Financial Markets and Genetic Variation

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September 6, 2017

Abstract

We investigate the extent to which a country's degree of genetic variation contributes to the observed variation in financial market activity across countries. We postulate that genetic variation can affect financial markets through its impact on aggregate investment behavior, innovation in the financial sector, and productivity. Our country-level, cross-sectional analysis reveals a significant hump-shaped relation between a country's predicted genetic variation and the size of its financial markets. This result is consistent with the conjecture that at relatively intermediate degrees of genetic variation, the associated intermediate levels of trust and risk-taking within the country result in the largest investment flows into public financial markets. Our results are robust to different measures of financial market size, several regression specifications, and the inclusion of a broad range of controls such as legal origin, institutional characteristics, culture, natural endowment, and trade openness. Our main findings appear to be restricted specifically to equity markets (vs. debt markets) where there is relatively more uncertainty and, thus, trust and risk-taking are relatively more important. Additional analysis suggests that better overall country-level governance can moderate the role that genetic variation plays in shaping equity market size.

Keywords: financial markets, genetic variation, migratory movements, governance
JEL Classification Codes: G1, G2, G3, O1, O4, O5

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1 Introduction

It is well documented that there exists substantial heterogeneity in financial markets across countries (Beck et al., 2003; Rajan & Zingales, 2003). This has spurred considerable research attention aimed at identifying the possible factors that explain this cross-country variation in financial market development. The result is a growing body of literature identifying many contributing factors, which include: (i) economic development[1] (Rajan & Zingales, 2003; Ang & McKibbin, 2007), (ii) trade and/or capital openness (Rajan & Zingales, 2003; Chinn & Ito, 2006), (iii) legal system origin, typically classified as common law or civil law (La Porta et al., 1997; 1998; Beck et al., 2003), (iv) cultural factors (Stulz & Williamson, 2003; Guiso et al., 2006; Guiso et al., 2008; Kwok & Tadesse, 2006), (v) regulatory institutions (La Porta et al., 1997; 1998; Djankov et al., 2008), and (vi) natural endowments (Acemoglu et al., 2001; Beck et al., 2003). The aim of our paper is to explore the extent to which a more deep-rooted factor – the degree of genetic variation within a country – can possibly account for some of the observed variation in financial markets across countries.

Using cross-sectional data from some 150 countries, we empirically explore the relation between aggregate, country-level genetic variation and the size of a country's financial markets. For each country, we gather data for several established measures that are generally regarded as important in characterizing the overall size and functioning of financial markets, and have been used in prior research (Rajan & Zingales, 2003; Beck et al., 2003; and Stulz & Williamson, 2003; Djankov et al., 2008). As a proxy for the genetic variation of a country, we adopt a *predicted* measure that is based on migratory distance of the country from East Africa that accounts for the ethnic composition within each country (Ashraf & Galor, 2013). In our analysis, we consider

[1] This demand-side story for increased financial development is in line with Robinson's (1952) argument that "where enterprise leads, finance follows."

several different regression specifications, several different subsamples, and control for a host of other possible factors shown previously in the literature to impact financial markets. In doing so, our study contributes to our understanding of how genetic variation can play a role in shaping important financial outcomes.

More broadly, our study complements the recent extant literature in the burgeoning field of research that lies at the intersection of genetics and economics/finance (see Ebstein et al., 2010; Beauchamp et al., 2011; and Benjamin et al., 2012 for thorough discussions and reviews of this literature). Research in this area typically indicates that genetic variation can account for variation in individual preferences, economic/financial decision making, and outcomes.[2] Much of this prior literature has explored the effect of genetic variation on individual-level decision making and outcomes. We are aware of only a few papers that study the relation between the genetic makeup of a country and aggregate outcomes of a country. Namely, Spolaore and Wacziarg (2009; 2013) show there is a relation between genetic distance – a measure associated with the time elapsed since two populations' last common ancestors – and income differences across countries. Guiso et al. (2009) document a negative relation between genetic distance and trust. Ashraf and Galor (2013) document a robust hump-shaped, cross-sectional relation between a country's predicted measure of genetic variation and its level of productivity and economic development. Becker et al. (2016) document that differences in risk preferences across countries are increasing in the genetic distance between counties. Our paper investigates the role of genetic variation in shaping an important country level aggregate outcome – the size of its public financial markets.

