The Impact of Social Security on Return Migration Among Latin American Elderly in the U.S.

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Abstract

International migration has long been considered to be the preserve of working-age adults. However, the rapid diversification of the elderly population calls for increased attention to the migration patterns of this group, and its possible motivations. This study examines whether Latin American immigrants are more likely to return to their home countries during later life if they receive lower Social Security benefits. Using a regression discontinuity approach on data from the U.S. Social Security Administration, I observe the results of a natural experiment whereby the Social Security Administration unexpectedly lowered the Social Security benefits of the 1917-1921 birth cohorts due to a miscalculation in their benefit calculation formula. Preliminary results suggest that Social Security benefit levels do not affect the probability of return migration for Latin American Social Security benificiaries.

1 Background

Two population trends are rapidly changing the U.S. demographic landscape and will continue to do so for several years to come: immigration and aging. Large inflows of foreign migrants enter the U.S.[1] as it undergoes unprecedented population aging, significantly altering the country's demographic composition. However, the extent of this change cannot be fully understood without first understanding the interaction between these two processes. Beyond their separate effects on the U.S. population composition, immigration and aging may interact and affect one another. To date, most empirical work on the interaction between aging and immigration focuses on the effects of migration on Social Security (Burtless & Singer, 2011; Social Security Administration, 2002b; Gustman & Steinmeier, 1998; R. Lee & Miller, 2000). However, far less work examines the effects of Social Security on migration.[2]

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[1] Recent evidence suggests that unauthorized immigration into the U.S. has decreased (Cave., 2011; Hoefer, Rytina, & Baker, 2011; Passel & Cohn, 2010). Nonetheless, this is a fairly recent dip in a four-decade increase in immigration to the U.S. Further studies should examine if this is a temporary downward spike or a continuous trend.

[2] Sana and Massey (2000) provide one of the few studies that examine the effect of Social Security on immigration. The authors find that male household heads in Mexico with jobs that did not participate in

One way in which Social Security may influence migration is by prompting return to the country of origin. Wealth differentials created by Social Security may lower or increase rates of return migration depending on whether residence in the U.S. during later life is a normal good.[3] Wealthier migrants in the U.S. may view their income as a means through which they can enjoy a better life in their home country upon retirement. Conversely, these migrants may choose to return migrate only upon concluding that their income in not sufficient to make ends meet in the U.S.

Return migration, in turn, holds numerous economic and social implications for the U.S. These ramifications include potential savings on old-age support programs via programs such as Medicare and Supplemental Security Income which are generally unavailable abroad, selectivity among immigrants who remain in the U.S., and hints as to the assimilation patterns of immigrants in the U.S.

As the largest group of immigrants in the United States (54 percent) (Grieco, 2010), examining Hispanic immigrants can assist in better understanding this issue. Hispanic elderly currently comprise seven percent of all elderly and are expected to increase to almost twenty percent of all elders by 2050 (Administration on Aging, 2010). Their sheer volume, as well as their relatively high propensity to return migrate (Jasso & Rosenzweig, 1990), position Hispanic immigrants as a key segment in studying return migration. This is the case despite the fact that to date, research on international migration during later life has been heavily focused on Europeans (Williams, King, & Warnes, 1997; Casado-Díaz, Kaiser, & Warnes, 2004) and older Americans (Sunil, Rojas, & Bradley, 2007; Truly, 2002).

This study assesses the role of Social Security in prompting older immigrants from Latin America to return to their country of origin. It observes the results of a natural experiment created by the "notch" generation whereby the Social Security Administration lowered the Social Security benefits of those born after December 31, 1916 due to a miscalculation in their benefit calculation formula. This study examines if those with lower payments were less likely to return migrate than those with higher Social Security levels.

1.1   The "Notch" generation

The basis for this natural experiment originates in the 1970s. In 1972, Congress implemented automatic cost-of-living-adjustments (COLA) to Social Security payments in order account for rising inflation. However, it was later discovered that the benefit calculation formula for beneficiaries born between 1910 and 1916 was flawed in indexing for both wages and pricing, resulting in a recalculation in 1977 and substantially lower payments for those born between 1917 and 1921 (Social Security Administration, 2002a). The latter group was later known as the "notch" generation as the drop in their benefit levels created a visible notch in graphs depicting average benefit levels by cohort. Social Security benefit levels

Mexico's Social Security system were more likely to migrate to the U.S. than their counterparts with jobs paying into Social Security.

[3]Defined as a good that experiences an increase in demand as the real income of an individual or economy increases (Investopedia, n.d.-b).

dropped by an average of 110^4 a month for individuals who retired at age 65 in the 1917 birth cohort compared to those who retired at age 65 in the 1916 birth cohort (Social Security Administration, 2002a).

The present study considers whether the different benefit levels created by the the 1977 legislation prompted different rates of return migration during later life.

The direction of this relationship can conceivably run in either direction. Higher Social Security payments may prompt return migration if residence in the U.S. is viewed as an inferior good.[5]

Work by Casado-Díaz, Kaiser, and Warnes (2004) suggests that this may be the case. The authors state that at least among Northern Europeans retiring in Southern Europe

> International migration for retirement is no longer the preserve of the rich or professional and artistic elites, but it remains selective of the more affluent and is strongly patterned by the socio-economic background of migrants... (p. 362).

However, there is also reason to believe that retirement in the U.S. is viewed as a normal good. Immigrants with higher income levels may view their greater wealth as a facilitator which helps them remain in the U.S. where the cost of living may be higher than in their home country. Roberts, Frank, and Lozano-Ascencio (1999) note that "For Mexicans in the U.S., their community of origin may offer . . . a social support safety net for the elderly and for their own retirement (p. 247)." Such was probably the case among one group of older Mexicans whose probability of return decreased with higher wages (Massey, 1987). These migrants may have preferred U.S. retirement but found their socioeconomic situation more sustainable in Mexico.

Regardless of the direction of this relationship, the Social Security benefit levels and, by extension, the income levels of return migrants have a tangible effect on the U.S. economy. Most immigrants arrive to the U.S. at working age (Batalova & Terrazas, 2007) and contribute to the pool of workers who support the retired population. While as of 2000 the Social Security Administration had received $374 billion in wages from illegitimate Social Security numbers thought to have come primarily from undocumented immigrants (Social Security Administration, 2002b), noted demographer Ronald Lee asserts that immigration is not the solution to the Social Security problem as these migrants will themselves age and draw upon the Social Security system during later life (Population Reference Bureau, 2008). However, this issue may be more nuanced if some immigrants do not age in the United States but rather, return to their home countries during later life.

