What Can We Learn about Financial Access from U.S. Immigrants? The Role of Country of Origin Institutions and Immigrant Beliefs

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Immigrants from countries with more effective institutions are more likely than other immigrants to have a relationship with a bank and to use formal financial markets more extensively. The evidence that a country's institutional environment shapes beliefs—and by extension the use of financial services—provides support for policies that focus on institutional reforms in promoting financial access. After holding wealth, education, and other factors constant, the impact of institutional quality in the country of origin affects the financial market participation of all immigrant groups except those who have lived in the United States for more than 28 years. These findings are robust to alternative measures of institutional effectiveness, to controlling for additional country of origin characteristics, and to various methods for addressing potential biases caused by immigrant self-selection. JEL codes: O16, J61, G11

There is a growing interest in understanding what determines the availability and use of financial services in developing and developed countries. Even across developed countries, there is significant variation in the percentage of individuals and households that use financial services. In the United States, a significant subset of the population makes little use of even basic financial services: 10–25 percent of households have neither a savings nor a checking account,[1] and participation in retirement savings and stock markets is even lower (Osili and Paulson 2004). In Canada, Germany, and Sweden, the fraction

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1. The exact estimate depends on the dataset. The Survey of Consumer Finances provides estimates closer to 10 percent, while the 1996–2000 SIPP data analyzed here produces estimates closer to 25 percent.

THE WORLD BANK ECONOMIC REVIEW, VOL. 22, NO. 3, pp. 431–455 doi:10.1093/wber/lhn019
Advance Access Publication November 20, 2008

of people without a bank account is much lower than in the United States, closer to 3 percent (Claessens 2006). The sparse data that are available suggest that in some developing countries the norm is to be without a bank account. About 75 percent of households in Mexico lack an account, as do 90 percent of Kenyan households (Beck, Demirgüç-Kunt, and Peria 2007).

Recent survey evidence from the United States suggests that a significant fraction of households choose not to hold bank accounts because they "often are imbued with a cultural distrust of banks, and they may be concerned with privacy" (Gambrell 2003, p. 2). Survey evidence from several developing countries, including Colombia and Mexico, suggests that similar concerns play a role in low rates of formal financial market participation in developing countries as well. For example, Caskey, Duran, and Solo (2006) and Solo and Manroth (2006) report that although low rates of participation are influenced by high transaction costs, lack of assets, and geographical distance to banks, many households also have concerns about the security of holding financial assets in weak institutional environments. Because financial markets provide important tools for enhancing welfare—tools to transfer resources across time and across countries, make payments, mitigate risk, and fund investments—low rates of participation may be associated with lower welfare.

This article examines the determinants of financial market participation by immigrants in the United States. It examines the role of the environment in the country of origin and the impact of individual-level characteristics, such as wealth and education. The focus is on U.S. immigrants, in part because immigrants are a large and growing segment of the U.S. population whose rates of participation in formal financial markets are low relative to otherwise similar individuals born in the United States (Osili and Paulson 2004; Rhine and Green 2006).

Focusing on U.S. immigrants makes it possible to study the impact of placing an individual into a different formal institutional environment while holding experience with institutions fixed. One can think about the immigrant experience in the United States as an experiment in institutional reform. In the process of migrating from one country to another, individuals move from one formal institutional environment to another, but they may maintain beliefs about institutions acquired in their countries of origin. This process provides an opportunity to gain insights into the potential role of institutional reform as a tool for expanding financial access. Institutional reform may increase financial access both directly (through the expansion of banks) and indirectly (through beliefs about the trustworthiness of financial institutions).

North (1990) suggests that one can think of these beliefs as informal institutional constraints or individual beliefs that are socially transmitted over time as part of the culture of a society. He defines institutions as "formal constraints—rules that human beings devise" and "informal constraints—such as conventions and rules of behavior" (p. 4). Because all immigrants face the same set of formal rules in the United States, studying the behavior of

immigrants in the United States can isolate the impact of informal institutional constraints.[2] Understanding the role of informal institutional constraints helps to better understand the formation of beliefs and is crucial for assessing the likely effects of formal institutional change.

Studying immigration to the United States maintains some of the interesting diversity of a cross-country study while eliminating some confounding factors. To a first approximation, it controls for factors that affect the supply of financial services across countries. The immigrants whose behavior is studied face the same competitive environment, make decisions in the same regulatory environment, are subject to the same legal structure and infrastructure, and so on. The focus is on how the experience of country of origin characteristics manifests itself in preferences and beliefs and by extension the use of financial services.

The empirical strategy is similar to that of Fernández and Fogli (2005) and Fernández (2007), who show that country of ancestry fertility and female labor force characteristics influence the fertility and work behavior of U.S.–born children of immigrants.[3] Studying immigrants, rather than their children, creates some additional empirical challenges. Immigrants are not random representatives of their birth countries: most of them have chosen to come to the United States. The decision to emigrate may be influenced by unobservable individual characteristics that are correlated with the country of origin variables whose influence is being measured. Techniques employed in the authors' earlier work on stock market participation (Osili and Paulson 2008) are used to ensure that the findings are robust to this type of self-selection.

The most important innovation in this article is the focus on two fundamental aspects of financial market participation: breadth and depth. Financial breadth is equal to one if an individual has any relationship with a bank (a savings or a checking account). The measure of financial depth ranges from zero to three and captures the number of distinct functions of financial markets the individual uses: safe savings products (saving accounts or certificates of deposit); payment services (checking or money market accounts); or investment services (stock, individual retirement accounts, or Keogh accounts).[4] In contrast to stock market participation, these measures of financial market participation are likely to be important for a broader segment of the population and are potentially of greater relevance for policymakers. This article adds to the literature by showing that the institutional quality of the country of origin affects a broad range of financial market behavior, not just stock market participation.

