IMMIGRANT HOUSEHOLD INVESTMENT BEHAVIOR AND COUNTRY OF ORIGIN: A STUDY OF IMMIGRANTS TO THE UNITED STATES

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ABSTRACT

Previous literature concerning immigrant financial market participation has typically treated the immigrant population as a homogeneous collective. However, the immigrant population in the United States is incredibly diverse, particularly in regards to country of origin. Using panel data, we test the hypothesis that differing information costs generate differences in U.S. immigrant asset market participation rates. We find significant variations (by country of origin) in the immigrant rates of holding stock, mutual funds, U.S. Savings Bonds, and other fixed income securities do exist. Our results provide support for the theory that information costs drive these differences. (JEL: G11)Keywords: Household investment decision making; immigrants ©2010. All rights reserved. Work in progress. All errors are our own. Copyright © 2012 John Wiley & Sons, Ltd.
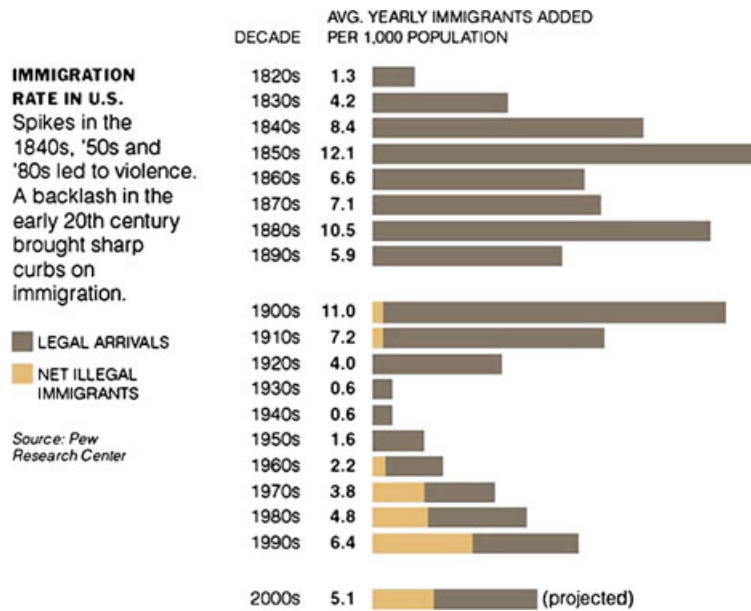
1. INTRODUCTION

[America is] not a "melting pot" that dissolves all differences.......With each wave of immigrants, we have become not only more diverse - but also more open...*Albert Gore, Jr., 45th Vice President of the United States*

Immigrants historically have been one of the most influential demographics in the United States. While immigration rates have fluctuated throughout American history, they increased steadily through the latter half of the 20th century (See Figure 1). Currently, immigrants comprise a sizeable portion of the American population. A U.S. Census Report estimated that in 2007, approximately 38.1 million foreign born individuals representing 12.6 percent of the total population resided in the United States (Grieco, 2010). Because immigrants represent a substantial share of the U.S. population, their participation in the American economy in general and financial markets in particular is of considerable interest to economists and policy makers alike.

Previous research has addressed differences between immigrants and natives in the United States in order to observe the role of immigrant status as a determinant of economic decision making. The literature includes studies on immigrant holdings of checking and savings accounts (Osili and Paulson, 2006), relationships with financial institutions (Osili & Paulson, 2008), and ownership of stocks and mutual funds (Chatterjee, 2009). Most studies, like those by Osili and Paulson (2006) and Chatterjee (2009), aggregate immigrants for study. However, the immigrant sub-population is in itself diverse, most visibly in terms of immigrant country of origin, and is likely to exhibit a broad range of propensities with regards to economic decision making. In recognition of this, a few economists have studied the savings rates of immigrants in North American countries (Carroll *et al.*, 1994; Carroll *et al.*, 1999) as well as in the United Arab Emirates (Al-Awad & Elhiraika, 2003) broken down by their respective countries of origin in an attempt to uncover the relationship between immigrant financial behavior and their country of origin or ethnic background.

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AVG. YEARLY IMMIGRANTS ADDED
PER 1,000 POPULATION

IMMIGRATION RATE IN U.S. Spikes in the 1840s, '50s and '80s led to violence. A backlash in the early 20th century brought sharp curbs on immigration.

■ LEGAL ARRIVALS
■ NET ILLEGAL IMMIGRANTS

Source: Pew Research Center

DECADE	
1820s	1.3
1830s	4.2
1840s	8.4
1850s	12.1
1860s	6.6
1870s	7.1
1880s	10.5
1890s	5.9
1900s	11.0
1910s	7.2
1920s	4.0
1930s	0.6
1940s	0.6
1950s	1.6
1960s	2.2
1970s	3.8
1980s	4.8
1990s	6.4
2000s	5.1 (projected)

New York Times (March 2, 2008)

Figure 1. Immigration rates in the United States

Consequently, in order to better understand immigrant participation in financial markets, it may be of value to study the role of heterogeneity within the immigrant population. At the intersection of the study of immigrant financial market participation and variation within the immigrant population by differences of birth country, there appears to be an open question in the literature as to the impact of immigrant differences on investment behavior. In this paper, we attempt to add to the literature in this area by analyzing the relationship between immigrant country of origin and participation in financial asset markets. The aim of this paper is two-fold: (i) identify differences in immigrant asset market participation rates by country of origin; (ii) identify a potential source for this variation. Understanding the nature of the differences in economic behavior of immigrant groups is important to understanding the U.S. economy overall. Furthermore, if we can understand more about the investment behavior of immigrant households, it may shed more light on the determinants of household financial behavior in general.

We find that immigrant participation rates do differ by country of origin in various asset markets. Even within broad regions of origin, such as Europe, the Middle East, and Asia, we find evidence of differences in participation rates by specific country. Our analysis shows that these differences in asset holding rates exist even after controlling for a number of immigrant specific characteristics; this is particularly true for stocks, which are information-intensive investments. We also provide evidence to support the hypothesis that information costs are driving these differences.

The remainder of this paper is organized as follows: Section 2 discusses existing literature in this area. Section 3 describes the sources of data used in this study. Section 4 discusses the empirical framework, econometric analysis, and results. Section 5 presents concluding remarks.

2. BACKGROUND AND LITERATURE REVIEW

2.1. Immigrants and financial behavior

Looking specifically at the participation of United States immigrants, Osili and Paulson (2006) find that immigrants have a lower rate of ownership of financial assets such as checking and savings accounts, which persists even for immigrants who have lived in the United States for many years. Osili and Paulson (2008) also find that immigrants from countries with higher financial institutional quality are more likely than other immigrants to use formal financial markets and to have a relationship with a bank after their move to the United States. In
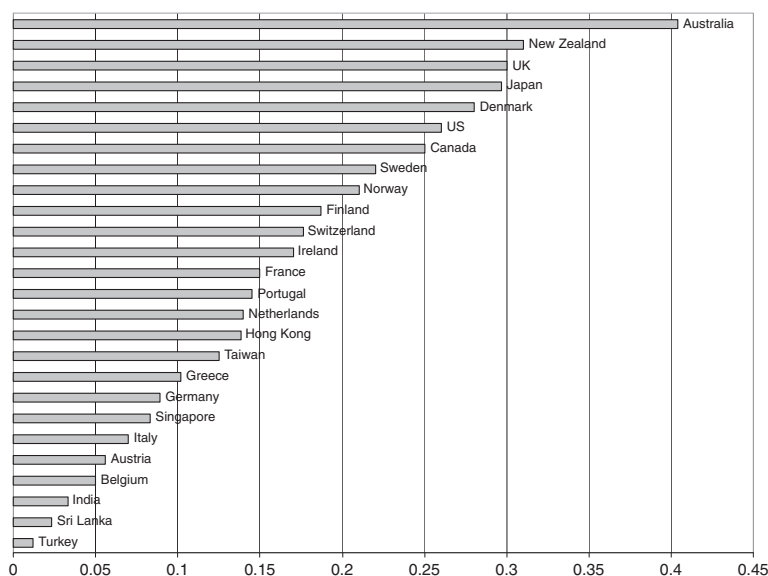
Source: *Guiso, Sapienza, and Zingales (2008).*

Figure 2. Stock market participation rates across countries

addition, Chatterjee (2009) finds that immigrant Americans are less likely to own financial assets such as stocks and mutual funds compared to natives, though he suggests that participation increases as the length of their stay in the United States increases. For both immigrants and natives, Chatterjee (2009) also observes that risk tolerance is a positive predictor of financial market participation.

Several other scholars have decomposed immigrant populations by their country of origin and ethnic background to determine the relationship with immigrant savings rates and earnings. Carroll *et al*. (1994) study savings rates utilizing data from a Canadian source and find no support for their hypothesis that ethnic differences affect the savings rates of immigrants. Carroll *et al*. (1999) also conduct the same analysis using data from the U.S. Census of Population and Housing from 1980 and 1990. Their results show that while the savings of immigrants differ across their countries of origin, those from countries with historically high savings rates such as Japanese, Korean, and Taiwanese immigrants generally do not have savings rates higher than those of other immigrants. Another study by Al-Awad and Elhiraika (2003) looks at the savings rates of immigrants to the United Arab Emirates and finds that immigrants from Pakistan and India have higher average savings rates than those from Arab countries, although they generally have lower incomes. Furthermore, a study by Adsera and Chiswick (2007) finds that the earnings of immigrants to European destinations varies by their country of origin. This paper contributes to the literature by demonstrating that investment decisions of immigrants also vary by their country of origin.

2.2. Determinants of financial market participation

The determinants of financial market participation, particularly in terms of the stock market, are well established. Stock market participation is increasing in income (Zhong & Xiao, 1995) and education (Bertaut & Haliassos, 1997). It is sensitive to transaction costs (Haliassos & Bertaut, 1995) and is also susceptible to neighbor and social community effects (Ng & Wu, 2010; Brown *et al*., 2008; Hong *et al*., 2004). In addition, Choudhury (2001) finds that minorities in the U.S. had lower financial market participation rates than white households.

The available literature on the financial market participation of various countries and regions throughout the world provides a useful benchmark for comparing the participation rates of immigrants from such countries and regions. Figure 2, from Guiso *et al*. (2008), allows a direct comparison of stock market participation rates across countries for which such data are available.[1]

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[1]Ozbilgin (2010) notes that studies of participation rates in developing countries are scarce, but such rates can be inferred to be extremely low.

2.2.1. North American financial market participation

The 2004 Survey of Consumer Finances Report indicates that in 2001, 21.3 percent of American households held stocks, 17.7 percent held pooled investment funds, and 3.0 percent held bonds (Bucks *et al.*, 2006). It is also estimated that in 2001, 51.9 percent of all families had holdings of stock, whether directly or indirectly. These percentages are observed to have fallen following the stock market crash of 2001 - by 2004, 20.7 percent of households held stocks, 15.0 percent held pooled investment funds, 1.8 percent held bonds, and only 48.6 percent of families had direct or indirect holdings of stock. In 2001, average stock holdings were 56 percent of total financial assets, while in 2004, this figure was 47.4 percent. In terms of Canadian financial market participation, Lipset (1993) notes that Canadians have historically been much less active in the stock market compared to Americans.

