Return Migration and the Age Profile of Retirement Among Immigrants[*]

Deborah A. Cobb-Clark, Corresponding Author

Melbourne Institute of Applied Economic and Social Research
University of Melbourne
Parkville VIC, 3010 Australia
d.cobb-clark@unimelb.edu.au
Ph: 61 3 9035 4266
Fx: 61 3 8344 2111
and
Institute for the Study of Labor (IZA)

and

Steven Stillman

Department of Economics
University of Otago
Po Box 56
Dunedin, New Zealand
steven.stillman@otago.ac.nz
Ph: 64 3 479 8654
and
Institute for the Study of Labor (IZA)

6 June 2012

Abstract:
We analyze the relationship between return migration rates and the age profile of retirement within immigrant populations. Our simple theoretical model illustrates that under reasonable conditions the probability of return migration is maximized at retirement. This implies that different immigrant populations will have different retirement profiles, not only because individual retirement behavior differs, but also because the propensity for return migration varies. Consistent with our theoretical model, we estimate a negative relationship between immigrants' retirement status and the return migration rate of their fellow countrymen. As theory suggests, this link is strongest for immigrants who are near the retirement age.

---

1. Introduction

In the coming decades, many countries are expected to experience dramatic increases in the fraction of their populations over the age of 65 and relative falls in the share of their working-age populations (Anderson and Hussey 2000; Bijak et al. 2007; Gruber and Wise 2001). The resulting increase in the demand for health care and old-age pensions – in the face of a more or less constant tax base – has left governments searching for strategies to cope with the anticipated fiscal pressures stemming from population aging. Whether or not increased immigration might reverse the trend toward population aging and increasing dependency ratios has been hotly debated. In 2001, the United Nations undertook a major study of the 'replacement migration' question and concluded that it was extremely unlikely that the magnitude of the immigration flow necessary to prevent ageing in most countries could ever be achieved. Since then, most experts have come to agree that immigration alone cannot provide a long-term, permanent solution to the effects of population aging (Bermingham 2001; Bijak et al. 2007; Boersch-Supan 2001; Holzmann 2005; Rendall and Ball 2004). After all, it is argued, immigrant populations also age generating their own fiscal pressure.

Ultimately, however, the effect of immigration on the economic activity and demographic structure of host countries will depend heavily on immigrants' retirement decisions and return migration patterns. Host countries will experience lower costs associated with old-age pensions and health care if immigrants work while they are young, but then delay their retirement or choose to return home in their old age.[1] Unfortunately, we know almost nothing about the labor market behavior of older immigrant workers – despite an explosion of research analyzing retirement decisions more generally. Moreover, although

---

[1] Most demographic projections of the effect of immigration on structural aging assume a constant rate of return migration, ignoring variation in return migration rates across source countries or across the life cycle. Rendall and Ball (2004) are an exception.

return migration occurs frequently, we also know very little about how the economic activity of temporary and permanent migrants might differ.[2]

This paper fills a void in the literature by investigating the relationship between immigrants' retirement status and the prevalence of return migration from the host country to their country of origin. We begin by developing a simple theoretical model to illustrate that under reasonable conditions the probability of return migration is maximized at retirement. Despite a large, mainly theoretical, literature analyzing the return migration decision (see Dustmann and Weiss 2007 for a review), the effect of retirement on immigrants' incentives to return home have been completely overlooked. Using this framework and data on immigrants in the Household, Income and Labour Dynamics in Australia (HILDA) Survey, we then examine the relationship between the propensity to be retired and the return migration rate of one's fellow countrymen. In addition, we examine whether, as hypothesized by our model, this link is strongest for those individuals who are closest to the retirement age.

Australia is a particularly attractive country for studying the effects of return migration on the age profile of immigrant retirement, because nearly one in four individuals in the Australian population is foreign-born (ABS 2007a) and, unlike the case in most countries, accurate data on return migration rates for individuals from different countries of birth are available. In this paper, we do not estimate a behavioral model of individual immigrants' retirement decisions for two reasons. First, while HILDA provides longitudinal data on retirement status for over 2,000 immigrants age 45 and above, only 136 retire during the first five waves which we use for our analysis, making it impossible to estimate a properly specified behavioral model that controls for unobserved heterogeneity in tastes for leisure. Second, HILDA does not follow individuals who move outside Australia making it

---

[2] Estimates suggest, for example, that between 20 and 50 percent of legal immigrants to the United States emigrated to another country in the 1960s and 1970s (Jasso and Rosenzweig 1982; Warren and Peck 1980). See Dustmann and Weiss (2007) for a review of the evidence on the magnitude of return migration.

impossible to estimate a joint model of retirement and return migration.[3] Hence, we instead focus on examining the way in which the potential costs and benefits of return migration affect the retirement status of immigrant populations.

Consistent with our theoretical model, we estimate a negative relationship between immigrants' retirement status and the return migration rate of their fellow countrymen, i.e. immigrants from countries with higher return migration rates are less likely to be observed to be retired in Australia compared to immigrants from countries with lower return migration rates. As theory suggests, this link is strongest for immigrants who are at (or near) the retirement age. Overall, there is a much closer link between return migration and the retirement status of immigrant men suggesting that for women return migration may be a family rather than individual decision.

2. The Previous Literature: Return Migration and Immigrant Retirement

The economics literature on return migration has been primarily concerned with understanding the incidence and optimal timing of this decision (Hill 1987; Stark et al. 1997; Dustmann and Kirchkamp 2002; Dustmann 2003b). While immigration itself typically stems from superior economic opportunities in the host country, immigrants' return migration is assumed to be driven by preferences for (or lower costs of) consumption at home (Hill 1987; Djajić 1989; Dustmann 1997b; Stark et al. 1997) or concerns for one's children (Dustmann 2003a). The potential for return migration has important consequences for immigrants' host-country decisions regarding work effort (Djajić 1989; Galor and Stark 1991), labor market participation (Dustmann 1997a), savings behavior (Galor and Stark 1990; Dustmann 1997b; Stark et al. 1997), and human capital investments (Dustmann 1999, 2007).

---

[3] Estimating a joint behavioral model of retirement and return migration decisions is of great interest. However, this requires panel data which includes information about labor force status and follows individuals who emigrate. Such data are not currently available.

For example, immigrants who anticipate returning home to relatively unfavourable economic conditions are expected to have higher participation rates and to work harder than either permanent immigrants or the native-born (Galor and Stark 1991; Dustmann et al. 1997a). Temporary migration may also reduce the incentives for human capital investment (Dustmann 1999, 2007), but increase the incentives for remittances (Merkle and Zimmermann 1992). Finally, the effect of re-migration on savings behavior depends on the wage differential and relative risk in the host and home countries (Dustmann 1997b).[4]

Difficulties in measuring return migration have limited empirical analyses of this process. As Dustmann and Weiss (2007) note, "there are typically no procedures in place that register immigrants who leave a country". At the macro level, this leaves researchers attempting to combine information from various censuses and surveys to infer the numbers (and characteristics) of immigrants who appear to have emigrated (e.g. Dustmann and Weiss 2007). At the micro level, researchers often rely on immigrants' stated intensions regarding return migration to understand how the behavior of temporary and permanent migrants differs. The general conclusion is that immigrants who intend to emigrate both save and remit more than immigrants who intend to remain permanently in the host country (Merkle and Zimmermann 1992; Sinning 2007; Bauer and Sinning in press).

Previous research has not studied the link between immigrants' intentions to emigrate and the timing of their retirement – though it seems reasonable to expect one. Moreover, given the importance of wage differentials in economic models of the migration decision, it is surprising that theoretical models do not account for the effect of retirement on the incentives for return migration.[5] The empirical evidence certainly suggests that many immigrants anticipate either returning to their home country or moving frequently between the home and

---

[4] Borjas and Bratsberg (1996) conclude that return migration intensifies the selection associated with the initial immigration process.

[5] The exception is Dustmann and Kirchkamp (2002) who model the employment status of return migrants in the home country.

host countries after retirement (De Coulon and Wolff 2006).[6] In what follows, we illustrate the theoretical effect of retirement in raising the incentives for immigrants to leave the host country and return home. We subsequently assess the effect that the level of return migration has on the age profile of retirement in the immigrant population.

