

# Family Form as Cultural Assimilation: Variations of Extended Household by Ethnicity and Immigration Generational Status

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**Abstract:** Past research showed a century-long decline followed by a recent rise in extended households in the US, and attributed the rise to immigration. However, no researchers of family structure have studied the changing trends as a process of immigrant assimilation. From the classical assimilation theory to the more recent segmented assimilation theory, we know that assimilation has different dimensions and directions, and affect groups of various backgrounds differently. Conceptualizing the change in household composition as a cultural assimilation, we study the process of acculturating one's family structure over immigration generations. We analyze data from the 1960 and 1970 US censuses as well as the 1994, 1999, 2004, 2009 March Current Population Surveys, via the hierarchical age-period-cohort model that properly estimates age, period, and cohort effects. We aim to answer three major research questions: (1) whether family structure as a cultural value is assimilated over three immigrant generations, based on classical assimilation theory; (2) whether certain immigrant groups in terms of place of origin experience a slower process in such assimilation, based on segmented assimilation theory and social psychological theory on assimilation; (3) whether the tempo of such assimilation would be faster for immigrants with a higher degree of education, based on classical sociological theory. By answering these questions, we can as well obtain an estimated period trend, controlling the effects of immigration.

## 1. Introduction

In spite of the long-run secular decline of intergenerational co-residence of persons aged 65 or older with their adult children from a high of 70% in the mid-nineteenth century to lower than 15% by the end of twentieth century in the US followed by a slight rise in the new century (Ruggles and Bower, 2003; Ruggles, 2007), the downward trend in the percentage of extended family households came to a stop in the 1980s (Glick, Bean and Van Hook, 1997). The change in trends can be explained by the increase of horizontally extended family households among immigrants with young adult relatives and by the upward prevalence of vertically extended family households with recent immigrant parents (Glick, Bean and Van Hook, 1997; Glick and Van Hook, 2002; Van Hook and Glick, 2007).

An interesting and important question follows from these research findings is whether immigrants who tend to live in extended family households, be they horizontally or vertically extended, assimilate and adopt the cultural values of the nuclear family that has become the norm of the U.S. majority residential population. From Gordon's (1964) ideal-typical conceptualization of assimilation to the more recent literature on segmented assimilation (e.g., Portes and Rumbaut, 1996; Portes and Zhou, 1993), there has been a huge body of literature on the study of how immigrants assimilate into American life. However, the literature has often focused on various dimensions of racial, ethnic or immigrant assimilation related to Gordon's conceptualization: spatial or residential, economic, educational, occupational, linguistic, and marital (e.g., Massey and Mullen, 1984; Reitz and Sklar, 1997; Rosenfeld, 2002; Schultz, 1998). What is missing in the literature is an understanding of the process of immigrant assimilation in the cultural dimension of family form, in particular whether immigrants assimilate into the overall pattern of single-family households.

To further explain the trends in the prevalence of extended family households and to further study immigrant assimilation in American life, we aim to provide the missing link by studying the

trends and patterns of intergenerational co-residence among major immigrant groups from 1960 to 2009, thus covering a period starting from before the 1965 Immigration Act to the most recent year with data available. To this end, we combine and analyze six datasets of two different data sources, the 1960 and 1970 Censuses and the 1994, 1999, 2004, and 2009 March Current Population Survey (CPS), with the purpose of understanding the residential form of three immigrant generations—the first generation, the second generation, and the third generation and beyond.

Following the introduction, we review the extant literature on the topic, especially the issue of assimilation. We then describe the data and our analytic method. To analyze the multiple cross-sectional data sources, we use a recently developed method, the hierarchical age-period-cohort (HAPC) model. This way, we can control the potential confounding effects of age, period, and cohort of repeated cross-sections. In the subsequent sections, we present the results, followed by a discussion of these results.

## **2. Theoretical Background and Considerations.**

### **2.1. The Literature on Assimilation**

Zangwill's 1908 not so popular Broadway show, *The Melting Pot*, a Romeo-and-Juliet story that portrayed an immigrant Russian fell in love with a Russian Christian, certainly popularized the term “the melting pot” in the twentieth century. Ironically, however, the type of romantic attraction and cultural assimilation the play intended to describe proved to be rather difficult in real life. Scholarly work later showed that America was anything but a huge melting pot. Relying on empirical data, the sociologist Ruby Jo Reeves Kennedy (1944) propounded in an *American Journal of Sociology* article the triple melting pot thesis and demonstrated that intermarriages occurred mainly *within*, rather *between*, the three main religious groups of Protestants, Catholics, and Jews. Kennedy's (1944) historical data of over 9,000 marriage records from New Haven, Connecticut showed that the US was a religiously

divided society, judged by the patterns and trends in intermarriages. Her analysis excluded the small number of racial intermarriages, a much more important issue in later decades.

In the post triple melting thesis era, numerous influential social scientists have conducted significant scholarship on the issues of assimilation and integration, including important works by Berry (1997), Gans (1997), Park (1950), Gordon (1964), Glazer and Moynihan (1963), Portes and Rumbaut (1996), Portes and Zhou (1993), and Rumbaut (1997). In this review we focus on the concepts of assimilation by Gordon (1964), Portes and Rumbaut (1996), Portes and Zhou (1993), and Berry (1997).

Studying how the early twentieth century immigrants especially those of southern and eastern European origins had managed to assimilate into the mainstream American society, Gordon (1964) found that the Poles, Italians and Greeks (among others) had originally faced a lot of discrimination in the United States upon arrival; however, over the course of three generations, these immigrants managed to become integral parts of the dominant white ethnic group. He proposed a seven-stage theory of assimilation:

- (1) Acculturation: new immigrants adopt language, dress, and daily customs of the host society (including values and norms);
- (2) Structural assimilation: it is about large-scale entrance of minorities will enter cliques, clubs and institutions in the host society;
- (3) Marital assimilation: it occurs when there is widespread intermarriage between the minority groups and the dominant group;
- (4) Identificational assimilation: it occurs when members of a group identify themselves as Americans and feel bonded to the dominant culture;
- (5) Attitude receptional assimilation: it is the absence of prejudice between the host and minority group;
- (6) Behavioral receptional assimilation: it is the absence of discrimination against immigrant groups;

- (7) Civic assimilation: it occurs when minority or immigrant group based value and power conflicts are absent.

Gordon (1964) concluded that common intermarriages between the early 20th century immigrant groups (such as Italians, Poles, and Greeks) and the established white ethnic groups (English, Germans, and Irish) were a clear indication that southern and eastern European national groups had assimilated into mainstream America.

Gans (1992) described several paths children of the new immigrants might take, including possible downward and upward mobility. Recognizing the more recent diverse social reality in the US especially the social phenomenon of urban underclass, Portes and Rumbaut (1996) proposed segmented assimilation theory (also see Portes and Zhou 1993). The central idea of this theory acknowledges the divergent paths of assimilation; that is, all immigrants may not take the “straight-line”, upward assimilation. In addition to upward assimilation, there can be downward assimilation and selective assimilation. Thus, the processes of adaptation and assimilation among recent or new immigrants may be different from those experienced by earlier European immigrants including the groups studied by Gordon (1964). In sum, there are three possible paths (Portes and Zhou 1993): the first is the upward assimilation as predicted by the classical assimilation literature, that is, acculturation and integration into the mainstream, middle-class American life; the second path, or downward assimilation, leads to assimilation into the underclass in American cities and to poverty; the third path leads to the so-called “selective assimilation” that encourages the preservation of the immigrant group’s ethnic culture and values while getting economically integrated. This theory makes more sense in contemporary American reality, allowing for different ways of becoming an American, and reconciling with the presence of a wider range of socioeconomic backgrounds than in previous waves of immigration as recognized by various scholars (e.g., Alba and Nee 1997, 2001; Portes and Rumbaut 1996).

Coming from a psychologist's point of view, Berry (1997) also found the one-model-fits-all classical assimilation theory problematic. Berry (1997) identified four strategies of acculturation: assimilation, integration, separation and marginalization. *Assimilation* refers to a process of adaptation by which an immigrant takes on the culture and values of the host mainstream society so that the minority becomes part of the majority; this is akin to the process described by classical assimilation theory. *Integration* can be defined as a somewhat similar process whereby an immigrant becomes an active participating member of the host mainstream society albeit simultaneously maintaining a distinct ethnic identity. *Separation* refers to the process of an immigrant who also maintains distinct ethnic identities, and at the same time refuses to actively participate in the mainstream society. *Marginalization* is the situation where an immigrant does not identify with the culture of origin or with that of the mainstream society, thus being sidelined by both the mainstream and the ethnic communities.

It is apparent that we have come a long way in our understanding of assimilation in the US, from a simple-minded idea of the melting pot to the triple melting pot thesis to the classical assimilation literature represented by Gordon's (1964) seven stages to the more recent scholarships by both sociologists (Portes and Zhou 1993) and by psychologists (Berry 1997) that are more in tune with today's social reality. With our current sociological knowledge of assimilation, it is easy for us to argue that perhaps in the early twenties century or even the nineteenth century assimilation never really occurred as one-directional. It is possible that for immigrants of certain origins, it would be easier to have upward assimilation while for others it might be easier to be merely integrated but not assimilated, or even possibly separated or marginalized. All these possibilities will have important ramifications for our understanding of family structure in the US.

## 2.2. Assimilation and Family Form

Recent scholarship on family composition all recognized the contributions by immigrants to the trends of extended family forms (e.g. Van Hook and Glick, 2007; Glick, Bean and Van Hook, 1997; Glick and Van Hook, 2002). The explanations offered and tested by researchers like Ruggles (1997) include the affluence hypothesis, the economic and development based theory, and explanations based on social mobility, urbanization, demographic changes (as in age structure) and attitudinal changes (in family values) over historical time. What is largely neglected in the literature is an understanding of the interplay between assimilation and family structure<sup>1</sup>.