2. This assumption is relaxed in the empirical work by including MSAs. The empirical strategy assumes that formal institutional constraints are the same for immigrants living in the same MSA.

3. Carroll, Rhee, and Rhee (1999) use a similar approach in their study of the cultural determinants of savings. Borjas (1987) looks at the impact of country of origin characteristics on immigrant wage assimilation.

4. Use of insurance products is not explicitly examined here. The financial depth measure is likely to capture the ability of an individual to use financial markets to smooth consumption.

It adds to the growing body of work that shows that culture and beliefs are important determinants of a variety of financial and nonfinancial behavior.

One important reason for being concerned with both the breadth and the depth of financial market participation is that better developed financial markets lead to improved conditions at the country level. According to an extensive body of literature that uses cross-country data, financial development accelerates growth, decreases poverty, and reduces inequality (see, for example, Rajan and Zingales 1998; Beck, Demirgüç-Kunt, and Levine 2004; Levine 2005).

This article is also related to a growing number of studies that show that the ability of a country's institutions to protect private property and provide incentives for investment can explain persistent disparities in financial development and economic performance across countries (see, for example, La Porta and others 1998; Levine 1998, 1999; Beck, Levine, and Loayza 2000; Açemoglu, Johnson, and Robinson 2001, 2002; Beck, Demirgüç-Kunt, and Levine 2003a, 2003b; Rajan and Zingales 2003; Rodrik, Subramanian, and Trebbi 2004).

Consistent with other studies of the determinants of financial behavior among immigrants (see, for example, Rhine and Green 2006), this article finds that wealthier and more educated immigrants are more likely to use basic banking services and have higher measures of financial depth. Hogarth, Anguelov, and Lee (2004) and Vermilyea and Wilcox (2002) find that these factors are important in explaining the financial behavior of nonimmigrants as well.

For a given level of wealth, education, and other factors, immigrants from countries with more effective institutions are more likely to have a relationship with a bank and use formal financial markets more extensively than immigrants from countries with less effective institutions. These results are robust to various ways of measuring institutional effectiveness, including other country of origin controls and a number of strategies for addressing potential bias caused by immigrant self-selection, including specifications with country fixed-effects.

Country of origin institutions affect the financial market participation of recent immigrants as well as those who have lived in the United States for up to 27 years. They influence the behavior of immigrants who arrive in the United States as children as well as those who immigrate as adults. The persistence of the effects suggests that the impact of country of origin conditions on beliefs may be more important than its impact on experience with financial institutions. One might expect the effect of limited experience with financial institutions to decay relatively quickly once immigrants arrive in the United States. In fact, institutional quality appears to persistently shape preferences and beliefs in a way that influences both the breadth and the depth of financial access.

The rest of the article is organized as follows. Section I describes the data. Section II presents the empirical findings. Section III provides some concluding comments.

I. The Data

Country data from various sources are combined with individual-level data from the U.S. Census Bureau's 1996–2000 Survey of Income and Program Participation (SIPP) to create the key variables of interest. Both types of data are described in this section.

Country Data

The country data include various measures of institutional quality and other important country characteristics (table 1). The measure of institutional quality is "protection from expropriation." This variable, which comes from the International Country Risk Guide (ICRG) IRIS-3 data, evaluates the risk of "outright confiscation and forced nationalization" of property. Ratings range from 1 to 10, with lower ratings given to countries in which expropriation of private foreign investment is a "likely" event. Country observations from 1982 to 1995 are averaged to form the protection from expropriation variable used in the empirical work.[5] Other important country of origin variables include geography, GDP per capita, measures of infrastructure availability, an indicator of whether immigrants are likely to speak English, and specific characteristics of the banking and financial sector in the country of origin, including the number of bank branches per 100,000 people and remittance flows. (For summary statistics for each of the country variables, see tables S.1.A and S.1.B in the supplemental appendix, available at http://wber.oxfordjournals.org/.)

Individual-Level Data

Historically high rates of immigration to the United States over the past two decades have raised the proportion of the U.S. population born abroad to at least 10 percent (Lollock 2001). The SIPP data, which include some 46,000 people, 11 percent of whom are immigrants, are designed to be representative of the U.S. population. Immigrants have experienced a wide range of country of origin environments before coming to the United States.

The sample is restricted to immigrants over 18 who live in a metropolitan statistical area (MSA). It includes 15,043 observations, with about 4 annual observations per person.[6]

5. Institutional quality measures are assigned to individuals born in the former Czechoslovakia, Soviet Union, or Yugoslavia in the following way: individuals who reported that they were born in Czechoslovakia, the Czech Republic, or the Slovak Republic are assigned the institutional quality measure for Czechoslovakia; individuals who reported that they were born in the Soviet Union, Armenia, Azerbaijan, Belarus, the Baltic States, Estonia, Georgia, Kazakhstan, the Kyrgyz Republic, Latvia, Lithuania, Moldova, the Russian Federation, Tajikistan, Turkmenistan, Ukraine, or Uzbekistan are assigned the institutional quality measure for the Soviet Union; and individuals who reported that they were born in Yugoslavia, Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, Slovenia, or Serbia are assigned the institutional quality measure for Yugoslavia.

6. Attention is restricted to the four annual survey waves for which wealth data are available. Other SIPP data are collected quarterly.