For example, if immigrants do eventually return migrate, their absence may generate savings in U.S. old-age support programs. Though they are eligible to receive Social Security payments while living abroad,[6] immigrants who return migrate cannot consume Medicare

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[4]In 1994 dollars.

[5]Defined as a type of good for which demand declines as the level of income or real GDP in the economy increases (Investopedia, n.d.-a).

[6]U.S. citizens and citizens of specific countries, including Mexico, may receive Social Security as long as they are living abroad except if they are dependents or survivors, in which case additional requirements apply (Social Security Administration, 2011).

and Supplemental Security Income as these programs are unavailable abroad.[7]

However, the amount of savings will differ based on the characteristics of those who return migrate compared to those who remain in the U.S. Higher income levels are associated with better health (Macinko, Shi, Starfield, & Jr., 2003) and lower consumption of public services (National Research Council, 1997), both of which translate into increased savings. The U.S. economy would benefit most if migrants who remained in the U.S. were those with these favorable characteristics while return migrants constituted those with the opposite traits.

Notwithstanding the salience of this issue for the U.S., the ramifications of return migration extend beyond those in the U.S. Higher levels of income at older ages may spur economic growth in the receiving country. Using simulation techniques, Deller (1995) assesses the economic impact of retirement migration on a small rural state. The author finds that for every 100 new retirees that enter into a community, 55 jobs will be created due to increased demand for health care, retail, eating and drinking establishments, and air transportation. This research study makes certain assumptions about the levels and types of consumption of retirees, both of which lead to economic growth among higher income retirees and achieve the opposite among lower-income retirees, the latter typically consuming more in public services than the former.

Aside from its economic ramifications, elderly return migration may also provide information on patterns of immigrant assimilation in the U.S. The successful immigrant narrative often involves arriving to the U.S. at a relatively disadvantaged position followed by a period of adaptation and eventual assimilation into the U.S. mainstream (Gordon, 1964). Duration in the United States is correlated with greater English-language proficiency (Stevens, 1992), higher employment levels (Chiswick, Cohen, & Zach, 1997), lower poverty rates (Myers, 2007), and a reduction in the income gap between immigrants and natives (Raphael & Smolensky, 2008). While evidence suggests that many immigrants generally fare well by the time they reach old age,[8] we do not observe the conditions of those who return to their home countries, particularly at old age. Faced with budget constraints, these migrants may return to their country of origin where the U.S. dollar may have a higher purchasing power.

This study assesses if higher Social Security payments result is a higher probability of return migration. Utilizing a natural experiment that created arbitrarily higher Social Security payments for certain birth cohorts, it determines if foreign-born elderly who received these higher payments were more likely to return to their home countries than their lower-paid counterparts.

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[7]There is undoubtedly some abuse in the system whereby immigrants do not report that they are living abroad in order to continue receiving benefits. However, officially, these immigrants are ineligible to receive Supplemental Security Income benefits abroad.

[8]The vast majority of foreign-born elderly have lived in the U.S. for over 21 years and are U.S. citizens, and almost 40 percent speak English very well or well (Ruggles et al., 2010). Almost a quarter of foreign-born elderly indicate only speaking English. This is likely due to question-wording which asks respondents what languages they speak at home. These outcomes are mediated by region of origin and the same positive pattern does not hold in terms of health (National Research Council, 2004).

2   Methods

2.1   Data

This analysis is based on two data bases from the Social Security Administration's master data files, namely the NUMIDENT and a one percent simple random sample of the Master Beneficiary Record (MBR). The former contains one record for every Social Security number in the U.S. whereas the latter contains one record for every person who has ever applied for Social Security benefits. This data is not publicly available but I was granted access to a merged file via a dissertation grant from Boston College's Center for Retirement Research. Social Security Administration personnel merged the data files and removed personal identifiers in order to protect the confidentiality of Social Security recipients. I conducted the analysis at the Social Security Administration in Washington, D.C. The NUMIDENT contains information on sex and country of birth. The MBR contains information on current and last place of residence, payment history, year of birth, year of death, primary Social Security beneficiary status, and the amount of benefits.

The variable used to track return migration is the zip code on file at the time of death or if the beneficiary is not dead, the zip code on file as of 2011. Turra and Elo (2008) use similar information to document mortality among immigrants who remain in the U.S. during later life and those who return migrate. The authors argue as to the quality of this variable by citing the fact that the Social Security Administration sends out questionnaires to foreign addresses once a year to update information on beneficiaries abroad. Failure to fill out these questionnaires can result in suspension of benefits.

Nonetheless, there are numerous limitations to documenting return migration in this manner. The first is that it may underestimate return migration. Immigrants may return migrate but not change their addresses with the Social Security Administration. However, the possibility of this occurrence is minimized by the fact that payments depend on updating personal information while abroad. Moreover, occasionally the address on file is that of the representative payee and not the actual beneficiary. A representative payee manages Social Security and Supplemental Security Income payments for beneficiaries who are incapable of managing their own finances. As noted in table 2, approximately nine percent of cases pre- and post-notch have a representative payee or had a representative payee at the time of death who, possibly, did not live in the same household. However, the fact that the potential magnitude of this bias is the same in both groups provides some assurance against differential bias across groups. An additional limitation is the possibility that return migrants have their Social Security benefits directly deposited into their bank accounts in which case they would not need to change their Social Security mailing address in order to receive benefits. However, the individuals I observe become eligible for Social Security benefits in the early 1980s, a time when direct deposit was virtually non-existent. Yet another limitation is that individual's return migration behavior is not known prior to 2011 or to their date of death. They may have migrated to and from their home country but this would not be observed.

Nonetheless, this variable does capture return migration behavior at the end of life or as of 2011 which is more information than is currently available from other sources for this

population.

An added contribution of this study is its use of direct methods to estimate the effects of the 1977 legislation on Social Security payments. Indirect methods estimate Social Security benefits from other information instead of directly observing benefit levels. For example, in examining mortality differences created by the "notch," Snyder and Evans (2002) estimated OASDI benefits for each group using cohort-specific profiles from the Current Population Survey. The authors use the same computer program that Social Security field offices use to calculate benefits and find that the higher income group had a statistically higher mortality rate. Krueger and Pischke (1992) use a similar program to assess the effect of Social Security on the labor supply and find a positive relationship.

While these estimations likely achieve high accuracy, the Social Security payments of immigrants may be more difficult to estimate due to additional pertinent variables such as time in the U.S., U.S. versus foreign work history, and legal status which are often difficult to record. Fortunately, using Social Security Administration data allows me to directly observe how benefit levels changed as a result of the 1977 legislation.