We propose to examine family form as an aspect of assimilation. Living in an extended family can be considered as a cultural value, and acculturation of the host society's customs, values, and norms is indeed a primary dimension of Gordon's (1964) theory of assimilation. This process of assimilation takes much longer than a single generation, and if it happens, it takes three generations, as Gordon (1964) found. Recognizing the contemporary literature on assimilation in particular the segmented assimilation theory by Portes and Zhou (1993), we also consider the difference between places of immigrant origins as important because prior research questioned whether extended family forms were solely a result of immigration or they are inherent in the culture of certain country of origins (Van Hook and Glick, 2007). As Jeffrey Reitz and Sherrilyn Sklar (1997) found, economic assimilation (which could take place rather quickly for immigrants) was affected when one's "foreignness" is most pronounced: the effect was very selectively for European immigrants but universally for racial minorities treated as "foreign". Therefore, country of origin in cultural assimilation is important to consider for a proper understanding of the trends in extended family. It is also possible that immigrant groups of certain origins are more likely to be marginalized or at least

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<sup>1</sup> In fact, to our knowledge; the only research focused on family structure and assimilation was done by Gratton, Gutmann, and Skop (2007), who analyzed the US census data from 1880 to 1970 to assess the influence of ethnicity and generation on family structure of some major immigration groups. They found few consistent ethnic effects and argued that the results disconfirmed segmented assimilation theory

separated (in the sense discussed by Berry 1997), thereby necessitating the need of keeping an extended family form.

Based on these considerations, we propose to study in the following analyses family form in the US (in terms of vertically and horizontally extended families or non-extended families) as an assimilation process: (1) Because family composition is a cultural value and can be assimilated, we propose to use a three-generation concept to understand such assimilation; that is, first-generation (new) immigrants would retain a higher rate of extended family in recent decades because such form is more common in their home countries, second-generation immigrants would have a lower rate, and third- and higher-generation immigrants would have a rate that should be similar to the rest of the population's.<sup>2</sup> (2) Certain countries of origin among the new immigrants such as Mexicans may show a slower process in possibly segmented assimilation because of the possible cultural separation (in terms of keeping their own values and living their own community life), with or without marginalization. (3) The speed of cultural assimilation in terms of family structure can be faster for those immigrants that are more socially mobile. According to some twenty-century sociologists, the isolated nuclear family was conducive to the fluid and mobile workplace (Parsons 1949; Parsons and Bales 1955); therefore, the well-educated immigrants may not take three generations to acculturate the value of non-extended family, or even it takes three generations, it would do so at a faster pace. In the next section, we will introduce the data for testing these ideas and for showing the true period trends once the effect of immigration is taken into account.

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<sup>2</sup> The three-generation definition of immigration status is the feasible but not a more refined one such as a four- or five-generation definition because neither the census nor the CPS data support such definition. Therefore, we are unable to observe full assimilation if the process takes more than three generation.



### 3. Data, Method and Variables

#### 3.1. Data and Sample

For the planned analysis, we need a micro dataset with three major characteristics. First, it should contain detailed information about nativity (e.g. ideally generation status of higher than 3). Second, it should have a large enough sample size to capture variations in each immigrant group by demographic characteristics and by cohorts. Third, it should provide fine-grain information about the household structure to correctly classify them into either vertically or horizontally extended households. In addition to these, we would like to bring the analysis to the most current date possible. To obtain such data, we combined 1960s and 1970s waves of Census data where we have all of the information above with the Current Population Survey's (CPS) last four waves for every five years (i.e. 1994, 1999, 2004 and 2009)<sup>3</sup>.

In order to make sample sizes comparable between CPS and Census data, we drew a random sample of 0.1% US population out of each of the 1960 and 1970 censuses. As a result, we obtained samples with comparable sizes that vary between 130 thousand and 220 thousand observations per wave (See Table 1 and Appendix for details about the samples). With such data, we are able to see if the extended family household form tends to be popular among only first generation immigrants and if it declines (indicating assimilation) over immigrant generations, and by how much. We also examine the differentials of national origin and socioeconomic status in the co-residential patterns over immigrant generations.

Another advantage of using the CPS data in combination with the census data over the previous studies that used only census data is that we are able to take a closer look at more recent trends with the additional waves from the CPS data between early 1990s up to 2009. This was not

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<sup>3</sup> Nativity information in CPS is only available since early 1990s. Therefore we could not use its previous waves.

possible in the previous research that used only the decennial census data and allowed only additional two data points after 1970. This would be regrettable because in the last two decades but especially after 2000, a century long trends may have been reversed. Thus, the need to look at these years closer is called for. We provide the descriptive evidence for the reversed trends in section 4.1.

### 3.2. Method

A major methodological challenge arises in analyzing repeated cross-sectional surveys due to the “identification problem” because of the exact linear dependency between age, period, and cohort (Period = Age + Cohort) existing in the age, period, and cohort data. Conventional solutions to the problem include nonlinear function of at least one of the age, period and cohort variables, proxy variables for them, and applications of constraints between their effects. We use a Hierarchical Age-Period Cohort model (HAPC) proposed by Yang and Land (2006, 2008), to address this problem. This model is useful because (a) it does not assume additive fixed age, period, and cohort effects, thus avoiding the identification problem; (b) it can capture contextual effects of historical time and cohort membership; and (c) can accommodate covariates necessary for representing social processes and mechanisms (Yang forthcoming).

To apply the HAPC model, we first define cohorts in 5-years groups<sup>4</sup>, a common practice in demographic and sociological research. A nonlinear transformation can also be applied to the age variable, depending on the substantive meaning of age effects. In our case, we include a quadratic age term that is in line with theoretical considerations regarding an individual’s choice of household structure (i.e., middle-aged heads of household have a higher likelihood of residing in extended family than very young or very old heads of household). Above all, instead of estimating a standard fixed-effects model by including control variables for age-period or cohort, the HAPC model takes into account multilevel structure of the data. In this case, the respondents are cross-classified in

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<sup>4</sup> We have 27 cohorts with varying sample size in each. In this respect our data is unbalanced.

different socio-temporal contexts defined by birth cohorts and time periods. Because respondents might have a common random error component due to their joint membership to the same period and cohort, for valid statistical inference, such contextual effects can be estimated as random effects in hierarchical (or mixed effects) models (Yang 2008; Yang and Land 2006). Such models are also known as cross-classified mixed-effects model. Imagine a multilevel model of individuals with two higher levels, one representing cohort and the other representing period. Instead of one level embedded in the other, these two levels are cross-classified because individuals of one particular cohort can belong to multiple time periods, and vice versa. In a typical application of Yang's (2008) or Yang and Land's (2006) specification, age is modeled as fixed by cohort and period effects are modeled as crossed random effects. When at least one of these two effects is regarded as random, the APC linear dependency is broken.

In other words, the typical HAPC model estimates fixed effects of age and other individual-level characteristics on the first level and random cohort and period effects on the second. We adopt a generalized linear version of the HAPC model via a logit link, also known as the mixed-effects (random and fixed effects) logistic regression model or cross-classified multilevel logit model.

$$\ln \left[ \frac{p(y_{ijk} = 1)}{1 - p(y_{ijk} = 1)} \right] = X\beta + u_j + v_k + e_{ijk} \quad (1)$$

where  $p(y=1)$  stands for the observed proportion of  $y=1$  (as opposed to the expected probability), in this case either the vertically or horizontally extended household type,  $X$  is a matrix containing all fixed-effects variables including age, immigrant generational status, education, country of origin, and others,  $\beta$  is the vector of parameter estimates for the fixed effects variables,  $u_j$  stands for the random period effects in the original specification of Yang and Land (2006) but fixed period effects in our

specification,  $\nu_j$  represents the random cohort effects, and  $\epsilon_{ijk}$  is the random error term.<sup>5</sup> The estimation of  $\mu_j$  and  $\nu_j$  enables us (1) to take into account influences coming from both contexts of cohort and period, and (2) to estimate and evaluate the importance of the two contexts vis-à-vis the fixed effects in analyzing the process of acculturation of family form.

Because we have only six time periods (two censuses and four CPS surveys), it is rather difficult to argue for modeling such effects as random as in the applications of Yang 2008 and Yang and Land 2006. This is especially true when our periods have important substantive meanings. That is, the first two periods sandwiched the 1965 Immigration Act and the later surveys were conducted with a rise in the number of immigrants. Equation 1 represents a generalized linear version of Yang and Land (2006) linear model. To better capture and understand such period effects, we modify (1) by treating the period effects  $\mu_j$  as fixed instead random, rendering a simple extension of their original specification.<sup>6</sup> To our knowledge, this extension to the typical HAPC model has not been applied in the empirical literature. The model in (1) still is identified in such event, and our preliminary analysis indicates that the results are similar to those from treating both period and cohort effects as random, except for the estimates of period effects.

### 3.3. Dependent and Independent Variables

We have two dichotomous dependent variables each of which indicates whether the household is vertically or horizontally extended, respectively. We define *vertically extended* households as those that include an adult children and grand children of the head or those households where head lives with at least one of his/her parents and a his/her children. In other words the household must contain members of three generations. Therefore, we exclude households that include only

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<sup>5</sup> We use the `xtmelogit` command in Stata for the estimation of random period and cohort effects.

<sup>6</sup> We estimated this model by using the dummy variable approach to modeling period effects of cross-section time series data in Stata.

two generations even if they are the first and the third (i.e. head lives with grandchildren but the parents of the grandchildren are absent) from our definition of vertically extended households. On the other hand, *horizontally extended* households are those that contain at least either one adult sibling of the head or one other relative (e.g. cousin, nephew). In these cases, either head or the co-residing sibling (or other relative); or both should be married in order to define the household to be horizontally extended. Put differently, the household must contain another family unit apart from head's own.