2.2.2. European financial market participation

Table 1, from Guiso *et al.* (2003), is useful for comparing rates of stock market participation among countries in Europe and the United States. It demonstrates persistent differences across countries, with the United States, United Kingdom, and Sweden having considerably higher participation than France, Germany, and Italy. Guiso *et al.* (2003) also observe that differences across these European countries in stock market participation remain large even after controlling for household characteristics, and that participation rates are roughly correlated with investor literacy.

2.2.3. Asian financial market participation

In China, it is estimated that in 2002, there were 68 million individual stock trading accounts, accounting for 5.4 percent of China's 1.28 billion people (KnowledgeAtWharton, 2007). With respect to Korean households, Cho (2006) estimates that 8.3 percent hold corporate stock. Finally, Iwaisako (2003) finds that in 1999, 25.2 percent of Japanese households held stock both directly and through mutual funds, while 23.6 percent held stock directly. In terms of share of assets, Iwaisako (2003) estimates that 8.5 percent of Japanese household financial assets are held in equity, 2.4 percent in mutual funds, 2.0 percent in trust funds, and 1.9 percent in bonds. It is of interest to note that 28.3 percent of assets in Japan are estimated to be held in life insurance or pensions.

3. DATA

3.1. Overview

For our empirical analysis, we utilize longitudinal panel data from the Survey of Income and Program Participation (SIPP) from 2001 to 2003. The SIPP is typically administered every 4 months and is conducted by the U.S. Census Bureau. The data are collected by interviewing all individuals in sample households and provide detailed information on their background, household structure, family relationships, and economic experiences, including their holdings of financial assets such as stocks, mutual funds, bonds, and retirement plans. In addition, the SIPP includes information on immigrant status, immigrant country of origin, and year of arrival in the United States. The SIPP is the best suited for this study among the available data sets due to its panel form, its information

Table 1. Microeconomic surveys and stock market participation for European countries and the U.S.

Country	Survey	Direct Participation	Total Participation
France	INSEE Survey on Wealth	0.15	0.23
Germany	Income and Expenditure Survey	0.17	-
Italy	Survey of Household Income and Wealth	0.07	0.15
Netherlands	Center Saving Survey	0.14	0.24
Sweden	HEK-Household Economy	0.27	0.54
United Kingdom	Family Resources Survey	0.27	0.34
United States	Survey of Consumer Finance	0.19	0.48

Source: Guiso *et al.* (2003)
Data refer to 1998, except for Sweden where they refer to 1999.
In all countries except the United States, total participation is defined as households investing in stocks or mutual funds.

Table 2. Summary statistics: respondent characteristics

Respondent Characteristics	Full Sample	Natives[‡]	Immigrants[‡]
Controls			
Average Age in 2001	35.48	43.11	41.91
Percent Male	48.62	47.73	48.52
Percent Married	43.62	53.71	65.18
Average Household Size	3.37	2.95	3.75
Percent with Children Under 18 in Household	35.73	33.99	49.81
Race			
Percent White	81.34	84.91	64.29
Percent Black	12.90	12.36	8.84
Highest Level of Education (Respondents Over 15 Only)			
Less than High School	21.00	17.44	34.10
High School Graduate	28.93	30.47	22.33
Some College	18.55	19.79	12.58
College Graduate	14.25	14.50	14.64
Technical or Associate's Degree	10.03	10.66	7.17
Advanced Degree	7.24	7.14	9.17
Assets			
Average Monthly Total Household Income	$4935.88	$4979.48	$4742.67
Average Monthly Per Capita Household Income	$1707.41	$1906.17	$1524.14
Average Household Net Worth	$175,349.70	$192,970.80	$149,801.10
Percent that Own Home	72.52	75.94	56.60
Percent that Own Stock	17.80	19.07	11.34
Percent that Own Mutual Funds	14.70	15.78	9.07
Percent that Own U.S. Savings Bonds	10.11	11.19	3.33
Percent that Own Fixed Income Securities	2.80	3.07	1.30

[‡]Native and Immigrant status is only ascertained for respondents 15 and over present during Wave 2.

Table 3. Summary statistics: immigrant years of stay in the United States

Years of Stay in the U.S.	Percent
Less than 5 Years	20.32
Between 5 and 10 Years	17.47
Between 11 and 15 Years	19.15
Between 16 and 20 Years	12.02
Between 21 and 25 Years	8.40
Between 26 and 30 Years	8.20
More than 30 Years	14.44

on financial market behavior and immigrant characteristics, its large sample size, and the significant number of immigrant respondents included.[2]

The most recent SIPP panel sets are those from 1996 to 2000, 2001 to 2003, and from 2004 to 2005. We elected to utilize the 2001 to 2003 panel in order to avoid using data collected entirely during upswings in the stock market as is the case with the 1996 and 2004 surveys, as these may produce results biased by business cycle patterns. The 2001 to 2003 time period is one of both downturn and upturn years in the stock market. The 2001 panel contains nine waves of interviews, each covering a four-month period. Questions usually ask respondents to provide an answer for each of the four months, and thus each respondent typically generates four observations every time they

[2]We elected to use the SIPP after considering a number of other available data sets. The United States Census, while comprehensive in terms of immigration information with a large immigrant sample, contains no information on financial assets such as stocks and bonds, and is not in panel form. Other often-used panel data sets such as the National Longitudinal Survey of Youth 1979 (NLSY79) and the Panel Survey of Income Dynamics (PSID) contain a very limited number of immigrant respondents (on the order of a few hundred).

Table 4. Summary statistics: immigrant country of origin

Region/Country of Origin	Percent	Region/Country of Origin	Percent	Region/Country of Origin	Percent
United Kingdom/Britain	**2.75**	**South Asia**	**5.76**	**Caribbean**	**8.26**
England	1.71	Bangladesh	0.37	Bahamas	0.13
Ireland	0.69	India	5.39	Barbados	0.01
Scotland	0.35			Bermuda	0.03
		East Asia	**9.82**	Cuba	3.45
Western Europe	**4.90**	China	3.58	Dominica	0.04
Austria	0.22	Hong Kong	0.69	Dominican Republic	1.54
Belgium	0.07	Japan	1.39	Grenada	0.07
France	0.68	Korea	2.70	Haiti	1.19
Germany	1.86	Taiwan	1.45	Jamaica	1.25
Netherlands	0.45			Trinidad and Tobago	0.31
Italy	1.04	**Southeast Asia**	**5.34**	Other Caribbean Countries	0.24
Portugal	0.49	Burma	0.06		
Spain	0.06	Cambodia	0.74	**Africa**	**3.27**
Switzerland	0.03	Laos	0.74	Egypt	0.25
		Singapore	0.09	Ethiopia	0.37
Northern Europe	**0.47**	Thailand	0.64	Ghana	0.29
Denmark	0.01	Vietnam	3.07	Kenya	0.19
Finland	0.03			Morocco	0.10
Norway	0.17	**Other Asian Countries**	**0.17**	Nigeria	0.47
Sweden	0.26			South Africa	0.24
		Pacific Islands	**5.09**	Northern Africa	0.13
Eastern Europe	**6.28**	Fiji	0.11	Other African Countries	1.21
Czech Republic	0.06	Indonesia	0.28		
Czechoslovakia	0.16	Malaysia	0.24	**Oceania**	**0.50**
Former USSR	0.19	Philippines	4.46	Australia	0.35
Greece	0.53			New Zealand	0.15
Hungary	0.09	**Canada**	**2.63**		
Latvia	0.10	**Other North American Countries**	**0.04**	**Other Country Not Listed**	**0.38**
Lithuania	0.10				
Poland	1.79	**South America**	**5.88**		
Romania	0.48	Argentina	0.30		
Russia	1.74	Bolivia	0.19		
Slovakia	0.12	Brazil	0.92		
Ukraine	0.49	Chile	0.26		
Yugoslavia	0.43	Colombia	1.32		
		Ecuador	0.92		
Other European Countries	**0.38**	Guyana	0.68		
		Peru	0.69		
Middle East	**4.10**	Uruguay	0.04		
Afghanistan	0.10	Venezuela	0.27		
Armenia	0.24	Other South American Countries	0.29		
Iran	0.88				
Iraq	0.32	**Central America**	**33.99**		
Israel	0.33	Belize	0.08		
Jordan	0.18	Costa Rica	0.12		
Lebanon	0.36	El Salvador	1.91		
Pakistan	0.86	Guatemala	1.26		
Palestine	0.07	Honduras	0.62		
Saudi Arabia	0.09	Mexico	28.99		
Syria	0.18	Nicaragua	0.66		
Turkey	0.34	Panama	0.21		
Other Middle Eastern Countries	0.15	Other Central American Countries	0.13		

are interviewed. However, not all questions, such as those related to asset holdings and value, are asked during every interview. The application of weights for each individual makes the sample, in any given month of the panel, representative of the United States population.[3]

We conduct this analysis at the household level in order to account for the fact that most investment decisions are made as collective household decisions rather than by individuals and to avoid artificial variation that may be caused by an individual-level analysis.[4] The full sample includes approximately 36,000 native and 5,000 immigrant households composing 48,840 native individuals and 7,178 immigrant individuals over the age of 15.

The percentage of immigrants in this sample, 12.8 percent, is similar to that found by the 2000 Census data (Malone *et al.*, 2003), which estimates that 11.1 percent of the United States population was foreign born. The SIPP does not include any indication of whether an immigrant is in the United States illegally; therefore, it is not possible to control for such a factor in the analysis. However, illegal immigrants are unlikely to respond to surveys in general and government-run surveys in particular. Thus, we assume that there are a negligible number of illegal immigrant respondents in the sample.

3.2. Descriptive statistics

Table 2 provides summary statistics for the weighted sample. The 'Full Sample' column in this table includes all individuals in the sample, including children. The 'Natives' and 'Immigrants' columns include only individuals who were over the age of 15 and present during Wave 2 interviews, which included questions on immigrant status.[5] Immigrants are on average younger, have a greater proportion of males, have a greater household size, and are more likely to have children younger than 18 in their household compared to their native counterparts. In terms of education, while a greater percentage of immigrants have less than a high school diploma compared to natives, the percentage of immigrants and natives with college degrees are roughly equal to the full sample average, and a higher percentage of immigrants hold advanced degrees compared to Americans. Looking at assets, immigrants have lower income, net worth, and rates of ownership of various assets. Tables 3 and 4 focus on the immigrant demographics and show that immigrants are differentiated by years of stay in the United States and originate from 96 countries.[6]

4. EMPIRICAL ANALYSIS

4.1. Empirical framework

In a standard frictionless consumption CAPM, agents maximize expected utility. Utility is additively separable, and future utility is discounted at rate δ. Agents can borrow or invest in two assets, one with a riskless rate of return and one with a stochastic return. The agent maximizes the expected value of the sum of discounted utility. The optimization problem is:

$$\max_{c_t} E_t \sum_{t=0}^{T} \delta^t U(c_t) \tag{1}$$

s.t.

$$c_t = W_t + y_t - s_t$$

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[3]The 2001 SIPP provides weights that inflate the sample size to be representative of the U.S. population in both size and composition in any given month. We use them to create relative weights that reflect the accurate composition of the population but total the given number of observations rather than the U.S. population.

