel B), carpenters stood to earn 70 cents more per day in America (19 present day dollars) but farm laborers only 22 cents more (6 present day dollars). These higher returns to skill in the USA, in absolute terms, results in a prediction from the Grogger and Hanson model of skilled migration from Ireland to America ("positive selection").

2.2. Landholding and the New Economics of Labor Migration

However, migration decisions are not solely made by individuals but also collectively by households. NELM studies model migration as a household strategy to diversify risk and finance capital investment (Rosenzweig & Stark, 1989; Stark & Bloom, 1985). In low income agricultural areas, for example, credit markets are often poorly developed. A primary means of financing land and capital investment in these places is through remittances sent by family members living abroad. These payments may be the return on a collective decision or agreement to trade-off the labor supply of household members in the short term, so that they can migrate and finance investment in the long term (Taylor et al., 2003).

Typically, NELM approaches predict members of the poorest households to be most motivated to move. The returns to migration from low income agricultural areas to high income urban areas tend to be high. These returns imply that the poorest households, with respect to land, wealth and income, face the highest relative gains from migration (Stark & Taylor, 1989; VanWey, 2005). Studies from historical Ireland and Norway support this by showing more migration among land-poor individuals (Abramitzky, Boustan, & Eriksson, 2013; Guinnane, 1997). Similarly, emigration from historical Italy appears to have been motivated by an intention to purchase or invest in land on return (Cinel, 2002). These findings are consistent with recent work by Dustmann & Okatenko (2014) which suggest that once migration costs can be met, poorer individuals are more likely to move.[4]

A NELM approach would predict a higher rate of migration among land-poor individuals (negative selection). Landholding can influence migration in different ways: it can be liquefied to overcome cost constraints; it is a source of agricultural employment; and its purchase and investment could be financed with remittances (VanWey, 2005). As discussed, cost constraints on migration from Ireland during this period were minimal. Further, larger, export-oriented farms were prospering in Ireland in the early twentieth century. The strong economic position of large farms and low

[4] Other studies of contemporary migration show similar variance in the effect of land on migration (Davis, Stecklov, & Winters, 2002; Garip, 2012; Gray, 2009; Mendola, 2008).

migration costs suggest that land-poor individuals and households had the greatest incentives to migrate.

3. Emigration and Selection on the Eve of First World War

This article is not the first to study selection from Ireland. Earlier studies of historical Ireland suggest that changes in poverty across time and space influenced selection patterns. Studies from the Great Famine period (1845-1852) suggest that migrants were poorer than the population as a whole, even though the very poorest faced poverty constraints (Anbinder & McCaffrey, 2015; Mokyr & Ó Gráda, 1982; Ó Gráda, 2000). Other studies imply that over time, emigrants in the post-Famine period were more likely to originate in the poorest Irish regions but, compared with earlier waves of migration, they tended to be relatively better skilled than non-migrants (Fitzpatrick, 1980, 1984; Stolz & Baten, 2012).

Irish emigrants conformed to the standard migrant profile of being young, single adults in search of work. By 1900 up to two-thirds of emigrants were unskilled and 60 per cent were aged between 15 and 24 (Guinnane, 1997, p. 106). Although many emigrants interpreted their migration decision as a form of political exile, evidence suggest that they left for similar reasons to other Europeans – poverty and unemployment (Miller, 1988, 2008). Emigration from these bleak conditions in nineteenth century Ireland was exacerbated by the great demand for labor in North American cities (O'Rourke, 1991).

Opportunities in rural Ireland declined throughout most of the nineteenth century. The modernization of the Irish economy and its exposure to liberal international trade contributed to the contraction of opportunities in agriculture and artisanal production (O'Rourke, 1997; Miller, 2008, p. 79-80). These poor economic opportunities combined with longer running trends in the decline of marriage and inheritance. This confluence resulted in unusually high rates of female emigration (Guinnane, 1990 & 1997, p. 105). Later, I discuss the challenge with analyzing outcomes among females using record linkage data.

Despite considerable aggregate wage growth in Ireland, regional inequality increased in the late nineteenth century. Between 1881 and 1905, Irish wages rose by up to 60 percent compared to British levels (Begley, Geary & Stark, 2014). There is disagreement on whether this growth resulted from the mass-migration of the poor or if it was capital accumulation and productivity growth (Begley et al., 2014; Boyer, Hatton, & O'Rourke, 1994; O'Rourke & Williamson, 1997). Whatever its source, Figure 2 shows that emigration was highly localized in western Ireland at the turn of the century.[5] These regions were characterized by high poverty and fertility, subsistence farming, and distance from ports and cities (Fernihough, 2011; Hatton & Williamson, 1993). In the appendix, I show that these were the least developed regions of Ireland (as measure by land value per acre).

In many ways, Ireland was a "classic case" of uneven development (Miller, 2008, p. 12). The decline of population in the west of Ireland occurred alongside population growth in the east.[6] Figure 3 shows high rates of internal migration around the manufacturing centers of Belfast, Dublin and the more prosperous agricultural regions of the southeast (Bourke, 1993; Kelly, Slingsby, Dykes, & Wood, 2013; Slingsby, Kelly, Dykes, & Wood, 2012). This regional pattern of internal migration appears to be the inverse of the map of emigration shown in Figure 2.

Though there were broad regional disparities in development and migration behaviors, local areas were also internally heterogeneous. In rural areas with high levels of inequality, agricultural growth and farm consolidation occurred alongside smallholding and subsistence economies. While some areas had Gini coefficients higher than 0.6, others were mostly poor or wealthy across the board with coefficient of less than 0.3. The relatively weak spatial relationship between land values and inequality in personal land holdings, permit me to isolate the effect of these characteristics on migration decisions.

[5] See Breathnach (2005) and Moran (2004) for discussions of development programs in these regions. The shape files for Poor Law Unions produced by Gregory (2008) were obtained online from the British Data Archive website (www.britishdataarchive.com). I linked these shapefiles to the census using the Irish Topographical Index.
[6] See Fotheringham, Kelly, & Charlton, 2013 and Kelly & Fotheringham, 2011 for analysis of population change.

4. Data and Estimation

4.1. Record Linkage

My goal was to create a sample of Irish-born migrants and non-migrants whom I could observe in their homes in Ireland as children or as young men before deciding whether to move within Ireland or to the United States. To do this I used the record linkage techniques developed by Abramitzky, Boustan and Eriksson (2012) and Ferrie (1996). The application of these techniques to the Irish and American historical censuses provided the main samples for this analysis.

This linkage procedure relies on uniquely matching males between census years. I searched for individuals that were enumerated in the complete-count 1901 census of Ireland, in either the 1911 census of Ireland or the 1910 American census.[7] These individuals were matched using their name, age and county of birth (for those who stay in Ireland). To mitigate potential problems due to misreporting, ages were permitted to deviate by up to two years in cases where no exact match could be found.

A more complete picture of selection from Ireland could be provided if females were also included in this analysis. Half the migration flow from Ireland at this time was comprised of females. However, these record linkage approaches are not well suited to matching females, as they are more likely to change their names after marriage. Female samples matched using these techniques tend to be non-representative of the population as a whole. As a result, only the migration of males is within the scope of this study.

This matching approach produced a sample on par or larger than those typically found in the literature. In total, 9,237 people were successfully matched from Ireland to the US, along with 56,420 inter-county movers and 344,147 non-movers within Ireland. These samples correspond to a match rate of 39 percent within Ireland and 13 percent for Irish immigrants in the United States. The difference between the migrant and non-migrant samples is mostly due to the extra

[7] The Irish data has been digitized by the National Archives of Ireland and prepared by Connor (2016) and Connor, Mills, & Moore-Cherry (2011). The data from the United States has been made available by the Minnesota Population Center and its collaborator, Ancestry.com.

information on county of birth from the Irish census, which allowed me to better distinguish between individuals with similar names and ages.

4.2. Robustness Sample

I provide an alternate matching approach to address potential concerns with the construction of this sample. This alternative method uses identical criteria to match individuals in Ireland and the United States and ignores the information on county of birth from the Irish census. The match rate of this robustness sample ("Equal Match") drops to 17 percent. For comparison, I include results from the Equal Match for comparison with the main sample ("Full Match").

The characteristics of these matched samples are similar to the full census population. Table 1 compares 6 to 40 year olds between these samples and the full census. While the share literate is similar across these samples, the occupational score of the matched samples are slightly higher on average than in the census data. Catholics were also less likely to be linked due to having more common names. It is notable that farmers are slightly overmatched in the Full Match and white-collar workers are more likely to be matched in the Equal Match.

This comparison suggests that the Full Match is of similar or higher quality to the Equal Match. This is evident from the greater share of white-collar workers and white-collar sons in the Equal Match, which suggests that higher status individuals may be overrepresented in samples matched with less information. Further, the Full Match has more than twice as many observation as the Equal Match and is more similar to the original census in its composition. Given these strengths, I relied on the Full Match as the primary data source for this analysis.

4.3. Estimating Selection by Occupation and Skill

I test for selection by studying the influence of economic characteristics on migration outcomes. I analyze decisions to migrate across counties or to the United States. The variables of interest are measures of occupation and literacy. The literacy measures were taken directly from the census and were observed for potential migrants and their fathers in 1901. The measures of

occupation required further work.

I relied on recent research to rank occupations in the Irish census and to measure differences by socioeconomic class. The occupational returns in the Irish census are not standardized. However, Fernihough, Ó Gráda, and Walsh (2015) have recently linked the occupational returns to a corresponding code in the Historical International Classification of Occupations (HISCO) (van Leeuwen & Maas, 2011). These codes permitted me to rank each occupation on the Historical Cambridge Social Interaction and Stratification Scale (henceforth "HISCAM index") and the Historical International Social Class Scheme (HISCLASS). The HISCAM index is a continuous ranking of occupations, constructed by measuring social distances between occupations in historical Europe (Lambert, Zijdeman, Van Leeuwen, Maas, & Prandy, 2013). The HISCLASS categories correspond to identifiable socioeconomic classes and provide important information with respect to skill, class and land ownership.