TABLE 1. Definitions and Sources of Country-Level Variables

Variable	Definition	Source
Protection from expropriation of private investment	Risk of outright confiscation and forced nationalization of property. Lower ratings are given to countries in which expropriation of private foreign investment is likely. Variable is average of annual country observations 1982–95	International Country Risk Guide (2008)
Average per capita GDP	Average real per capita GDP 1982–1995, in 1995 dollars	World Bank, World Development Indictors Database (1982–95)
English speaking	Equal to one if English is one of country's official languages and at least half of immigrants from the country surveyed in the 1980 U.S. Census report not speaking a language other than English at home	Bleakley and Chin (2004)
Remittances per capita as a percent of GDP	Total worker remittances received in a given country in a given year divided by the country's total population, divided by the country's GDP (in 1995 dollars) for a given year. Variable is average of annual country observations 1982–95	World Bank, World Development Indictors Database (1982–95)
Banking branch penetration	Number of bank branches per 100,000 people in the country, based on information from a regulatory survey	Beck, Demirgüç-Kunt, and Peria (2007)
Banking freedom	Average absence of government interference in banking system during 1995–99. Indicator is based on five questions: Does the government own banks? Can foreign banks open branches and subsidiaries? Does the government influence credit allocation? Are banks free to operate without government regulations such as deposit insurance? Are banks free to offer all types of financial services, including buying and selling real estate, securities, and insurance policies?	Beck, Demirgüc-Kunt, and Maksimovic (2004)
Internet use	Average number of Internet users (defined as people with access to the World Wide Web) per 1,000 people during 1982–95	World Bank, World Development Indictors Database (1982–95)

As a group, immigrants are younger than people born in the United States (table 2). They are more likely to have more children and to be married, nonwhite, and unemployed or economically inactive. Immigrants also tend to be less educated than the native born: slightly less than 36 percent of the

TABLE 2. Characteristics of Individuals Born in the United States and U.S. Immigrants

Characteristic	Native born	Immigrant
Age	46.47 (17.52)	45.22 (16.51)
Percent male	45.6	46.2
Percent married	57.4	65.6
Percent nonwhite	16.4	32.2
Percent unemployed or out of the labor force	33.8	36.7
Number of children under 18 in household	0.720 (1.090)	1.118 (1.347)
Average monthly per capita household income ($)	2,224 (2,832)	1,640 (2,375)
Median monthly per capita household income ($)	1,578	1,050
Average household wealth ($)	185,754 (1,398,146)	122,685 (978,910)
25th percentile of household wealth ($)	14,660	3,017
Median household wealth ($)	71,123	29,001
75th percentile of household wealth ($)	186,512	117,917
Educational attainment (percent)		
Less than high school	15.0	35.8
High school graduate	30.4	24.5
Some college	30.6	20.1
Bachelor's degree	15.9	12.5
Advanced degree	8.1	7.1
Financial market participation		
Financial breadth (percent with bank relationship)	76.3	61.0
Financial depth (mean number of types of financial relationships)	1.71 (1.02)	1.22 (1.01)
Financial depth (median number of types of financial relationships)	2.00	1.00
Percent who own stock	20.0	8.6
Percent with a checking account (interest or noninterest bearing)	63.8	47.0
Percent with a savings account	54.8	40.1
Other characteristics (percent)		
Self-employed	9.1	8.7
Drives own car to work	81.7	75.1
Visited doctor in past 12 months	78.8	79.3
Purchased prescription drugs for children in past 12 months	51.8	34.1
Sample size		
Number of individuals	31,046	5,020
Number of observations	100,839	15,043

Note: Numbers in parentheses are standard deviations. Except where otherwise noted, mean values are reported. The unit of observation is a person-wave. Sample is restricted to the four waves of the SIPP that provide wealth information and to individuals 18 and over living in MSAs for whom data on expropriation risk were available.

Source: Authors' analysis based on data from the U.S. Census Bureau's 1996–2000 SIPP.

immigrant sample never completed high school—more than twice the 15 percent of the native-born sample. However, the percentage of the adult population with advanced degrees is roughly similar among immigrants (7 percent) and the native born (8 percent).

Monthly per capita household income is significantly lower among immigrants than among the native born. In addition to having lower incomes, immigrant households also have far less accumulated wealth than households with U.S.–born heads. The median immigrant household has wealth of $29,001; the median for households headed by U.S.–born individuals is $71,123.

The indicators of financial access of interest here are financial breadth (as measured by checking or savings account ownership) and financial depth (the number of functions of financial markets—safe savings, payment services, investment services—an individual uses). The values for financial depth range from zero to three. Sixty-one percent of the immigrant sample and 76 percent of the native-born sample have a savings or a checking account (table 2). Forty-seven percent of immigrants and 64 percent of the native born have checking accounts. Savings account ownership has a similar pattern, with 41 percent of the immigrant sample and 55 percent of the native-born sample owning savings accounts. The median measure of financial depth is 1 for immigrants and 2 for the native born.

Nearly half of immigrants arrived in the United States within the 10 years before the start of the survey (table 3). Just under half were born in Latin America and the Caribbean, with about a quarter of the total sample coming from Mexico; about 18 percent were born in Europe or Canada. About 71 percent of immigrants were at least 21 years old at the time they immigrated.

II. Empirical Findings

Financial breadth (B_{isj}) and depth (D_{isj}) are estimated using the linear model

$$B_{isj} \text{ or } D_{isj} = \alpha + \beta_1 X_i + \beta_2 Z_j + \delta_s + \varepsilon_{isj}$$

where B_{isj} is the decision to have a bank account, and D_{isj} is the intensity of financial market participation, for individual i who lives in MSA s and comes from country j. Individual controls—including age, age-squared, wealth quartiles, income, labor force status, education, sex, marital status, number of children in the household, and race—are incorporated in X_i. These characteristics control directly for the demand for financial services and indirectly for the supply of financial services, to the extent that socioeconomic characteristics influence the location or advertising of financial services. A full set of MSA fixed effects is included in δ_s; Z_j measures the characteristics of country j,

TABLE 3. Characteristics of Immigrants to the United States

Characteristic	Percent of all immigrants
Year of arrival in the United States	
Before 1964	11.5
1965– 69	8.2
1970–74	10.1
1975–79	12.8
1980–84	17.9
1985–89	18.4
1990–96	21.2
Age at migration	
5 or younger	3.7
6–10	4.6
11–15	6.8
16–20	14.3
Over 20	70.6
Region of origin	
Latin America and Caribbean	44.3
Asia	30.3
Europe and Canada	18.0
South America	6.3
Africa	0.9
Australia and Oceania	0.2

Note: Mean values are reported. The unit of observation is a person-wave. Sample is restricted to the four waves of the SIPP that provide wealth information and to individuals 18 and older living in MSAs for whom data on expropriation risk were available.