[4]Household level analysis of investment behavior is also widely accepted in the literature (See for example Rosen and Wu (2004)). Further, as a test of sensitivity, we have repeated the main analysis of this paper at the individual level and found that significant results are consistent with those found at the household level.

[5]This explains the fact that some of the average figures for the full sample do not lie within the range of the average figures for natives and immigrants.

[6]Immigrants from undefined regions of origin (such as those denoted 'Other') are not included in the analysis of this paper.

$$W_{t+1} = s_t(1+r) + \alpha_t z_t$$

where c_t is real consumption in time t, y_t is exogenous real labor income in t, W_t is total wealth at time t, s_t is total real saving in t, α_t is the amount saved in the risky asset in time t, $1+r$ is the gross riskless return, and z_t is the excess return on stocks over the riskless rate.

If we consider a model with certain types of frictions (information costs, transaction costs, etc.), there is a cost of risky asset market participation, I_t. The lump-sum expense of purchasing investment information (investment guides, investment magazines, broker advice, etc.), the opportunity cost of the time spent in obtaining investment information, or transaction costs will result in the above optimization problem with following constraints:

$$c_t = W_t + y_t - s_t - I_t$$
$$W_{t+1} = s_t(1+r) + \alpha_t z_t.$$

The initial cost of acquiring the information necessary for market participation or the recurring expense of maintaining the portfolio and investing in new opportunities could be large enough to make an individual persistently abstain from the market.[7] Thus, if the cost of participating (I_t) is perceived to be sufficiently high to remove the expected utility gain, the household will not participate, and the constraints become the same as in equation (1), with $\alpha_t = 0$.

Simulations of a calibrated life-cycle model, described in detail in Bertaut and Haliassos (1997), show that asset market participation costs are affected by level of education, the degree of risk aversion, and labor income risk. The effect that differences in information costs have on stockholding has been documented by Bogan (2008), who found that increased access to information through the internet was related to greater stock market participation. We conjecture that the immigrant population is not a homogeneous collective and that participation costs, I_t, (the expense of purchasing investment information or the opportunity cost of the time spent in obtaining investment information) may differ for various immigrant groups - inducing different asset holdings.

This information access hypothesis suggests that immigrants from countries with greater informational exchange and contact with the United States, such as English-speaking countries and those with financial markets highly interlinked with the U.S. will be more likely to invest in risky assets (information intensive assets). Our primary empirical analysis will establish if immigrants as a group exhibit different investment behaviors and then test if immigrant investment behaviors differ by country of origin. Specifically, the analysis utilizes probit models to understand, at a micro level, the relationship between stock market participation and immigrant birth country, while controlling for other factors that are known to impact stock market participation. The models are similar to those used by Bogan (2008), Hong *et al*. (2004), and Bertaut and Haliassos (1997). Within the subsample of immigrants, we also analyze other immigrant specific characteristics to further investigate if differential information cost could be driving different investment behavior. Specifically, we analyze the effect of length of time in the U.S., immigrant legal status, and ethnic concentration levels on asset market participation.

4.2. Econometric analysis

In our study of the extensive margin of financial asset ownership, we look at the relationship between the decision of a household to hold stocks, mutual funds, bonds, or other fixed income securities and immigrant status or immigrant birth country while controlling for age, gender, income, education, English ability, and other socio-economic characteristics. First, we utilize univariate probit models in which the dependent variable is binary for financial asset holding (stocks, mutual funds, U.S. Savings Bonds, or other fixed income securities[8]) and the independent variables include a dummy variable for immigrant status as well as a variety of

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[7]For example, Christelis *et al*. (2010) find that limited information processing abilities reduce the propensity to hold stocks and increase the propensity to hold less information intensive assets.
[8]Other fixed income securities include treasury bills, corporate bonds, and municipal bonds.

respondent characteristic control variables, year effect controls, and region of residence controls[9] [10] (See Equation (2)). Since each of the asset types studied in this paper have different risk and return profiles, we conduct the analysis for holdings of various assets separately (See for example (Malmendier & Nagel, 2011; Rosen & Wu, 2004).

Another issue that we address in this analysis is the potential effect of differing nationalities between a household head and spouse. We retain these households in the sample but include a variable to control for mixed nationality among decision makers in a household.[11] Thus, the model specification with household head i at time t is:

$$ASSETOWNERSHIP_{it} = \beta_0 + \beta_j IMMIGRANTSTATUS_{it} + \sum \beta_k V_{itk} \qquad (2)$$
$$+ \sum \beta_l W_{itl} + \sum \beta_m X_{itm} + \beta_n Z_{it} + \varepsilon_{it}$$

where $IMMIGRANTSTATUS_{it}$ represents a dummy variable for household head immigrant status, V_{itk} is the set of respondent characteristic and asset control variables, W_{itl} is the set of year effect control variables, X_{itm} is the set of region of residence control variables, and Z_{it} is the control variable for mixed nationality among household decision makers. (See Appendix A: Definition of Variables for detailed descriptions of variables.) All probit analysis results reported are marginal effects with standard errors adjusted for intra-cluster correlations at the household level.

We also use a univariate probit model to analyze the relationship between immigrant country of origin and asset holding. This model specification with household head i at time t is:

$$ASSETOWNERSHIP_{it} = \beta_0 + \sum \beta_j COUNTRYofORIGIN_{itj} + \sum \beta_k V_{itk} \qquad (3)$$
$$+ \sum \beta_l W_{itl} + \sum \beta_m X_{itm} + \beta_n Z_{it} + \varepsilon_{it}$$

where $COUNTRYofORIGIN_{itj}$ represents a set of country of origin dummy variables denoting the immigrant's birth country, V_{itk} is the set of respondent characteristic and asset control variables, W_{itl} is the set of year effect control variables, X_{itm} is the set of region of residence control variables, and Z_{it} is the control variable for mixed nationality among household decision makers.

This paper focuses on whether a household invests in a particular asset (the extensive margin of asset ownership) as opposed to how much a household invests (the intensive margin of asset allocation) for two primary reasons. First, the data set used in this study aggregates stocks and mutual funds for valuation and does not allow analysis of these asset types separately. Second, a study of the intensive margin of asset allocation produces results that are generally reflective of those for a study of the extensive margin - a cohort that is more likely to hold an asset is also likely to hold a greater amount of such assets, and vice versa. However, a basic analysis of the intensive margin of asset allocation among immigrants in the data sample used in this study is available in Appendix B: Intensive Margin of Asset Allocation.

4.3. Results

Table 5 shows the results produced from Equation (2). The first and second columns show that an immigrant household is 4.41 percent less likely to own stock and 3.38 percent less likely to invest in mutual funds. The negative effects of being an immigrant on holdings of these assets have been shown previously by Chatterjee (2009) and Osili and Paulson (2006). Controls for respondent characteristics affecting stock and mutual fund holding take the expected signs. The household head being married and being male both have positive effects, while being non-white has a significant negative effect. Having children under the age of 18 has a positive effect on owning these assets. This may be attributed to the fact that households with children in the earlier segment of their life-cycles have been found to be more likely to hold riskier assets compared to households without children

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[9]Due to limitations of the information available in the data, we are unable to control for levels of risk aversion or other personal risk preferences. In addition, a control for a respondent's familiarity with technology, computer usage, is not included as all respondents used a computer either at home, work, or school. Using U.S. state as an alternative to U.S. region as a control for location of residence does not produce significantly different results.
[10]The use of probit models in the research of the extensive margin of asset ownership is well-established in the literature (Chatterjee, 2009; Bogan, 2008; Rosen & Wu, 2004; Hong *et al*., 2004; Bertaut & Haliassos, 1997).
[11]A regression including all other variables in a sample restricted to households with differing household head and spouse nationality does not produce significantly different results.

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Table 5. Marginal effects of respondent characteristics on asset market participation

	Stock Ownership	Mutual Fund Ownership	U.S. Savings Bond Ownership	Other Fixed Income Ownership
Immigrant	−0.0441***	−0.0338***	−0.0633***	−0.0024*
	(0.0097)	(0.0085)	(0.0056)	(0.0012)
Age in 2001	−0.0049***	−0.0017*	−0.0014*	0.0001
	(0.0011)	(0.0009)	(0.0008)	(0.0002)
Age in 2001 Sq.	0.0000***	0.0000	0.0000**	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Married	0.0265***	0.0219***	0.0189***	0.0009
	(0.0070)	(0.0060)	(0.0051)	(0.0010)
Male	0.0114**	0.0040	0.0030	−0.0004
	(0.0058)	(0.0050)	(0.0044)	(0.0008)
Non-White	−0.0306***	−0.0186**	−0.0239***	−0.0038***
	(0.0088)	(0.0077)	(0.0065)	(0.0011)
Children Under 18	0.0349***	0.0496***	0.0479***	0.0059***
	(0.0094)	(0.0081)	(0.0074)	(0.0020)
Household Size	−0.0298***	−0.0275***	−0.0062***	−0.0032***
	(0.0034)	(0.0029)	(0.0024)	(0.0006)
Log Household Net Worth	0.0961***	0.0755***	0.0284***	0.0087***
	(0.0025)	(0.0021)	(0.0017)	(0.0007)
Log Total Household Income	0.0308***	0.0128***	0.0068***	0.0009**
	(0.0036)	(0.0027)	(0.0023)	(0.0004)
Own Pension	0.0302***	0.0184***	0.0360***	−0.0016*
	(0.0069)	(0.0059)	(0.0054)	(0.0009)
Own Home	−0.0983***	−0.0637***	−0.0197***	−0.0108***
	(0.0105)	(0.0092)	(0.0071)	(0.0024)
Own Business	−0.0169**	−0.0128*	−0.0250***	−0.0028***
	(0.0082)	(0.0070)	(0.0056)	(0.0008)
Managerial Occupation	0.0073	0.0048	0.0191***	−0.0021**
	(0.0073)	(0.0062)	(0.0058)	(0.0009)
Education Variables				
High School Graduate	0.0709***	0.0606***	0.0483***	0.0078***
	(0.0132)	(0.0123)	(0.0105)	(0.0027)
Some College	0.1629***	0.1333***	0.1005***	0.0128***
	(0.0163)	(0.0156)	(0.0135)	(0.0038)
College Graduate	0.2447***	0.2466***	0.1131***	0.0307***
	(0.0181)	(0.0183)	(0.0148)	(0.0066)
Technical or Associate's Degree	0.1624***	0.1493***	0.0930***	0.0154***
	(0.0183)	(0.0181)	(0.0156)	(0.0050)
Advanced Degree	0.2394***	0.3031***	0.1198***	0.0440***
	(0.0205)	(0.0217)	(0.0174)	(0.0098)
English Ability	0.0478	0.0668***	0.0335	0.0065**
	(0.0259)	(0.0171)	(0.0188)	(0.0009)
Year Effect Controls	Yes	Yes	Yes	Yes
Region of Residence Controls	Yes	Yes	Yes	Yes
Mixed Nationality Control	Yes	Yes	Yes	Yes
Observations	70,908	70,908	70,908	70,908
Pseudo-R^2	0.2105	0.2197	0.1085	0.2710

Standard errors in parentheses.
***Significant at the 1% level.
**Significant at the 5% level.
*Significant at the 10% level.