Our unit of analyses is household heads and we use their attributes to estimate the household structure information for the dependent variables<sup>7</sup>. To understand the mechanisms of immigrants' assimilation regarding residential patterns, our analyses focus on the possible determinants of residing in a vertically or horizontally extended household for a household head. The set of potential explanatory factors are taken from the previous literature (e.g., Glick, Bean and Van Hook, 1997; Glick and Van Hook, 2002; Ruggles, 2007; Van Hook and Glick, 2007). These include demographic variables such as age, sex, education, race, family income and generation status (nativity) of household head (first, second or third or higher generation) and additional contextual variables such as whether household is in a metropolitan area and place of origin if household head is a first or second generation immigrant. We define key immigrant groups from 5 major places of origin (US Territories and Canada, Latin America, Europe, Middle East and Africa and Asia). The group of Canada and US territories includes American Samoa, Guam, Puerto Rico, US Virgin Islands, other US Possessed Territories and Outlying Areas, Canada and Atlantic Islands but Canadians and Puerto Ricans make up to 80% of this group with Canadians comprising of about half of this group. Mexicans are the largest sized place of origin in the Latin American group.

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<sup>7</sup> The definition of the household head is consistent between CPS and Census data.

Europe includes Western and Eastern Europe including Russia. Immigrants from Africa and the Middle East predominantly include immigrants from North Africa and broader Middle East

Additionally we generate a number of interaction terms and we include them into our specifications. Our full specifications include an interaction term between gender and education and another one between race and education. We also include interaction terms between generation status and education in our final models.

We are as interested in the intercept estimates as in the coefficient estimates because the intercepts capture the left-over, cultural influence and values of or attitudes toward forms of household extension. To compare the effect of immigration generations of various places of origin on household structure, we compute predicted probabilities from the logistic estimates and sample data. This gives us a better sense of cultural assimilation of family form over immigration generations for various immigrant groups when the key determinants are taken into account.

## **4. Results**

### **4.1. Descriptive Analysis**

In the following descriptive analysis, we examine the trend of both vertically extended and horizontally extended households over time and over immigration generation status. Immigration generation status is defined by an immigrant's nativity status and his/her parents' immigration status. One is a first-generation immigrant if he or she was foreign born, a second-generation immigrant if at least one parent was foreign born (we separate inter-immigration status parent groups), and a third or older immigration generation (or native) if neither parent was foreign born.

As a support to the earlier point about the reversal of the century-long declining trend, we can clearly see in Figure 1 an overall increasing trend in the percentage of vertically extended households almost in each nativity status. This trend is especially steep among the first generation

immigrants and second generation immigrants since the mid 1990s: a result consistent with the implications of previous research (Glick, Bean and Van Hook, 1997; Glick and Van Hook, 2002). It is important to note here that the share of first generation immigrants in the overall US population has increased from about 9% to 16% during the same time period (see Table A1 in the Appendix).

---Figure 1 about here---

More important and pertinent to our focus of the paper is the over-immigration generation status trend in the prevalence of extended households in the US. It is obvious that first-generation immigrants exhibit the highest percentages of vertically extended households, from just above 4% in 1970 to over 10% in 2009. Second in line is the second-generation immigrant heads with both parents foreign born, from just over 3% to about 4% of whom lived in a vertically extended household. The distinction between the third- or older generation immigrants and the mixed status second-generation immigrants is less clear except for the most recent year when both types of mixed parentage second-generation immigrants show a slightly elevated level of vertically extended households. Overall, however, the information conveyed in Figure 1 is loud and clear: immigrants into the US did assimilate the cultural trait of simple household over immigration generations.

We analyze not only the trends in vertically extended households, but also the trends in horizontally extended households. Figure 2 shows those trends by nativity status. As opposed to the rate of vertically extended households, horizontally extended households exhibits less dramatic trends over time. Strikingly the level differences are bigger between the first generation immigrants and the rest of the groups. Overall the trends have somewhat increased in all categories though more dramatically for the first-generation immigrants between 1970s and 1990s. Since the early 90s it seems like it has leveled off in all categories but the second generation immigrants where the rate of horizontally extended households have been increasing. The overall pattern of cultural

assimilation of residential form in moving away from horizontally extended households is even clearer in Figure 2 than in Figure 1.

--Figure 2 about here--

Naturally, some immigrant groups might have a stronger culture of co-residence than the others. Figure A1 and A2 in the appendix describes distributions of first and second generation immigrants in vertically and horizontally extended households respectively by their countries of origin in (a more detailed) eight<sup>8</sup> nativity groups: immigrants from other US Territories and Canada, Mexico, Other Latin America, Western Europe and Australia, Eastern Europe and Russia, Middle East and South East Asia, Africa. In both figures we can see that there are two different levels around which broad regions are grouped: Immigrants from Mexico and other Latin America and East and South East Asia have higher rates of extended family types than immigrants from Canada, West Europe and Australia and East Europe and Russia although trends differ in each.

## **4.2. Results from the HAPC Analysis**

In this section, we present our preliminary results from mixed effects logistic regression (Hierarchical Age-Period-Cohort Analysis). Table 1 shows the summary statistics of all at the variables used in our specifications. Some of them may require further explanations here. First of all, education variable in Census and CPS exhibit slight differences in categorization. To make it comparable we constructed a continuous “years in education” variable from a 10-category variable that roughly measured the grades completed (with intervals at the top and bottom levels). We took the mid points of intervals therefore the maximum number of years in education is truncated at 16.

Metropolitan areas defined as those that consist of a large city and the surrounding economically-integrated counties or combinations of counties centering on a substantial urban area. We aimed to

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<sup>8</sup> These 8 origin groups are reduced to 5 broader groups for the analysis in the next section to overcome sample size problems.



capture urban/rural differences with this categorical variable since it is the best comparable measure of it in Census and CPS surveys. The income variable measures total family income and it is adjusted for family size using the OECD equivalized scale and with consumer price index based on 1984 prices.

Finally, note that the generation status variable uses a conservative definition for the second generation immigrants where we included only those whose both parents were foreign born. Household heads whose father or mother are US born are included in the category of third or higher generation immigrants. Since one of their parents is born in the US, they may exhibit similar patterns as those third generation immigrants. However, we will run a sensitivity analysis in the future to the alternative definitions of second generation immigrants.

Table 2 and Table 3 show the results of mixed effects logit regression models for vertically and horizontally extended households respectively<sup>9</sup>. In each table models 1 to 10 include stepwise a number of covariates and controls regarding household type choice. Model 1 in both Table 2 and Table 3 provide us the unconditional effects of period, age and cohort. We identify a significant and a positive age and cohort effects on the likelihood of living in either vertically or horizontally extended households.

Model 2 includes gender and race dummies in addition to the unconditional age- period and cohort effects in model 1. Gender of the household head turned out to be an important determinant of household type. Except models 7 to 10, in all models we find that a female head has around half (o.r.: 0.6) a chance of living in a horizontally extended households than a male household head but she is about 1.5 times more likely to live in a vertically extended households.

Compared to a white household head, a black head or a head in other races is about twice as likely to have a vertically extended family. However, black household heads are as likely as whites to

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<sup>9</sup> Tables report logit coefficients. Odds ratios are also provided throughout the text.

have a horizontally extended household although household heads in other races have almost twice more chances to live in a horizontally extended family than black or white household heads (Models 2 to 6 in Table 2 and 3 ).

Model 3 includes education of the head as a control while Model 4 controls for the adjusted total family income of the head. We find that an additional year in education would decrease the chance of living in an extended family of either form by 10 to 12%. On the other hand, approximately every \$3 increase in real family income results in about 10% decline in the odds of living in vertically extended households and 12% increase in the odds of living in a horizontally extended household. This shows that as the households get poorer they are less likely live in a horizontally extended household and more likely to live in a vertically extended household.

Model 5 controls for the urban rural differences via metropolitan area status. We would expect to observe that living in a metropolitan area would reduce the chances of living in extended families (for example; because housing prices are usually higher). Here our reference category is those that have an unknown metropolitan area status. The signs of the coefficients are in the expected direction. We find that living in a metropolitan area reduces the odds of having a horizontally extended family between 10 and 15% compared to living in an area whose metropolitan status is not clear. Whereas, being not in a metropolitan area increase the chances of living in a horizontally extended family by about twice. The effect of living in a metropolitan area relative to the reference category on vertically extended family types is insignificant but not living in a metropolitan area also increases chances of living with a vertically extended family.

Model 6 takes into account generation status of the household heads where we consider third or higher generation (natives) as the reference category. The specification in Model 6 does not take into account the origin of immigrants and simply reports the overall effect of nativity. We find that first-generation immigrants were about 2,5 times more likely to live in horizontally extended

families and 1.4 times more likely to live in vertically extended families than the natives. For the second-generation immigrants, the odds for horizontal extension were increased about 1.5 times and the odds for vertical extension were increased about 10%. This result is important in that it shows the process of assimilation as indicated by immigrant generation status is taking the direction from the extended households towards non-extended household types.

Model 5 includes 6 additional dummy variables indicating the world region where the household head immigrated from as long as s/he is a first or a second generation immigrant. The reference category is now, first and second generation immigrants from US Territories and Canada. In other words, one can think about these origin variables as interacted with nativity status (i.e. they are only valid for the first and second generation immigrants). In Table 2 models 7 to 10 show that coming from Europe, Asia, Middle East and Africa turned out to be not significantly different from coming from Canada or other US Territories for the likelihood of having a vertically extended family. On the other hand among the immigrants; both first and second generation Hispanics are about 1.8 times more likely to live in a vertically extended household compared to first and second generation immigrants from the US Territories and Canada. A higher likelihood of living in an extended family for Hispanics is well-documented in the prior literature (e.g. Blank and Torrechilha 1998). However, we find that the likelihood of living in a vertically extended family for the Hispanic immigrants compared to the Canadian immigrants remains the same for both the first and the second generation immigrants. This means if Canadian immigrants exhibit similar rates of vertically extended households as natives, then this means Hispanics exhibit a very slow pace of assimilation from first to second generation.