Source: Authors' analysis based on data from the U.S. Census Bureau's 1996–2000 SIPP.

including institutional quality. The MSA controls hold variation in the supply of financial services constant at the MSA level.[7]

If individuals from countries with more effective institutions will be more likely to participate in financial markets, then this will manifest itself in an estimate of β_2 that is significant and positive. It is possible that individual characteristics, such as wealth and education, are influenced by the country of origin environment as well, so the total effect of country of origin institutions may be larger than what is captured by β_2. Including individual characteristics allows the direct effect of country of origin institutions on behavior to be isolated.[8] All of the reported standard errors are adjusted to allow for correlation across

7. One concern is that the supply of banks may vary at the neighborhood level. The estimates rely on the MSA geographical identifiers available in the public use SIPP samples. It is likely that several of the individual characteristics, such as education, income, and wealth, are also correlated with the supply of banks and other neighborhood-level characteristics.

8. Doing so addresses an important concern with some earlier cross-country studies that focused on the impact of institutions on financial development. The identification strategy used by Açemoglu, Johnson, and Robinson (2001), for example, stresses the link between institutional development and settler mortality during the colonial period, but it leaves open the possibility that the human capital of colonial settlers played a role in future economic development.

observations for immigrants that come from the same country. When the dependent variable is B_{isj} (equal to one if the immigrant has a savings or a checking account and zero otherwise), a correction is made for the heteroskedasticity that is implicit in a linear probability model.[9]

Baseline Findings

The relation between financial market participation and institutional quality is explored using a sample that is restricted to immigrants who are at least 18 years old, live in an MSA, and come from one of the 78 countries for which institutional quality data are available.[10] The results indicate that institutional quality has a positive and significant effect on having a bank account (table 4, column 1). If an individual from a country with average institutions, as captured by the protection from expropriation measure, had instead come from a country that had institutions that were one standard deviation above the mean, the likelihood that he or she would have a savings or a checking account would increase by 4.7 percentage points—a 7.7 percent increase in the likelihood of having a bank account relative to the observed likelihood for immigrants of 61 percent. The same change is associated with a 10 percent increase in financial depth (table 5, column 1). This is roughly equivalent to considering what would happen if Argentina's protection from expropriation measure had been the same as Germany's between 1982 and 1995.

These baseline findings suggest that immigrants come to the United States with beliefs shaped by the effectiveness of their home-country institutions. The ability of home-country institutions to protect investment and provide incentives for investment has a significant effect on immigrant behavior in the United States over and above the impact of individual characteristics such as wealth, income, and education. These results were replicated using other measures of institutional quality, with largely the same conclusions.[11]

Additional Country Controls

How robust are these findings? Important country of origin characteristics that may be correlated with institutional quality may have been omitted from the baseline results. The impact of adding additional country characteristics is shown in columns 2–7 of tables 4 and 5.[12]

9. A linear probability model is used because it is computationally attractive given the large number of fixed effects, because it is consistent under weak assumptions, and because the coefficient estimates are easy to interpret. In particular, the coefficients on interaction terms are straightforward to interpret (see Ai and Norton 2003). Nonlinear estimation methods, such as probit or logit, generate similar results.

10. See table S.2 in the supplemental appendix for the impact of age, age-squared, wealth quartiles, education, and other explanatory variables on financial market participation.

11. See tables S.3A and S.3B in the supplemental appendix for these estimates.

12. The issue of omitted country characteristics is also addressed in specifications that include country fixed effects (see table 6).

TABLE 4. Effect of Institutional Quality on Probability of Having a Bank Relationship

Explanatory variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Protection from expropriation	0.027***	0.017***	0.020***	0.019**	0.017**	0.040***	0.038***
	(0.005)	(0.004)	(0.008)	(0.008)	(0.008)	(0.012)	(0.012)
Average per capita GDP* 1,000,000			2.490**	2.470**	1.560	−5.330	10.0**
			(1.180)	(1.150)	(1.12)	(3.24)	(4.43)
English speaking				0.024	0.010	−0.073	−0.065
				(0.018)	(0.015)	(0.049)	(0.47)
Remittances per capita					−0.335	−0.899**	−0.963***
					(0.205)	(0.412)	(0.0358)
Banking branch penetration						0.001	0.001
						(0.001)	(0.001)
Bank freedom						0.065	0.062***
						(0.018)	(0.018)
Internet use							0.014**
							(0.006)
Continent controls	No	Yes	No	No	No	No	No
Adjusted *R*-squared	0.2666	0.2715	0.2687	0.2688	0.2685	0.2846	0.2853
Number of observations	14,232	14,232	13,336	13,336	11,782	9,116	9,116

***Significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Note: Numbers in parentheses are standard errors. All regressions include controls for age, age-squared, wealth quartiles, labor force status, income, marital status, sex, ethnicity, education, number of children, and MSA. The number of observations differs depending on the number of countries for which a particular country characteristic is available. A linear model is used and standard errors are corrected for heteroskedasticity and clustering at the country level.

Source: Authors' analysis based on data from the U.S. Census Bureau's 1996–2000 SIPP and sources cited in table 1.