(Love, 2010). The average age of household heads with children in this sample is 38. Stock and mutual fund holding is decreasing with household size. It is also increasing with household net worth, total household income, and education. While home and business ownership appears to have a negative effect and pension

ownership has a positive effect, being in a managerial position does not appear to be significant. English ability also has a positive effect and is statistically significant for mutual fund holding, but not for stock holding.

The third and fourth columns of Table 5 show that immigrants are also 6.33 percent less likely to hold U.S. Savings Bonds, and while being an immigrant has a negative effect on holdings of other fixed income securities, this estimator is not statistically different from zero. All other characteristics affect bond and other fixed income holding in ways similar to their effect on stock and mutual fund holding, though a number of the estimators are not statistically different from zero. Moreover, in contrast to stock and mutual fund holding, being in a managerial occupation has a significant positive effect on bond holding.

Table 6 shows the marginal effects of variables produced by the probit regressions breaking down the immigrant household pool by country of origin (Equation (3)). All results shown in this analysis are relative to the American native population. The first column shows the analysis for stockholding; the most risky and information intensive type of investment. Among immigrants from Europe, the results show that those from Italy and Romania are significantly less likely to hold stock. Immigrants from Middle Eastern countries have varying stock holding rates; those from Israel and Lebanon appear to have lower rates of holding, while those from Jordan and Palestine have considerably higher rates of ownership compared to Americans. Among Asian immigrants, Korean immigrants invest in stock significantly less, while those from Hong Kong are likely to invest more. Immigrants from Pacific Island countries such as Indonesia and the Philippines are significantly less likely to hold stock; however, those from Malaysia have higher rates of participation. Immigrants from Central American and Caribbean countries are generally less likely to hold stock, as can be seen from the significant negative coefficients on Mexico, Nicaragua, Cuba, and Jamaica. Immigrants from South Africa are also shown to have lower rates of stockholding.

The second column of Table 6 shows the marginal effect of country of origin of immigrants on mutual fund holding; the second most information intensive type of investment. Among European immigrants, those from Ukraine and Yugoslavia are significantly less likely to hold mutual funds. Similar to stockholding, rates among Middle Eastern immigrants are mixed - being an Afghani immigrant has a strong positive effect on holdings, while being an Iranian immigrant has a significantly negative effect. Also similar to stockholding, Mexican and Cuban immigrants are less likely to hold mutual funds. However, a significantly positive coefficient on Colombia shows that Colombian immigrants are more likely to hold mutual funds than their American counterparts.

The third column of Table 6 shows the marginal effect of immigrant country of origin on holdings of U.S. Savings Bonds. German, Italian, Polish, and Russian immigrants are significantly less likely to hold bonds compared to the natives. However, immigrants from the former USSR are significantly more likely.[12] Among Asian immigrants, Indian and Vietnamese immigrants are significantly less likely to own bonds. For North American immigrants, Canadians are less likely to hold U.S Savings Bonds. Additionally, like their rates of stock and mutual fund holding, Mexican and Cuban immigrants also have significantly lower rates of bond holding.

Finally, the fourth column of Table 6 shows a positive effect among immigrants from Eastern Europe on holding other fixed income securities including treasury bills, corporate bonds, and municipal bonds. The results show that immigrants from Czechoslovakia, the Czech Republic, and Hungary are more likely to hold these assets than Americans. The results for other fixed income securities ownership are not statistically different from zero.

From these results, we can see that while many of the estimators of country of origin effects for asset holding are negative, attesting to low rates of participation by some immigrant groups relative to natives, there are significant variations in the magnitude of these estimators, and a number of the estimators are positive. We also can observe that it is difficult to generalize immigrant investment participation patterns by region of origin, though we observe a consistent low rate of asset market participation for Central American,

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[12]The USSR (Union of Soviet Socialist Republics) ceased to exist in 1991. Thus, reported emigration from the USSR suggests that the respondent immigrated before 1991, and this estimator may be influenced by length of stay. See Section 4.5.1 for a robustness check concerning immigrant length of stay in the United States.

South American, and Caribbean immigrants and a high rate of market participation for other fixed income securities among Eastern European immigrants. Among European, Middle Eastern, Asian, and Pacific Islander immigrants, significant and considerable differences exist at the country level. These results support

Table 6. Marginal effects of country of origin on asset market participation

	Stock Ownership	Mutual Fund Ownership	U.S. Savings Bond Ownership	Other Fixed Income Ownership
Western Europe				
Germany			−0.0804***	
			(0.0107)	
Italy	−0.0829*		−0.0748*	
	(0.0370)		(0.0188)	
Eastern Europe				
Czechoslovakia				0.1043***
				(0.0830)
Czech Republic				0.0681*
				(0.0774)
Hungary				0.2368***
				(0.1845)
Poland			−0.0641*	
			(0.0200)	
Romania	−0.1535***			
	(0.0131)			
Russia			−0.0822**	
			(0.0142)	
Ukraine		−0.1064**		
		(0.0188)		
USSR (Former)			0.5520**	
			(0.3072)	
Yugoslavia		−0.0988**		
		(0.0192)		
Middle East				
Afghanistan		0.5872***		
		(0.1423)		
Iran		−0.093**		
		(0.0205)		
Israel	−0.1350*			
	(0.0361)			
Jordan	0.5846***			
	(0.0821)			
Lebanon	−0.1371*			
	(0.0328)			
Palestine	0.5876***			
	(0.1208)			
South Asia				
India			−0.0795***	
			(0.0092)	
Respondent Characteristic Controls	Yes	Yes	Yes	Yes
Year Effect Controls	Yes	Yes	Yes	Yes
Region of Residence Controls	Yes	Yes	Yes	Yes
Mixed Nationality Control	Yes	Yes	Yes	Yes
Observations	70,310	70,093	69,593	68,284
Pseudo-R^2	0.2149	0.2218	0.1080	0.2723
Countries Represented	59	53	38	24

(*Continues*)

Table 6. (Continued)

	Stock Ownership	Mutual Fund Ownership	U.S. Savings Bond Ownership	Other Fixed Income Ownership
East Asia				
Hong Kong	0.4406***			
	(0.1306)			
Korea	−0.1401**			
	(0.0237)			
Southeast Asia				
Vietnam			−0.0625**	
			(0.0207)	
Pacific Islands				
Indonesia	−0.1579***			
	(0.0089)			
Malaysia	0.2789*			
	(0.1878)			
Philippines	−0.0792*			−0.0060**
	(0.0334)			(0.0013)
North America				
Canada			−0.0542*	
			(0.0195)	
South America				
Colombia		0.1542**		
		(0.0878)		
Central America				
Mexico	−0.0901***	−0.0936***	−0.0616***	
	(0.0204)	(0.0148)	(0.0134)	
Nicaragua	−0.1152*			
	(0.0395)			
Caribbean				
Cuba	−0.1504***	−0.0897***	−0.0620*	
	(0.0155)	(0.0188)	(0.0212)	
Jamaica	−0.1411*			
	(0.0311)			
Africa				
South Africa	−0.1249*			
	(0.0407)			
Respondent Characteristic Controls	Yes	Yes	Yes	Yes
Year Effect Controls	Yes	Yes	Yes	Yes
Region of Residence Controls	Yes	Yes	Yes	Yes
Mixed Nationality Control	Yes	Yes	Yes	Yes
Observations	70,310	70,093	69,593	68,284
Pseudo-R^2	0.2149	0.2218	0.1080	0.2723
Countries Represented	59	53	38	24

Standard errors in parentheses.
***Significant at the 1% level.
**Significant at the 5% level.
*Significant at the 10% level.
Only significant results are reported here. Full results available upon request.

our hypothesis that there exist significantly differing propensities in terms of financial asset holding among the immigrant population at the country of origin level. Moreover, the absence of a pattern by region of origin provides evidence against general regional migration policies and patterns driving asset market participation.

4.4. Robustness check - principal component analysis

Since several of our respondent characteristic control variables could be correlated with one another, we utilize principal component analysis (PCA) and parallel analysis to identify any potential collinearity issues.[13] We re-run our regression analyses (Tables 5 and 6) using only the variables that were identified to be retained from the PCA and parallel analysis. We find that our results are consistent in both significance and magnitude for every variable in Table 5 and Table 6.

4.5. Immigrant subsample analysis

Next, we analyze the effect of additional factors related to immigrant status that may help us understand immigrant information costs' influence on immigrant asset holding - length of stay in the United States, immigrant legal status, and ethnic concentration of Metropolitan Statistical Area (MSA) of residence. This information is only available for immigrant respondents due to the inherent nature of such factors; therefore, we restrict our sample in this section to immigrant households. We analyze the effect of the variable(s) of interest in a probit analysis that includes respondent characteristics, year effect controls, region effect controls, and the multiple nationality household control. We then include country of origin variables from the previous analysis in order to observe the effect of including the variable(s) of interest on the significance and sign of the country of origin variable coefficients. In this analysis, as a reference for the estimators on other country of origin variables, we omit the country of origin variables for English-speaking countries (United Kingdom, Oceania) as they are the best intuitive proxy possible for the United States.

4.5.1. Length of time in the United States

It is conceivable that the duration of an immigrant's stay in the United States has a significant impact on investment decisions. As an immigrant spends more time in the United States, he is likely to improve language ability and increase knowledge of American investment options. Thus, length of stay in the U.S. should decrease information costs and correspondingly increase asset market participation. Table 7 shows the results of probit regressions with variables that differentiate the immigrant population by length of stay in addition to control variables.[14] Column 1 shows that an increase in the length of stay in the United States is associated with a reduction in the magnitude of a negative effect on stockholding compared to immigrants who have been in the United States for over 30 years. Column 2 shows that while recent (less than 5 year stay) immigrants are less likely to hold mutual funds compared to other immigrants, a longer stay is not associated with any statistically significant negative differences in mutual fund holding. Column 3 shows a significant negative effect of being a recent immigrant on U.S. Savings Bond ownership, with magnitude of the negative effect decreasing as length of stay increases, though many coefficients are not significant. Finally, column 4 shows that length of stay between 11 years and 15 years is positive and significant when considering holdings of other fixed income securities, which are less information intensive.

Table 8 shows the results of probit regressions with length of stay variables and country of origin variables. English-speaking countries are omitted. Column 1 shows the effect of including length of stay variables on rates of stockholding. The results show that, after controlling for length of stay, fewer country effects remain. However, the low rates of ownership associated with being an immigrant from Romania, Israel, Korea, Indonesia, Philippines, Mexico, Cuba, and Jamaica as well as the higher rates of holding associated with being an immigrant from Jordan, Palestine, and Hong Kong that were found in the original analyses continue to be significant. Additional positive effects of being a Swedish immigrant and negative effects of emigrating from Vietnam and El Salvador can be seen.

Column 2 shows that for mutual fund holding rates, the previously identified higher rate of participation among immigrants from Colombia remains statistically significant; however, the negative estimators for being an immigrant from Ukraine, Yugoslavia, Afghanistan, Iran, Mexico, and Cuba are no longer significant after controlling for length of stay. For holdings of U.S. Savings Bonds, only the previously identified effects associated with

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[13]Using PCA, we generate eigenvalues from the respondent characteristic variables in the original data set. We then create a random data set with the same number of observations and variables as the original data. After computing a correlation matrix and generating eigenvalues for the correlation matrix of the random data set, we compare these eigenvalues to the ones from our original data. From this parallel analysis, we find that eight of the respondent characteristic variables should be retained.