We posit that a country's degree of genetic variation can impact its financial markets through

[2] For example, genetic variations have been shown to impact individuals': investment biases (Cronqvist & Siegel, 2014), portfolio allocation choices (Barnea at al., 2010; Cesarini et al., 2010), risk preferences (Cesarini et al., 2009; Zyphur et al., 2009; Kuhnen & Chiao, 2009; Dreber et al., 2009; Becker et al., 2016), decision biases (Cesarini et al., 2012), income (Taubman, 1976; Benjamin et al., 2012), cooperative tendencies and pro-social behaviors (Wallace et al., 2007; Israel et al., 2009), and trusting behavior (Cesarini et al., 2008; Tabellini, 2008; Guiso et al., 2009).

aggregate investment behavior, as well as innovation and productivity arising from the corresponding spectrum of traits within the population. Specifically, there are three, non-mutually exclusive, avenues through which genetic variation can impact financial market size. First, genetic variation can affect aggregate investment behavior. It has been shown that genetics can impact both trust (Cesarini, et al., 2008; Tabellini, 2008; Guiso et al., 2009; Ashraf & Galor, 2013) and cooperative tendencies (Wallace et al., 2007; Israel et al., 2009). In particular, Guiso et al. (2009), Ashraf and Galor (2013), and Cline and Williamson (2016) empirically document a negative, country-level relation between trust and genetic variation, using different measures of trust. Thus, we hypothesize that at low levels of genetic variation, trust will be very high and individuals will be more inclined to invest in informal private avenues instead of through organized financial markets; at the other extreme case of high levels of genetic variation, trust will be low and individuals will be less likely to invest altogether. However, at intermediate levels of genetic variation and, thus, moderate levels of trust, individuals will be more inclined to invest in more secure and organized financial markets.[3] Taken together, we expect to find that intermediate levels of genetic variation will be associated with the largest public financial markets. Second, genetic variation can affect the level of innovation in the financial sector; this avenue follows from the idea that there is a beneficial component of higher levels of genetic variation arising from complementarities associated with a wider spectrum of traits within a population, which allows for the development and implementation of new technologies and increasing levels of financial

[3] Becker et al. (2016) show that absolute difference in average risk attitudes between two countries is significantly increasing in the length of time since today's populations shared common ancestors, as proxied by genetic distance, predicted migratory distance, and linguistic distance. They further show that ancient migration patterns are not only reflected in cross-country differences in average risk aversion, but also in the dispersion of the risk preferences within a country. Specifically, at the country-level, they find that a negative relation between the standard deviation of measured risk attitudes of a representative sample of a country's population and migratory distance from East Africa, implying more genetic variation is associated with greater risk-taking.

innovation. Yet, there can be a disadvantageous component of higher levels of genetic variation resulting from coordination problems and mistrust, which can lower cooperation among the population and inhibit efficient production (Ashraf & Galor, 2013). Thus, genetic variation can affect financial innovation, which in turn can impact the size of financial markets via the supply of finance. Lastly, the third avenue is through the effect of genetic variation on economic growth via its effect on productivity (Ashraf & Galor, 2013) and the consequential demand for finance, which in turn can impact the size of financial markets. Taken together, we predict that intermediate levels of genetic variation will be associated with the largest public financial markets.

To investigate the relation between aggregate genetic variation and financial market size, we conduct a cross-sectional analysis for roughly 150 countries. As predicted, our baseline analysis yields a significant hump-shaped relation between a country's degree of genetic variation and the proxy measures for financial market size. This result is consistent with our prediction that genetic variation accounts for some of the variation in the size of the financial markets across countries. We find the relations between genetic variation and our proxies for the size of *equity* markets are robust after controlling for a myriad of other possible factors that have been previously shown to affect financial markets including: legal origin, institutional characteristics, natural endowment, and trade openness. Our results are also robust after controlling for cultural aspects within a country; this is particularly important because there is an emerging body of literature focused on identifying how differences in various cultural dimensions across countries can influence financial behavior and financial outcomes (e.g., firm performance, governance, risk attitudes, access to finance and investment decisions, capital structure, and financial market development).[4] There