TABLE 5. Effect of Institutional Quality on Depth of Financial Market Participation

Explanatory variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Protection from expropriation	0.073***	0.046***	0.046***	0.041**	0.041**	0.074***	0.068***
	(0.013)	(0.014)	(0.018)	(0.019)	(0.018)	(0.020)	(0.020)
Average per capita GDP* 1,000,000			9.100***	9.030***	5.750**	−3.13	−15.8**
			(3.010)	(3.010)	(2.780)	(7.61)	(7.35)
English speaking				0.077	0.079	−0.223**	−0.204
				(0.052)	(0.067)	(0.106)	(0.100)
Remittances per capita					−0.621	−1.504**	−1.679**
					(0.372)	(0.725)	(0.612)
Bank branch penetration						0.001	0.002
						(0.002)	(0.002)
Bank freedom						0.093**	0.084**
						(0.040)	(0.039)
Internet use							0.039***
							(0.007)
Continent controls	No	Yes	No	No	No	No	No
Adjusted *R*-squared	0.3999	0.4044	0.4072	0.4076	0.3943	0.4075	0.4089
Number of observations	14,232	14,232	13,336	13,336	11,782	9,116	9,116

***Significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Note: Numbers in parentheses are standard errors. All regressions include controls for age, age-squared, wealth quartiles, labor force status, income, marital status, sex, ethnicity, education, number of children, and MSA. The number of observations differs depending on the number of countries for which a particular country characteristic is available. A linear model is used. Standard errors are corrected for heteroskedasticity and clustering at the country level.

Source: Authors' analysis based on data from the U.S. Census Bureau's 1996–2000 SIPP and sources cited in table 1.

Column 2 reports estimates that include continent controls in addition to protection from expropriation.[13] The size of the coefficient on protection from expropriation declines modestly, but otherwise the results are unchanged. This rules out the possibility that the results were driven by discrimination against individuals based on their continent of origin or that countries on the same continent tend to share institutional qualities.[14] Columns 3 and 4 add controls for average GDP per capita and whether the origin country is English speaking. Adding these controls does not change the strong positive correlation between coming from a country with strong institutions and participating more extensively in U.S. financial markets.

The effect of controlling for remittances to the home country is shown in column 5. If immigrants are not investing in U.S. financial markets, they may be investing at home through remittances. Including a measure of remittances received in the home country does not alter the effect of institutional quality. Immigrants from countries that receive higher per capita remittances are less likely to participate in U.S. financial markets, but the size and the significance of the remittance variable depends on the other covariates. (Ideally, one would measure the importance of remittances from the perspective of the immigrant who sends them; measures of individual remittances are not available.)

An important issue is whether the availability of home-country financial markets influences the likelihood of financial market participation among immigrants in the United States. Immigrants who come from countries in which financial markets are more developed may have more experience with banks before coming to the United States. Two explanatory variables—bank penetration and bank freedom—are added in column 6 to address this question. Bank penetration measures the number of bank branches per 100,000 residents in the country of origin.[15] Bank freedom measures the absence of government interference in the banking sector and is likely to be higher in countries where entry is less costly (see table 1 for definition). The freedom of the banking sector in the country of origin has a positive and significant effect on financial market participation in the United States. Bank penetration has no significant effect on financial market participation.

The remittance variable becomes statistically significant when these variables are included: as expected, immigrants from countries in which per capita remittances are higher are less likely to participate in U.S. financial markets. This result is consistent with work by Aggarwal, Demirgüç-Kunt, and Peria (2006), who find that remittances promote financial development in the receiving country.

13. The six continent groupings are Latin America and the Caribbean, Europe and Canada, Asia, Africa, South America, Australia, and Oceania.

14. Because the estimates include a control for being nonwhite, the continent controls capture differential treatment based on continent of origin, holding racial characteristics fixed.

15. Beck, Demirgüç-Kunt, and Maksimovic (2004) find that firms' access to finance is more restricted by banking industry concentration in countries in which bank freedom is lower.

The impact of home country institutions remains important even after the banking sector variables are added. The coefficient on institutional quality in the regression in which having a bank account is the dependent variable is highly significant and equal to 0.040. The availability and freedom of the banking sector is likely to be influenced, perhaps strongly, by the quality of country of origin institutions. These results were replicated using a measure of banking concentration (the percentage of banking assets held by the three largest banks), with similar results.

In column 7, a proxy for infrastructure conditions in the country of origin is added. The measure used is the number of Internet users (defined as people with access to the World Wide Web) per 1,000 people. (The specific measure does not seem to be important, as similar results are obtained for telephone use or the percentage of paved roads.) In countries in which infrastructure is weak, individuals may have little direct experience with banks and other financial institutions, because it may be costly to get to and communicate with them. These conditions appear to spill over to behavior in the United States. Immigrants from countries with more extensive infrastructure are more likely to participate in U.S. financial markets, whether financial breadth or financial depth is used as the dependent variable. The coefficient on institutional quality remains positive and strongly significant in these regressions.

Overall, the results presented in tables 4 and 5 suggest that the finding that financial market participation in the United States is influenced by the quality of institutions in the country of origin is robust to including additional attributes of the country of origin. This can be interpreted as evidence that immigrants from countries with weak institutions believe that institutions in the United States are also weak. Although other explanations are possible, many of them are less consistent with the empirical findings. For example, low rates of financial market participation among immigrants from countries with weak institutions might reflect their lack of direct experience and information about financial markets rather than a belief that institutions cannot be trusted. This seems unlikely to be the dominant explanation, however, given the positive coefficient on institutional quality in estimates that include controls for bank penetration and other characteristics of the banking and financial sector in the country of origin.

Immigrant Self-Selection

Immigrants are not random representatives of their country of origin. They choose to migrate, and that decision may be influenced by characteristics that are not observable. If unobserved individual characteristics that influence the decision to migrate and the decision to participate in financial markets are correlated with institutional quality in the country of origin, the coefficient that measures the impact of institutional quality will be biased.