[14]In order to protect respondent privacy, year of arrival in the 2001 SIPP has been hard coded into various ranges of years. A continuous variable for length of stay is not available.

Table 7. Marginal effects of length of stay

	Stock Ownership	Mutual Fund Ownership	U.S. Savings Bond Ownership	Other Fixed Income Ownership
Length of Stay Variables				
Less than 5 Years	−0.0537***	−0.0407***	−0.0185***	0.0012
	(0.0158)	(0.0098)	(0.0043)	(0.0023)
5 to 10 Years	−0.0403*	−0.0188	−0.0094	0.0014
	(0.0176)	(0.0130)	(0.0053)	(0.0029)
11 to 15 Years	−0.0341	0.0135	−0.0122**	0.0054**
	(0.0187)	(0.0192)	(0.0049)	(0.0053)
16 to 20 Years	−0.0336*	0.0200	−0.0064	0.0004
	(0.0173)	(0.0201)	(0.0050)	(0.0012)
21 to 25 Years	−0.0321	−0.0130	0.0015	−0.0003
	(0.0167)	(0.0126)	(0.0084)	(0.0006)
26 to 30 Years	−0.0168	−0.0087	−0.0002	−0.0006
	(0.0196)	(0.0134)	(0.0075)	(0.0006)
Respondent Characteristic Controls	Yes	Yes	Yes	Yes
Year Effect Controls	Yes	Yes	Yes	Yes
Region of Residence Controls	Yes	Yes	Yes	Yes
Mixed Nationality Control	Yes	Yes	Yes	Yes
Observations	6569	6569	6569	5123
Pseudo-R^2	0.2962	0.3206	0.2255	0.4180

Standard errors in parentheses.
***Significant at the 1% level.
**Significant at the 5% level.
*Significant at the 10% level.
The sample consists of immigrants only. The variable for length of stay longer than 30 years in the United States is omitted from the analysis.

emigrating from Germany remains significant, with increases in the significance of rates of holding among immigrants from Austria, Sweden, Czechoslovakia, Czech Republic, China, Cambodia and Chile. Most notably, the Former USSR, Mexico, and Cuba are no longer significant after controlling for length of stay. The results for ownership rates of other fixed income securities (less information intensive assets) appear to be affected very little by the addition of length of stay controls.

4.5.2. Immigrant legal status

One concern with the sample of immigrants is that it could include distinct categories of migrants - categories that have implications for financial behavior. If migrants intend to return to their home country, this may affect their U.S. asset market participation while in the United States. Additionally, whether an immigrant is naturalized or has permanent resident status is likely to have an impact on income and financial stability due to the associated ability to live and work in the United States.

Using a variable that simply denotes whether or not an immigrant is naturalized or has permanent resident status would be problematic for this analysis since it would be highly correlated with length of stay. 87.08 percent of individuals in the immigrant sample are naturalized or permanent residents, and of the remaining 12.92 percent, approximately half are recent immigrants with less than a 5-year stay in the United States. As an alternative, we use a variable that denotes whether an immigrant had permanent resident status upon entering the United States.[15] Having such status at the time of entry is likely to give an immigrant a lasting advantage in their ability to work immediately and achieve naturalization earlier compared to immigrants without permanent residency. The use of this variable is advantageous in that it is not strongly correlated with an immigrant's length of stay and likely captures a more isolated effect of having working legal status. This variable is not related to information costs but proxies for risk (income variability/risk) that could be influencing asset market participation.

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[15]Using this alternative variable produces much the same results as the use of a variable denoting whether an immigrant has permanent resident or naturalized status and controlling for length of stay. The estimators on the latter variables are not statistically significant.

Table 9 shows the results of an analysis of immigrant households including a dummy variable for whether the respondent had permanent resident status at the time of entry. The variable appears to have little statistical significance in terms of its effects on asset ownership. Correspondingly, controlling for legal status has little impact on the estimators of country of origin. The results of this analysis are shown in Table 10. Columns 1, 2, and 4 show

Table 8. Marginal effects of country of origin with length of stay

	Stock Ownership	Mutual Fund Ownership	U.S. Savings Bond Ownership	Other Fixed Income Ownership
Length of Stay Variables				
Less than 5 Years	−0.708***	−0.0438***	−0.0174***	0.0003
	(0.0131)	(0.0097)	(0.0044)	(0.0014)
5 to 10 Years	−0.0543***	−0.0273*	−0.0106**	−0.0003
	(0.0148)	(0.0117)	(0.0040)	(0.0007)
11 to 15 Years	−0.0469**	0.0081	−0.0129***	0.0053**
	(0.0166)	(0.0201)	(0.0043)	(0.0057)
16 to 20 Years	−0.0476**	0.0179	−0.0063	0.0004
	(0.0147)	(0.0218)	(0.0045)	(0.0013)
21 to 25 Years	−0.0367*	−0.0213	0.0003	−0.0007
	(0.0161)	(0.0115)	(0.0073)	(0.0005)
25 to 30 Years	−0.0142	−0.0103	0.0006	−0.0008
	(0.0213)	(0.0146)	(0.0077)	(0.0006)
Western Europe				
Austria			0.18722**	
			(0.1875)	
Germany			−0.0105*	−0.0007*
			(0.0034)	(0.0006)
Northern Europe				
Sweden	0.2122*		0.1419**	
	(0.1892)		(0.1407)	
Eastern Europe				
Czechoslovakia			0.0893*	0.0110**
			(0.1026)	(0.0163)
Czech Republic			0.1031*	
			(0.1265)	
Hungary				0.0649***
				(0.0768)
Poland		0.0794*		
		(0.0645)		
Romania	−0.0596**			
	(0.0107)			
Middle East				
Israel	−0.0593**			
	(0.0115)			
Jordan	0.3662**	0.2462*		0.0312**
	(0.2467)	(0.2459)		(0.0400)
Palestine	0.3734***			
	(0.1677)			
Respondent Characteristic Controls	Yes	Yes	Yes	Yes
Year Effect Controls	Yes	Yes	Yes	Yes
Region of Residence Controls	Yes	Yes	Yes	Yes
Mixed Nationality Control	Yes	Yes	Yes	Yes
Observations	5975	5704	5416	3024
Pseudo-R^2	0.3568	0.3579	0.3104	0.4866
Countries Represented	53	45	34	18

(*Continues*)

Table 8. (Continued)

	Stock Ownership	Mutual Fund Ownership	U.S. Savings Bond Ownership	Other Fixed Income Ownership
East Asia				
China			0.0570**	
			(0.0534)	
Hong Kong	0.2879***			
	(0.1377)			
Korea	−0.0611**			
	(0.0115)			
Southeast Asia				
Cambodia			0.2642***	
			(0.1933)	
Vietnam	−0.0456*			
	(0.0180)			
Pacific Islands				
Indonesia	−0.0627***			
	(0.0090)			
Philippines	−0.0442*			
	(0.0180)			
South America				
Colombia		0.1506***		
		(0.0909)		
Chile			0.2550**	
			(0.2219)	
Central America				
El Salvador	−0.0642***			
	(0.0101)			
Mexico	−0.0695***			
	(0.0217)			
Caribbean				
Cuba	−0.0674***			
	(0.0104)			
Jamaica	−0.0601*			0.0225**
	(0.0126)			(0.0358)
Respondent Characteristic Controls	Yes	Yes	Yes	Yes
Year Effect Controls	Yes	Yes	Yes	Yes
Region of Residence Controls	Yes	Yes	Yes	Yes
Mixed Nationality Control	Yes	Yes	Yes	Yes
Observations	5975	5704	5416	3024
Pseudo-R^2	0.3568	0.3579	0.3104	0.4866
Countries Represented	53	45	34	18

Standard errors in parentheses.
***Significant at the 1% level.
**Significant at the 5% level.
*Significant at the 10% level.
The sample consists of immigrants only. English speaking country of origin variables and the variable for length of stay longer than 30 years are omitted from the analysis. Only significant results are reported here. Full results available upon request.

that country of origin effects on stockholding, mutual fund holding, and fixed income securities holding are similar to results found in Table 6. Country of origin effects on U.S. Savings Bonds differ most after controlling for legal status - only the effects associated with Germany and the former USSR are consistent with the Table 6 results. Overall, investment behavior does not seem to be influenced by differing levels of income variability/risk.

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Table 9. Marginal effects of immigrant legal status

	Stock Ownership	Mutual Fund Ownership	U.S. Savings Bond Ownership	Other Fixed Income Ownership
Permanent Resident Status at Entry	0.0080	−0.0053	−0.0026	−0.0010
	(0.0122)	(0.0092)	(0.0056)	(0.0010)
Respondent Characteristic Controls	Yes	Yes	Yes	Yes
Year Effect Controls	Yes	Yes	Yes	Yes
Region of Residence Controls	Yes	Yes	Yes	Yes
Mixed Nationality Control	Yes	Yes	Yes	Yes
Observations	7473	7473	7473	5888
Pseudo-R^2	0.2676	0.2848	0.1874	0.3751

Standard errors in parentheses.
***Significant at the 1% level.
**Significant at the 5% level.
*Significant at the 10% level.
The sample consists of immigrants only.

4.5.3. Ethnic concentration levels in metropolitan statistical area of residence

Next, using the subsample of immigrant households, we control for the possibility that the concentration of people who have emigrated from the same country as an immigrant in said immigrant's community may have an impact on their household investment behavior, through possible neighbor and/or community effects (See Ng & Wu, 2010; Brown *et al.*, 2008; Hong *et al.*, 2004). If information costs are inhibiting asset market participation, then immigrants that primarily live around other immigrants would not have the same exposure to U.S.-related information as an immigrant in a community of native U.S. citizens. Thus, we would hypothesize that increased ethnic concentration would be negatively related to U.S. asset market participation.

In order to test this hypothesis, we construct an ethnic concentration variable using a method similar to that used by Osili and Paulson (2006, 2008). We supplement the 2001 SIPP with data from the 2000 Integrated Public Use Microdata Sample (IPUMS) 5 percent sample of the U.S. Census. We define ethnic concentration for an immigrant respondent from a given country k in MSA of residence j using the following equation:

$$EthnicConcentration_{kj} = \frac{\text{Number of individuals born in country k residing in MSA j}}{\text{Total number of individuals including natives residing in MSA j}}$$

Table 11 provides a summary of the top 25 MSAs with the largest total populations and the foreign born ethnic groups that compose the greatest percentage of the total population in each MSA.

Table 12 shows the results of probit regressions including the ethnic concentration variable in a sample restricted to immigrant households. The results show that level of ethnic concentration has a considerable and significant negative effect on stock and mutual fund holding, but does not have a statistically significant effect on ownership of bonds or other fixed income. This could in part be explained by the research of Osili and Paulson (2006) and others who note several important effects of ethnic concentration on immigrants. For example, Borjas (1998, 2000) found that immigrants who live in areas with high levels of similar ethnicity concentration have lower wage growth and greater income uncertainty. Geographic clustering of immigrants from the same country also has been shown to be associated with lower educational attainment and language proficiency (Gang & Zimmerman, 2000; Chiswick & Miller, 2002). All of these effects would decrease the probability of holding stock-related assets.