I needed to link sons to obtain reliable measure of pre-migration status. The economic characteristics of migrants cannot be reliably inferred from post-migration occupations, or from arrival or departure records.[8] In the receiving country, migrants may hold occupations below their true level of skill (Abramitzky, Boustan, & Eriksson, 2014). Conversely, the decision to migrate may be motivated by transitory job loss (Fernández-Huertas Moraga, 2011). To overcome these problems, I analyze the characteristics of the fathers of potential future migrants while their sons were in childhood in Ireland. Further, this helps avoid reverse causality in fathers' wealth through the migration of their sons.

This father and son data is used to analyze selection into internal or international migration with a series of binary logistic regressions. These models predict whether migrants and non-migrants differed from each other with respect to skill, landholding or education. The logistic regression models take the following form:

[8] This issue is more confined to measures of occupation and income which are transitory rather than to anthropometric indicators.

$$\ln\left[\frac{Y}{1-Y}\right] = \beta_0 + \Sigma_{k=1..K}\beta_k X_k$$

(1)

where Y refers to the probability of an Irish male in 1901, moving county to an area within Ireland or to the United States by 1910/1911. All coefficients are presented as odds ratios where coefficients greater than one indicate higher odds of migration while values below one imply lower odds. Thus, β_k can be interpreted as the change in the odds of an individual migrating to a destination associated with a one-unit change in the k^{th} independent variable. In this case, selection is inferred from the differences in the odds of migration by own and fathers' occupation and literacy, where the reference population are individuals living in all other destinations in 1910/1911.

One could argue that a multinomial logit approach would be better suited to this analysis. A multinomial logit approach uses a fixed base category to compare location decisions, typically between movers to different destinations and non-movers. However, when analyzing selection into international migration, it is preferable to compare migrants to the entire population rather than just the people who stay in their county of origin. This is particularly important when migration decisions to other destinations are also selective (as shown later). Thus, I use a series of binary logistic regressions, as the reference category is better suited to this study.

4.4. Estimating Selection by Source Region Conditions

The study of selection in response to source area inequality is a main contribution of this study. I focus on whether selection varies with birth order and local landholding across PLUs. This analysis is data intensive and requires a different approach. Instead of analyzing selection across a set of potential destinations, the outcome variable in these models is a binary choice for whether or not individuals in rural areas stayed in their childhood county.

The data on birth order was extracted from the 1901 census. Individuals were assigned a birth order of "First Son", "Last Son", "Middle Son" or "Only Son" based on their age relative to their

siblings which was observed from their childhood households. This variable will be mis-measured for families where older siblings have already left home. To mitigate this problem, the sample is confined to sons with younger mothers (aged under 43).[9]

The data on local inequality and the value of landholdings were transcribed from the Irish land census of 1901. These registers detail the valuation and number families living on agricultural holdings within each PLU.[10] The census classified valuations into eleven categories ranging from £4 or less to greater than £300. I used this information to measure the average per acreage value of landholdings and to construct a within PLU Gini index of inequality. Data from the land census apply only to families living on agricultural holdings. Thus, the Gini index reflects inequality among agricultural landholders and is mainly applicable to rural areas.

This land register data needed to be manually linked to the census records. The digitized 1901 census contains information on street address, electoral division and county of residence and birth. Having no information on PLU of residence required that I use the Irish Topographical Index to compile and link each of the 3,000 enumeration districts from the census to one of the 158 PLUs from the land census. All cases were successfully matched to a PLU and I could assign each individual the land value and Gini index of their PLU of residence.

The value of holdings may be a better indicator of income or consumption than of wealth. The history of tenancy in historical Ireland makes it difficult to draw a sharp distinction between owners and occupiers (Turner, 2002). Thus, land values may be limited measures of individual wealth. This said, studies suggest that the price of agricultural land mainly reflects the rents that can be extracted from agriculture (Burt, 1986; Featherstone & Baker, 1987) and secondly, the capitalization of amenities and future land use opportunities (Borchers, Ifft, & Kuethe, 2014; Plantinga, Lubowski, & Stavins, 2002). As such, the value of land may be a reasonable proxy for economic opportunity in agricultural areas.

[9] This restriction only affects the magnitude of the results but not differences in significance or interpretation.
[10] A family was defined as a married couple with children (if any) or a collective of people who shared a house and boarded at the same table.

I used a binary logistic model to analyze the effects of land inequality and birth order on the decision to leave ones' source county. These models take the following form:

$$\ln\left[\frac{Y}{1-Y}\right] = \beta_0 + \beta_1 X_1 + \beta_k X_k + \beta_1 X_1 \beta_k X_k \quad (2)$$

where Y refers to the probability of an individual leaving their childhood county between 1901 and 1911. $\beta_1 X_1$ refers to the landholding status of an individual's father, which is inferred from whether the father reported being a "Farmer" (landholder) or working in a non-farming occupation (non-landholder). I use the landholding status as the primary measure of selection. The interaction term $\beta_1 X_1 \beta_k X_k$ interacts landholding status with $\beta_k X_{kj}$, which refers to a measure of PLU inequality or family birth order. This interaction term allows selection on landholding to vary with local inequality or birth order position.

These models make use of a weighting procedure. It is challenging to study source area effects on selection if match rates vary geographically. Figure 2 showed that emigrants to America, which had a lower match rate, were more likely to originate in western Irish counties. These lower match rates mean that contextual influences on migration would be underestimated in high emigration areas and overestimated elsewhere. I overcome this problem by reweighting the sample of international migrants to be equivalent in size to the population staying in Ireland.

5. Results

I test for selection over four analyses. First, I gauge selection into transatlantic migration using measures of own and fathers' literacy and socioeconomic class. These results are presented for the Full Match and Equal Match samples. Second, I compare the profiles of international migrants to individuals who moved within Ireland. This provides an indirect assessment of whether domestic opportunities influenced the composition of the flow of migration overseas. These analyses show that most overseas migrants originated in agricultural areas. In the third section, I test whether rural outmigration was influenced by differences in inequality and land values within and between PLUs. Finally, I conclude with an examination of whether land

inheritance was a primary channel through which landholding influenced migration decisions.

5.1. Selection to the USA

5.1.1. All Occupations

Table 2 estimates the basic relationship between own and fathers' occupation and migration to the USA.[11] These estimates consistently show that migrants held occupations below the mean prior to migration but their fathers held above average occupations. This divergence is expressed by Columns 1 and 2, which show the odds of emigration associated with a standard deviation increase in the HISCAM index.[12] An occupational improvement of this size *reduces* an individuals' odds of emigration by 3 percent. However, the same shift in fathers' occupation increases sons' emigration by 9 percent. This is a preliminary indication of negative selection on own occupation but positive selection on fathers' occupation.

Divergence in migration outcomes based on own and fathers' occupation is mainly driven by landholding status. Column 3 shows men occupied as farmers and white-collar workers to be 5 percentage points less likely to emigrate than laborers. However, only the lower odds of migration for farmers (relative to "medium skilled workers") is statistically significant. In contrast, in Column 4 farmers' sons are 28 percent, and white-collar and skilled workers' sons (non-significant) 10 to 20 percent, more likely to emigrate. This provides quite strong evidence that migration was selective with respect to landholding and selective to a lesser extent on skill-level.

Results presented later in this article suggest that land acquisition can account for the differences in migration between farmers and their sons. Inheritance norms and competition among siblings meant that farmers' sons were limited in their opportunity to acquire land. Thus, young men declaring themselves as a "farmer" had, at a relatively young age, inherited land or acquired it elsewhere. As a result, their siblings who did not anticipate inheriting land may have decided to

[11] These models include Provincial fixed effects, which control for between region differences in occupational and economic conditions.

[12] A standard deviation in the HISCAM index is equivalent to the difference between general laborers and cabinetmakers or skilled construction workers such as a bricklayers.

leave the household and emigrate for work. This process may account for why farmers' sons are more likely to emigrate but farmers themselves are less likely to do so.

These findings are similar for the Equal Match, which produces slightly stronger selection estimates. Columns 5 and 6 shows similar patterns of negative selection on own occupation and positive selection on fathers' occupation. Similarly, Column 8 shows higher odds of emigration for farmers' sons than laborers' sons. The most notable difference in the Equal Match is the lower odds of migration for white-collar workers and their sons. As already discussed, white-collar workers are particularly sensitive to the matching procedure and as such, caution should be exercised in drawing inferences from their outcomes.

5.1.2. Agricultural Occupations

Further decomposition is required to understand selection from agricultural areas. Farmers differed in the value and productivity of their land, as well as in their orientations toward subsistence and market production. This makes it challenging to interpret differences in migration by occupation from agricultural areas. As such, Table 3 analyzes selection on agricultural occupations by decomposing farmers and laborers by the value of land in rural source areas.[13] Estimates of selection from the Full Match and Equal Match yield similar conclusions.

Columns 1 and 2 show higher odds of emigration from poorer rural areas. Overall, this implies that selection on landholding constitutes a more intermediate form of selection. The sons of farmers in poor areas are more likely to emigrate than the sons of farmers in wealthier areas or landless laborers. More generally, individuals in poor areas are up to twice as likely to move: this difference is largest for farmers' sons in poor areas relative to laborers' sons in wealthy areas. These patterns are consistent with high rates of emigration from Ireland's poorer west coast.

Within area comparisons show the sons of farmers are more likely than laborers' to move to the

[13] "Poor" areas are classified as one standard deviation below the national mean for value per acre, medium areas are within a standard deviation of the mean while "wealthy" areas are greater than one standard deviation above.

USA. Laborers' sons are from 3 percent (in medium areas) to 70 percent (in wealthy areas) less likely to emigrate than farmers' sons. However, this finding reverses when own occupations are analyzed. The odds of emigration for men occupied as farmers is around 13 percent lower than for laborers. This provides further support for the role of land acquisition in migration.