Borjas (1987) describes one channel through which immigrant self-selection could bias the results. In his model, the decision to migrate is a function,

among other things, of unobserved migrant ability and the distribution of income in the country of origin and the destination country. Because high-ability migrants are concerned only with the right tail of the income distribution, they tend to migrate from more equal societies to less equal ones. In contrast, low-ability migrants will move from less equal societies to more equal ones, to protect themselves against a draw from the low end of the wage distribution. Assuming that unobserved ability affects financial behavior as well as labor market outcomes, this type of selection could bias the results presented here.

Because countries with low inequality also tend to have strong institutions, the finding that financial market participation increases with institutional quality in the country of origin could be driven by ability bias. For example, immigrants from Sweden, a country with low inequality relative to the United States and high-quality institutions, are likely to be of high ability. In contrast, immigrants from Brazil, a country with high inequality and less effective institutions, will tend to have lower unobserved ability.

Other unobserved individual characteristics that may influence the decision to participate in financial markets and may also be correlated with institutional quality in the country of origin. For example, immigrants from countries with weak institutions may come from parts of the country that have fewer financial institutions. In contrast, immigrants from countries with strong institutions may come from parts of the country in which financial markets are very deep. These potential factors cannot be addressed directly, because neither individual data on the region within a country an immigrant comes from nor data on experience with financial institutions are available. To produce unbiased estimates of the effect of institutional quality in the country of origin on financial market participation in the United States, one would like to eliminate the possibility that omitted individual characteristics (such as risk aversion or prior exposure to formal financial institutions) are correlated with institutional quality in the country of origin. Unobserved individual heterogeneity need not be completely eliminated to produce unbiased estimates of the effect of institutional quality. Because the variable of interest, institutional quality, varies only at the country level, the goal is to eliminate sources of unobserved heterogeneity that are correlated with country of origin characteristics.

Ideally, one would simply include country of origin fixed effects in the baseline specification to ensure that the error term in the regression was orthogonal to all country of origin characteristics. This approach is not feasible, because the key variable of interest, institutional quality, does not vary at the country level.

A new measure of institutional quality that varies by country of origin was therefore created. This measure draws on the literature that shows that a wide range of immigrant behavior is influenced by the size of the immigrant network. Network effects have been shown to be important for employment (Munshi 2003), wage growth and human capital accumulation (Borjas 1995,

2000), and language proficiency (Chiswick and Miller 1996). Fernández and Fogli (2005) show that the impact of country of ancestry norms on fertility and women's labor force participation is amplified for the children of immigrants who reside in neighborhoods with other people from the same country of ancestry.

Following this literature, the new measure of institutional quality captures both institutional quality and the potential size of an immigrant network. The alternative measure of institutional quality varies by country of origin, which allows country of origin fixed effects to be included in the estimation and any correlation between unobserved individual attributes and country of origin to be eliminated.

Ethnic concentration is used to measure the potential size of the immigrant network for migrants from a particular country who live in a particular MSA. It is defined as the percentage of people in an MSA who come from the same country as the immigrant in question:

$$EC_{sj} = \frac{\text{Number of immigrants from country } j \text{ living in MSA} s}{\text{Total population in MSA} s}$$

Data from the U.S. Census Bureau's 1990 Integrated Public Use Microdata Series (IPUMS) (Ruggles and others 2008) were used to create this measure for each country of origin and MSA pair.

There is significant variation in ethnic concentration across MSAs for immigrants from a particular country. Mexican immigrants, for example, make up 4.2 percent of the population in Chicago but just 0.5 percent of the population of Milwaukee. The potential size of the immigrant network also varies by country of origin.[16] The median Cuban immigrant, for example, lives in an area in which 17 percent of the population is from Cuba; the median Mexican immigrant lives in an area in which 9 percent of the population is from Mexico. By contrast, immigrants from Vietnam and India are much less likely to cluster: Vietnamese immigrants account for only 0.7 percent of their typical neighborhood in the United States, and Indian immigrants account for just 0.3 percent. In addition to variation by country, there is also variation in the size of the potential immigrant network across MSAs for immigrants from a particular country.

The new measure of institutional quality, $Z_j x EC_{sj}$, is equal to the interaction of institutional quality and ethnic concentration for an individual from country j who lives in MSA s. The following model is estimated:

$$B_{isj} \text{ or } F_{isj} = \alpha + \beta_1 X_i + \beta_2 Z_j x EC_{sj} + \beta_3 EC_{sj} + \delta_s + \delta_j + \varepsilon_{isj}.$$

16. For information on the median ethnic concentration for immigrants from each country, see table S.4 in the supplemental appendix.

TABLE 6. Institutional Quality and Ethnic Concentration

Explanatory variable	Probability of having a bank relationship	Depth of financial market participation
Protection from expropriation*	0.827*	2.422**
ethnic concentration	(0.487)	(1.075)
Ethnic concentration	−5.734*	−18.090**
	(3.581)	(7.995)
Country controls	Yes	Yes
Adjusted *R*-squared	0.2754	0.4104
Number of observations	13,867	13,867

***Significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Note: Numbers in parentheses are standard errors. All regressions include controls for age, age-squared, wealth quartiles, labor force status, income, marital status, sex, ethnicity, education, number of children, and MSA. A linear model is used. Standard errors are corrected for heteroskedasticity and clustering at the individual level.

Source: Authors' analysis based on data from the U.S. Census Bureau's 1996–2000 SIPP and sources cited in table 1.