2.   Theoretical Framework and Estimation Model

2.1 Modelling the Effect of Retirement on Return Migration

We begin by developing a simple model of the net benefit of return migration concentrating on immigrants' decisions about where (rather than how much) to work.[7] Immigrants decide whether or not to return to their country of origin on the basis of the total future consumption achievable in the two countries until the end of life. The model is static and we do not account for either uncertainty in — or the trajectory of — wages, prices, or consumption over time. This simple approach allows us to abstract from unnecessary complexity.

Our main interest is in understanding how retirement affects the incentives for return migration. An individual's retirement date is assumed to be determined outside the model, perhaps as a result of institutional arrangements that define the age at which he or she may access either public or employer-provided pension benefits. Immigrants save throughout their working lives to fund consumption in retirement. We assume that there are fixed costs associated with return migration, for example retirement savings may only be partially portable and thus transferring them to the origin country may involve a loss of benefits. Finally, we assume that immigrants' preferred bundle of consumption goods is constant

---

[6] This potential for return migration may provide a partial explanation for nativity differences in retirement expectations (Cobb-Clark and Stillman 2009).
[7] See Hill (1987) who adopts a similar approach.

across countries, but that it is less costly in the origin than in the host country (see Stark et al. 1997; Dustmann and Kirchkamp 2002).[8]

Time is continuous in the model. Immigrants begin their lives in at $t = 0$ in the host country and die at $t = 1$. Retirement occurs at time τ with $0 < \tau < 1$. Consider first the savings process. In the period prior to retirement, immigrants save a portion of their earnings to fund post-retirement consumption. Accumulated retirement savings at time t are then given by:

$$S_t = (1 - R)\left[t(w^H - c^H) \right] + R\left[\tau(w^H - c^H) - (t - \tau)c^H \right] \tag{1}$$

where w^H denotes host-country wages, c^H is the consumption level in the host country, and R is an indicator variable that takes the value 0 in the pre-retirement period $(t < \tau)$ and 1 in the post-retirement period $(t \geq \tau)$. In the pre-retirement period $(R = 0)$, savings are equal to total earnings minus total consumption to date. In the post-retirement period $(R = 1)$, savings equal the total savings accumulated at retirement minus any post-retirement consumption. Consumption levels are chosen so as to exhaust any savings at the end of life.

Following others in the literature (e.g. Dustmann 1997a, 2007; Dustmann and Kirchkamp 2002), we assume that at each period $t = t^*$ immigrants make a decision whether or not to leave the host country and return home. Immigrants benefit from return migration if their accumulated retirement savings and future earnings afford a higher standard of living in the origin country than in the host country. Specifically, the net benefit to return migration at time t^* is given by the difference in future total consumption achievable in the two countries. Given that we assume that there are no bequests and all resources are exhausted at death, this implies that future consumption over one's remaining life time is equivalent to future resources. Immigrants are assumed to emigrate whenever the net benefits from doing so are positive. Return migration occurs, therefore, if and only if

---

[8] The assumption that consumption is cheaper in the origin country is needed in this simple model to generate return migration after retirement, but more generically immigrants may instead desire to emigrate because the marginal utility of leisure is higher in the origin country perhaps for cultural or familial reasons.

$$NB_{t^*} = \Pi_{t^*}^O - \Pi_{t^*}^H > 0 \tag{2}$$

where $\Pi_{t^*}^O$ and $\Pi_{t^*}^H$ are the future resources available at time t^* if immigrants do and do not choose to return migrate, respectively. More specifically, the net benefit to return migration at time t^* can be written in terms of accumulated savings and any future earnings over one's remaining career as follows

$$NB_{t^*} = \frac{1}{p}\left\{S_{t^*} + (\tau - t^*)w^O(1-R) - \bar{C}\right\} - \left\{S_{t^*} + (\tau - t^*)w^H(1-R)\right\} \tag{3}$$

where w^O captures origin-country wages, $\bar{C}$ represents fixed costs (e.g. the loss of pension benefits, travel costs, etc.) associated with return migration.[9] The host-country price level is normalized to 1 and relative origin-country prices are given by p. We assume $w^O < w^H$ and $p < 1$ implying that although economic opportunities are better in the host country than in the origin country, immigrants' preferred consumption bundle is less expensive at home.

The net benefit to return migration will be positive at time t^* if the resources available for consumption over an immigrant's remaining life time are higher in the origin country than in the host country. The last term in equation (3) reflects the total resources available if an immigrant decides to remain in the host country. Total resources include retirement savings accumulated to time t^* while working in the host country as well as an immigrant's earnings over his or her remaining working life in the host country. Post-return resources levels are given by the first term on the right-hand side of equation (3). Although accumulated savings are the same (S_{t^*}), future resources will be lower in the origin country because $w^O < w^H$ and because return migrants must also pay the fixed costs associated with return migration ($\bar{C}$). At the same time, each dollar of resources funds more consumption in the origin country because prices (p) are lower. Consistent with other models in the literature (Djajić 1989;

---

[9] We ignore the effects of time discounting for simplicity.

Dustmann 1997b; Stark et al. 1997), remigration may occur despite persistently higher host-country wages because consumption is less expensive in the origin country.

How does retirement affect the probability of return migration? To address this question, we consider the way in which the incentives for return migration change over time both before and after retirement. In the post-retirement period ($t^* \geq \tau$), immigrants choose to return to their country of origin if and only if

$$M_{t^*} = I\left(\frac{(1-p)S_{t^*} - \bar{C}}{p} > 0\right)$$

(4)

where I denotes a simple indicator function and M reflects the return migration decision. Substituting accumulated savings as given by equation (1) and rearranging implies that

$$\begin{aligned} M_{t^*} &= I\left((1-p)S_{t^*} > \bar{C}\right) \\ &= I\left((1-p)[S_R - (t^* - \tau)c^H] > \bar{C}\right) \end{aligned}$$

(5)

Hence, after retirement, return migration occurs if the costs of return migration ($\bar{C}$) are less than the additional consumption made possible by consuming one's remaining savings in the origin country where prices are lower. Equation (5) implies that the change in the probability of return migration over time in the post-retirement period is given by:

$$\frac{\partial \Pr(M=1)}{\partial t^*} = -(1-p)c^H.$$

(6)

Before retirement (i.e. in periods $t' < \tau$), however, immigrants also take into account the effect that return migration will have on their future earnings. Given the net benefit to return migration shown in equation (3), immigrants choose to return migrate in the pre-retirement period if and only if

$$M_{t'} = I\left(\frac{S_{t'} + (\tau - t')w^O - \bar{C} - p\left[S_{t'} + (\tau - t')w^H\right]}{p} > 0\right)$$

(7)

Substituting accumulated savings and rewriting implies that immigrants choose to return migrate in the pre-retirement period whenever:

$$
\begin{aligned}
M_t &= I\left(S_t + (\tau - t')w^O - pS_t + p(\tau - t')w^H > \overline{C}\right) \\
&= I\left((1-p)S_t - (\tau - t')(pw^H - w^O) > \overline{C}\right) \\
&= I\left((1-p)t'(w^H - c^H) - (\tau - t')(pw^H - w^O) > \overline{C}\right)
\end{aligned}
\tag{8}
$$

Immigrants return migrate before retirement only if the advantages of consuming one's accumulated savings in the origin country outweigh both the cost of return migration and the earnings loss associated with returning to a low-wage labor market. Thus, the change in the probability of return migration over the pre-retirement period is given by:

$$
\frac{\partial \Pr(M = 1)}{\partial t} = (w^H - w^O) - (1-p)c^H
\tag{9}
$$

There are several things to note about these changes over time. First, the probability of remigration declines over the post-retirement period so long as consumption in the origin country is less expensive than in the host country (i.e. $p < 1$) (see equation (6)). Every year that return migration is delayed involves a loss associated with consuming in the higher price market which is no longer being compensated by higher wages. In the pre-retirement period, the probability of return migration increases every year so long as the wage advantage afforded by the host country dominates the higher living costs. This will be true whenever there is a positive economic return to immigration to the host country in the first place. Together these relationships imply that the probability of return migration is maximized at the point of retirement when the wage advantage of the host country relative to the origin country is no longer relevant and the consumption benefits of moving one's retirement savings to the lower cost country are maximized.

3.2 Return Migration Rates and the Retirement Status of Immigrant Populations

The simple model discussed above is useful in highlighting how the incentives for return migration change when retirement occurs and higher relative wages are no longer a factor in immigrants' decisions about whether to stay or to return home. We now show how this interdependence between emigration and retirement affects the aggregate retirement status of the remaining immigrant population and then link this directly to the empirical models that we estimate.