2.2   Empirical Strategy

2.2.1   Comparison of Treatment and Control Groups

The individuals included in this analysis are primary Social Security beneficiaries aged 62 years and older who were born in Latin America between 1915 and 1918. As noted, those born after December 31, 1916, received lower Social Security benefits than those born prior to this date. I do not include secondary Social Security beneficiaries, e.g. spouses, dependent children, as these individuals may have received benefits without having lived and worked in the U.S.

Including only four birth cohorts guards against misleading results due to inherent differences between the treatment and control groups rather than differences in Social Security benefits. As is, there exists a four-year age difference between certain individuals who received higher Social Security benefits and those who received lower Social Security benefits, creating concern that the latter is an invalid counterfactual for the former. In their assessment of the effects of higher income on mortality using the "notch" generation, Snyder and Evans (2002) caution against this issue. They note that observing a multi-year time span might produce spurious differences in mortality rates between both cohorts due to secular trends in mortality rather than OASDI benefits. Unfortunately, Social Security Administration data files do not contain many common control variables with which to test this assumption. Among the key variables it does not include are education, number of children, and living arrangements.

As a method of addressing this issue without Social Security Administration data, I use data from IPUMS U.S.A. to test whether there are significant demographic differences between both cohorts. Because it is based on the U.S. census, IPUMS U.S.A. is not available for 1979, the year in which the 1917 cohort turned 62 and became age-eligible for benefits. Therefore, I compare demographic characteristics of Latin American immigrants in the U.S.

from the 1915-1916 birth cohorts to those of the 1917-1918 cohorts using the 1980 census. In this year, the 1915-1916 cohorts were 65-66 and the 1917-1918 cohorts were 63-64.

I use a t-test to test the mean difference in continuous variables between both groups, and a chi-square test to test differences in categorical variables between both groups.

2.2.2 Regression Discontinuity Approach

Having compared both groups, I use a regression discontinuity approach to assess whether higher Social Security payments result in a higher probability of return migration. Regression discontinuity is a selection-on-unobservables design that exploits the natural variation in treatments that depend on whether units fall below a certain threshold. In general, the units in a treatment group differ from those of the control group on characteristics other than treatment status, thereby obfuscating the true effect of the treatment. However, regression discontinuity is based on the premise that individuals whose indices fall just below an arbitrary threshold are comparable to those who indices fall just above it. In this way, it minimizes the threat of selection bias and provides virtually transparent identification.

In this analysis, treatment, D_i, consists of having received higher Social Security payments as a result of being born before January 1, 1917, c. Therefore, D_i equals 1 for those born before c, and 0 for those born after this date. Because treatment is strictly conditional on date of birth, X_i, individuals born shortly before this cut-off date likely resemble those born shortly afterward. Using this natural source of exogeneity, I obtain a causal estimate of the effect of greater Social Security benefits, measured by the coefficient τ, on the probability of return migration for those born around c. Specifically, I compare this outcome among beneficiaries born between January 1, 1915 and December 31, 1916, denoted by $h - c$, to those born between January 1, 1917 and December 31, 1918, denoted by $c + h$.

In its simplest form, this regression discontinuity approach is represented by

$$\text{logit(return migrate)} = \alpha + \tau D_i + \lambda S_i + \rho M x_i + \varepsilon_i \tag{1}$$
$$\text{with } h - c < X_i < c + h$$

where $M x_i$ indicates whether the individual is from Mexico and S_i is given a value of 1 if the individual is male. The reader will note that τ mirrors the average treatment effect of a simple logistic regression (D. S. Lee, 2009; Jacob & Lefgren, 2004). The only difference between the two estimates is that regression discontinuity calls for restricting the sample to small neighborhoods to the right and to the left of the threshold.

However, Angrist and Pischke (2008) note that in a regression discontinuity approach, it is necessary to distinguish the effect of the discontinuity, represented by D_i, from the smooth linear function, X_i, even though the former is a deterministic function of the latter. This proposition leads to the following model:

$$\text{logit(return migration)} = \alpha + X_i + \tau D_i + \lambda S_i + \rho M x_i + \varepsilon \tag{2}$$
$$\text{with } h - c < X_i < c + h$$

The authors go on to caution that estimates based on observations near the threshold bias the sample average for the population average in the neighborhood of the threshold. One solution they propose to this problem is the use of local linear regression with more weight given to points close to the cutoff. This variation of regression discontinuity is illustrated in the following equation:

$$\text{logit(return migrate)} = \alpha + \tau D_i + \beta(X_i - c) + \gamma(X_i - c) \cdot D_i$$
$$+ \lambda S_i + \rho M x_i + \varepsilon_i \tag{3}$$
$$\text{with } h - c < X_i < c + h$$

The variable created by subtracting the individual birthdate, X_i, by the threshold hold, c_i, assigns a greater weight to observations closer to the January 1, 1917 cut-off. I present the results of the models represented in equations 2 and 3.

3 Results

3.1 Pre- Post-Notch Comparison

Before examining differences in the probability of return migration among those with higher and lower Social Security benefits, it is important to first assess whether both groups are comparable. As discussed, Social Security Administration data files do not contain several pertinent control variables. Therefore, I compare the demographic characteristics of the pre- and post-notch groups as depicted in the 1980 census. Moreover, because the regression discontinuity analysis using Social Security Administration data only includes primary Social Security beneficiaries, this descriptive analysis using IPUMS U.S.A. only includes those receiving Social Security in 1980.

Table 1 describes Latin American immigrants aged 63-64 and 65-66 living in the U.S. in 1980 who were receiving Social Security benefits, and whether their characteristics are statistically different. This table reveals that there are no statistically significant differences between these two groups on these observable characteristics. Approximately 40 percent of the pre- and post-notch group is male, close to half completed less than a primary education, most are married and living with their spouse, and relatively few live with their children. Moreover, close to half of both groups were born in Mexico and relatively few speak fluent English. Close to half of both groups are naturalized citizens and the majority have been in the U.S. for over 21 years. Moreover, less than 20 percent of both groups was employed at the time of the survey.

This descriptive snapshot of the 1915-1916 and 1917-1918 birth cohorts provides some assurance that the pre- and post-notch group I examine in the regression discontinuity analysis resemble one other.

3.2 Descriptive Statistics

Having compared both groups in the census, the following section examines those included in the regression discontinuity analysis using Social Security Administration data. Table 2 displays descriptive statistics of primary Social Security beneficiaries born in Latin America in 1915-1916 (the pre-notch group), and in 1917-1918 (the post-notch group).