Findings of intermediate selection for migration from Ireland to the USA are not consistent with predictions derived from differences in returns to skill between the two countries. The main occupational differences in migration appear to have been between the sons of poorer farmers and others. This highlights the importance of landholding on migration decisions. One means through which land may have been influential was through the provision of employment opportunities in source areas.

5.2. Selection into Internal and International Migration

I begin examining the influence of source country opportunities on selection into emigration by comparing international migrants to people who moved within Ireland. To describe the characteristics of internal and international migrants, I model occupational differences and location choices using logistic regression models. This analysis yields two main findings. First, the sons of agricultural workers are less likely to move overall. Second, conditional on moving, white-collar workers' and farm laborers' sons are more likely to move to urban and rural areas in Ireland respectively, while the sons of farmers tend to move to the USA.

5.2.1. Descriptive Analysis

In contrast to intermediate selection into overseas migration, selection into internal migration appears to have been bimodal. This is evident in Figure 4, which compares the distribution of own and fathers' occupation for non-movers, internal migrants and migrants to the USA. These plots show that the fathers of migrants to the USA held higher ranking occupations than non-migrants, who were overrepresented in low- and mid-ranking occupations. In contrast, cross-county movers were more likely to hold occupations at the tails of the distribution. This bimodal form of selection into internal migration is characterized by higher migration among laborers'

sons on one side, and higher skilled and white-collar sons on the other.

Analysis of occupational categories rather than quantitative rankings show lower levels of migration among the sons of agricultural workers. Table 4 presents the share of sons that migrated within Ireland and abroad by fathers' occupation.[14] For interpretation, Columns 1 and 2 provide qualitative and quantitative rankings of these occupations. Column 3 shows that while 78 to 88 percent of the sons of non-agricultural workers stayed in their childhood county, over 88 to 91 percent of agricultural workers' did the same.

Table 4 suggests that these migration patterns may reflect domestic demand for skill. In Column 3, relatively large shares of sons with highly skilled fathers moved county. Further, Column 4 and 5 suggest that location choice varied with agricultural skill. Conditional on moving, two in five farm laborers' sons moved to rural areas while only one in five white-collar sons did the same. Similarly, urban areas attracted sons with higher skilled fathers. While 9 and 15 percent of skilled and white-collar sons moved to an urban area, only 4 to 6 percent of farmers' or laborers' sons did the same.

The sons of farmers were most highly represented in the flow to America. Table 4 shows that around 3 percent of farming sons moved to the USA, compared with 2 percent of white-collar and laboring sons. This point is strengthened when compared to the population as a whole: farmers' sons comprised 50 percent of the total population, 35 percent of the migrant flow within Ireland but 59 percent of the flow to America. Among movers only, 30 percent of farmers' sons chose America while only 17 percent and 9 percent of white-collar and laborers' sons did the same.

5.2.2. Logit estimation

I more formally study this location choice by own and fathers' occupation by incorporating control variables in a logistic regression analysis. These models take the following form:

[14] An identical table by own occupation shows similar patterns and is included in the appendix.

$$\ln\left[\frac{Migrate}{1-Migrate}\right] = \beta_0 + \beta_1 Occupation_1 + \beta_2 Literacy_2 + \Sigma_{k=1..K}\beta_k X_k$$

(3)

where the outcome variable *Migrate* refers to whether an individual decided to move county to one of three discrete destinations: a rural area in Ireland ("Moved Rural"); an urban area in Ireland ("Moved Urban"); or to the United States ("Moved USA"). The odds of migrating to each destination are presented separately in Tables 5 and 6. The variables of interest *Occupation* and *Literacy* refer to the characteristics of individuals or their fathers while $\beta_k X_k$ refers to a set of control variables, which include provincial fixed effects.

Table 5 presents the results based on own pre-migration characteristics. These results confirm that individuals moving within Ireland were drawn from both tails of the skill distribution. Column 1 shows farm and non-farm laborers and skilled and white-collar workers to be more than twice as likely as farmers to move to rural areas in Ireland. Column 2 shows similarly high rates of migration to urban areas for men working outside of agricultural occupations. In this case, migration to urban areas is more likely for non-farm laborers and skilled and white-collar workers. Along with Table 2, these results indicate that owner-occupier farmers are less likely to migrate to any destination.

Consistent with earlier tables, Column 3 shows weak patterns of selection to the USA on own occupation and literacy. Differences in these characteristics are small and non-significant. In contrast, Irish speaking ability and residence in the western provinces of Connaught and Munster provide evidence of strong geographical selectivity. Further analysis in the Appendix uses a finer fixed effects specification to show that selection on Irish speaking ability reflects greater migration from PLUs in the west of Ireland.

Estimates of selection on fathers' occupation in Table 6 corroborate the finding of intermediate selection into trans-Atlantic migration and bimodal selection into internal migration. Columns 1 and 2 show more migration to urban areas for the sons of skilled and white-collar workers, and higher rates of migration to rural areas for farm laborers' and white-collar workers' sons. Column

3 shows the sons of farmers and white-collar workers to be significantly more likely than agricultural and non-agricultural laborers' sons to move to the United States. These results are robust to provincial fixed effects and a range of control variables.

These findings may suggest that opportunities in Ireland deterred migration to the United States. Migration to rural areas among the sons of agricultural laborers is consistent with the expansion of Irish agricultural opportunities at this time, while migration among white-collar sons to urban areas likely reflects the high returns to skill in Irish towns and cities. While farmers' sons are most likely to move to the United States, the historical literature provides no strong evidence that these men were better prepared than others, for work in the urban labor markets of America.[15] Thus, the overrepresentation of farmers' sons among emigrants may be reflective of differences in domestic opportunities.

5.3. Selection and Inequality in Landholdings

In this section, I analyze rural outmigration for sons across areas which varied in their value and distributions of land. I focus on differences between the sons of landholding farmers, landless laborers and skilled and white-collar workers. An earlier study by Hatton and Williamson (1993) used county-level data to show that migration rates were lower in areas with more small farms. Hatton and Williamson interpreted this result as an effect of local opportunity: the acquisition of land was easier where holdings were less concentrated. In this study, I use the Gini index to study whether the structure of landholding affects the probability and selectivity of rural outmigration.

Hatton and Williamson's study and the NELM literature provides two hypotheses. First, outmigration is lower where land is distributed more equally (low inequality). In these places it would, conceivably, be easier to acquire land. Second, sons from land-poor households are more likely to leave rural areas, as they had the most to gain from migration. I test these hypotheses with the following specification:

[15] Conversely, the report of the Royal Commission on Labour claimed that farmers' sons were better suited than laborers' sons to agricultural work in Ireland.

$$\ln\left[\frac{Migrate}{1-Migrate}\right] = \beta_0 + \beta_1 Laborer_{1i} + \beta_2 Skilled/WhiteCollar_{2i} + \beta_3 Gini_{3j} + \beta_4 Land\ Value_{4j} + \beta_3 Gini_{3j}\beta_4 Land\ Value_{4j} + \beta_1 Laborer_{1i}\beta_3 Gini_{3j} + \beta_2 Skilled/WhiteCollar_{2i}\beta_3 Gini_{3j} + \Sigma_{k=1\ldots K}\beta_k X_k$$

(4)

where *j* denotes the childhood PLU of each individual and the outcome variable is whether a son left their 1901 county of residence to move to any location. The explanatory variables of interest, *Gini* and *Land Value*, refer to the Gini index and average land value per acre of the PLU, and *laborer* and *skilled/whitecollar* refer to fathers' occupation. I allow the effects of inequality and land value to vary together and with fathers' occupation. In this equation, β_k refers to a set of control variables including age and age squared.

Table 7 suggests that the effects of land value and inequality on migration are interdependent. Column 1 estimates a model with main effects for land value and the Gini coefficient. While the Gini coefficient has a small positive effect on migration, land value appears to have none. Column 2 shows that the underlying interaction of these variables masks their true influence on migration decisions. Once interacted, increases in the Gini index and land value (significant at 0.10 level) predict higher odds of outmigration. This implies that no direct prediction can be drawn from these characteristics in isolation.

Panel A and B of Figure 5 plot predicted probabilities from the interaction of land value, the Gini index and fathers' occupation (see Equation 4). Panel A displays predictions of migration from poor areas while Panel B depicts migration from wealthy areas.[16] Gini index values of around 0.25 refer to areas where landholdings are quite equally distributed while values of 0.60 indicate that local land is concentrated among a relatively small number of families. In these plots, selection varies with both inequality and land value.

The effect of inequality and land value on migration are dependent on fathers' occupation. Panel

[16] Poor and wealthy areas are defined as two standard deviations either side of the mean PLU land value.

A and B shows the sons of skilled and white-collar workers to be most likely to leave agricultural areas. The probability of these sons moving county or to the United States is around 18 percent on average. This increases to 24 percent for sons in poor and unequal areas (Panel A). Further, the difference in migration between skilled and white-collar workers' sons and agricultural workers' sons, remains stable with changes in inequality: the odds of migration for skilled and white-collar sons is consistently 5 to 6 percentage points higher than for other sons.

Higher rates of outmigration among laborers' sons, relative to farmers' sons, supports the hypothesis that land-poor individuals moved more. On average, the probability of these sons leaving their home area is around 14 percent, with no significant difference between farmers' and laborers' sons. However, these probabilities only diverge in Panel B in places where inequality levels and land values are both high. The probability of migration for farmers' sons drops from 14 percent in areas with low inequality to 11 percent where inequality is high. In contrast, migration among laborers' sons does not vary with inequality in holdings.

These findings provide mixed support for the hypothesis of lower migration from more equal areas. On the one hand, migration is *less* likely from poor areas with lower levels of inequality: the probability of migration increases from around 13 to 15 percent between places with low and high levels of inequality. This is consistent with Hatton and Williamsons' finding of lower migration from areas with large shares of small farms. However, the odds of migration appears to *decrease* with inequality, in areas with higher land values.