We also test the hypothesis that high ethnic concentration will only have a negative impact on the financial knowledge and decision making of recent immigrants in comparison with other immigrants. After controlling for this effect by including an interaction variable between ethnic concentration and less than 5-year stay, the negative effect of ethnic concentration remains statistically significant for stock and mutual fund ownership.

Table 13 presents the results of the main analysis of the marginal effects of country of origin on asset holding with ethnic concentration and the interaction between ethnic concentration and recent immigration included. The results for stockholding in column 1 show results consistent with the main analyses presented in Table 6. In

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Table 10. Marginal effects of country of origin with legal status

	Stock Ownership	Mutual Fund Ownership	U.S. Savings Bond Ownership	Other Fixed Income Ownership
Permanent Resident Status at Entry	0.0044	−0.0098	−0.0016	−0.0021**
	(0.0125)	(0.0097)	(0.0056)	(0.0017)
Western Europe				
Austria			0.2106**	
			(0.2013)	
Germany			−0.0136**	
			(0.0049)	
Italy				−0.0013*
				(0.0009)
Northern Europe				
Netherlands		0.1354*		
		(0.1152)		
Eastern Europe				
Czechoslovakia				0.0105*
				(0.0144)
Hungary				0.1385***
				(0.1250)
Poland		0.0880**		
		(0.0621)		
Romania	−0.0655**			
	(0.0111)			
USSR (Former)			0.6250**	
			(0.4170)	
Middle East				
Afghanistan		0.6292***		
		(0.1722)		
Israel	−0.0634*			
	(0.0132)			
Jordan	0.4902***			
	(0.1277)			
Pakistan		0.1186*		
		(0.1098)		
Palestine	0.4730*			
	(0.1621)			
Respondent Characteristic Controls	Yes	Yes	Yes	Yes
Year Effect Controls	Yes	Yes	Yes	Yes
Region of Residence Controls	Yes	Yes	Yes	Yes
Mixed Nationality Control	Yes	Yes	Yes	Yes
Observations	6883	6698	6226	3748
Pseudo-R^2	0.3274	0.3215	0.2549	0.4310
Countries Represented	56	50	36	21

(*Continues*)

contrast, most of the significant country of origin effects associated with mutual fund ownership, U.S. Savings Bond ownership and other fixed income securities ownership disappear.

4.6. Other possible explanations

There are other potential explanations for our empirical findings. The differences by country of origin in immigrant investment behavior could be driven by cultural differences in investment behavior or cross-country differences in attitudes about risk. With regard to cultural differences, our results are inconsistent with these hypotheses.

Table 10. (Continued)

	Stock Ownership	Mutual Fund Ownership	U.S. Savings Bond Ownership	Other Fixed Income Ownership
East Asia				
Hong Kong	0.3224***			
	(0.1386)			
Korea	−0.0651**			
	(0.0128)			
Southeast Asia				
Cambodia			0.2428***	
			(0.01659)	
Pacific Islands				
Indonesia	−0.0676***			
	(0.0095)			
South America				
Colombia		0.1647***		
		(0.0868)		
Chile			0.3237**	
			(0.2781)	
Central America				
El Salvador	−0.0685**			
	(0.0110)			
Mexico	−0.06224***	−0.0356*		
	(0.0206)	(0.0157)		
Caribbean				
Cuba	−0.0704***			
	(0.0113)			
Jamaica	−0.0648*			
	(0.0142)			
Respondent Characteristic Controls	Yes	Yes	Yes	Yes
Year Effect Controls	Yes	Yes	Yes	Yes
Region of Residence Controls	Yes	Yes	Yes	Yes
Mixed Nationality Control	Yes	Yes	Yes	Yes
Observations	6883	6698	6226	3748
Pseudo-R^2	0.3274	0.3215	0.2549	0.4310
Countries Represented	56	50	36	21

Standard errors in parentheses.
***Significant at the 1% level.
**Significant at the 5% level.
*Significant at the 10% level.
The sample consists of immigrants only. English speaking country of origin variables are omitted from the analysis. Only significant results are reported here. Full results available upon request.

Our results show that many of the participation rates of immigrants are not reflective of the asset market participation rates in their respective home countries. Moreover, Weber and Hsee (1998) show that there are not cultural differences in *attitudes towards perceived risk* of financial options. Further, our immigrant legal status analysis does not indicate that immigrant income risk is correlated with asset market participation. Thus, the results from our empirical analysis are most consistent with the premise that differing information costs are driving different immigrant asset market participation rates. Compelling evidence is present along three dimensions: (i) Immigrants from countries with greater informational exchange and contact with the U.S. have participation rates similar to Americans born in the U.S. (ii) The longer immigrants have been in the United States (the greater the reduction in information costs), the more similar their investment patterns are to native Americans. and (iii) Immigrants that are more isolated from non-immigrants have relatively lower asset market participation rates.

Table 11. Top 25 most populous MSAs and foreign-born statistics

Metropolitan Statistical Area (MSA)	Total Population	Foreign Born Population	Percent Foreign Born	Largest Ethnic Group - 1	Ethnic Concentration - 1	Largest Ethnic Group - 2	Ethnic Concentration - 2
Los Angeles-Riverside-Orange County, CA	12,777,102	4,072,355	31.87%	Mexico	14.95%	El Salvador	2.07%
New York-New Jersey-Long Island, NJ	9,306,900	3,136,613	33.70%	Caribbean	9.43%	China	2.27%
Chicago-Gary-Kenosha, IL	8,173,110	1,423,470	17.42%	Mexico	7.10%	Poland	1.73%
Washington-Baltimore, DC	7,247,020	970,533	13.39%	El Salvador	1.50%	Korea	0.83%
Philadelphia-Wilmington-Atlantic City, NJ	5,940,758	422,121	7.11%	Caribbean	0.63%	India	0.58%
Detroit-Ann Arbor-Flint, MI	5,150,384	373,618	7.25%	Canada	0.66%	Iraq	0.61%
Houston-Galveston-Brazoria, TX	4,423,653	866,823	19.60%	Mexico	9.83%	El Salvador	1.44%
Atlanta, GA	3,987,990	416,913	10.45%	Mexico	2.98%	Caribbean	0.72%
Miami-Fort Lauderdale, FL	3,845,904	1,548,523	40.26%	Cuba	14.45%	Caribbean	7.69%
Boston-Worcester-Lawrence, MA	3,678,204	538,833	14.65%	Caribbean	2.11%	China	0.93%
San Francisco-Oakland-San Jose, CA	3,422,949	1,130,094	33.02%	Mexico	6.28%	Philippines	3.93%
Dallas-Fort Worth, TX	3,377,635	585,883	17.35%	Mexico	10.16%	India	0.71%
Seattle-Tacoma-Bremerton, WA	3,273,437	398,600	12.18%	Mexico	1.36%	Philippines	1.23%
Phoenix-Mesa, AZ	3,070,331	444,136	14.47%	Mexico	9.25%	Canada	0.51%
Cleveland-Akron, OH	2,948,392	134,955	4.58%	India	0.28%	Germany	0.27%
Minneapolis-St. Paul, WI	2,856,295	206,301	7.22%	Mexico	1.07%	Laos	0.79%
San Diego, CA	2,807,873	604,450	21.53%	Mexico	10.39%	Philippines	3.05%
St. Louis, IL	2,602,448	81,631	3.14%	Mexico	0.25%	India	0.23%
Tampa-St. Petersburg-Clearwater, FL	2,386,781	234,577	9.83%	Mexico	1.14%	Cuba	1.03%
Pittsburgh, PA	2,285,064	59,635	2.61%	Italy	0.32%	India	0.30%
Denver-Boulder-Greeley, CO	2,159,535	244,509	11.32%	Mexico	5.97%	Vietnam	0.45%
Portland-Salem, OR	2,071,614	234,488	11.32%	Mexico	3.85%	Vietnam	0.81%
Cincinnati-Hamilton, OH	1,807,530	49,739	2.75%	India	0.30%	Germany	0.20%
Sacramento-Yolo, CA	1,802,907	261,356	14.50%	Mexico	4.07%	Philippines	1.05%
Milwaukee-Racine, WI	1,684,056	84,560	5.02%	Mexico	1.67%	Germany	0.31%

The IPUMS 2000 5% Sample consists of all MSA residents 18 and over in the 2000 Census.

Table 12. Marginal effects of ethnic concentration

	Stock Ownership		Mutual Fund Ownership		U.S Savings Bond Ownership		Other Fixed Income Ownership	
Ethnic Concentration	−0.5808*** (0.1741)	−0.3994*** (0.1397)	−0.5525*** (0.1555)	−0.2747*** (0.1252)	0.0251 (0.0596)	0.0020 (0.0167)	−0.0033 (0.0063)	−0.0010 (0.0027)
Ethnic Concentration x Less than 5 Year Stay		−5.0746* (2.2309)		−5.2547* (1.6640)		−1.7522 (0.7821)		−0.2673 (0.2773)
Respondent Characteristic Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region of Residence Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mixed Nationality Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6124	5372	6124	5372	6124	5372	4832	4193
Pseudo-R^2	0.2805	0.3146	0.3030	0.3249	0.1929	0.2284	0.4099	0.4047

Standard errors in parentheses.
***Significant at the 1% level.
**Significant at the 5% level.
*Significant at the 10% level.
The sample consists of immigrants only.

5. CONCLUSION

Current economic literature attests to the negative effects associated with being an immigrant in the United States regarding holdings of various financial assets such as savings and checking accounts as well as stock and mutual funds (Osili & Paulson, 2006; Chatterjee, 2009). Many studies of immigrant behavior, such as those aforementioned, treat the immigrant population as a homogeneous collective; however, immigrants are exceedingly diverse, originating from around the world. This paper demonstrates the existence of variation in rates of stock, mutual fund, U.S. Savings Bonds, and other fixed income securities market participation within the immigrant population differentiated by country of origin. Variation exists even within broad regions of emigration, such as Europe, the Middle East, and Asia, though asset holding rates among immigrants from Central and South America as well as the Caribbean tend to be consistently low. Our findings also show a consistent pattern of high rates of holding fixed income securities among Eastern European immigrants. Furthermore, immigrants from a few countries of origin have rates of asset holding that are higher than those of Americans.

Our primary hypothesis for the driver of differences across holding rates among immigrants involves information costs and information access. The information access hypothesis suggests that immigrants from countries with greater informational exchange and contact with the United States, such as English-speaking countries and those with financial markets highly interlinked with the U.S. will be more likely to invest. Our results do provide support for this theory. We find that immigrants from most countries that have greater information access ability (such as Western European and English-speaking countries) do not have rates of participation significantly different from Americans born in the U.S.

We also find a high rate of stockholding among immigrants from Hong Kong. Immigrants from Hong Kong are likely to be familiar with English and their stock market has historically had strong ties to the American financial center in New York. Our results with regard to immigrant ethnic concentration also provide support for an information access effect *(through a peer effects influence)* on asset market participation. Additionally, we find that immigrants from countries with limited financial market connections to the United States (e.g. Romania, Indonesia, Cuba) have significantly lower participation rates. Moreover, our robustness check shows that length of time in the U.S. decreases the negative effect on stock holding and other asset holding.