These descriptive statistics reveal that both groups are fairly similar. Approximately half of both groups consist of males. At first glance, this number may be surprising as the proportion of males is typically lower among older age groups (Howden & Meyer, 2011). However, this relatively high sex ratio is explained by the fact that the deceased are not dropped from the sample. Since the Social Security Administration keeps the last known address on file, the deceased are not right-censored and are kept in the sample. Moreover, a substantial proportion of both groups were born in Mexico. Given that over half of immigrants from Latin America are from Mexico (Grieco & Trevelyan, 2010), it is not surprising that such a high proportion of Latin American primary Social Security beneficiaries are from Mexico. Moreover, relatively few pre- and post-notch retired at age 65 years or older. This finding falls in line with Gruber and Wise's (1998) seminal conclusion that the age of public pension eligibility has a greater impact on the propensity to retire than the normal retirement age.

The only characteristic in which immigrants pre- and post-notch significantly differ is in the proportion who had died by 2011. Five percentage points more in the pre-notch group had died than those post-notch. This is not surprising as the former group is older. However, while the deceased are not dropped from the sample, it it worth pondering the ramifications of this difference. Pablos-Méndez (1994) describes the "salmon bias" as the desire to die in one's home country, thereby biasing estimates of immigrants who remain in the U.S. If immigrants do indeed choose to return migrate only upon realizing they will die soon, this situation may obfuscate the effect of Social Security benefits in determining return migration. However, this bias would pertain to both the treatment and control groups and not affect the interpretation of the outcome.

Both the treatment and control groups were also equally likely to have a representative payee or to have had a representative payee at the time of death. This similarity is important as the presence of a representative payee potentially biases the results. If the beneficiary has a representative payee, the zip code on file may represent that of the payee and not the beneficiary. The fact that both groups are equally likely to have a representative payee provides some assurance that any differences their return migration rates is not due to this issue.

3.3 Effect of the Notch

As noted, a regression discontinuity design rests on the assumption that crossing an arbitrary threshold significantly increases the probability of treatment. In this case, treatment consists of having received higher Social Security benefits as a result of being born before January 1st, 1917. Figure 1 displays the average Social Security benefit for each two-month interval between 1913 and 1920 as well as a polynomial fit line on either side of the notch. As

is consistent with historical accounts (Social Security Administration, 2002a), the polynomial line increases up to 1917 after which it decreases noticeably in 1916.

However, Angrist and Pischke (2008) warn that polynomial models may not adequately represent the effect of the threshold on the explanatory variable. The authors caution that a discontinuity in the explanatory variable upon crossing the threshold may be due to latent higher-order terms rather than the effect of crossing the threshold. To address this issue, they suggest comparing average outcomes of small neighborhoods to the right and to the left of the threshold, as the treatment effect should not depend on the correct specification of the model in this case. Thus, the rectangular bars indicate the average Social Security benefit for the birth cohorts on which this analysis is focused, namely those born between 1915 and 1918. This figure demonstrates fairly similar benefits between the 1915 and 1916 birth cohorts and a significant drop in the benefits of the 1917 and 1918 birth cohorts. Specifically, the average monthly benefit for the pre-notch group is 19 percent higher than that of the post-notch group in these years. Table 3 indicates that the differences in the mean benefits of the pre- and post-notch group are statistically significant even after controlling for sex and whether the beneficiary was born in Mexico. The coefficients for the birth years 1917 and 1918 are statistically different from that of 1915, while 1916 is not.

While statistically significant, it is nonetheless important to ponder the viability of this income differential in affecting return migration. The literature points to a strong negative relationship between duration in the U.S. and the propensity to return migrate (Massey, 1987; Ruiz-Tagle & Wong, 2009). Over time, migrants develop social and familial networks while abroad that may be more influential in determining return migration than income, particularly when this income differential is only 19 percent.

However, in the context of international migration, this 19 percent income differential may hold significantly more value in the home country. According to Stark, Hemelstein, and Yegorov (1997), in choosing their optimal length in the U.S., immigrants put a high premium on the relative value of their income in the home country. Specifically, the longer a migrant is abroad, the longer she forgoes the opportunity to spend her savings in the home country where she can buy more goods and services. This is particularly true in cases where there is a high purchasing power differential between the destination and home countries and low wages in the home countries, as is the case in Latin America and the U.S. Thus, according to this theoretical model, the 19 percent higher income possessed by the pre-notch group compared to the post-notch group may shorten their stay in the U.S. since they obtain the desired pocket of money in a shorter time span.

An initial look at the return migration rates of both groups suggests that this is not the case. Figure 2 displays the proportion of Latin American primary Social Security beneficiaries born in 1915-1916 and 1917-1918 who were living abroad at the time of death or as of 2011, as well as those who were living specifically in their home countries. As denoted in figure 2, approximately 10 percent and 11 percent of the pre-and post-notch group, respectively, was living abroad at the time of death or as of 2011, the vast majority of whom returned to their home countries.

It is important to note that despite the natural exogeneity provided by the notch, Social

Figure 1: Average monthly Social Security benefit for Latin American primary beneficiaries born pre- and post-notch
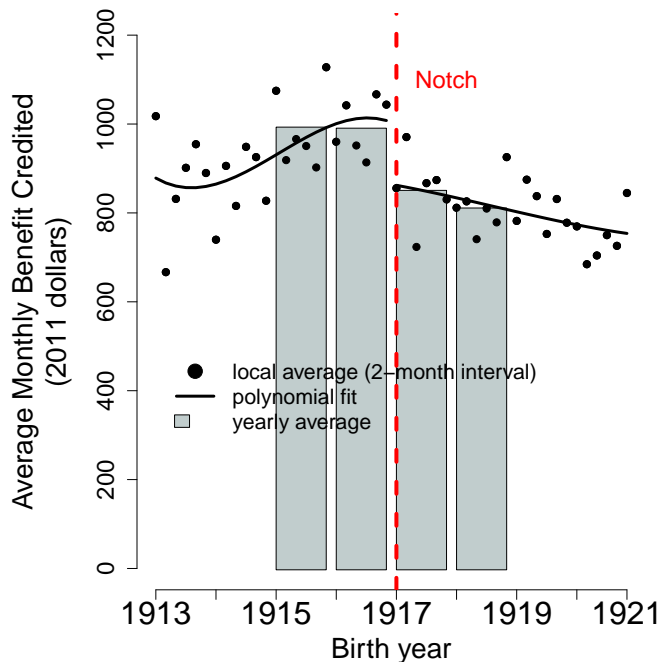
Security is but one source of income. Many of the migrants in this work likely receive Supplemental Security Income, financial assistance from their families, and other income. However, because the 1915-1916 birth cohorts are assumed to be very similar to the 1917-1918 birth cohorts, their "other" sources of income are presumably very similar. Therefore, the 19 percent higher Social Security income received by the pre-notch group is an exogenous addition to their total income, which is likely almost identical to the post-notch group.