Local opportunities for employment and land acquisition may have driven differences in migration across places. The high migration rate of skilled and white-collar sons may have been a response to a lack of blue and white-collar jobs in rural areas. This is notable from poor and unequal areas where opportunities for white-collar workers were most sparse. Moreover, lower migration among farmers' sons in places with high inequality and land values may have resulted from greater opportunities to acquire land through inheritance or other means.

5.4. Birth Order and Migration

The inheritance of land may have been a primary channel through which landholding status affected migration outcomes. I examine whether migration behavior varied with inheritance opportunities, as inferred by birth order. An earlier study of rural Ireland by Ó Gráda (1980) suggests that the first and last sons of farmers were more likely to inherit than their siblings in the middle of the birth order (primogeniture and ultimogeniture). This generates two hypotheses. First, the sons of farmers are less likely to leave their home areas. Second, farmers' sons in the middle of the birth order are more likely to migrate than their first and last born siblings. I test this with the following specification:

$$\ln\left[\frac{Migrate}{1-Migrate}\right] = \beta_0 + \beta_1 Farmer_{1i} + \beta_2 Birth\ Order_{2i} + \beta_1 Farmer_{1i}\beta_2 Birth\ Order_{2i} + \Sigma_{k=1\ldots K}\beta_k X_k$$

(5)

where the outcome is whether a son left their childhood county. The parameter β_1 indicates whether the father is a farmer or a laborer, β_2 refers to an individuals' birth order position among his siblings while $\beta_1\beta_2$ refers to the interaction between fathers' occupation and birth order.

I find the sons of farmers to be less likely to leave their childhood counties. In Column 1 of Table 8, the sons of laborers are 16 percent more likely than the sons of farmers to migrate across counties or to the United States. This lower probability of all-destination migration for farmers' sons remains unchanged with the addition of birth order controls in Column 2. On average, sons in the middle of the birth order are around 12 percent more likely to migrate than first or last sons, and 50 percent more likely to migrate than sons with no siblings.

The middle sons of farmers are more likely to migrate than siblings positioned elsewhere in the birth order. Figure 6 graphs the interaction of birth order and fathers' occupation on migration (Column 3, Table 8). The first and last sons of farmers are, at a minimum, ten percentage points less likely to migrate than laborers' sons positioned throughout the birth order. This gap increases by up to 50 percent for farmers' sons with no siblings. Notably, the probability of migration for farmers' sons in the middle of the birth order is similar to that of laborers' sons.

Access to inheritance provides the most likely explanation for birth order differences. This is best highlighted by the difference in behaviors between the middle and only sons of farmers. By being sole heirs, only sons were insulated from competition and variation in inheritance norms. This position made only sons highly likely to inherit and as a result, less migratory.[17] The influence of inheritance on migration is also underscored by the similarity in behaviors between the middle sons of farmers, the least likely to inherit, and the sons of landless men (laborers). Overall, these results provide quite strong evidence that inheritance was the main source of difference in the outmigration behavior of farmers' and laborers' sons.

The importance of inheritance in historical Ireland can be directly compared to other contexts. Abramitzky, Boustan and Eriksson (2013) study birth order and migration in nineteenth century Norway. They find eldest sons in asset-holding households to be 7.3 percentage points less likely to migrate than their siblings. By estimating a comparable model for Ireland, I find that first born sons are 11.6 percentage points less likely to migrate. Further, if the definition of inheriting son is widened to include both first and last born sons, being an heir reduces the probability of migration by 16.8 percentage points. The strong effect of birth order on migration implies that land inheritance may have been of unusual importance in historical Ireland.

6. Discussion and Conclusion

A century ago, industrial growth in Ireland was sluggish and hundreds of thousands of Irish people emigrated from Ireland. Policy-makers were concerned that Ireland was losing its most talented and able individuals to the United States. My findings provide limited support for these concerns. I show that emigrants were typically drawn from poorer farming households in the least developed western Irish counties. These migrants were drawn from households near the middle of the national wealth distribution (intermediately selected).

[17] It is also possible that other siblings had left the house after earlier indications that the remaining son would inherit. However, the sample restriction and controls for mothers' age reduces this influence.

I find evidence of sorting between internal and international migration which suggests that labor market opportunities in Ireland may have selectively deterred emigration. While international migrants were drawn from the middle of the wealth distribution, movers within Ireland tended to be the sons of highly skilled workers or landless laborers. The sons of highly skilled workers were more likely to make urban moves, and landless laborers, rural moves. Historical accounts of this period have emphasized greater demand for skill in urban areas and for agricultural labor in rural areas. These differences in location choices indicate that employment opportunities may have deterred emigration among individuals with valuable skills in the Irish economy.

The pull of domestic opportunities is also evident in which men decided to leave their home areas. The sons of white-collar and skilled workers were more likely to leave rural locations, particularly those where employment in blue- or white-collar occupations was limited. In similar fashion, the sons of farmers were less likely to leave agricultural areas where holdings were consolidated and valuable. These areas, perhaps, provided employment opportunities or greater opportunities to acquire land. This point is strengthened by the finding that landholders' sons were the least likely to migrate when their prospects of inheritance were strong. These findings challenge claims that emigration from historical Ireland can be largely explained by high overseas wages (e.g. Geary, 1935).

These findings are not fully consistent with canonical models of selection into international migration. Among the population of Irish farming households, emigrants *were* negatively selected. This would be consistent with predictions from the Borjas model. However, what remains to be resolved is why poorer farmers' sons were, relative to laborers' sons, similarly likely to leave their home areas but more likely to move to the USA. This is challenging to interpret as there is little evidence of differences in the returns to migration for laborers' and poorer farmers' sons or of differences in the ability to meet the costs of migration.

Historical accounts of Irish emigration and NELM models provide a speculative explanation. In their classic anthropological study, Arensberg & Kimball (1940) argued that small farmers in

western Irish counties became dependent on the flow of American dollars sent by letter from the USA: Schrier (1958) estimated these flows to be around 260 million dollars in total. Recent studies echo the claim that smallholding families relied on migrating family members to finance capital investment and to support large families (Meagher, 2005; Miller, 2008; Turner, 2002).

It is challenging to bring direct evidence on this hypothesis. However, I do find that non-inheriting sons of farmers disproportionately took to emigration. This finding could be explained by higher motivation for migration to locations which offered high absolute returns to low skilled work, particularly, among sons who wanted to finance personal consumption *and* subsidize families in source areas. This motivation would conceivably have been greatest among individuals from poorer farming families whose livelihoods largely depended on relatively uneconomical smallholdings.

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Table 1. Comparison of Samples

Comparison of Samples

		1901 Census	Full Match	Equal Match
	Total Observations	1,346,277	421,759	187,210
	Age (mean)	21	21	21
	Share literate	0.87	0.87	0.87
	Share Catholic	0.75	0.72	0.72
Own occupation	White-collar workers	0.10	0.11	0.13
	Foremen and skilled workers	0.12	0.12	0.13
	Farmers and fishermen	0.37	0.39	0.37
	Medium skilled workers	0.10	0.10	0.10
	Laborers	0.13	0.11	0.11
	Farm laborers	0.18	0.17	0.16
	Mean Occupational score (HISCAM index)	50	51	51
Occupation of father	White-collar workers	0.08	0.08	0.10
	Foremen and skilled workers	0.12	0.11	0.12
	Farmers and fishermen	0.51	0.53	0.52
	Medium skilled workers	0.07	0.07	0.07
	Laborers	0.10	0.09	0.09
	Farm laborers	0.11	0.11	0.10
	Mean Occupational score (HISCAM index)	53	53	53
	Sample: males, aged 6-40			

Table 2. Selection to the USA with Sample Comparison

Selection to the USA with Sample Comparison

	Dependent Variable: Moved to the USA							
	Full Match				Equal Match			
	1	2	3	4	5	6	7	8
HISCAM index	0.97*	1.09***			0.95**	1.08***		
	(-2.02)	(4.09)			(-3.09)	(3.62)		
Occupation [reference = Laborer]								
Farmers			0.95	1.28**			1.00	1.34***
			(-0.95)	(3.22)			(0.04)	(3.71)
Skilled farm workers			1.05	1.52			1.14	1.51
			(0.29)	(1.79)			(0.74)	(1.70)
Farm laborer			1.01	1.01			1.08	1.08
			(0.11)	(0.07)			(1.26)	(0.79)
White-collar workers			0.96	1.20			0.80**	0.98
			(-0.57)	(1.81)			(-3.21)	(-0.15)
Foremen and skilled workers			1.01	1.12			0.94	1.03
			(0.15)	(1.22)			(-0.96)	(0.30)
Medium skilled workers			1.07	0.92			0.98	0.84
			(1.05)	(-0.75)			(-0.31)	(-1.59)
Characteristics of:	Son	Father	Son	Father	Son	Father	Son	Father
Observations	168,438	128,341	168,438	128,341	76,993	54,650	76,993	54,650

Notes: $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Controls include: age, age squared, province fixed effects

Test statistics presented in parentheses.

Table 3. Selection to the USA from Agricultural Areas.

Selection to the USA from Agricultural Areas

	Dependent Variable: Moved to the USA			
	Full Match		Equal Match	
	1	2	3	4
Occupation [reference = Laborer (poor area)]				
Farmer (poor area)	0.87	1.12	1.12	1.13
	(-0.45)	(0.85)	(0.39)	(0.93)
Farmer (medium area)	0.56***	0.77**	0.67**	0.87
	(-4.21)	(-3.06)	(-2.85)	(-1.59)
Laborer (medium area)	0.69***	0.74***	0.85*	0.81***
	(-5.98)	(-5.93)	(-2.51)	(-3.90)
Farmer (wealthy area)	0.59***	0.85***	0.72***	0.93
	(-5.87)	(-2.94)	(-3.60)	(-1.29)
Laborer (wealthy area)	0.75	0.50***	0.84	0.53***
	(-1.66)	(-3.72)	(-0.98)	(-3.37)
Characteristics of:	Son	Father	Son	Father
Observations	82,258	110,709	32,971	47,352

Notes: $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Controls include: age, age squared, province fixed effects

Test statistics presented in parentheses.