[4] This literature is quite extensive and in lieu of a full literature review, we cite a selection of papers that we believe span this area: Chui et al. (2002), Licht et al., 2005; Guiso et al. (2006), Kwok and Tadesse (2006), Shao et al. (2010), Aggarwal and Goodell (2013), Frijns et al. (2013), Li et al. (2013), Holderness (2014), and Lievenbruck and Schmid (2014). This is by no means and exhaustive list, and we encourage interested readers to refer to these paper and the references therein for a more comprehensive review of this literature.

also exists ample research, generally referred to as "dual inheritance theory" or "gene-culture coevolution", pointing toward the important linkage and interaction between genetics and culture (Cavalli-Sforza & Feldman, 1981; Boyd & Richerson, 1985; Richerson & Boyd, 2005; Way & Lieberman, 2010; Laland et al., 2010; Spolaore & Wacziarg, 2013 for a review). We control for culture using several different proxy measures that have been shown to be influential, and we continue to document a robust relation between genetic variation and financial market size. This suggests that genetic variation can play a direct role in shaping financial markets, aside from the possible indirect channel operating through cultural differences.

However, the relations between genetic variation and our proxies for the size of *debt* markets are no longer significant after we include our full set of control variable. We conjecture that genetic variation plays a much weaker role in shaping the size of public debt markets vs. equity markets because of the relatively lower degree of risk and uncertainty in debt markets vs. equity markets. As such, there is a greater scope for genetic variation to impact equity markets, where there is more uncertainty, through its direct impact on trust and cooperative tendencies of investors (Guiso et al., 2008). Furthermore, risk-taking is relatively more salient when one invests in stocks vs. bonds; thus, there is more scope for genetic variation to shape the size of equality markets, via increased activity and flows into equity markets, through the impact of genetic variation on investors' risk-taking behavior (Becker et al., 2016). This result could also be explained by the fact that financial innovation may be more prevalent in areas of the financial sector related to equities markets vs. debt markets (Cardella et al., 2014). We conduct some additional subsample analysis and show that both trust and genetic variation are more strongly related to equity market size in countries with relatively lower quality governance; this finding suggests that better overall governance within a country can moderate the effect that genetic variation plays in shaping its public financial markets.

We view our study as contributing broadly to the area of research aimed at shedding light on the possible factors that have played a role in explaining the substantial variation in financial markets across countries. While much of the previous literature has focused primarily on the role of structural, institutional, cultural, or political factors, we take a complementary approach by investigating a more deep-rooted characteristic of a country – its degree of aggregate genetic variation. Our cross-sectional analysis reveals a robust, hump-shaped relation between a country's genetic variation and the size of its financial markets. Given the inextricable role that financial markets can play in economic growth and the welfare of a society, it is important to understand the possible factors that could have played a role in shaping the observed contemporary distribution of financial market development across countries (Beck et al., 2003); the insights gleaned from this study can contribute to this understanding.

2 Hypothesis Development

We proceed by motivating the main hypothesis of our study; namely, there is an overall hump-shaped relation between a country's genetic variation and the size and activity of its financial markets. We postulate that the relation between genetic variation and financial markets can manifest itself through three possible avenues, which need not be mutually exclusive: (i) by directly impacting the investment behavior of individuals and organizations within a country and the resulting flows into public financial markets, (ii) by impacting the level of financial innovation and the subsequent supply of finance, and (iii) by impacting the level of economic development in a country and the subsequent demand for finance.