Note that the probability that an immigrant *i* from sending country *j* retires in the host country is given by the joint probability:

$$Prob(R_{ij} = 1, M_{ij} = 0) = Prob(M_{ij} = 0 | R_{ij} = 1)Prob(R_{ij} = 1)$$

$$= [1 - Prob(M_{ij} = 1 | R_{ij} = 1)]Prob(R_{ij} = 1) \quad (10)$$

where, as before, *R* and *M* are indicator variables for being in the post-retirement period and having return migrated, respectively. Equation (10) demonstrates that there is a negative relationship between the probability that remaining immigrants are retired and the probability of emigrating in the post-retirement period. In the limit, when return migration to country *j* is nearly universal, none of the immigrants from country *j* remaining in the host country will be retired. This implies that different immigrant populations will have different retirement profiles, not only because individual retirement behavior differs, but also because variation in sending-country wages or price levels lead to differing propensities of return migration.

3.3 Estimation Model

To empirically analyze the relationship between country-specific return migration rates and the pattern of retirement, we estimate reduced-form models of retirement status controlling for country of birth-specific emigration rates and individuals' demographic and human capital characteristics. Including controls for characteristics that are potentially related to retirement status, such as age, years in Australia, education, and work experience, allows us

to account for the effect that differences in the composition of immigrant populations from different countries of origin plays in explaining the relationship between country of birth-specific emigration rates and retirement status. Since our objective is not to estimate a behavioral model of the retirement decision, but rather to understand the way that the propensity to be retired at a point in time (i.e. retirement status) differs among individuals from different countries of birth, we adopt a cross-sectional estimator, pooling data from multiple survey waves to improve efficiency.

We assume that an individual's propensity to be retired (R_i^*) can be expressed as:

$$R_{ij}^* = X_{ij}\beta + Z_j\phi + \varepsilon_{ij} \tag{11}$$

where X_{ij} captures demographic and human capital characteristics, Z_j, is the aggregate emigration rate over the previous five years for each sending country (see Section 4.2) and ε_{ij} is a random error term. Emigration rates are calculated using administrative data and capture the cross-national variation in institutional arrangements, price levels, etc. that underlie the aggregate costs and benefits of emigration for individuals from each specific origin country. The simple theoretical model discussed above shows that we should expect to find a negative relationship between country-specific emigration rates and the propensity for any individual immigrant to report being retired.

The propensity to be retired is unobserved, so we create an indicator variable reflecting actual retirement status. Specifically,

$$\Pr(R_{ij} = 1) = \Pr(X_{ij}\beta + Z_j\phi + \varepsilon_{ij} > 0) = \Phi(Q\gamma) \tag{12}$$

where $Q = (X_{ij}, Z_j)$, $\gamma = (\beta, \phi)$, and Φ is the standard normal cumulative density function.

Finally, we assume that $\varepsilon_{ij} \sim N(0,1)$, is independent of the explanatory variables in equation

(12) and is potentially clustered for individuals from the same country of birth j.[10]

4. The Data

4.1 The Household Income and Labour Dynamics Survey

The main data source used for the analyses in this paper is the Household Income and Labour

Dynamics in Australia (HILDA) Survey which collects longitudinal information from a

nationally-representative sample of more than 7,600 Australian households encompassing

almost 20,000 individuals aged 15 and older (see Wooden, et al. 2002). As 22.1 percent of

the Australian population is foreign-born (ABS 2007), the HILDA sample includes a large

number of immigrants from a range of origin countries (eighty-eight, in fact). Moreover,

while many studies of retirement behavior are based only on samples of older individuals,

each non-employed HILDA respondent aged 45 and over is asked about his or her retirement

status.[11] The ability to measure retirement status among several cohorts of foreign-born

workers from different countries of birth makes HILDA data well suited to examine the

relationship between the propensity of return migration and retirement status.

We pool the first five waves of HILDA data covering the years 2001 to 2005 to

examine the retirement status of foreign-born men and women over the age of 45. We have

made a number of necessary sample restrictions. Specifically, individuals under the age of 45

were not asked the retirement questions and have been dropped from the sample. We then

drop a small number of individuals who either have never worked or are missing information

for retirement status or other key variables of interest. This leaves us with a main estimation

---

[10] Note that this also accounts for clustering over time in the error-term for a particular individual. As discussed in Moulton (1990), statistical inference can be seriously misleading when a regressor is measured at a more aggregated level than the observations in a regression, unless the regression allows for clustering at this level.
[11] In particular, all non-employed respondents were asked "Have you retired (completely) from the workforce." Response categories include: yes, no, and never worked.

sample of 1,122 immigrant men and 1,032 immigrant women.[12] Each individual provides, on average, 3.6 waves of data, leading to 7,798 observations in our estimation sample. Details about sample individual characteristics for the analysis sample along with a comparison sample of the Australian-born are presented in Appendix Table 1.

4.2 The Probability of Return Migration

Although most countries do not systematically collect detailed information on emigrants (see Dustmann and Weiss 2007), Australia is an exception. Australia's status as an island nation means that all individuals entering or leaving the country do so through one of only seven international airports. Moreover, each person entering or leaving Australia is required to provide the Australian Department of Immigration and Citizenship (DIAC) with a completed Incoming or Outgoing Passenger declaration at the airport. These cards are legal documents and there are penalties for not filling them out completely or for making false statements. The data obtained from these cards are then matched to the personal information obtained from an electronic swipe of the person's passport.[13]

We use the published statistics on permanent departures calculated from these data (Department of Immigration and Citizenship 2007) along with census information (ABS undated) to calculate a country-specific emigration rate for 1996 – 2001 (M_j^{96-01}) for all 88 countries of births represented in HILDA as follows:

$$M_j^{96-01} = \frac{E_j^{96-01}}{E_j^{96-01} + P_j^{01}} \tag{13}$$

where E_j^{96-01} is the total number of individuals born in country j who permanently left Australia between 1996 and 2001 and P_j^{01} is the number of individuals enumerated in the

---

[12] This is out of a total non-aboriginal sample meeting the same criteria of 7,271 individuals, hence the proportion of the sample which is foreign-born is 29.6 percent. This is higher than in the overall Australian population because of the older age group being examined.

[13] See http://wwww.immi.gov.au and http://www.infrastructure.gov.au for more information.

2001 Australia census who were born in country *j*. The denominator of the ratio in equation (13) reflects the population of individuals from country *j* who would have resided in Australia in 2001 in the absence of emigration.

Information about both the weighted (by sample size) and unweighted densities of emigration rates are provided in Figure 1. The emigration rate of immigrants to Australia ranges from 0.005 (Italy) to 0.090 (Hong Kong).[14] Immigrants from China, New Zealand, and Hong Kong have relatively high return migration rates, while immigrants from countries such as Italy, India and Germany are more like to remain in Australia. Emigration rates are plotted on a log-scale in each graph and, as can be seen in the unweighted results, the distribution across countries in approximately log-normal. Thus, we use a log-normal functional form for the emigration rate in all our descriptive results and regression analyses. In all cases, this provides a better model fit than when we treat the emigration rate as a linear variable.

Figure 1 Here

4.3 The Timing of Retirement among Immigrants

We begin by examining the mean age, years in Australia and declared retirement status of the immigrants in our sample. The first column in Table 1 presents the results for the overall sample, while the remaining columns highlight the results for the five countries that each make up more than 4 percent of the foreign-born population in HILDA (in order of importance: UK; New Zealand; Italy; Germany; Netherlands) and four important Asian countries (China; Vietnam; India and Hong Kong). Overall, 43 percent of the men in our sample and 51 percent of the women are retired. For men aged 65 and above and women aged 59 and above, the figures are 91 and 89 percent, respectively.

Table 1 Here

---

[14] Taiwan has the highest emigration rate in our sample at 0.097, but there are only 9 immigrants from Taiwan in HILDA as opposed to 51 from Hong Kong, thus we focus on Hong Kong when making comparisons.

Our theoretical model predicts that as the net benefits of return migration increase, the proportion of the immigrant population that chooses to remain in Australia after retirement falls. Hence, we expect immigrants from countries with high return migration rates to be on average younger and less likely to be retired. Examining the results for the nine countries highlighted in Table 1, this general pattern emerges. For example, immigrant men from New Zealand, China, Hong Kong, and Vietnam are in their mid-fifties on average, while immigrant men from other source countries are, on average, in their early-sixties. Interestingly, the relationship between immigrants' average age and the length of time they have spent in Australia is not straight-forward. Although immigrant women from India and Hong Kong have both been in Australia for approximately three decades on average, the average age of women from India (60.5) is substantially higher than that of women from Hong Kong (54.4). These differences point to the importance of carefully accounting for age and years since migration in our estimation models.