Table 3 models 7 to 10 show that the first generation Latino immigrants are three times more likely to live in horizontally extended families compared to immigrants from US Territories and Canada. However, second generation immigrants from Latin American Countries are only 1.5

times more likely to live in horizontally extended households compared to immigrants from Canada and US territories. This implies assimilation from first generation to second generation among the Hispanics, even when we control for main demographic and contextual factors. First generation immigrants from Middle East and Africa and from Asia are also about 1.5 times more likely to live in a horizontally extended family. However, in the second generation we cannot statistically distinguish these groups from the immigrants from US Territories and Canada; which we take as a clear indication of assimilation from first to second generation .

Now, consider the last three models (8, 9 and 10) that report the coefficients of interaction terms. In model 8 we include an interaction term between gender and education to see whether education has a differential impact on the household type for female headed household. And in model 9 we introduced an interaction term between education and race categories. Finally, model 10 includes an interaction variable between nativity and education.

Interpreting the coefficients of interaction terms usually is not straightforward in logistic regression. The problems arise because first, logit models are already interactive on the probabilities or odds. Second, the effect of one of the interaction component on  $p(y)$  is not constant, thus complicating the interpretation. Last but not the least, unobserved heterogeneity across groups may affect coefficients of interaction terms that aim to capture group differences in slopes.

We do not formally address all these potential problems at this stage. However, because variables female and education have a linear relationship with the logit, we can interpret that the coefficient of interaction term as the partial derivative of  $p(y)$ , given the range of values of education for women which decrease for extra year of education. For the moment we stop here since we will also conduct further analysis testing against simpler models of one interaction component versus both components and the interaction term. At this stage it is sufficient to note about the individual

significance of all three interaction terms (i.e. female and education; race and education and nativity and education) in both types of extended family types.

However, we provide predicted probabilities derived out of Model 10, which includes full set of covariates and controls. Figures 3 and 4 exhibit the trends of predicted probabilities for vertically and horizontally extended households respectively. Figure 3a shows the trends of predicted probabilities evaluated for each nativity status separately<sup>10</sup> over survey periods. We can clearly see from this figure that there is an upward trend both for the first generation immigrants and for the second generation immigrants and natives. First generation immigrants are far more likely to live in the vertically extended households than the second generation immigrants and the third generation immigrants, even when we take into account all the controls. The order of the lines from higher probability to lower probability implies assimilation in the family form from first to second generation. Figure 3b evaluates the predicted probabilities for each immigrant origin. This figure shows that Hispanics are the driving group among all the immigrant groups. Immigrants from other origins exhibit almost no difference in terms of probability of living in vertically extended household.

Figure 4a shows the trends of predicted probabilities of living in a horizontally extended household evaluated for each nativity status separately. Although the trends over time are relatively smooth for the horizontally extended households, first generation immigrants are still far more likely to live in extended households than the second generation immigrants and natives. Between second generation immigrants and natives there is no significant difference. Finally, figure 4b shows the predicted probabilities for the horizontally extended households evaluated for each country origin. Again Hispanics are by far the driving group, which is followed Asians and Africans and Middle eastern. However these latter groups are far more similar to European immigrants than the Hispanic immigrants.

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<sup>10</sup> Other covariates and controls are evaluated at their means.

## 5. Conclusions

To sum up, our preliminary results showed that there is a clear upward trend (period effect) on the vertically extended family form: household heads are tended to live in vertically extended families for all generation although at much higher levels among the first generation. These trends are clear even after we control for age, education, gender of the head, family income and metropolitan area... etc. We did not find an increasing trend in the likelihood of living in horizontally extended household after introducing control variables.

We found some support to the opportunity argument that well educated immigrants may take shorter than three generations to assimilate by way education. We also found that place of origin matters. In particular, we found that Hispanics are more likely to live in both types of extended households and less likely to show signs of assimilation between first and second generation, and especially for the vertically extended households. Except Europeans, all the other immigrant groups are more likely to live in a horizontally extended household compared to Canadians and immigrants from US Territories in the first generation. But in the second generations, (although the probability declines about 50%) only Hispanics remain more likely to live in a horizontally extended household. In general, we found evidence that the process of assimilation, as indicated by immigration generation, demonstrates a trend of moving from extended to nonextended family forms for all groups.

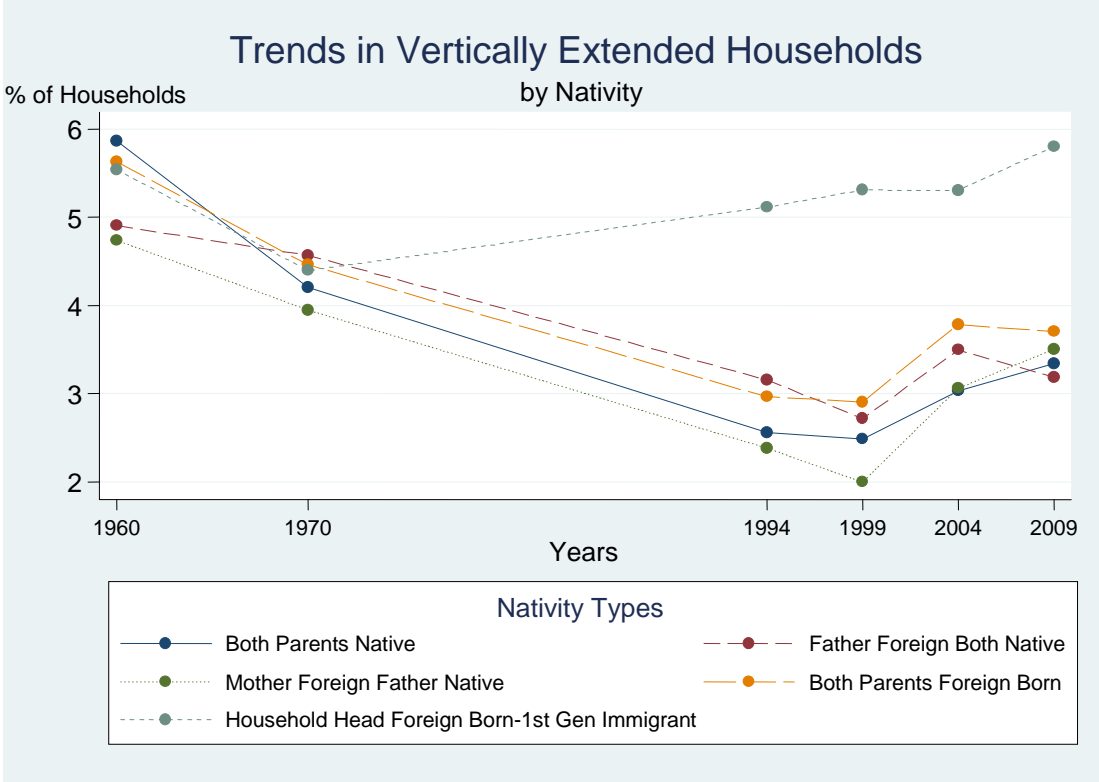
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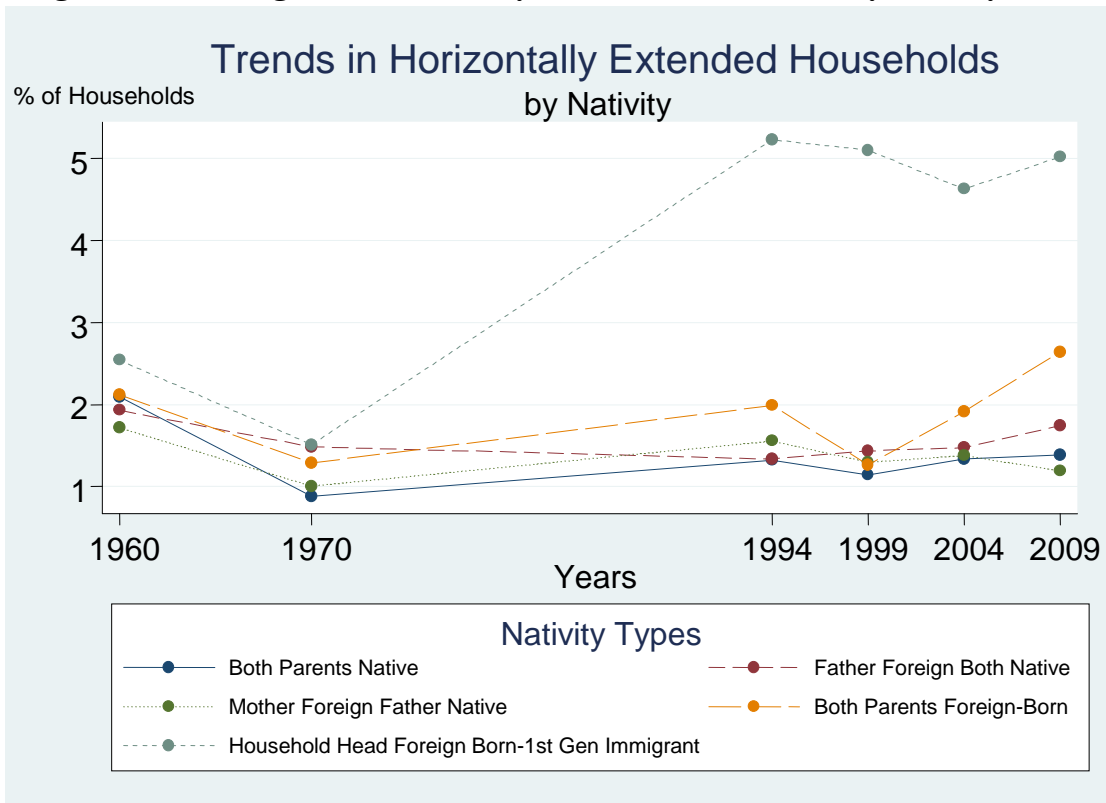


Figure 1: Percentages of Vertically Extended Households by Year and Nativity Status.



Note: The table excludes those households with an unknown nativity status. Sampling weights are applied.

Figure 2. Percentages of Horizontally Extended Households by Nativity Status



Note: The table excludes those households with an unknown nativity status. Sampling weights are applied.