Table 4. Migration Decisions and Father's Occupations (row percentages).

	1	2	3	4	5	6	7
Occupation	Occupational Status	HISCAM Index (mean)	Stayed in County	Moved County to Rural Area	Moved County to Urban Area	Moved to the USA	Total
Agricultural							
Farmers	High	58	57284 / 90%	1596 / 3%	2821 / 4%	1605 / 3%	63306 / 100%
Skilled farm workers	Medium	53	675 / 91%	15 / 2%	29 / 4%	21 / 3%	740 / 100%
Farm laborers	Low	52	12469 / 88%	674 / 5%	741 / 5%	229 / 2%	14113 / 100%
Non-agricultural							
White-collar workers	High	58	9181 / 78%	570 / 5%	1827 / 15%	218 / 2%	11796 / 100%
Foremen and skilled workers	Medium	50	13729 / 86%	501 / 3%	1431 / 9%	295 / 2%	15956 / 100%
Medium skilled workers	Medium	46	8653 / 86%	302 / 3%	922 / 9%	144 / 1%	10021 / 100%
Laborers	Low	35	11537 / 88%	460 / 4%	846 / 6%	206 / 2%	13049 / 100%
Total	-	53	113528 / 88%	4118 / 3%	8617 / 7%	2718 / 2%	128981 / 100%

Table 5. Binary Logistic Models for Selectin on Own Characteristics. This table shows migrant selection among sons aged 18 or under and living with father in 1901. Base year is 1901 and the outcome year is 1910/1911. All characteristics are pre-migration characteristics. Provincial fixed effects. Odds coefficients.

Binary Logistic Models for Selectin on Own Characteristics

	Dependent Variable:		
	Moved Rural	Moved Urban	Moved USA
	1	2	3
Occupation [reference = Laborer]			
Farmers	0.50***	0.50***	0.96
	(-18.02)	(-20.86)	(-0.71)
Skilled farm workers	0.44***	0.93	1.02
	(-4.31)	(-0.56)	(0.09)
Farm laborer	0.95	0.77***	0.99
	(-1.39)	(-7.54)	(-0.11)
White-collar workers	1.54***	1.71***	0.95
	(11.25)	(16.04)	(-0.79)
Foremen and skilled workers	1.01	1.28***	1.01
	(0.16)	(7.41)	(0.22)
Medium skilled workers	1.10*	1.25***	1.07
	(2.27)	(6.29)	(0.96)
Can read and write	1.10*	1.20***	1.00
	(2.48)	(4.87)	(0.07)
Protestant	0.93*	1.63***	0.96
	(-2.57)	(21.50)	(-0.99)
Speaks Irish	0.84**	0.78***	1.41***
	(-3.18)	(-5.17)	(5.54)
Lives with parents	0.46***	0.63***	0.88***
	(-28.87)	(-21.19)	(-3.81)
Unmarried	1.41***	1.27***	1.06
	(10.20)	(8.60)	(0.86)
Province [reference = Leinster]			
Connaught	0.81***	0.62***	2.19***
	(-5.48)	(-12.25)	(15.66)
Munster	0.65***	0.79***	1.80
	(-13.73)	(-8.51)	(13.02)
Ulster	0.77***	1.05*	1.30***
	(-9.09)	(1.98)	(5.49)
Observations	168,438	168,438	168,438

Notes: $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Controls include: age, age squared

Test statistics presented in parentheses.

Table 6. Binary Logistic Regressions for Selection Based on Father's Occupation. This table shows migrant selection among sons aged 18 or under and living with father in 1901. Base year is 1901 and the outcome year is 1910/1911. All characteristics are pre-migration characteristics. Provincial fixed effects. Odds coefficients.

Binary Logistic Models for Selectin on Father's Characteristics

	Dependent Variable:		
	Moved Rural	Moved Urban	Moved USA
	1	2	3
Occupation of father [reference = Laborer]			
Farmers	0.72***	0.70***	1.31***
	(-5.78)	(-8.41)	(3.45)
Skilled farm workers	0.61	0.65*	1.47
	(-1.88)	(-2.19)	(1.64)
Farm laborer	1.40***	0.87*	1.00
	(5.42)	(-2.56)	(-0.02)
White-collar workers	1.35***	2.37	1.23*
	(4.56)	(19.22)	(2.06)
Foremen and skilled workers	0.86	1.26***	1.15
	(-2.19)	(5.08)	(1.52)
Medium skilled workers	0.83*	1.25***	0.93
	(-2.50)	(4.36)	(-0.61)
Father can read and write	1.15**	1.50	0.87**
	(3.27)	(11.62)	(-2.96)
Protestant	1.09	1.58***	1.13*
	(1.91)	(15.81)	(2.03)
Speaks Irish	0.82	0.80**	1.38***
	(-1.93)	(-3.13)	(3.56)
Province [reference = Leinster]			
Connaught	0.86**	0.72***	2.32***
	(-2.74)	(-7.18)	(12.77)
Munster	0.79	0.83***	2.01***
	(-4.99)	(-5.42)	(11.34)
Ulster	0.83	1.12***	1.32***
	(-4.08)	(3.71)	(4.21)
Observations	128,332	128,332	128,332
Notes:	*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$		
Controls include: age, age squared			
Test statistics presented in parentheses.			

Table 7. The Effect of Land Wealth on Migration from Rural Areas. Estimates from the Interaction effect of Land Value, Gini and Occupation are presented in Figure 5.

The Effect of Land Wealth on Migration from Rural Areas

	Dependent Variable: Left Home County			
	1	2	3	4
Gini	1.02	1.04	1.09	1.12
	(0.28)	(0.54)	(1.13)	(1.44)
Land value	1.00	1.07	0.97***	1.06
	(-0.64)	(1.95)	(-3.48)	(1.72)
Gini x Land value		0.84*		0.81**
		(-2.15)		(-2.59)
Occupation of father [reference = Farmer]				
Laborer			1.13***	1.14***
			(6.22)	(6.37)
Skilled/white-collar workers			1.65***	1.65***
			(24.37)	(24.41)
Observations	142,943	142,943	142,943	142,943

Notes: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Controls include: age, age squared

Test statistics presented in parentheses. Column 4 shows the main effects for the interaction graphed in Figure 5.

Table 8. The Effect of Birth Order on Migration from Rural Areas

The Effect of Birth Order on Migration from Rural Areas

	Dependent Variable: Left Home County		
	1	2	3
Occupation of father [reference = Farmer]			
Laborer	1.16***	1.16***	1.21***
	(4.07)	(4.14)	(3.65)
Birth order [Reference = First son]			
Last son		1.02	0.98
		(0.31)	(-0.32)
Middle son		1.12**	1.19***
		(2.99)	(4.07)
Only son		0.75***	0.66***
		(-4.45)	(-5.11)
Laborer x Last son			1.15
			(1.17)
Laborer x Middle son			0.79**
			(-3.01)
Laborer x Only son			1.46**
			(2.76)
Observations	38,236	38,236	38,236
Notes:	*p < 0.05, **p < 0.01, ***p < 0.001		

Controls include: age, age squared

Test statistics presented in parentheses. Column 3 shows the interactions which are graphed in 6.