We further investigate the links between average age, retirement status and emigration rates by plotting country-specific retirement rates for HILDA respondents aged 45 plus and the proportion of the immigrant population from each origin country aged 65 plus, as measured in the 2006 Census (ABS 2007b), against emigration rates (see Figures 2 and 3). The size of the plot circles in Figure 2 are proportional to the HILDA sample size for men/women from each origin country and the solid line in each graph is the best linear fit of the data (and the regression equation corresponding to this line is presented above the graph), with each point weighted by the HILDA sample size for men/women from each origin country. The plot circles and solid line are similarly defined in Figure 3 with the exception that we weight by origin-specific total immigrant population size since our independent variable in this figure is based on Census data.

Figures 2 and 3 Here

These figures indicate that, as predicted by our theoretical model, there is a large, negative, and significant relationship between a country's return migration rate and the fraction of that country's immigrant population in Australia that is either retired or over age 65. For example, only 12.2 percent of men and 35.3 percent of women from New Zealand aged 45 plus are retired compared to 58.2 percent of men and 71.2 percent of women from Italy. Likewise, less than 10 percent of the New Zealand-born population in Australia is aged 65 plus, while over 50 percent of the Italian-born population in Australia is in this age-group.

5. The Empirical Relationship between Return Migration and Retirement Status

5.1 Basic Regression Analysis

We now expand on the descriptive analysis in the previous section by using regression analysis to control for other socioeconomic characteristics that are related to the likelihood that individuals are retired and may also systematically differ by country of origin. We do this by estimating equation (12) using a maximum likelihood probit regression model. We estimate three alternative specifications of this equation. The first controls only for the country of origin-specific return migrant rate and indictor variables for the survey year and hence approximates the descriptive analysis in Figure 2. The demographic composition of different immigrant populations is closely related to their retirement patterns and may also be related to return migration rates. Thus, the second specification controls for each individual's age and years living in Australia (both as quadratics). The third specification adds additional controls for individuals' marital status, human capital (education, a quadratic in actual labor market experience, health status) household characteristics (number of children/adults) characteristics and whether or not they were born in an English language speaking country.[15]

---

[15] Specifications are as follows. Model 1: the log of the return migration rate (see equation (13) and indicator variables for waves 2–5. Model 2 also includes: a quadratic in age and a quadratic in years since first arrival in Australia. Model 3 further includes: a quadratic in years of actual work experience; indicator variables for having finished year 12, having a vocational certificate, having a tertiary degree; and being currently married (or cohabitating) as well as the length of this relationship; the number of individuals aged 0-15, 16-20 and 21 plus

Marginal effects and standard errors for the impact of the return migration on the likelihood that an individual is retired are reported separately by gender in Table 2.[16]

Table 2 Here

The results indicate that, when we do not control for differences in individual and household characteristics, we find a strongly significant (at the 1 percent level) negative relationship between the incidence of retirement and return migration rates. Specifically, male immigrants (female immigrants) from origin countries with a 100 percent higher return migration rate are 12.8 (8.7) percentage points less likely to be retired.[17] The relationship between return migration and retirement status falls by a quarter for men, but remains unchanged for women when we control for each individual's age and years living in Australia. In both cases, the relationship remains strongly significant.

Finally, our third specification adds detailed controls for individual and household characteristics. Accounting for disparity in the socio-demographic characteristics of immigrants from different origin countries reduces the estimated relationship between return migration and retirement status. The effect is still sizable for men (5.1 percentage points), but is no longer significant at conventional levels. At the same time, the effect all but disappears for immigrant women suggesting that the link between their retirement status and the return migration rate of their fellow countrymen is largely explained by variation across origin countries in women's socio-demographic characteristics.

---

in the household; indicators for good, average, fair/poor, or missing self-reported health status; and an indicator variable for being born in an English speaking country. The English-speaking background countries are the United Kingdom, Ireland, United States, Canada, New Zealand and South Africa. Alternative results from a model of non-employment (rather than declared retirement) are substantially the same and are reported in Appendix Table 2. Full results from all regression models are available by request from the authors.

[16] All estimation is performed in STATA 10. Standard errors are calculated using the delta method accounting for clustering on country of birth. This also controls for clustering of individuals across time.

[17] Recall that return migration rates range from 0.005 for Italy to 0.09 for Hong Kong hence a doubling of the emigration rate is well within the variation observed in the data.

5.2 Retirement Status and Return Migration Rates: Variation Across Age-Groups

While we find mixed evidence of a relationship between return migration and retirement status among the immigrant population as a whole, our theoretical model indicates that the link between retirement status and return migration should be the strongest among immigrants who are closest to retirement age. We investigate this issue by re-estimating the third specification above allowing the relationship between return migration rates and retirement status to depend on how close immigrants are to qualifying for the Australian Age Pension.[18] For conciseness we will refer to this as the retirement age.

Specifically, we estimate three specifications of the following modified version of equation (12):

$$\Pr(R_{ij} = 1) = \Pr(X_{ij}\beta + Z_j\phi + Z_j Age_{ij}^*\lambda + \varepsilon_{ij} > 0). \tag{14}$$

In the first specification, Age_{ij}^* is defined as the number of years in absolute value an individual is away from the retirement age. In the second specification, the same definition is used but Age_{ij}^* is further interacted with whether an individual is younger or older than the retirement age. In the third specification, the main effect is now defined as being the relationship between return migration rates and retirement status of individuals within two years of the retirement age. There are separate interaction effects for being more than two but less than five years away from the retirement age and for being five or more years away from the retirement. Marginal effects and standard errors for the impact of the return migration on the incidence of retirement are reported separately by gender in Table 3.

The results from the first specification indicate that – if the return migration rate of their fellow countrymen were 100 percent higher – male (female) immigrants aged 65 (63) would have a retirement rate that was 12.7 (8.4) percentage points higher. This relationship is

---

[18] Although the institutional details of employer-provided pension plans can vary, Australian men (both citizens and permanent residents) qualify for the Age Pension provided by the Australian government at age 65, while Australian women born before June 30, 1944 qualify at age 63. See www.centrelink.gov.au.

statistically significant at the 1 percent level for men and at the 5 percent level for women. For every year that immigrants are younger or older than the retirement age, the strength of this relationship declines by 0.7-0.9 percentage points. Allowing the age pattern to differ for people younger and older than retirement (specification 2) halves the size of the relationship for retirement aged men and reduces by one-quarter the effect for retirement aged women. In neither case is this relationship statistically significant at conventional levels. If, rather than assuming a linear relationship, we instead categorize immigrants' age relative to the retirement age (specification 3), we find that for immigrant men aged 63 to 67 being from an origin country with a 100 percent higher return migration rate reduces the incidence of retirement by 9.4 percentage points. This effect is statistically significant at the 1 percent level. The relationship between return migration rates and retirement status for retirement aged women remains similar to that found in the second specification and again is not statistically significant at conventional levels.

Table 3 Here

The results for male immigrants are strongly supportive of our theoretical model. In particular, there is a significant negative relationship between the incidence of retirement and return migration rates for men at (or near) retirement age, the strength of which declines as immigrants move further away from the retirement age. The results for women are less conclusive and may reflect the fact that retirement and return migration decisions for them are more likely to the result of family rather than individual decision.

To highlight the scale of the effect of return migration rates on retirement status, we calculate predicted retirement rates holding individuals' characteristics constant at the overall sample mean for retirement aged men and women (by gender) and varying return migration rates. We do this using the results from the third specification in Table 3 and report, in Table 4, the results for immigrants who are within two years of the retirement age and are from one

of the nine countries discussed in Table 1. We also present confidence intervals for these results calculated using the estimated standard error of each prediction.

Table 4 Here

Comparing the two extremes, we see that immigrant men (women) within two years of the retirement age from Hong Kong, which has a return migration rate of 9.0 percent, are 22.1 (10.0) percentage points less likely to be retired than otherwise equivalent immigrants from Italy, which has a return migration rate of 0.5 percent. The difference for men is significant just outside the 5 percent level, while the difference for women is not significantly different at conventional levels This disparity implies that the national-origin mix of the immigrant inflow has important implications for the extent of return migration as well as for the retirement status (and age structure) of the immigrant population.