**Table 1: Summary Statistics for All Variables: Pooled CPS and CENSUS data (N=371392)**

<b>Dependent Variables</b>		Mean	Std. Dev.	Min	Max	
Vertically Extended Households		0.04	0.19	0	1	
Horizontally Extended Households		0.02	0.13	0	1	
<b>Level 1 Variables</b>						
Age		48.23	16.49	2	100	
Age <sup>2</sup>		2598.00	1716.02	4	10000	
Female		0.36	0.48	0	1	
Race:						
White		0.85	0.36	0	1	
Black		0.11	0.31	0	1	
Other		0.05	0.21	0	1	
Years of Education		11.69	3.04	0	16	
Metropolitan Area:						
Status Unknown or NA		0.05	0.21	0	1	
Not in a Metropolitan Area		0.23	0.42	0	1	
In a Metropolitan Area		0.72	0.45	0	1	
Income:						
Real income		Family income (at 1982-84 US \$)/family size	\$15,988	15662	0	\$380,014
(Log)Real income			9.31	0.99	0	12.85
Nativity:						
First Generation		Individual Born abroad = 1; Else = 0	0.12	0.33	0	1
Second Generation		Both parents born abroad=1 ; Else = 0	0.06	0.24	0	1
Third /Higher Generation (Native)		One or both parents born in the US=1; Else = 0	0.81	0.39	0	1
First and Second Generation Immigrants by Origin:						
1 <sup>st</sup> Gen. Canadians and US Territ.		US territories include: American Samoa, Guam, Puerto Rico, US Virgin Islands, other US possessed territories and outlying areas.	0.013	0.11	0	1
2 <sup>nd</sup> Gen. Canadians and US Territ.			0.006	0.07	0	1
1 <sup>st</sup> Gen. Hispanics		Mexicans and Other Latin Americans	0.051	0.22	0	1
2 <sup>nd</sup> Gen. Hispanics			0.008	0.09	0	1
1 <sup>st</sup> Gen Europeans		West and East Europeans and Russians	0.032	0.18	0	1
2 <sup>nd</sup> Gen Europeans			0.044	0.21	0	1
1 <sup>st</sup> Gen. Middle Eastern		Middle Eastern and North Africans	0.005	0.07	0	1
2 <sup>nd</sup> Gen. Middle Eastern			0.001	0.03	0	1
1 <sup>st</sup> Gen Asians		East and Southeast Asian and Indians	0.024	0.15	0	1
2 <sup>nd</sup> Gen Asians			0.004	0.06	0	1
<b>Periods:</b>						
1960			0.14	0.35	0	1
1970			0.17	0.37	0	1
1994			0.15	0.36	0	1
1999			0.14	0.34	0	1
2004			0.20	0.40	0	1
2009			0.20	0.40	0	1
<b>Level 2 Variables :</b>			<b>N</b>	<b>Min</b>	<b>Max</b>	
Cohort		Five-year birth cohorts	N=27	1860	1994	

**Table 2. Mixed Effects Logit Estimates Age -Period-Cohort Models of Vertically Extended Households**

Equation 1	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Age	0.180*** (0.005)	0.185*** (0.005)	0.183*** (0.005)	0.188*** (0.005)	0.189*** (0.005)	0.188*** (0.005)	0.188*** (0.005)	0.188*** (0.005)	0.188*** (0.005)	0.188*** (0.005)
Age <sup>2</sup>	-0.002*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)
Survey years (Ref: 1960)										
1970	-0.367*** (0.033)	-0.398*** (0.033)	-0.331*** (0.033)	-0.315*** (0.033)	-0.319*** (0.033)	-0.323*** (0.033)	-0.344*** (0.033)	-0.341*** (0.033)	-0.340*** (0.033)	-0.339*** (0.033)
1994	-0.615*** (0.069)	-0.745*** (0.070)	-0.510*** (0.069)	-0.501*** (0.069)	-0.518*** (0.069)	-0.546*** (0.070)	-0.631*** (0.070)	-0.630*** (0.070)	-0.628*** (0.070)	-0.613*** (0.070)
1999	-0.582*** (0.078)	-0.735*** (0.078)	-0.467*** (0.077)	-0.448*** (0.077)	-0.467*** (0.077)	-0.497*** (0.079)	-0.595*** (0.078)	-0.596*** (0.078)	-0.594*** (0.078)	-0.578*** (0.078)
2004	-0.374*** (0.084)	-0.600*** (0.085)	-0.297*** (0.083)	-0.276*** (0.083)	-0.293*** (0.083)	-0.319*** (0.085)	-0.421*** (0.084)	-0.424*** (0.084)	-0.423*** (0.085)	-0.405*** (0.084)
2009	-0.275*** (0.092)	-0.515*** (0.092)	-0.179** (0.091)	-0.156* (0.090)	-0.177* (0.090)	-0.206** (0.093)	-0.320*** (0.092)	-0.324*** (0.092)	-0.322*** (0.092)	-0.304*** (0.092)
Female		0.402*** (0.019)	0.410*** (0.019)	0.381*** (0.019)	0.372*** (0.019)	0.376*** (0.019)	0.378*** (0.019)	0.186*** (0.059)	0.195*** (0.059)	0.217*** (0.059)
Race (Ref. Other Races)										
White		-0.780*** (0.035)	-0.744*** (0.035)	-0.731*** (0.035)	-0.725*** (0.035)	-0.610*** (0.036)	-0.683*** (0.044)	-0.683*** (0.044)	-0.506*** (0.125)	-0.629*** (0.127)
Black		-0.071* (0.039)	-0.149*** (0.039)	-0.168*** (0.039)	-0.182*** (0.039)	-0.021 (0.041)	-0.095** (0.048)	-0.096** (0.048)	-0.002 (0.133)	-0.259* (0.138)
Education (in Years)			-0.092*** (0.003)	-0.083*** (0.003)	-0.084*** (0.003)	-0.075*** (0.003)	-0.068*** (0.003)	-0.074*** (0.004)	-0.061*** (0.010)	-0.089*** (0.011)
Log Family Income (at 1984 prices)				-0.092*** (0.009)	-0.100*** (0.009)	-0.098*** (0.009)	-0.092*** (0.009)	-0.093*** (0.009)	-0.093*** (0.009)	-0.090*** (0.009)
Metropolitan Area										
Not in Metropolitan Area					-0.023 (0.042)	-0.011 (0.042)	-0.000 (0.042)	0.003 (0.042)	0.003 (0.042)	0.006 (0.042)
Metropolitan Area					0.153*** (0.039)	0.106*** (0.039)	0.112*** (0.039)	0.117*** (0.039)	0.116*** (0.039)	0.129*** (0.039)
Nativity: (Ref.: Third or higher generation immigrants)										
First generation immigrants						0.340*** (0.026)	0.069 (0.073)	0.073 (0.073)	0.069 (0.073)	-0.324*** (0.098)
Second Generation Immigrants						0.115*** (0.035)	0.090 (0.121)	0.091 (0.121)	0.088 (0.121)	-0.594*** (0.167)

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Table 2 (Continued)

Origins (Ref.: 1st and 2nd Gen Immigrants from Canada and other US Territories)

1 <sup>st</sup> Gen. Hispanics							0.608***	0.611***	0.608***	0.613***
							(0.078)	(0.078)	(0.078)	(0.078)
2 <sup>nd</sup> Gen. Hispanics							0.601***	0.601***	0.598***	0.627***
							(0.143)	(0.143)	(0.143)	(0.143)
1 <sup>st</sup> Gen. Europeans							-0.082	-0.087	-0.089	-0.068
							(0.087)	(0.087)	(0.087)	(0.087)
2 <sup>nd</sup> Gen. Europeans							-0.114	-0.113	-0.115	-0.064
							(0.127)	(0.127)	(0.127)	(0.127)
1 <sup>st</sup> Gen. Middle Eastern and African							0.011	0.014	0.011	-0.049
							(0.141)	(0.141)	(0.141)	(0.141)
2 <sup>nd</sup> Gen. Middle Eastern and African							-0.058	-0.059	-0.058	-0.088
							(0.346)	(0.346)	(0.346)	(0.346)
1 <sup>st</sup> Gen. Asians							0.140	0.140	0.136	0.090
							(0.092)	(0.092)	(0.092)	(0.093)
2 <sup>nd</sup> Gen. Asians							-0.038	-0.039	-0.042	-0.072
							(0.179)	(0.179)	(0.179)	(0.179)
<b>Interactions</b>										
Female x Education								0.018***	0.017***	0.015***
								(0.005)	(0.005)	(0.005)
White x Education									-0.016	-0.004
									(0.010)	(0.010)
Black x Education									-0.008	0.015
									(0.011)	(0.012)
1st Generation x Education										0.038***
										(0.006)
2nd Generation x Education										0.062***
										(0.010)
Intercept	-7.256***	-6.751***	-5.790***	-5.196***	-5.206***	-5.432***	-5.511***	-5.429***	-5.575***	-5.308***
	(0.145)	(0.150)	(0.151)	(0.160)	(0.163)	(0.165)	(0.167)	(0.168)	(0.199)	(0.203)
<b>Random Effects Variance Components</b>										
Cohort Effect, $\sigma_{vj}$	0.299***	0.301***	0.291***	0.289***	0.289***	0.299***	0.295***	0.295***	0.296***	0.293***
	(0.056)	(0.055)	(0.050)	(0.050)	(0.050)	(0.051)	(0.051)	(0.051)	(0.051)	(0.050)
Log-Likelihood	-58665.77	-57776.34	-57284.72	-57231.67	-57193.97	-57108	-56988.48	-56982.5	-56980.68	-56950.87
Chi <sup>2</sup>	1607.715***	3523.442***	4533.971***	4649.467***	4719.471***	4902.247***	5211.285***	5195.385***	5180.105***	5202.928***
BIC	117447	115706.6	114736.2	114642.9	114593.1	114446.9	114310.4	114311.3	114333.3	114299.3
N	371392	371392	371392	371392	371392	371392	371392	371392	371392	371392