Regarding the potential influence of genetic variation on financial market size through investment behavior, prior literature has shown that genetics play a role in shaping both trust (Cesarini et al., 2008; Tabellini, 2008; Guiso et al., 2009; Ashraf & Galor, 2013; Cline & Williamson, 2016) and risk-taking behavior (Cesarini et al., 2009; Zyphur et al., 2009; Kuhnen &

Chiao, 2009; Dreber et al., 2009; Becker et al., 2016). Specifically, at the country-level, trust has been previously shown to be negatively related to genetic variation (Guiso et al., 2009; Ashraf & Galor, 2013; Cline & Williamson, 2016).[5] In Appendix C, we report regression results that country-level trust is generally negatively related to the level of genetic variation among the countries that comprise our sample, which is consistent with the prior literature, and supports our claim that genetic variation can impact financial markets through the channel of differences in trust and the resulting investment flows into financial markets. At the same time, risk-taking has been shown to be positively related to genetic variation (Becker et al., 2016). Relatedly, cross-country migrations and the inflow of immigrants can increase cultural and ethnic diversity (Collier, 2013), which can decrease the trust among the population (as argued by Bove & Elia, 2016; Gerring et al., 2015 and documented by Alesina & La Ferrara, 2002), as well as reduce human capital and stability (Gören, 2014).

We postulate that at low levels of genetic variation, individuals may be more trusting and, hence, more inclined to invest in informal, unstructured private avenues since the perceived counter-party risk of investing privately would be lower. As a result, public financial market may be smaller in countries with low levels of genetic variation because the demand for such investment instruments is lower. At the other extreme, in countries with high levels of genetic variation where trust is low, individuals may be reluctant to invest in financial instruments because of too high of perceived risk (Guiso et al., 2008). Thus, high levels of genetic variation may have a decreasing impact on the size of financial market from reduced demand for such investment instruments. Whereas at intermediate level of genetic variation and intermediate level of trust and attitudes toward risk-taking within the country, individuals are sufficiently risky to seek investment options,

[5] We refer readers specifically to Table 3 in Guiso et al. (2009), Table 9 in Ashraf and Galor (2013), and Table 4 in Cline and Williamson (2016) for the empirical, country-level regression analysis of trust and genetic variation, all of which document a negative and significant coefficient of the measure of genetic variation on trust.

but prefer the additional security and reductions in risk from structured and regulated public financial markets. Aggregated over individuals within a country, this pattern of investment behavior would be predicted to generate a hump-shaped relation between a country's genetic variation and the size of its financial markets.

With regard to the potential direct effect of genetic variation on financial innovation, we take a broad view of financial innovation to represent any new technologies, advancements, and/or improvements in all possible functions of the financial sector, which include: new products, new services, new processes, and new organizational forms, each of which facilitate and/or improve the functioning of the financial sector (Frame & While, 2004).[6] Paralleling the arguments put forth by Ashraf and Galor (2013), increasing genetic variation will have a beneficial effect of widening the spectrum of traits across the population, which then increases the amount of financial innovation in a country via the complementarities of more specialized traits and higher concentrations of more innovative thinkers; in turn, this can increase the supply of financial products, services, processes, etc., and, consequently, increase the size of the financial markets. However, when there are high levels of genetic variation, there may be decreases in trust and cooperation among the population. Thus, the benefits of genetic variation on financial innovation can be (partially) offset by the disadvantageous effects resulting from mistrust, less cooperation, and lower production efficiency.[7] Overall, this interplay between the beneficial effects of genetic

[6] Both the prevalence and significance of financial innovation, especially during the 20th century, have been extensively recognized (Miller, 1986; Merton, 1992; Allen & Gale, 1994; Tufano, 2003; Frame & White, 2004; Lerner, 2006; Cardella et al., 2014). Moreover, Lerner (2006) points to the importance of financial innovation within the financial sector, as well industries outside the financial sector; similarly, Frame and White (2004) note the direct and indirect benefits of financial innovation. Hence, there is a profit incentive to innovate in the financial sector, which serves as distinct motivation for financial innovation.

[7] Bove and Elia (2016) present a similar argument regarding the impact of cultural diversity on productivity, positing that there is a beneficial component of increased cultural diversity within a country coming through increased technological innovation, new ideas, and a greater variety of goods and services; while, at the same time, there is detrimental component of increased cultural diversity coming through reduced coordination and divergence of policy preferences; Gerring et al. (2015) provide a detailed discussion and review of the possible negative effects associated with increased diversity in what they refer to generally as the "Diversity Debt Hypothesis".

variation and the possible disadvantageous effects of high levels of genetic variation is predicted to result in a hump-shaped relation between genetic variation and financial innovation.