While this figures suggests that the 19 percent income differential created by the "notch" had no effect on return migration, it is difficult to answer this question without controlling for the few key variables available in this data set, namely sex and region of birth.

3.4 Regression Discontinuity Results

Table 4 demonstrates the results of the regression discontinuity analysis which includes these controls. This table presents estimates which do not weigh according to the distance from the notch. Model 1 includes individuals born between January 1, 1915 and December 31, 1918. Models 2 and 3 adjust the bandwidth, h, to assess the sensitivity of this model to the period of observation. Model 2 reduces the bandwidth by half to include only those born between in 1916 and 1917 whereas model 3 doubles the bandwidth to eight years to include those born between 1913 and 1920. These adjustments do not alter the primary result which

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Figure 2: Proportion of Latin American primary beneficiaries who return migrated by notch status
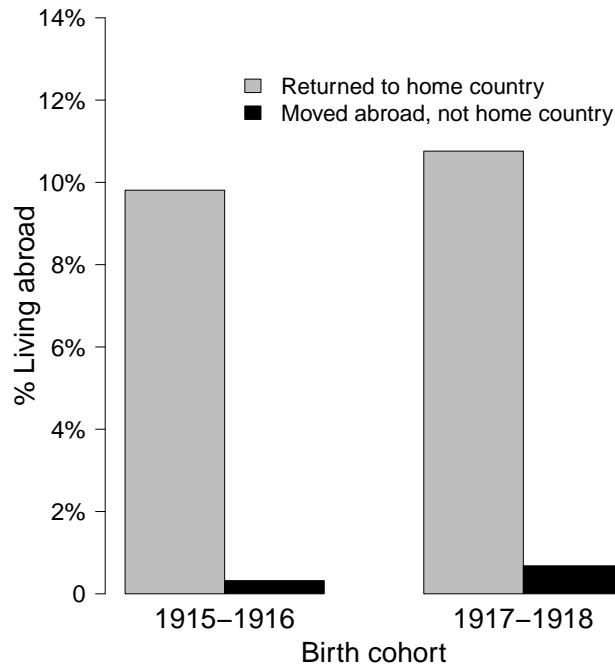
is that the income differential created by the notch does not affect the probability of return migration.

The table also demonstrates the demands that this regression discontinuity approach makes on the data with its standard errors increasing notably with smaller bandwidths.

Figures 3(a), 3(b), and 3(c) provide a graphical representation of this result. These figures display the probability of return migration for each two-month interval in the respective bandwidth based on models 1, 2, and 3 on table 4. This graph demonstrates that the probability of return migration hovers around ten percent for individuals born pre- and post-notch even after controlling for sex and whether they were born in Mexico irrespective of the bandwidth, h. Although the lowess smoother on figures 3(a) and 3(b) suggest a substantial difference in the probability of return migration between both groups, the results on table 4 indicate that these differences are not statistically significant.

Table 5 and figures 4(a), 4(b), and 4(c) demonstrate that the general results do not change even when utilizing weights in accordance with the distance from the notch.

At first glance, this finding suggests that income does not play a strong role in the decision to return migrate for Latin American primary Social Security beneficiaries. Indeed, both ethnographic (Suro, 1998; Aguilera, 2004) and quantitative work (Ruiz-Tagle & Wong, 2009) support the idea that the familial and social networks that immigrants develop over time

in the U.S. are key in determining return to the country of origin, perhaps more so than income.

However, this finding may also imply that income plays a more nuanced role in the decision to return migrate than a deterministic linear function. For Latin American primary Social Security beneficiaries, the threshold income differential at which point they decide to return migrate may be much higher or much lower than 19 percent. For example, there is evidence to suggest that it is immigrants who do not receive *any* Social Security in the U.S. who return migrate. Aguila and Zissimopoulos (2008) estimate that less than 12 percent of Mexicans in Mexico aged 65 years and older with U.S. migration experience were receiving U.S. Social Security. This number compares to 70 percent of Mexicans aged 65 and older in the U.S. that same year (Ruggles et al., 2010).

The citizenship requirements of Social Security may also explain the non-influence of income in this result. Social Security recipients must be U.S. citizens or legal permanent residents (General Accounting Office, 2003). Technically, formerly undocumented immigrants are eligible to collect Social Security benefits that they accrued while undocumented once they obtain U.S. legal status (General Accounting Office, 2003). However, Burtless and Singer (2011) report that "an overwhelming percentage of undocumented migrants who earn Social Security-covered wages will probably not become legal U.S. residents or gain eligibility for Social Security (pgs. 19-20)." These facts point to the possibility that elderly Latin American immigrants return migrate if they do not have the legal ability to remain in the U.S. upon reaching retirement age, a situation which the data of the present study would not capture.

A result that *is* significant in all three of the models is region of birth. In all three of the models, individuals born in Mexico were more likely to return migrate than those who were born in other countries. While this result has been found to hold among Mexican immigrants of all ages (Passel & Cohn, 2009; Massey, Durand, & Malone, 2002), little information exists as to whether this pattern applies to older Mexicans in particular.

A possible reason for this finding is the closer proximity of Mexican immigrants to their country of origin than other immigrants. In their analysis of the effect of the "salmon" bias on the Hispanic epidemiological paradox, Palloni and Arias (2004) assume that Mexican immigrants are more likely to return migrate since their country of origin is closer and therefore, more "easily reachable (p. 402)." However, the authors acknowledge the tenuousness of this assumption given the high volume of Salvadoran and Guatemalan return migration in the 1990s. Roberts, Frank, and Lozano-Ascencio (1999) have another take as to why proximity might be important in determining return migration. The authors claim that the geographical closeness of Mexico and the U.S. facilitates return migration not so much by making it physically easier to cross borders but by strengthening social and economic ties of immigrants and their home country during visits to the home country. In other words, Mexican immigrants may be more likely to retire in Mexico because they reinforced their social and economic networks during visits. This is likely not the case for immigrants from countries whose physical distance impedes on their ability to frequently visit.