**Table 3. Mixed Effects Logit Estimates Age -Period-Cohort Models of Horizontally Extended Households**

<b>Equation 1</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>	<b>Model 6</b>	<b>Model 7</b>	<b>Model 8</b>	<b>Model 9</b>	<b>Model 10</b>
Age	0.073*** (0.006)	0.067*** (0.006)	0.069*** (0.006)	0.060*** (0.006)	0.061*** (0.006)	0.058*** (0.006)	0.058*** (0.006)	0.057*** (0.006)	0.057*** (0.006)	0.057*** (0.006)
Age <sup>2</sup>	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Survey years (Ref: 1960 )										
1970	-0.735*** (0.051)	-0.720*** (0.052)	-0.619*** (0.052)	-0.646*** (0.052)	-0.652*** (0.052)	-0.660*** (0.052)	-0.725*** (0.052)	-0.720*** (0.052)	-0.718*** (0.052)	-0.711*** (0.052)
1994	-0.108** (0.052)	-0.073 (0.053)	0.257*** (0.053)	0.246*** (0.053)	0.216*** (0.053)	0.122** (0.054)	-0.099* (0.054)	-0.088 (0.055)	-0.081 (0.055)	-0.042 (0.056)
1999	-0.195*** (0.055)	-0.123** (0.056)	0.247*** (0.056)	0.219*** (0.056)	0.180*** (0.057)	0.069 (0.057)	-0.178*** (0.058)	-0.169*** (0.058)	-0.163*** (0.058)	-0.122** (0.059)
2004	-0.125** (0.052)	-0.074 (0.054)	0.330*** (0.053)	0.303*** (0.053)	0.272*** (0.054)	0.164*** (0.054)	-0.094* (0.055)	-0.087 (0.055)	-0.079 (0.056)	-0.036 (0.057)
2009	-0.052 (0.053)	-0.006 (0.055)	0.433*** (0.054)	0.404*** (0.054)	0.360*** (0.055)	0.240*** (0.055)	-0.039 (0.056)	-0.033 (0.057)	-0.026 (0.057)	0.018 (0.058)
Female		-0.558*** (0.029)	-0.559*** (0.029)	-0.517*** (0.030)	-0.536*** (0.030)	-0.523*** (0.030)	-0.508*** (0.030)	-0.891*** (0.100)	-0.891*** (0.100)	-0.859*** (0.101)
Race										
White		-0.958*** (0.042)	-0.934*** (0.042)	-0.952*** (0.042)	-0.931*** (0.042)	-0.588*** (0.044)	-0.564*** (0.058)	-0.563*** (0.058)	-0.374** (0.152)	-0.552*** (0.154)
Black		-0.875*** (0.055)	-0.964*** (0.056)	-0.935*** (0.056)	-0.963*** (0.056)	-0.487*** (0.059)	-0.484*** (0.069)	-0.487*** (0.069)	-0.082 (0.182)	-0.419** (0.190)
Education (in Years)			-0.112*** (0.004)	-0.128*** (0.004)	-0.130*** (0.004)	-0.097*** (0.004)	-0.083*** (0.004)	-0.091*** (0.005)	-0.074*** (0.012)	-0.115*** (0.014)
Log Family Income (at 1984 prices)				0.153*** (0.016)	0.126*** (0.016)	0.145*** (0.016)	0.173*** (0.016)	0.171*** (0.016)	0.171*** (0.016)	0.178*** (0.017)
Metropolitan Area:										
Not in Metropolitan Area					-0.135* (0.073)	-0.099 (0.073)	-0.055 (0.073)	-0.052 (0.073)	-0.056 (0.073)	-0.048 (0.073)
Metropolitan Area					0.325*** (0.069)	0.163** (0.069)	0.197*** (0.069)	0.203*** (0.069)	0.200*** (0.069)	0.223*** (0.069)
Nativity: (Ref.: Third or Higher Gen. Immigrant)										
First generation immigrants						0.901*** (0.032)	0.296*** (0.105)	0.300*** (0.105)	0.302*** (0.105)	-0.229* (0.138)
Second Generation Immigrants						0.306*** (0.052)	0.194 (0.174)	0.194 (0.174)	0.196 (0.174)	-0.072 (0.240)

(Continued on the next page)

Table 3 (Continued)

Origins (Ref.: 1st and 2nd Gen Immigrants from Canada and other US Territories):

1 <sup>st</sup> Gen. Hispanics							1.073*** (0.108)	1.074*** (0.108)	1.075*** (0.108)	1.087*** (0.108)
2 <sup>nd</sup> Gen. Hispanics							0.678*** (0.201)	0.678*** (0.201)	0.678*** (0.202)	0.667*** (0.202)
1 <sup>st</sup> Gen. Europeans							-0.210* (0.125)	-0.217* (0.125)	-0.214* (0.125)	-0.171 (0.125)
2 <sup>nd</sup> Gen. Europeans							-0.138 (0.185)	-0.137 (0.185)	-0.134 (0.185)	-0.117 (0.185)
1 <sup>st</sup> Gen. Middle Eastern							0.456*** (0.167)	0.460*** (0.167)	0.468*** (0.167)	0.405** (0.167)
2 <sup>nd</sup> Gen. Middle Eastern							-0.121 (0.533)	-0.122 (0.533)	-0.123 (0.533)	-0.119 (0.534)
1 <sup>st</sup> Gen. Asians							0.676*** (0.122)	0.678*** (0.122)	0.666*** (0.122)	0.617*** (0.122)
2 <sup>nd</sup> Gen. Asians							0.286 (0.238)	0.285 (0.238)	0.278 (0.238)	0.293 (0.238)
<b>Interactions</b>										
Female x Education								0.034*** (0.008)	0.034*** (0.008)	0.032*** (0.008)
White x Education									-0.016 (0.012)	0.001 (0.012)
Black x Education									-0.037** (0.015)	-0.009 (0.016)
1st Generation x Education										0.049*** (0.008)
2nd Generation x Education										0.023 (0.015)
Intercept	-5.664*** (0.148)	-4.564*** (0.155)	-3.502*** (0.155)	-4.502*** (0.187)	-4.472*** (0.194)	-5.329*** (0.200)	-5.725*** (0.204)	-5.622*** (0.205)	-5.818*** (0.240)	-5.459*** (0.248)
<b>Random Effects-Variance Components</b>										
Cohort Effect, $\sigma$	0.094*** (0.023)	0.098*** (0.024)	0.080*** (0.020)	0.079*** (0.020)	0.080*** (0.020)	0.081*** (0.020)	0.079*** (0.019)	0.080*** (0.019)	0.080*** (0.019)	0.083*** (0.020)
Log-likelihood	-32523.49	-32113.26	-31773.19	-31723.77	-31618.47	-31248.83	-31049.2	-31040.76	-31037.7	-31020.4
Chi <sup>2</sup>	439.4944***	1348.275***	2097.827***	2194.009***	2399.826***	3318.519***	3886.35***	3937.055***	3930.426***	3881.254***
BIC	65162.41	64380.41	63713.1	63627.09	63442.15	62728.5	62431.84	62427.8	62447.32	62438.37
N	371392	371392	371392	371392	371392	371392	371392	371392	371392	371392