The last avenue through which genetic variation of a country can play a role in shaping the size of its financial markets is indirectly through economic development and the subsequent demand for financial market growth. There exists substantial research highlighting the important link between economic development and financial markets. The idea is that as a country becomes more productive, the accompanying increased economic development increases the demand for more well-functioning financial markets/institutions, which then increases the size of financial markets. The demand-driven effect has been proposed conceptually (Robinson, 1952), documented empirically (Luintel & Khan, 1999; Rajan & Zingales, 2003; Ang & McKibbin, 2007), and even suggested anecdotally, e.g., ‘‘the US has also regained its primacy as the world's leading stock market…Underlying these gains is a powerful upsurge in productivity.” (Farrell et al., October, 1995). Ashraf and Galor (2013) empirically document a hump-shaped relation between a country's degree of genetic variation and its level of economic development. Combining the link between economic development and financial markets (based on increased demand for finance) with the findings of Ashraf and Galor suggests that the degree of genetic variation can influence financial market size through economic development and subsequent demand for finance.

To summarize, we posit that the genetic variation within a country can play a role in shaping the size of a country's financial markets through the following three channels:

[1] *Genetic variation can influence investment behavior through its effect on the propensity to trust and make risky decision, which, subsequently, impacts the size of public financial markets*

[2] *Genetic variation can influence the level and degree of innovation in the financial sector, which, subsequently, impacts the size of public financial markets.*

[3] *Genetic variation can influence the level of economic development within a country, which* *indirectly impacts the size of public financial markets through the demand for financing.*

Importantly, the potential influence of a country's degree of genetic variation on the size of its public financial markets is hump-shaped through each of these three postulated channels. Therefore, our main resulting prediction is that within our sample of countries, controlling for established factors that can influence financial markets, countries with intermediate levels of genetic variation will be associated with the largest public financial markets.

3 Data and Methodology

3.1 Methodology

To explore the empirical relation between genetic variation and financial market size, we employ a country-level, cross-sectional regression analysis. Specifically, we regress a proxy for financial market size on a measure of genetic variation:

$$FM_i = a_0 + a_1 \cdot gv_i + a_2 \cdot {gv_i}^2 + a_3 \cdot d_i + \boldsymbol{\beta X}_i + \varepsilon_i, \quad (1)$$

where FM_i is a proxy measure for the size of country i*'s* financial market, gv_i is the measure of country i*'s* degree of predicted genetic variation, ${gv_i}^2$ is the square of its genetic variation measure, and $\boldsymbol{X_i}$ is a vector of country-level control variables for country i. We include the ${gv_i}^2$ term to enable us to identify a non-linear relation between genetic variation and financial market size. To ensure that the relation between genetic variation and financial market size is not coming entirely through the indirect effect of economic development and the demand for finance, we include a measure of country i*'s* level of demand for financial development, d_i, which will be proxied for with per capita GDP.[8] If it is the case that there is a component of the relation between genetic variation and financial market size operating through financial innovation and investment

[8] We acknowledge here that the demand for finance, d_i, as proxied for by a measure of economic development, is likely to be endogenous to financial market size. That said, the motivation of our paper is not to identify a causal link between economic development and financial market size. Rather, the motivation for including d_i is to control for the demand for finance, at the country level, in the cross-sectional analysis, allowing us to show that the relation between genetic variation and financial market size that is not coming entirely through the demand channel.

behavior (and not entirely through economic development) and the effect is hump-shaped, then we would expect to find $a_1 > 0$ and $a_2 < 0$, both statistically significant.

3.2 Data

We first describe the measures we use to proxy for financial market size, as well as the main independent variables we use in the regression analysis, which include: our measure for a country's degree of genetic variation, our proxy for a country's level of demand for finance, as well as other control variables. In total, we collect the requisite data for a cross-section of roughly 150 countries. A list of the countries in our sample and a full description of the variables we use and their sources can be found in Appendix A and Appendix B, respectively.