6. Conclusions

This paper analyzes the relationship between immigrants' retirement status and the prevalence of return migration from Australia to their country of origin. Our focus is not on estimating a behavioral model of individuals' retirement decisions, but rather on assessing the way in which the potential costs and benefits of return migration (as reflected in country-specific emigration rates) affect the retirement status of immigrants. Understanding this relationship is important because immigrants' decisions about when to retire and where to spend their retirement years drives the extent to which immigrant aging will result in an increased demand for health care or old-age pensions.

Our theoretical model demonstrates that under reasonable conditions the incentives to return migrate are greatest at retirement implying that there is a direct link between the prevalence of return migration among and the retirement status of different immigrant populations. Consistent with this model, we estimate a negative relationship between the

immigrants' retirement status and the return migration rate of their fellow countrymen. As theory suggests, this link is strongest for immigrants who are at (or near) retirement age.

These results point to several important policy conclusions. First, as return migration rates vary substantially across sending countries, it is also the case that the age structure and composition of the domestic labor force in the years ahead rests fundamentally on the national origin mix of today's immigration flow. In short, immigrant selection policies have direct consequences for the funding of old-age pensions. Moreover, institutional arrangements surrounding the eligibility for citizenship, access to (and portability of) pensions, the provision of health care, etc. are likely to affect the net benefits to return migration and will therefore have far reaching consequences for the age composition of immigrant populations. Most of these relationships have received little attention and are not yet well understood. Modelling the linkages between return migration and retirement status (as we have done here), however, provides a useful way of beginning to think about the complex relationships between a range of domestic policies and demographic transitions within the immigrant population.

At the same time, these results leave open a number of important questions for future research. In particular, while some researchers have linked return migration to the incentives to accumulate savings or to send remittances (e.g. Galor and Stark 1990; Dustmann 1997b; Stark et al. 1997), it would be useful to understand how the potential for return migration is linked to the specific ways that immigrants fund their retirement. It seems sensible to expect that immigrants who intend to return home will have strong incentives to diversify their risk by saving both at home and abroad (Dustmann 1997b; Osili 2007). But what does this imply about the types of assets that immigrants hold? To what extent are decisions about home ownership or financial assets driven by expectations regarding return migration? Answers to these questions are important because consumption expenditures depend not only on wealth

levels, but also on the composition of wealth, and because assets differ in terms of their expected rates of return, riskiness, and liquidity leading them to serve different functions in providing for a household's financial security (Cobb-Clark and Hildebrand 2009).

Finally, we need to know more about gender differences in immigrants' patterns of retirement and return migration. Making progress in this area is likely to require a household perspective of the return migration decision similar to that used to understand the initial immigration process (Mincer 1978). Our results, for example, point to a much closer relationship between the level of return migration and the retirement status of immigrant men. This may suggest that for many women the decision to return migrate – like the initial decision to immigrate – is based on family (rather than individual) returns. Moreover, women's retirement also needs to be understood in a household context. Specifically, we need to know more about the ways in which expectations regarding return migration, cultural differences in attitudes towards women, gender differences in assimilation profiles, etc. lead the age profile of retirement to differ for immigrant men and women.

References:

Anderson, Gerard F. and Hussey, Peter Sotir, 2000. "Population Aging: A Comparison Among Industrialized Countries", *Health Affairs*, Vol. 19(3), May/June, pp. 191 – 203.

Australian Bureau of Statistics (ABS) no date. *Birthplace of Individual by Sex, Counts of Persons for Australia, 2001 Census Classification Counts*. Commonwealth of Australia, Catalogue, 2022.0. – downloaded at www.abs.gov.au

Australian Bureau of Statistics (ABS) 2007a. *Country of Birth of Person (Full Classification List) by Sex, 2006 Census of Population and Housing*. Commonwealth of Australia, Catalogue, 2068.0.

Australian Bureau of Statistics (ABS) 2007b. *Country of Birth of Person by Age by Sex, 2006 Census of Population and Housing*. Commonwealth of Australia, Catalogue, 2068.0.

Baker, Michael, and Dwayne Benjamin. 1997, "The Role of the Family in Immigrants' Labour Market Activity: An Evaluation of Alternative Explanations." *American Economic Review*, 87(4), pp.705-27.

Bauer, Thomas K. and Sinning, Mathias, in press, "The Savings Behavior of Temporary and Permanent Migrants in Germany" *Journal of Population Economics*, forthcoming.

Bermingham, John R., 2001. "Immigration: Not a Solution to Problems of Population Decline and Aging", *Population and Environment: A Journal of Interdisciplinary Studies*, Vol. 22(4), March, pp. 355 – 363.

Bijak, Jakub, Kupiszewska, Dorota, Kupiszewski, Saczuk, Katarzyna, and Kicinger, Anna, 2007. "Population and Labour Forces Projections for 27 European Countries, 2002-2052: Impact of International Migration on Population Ageing" *European Journal of Population*, Vol. 23, pp. 1 – 31.

Blau, Francine D., Kahn, Lawrence M., Moriarty, Joan Y. and Souza, Andre Portela, 2003, "The Role of the Family in Immigrants' Labor-Market Activity: Evidence from the United States", *American Economic Review*, Vol. 91(1), March, pp. 429-447.

Blau, Francine D., Kahn, Lawrence M., and Papps, Kerry L., 2008, "Gender Source Country Characteristics and Labor Market Assimilation Among Immigrants: 1980 – 2000" *IZA Discussion Paper* 3725, October.

Boersch-Supan, Axel, 2001. "Labor Market Effects of Population Aging", *NBER Working Paper* No. W8640.

Borjas, George and Bratsberg, Bernt, 1996, "Who Leaves? The Outmigration of the Foreign-Born", *The Review of Economics and Statistics*, Vol. 78(1), February, pp. 165 – 176.

Cobb-Clark, Deborah A. and Crossley, Thomas F. YEAR, "Revisiting the Family Investment Hypothesis", *Labour Economics*, Vol. 11(3), June, pp. 373 – 393.

Cobb-Clark, Deborah A. and Stillman, Steven, 2009. "The Retirement Expectations of Middle-Aged Individuals", *Economic Record*, Vol. 85(269), June, pp. 146–63.

Cobb-Clark, Deborah A. and Hildebrand, Vincent A., 2009. "The Asset Portfolios of Native-born and Foreign-born Australian Households", *Economic Record*, Vol. 85(268), March, pp. 46-59.

De Coulon, Augustin and Wolff, François-Charles, 2006, "The Location of Immigrants at Retirement: Stay/Return or `Va-et-Vient'?" *IZA Discussion Paper* 2224, July.

Department of Immigration and Citizenship, 2007, *Emigration 2006-07 Australia*. Commonwealth of Australia, ISSN 1324-3411.

Djajić, Slobodan, 1989, "Migrants in a Guest-Worker System" *Journal of Development Economics*, Vol. 31, pp. 327 – 339.

Dustmann, Christian 1997a, "Differences in the Labor Market Behavior between Temporary and Permanent Migrant Women", *Labour Economics*, Vol. 4, pp. 29 – 46.

Dustmann, Christian, 1997b, "Return Migration, Uncertainty and Precautionary Savings" *Journal of Development Economics*, Vol. 52, pp. 295-316.

Dustmann, Christian, 1999. "Temporary Migration, Human Capital and Language Fluency of Migrants", *Scandinavian Journal of Economics*, Vol. 101(2), pp. 297 – 314.

Dustmann, Christian, 2003a, "Children and Return Migration", *Journal of Population Economics*, Vol. 16, pp. 815-830.

Dustmann, Christian, 2003b, "Return Migration, Wage Differentials, and the Optimal Migration Duration", *European Economic Review*, Vol. 47, pp. 353-369.

Dustmann, Christian, 2007, "Return Migration, Investment in Children, and Intergenerational Mobility: Comparing Sons of Foreign and Native Born Fathers", *IZA Discussion Paper* 3080, September.

Dustmann, Christian and Kirchkamp, Oliver, 2002, "The Optimal Migration Duration and Activity Choice after Re-Migration" *Journal of Development Economics*, Vol. 67, pp. 351-372.

Dustmann, Christian and Weiss, Yoram, 2007, "Return Migration: Theory and Empirical Evidence from the UK", *British Journal of Industrial Relations*, Vol. 45(2), June, pp. 236 – 256.

Galor, Oded and Stark, Oded, 1990, "Migrants' Savings, the Probability of Return Migration and Migrants' Performance", *International Economic Review*, Vol. 31(2), May, pp. 463-467.