Somewhat surprisingly, males were not more likely to return migrate than females. Pre-

vious studies document the greater tendency among males to return to the country of origin albeit these studies usually pertain to immigrants of all ages instead of just elders (Ruiz-Tagle & Wong, 2009; Turra & Elo, 2008; Aguila & Zissimopoulos, 2008).[9]

4   Discussion

This study examines whether elderly Latin American immigrants in the U.S. are more likely to return to their country of origin if they receive lower Social Security payments. To minimize the possibility of selection bias in answering this question, I utilize a natural experiment whereby the Social Security Administration unexpectedly lowered the Social Security benefits of beneficiaries born after 1916, a group otherwise known as the "notch" generation, due to an error in their benefit calculation formula. I compare the probability of return migration for the 1915-1916 birth cohorts to that of the the 1917-1918 birth cohorts to determine if Social Security differentials had an effect on the outcome. The exogenous source of these differences in Social Security benefits ensures that those who benefited from this windfall are similar to those who did not.

At face value, the results of this analysis suggest that lower Social Security benefits do not influence the probability of return migration. This finding falls in line with studies describing the primal role of social ties and time in the U.S. in determining return migration (Massey, 1987; Ruiz-Tagle & Wong, 2009), rather than financial context. The results of this study may signal that while economics play an important role in determining return migration for the general migrant population (Massey, 1987; Stark et al., 1997; Lindstrom, 1996), such may not be the case among older immigrants. These migrants may be drawn to the country of origin more so out of transnational ties than monetary ones. However, the decision to return may also be a function of business ties in the home country rather than income stream in the destination country. Although not specific to elderly, (Durand, Kandel, Parrado, & Massey, 1996) find that Mexican immigrants are much more likely to return to Mexico with savings if they own a home or land in Mexico.

However, there are several other ways to interpret this result. One explanation is that the 19 percent income differential created by the notch is not large enough to prompt or discourage return migration. Immigrants with lower income levels may indeed be more compelled to return migrate but only if they receive substantially less income. For example, Van Hook and Zhang (2011) found an association between poverty and emigration from the the U.S. among Mexican women but not for Mexican men.

Another explanation is that the relationship between Social Security benefits and return migration during later later is not linear. It may be that elderly immigrants are more likely to return to their countries of origin if they do not receive *any* retirement benefits. In the aforementioned study, Van Hook and Zhang (2011) find that elderly immigrants were less likely to emigrate from the U.S. if they received cash welfare or Supplemental Security Income. Though these programs are means-tested and are not Social Security, this finding

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[9]Aguila and Zissimopoulos (2008) examine return migration among Mexicans aged 50 years and older but most of these individuals returned to Mexico at working ages.

may suggest that immigrants stay in the U.S. if they have a consistent income stream such as Social Security. This paper would not capture this situation as it is limited to primary Social Security beneficiaries.

Before discussing the policy implications of this finding, there are numerous noteworthy limitations to mention. The first is that it is limited to primary Social Security beneficiaries. Therefore, this analysis does not provide information on return migration among undocumented immigrants or those who do not qualify for Social Security for other reasons. Another limitation is that it does not provide information on the age of return migration or the prevalence of cyclical migration to and from the country of origin during later life. Rather, it only includes information on the last country of residence as of 2011 or at the time of death. Further research should determine whether elderly immigrants partake in cyclical migration. Yet another limitation is that the regression discontinuity approach used in this work represents a very local average treatment effect. In other words, the results only apply in migrants born close to January 1, 1917 and cannot be generalized to birth cohorts born very far from this date. Despite these limitations, this is the first study to use direct estimates of the effect of the Social Security notch to assess whether it influences return migration among Latin American elderly in the U.S. albeit on a restricted universe.

Having noted these limitations, the magnitude of return migration is not inconsequential (approximately 10 percent) given the characteristics of this sample. These individuals are not undocumented immigrants who are ineligible for services but rather, immigrants who have worked in the U.S. for at least ten years and forgo consuming public services to which they would otherwise be entitled had they not returned to their home countries. In one year, the Centers for Medicare and Medicaid Services spend approximately $8,100 per capita on Medicare services (Medicare Payment Advisory Commission, 2012). Assuming migrants have similar Medicare spending patterns as the average Medicare beneficiary, every return migrant saves the U.S. budget this much in expenditures per year. Over ten years, this amount adds up to $81,000 per beneficiary. This does not include savings in Supplemental Security Income and other programs that are not available abroad.

However, the amount of savings will hinge on the proportion of time the migrant spends in the home country versus the U.S. Unfortunately, the Social Security Administration data used for this work does not include this information. Further research should investigate travel to and from the U.S. during later life.

Not only does it generate savings, but this 10 percent return migration rate represents a significant shift in resources from one country to another. In describing the importance of retirement migration from Northern to Southern Europe, Williams, King, and Warnes (1997) state that retirement migration "is a highly selective migration process which redistributes individuals - and their concomitant incomes, expenditure, health and health care needs - across international boundaries (p. 132)."

One aspect of this redistribution involves the transport of Social Security payments from the U.S. to return migrants' home countries. While the siphoning off of this income stream may not significantly impact the U.S. budget, it may create sizable economic multiplier effects abroad (Deller, 1995; Serow & Haas, 1992). Serow and Haas (1992) find that for every

entering retiree, 1.5 jobs were created in one North Carolina community due to increased demand for retail, health care, and eating and dining establishments. This result only applies to one North Carolina community but similar results may also pertain to comparable communities in Latin America. Aside from consumption, a proportion of this income likely also goes toward production, particularly if migrants are more educated and own land or businesses (Durand et al., 1996).

This income stream may also ameliorate budget constraints within households. Reil-Held (2006) finds a positive relationship between the amount elderly people receive in public transfers and the amount they give to younger generations. Evidence suggests that this is particularly true for elderly individuals with lower-income children (McGarry & Schoeni, 1995). The lower the income of their middle-aged children, the more elderly parents in one study transferred to their children (Cox & Jimenez, 1992). This is likely the case in numerous Latin American countries given the generally downward direction of private transfer from older to younger individuals (R. D. Lee & Mason, 2011).

Conversely, depending on their length of stay, these migrants may put greater pressure on their families and old-age support programs in Latin American countries. Between 2000 and 2050, the old-age dependency ratio in Latin America and the Caribbean will triple from 9 persons 65 and older per every 100 of working age individuals to 26 per 100, respectively (United Nations, n.d.). Older return migrants may intensify the ramifications of this trend if they remain in their home countries long enough to draw upon public services. Further research should investigate whether these migrants coordinate their travel to and from the U.S. around their use of Medicare.

An important related question is whether the gains from incoming Social Security revenue offset the costs of supporting additional elderly in the country. As is, Latin America faces considerable challenges in providing a safety net for its burgeoning elderly population (Wong & Palloni, 2009). Future research should examine return migration flows by age and the associated costs and benefits for the receiving country.