A full set of country of origin controls is included in δ_j. All of the other variables are defined above. One would expect β_2 to be positive and the effect of high-quality institutions to be magnified for immigrants who live in MSAs with large percentages of other immigrants from the same country, who have experienced the same institutions. The ethnic concentration variable on its own, EC_{sj}, helps control for the availability of informal investments that might substitute for formal financial services. This implies that the sign of β_3 will be negative and that individuals who reside in MSAs with a large fraction of immigrants from the same country of origin will be less likely to participate in formal financial markets.

Including MSA fixed effects in all of the estimates rules out another potential source of bias in the new institutional quality measure.[17] As location choice is nonrandom, immigrants who choose to live in an MSA with a large fraction of immigrants from the same country of origin may be systematically different along unobservable dimensions from immigrants who choose to live in an MSA with very few immigrants from their country of origin. Including MSA fixed effects ensures that the coefficient on protection from expropriation interacted with ethnic concentration will not be biased by these unobservable characteristics.

The estimates using the new institutional quality measure and country of origin fixed effects show that the coefficient on institutional quality interacted with ethnic concentration is positive and significant for both breadth and depth (table 6).

17. Because EC_{sj} varies by country of origin for a given MSA, both country and MSA fixed effects can be included in the regressions.

For the median immigrant who lives in an MSA in which 0.78 percent of the population comes from the same country, the likelihood of having a bank account would increase 1.1 percentage points and the individual would use 0.03 more financial market functions if institutional quality were one standard deviation higher from 1982 to 1995. In the baseline estimates without country of origin fixed effects, the same change in institutional quality was estimated to be 4.7 percentage points for financial breadth. This suggests that immigrant self-selection that is correlated with institutional quality is substantial and may account for nearly three-quarters of the size of the estimated effect in the baseline specification.

These findings also indicate that the impact of coming from a country with weak institutions is reinforced when individuals from countries with weak institutions live near one another. For example, ethnic concentration is roughly twice the median for Filipino immigrants and about half the median for Portuguese immigrants. A one standard deviation improvement in institutions in the Philippines is predicted to raise the probability that Filipinos have a bank account by 2.6 percentage points and to increase financial depth by 0.08. Among Portuguese immigrants, the same improvement in institutional quality would increase bank account ownership by 0.52 percentage points and financial depth by 0.02. The finding that the effect of institutional quality varies with the size of the potential immigrant network is consistent with work by Madrian and Shea (2000); Duflo and Saez (2002); and Hong, Kubik, and Stein (2004), who show that social interactions have important effects on financial decisions.

In addition to addressing an important econometric issue, the estimates that include institutional quality interacted with ethnic concentration may shed light on a substantive issue. North (1993) defines institutions as a trinity consisting of the formal rules of the game, informal institutional constraints, and the enforcement of formal and informal constraints. One potential role of neighborhoods with large populations of immigrants from a single country is the enforcement of country of origin norms and customs (see, for example, Kandori 1992). When immigrants live in a place in which country of origin institutional constraints are more likely to be enforced, these constraints should matter more.

Another possibility is that immigrants from countries with weak institutions who also lack experience with financial institutions seek out locations in the United States where their immigrant network is particularly large because they rely on the immigrant network for informal substitutes to formal finance. It is also possible that groups of immigrants from countries with weak institutions who are particularly suspicious of formal financial institutions decide to locate in areas in which their immigrant network is larger because the network offers informal substitutes for formal finance. These explanations of the findings are broadly consistent: all rely on the institutional environment in the country of origin shaping immigrant beliefs in a way that influences financial choices and potentially decisions about where to locate in the United States.

Persistence of Institutions

How persistent are the effects of country of origin institutions? The effect of institutional quality in the country of origin on financial market participation in the United States is examined for subsets of immigrants based on the number of years they have lived in the United States (table 7)

Columns 2–6 divide immigrants into five subsamples based on how long they have been living in the United States. Two estimates are produced for each subsample: one that includes controls for how old the immigrant was when he or she arrived in the United States and one that does not. The effects of informal institutional constraints are very persistent. The effect of protection from expropriation is positive and significant for every subsample except the subsample of immigrants who have been in the United States for more than 28 years.

The persistent impact of country of origin institutions suggests that lack of experience with financial institutions before migration is unlikely to be the major mechanism by which institutions influence individual behavior. If lack of experience with institutions because of restricted supply conditions in the country of origin were the primary mechanism through which institutions influenced individual behavior, the effect would be likely to decay relatively quickly with time spent in the United States. The long-lasting effect of country of origin institutions is akin to the finding that individuals who lived through the Great Depression have persistently higher savings rates (see Meredith and Schewe 1994).

Intergenerational Transmission of Informal Institutional Constraints

The robustness of the findings can also be examined by studying the mechanism through which institutions influence behavior and by determining whether institutional beliefs and attitudes are passed on across generations. The SIPP data provide information on region or country of ancestry for individuals born in the United States. These data can be used to determine the effect of institutional quality in the home country (or country of ancestry) on having a bank account and on financial depth (table 8).

The results indicate a positive and significant effect of institutional quality on financial market participation for immigrants but not for their descendants: among individuals born in the United States who trace their ancestry to one of the same countries, institutional quality in the country of ancestry has no effect on financial market participation. The influence of institutional environment in the country of origin thus does not appear to be passed on to future generations.