Galor, Oded and Stark, Oded, 1991, "The Probability of Return Migration, Migrants' Work Effort, and Migrants' Performance", *Journal of Development Economics*, Vol. 35, pp. 399 – 405.

Gruber, J. and Wise, D. A., 2001. "An International Perspective on Policies for an Aging Society" *NBER Working Paper No. W8103*.

Hill, John K., 1987, "Immigrant Decisions Concerning Duration of Stay and Migratory Frequency", *Journal of Development Economics*, Vol. 25, pp. 221- 234.

Holzmann, R., 2005. "Demographic Alternatives for Aging Industrial Countries: Increases Total Fertility Rate, Labor Force Participation, or Immigration, *IZA Discussion Paper* No. 1885.

Jasso, Guillermina and Rosenzweig, Mark, 1982, "Estimating the Emigration Rates of Legal Immigrants using Administrative and Survey Data: the 1971 Cohort of Immigrants to the United States", *Demography*, Vol. 19, pp. 279-290.

Merkle, Lucie and Zimmermann, Klaus F., 1992, "Savings Remittances, and Return Migration", *Economic Letters,* Vol. 38, pp. 77 – 81.

Mincer, Jacob, 1978, 'Family Migration Decisions', *Journal of Political Economy*, Vol. 86, pp. 749–773.

Moulton, B., 1990, "An Illustration of a Pitfall in Estimating the Effects of Aggregate Variables on Micro Units," *Review of Economics and Statistics*, pp. 334-338.

Osili, Una Okonkwo, 2007, "Remittances and Savings from International Migration: Theory and Evidence Using A Matched Sample", *Journal of Development Economics*, Vol. 83, pp. 446 – 465.

Rendall, Michael S. and Ball, Deborah J., 2004. "Immigration, Emigration and the Ageing of the Overseas-born Population in the United Kingdom", *Population Trends*, 116, Summer, pp. 18 – 27.

Renshon, Stanley, 2000, "Dual Citizens in America: An Issue of Vast Proportions and Broad Significance", *Backgrounder*, Center for Immigration Studies, Washington, USA, July.

Schoeni, Robert F., 1998, "Labor Market Assimilation of Immigrant Women" *Industrial and Labor Relations Review*, Vol. 51(3), April, pp. 483 – 504.

Sinning, Mathias, 2007, Determinants of Savings and Remittances: Empirical Evidence from Immigrants to Germany" *IZA Discussion Paper*, August.

Stark, Oded, Helmenstein, Christian, and Yegorov, Yury, 1997, "Migrants' Savings, Purchasing Power Parity, and the Optimal Duration of Migration" *International Tax and Public Finance*, Vol. 4, pp. 307-324.

United Nations (UN) 2001. "Replacement Migration: Is it a Solution to Declining and Ageing Populations? New York: Department of Economic and Social Affairs, Population Division.

Warren, Robert and Peck, Jennifer M., 1980, "Foreign-born Emigration from the United States", *Demography*, Vol. 17, pp. 71 – 84.