Acknowledgements

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Table 1: Descriptive statistics of Latin American immigrants aged 63-64 in 1980 (Pre-notch) and 65-66 in 1980 (Post-notch) receiving Social Security as captured in 1980 census

	Pre-notch	Post-notch	Statistically different
	(N=802)	(N=1,285)	
Male	40.3%	40.9%	No
Education			No
None	9.6%	9.8%	
<Primary	23.6%	23.0%	
Primary	16.5%	16.2%	
Junior High	20.2%	22.0%	
High School	18.7%	17.4%	
>High School	11.5%	11.7%	
Marital status			No
Married, spouse present	64.5%	61.0%	
Married, spouse absent	2.0%	2.6%	
Separated	3.4%	3.9%	
Divorced	6.5%	7.6%	
Widowed	18.8%	18.1%	
Single	4.9%	7.1%	
Living with Spouse	64.5%	60.8%	No
Living with 1+ children	37.4%	37.9%	No
Region of birth			No
Mexico	48.6%	46.8%	
Central America	5.2%	5.9%	
South America	9.2%	8.2%	
Cuba	25.8%	27.0%	
West Indies	11.1%	12.1%	
English fluency			No
Speaks only English	15.3%	16.3%	
Very well	17.6%	18.4%	
Well	17.8%	17.9%	
Not well	26.6%	25.2%	
None	22.7%	22.2%	
Naturalized U.S. citizen	50.3%	51.4%	No
Years in U.S.			No
0-5	2.6%	3.1%	
6-10	6.9%	6.7%	
11-15	12.5%	14.9%	
16-20	14.2%	14.7%	
21+	61.2%	58.9%	
Employed	19.5%	18.9%	No

Source: Author's calculations using the 5% IPUMS U.S.A. sample of the 1980 census

Table 2: Descriptive statistics of primary Social Security beneficiaries from one percent Master Beneficiary Record

	Total	Pre-Notch	Post-Notch
	(N=753)	(N=316)	(N=437)
Male	50.1%	49.2%	50.7%
Born in Mexico	37.3%	38.0%	36.8%
Retired at 65	17.0%	17.1%	16.9%
Died by 2011	74.0%	76.9%	71.9%
Representative payee	8.9%	8.9%	8.9%

Table 3: Predictors of the average Monthly Benefit Credited (MBC) among elderly Latin American primary Social Security beneficiaries

	Total
	(N=749)
Intercept	936.02*
	(37.67)
Born 1915	−
Born 1916	−22.33
	(47.72)
Born 1917	−133.78*
	(45.71)
Born 1918	−208.93*
	(42.78)
Born in Mexico	−181.26*
	(32.10)
Male	272.21*
	(31.09)

Source: Author's calculations using the one percent sample of the Social Security Administration's Master Beneficiary Record and the NUMIDENT.

* p-value<0.05

Table 4: Predictors of return migration among primary Social Security beneficiaries in the U.S. born in Latin America (i.e., Equation 2)

	Model 1	Model 2	Model 3
Bandwidth (h)	1915-1918	1916-1917	1913-1920
Constant	10.41	12.99	-5.96^*
	(9.36)	(26.25)	-3.17
Birthday	0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)
Notch	0.55	0.71	-0.21
	(0.52)	(0.73)	(0.36)
Male	0.33	0.36	0.12
	(0.25)	(0.36)	(0.17)
Born in Mexico	1.07^*	1.15^*	1.06^*
	(0.25)	(0.36)	(0.13)

Source: Author's calculations using the one percent sample of the Social Security Administration's Master Beneficiary Record and the NUMIDENT.

* $p<0.05$

Table 5: Predictors of return migration among primary Social Security beneficiaries in the U.S. born in Latin America (weighted to adjust for the bias in the neighborhood of the boundary, i.e., Equation 3)

	Model 1	Model 2	Model 3
Bandwidth (h)	1915-1918	1916-1917	1913-1920
Constant	-2.95^*	-3.36*	-2.54*
	(0.40)	(0.62)	(0.26)
Notch	0.58	0.72	-0.15
	(0.51)	(0.75)	(0.35)
Birthday - January 1, 1917	-0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)
Notch * (Birthday - January 1, 1917)	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)
Male	0.32	0.38	0.11
	(0.25)	(0.36)	(0.17)
Born in Mexico	1.07^*	1.14^*	1.07^*
	(0.25)	(0.37)	(0.18)

Source: Author's calculations using the one percent sample of the Social Security Administration's Master Beneficiary Record and the NUMIDENT.
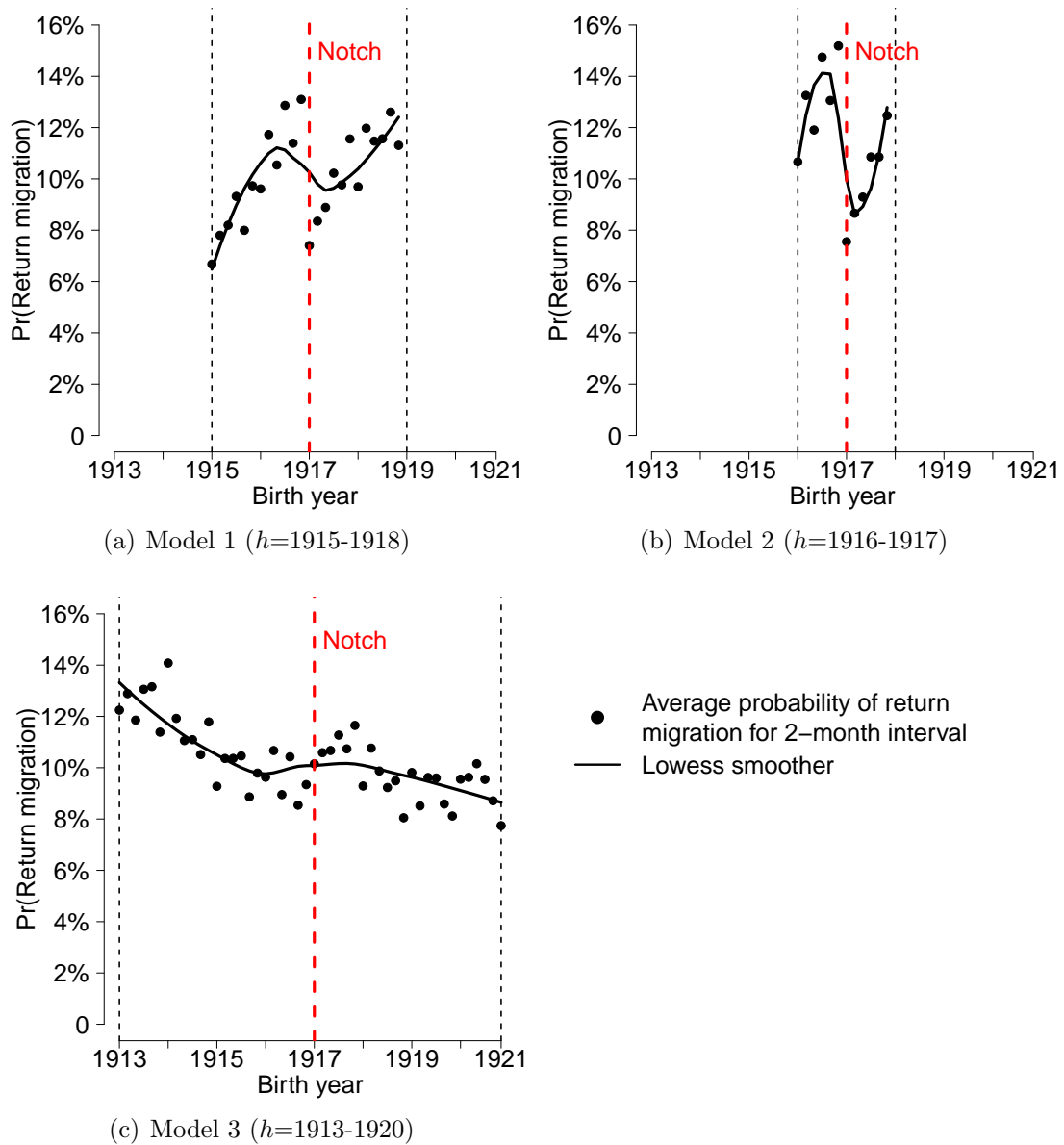
* $p<0.05$