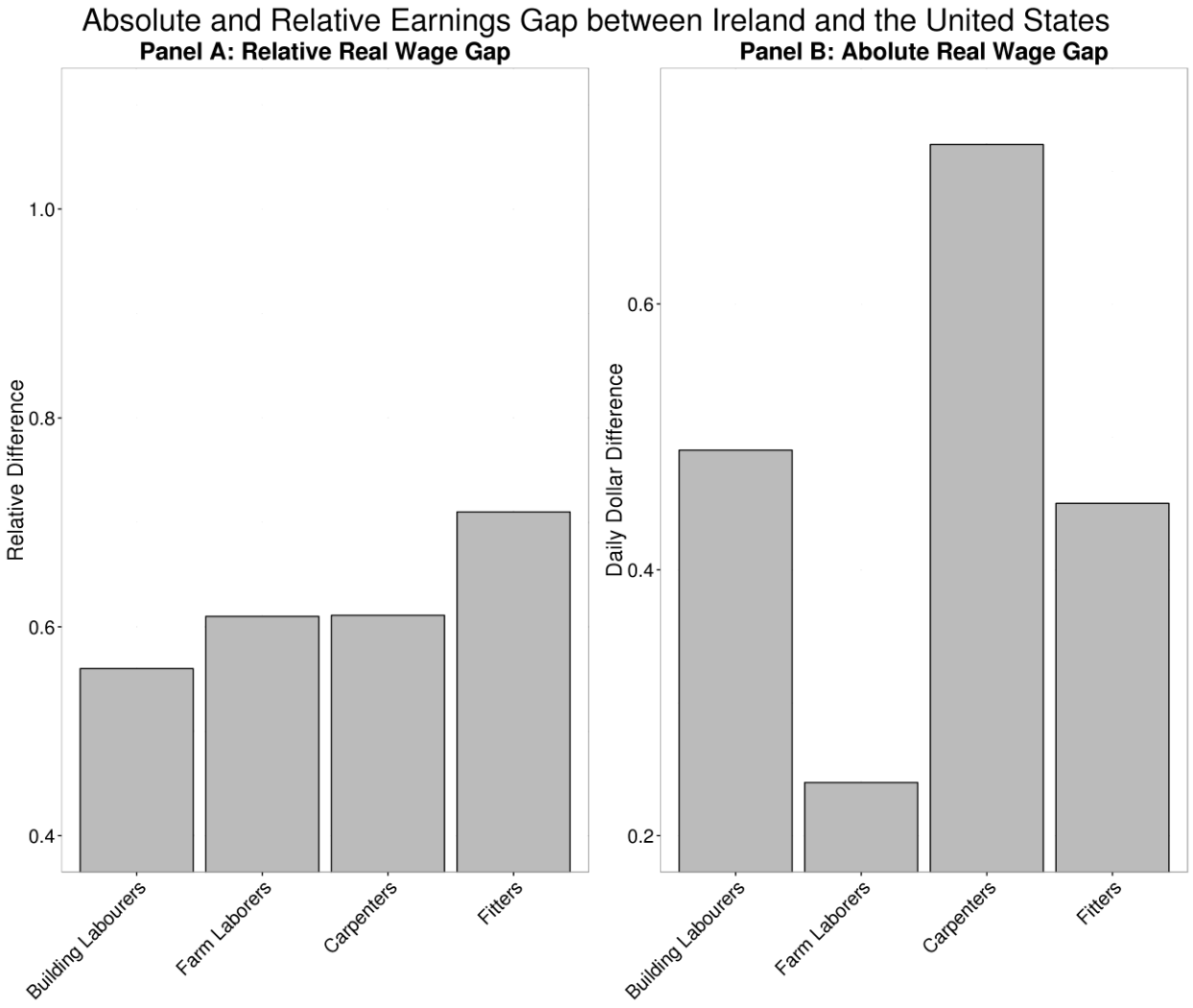


Figure 1. Absolute and Relative Earnings Gap between Ireland and the United States. The bars in Figure 1 show the real wage gap between building laborers, carpenters, farm laborers and fitters in Ireland and the United States. In Panel A, a value of 1 implies that real wages are identical in Ireland and the US while a value of 0.6 implies a given occupational wage in Ireland is 60 percent of its US level. Panel B shows the absolute gap in wages by occupation between Ireland and the US. The data on relative wages came from Boyer et al. (1993, 1994) while the data on absolute wages came from the reports of the Bureau of Labor Statistics.

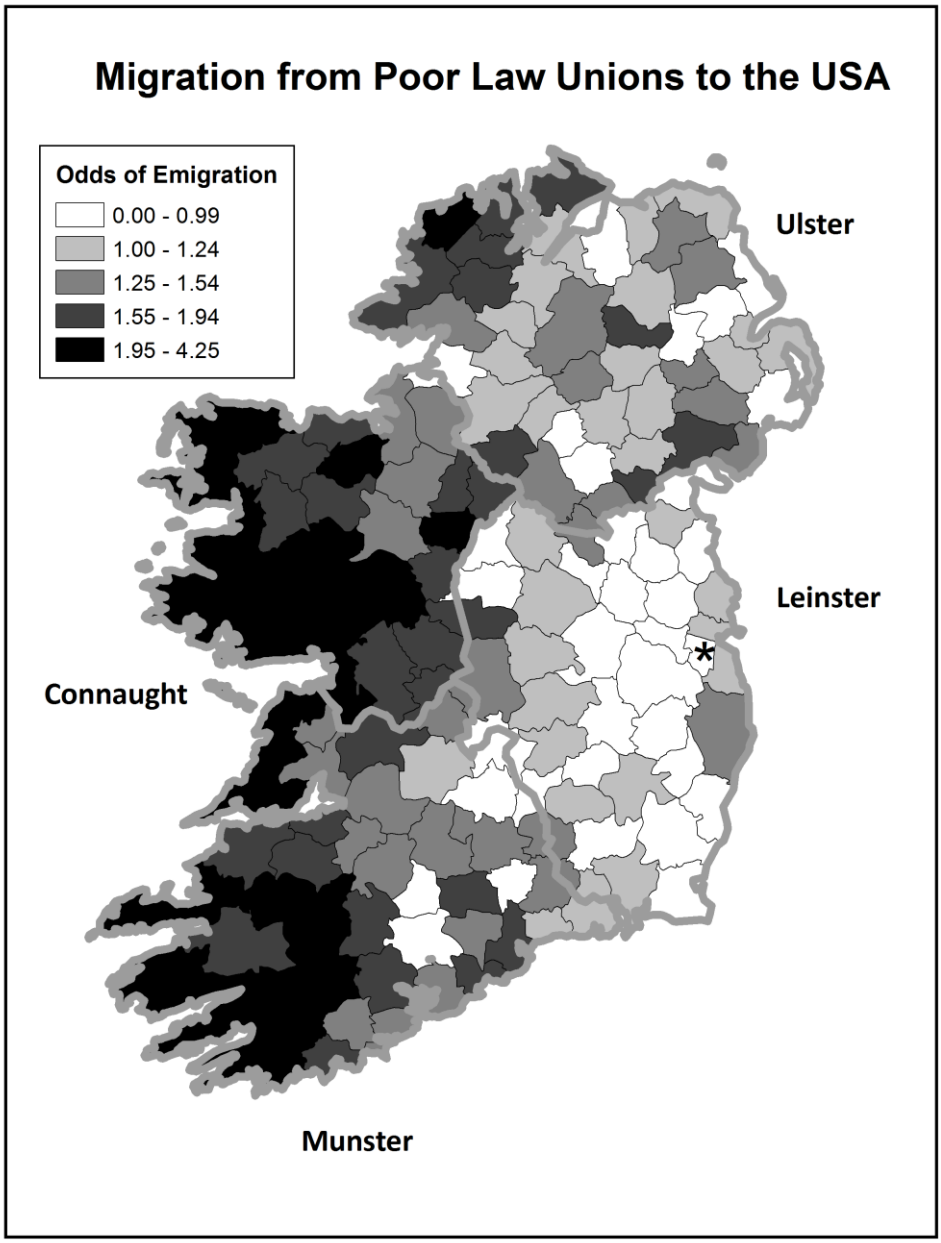


Figure 2. Migration from Poor Law Unions to the USA. Figure 2 shows the odds ratios derived from a Multinomial logit model with Poor Law Union (PLU) fixed effects in 1901. The omitted category for the fixed effects was the PLU of Dublin South (marked on the figure with an asterisk "*". Breaks in the data were assigned using quantiles.

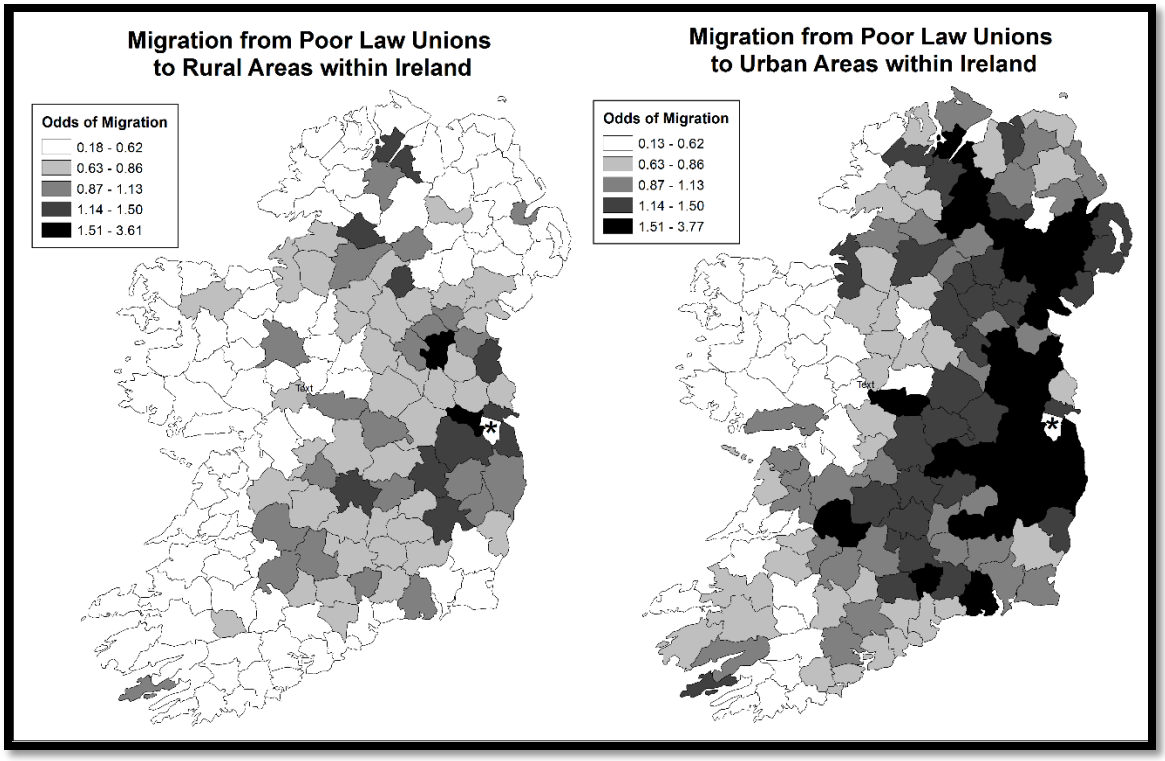


Figure 3. Migration from Poor Law Unions to Areas within Ireland. Figure 3 shows the odds ratios derived from a Multinomial logit model for migration within Ireland with Poor Law Union (PLU) fixed effects. The omitted category for the fixed effects was the PLU of Dublin South (marked on the figure with an asterisk "*'). Breaks were assigned consistently in both maps and were determined using quantile breaks.