Wooden, M., Friden, S., and Watson, N., 2002. "The Household Income and Labour Dynamics in Australia (HILDA) Survey: Wave 1" *Australian Economic Review,* Vol. 35(3), pp. 339-348.
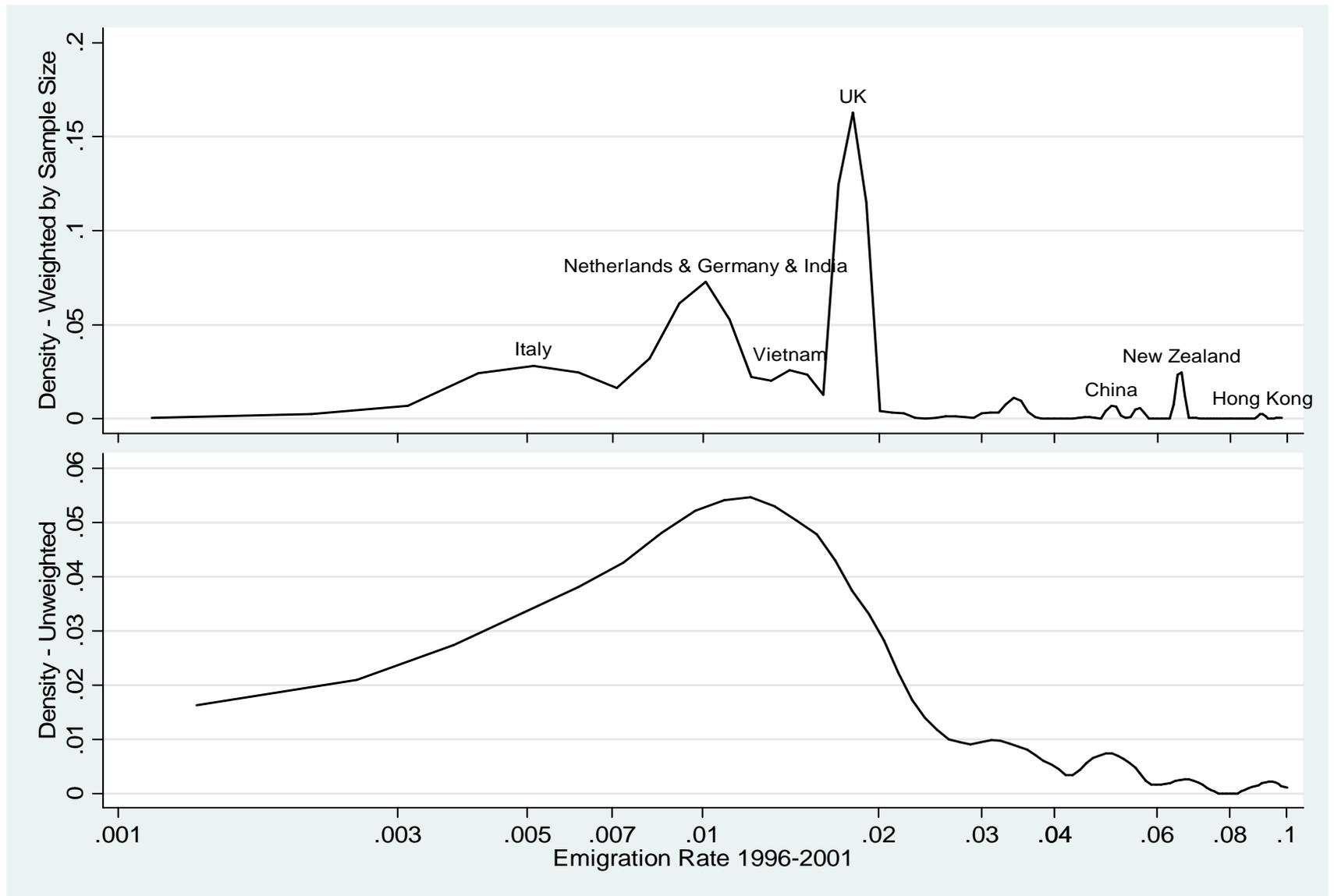
Figure 1: Distribution of Emigration Rates Across Countries
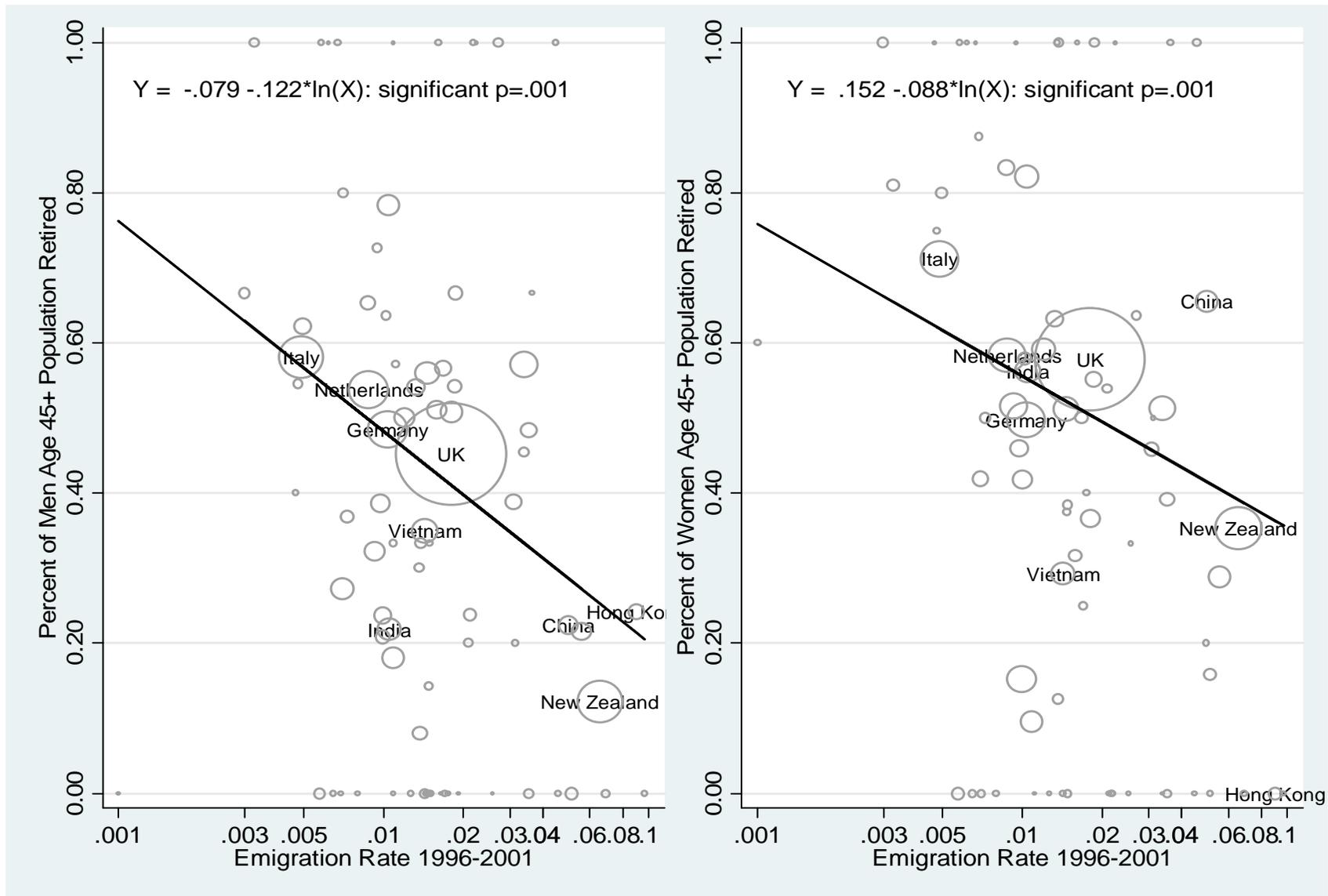
Figure 2: The Relationship between Retirement Rates and Emigration Rates Across Countries by Gender
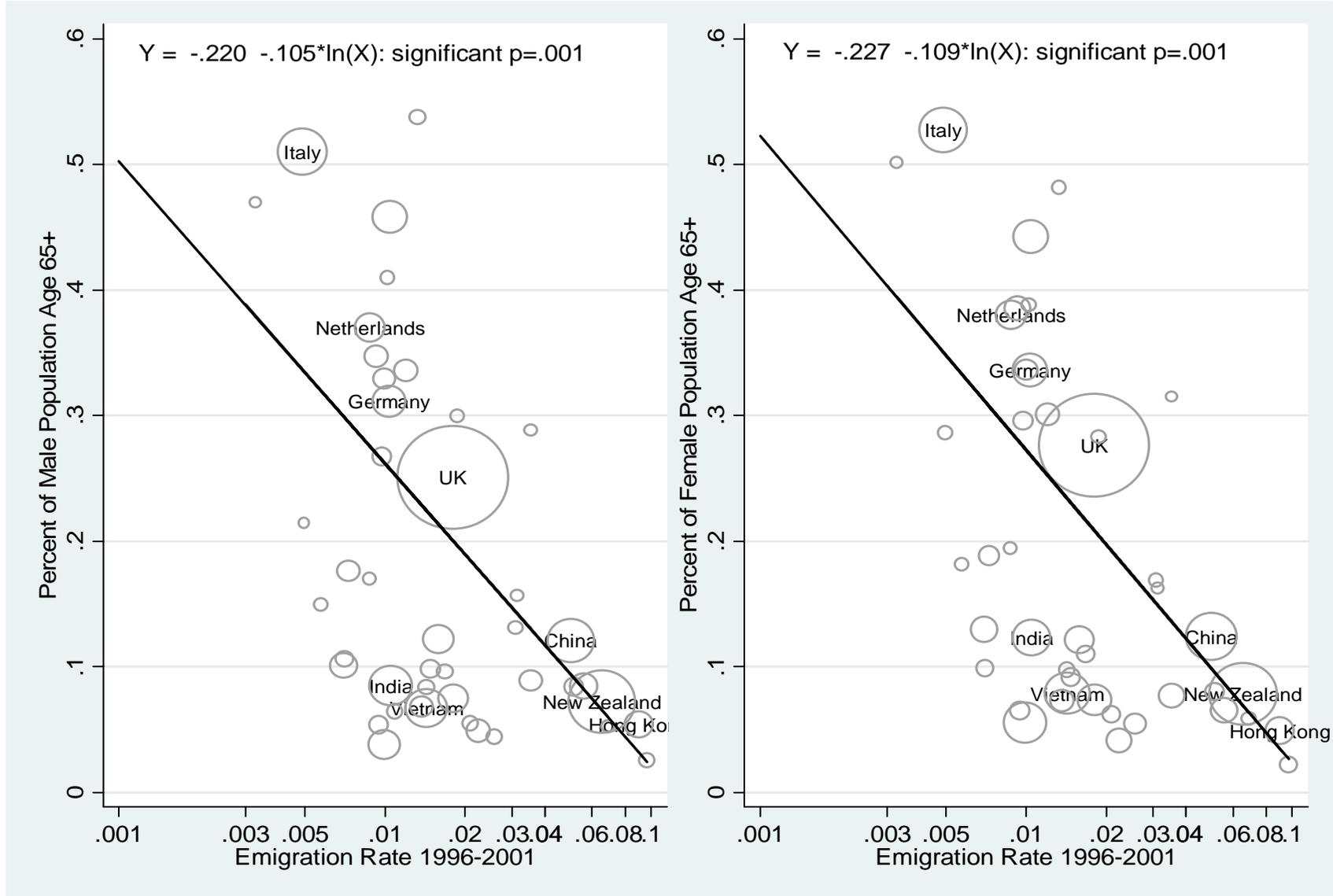
Figure 3: The Relationship between Population Composition and Emigration Rates Across Countries by Gender

Table 1: Emigration Rates, Age Distibution, Years in Australia and Percent Retired by Gender and Country of Birth

	All Immigrants	Italy	Netherlands	Germany	India	Vietnam	UK	China	New Zealand	Hong Kong
Emigration Rate	0.020	0.005	0.009	0.010	0.011	0.014	0.018	0.050	0.065	0.090
Men										
Mean Age	60.5	63.9	62.8	63.1	55.9	54.4	62.0	56.0	54.5	54.5
	(0.17)	(0.63)	(0.67)	(0.58)	(1.20)	(0.86)	(0.28)	(1.41)	(0.49)	(1.34)
Mean Years in Australia	34.3	43.8	43.5	43.6	24.7	17.4	37.3	14.2	28.5	19.3
	(0.24)	(0.56)	(0.72)	(0.80)	(1.37)	(0.69)	(0.40)	(1.37)	(0.81)	(1.70)
Percent Retired	0.426	0.582	0.538	0.485	0.218	0.350	0.452	0.224	0.123	0.242
	(0.008)	(0.031)	(0.035)	(0.036)	(0.047)	(0.054)	(0.013)	(0.060)	(0.021)	(0.076)
Percent Retired Age >64	0.907	0.959	0.847	0.784	NA	NA	0.934	NA	0.581	NA
	(0.008)	(0.018)	(0.039)	(0.044)			(0.010)		(0.090)	
Observations	4,055	251	199	198	78	80	1,541	49	253	33
Individuals	1,122	70	49	51	24	29	391	16	72	11
Percent of Immigrants		6%	4%	5%	2%	3%	35%	1%	6%	1%
Women										
Mean Age	60.0	61.1	62.0	61.6	60.5	51.4	61.9	59.9	57.7	54.4
	(0.18)	(0.68)	(0.77)	(0.76)	(1.28)	(0.56)	(0.30)	(1.23)	(0.58)	(1.77)
Mean Years in Australia	34.9	42.4	45.4	46.0	30.3	17.1	37.3	18.0	27.7	29.8
	(0.24)	(0.55)	(0.69)	(0.85)	(1.69)	(0.90)	(0.35)	(1.77)	(0.93)	(4.43)
Percent Retired	0.515	0.712	0.583	0.497	0.563	0.292	0.578	0.655	0.353	NA
	(0.008)	(0.034)	(0.038)	(0.037)	(0.056)	(0.057)	(0.013)	(0.063)	(0.030)	
Percent Retired Age >59	0.889	0.941	0.882	0.872	NA	NA	0.894	NA	0.804	NA
	(0.008)	(0.024)	(0.034)	(0.038)			(0.011)		(0.042)	
Observations	3,743	177	168	181	80	65	1,441	58	255	18
Individuals	1,032	54	42	44	23	25	364	23	73	6
Percent of Individuals		5%	4%	4%	2%	2%	35%	2%	7%	1%

Note: See the paper for further information about how the sample is created and variables are defined. NA are cells with too few observations to give an accurate estimate.