An alternative source of the immigrant participation differences may be that investment behaviors are carried over from an immigrant's country of origin. In our results, we find little support for this theory. Many of the

Table 13. Marginal effects of country of origin with ethnic concentration

	Stock Ownership	Mutual Fund Ownership	U.S. Savings Bond Ownership	Other Fixed Income Ownership
Ethnic Concentration	−0.4382**	−0.2805**	0.0150	0.0016***
	(0.1848)	(0.1630)	(0.0232)	(0.0040)
Ethnic Concentration x Less than 5 Year Stay	−6.9301***	−5.5237*	−1.0974*	−0.0766
	(1.873)	(1.2765)	(0.7141)	(0.1453)
Western Europe				
Austria			0.0784**	
			(0.1158)	
Eastern Europe				
Czechoslovakia			0.0652**	
			(0.1036)	
Hungary	0.5887***	0.3852***		0.2851***
	(0.1740)	(0.1953)		(0.2925)
Romania	−0.0372***			
	(0.0097)			
Ukraine			0.0175*	
			(0.0277)	
Middle East				
Iran		−0.0164*		
		(0.0094)		
Israel	−0.0366**			
	(0.0097)			
Lebanon	−0.0333*			
	(0.0103)			
Palestine	0.3174***			
	(0.1671)			
South Asia				
India	−0.0278*			
	(0.0137)			
East Asia				
China			0.0195*	
			(0.0314)	
Korea	−0.0399***			
	(0.0104)			
Southeast Asia				
Vietnam	−0.0380***			
	(0.0101)			
Respondent Characteristic Controls	Yes	Yes	Yes	Yes
Year Effect Controls	Yes	Yes	Yes	Yes
Region of Residence Controls	Yes	Yes	Yes	Yes
Mixed Nationality Control	Yes	Yes	Yes	Yes
Observations	4727	4505	4187	1964
Pseudo-R^2	0.3744	0.3644	0.3151	0.4807
Countries Represented	45	39	30	14

(*Continues*)

participation rates of immigrants found in this paper are not reflective of the rates of their countries of origin. For example, despite the low rate of participation in Hong Kong compared to the United States (See Figure 2), immigrants from Hong Kong are significantly more likely to hold stock than Americans. Our results also show that immigrants from Australia, New Zealand, and the United Kingdom, countries shown to have higher rates of participation than the United States (See Figure 2), are not significantly more likely to hold stock. Thus, our results present an interesting possibility for future research to uncover specific information and peer effect influences that may be driving the variation in immigrant asset holding across countries of origin.

Table 13. (Continued)

	Stock Ownership	Mutual Fund Ownership	U.S. Savings Bond Ownership	Other Fixed Income Ownership
Pacific Islands				
Indonesia	−0.0378***			
	(0.0097)			
Malaysia		−0.0179*		
		(0.0103)		
Philippines	−0.0384***			
	(0.0106)			
North America				
Canada				−0.0001*
				(0.0001)
South America				
Colombia		0.0774**		
		(0.0618)		
Chile			0.1420***	
			(0.1825)	
Central America				
El Salvador	−0.0389***			
	(0.0101)			
Mexico				−0.0006***
				(0.0013)
Caribbean				
Cuba	−0.0342*			
	(0.0121)			
Jamaica	−0.0390**			
	(0.0099)			
Respondent Characteristic Controls	Yes	Yes	Yes	Yes
Year Effect Controls	Yes	Yes	Yes	Yes
Region of Residence Controls	Yes	Yes	Yes	Yes
Mixed Nationality Control	Yes	Yes	Yes	Yes
Observations	4727	4505	4187	1964
Pseudo-R^2	0.3744	0.3644	0.3151	0.4807
Countries Represented	45	39	30	14

Standard errors in parentheses.
***Significant at the 1% level.
**Significant at the 5% level.
*Significant at the 10% level.
The sample consists of immigrants only. English speaking country of origin variables are omitted from the analysis. Only significant results are reported here. Full results available upon request.

APPENDIX A

A. Definition of Variables

Household Asset, Income, and Wealth Variables

- Stock Ownership - A dichotomous dependent variable that is given a value of 1 if the respondent owns stock either jointly or in his or her own name in the given reference month. The variable is 0 otherwise. Stock ownership does not include assets in IRA accounts, Keogh accounts, 401Ks, or other pension plans.
- Mutual Fund Ownership - A dichotomous dependent variable that is given a value of 1 if the respondent owns mutual funds either jointly or in his or her own name in the given reference month. The variable is 0 otherwise.
- Fraction of Stocks and Mutual Funds - The fraction of the value of a respondent's solely owned and respondent's share of jointly owned stocks and mutual funds out of the total value of a respondent's financial assets in the given reference month. Financial assets include checking accounts, savings accounts, money market funds, certificates of deposit, IRA accounts, Keogh accounts, 401K and thrift accounts, U.S. Government securities, corporate

bonds, municipal bonds, U.S. Savings Bonds, stock, and mutual funds. The composition of financial assets does not include physical or human capital as in Rosen and Wu (2004).

- U.S. Savings Bond Ownership - A dichotomous dependent variable that is given a value of 1 if the respondent owns U.S. Savings Bonds either jointly or in his or her own name in the given reference month. The variable is 0 otherwise.
- Fraction of U.S. Savings Bonds - The fraction of the face value of respondent's solely owned and respondent's share of jointly owned U.S. Savings Bonds out of the total value of a respondent's financial assets in the given reference month. See 'Fraction of Stocks and Mutual Funds' for a definition of the composition of total financial assets.
- Other Fixed Income Ownership - A dichotomous dependent variable that is given a value of 1 if the respondent owns U.S. Government securities (such as U.S. Treasury Bills), corporate bonds, or munici-#pal bonds either jointly or in his or her own name in the given reference month. The variable is 0 otherwise.
- Fraction of Other Fixed Income - The fraction of the value of the respondent's solely owned and respondent's share of jointly owned Other Fixed Income out of the total value of a respondent's financial assets in the given reference month. See 'Fraction of Stocks and Mutual Funds' for a definition of the composition of total financial assets.
- Log of Household Net Worth - The natural logarithm of the net worth of the respondent's household.
- Log of Total Household Income - The natural logarithm of the total monthly household income of the respondent in the given reference month.
- Own Pension Dummy Variable - A dummy variable that is given a value of 1 if the respondent participated in at least 1 retirement or pension plan in the given reference month. The variable is 0 otherwise.
- Own Home Dummy Variable - A dummy variable that is given a value of 1 if the respondent, person, or persons in the respondent's household own the home of residence in the given reference month. The variable is 0 otherwise.
- Own Business Dummy Variable - A dummy variable that is given a value of 1 if the respondent owns a business in the given reference month. The variable is 0 otherwise.

Respondent Characteristic Variables

- Age of Respondent in 2001 - The age of the respondent as of their last birthday reported between February and June 2001.
- Age Squared - The squared age of the respondent as of their last birthday reported between February and June 2001.
- Married Dummy Variable - A dummy variable that is given a value of 1 if the respondent was married and lived with spouse or married with spouse not in the home in the given reference month. The variable is 0 otherwise. Married does not include widowed individuals.
- Male Dummy Variable - A dummy variable that is given a value of 1 if the respondent is male in the given reference month and set to 0 otherwise.
- Non-White Dummy Variable - A dummy variable that is given a value of 1 if the respondent reported being of a race other than White and set to 0 otherwise. Non-White races consist of African American, American Indian, Aleut, or Eskimo, and Asian or Pacific Islander. All respondents fall within these categories or the 'White' category.
- Children Under 18 Dummy Variable - A dummy variable that is given a value of 1 if the respondent reported having children under the age of 18 in his or her family in the given reference month.
- Household Size - The number of people reported by the respondent to be living in his or her household in the given reference month.
- Managerial Occupation Dummy Variable - A dummy variable that is given a value of 1 if the respondent has an occupation that has a U.S. Census code of managerial or professional specialties (U.S. Census Occupation Code 000–199). The variable is 0 otherwise.
- Less than High School Graduate Dummy Variable - A dummy variable that is given a value of 1 if the respondent's highest level of education is less than high school graduation and 0 otherwise.
- High School Graduate Dummy Variable - A dummy variable that is given a value of 1 if the respondent's highest level of education is high school graduation and 0 otherwise.

- Some College Dummy Variable - A dummy variable that is given a value of 1 if the respondent's highest level of education is some college but no degree and 0 otherwise.
- College Graduate Dummy Variable - A dummy variable that is given a value of 1 if the respondent's highest level of education is a Bachelor's Degree and 0 otherwise.
- Technical or Associate's Degree Dummy Variable - A dummy variable that is given a value of 1 if the respondent's highest level of education is a Diploma or Certificate from a technical, vocational, or trade school beyond high school or an Associate's Degree in college from an occupational, vocational, or academic program. The variable is 0 otherwise.
- Advanced Degree Dummy Variable - A dummy variable that is given a value of 1 if the respondent's highest level of education is a Master's Degree, a professional school degree (MD, DDS, DVM, LLB, JD), or a Doctoral Degree. The variable is 0 otherwise.
- English Ability Dummy Variable - A dummy variable that is given a value of 0 if the respondent reported that he or she could not speak English well or if they could not speak English at all. The variable is 1 otherwise.

Immigrant Characteristic Variables

- Immigrant Dummy Variable - A dummy variable that is given a value of 1 if the respondent reported that he or she was foreign born, whether naturalized or not naturalized. The variable is 0 otherwise. This variable exists only for respondents in the sample over the age of 15 who were present during Wave 2.
- Country of Origin Dummy Variables - All dummy variables labeled with the names of countries are given a value of 1 if the respondent reported that he or she was born in that country and 0 otherwise.
- Length of Stay Dummy Variables - A dummy variable that is given a value of 1 if the respondent is an immigrant and immigrated to the United States within the given number of years and 0 otherwise. The reference year is 2001. For example, the Less than 5 Years Dummy Variable is 1 if the respondent immigrated between 1996 and 2001. Length of Stay Dummy Variables are Less than 5 Years, 6 to 10 Years, 11 to 15 Years, 16 to 20 Years, 21 to 25 Years, 26 to 30 Years, and Over 30 Years. The Over 30 Years Dummy is not included in analyses.
- Permanent Resident Status at Entry Dummy Variable - A dummy variable that is given a value of 1 if the respondent had permanent resident status at the time of their entry into the United States and 0 otherwise.
- Ethnic Concentration in MSA of Residence - See Section 6.3 for a detailed description of the construction of this variable.
- Mixed Nationality Dummy Variable - A dummy variable that is given a value of 1 if the respondent lives in a household in which the household head's birth country is not the same as that of his or her spouse. The variable is 0 otherwise.

Other Control Variables

- Year Dummy Variables - A dummy variable that is given a value of 1 if the reference month is in the corresponding year and 0 otherwise. Year 1 represents 2001, Year 2 represents 2002, and Year 3 represents 2003. The Year 1 variable is not included in the analyses and is the reference period for year controls.
- Region Dummy Variables - A dummy variable that is given a value of 1 if the respondent's state of residence is in the corresponding region as categorized by the U.S. Census Bureau. Region Dummy Variables are Northeast, Midwest, South, and West and 0 otherwise. The Northeast Dummy Variable is not included in the analyses and is the reference region for region of residence controls.