Figure 3a) Predicted Probabilities of Vertically Extended Family by Nativity

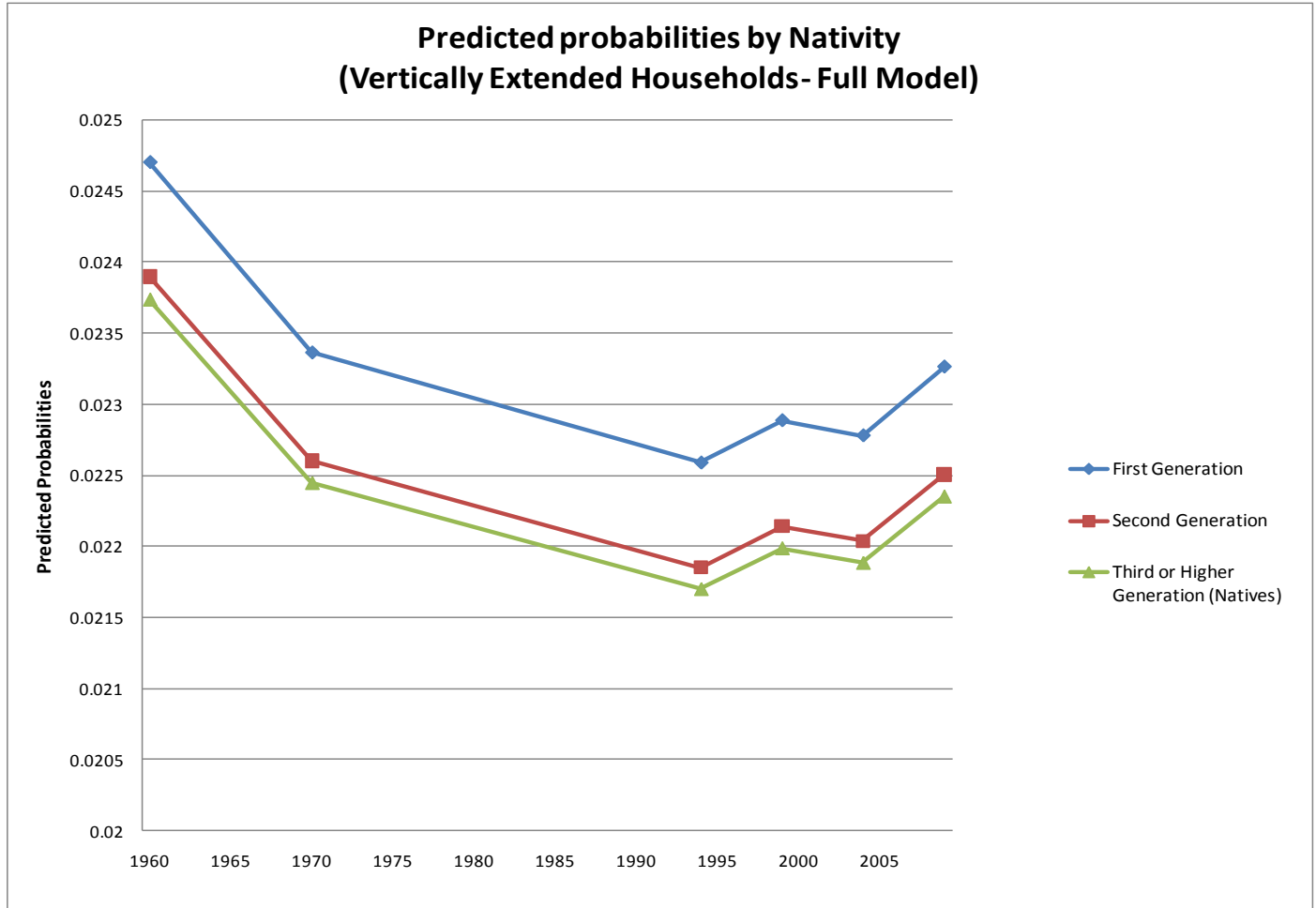




Figure 3b) Predicted Probabilities of Vertically Extended Family by Origin

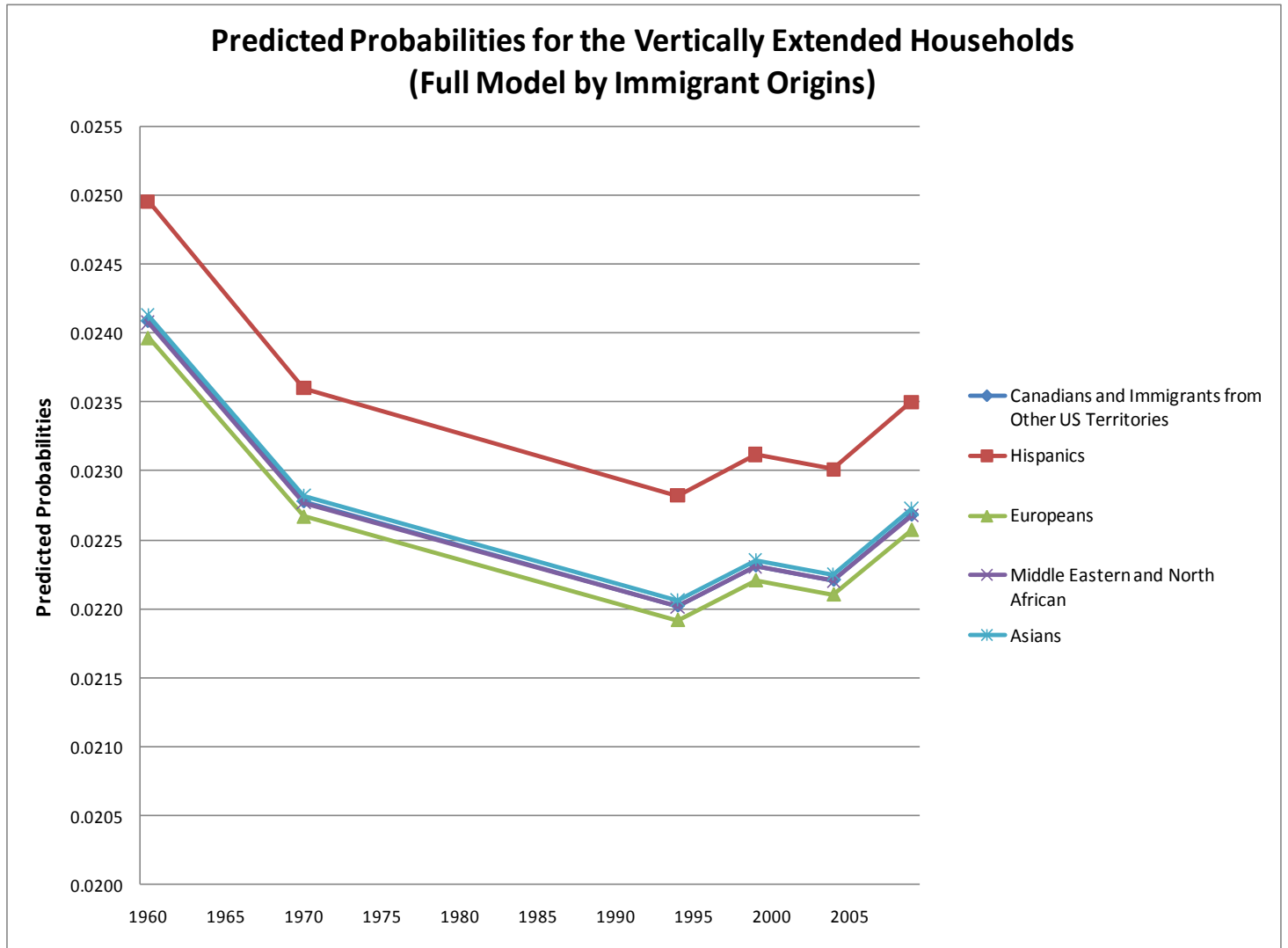


Figure 4a) Predicted Probabilities of Horizontally Extended Family by Nativity

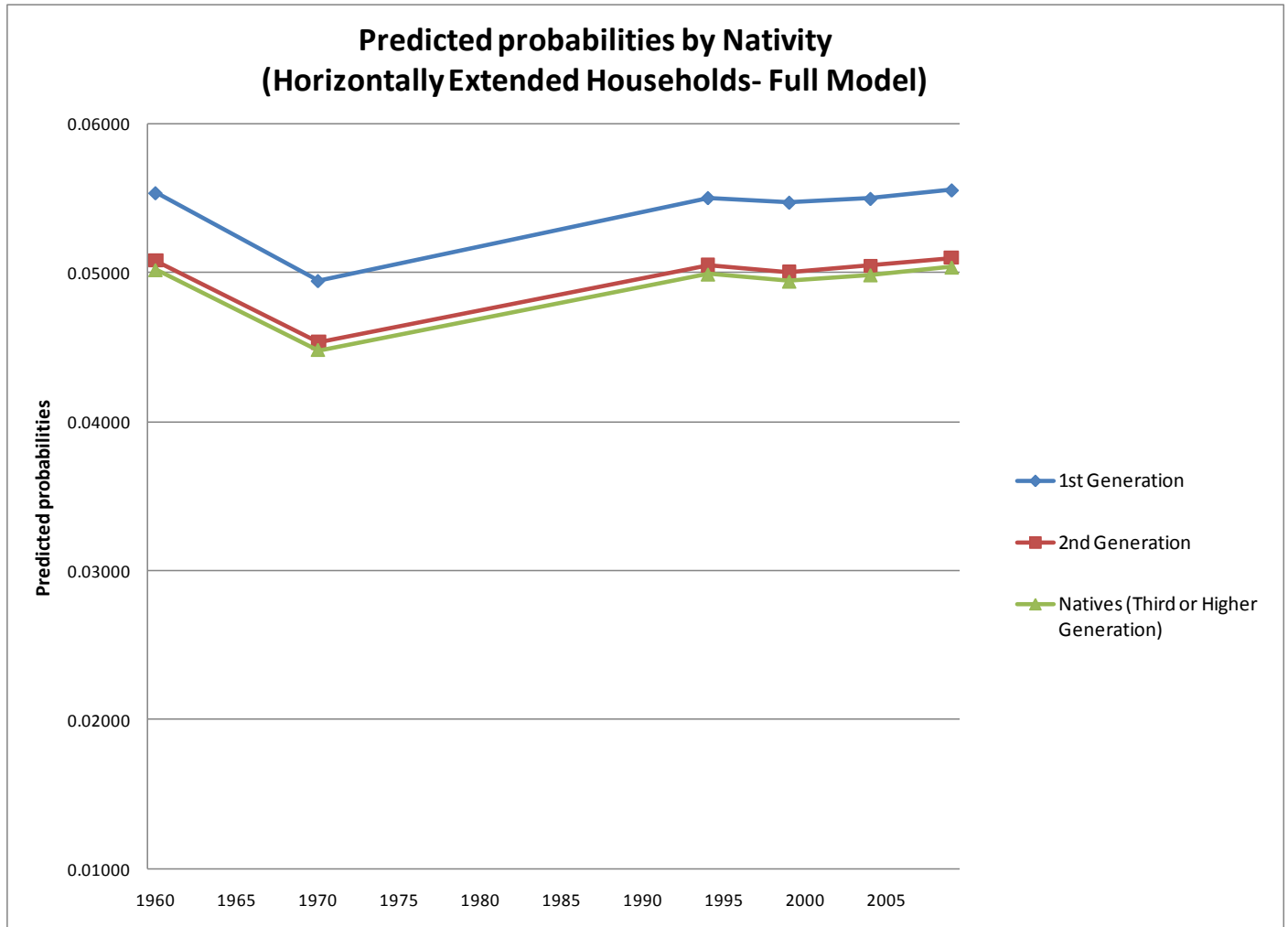
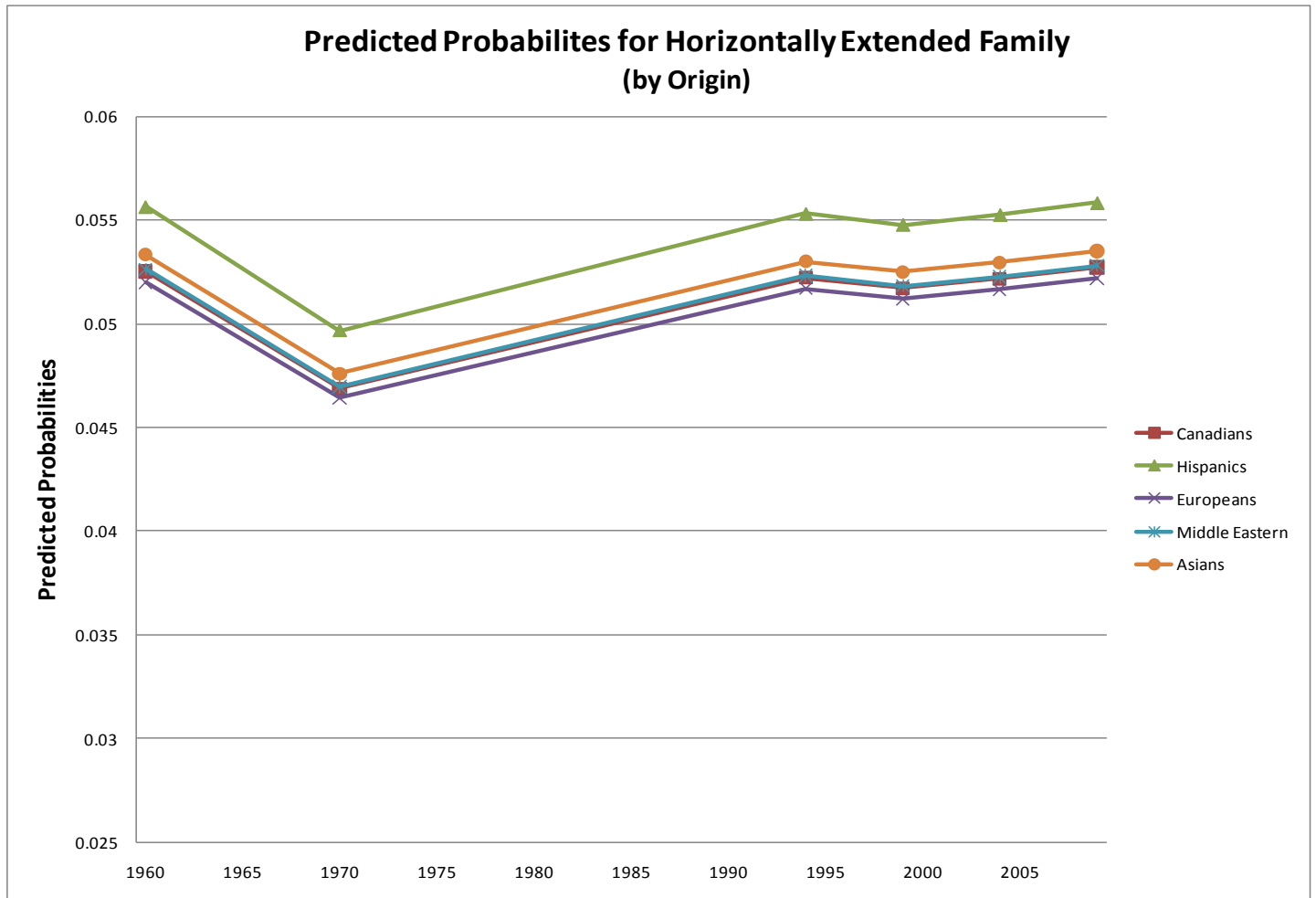