(a) Model 1 (h=1915-1918)

(b) Model 2 (h=1916-1917)

(c) Model 3 (h=1913-1920)

Figure 3: Average probability of return migration for Latin American primary Social Security beneficiaries

Source: Author's calculations using the one percent sample of the Social Security Administration's Master Beneficiary Record and the NUMIDENT.

(a) Model 1 (h=1915-1918)

(b) Model 2 (h=1916-1917)

(c) Model 3 (h=1913-1920)

- Average probability of return migration for 2–month interval
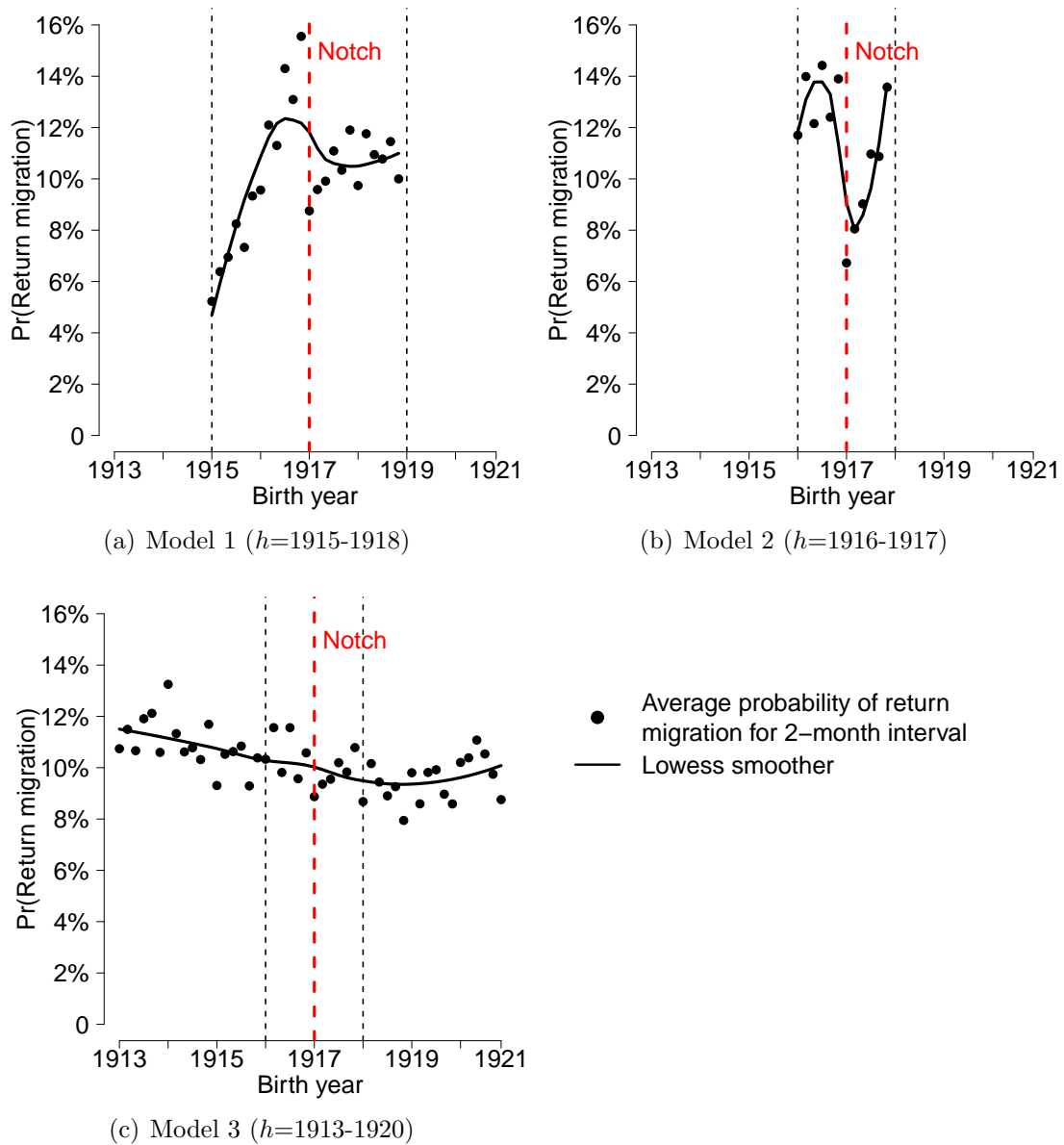— Lowess smoother

Figure 4: Average probability of return migration for Latin American primary Social Security beneficiaries (weighted to adjust for the bias in the neighborhood of the boundary)

Source: Author's calculations using the one percent sample of the Social Security Administration's Master Beneficiary Record and the NUMIDENT.