APPENDIX B

Intensive Margin of Asset Allocation

A study of the intensive margin of asset allocation is possible in this study, as the SIPP 2001 provides information on the value of financial assets held by respondents. Table 14 shows that immigrants on average hold a lower value of the assets under study and that these assets typically compose a smaller portion of immigrant financial asset portfolios compared to natives.

Table 14. Composition of financial assets

	Full Sample	Natives[‡]	Immigrants[‡]
Average Value of Stocks and Mutual Funds	$11,571.02	$15,860.31	$6027.32
Average Value of U.S. Savings Bonds	$195.19	$296.98	$107.95
Average Value of Other Fixed Income Securities	$1253.60	$1880.83	$874.19
Average Fraction of Stocks and Mutual Funds	0.118	0.121	0.089
Average Fraction of U.S. Savings Bonds	0.024	0.025	0.006
Average Fraction of Other Fixed Income Securities	0.010	0.010	0.005

[‡]Native and Immigrant status is only ascertained for respondents 15 and over present during Wave 2.

B.1 Model Specification

In our study of the intensive margin of financial asset allocation, we relate the fraction of an asset in the respondent's financial assets to immigrant status or immigrant birth country while controlling for demographic and socio-economic factors including English ability in addition to year effect controls, region of residence controls, and a mixed nationality control.[16] A variety of econometric methods have been used to study asset allocation, in which shares are bounded by zero and one. Heaton and Lucas (2000) restrict their sample to only those individuals with stock holdings above a certain level and use ordinary least squares estimation. Rosen and Wu (2004), Poterba and Samwick (2003), and Edwards (2008) use a tobit estimator. In our analysis we use a tobit model with a left-censor limitation at 0.

The model specification for household head i at time t is:

$$FRACTIONofFINANCIALASSETS_{it} = \beta_0 + \sum \beta_j IMMIGRANT_{itj} + \sum \beta_k V_{itk} \quad (4)$$
$$+ \sum \beta_l W_{itl} + \sum \beta_m X_{itm} + \beta_n Z_{it} + \varepsilon_{it}$$

where $IMMIGRANT_{itj}$ represents either a dummy variable for immigrant status or a set of country of origin dummy variables denoting an immigrant's birth country, V_{itk} is the set of respondent characteristic and asset control variables, W_{itl} is the set of year effect control variables, X_{itm} is the set of region of residence control variables, and Z_{it} is the control variable for mixed nationality among household decision makers. See Appendix A: Definition of Variables for more detailed descriptions of variables.

B.2 Results

Table 15 shows the results of tobit regressions relating immigrant status to the fraction of stock and mutual funds as well as the fraction of U.S. Savings Bonds held among financial asset portfolios. The sign of the coefficients on control variables, where significant, is largely similar to those found on the same variables in the probit regression. In the first column, the coefficient on the immigrant variable shows that stocks and mutual funds compose approximately 6.85 percent less of immigrants' financial asset portfolios compared to their American native counterparts. The second column shows that immigrant financial asset portfolios contain 16.19 percent fewer bonds than Americans, and the third shows that other fixed income assets compose 12.09 percent less of immigrant total financial assets.

Table 16 shows the results of tobit regressions in which the immigrant population is broken down by their country of origin. The results show that with some variation, the results are consistent with the results obtained from the probit regressions. The results for the fraction of stocks and mutual funds among financial assets are shown in the first column. Among European countries, the probit analysis showed that Italian and Romanian immigrants were less likely to hold stock, and the tobit results show that stocks and mutual funds compose a significantly smaller portion of their financial asset portfolio compared to American natives. In addition, the tobits show that immigrants from Germany, Switzerland, the former USSR, and the Netherlands hold more stock in their portfolios than natives, while those from Czech Republic hold less. Much of the results for immigrants from Middle Eastern countries are also what we would expect from the probit results. Countries of origin associated with higher rates of holding stock or mutual funds

[16]The methodology of data collection for the SIPP combined the value of stocks and mutual funds; therefore, the analysis here cannot analyze them separately.

Table 15. Effects of respondent characteristics on asset allocation

	Fraction of Stocks and Mutual Funds	Fraction of U.S. Savings Bonds	Fraction of Other Fixed Income
Immigrant	−0.0685***	−0.1619***	−0.1209***
	0.0238)	(0.0208)	(0.0552)
Age in 2001	−0.0128***	−0.0047**	−0.0008
	(0.0023)	(0.0019)	(0.0064)
Age in 2001 Sq.	0.0001***	0.0000***	0.0001
	(0.0000)	(0.0000)	(0.0001)
Married	0.0318**	0.0154	0.0227
	(0.0145)	(0.0109)	(0.0339)
Male	0.0068	−0.0053	−0.0210
	(0.0116)	(0.0090)	(0.0274)
Non-White	−0.0393**	−0.0329**	−0.1412**
	(0.0210)	(0.0160)	(0.0634)
Children Under 18	0.0568***	0.0700***	0.1958***
	(0.0179)	(0.0141)	(0.0537)
Household Size	−0.0496***	−0.0024	−0.1146***
	(0.0069)	(0.0049)	(0.0202)
Log Household Net Worth	0.2001**	0.0311***	0.2958***
	(0.0053)	(0.0034)	(0.0130)
Log Total Household Income	0.0152**	0.0073*	0.0238*
	(0.0063)	(0.0044)	(0.0144)
Own Pension	−0.0097	0.0364***	−0.0805**
	(0.0130)	(0.0098)	(0.0337)
Own Home	−0.1734***	-0.0081	−0.2635***
	(0.0183)	(0.0136)	(0.0405)
Own Business	−0.0114***	−0.0451***	−0.1041***
	(0.0167)	(0.0130)	(0.0376)
Managerial Occupation	−0.0121	0.0225**	−0.0818**
	(0.0134)	(0.0100)	(0.0342)
Education Variables			
High School Graduate	0.1487***	0.0868***	0.1763***
	(0.0287)	(0.0203)	(0.0638)
Some College	0.2689***	0.1392***	0.2296***
	(0.0298)	(0.0207)	(0.0637)
College Graduate	0.3569***	0.1441***	0.4242***
	(0.0298)	(0.0215)	(0.0637)
Technical or Associate's Degree	0.2748***	0.1336***	0.2476***
	(0.0312)	(0.0232)	(0.0708)
Advanced Degree	0.3844***	0.1491***	0.4886***
	(0.0307)	(0.0227)	(0.0668)
English Ability	0.1591**	0.0897	0.4647**
	(0.0778)	(0.0601)	(0.2231)
Year Effect Controls	Yes	Yes	Yes
Region Controls	Yes	Yes	Yes
Mixed Nationality Control	Yes	Yes	Yes
Observations	58,590	58,590	58,590
Pseudo-R^2	0.1457	0.0706	0.2634

Standard errors in parentheses.
***Significant at the 1% level.
**Significant at the 5% level.
*Significant at the 10% level.

(Afghanistan, Jordan, and Palestine) are also shown to be associated with a greater amount of these assets, while Lebanon, associated with a lower rate of holding, is also shown to hold less. The tobit results show a similar story for Asian immigrants - higher rates of participation relative to Americans (Hong Kong, Malaysia) are associated with more holdings of stocks and mutual funds, and vice versa (Philippines). Additionally, the tobit analysis shows that

stocks and mutual funds compose 35.32 percent less of Japanese immigrant financial asset portfolios compared to natives. Finally, the tobit results also support the trend of low holdings of stocks and mutual funds among Central and South American immigrants as well as those from Caribbean and African regions.

The results for fractions of U.S. Savings Bonds and other fixed income among financial assets, shown in columns 2 and 3, tell much the same story - a country of origin associated with higher or lower rates of ownership of these assets are associated with greater or lesser amount of these assets in their portfolios, respectively, when

Table 16. Effects of country of origin on asset allocation

	Fraction of Stocks and Mutual Funds	Fraction of U.S. Savings Bonds	Fraction of Other Fixed Income
Western Europe			
Germany	0.1873**	−0.2557***	
	(0.0951)	(0.0876)	
Italy	−0.1946*		−0.4346*
	(0.1096)		(0.2348)
Switzerland	0.2668***		
	(0.0337)		
Eastern Europe			
Czechoslovakia			0.3760***
			(0.0993)
Czech Republic	−0.3585***	0.2212***	
	(0.0813)	(0.0794)	
Greece			0.5696***
			(0.2934)
Hungary			0.9281***
			(0.1016)
Poland		−0.1636*	
		(0.0878)	
Romania	−0.7257***		
	(0.2085)		
Russia		−0.4405***	
		(0.1201)	
USSR (Former)	0.5320***	0.3086*	
	(0.1316)	(0.1820)	
Northern Europe			
Netherlands	0.2520*		
	(0.1334)		
Norway		−0.2019*	
		(0.1171)	
Middle East			
Afghanistan	0.8920***		
	(0.2140)		
Jordan	0.6674***		0.4865*
	(0.0850)		(0.2852)
Lebanon	−0.6866***		
	(0.1987)		
Palestine	0.1869***		
	(0.0398)		
Respondent Characteristic Controls	Yes		
Year Effect Controls	Yes		
Region Controls	Yes		
Mixed Nationality Control	Yes		
Observations	58,590	58,590	58,590
Pseudo-R^2	0.1496	0.0699	0.2655
Countries Represented	64	36	22

(*Continues*)

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Table 16. (Continued)

	Fraction of Stocks and Mutual Funds	Fraction of U.S. Savings Bonds	Fraction of Other Fixed Income
South Asia			
India		−0.2396***	
		(0.0713)	
East Asia			
Hong Kong	0.3597***		
	(0.1207)		
Japan	−0.3529**		
	(0.1706)		
Southeast Asia			
Vietnam		−0.3086**	
		(0.1363)	
Pacific Islands			
Malaysia	0.3144**		
	(0.1341)		
Philippines	−0.2182*		−0.4678*
	(0.1192)		(0.2480)
North America			
Canada		−0.1279*	
		(0.0697)	
South America			
Chile		0.3068*	
		(0.1553)	
Guyana	−0.4602*		
	(0.2648)		
Central America			
El Salvador	−0.5462*		
	(0.2846)		
Guatemala	−0.4844*		
	(0.2500)		
Mexico	−0.2041**	−0.1394**	
	(0.0825)	(0.0634)	
Nicaragua	−0.4319***		
	(0.1226)		
Caribbean			
Cuba	−0.3229***	−0.1587*	
	(0.1158)	(0.0909)	
Africa			
South Africa	−0.5435**		
	(0.2657)		
Respondent Characteristic Controls	Yes		
Year Effect Controls	Yes		
Region Controls	Yes		
Mixed Nationality Control	Yes		
Observations	58,590	58,590	58,590
Pseudo-R^2	0.1496	0.0699	0.2655
Countries Represented	64	36	22

Standard errors in parentheses.
***Significant at the 1% level.
**Significant at the 5% level.
*Significant at the 10% level.
Only significant results are reported here. Full results available upon request.

compared to natives. Germany, Poland, Russia, India, Vietnam, Canada, Mexico, and Cuba were found to have low rates of U.S. Savings Bond holdings in the probit analyses and can be observed to hold less of them, while the opposite is true for the USSR. For other fixed income holdings, the estimators for Czechoslovakia and Hungary, which were found to have high rates of holding, show that they are also likely to hold more.

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