Figure 4b) Predicted Probabilities of Horizontally Extended Family by Nativity



## Appendix 1

**Table A1. Trends of the share of each nativity group in the overall US population.**

	<b>1960</b>	<b>1970</b>	<b>1994</b>	<b>1999</b>	<b>2004</b>	<b>2009</b>	<b>Total</b>
<b>Both parents native-born</b>	37,819	47,962	43,872	39,163	60,177	58,262	287,255
%	71.36	75.6	79.96	77.33	78.45	76.52	76.64
<b>Father foreign, Mother native</b>	2,386	2,561	1,426	1,325	1,631	1,663	10,992
%	4.5	4.04	2.6	2.62	2.13	2.18	2.93
<b>Mother foreign, Father native</b>	1,224	1,393	966	1,003	1,307	1,342	7,235
%	2.31	2.2	1.76	1.98	1.7	1.76	1.93
<b>Both parents Foreign born</b>	6,608	6,366	2,565	2,374	2,721	2,837	23,471
%	12.47	10.03	4.67	4.69	3.55	3.73	6.26
<b>Head Foreign born</b>	4,962	5,162	6,041	6,779	10,872	12,031	45,847
%	9.36	8.14	11.01	13.39	14.17	15.8	12.23
<b>Total</b>	52,999	63,444	54,870	50,644	76,708	76,135	374,800
%	100	100	100	100	100	100	100

Source: Census 1960 and 1970 and CPS, 1994, 1999, 2004 and 2009 waves. Missing and unknown codes are not shown in this table. Unit is households.

Table A2. Trends of the share of each immigrant group (the first generation) in the overall US population

Birth Place of HH Heads	Survey Year						Total
	1960	1970	1994	1999	2004	2009	
<b>US &amp; Canada<sup>11</sup></b>	223	356	587	511	684	618	2979
%	4.93	7.57	8.7	7.69	6.28	5.25	6.58
<b>Mexico</b>	220	329	1506	1872	2940	3372	10239
%	4.87	6.99	22.32	28.17	27	28.62	22.61
<b>Other Latin America</b>	128	387	1481	1701	2536	2631	8864
%	2.83	8.23	21.95	25.59	23.29	22.33	19.57
<b>West Europe &amp; Australia</b>	1955	1752	583	626	788	776	6480
%	43.26	37.24	8.64	9.42	7.24	6.59	14.31
<b>East Europe and Russia</b>	1622	1336	566	510	795	745	5574
%	35.89	28.4	8.39	7.67	7.3	6.32	12.31
<b>East and South East Asia</b>	285	421	1963	1145	2583	2795	9192
%	6.31	8.95	29.1	17.23	23.72	23.73	20.3
<b>Middle East and North Africa</b>	83	106	60	203	406	413	1271
%	1.84	2.25	0.89	3.05	3.73	3.51	2.81
<b>Africa</b>	3	18	0	78	157	430	686
%	0.07	0.38	0	1.17	1.44	3.65	1.51
<b>Total</b>	4,519	4,705	6,746	6,646	10,889	11,780	45,285
%	100	100	100	100	100	100	100

**Note:** First rows indicate number of households and second rows indicate column percentage. Missing codes are excluded from the table. Census 1960 and 1970 and CPS, 1994, 1999, 2004 and 2009 waves are used.

<sup>11</sup> US & Canada category includes those that are born in Canada, US Virgin Islands, American Samoa, US Outlying Areas and Puerto Rico.

Figure A1: Occurrence of Vertically Extended Households in Immigrant Groups by Their Origin

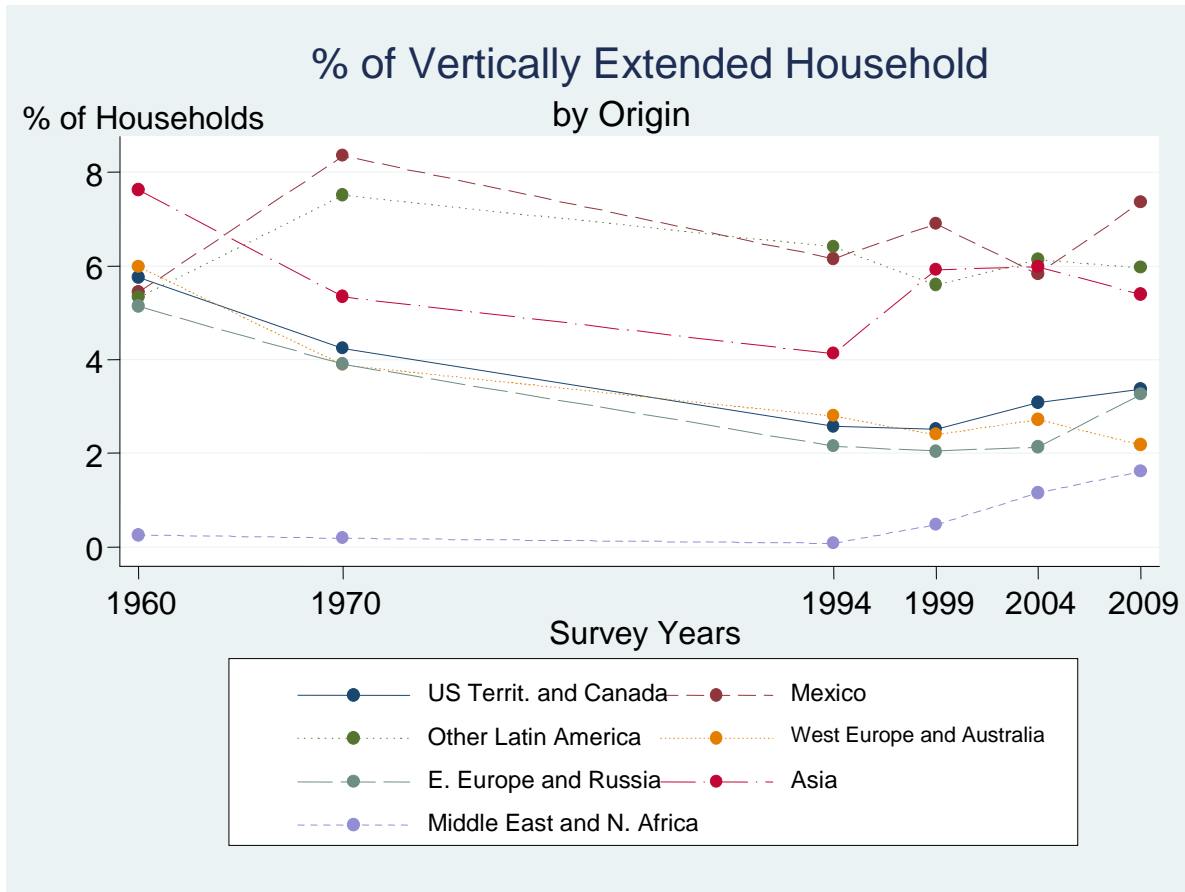


Figure A2: Occurrence of Vertically Extended Households in Immigrant Groups by Their Origin