Additional Robustness Checks

The effect of institutions in the country of origin is present even in immigrants who were younger than 16 when they immigrated (that is, before many of

TABLE 7. Persistence of Effect of Institutional Quality in Home Country on Financial Market Participation, by Years in the United States

Item	Years in the United States					
	All	1–7	8–12	13–17	18–27	28+
Probability of bank relationship						
No age at arrival controls						
Protection from expropriation	0.027***	0.022**	0.029**	0.023***	0.027***	0.012
	(0.005)	(0.011)	(0.011)	(0.008)	(0.009)	(0.011)
Adjusted *R*-squared	0.2666	0.3653	0.3168	0.3033	0.2653	0.2369
Age at arrival controls						
Protection from expropriation	0.027***	0.022**	0.027**	0.022***	0.027***	0.010
	(0.005)	(0.011)	(0.011)	(0.008)	(0.009)	(0.011)
Adjusted R-squared	0.2673	0.3679	0.3191	0.3046	0.2656	0.2427
Depth of financial market participation						
No age at arrival controls						
Protection from expropriation	0.071***	0.052**	0.078***	0.081***	0.083***	0.050*
	(0.012)	(0.023)	(0.024)	(0.019)	(0.020)	(0.029)
Adjusted *R*-squared	0.3969	0.4293	0.4593	0.4369	0.4284	0.3967
Age at arrival controls						
Protection from expropriation	0.069***	0.052**	0.075***	0.081***	0.083***	0.039
	(0.012)	(0.022)	(0.023)	(0.020)	(0.020)	(0.028)
Adjusted *R*-squared	0.3978	0.4312	0.4630	0.4364	0.4283	0.4012
Number of observations	14,232	2,619	2,192	2,145	2,750	2,955

***Significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Note: Numbers in parentheses are standard errors. All regressions include controls for age, age-squared, wealth quartiles, labor force status, income, marital status, sex, ethnicity, education, number of children, and MSA. A linear model is used. Standard errors are corrected for heteroskedasticity and clustering at the country level.

Source: Authors' analysis based on data from the U.S. Census Bureau's 1996–2000 SIPP and sources cited in table 1.

TABLE 8. Intergenerational Transmission of Institutional Lessons: The Effect of Institutional Quality on Financial Market Participation, Selected Native Born and Immigrants

Measure	Selected native born	Immigrant
Probability of bank relationship		
Protection from expropriation	−0.0001	0.041***
	(0.012)	(0.010)
Adjusted *R*-squared	0.2226	0.2964
Depth of financial market participation		
Protection from expropriation	0.039	0.127***
	(0.038)	(0.029)
Adjusted *R*-squared	0.3666	0.4300
Number of observations	44,181	7,040

***Significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level.

Note: Numbers in parentheses are standard errors. All regressions include controls for age, age-squared, wealth quartiles, labor force status, income, marital status, sex, ethnicity, education, number of children, and MSA. A linear model is used. Standard errors are corrected for heteroskedasticity and clustering at the country level. Selected native born includes U.S.-born individuals who identified their ancestral country as Canada, Cuba, the Dominican Republic, France, Germany, Hungary, Ireland, Italy, Mexico, the Netherlands, Poland, Russian Federation, or the United Kingdom. The immigrant sample includes individuals born in the same countries.

Source: Authors' analysis based on data from the U.S. Census Bureau's 1996–2000 SIPP and sources cited in table 1.

them would have been likely to have had much direct experience with institutions other than school). This finding suggests that families and possibly the education system, not just direct experience, play important roles in shaping an individual's beliefs about the trustworthiness of institutions (see table S.5 in the supplemental appendix).

Institutional quality is particularly important in explaining financial behavior when the institutional confidence required for an investment is especially high. Institutions have a greater effect on owning stock than on having a savings account, for example. Institutions have no effect on nonfinancial behavior, such as driving a car to work or visiting a doctor. The finding that institutions matter when they would be expected to and do not matter when they would not be expected to suggests that institutional quality is not a proxy for some other country of origin characteristic—national attitudes regarding self-reliance or altruism, for example—that explains all sorts of behavior (see table S.6).

Institutional quality affects groups of immigrants differently (see table S.7). Although institutional quality has a significant effect on financial behavior for both immigrants with high levels of education and those with low levels, it has a larger effect on the behavior of immigrants with less schooling. Restricting the sample to naturalized U.S. citizens reveals that financial breadth and financial depth are significantly positively correlated with home-country institutional effectiveness. A quarter of the immigrants were born in Mexico; eliminating

Mexican immigrants from the sample shows that the results are not driven by this large number of immigrants who share the same institutional environment.

Interacting the institutional quality measure with wealth quartiles and income deciles reveals that institutional quality is strongly associated with greater financial market participation for all wealth quartiles and that the size of the effect is not statistically different across wealth quartiles. For income, the effect of institutional quality is positive and statistically significant for the bottom four quintiles. For households in the top 20 percent of the income distribution, institutional quality has no statistically significant effect on financial breadth or depth.

III. Conclusions

Immigrants from countries with institutions that more effectively protect private property and provide incentives for investment are more likely to have a bank account in the United States and to participate more extensively in U.S. financial markets than immigrants from countries with institutions that do so less effectively. These findings are robust to alternative measures of institutional effectiveness and to various methods of controlling for immigrant self-selection, including specifications with country fixed effects.

What do these findings reveal about the likely results of efforts to increase financial access in developing countries? First, institutional reform is a very important tool for expanding financial access. It is likely to increase financial access both directly (through the expansion of banks) and indirectly (through beliefs about the trustworthiness of financial institutions). Second, institutions matter even after controlling for wealth, income, and education. This suggests that limited use of financial services is not simply a problem of poverty (see Claessens 2006). While poverty reduction is likely to increase financial market participation, institutional reform has an important role to play as well.

One can think about the immigrant experience in the United States as an experiment in institutional reform. In some sense, this experiment corresponds to a best-case scenario for institutional reform: the change in the institutional environment is credible and multifaceted, affecting fiscal, monetary, and trade policy as well as the judicial and political system. In addition, through the decision to migrate, most of the people in the sample sought out institutional change and were motivated to succeed economically. Because mistrust of banks is deeply rooted in informal institutional constraints and slow to change, even in this environment institutions in the country of origin influence the behavior of immigrants in the United States for decades.

Funding

This work was supported by the Russell Sage Foundation.

Supplementary Material

Supplementary Material is available at *The World Bank Economic Review* online.

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