Table 2: Probit Model of Likelihood of Being Retired Stratified by Gender
(Marginal Effects and Standard Errors)

	(1)	(2)	(3)
	Men		
Log Emigration Rate	-0.128**	-0.087**	-0.051
	(0.038)	(0.030)	(0.034)
Percent Declared Retired	0.426	0.426	0.426
Pseudo R-squared	0.021	0.474	0.594
Observations	4,055	4,055	4,055
	Women		
Log Emigration Rate	-0.089**	-0.090**	-0.027
	(0.031)	(0.031)	(0.038)
Percent Declared Retired	0.515	0.515	0.515
Pseudo R-squared	0.011	0.472	0.584
Observations	3,743	3,743	3,743
Controling for Year	X	X	X
Controling for Age/Yrs in Australia		X	X
Controling for Indv/Hhold Chars			X

Note: Robust standard errors in parentheses that allow for clustering for at the disaggregate country level which includes accounting for clustering of individuals across time. ** $p<0.01$, * $p<0.05$, + $p<0.1$. See the paper for details about the included control variables.

Table 3: Probit Model of Likelihood of Being Retired by Gender and Age
(Marginal Effects and Standard Errors)

	(1)	(2)	(3)
	Men		
Log Emigration Rate at Retirement Age (Age 65)	-0.127**	-0.064	-0.094**
	(0.038)	(0.041)	(0.034)
Log Emigration Rate * |age-65|	0.009**		
	(0.003)		
Log Emigration Rate * |age-65| if age < 65		-0.003	
		(0.005)	
Log Emigration Rate * |age-65| if age > 65		0.027**	
		(0.004)	
Log Emigration Rate * (2 < |age-65| < 5)			0.023**
			(0.007)
Log Emigration Rate * (|age-65| > 5)			0.054**
			(0.010)
P-Value on Test of Symmetric Age Effect		0.000	
Pseudo R-squared	0.599	0.605	0.600
Observations	4,055	4,055	4,055
	Women		
Log Emigration Rate at Retirement Age (Age 63)	-0.084*	-0.061	-0.053
	(0.036)	(0.041)	(0.036)
Log Emigration Rate * |age-63|	0.007**		
	(0.002)		
Log Emigration Rate * |age-63| if age < 63		0.003	
		(0.003)	
Log Emigration Rate * |age-63| if age > 63		0.016**	
		(0.005)	
Log Emigration Rate * (2 < |age-63| < 5)			0.011
			(0.011)
Log Emigration Rate * (|age-63| > 5)			0.037**
			(0.011)
P-Value on Test of Symmetric Age Effect		0.041	
Pseudo R-squared	0.587	0.588	0.588
Observations	3,743	3,743	3,743

Note: Robust standard errors in parentheses that allow for clustering for at the disaggregate country level which includes accounting for clustering of individuals across time. ** p<0.01, * p<0.05, + p<0.1. All regressions include controls for individual and household characteristics and the year of observation.

Table 4: Predicted Probability of Being Retired for Individual with Mean Characteristics from Different Countries by Gender

	Emigration Rate	Men			Women		
		Mean	Lower 95% CI	Upper 95% CI	Mean	Lower 95% CI	Upper 95% CI
Italy	0.005	0.847	0.763	0.908	0.889	0.828	0.932
Netherlands	0.009	0.811	0.733	0.873	0.872	0.814	0.917
Germany	0.010	0.800	0.722	0.863	0.867	0.807	0.913
India	0.011	0.799	0.721	0.862	0.867	0.806	0.913
Vietnam	0.014	0.777	0.697	0.844	0.857	0.789	0.908
United Kingdom	0.018	0.762	0.669	0.838	0.854	0.825	0.879
China	0.050	0.678	0.549	0.789	0.813	0.682	0.904
New Zealand	0.065	0.656	0.532	0.765	0.807	0.730	0.869
Hong Kong	0.090	0.625	0.462	0.769	0.789	0.614	0.906

Note: Predicted probabilities are calculated using the coefficients from the third specification in Table 3, setting all characteristics to the sample mean by gender for individuals within 2 years of the retirement age besides the emigration rate, which is set to the appropriate level for a particular country.

Appendix Table 1: Characteristics by Gender and Immigration Status

	Immigrants		Australian Born	
	Men	Women	Men	Women
Age	60.5	60.0	59.7	60.4
	(0.2)	(0.3)	(0.1)	(0.1)
Years in Australia	34.3	34.9		
	(0.3)	(0.3)		
Years of Work Experience	37.1	26.7	38.0	25.1
	(0.2)	(0.3)	(0.1)	(0.1)
Ed = Year 11 or less	0.27	0.43	0.38	0.56
	(0.01)	(0.01)	(0.01)	(0.00)
Ed = Year 12	0.10	0.14	0.07	0.07
	(0.01)	(0.01)	(0.00)	(0.00)
Ed = Certificate	0.42	0.24	0.38	0.21
	(0.01)	(0.01)	(0.01)	(0.00)
Ed = Tertiary	0.21	0.19	0.17	0.16
	(0.01)	(0.01)	(0.00)	(0.00)
Excellent Health	0.07	0.07	0.07	0.07
	(0.01)	(0.01)	(0.00)	(0.00)
Good Health	0.25	0.25	0.28	0.29
	(0.01)	(0.01)	(0.00)	(0.00)
Average Health	0.35	0.33	0.34	0.36
	(0.01)	(0.01)	(0.00)	(0.00)
Fair / Poor Health	0.22	0.23	0.24	0.22
	(0.01)	(0.01)	(0.00)	(0.00)
Missing Health / SCQ	0.11	0.12	0.07	0.07
	(0.01)	(0.01)	(0.00)	(0.00)
Married/Cohabiting	0.84	0.67	0.76	0.63
	(0.01)	(0.01)	(0.00)	(0.00)
Years if Married/Cohab	29.8	30.3	30.1	31.6
	(0.3)	(0.4)	(0.2)	(0.2)
Number Kids 0-15	0.33	0.20	0.33	0.21
	(0.02)	(0.01)	(0.01)	(0.01)
Number Kids 16-20	0.18	0.17	0.19	0.17
	(0.01)	(0.01)	(0.01)	(0.00)
Number Adults 21+	2.07	1.93	1.96	1.85
	(0.01)	(0.02)	(0.01)	(0.01)
Observations	4,055	3,743	9,344	10,266
Individuals	1,122	1,032	2,467	2,650

Note: See the paper for further information about how the sample is created and variables are defined.

Appendix Table 2: Probit Model of Likelihood of Being Not Employed
(Marginal Effects and Standard Errors)

	(1)	(2)	(3)
	Men		
Log Emigration Rate	-0.107**	-0.045*	-0.023
	(0.030)	(0.020)	(0.022)
Percent Declared Retired	0.491	0.491	0.491
Pseudo R-squared	0.015	0.373	0.529
Observations	4,055	4,055	4,055
	Women		
Log Emigration Rate	-0.076**	-0.063**	-0.012
	(0.026)	(0.023)	(0.027)
Percent Declared Retired	0.598	0.598	0.598
Pseudo R-squared	0.009	0.347	0.479
Observations	3,743	3,743	3,743
Controling for Year, Location	X	X	X
Controling for Age/Yrs in Australia		X	X
Controling for Indv/Hhold Chars			X

Note: Robust standard errors in parentheses that allow for clustering for at the disaggregate country level which includes accounting for clustering of individuals across time. ** p<0.01, * p<0.05, + p<0.1. See the paper for details about the included control variables.