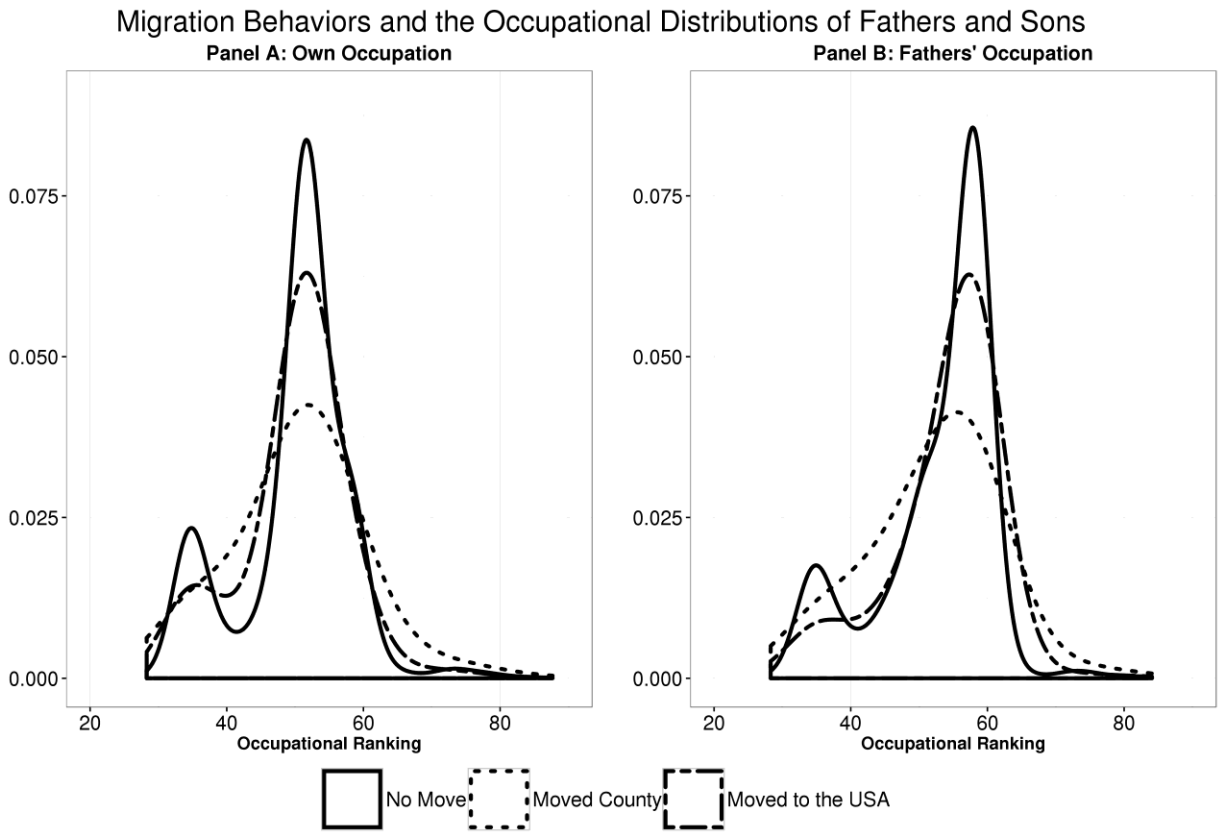


Figure 4. Migration Behaviors and the Occupational Distributions of Fathers and Sons. These graphs plot the kernel density of the HISCAM index for non-movers, inter-county and international migrants. Higher values of the index correspond to higher status occupations. The graphs shows evidence of positive selection into all forms of migration. However, inter-county movers are overrepresented at the tails of the distribution.

Figure 5. The Effect of Inequality on Migration in Farming and Laboring Families. Confidence intervals set at 95%. The maximum, minimum and mean values of the Gini value correspond to 0.64, 0.22 and 0.44 respectively. These predictions are derived from Model 4 in Table 7.

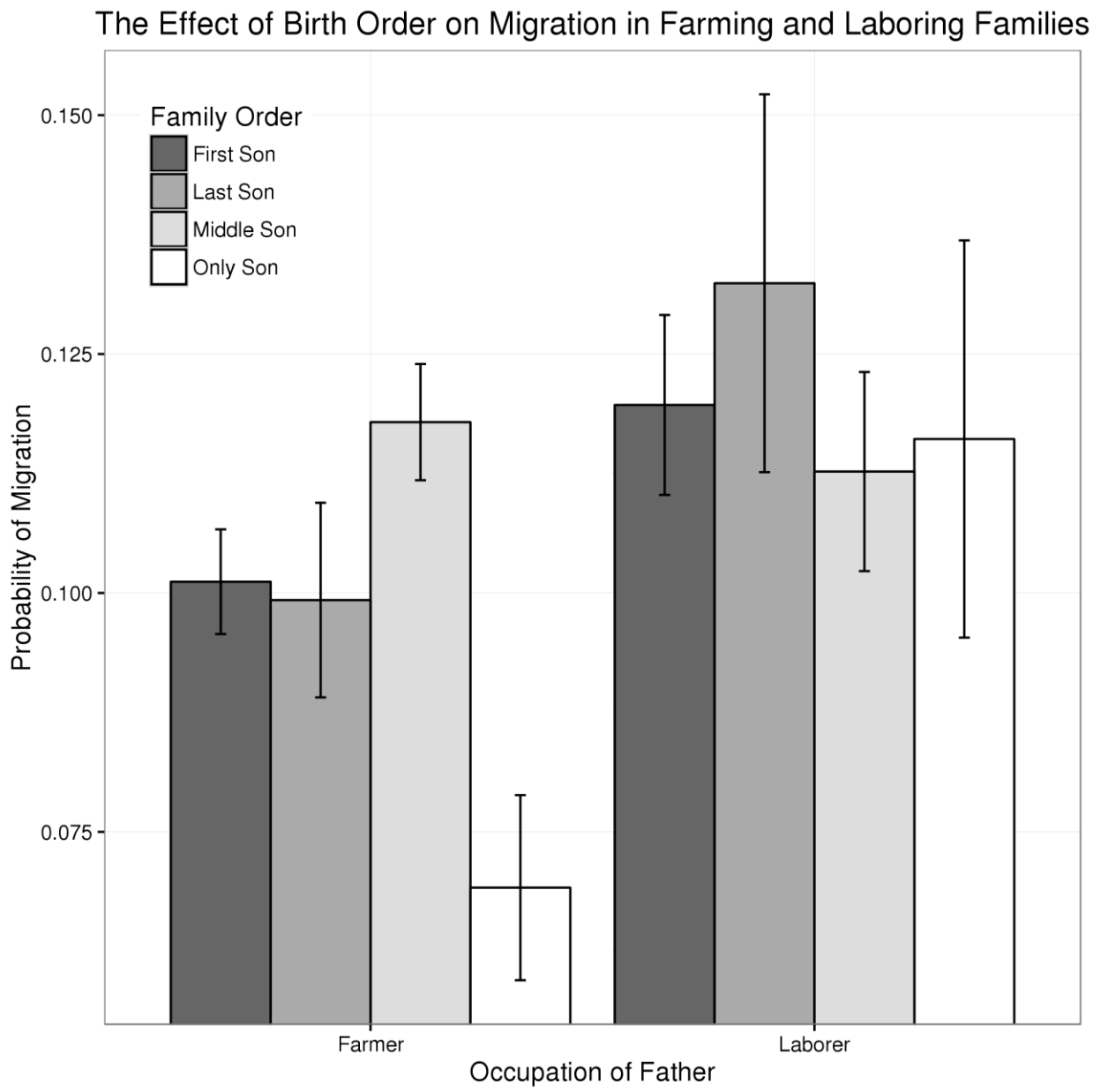


Figure 6. The Effect of Birth Order on Migration in Farming and Laboring Families. Confidence intervals are set at 95%.

Appendix

Appendix Table 1. Migration Decisions and Own Occupations (row percentages).

	1	2	3	4	5	6	7
Occupation	Status	HISCAM Index (mean)	Stayed in County	Moved County to Rural Area	Moved County to Urban Area	Moved to the USA	Total
Agricultural							
Farmers	High	58	77064 / 90%	2657 / 3%	3491 / 4%	2165 / 3%	85377 / 100%
Skilled farm workers	Medium	53	1311 / 87%	43 / 3%	101 / 7%	46 / 3%	1501 / 100%
Farm laborers	Low	52	30001 / 84%	2322 / 6%	2424 / 7%	1025 / 3%	35772 / 100%
Non-agricultural							
White-collar workers	High	58	17856 / 72%	2624 / 11%	3856 / 16%	526 / 2%	24862 / 100%
Foremen and skilled workers	Medium	50	22333 / 79%	1882 / 7%	3332 / 12%	638 / 2%	28185 / 100%
Medium skilled workers	Medium	46	16744 / 78%	1600 / 7%	2515 / 12%	548 / 3%	21407 / 100%
Laborers	Low	35	20741 / 82%	1728 / 7%	2190 / 9%	614 / 2%	25273 / 100%
Total	-	53	186050 / 84%	12856 / 6%	17909 / 8%	5562 / 3%	222377 / 100%

Appendix Table 2. Selection to the USA with Sample Comparison.

Selection to the USA with Sample Comparison

	Dependent Variable: Moved to the USA							
	Full Match				Equal Match			
	1	2	3	4	5	6	7	8
HISCAM index	0.99	1.16**			0.97	1.15***		
	(-0.73)	(7.03)			(-1.74)	(6.40)		
Occupation [reference = Laborer]								
Farmers			1.09	1.55***			1.15**	1.61***
			(1.69)	(5.79)			(2.93)	(6.17)
Skilled farm workers			1.24	1.75*			1.41*	1.72*
			(1.23)	(2.38)			(2.11)	(2.25)
Farm laborer			1.05	1.04			1.15**	1.13
			(0.81)	(0.37)			(2.58)	(1.22)
White-collar workers			0.95	1.26*			0.81**	1.22
			(-0.72)	(2.32)			(-3.27)	(0.29)
Foremen and skilled workers			1.00	1.14			0.89*	1.04
			(-0.04)	(1.46)			(-1.98)	(0.39)
Medium skilled workers			1.04	0.90			0.94	0.81
			(0.54)	(-0.99)			(-1.05)	(-1.90)
Characteristics of:	Son	Father	Son	Father	Son	Father	Son	Father
Observations	168,438	128,341	168,438	128,341	76,993	54,650	76,993	54,650

Notes: $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Controls include: age, age squared, province fixed effects

Test statistics presented in parentheses.

Appendix Table 3. Binary Logistic Models for Selectin on Own Characteristics with PLU Fixed Effects.

Binary Logistic Models for Selectin on Own Characteristics with PLU Fixed Effects

	Dependent Variable:		
	Moved Rural	Moved Urban	Moved USA
	1	2	3
Occupation [reference = Laborer]			
Farmers	0.49***	0.52***	0.94
	(-17.63)	(-18.52)	(-1.16)
Skilled farm workers	0.51***	1.01	0.82
	(-3.49)	(0.08)	(-1.10)
Farm laborer	0.96	0.78***	1.02
	(-1.07)	(-6.94)	(0.37)
White-collar workers	1.52***	1.78***	0.93
	(10.73)	(17.21)	(-1.04)
Foremen and skilled workers	1.00	1.29***	1.01
	(-0.01)	(7.60)	(0.17)
Medium skilled workers	1.11*	1.26***	1.07
	(2.52)	(6.35)	(0.94)
Can read and write	1.07	1.17***	1.06
	(1.79)	(4.17)	(1.01)
Protestant	1.02	1.65**	0.97
	(0.51)	(20.69)	(-0.70)
Speaks Irish	1.03	0.92	1.09
	(0.43)	(-1.59)	(1.13)
Lives with parents	0.47***	0.64***	0.86***
	(-27.96)	(-20.48)	(-4.35)
Unmarried	1.34***	1.21***	1.13
	(7.92)	(6.36)	(1.79)
Observations	168,438	168,438	168,438
Notes:	*p < 0.05, **p < 0.01, ***p < 0.001		

Controls include: age, age squared, PLU FE

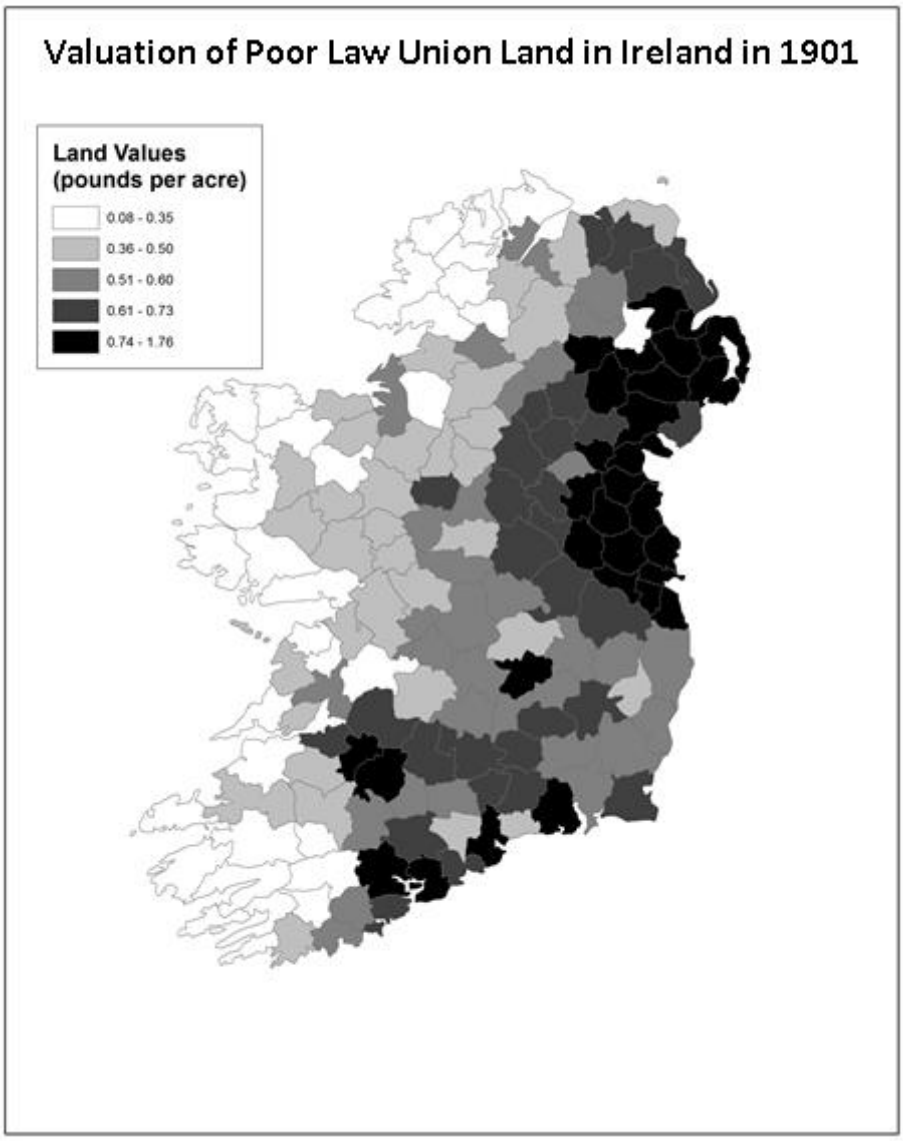
Test statistics presented in parentheses.

Appendix Table 4. Binary Logistic Models for Selectin on Father's Characteristics with PLU Fixed Effects.

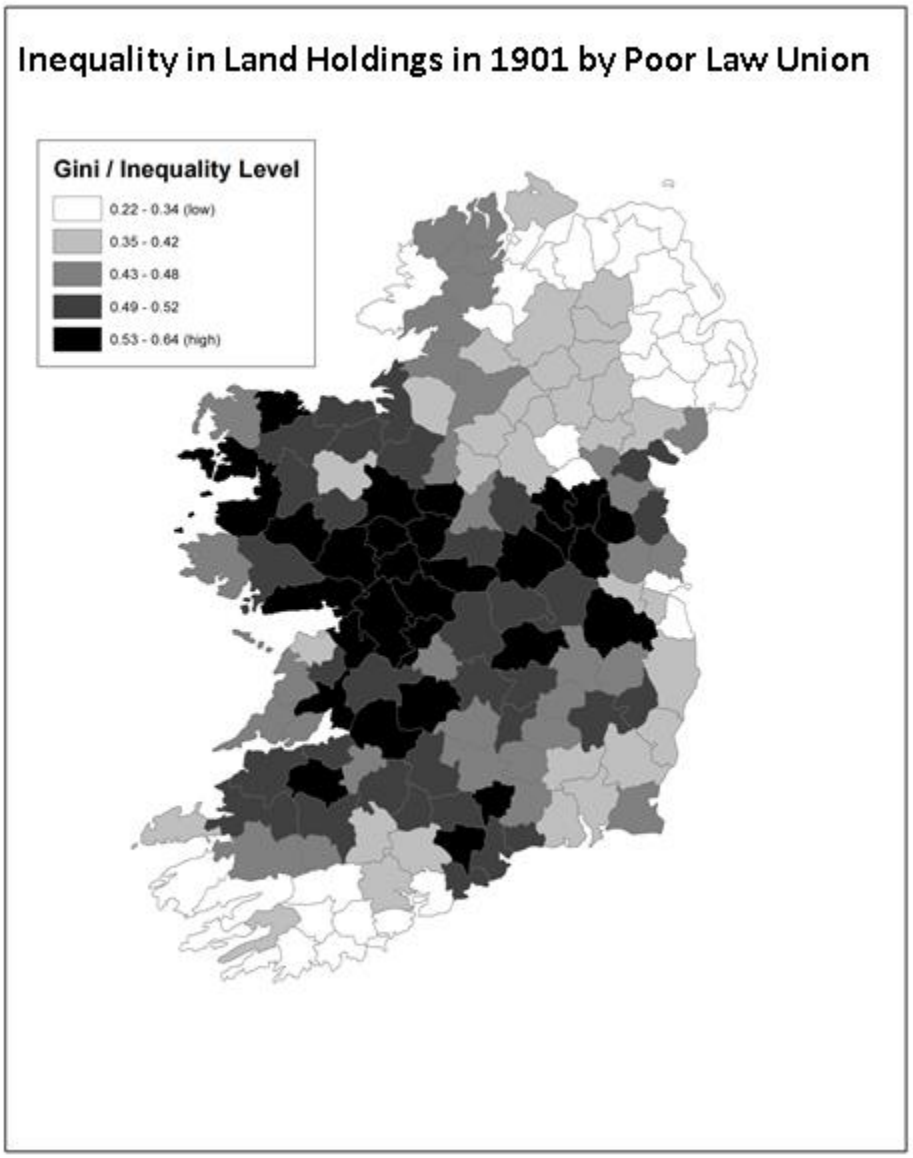
Binary Logistic Models for Selectin on Father's Characteristics with PLU Fixed Effects

	Dependent Variable:		
	Moved Rural	Moved Urban	Moved USA
	1	2	3
Occupation of father [reference = Laborer]			
Farmers	0.59***	0.62***	1.14
	(-8.97)	(-10.94)	(1.65)
Skilled farm workers	0.70	0.72	1.31
	(-1.34)	(-1.66)	(1.12)
Farm laborer	1.20***	0.77***	0.98
	(2.84)	(-4.82)	(-0.20)
White-collar workers	1.26***	2.41***	1.18
	(3.45)	(19.27)	(1.60)
Foremen and skilled workers	0.84**	1.28***	1.12
	(-2.62)	(5.30)	(1.23)
Medium skilled workers	0.87	1.28***	0.93
	(-1.83)	(4.89)	(-0.61)
Father can read and write	1.15**	1.51***	0.93
	(3.18)	(11.69)	(-1.53)
Protestant	1.33***	1.74***	1.20**
	(6.25)	(17.89)	(2.94)
Speaks Irish	1.18	1.04	1.05
	(1.47)	(0.57)	(0.43)
Observations	128,332	128,332	128,332

Notes: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$
Controls include: age, age squared, PLU FE
Test statistics presented in parentheses.



Appendix Figure 1. Valuation of Poor Law Union Land in Ireland in 1901. This map shows land value per acre, where black represents high land values and white corresponds to low land values. Land values were lower on Ireland's less developed west coast and higher in the more prosperous in-land agricultural and in more urbanized areas along the eastern and southern coast.



Appendix Figure 2. Inequality in Land Holdings in 1901 by Poor Law Union. This map shows lower levels of inequality on the northern coast of Ireland and in the southwest.