Financial Market Size (FM)

Financial markets are multifaceted and quite complex, making it difficult, in practice, to precisely measure their size, activity, and functionality (Rajan & Zingales, 2003). To robustly capture the size of a country's financial markets, we consider six measures – three relating to equity markets and three relating to debt markets. The first equity market measure is stock market capitalization (*Market Cap*), which is the total market value of all listed shares; the second measure is total stocks traded (*Stocks Traded*), which is the total value of shares traded during a given year; the third measure is total listed companies (*Stocks Listed*), which is the total number of domestically listed companies on the country's stock exchanges. The first debt market measure is total private credit (*Private Credit*), which is the private credit by deposit money banks and other financial institutions; the second is domestic credit to the private sector (*Domestic Credit*), which is amount of financial resources provided to the private sector; the third is total liquid liabilities (*Liquid Liability*), which is the total broad money or M3.

To be consistent with the time period for when a country's degree of genetic variation is measured, which is for year 2000 CE, we collect data on all six financial market measures for each of the countries in our sample for each year from 1998 to 2002, i.e., a five-year window around the year in which a country's degree of genetic variations is measured.[9] We then take the average over these five years to generate a single value for each of the financial market measures. We acknowledge that none of the measures for financial market size are all-encompassing. However, by considering six different measures, and taking the average of each measure over a range of time, we hope to establish a more robust conclusion regarding the relation between a country's genetic variation and the size of its financial markets. Moreover, these six measures are generally regarded as standard financial markets size proxies in the existing literature (e.g., King & Levine, 1993; Wurgler, 2000; Rajan & Zingales, 2003; Beck et al., 2003; Stulz & Willianson, 2003; Djankov et al., 2008; Hsu et al., 2014).

In our regression analysis, we use the natural logarithm transformation of the six financial market measures in order to address the large degree of positive skewness. Using log transformed measures, in lieu of GDP scaled measures, offers a couple of advantages. First, by not scaling our financial market size measures by GDP, we ensure that any observed relation between genetic variation and financial market size is not coming solely through its effect on GDP (i.e., impacting only the denominator of the scaled measure). Second, to investigate the relation between genetic variation and financial markets coming through financial innovation and investment behavior, it will be necessary to control for economic development and the subsequent demand for finance, which we do by using a country's per capita GDP.[10] We average the yearly measure of per capita

[9] A key component in the predicted measure of country-level genetic variation is accounting for migration flows of the contemporary population since the post-1500 era, which is described in more detail below. This population migration data is compiled by Putterman and Weil (2010) in the *World Migration Matrix 1500-2000* for year 2000. As a result, the genetic variation measure for each country that we adopt from Ashraf and Galor (2013) is for year 2000, and the reason we center our analysis on year 2000. For robustness, we also considered a longer window from 1995-2005 for the six financial market proxies and the results are generally robust.

[10] GDP is similarly used by Rajan and Zingales (2003), and also corresponds with the proxy of contemporary economic development used in Ashraf and Galor (2013).

GDP across the five-year window from 1998 through 2002 and take the log transformation, and denote it as *Per Capita GDP*. In addition, as we show later in Table 3, our main results are generally robust if we scale the financial market variables by GDP, which is in line with prior studies (Rajan & Zingales, 2003).

Genetic Variation (gv)

In what follows, we provide a brief discussion of what is meant by genetic variation, how it is generally measured, and a sketch how Ashraf and Galor (2013) construct a measure of predicted genetic variation, which we adopt in our data analysis.

Population geneticists typically measure the degree of genetic variation across individuals within a given population using an index called expected heterozygosity. This index can be interpreted as the probability that two randomly selected individuals from the relevant population are genetically different from one another; the higher this index, the more genetically diverse the population.[11] The most reliable data for genetic variation consists of 53 ethnic groups, spanning a total of 21 countries, from the Human Genome Diversity Cell Line Panel, compiled by the Human Genome Diversity Project-Centre d'Etudes du Polymorphisme Humain (HGDP-CEPH) (Cann et al., 2002; Cavalli-Sforza, 2005). Anthropologists maintain that these 53 ethnic groups are not only native to their current locations, but have also been essentially isolated from genetic flows from

[11] To construct this index of expected heterozygosity, geneticists collect sample data on allelic frequencies within the given sample population, and construct a gene-specific measure of heterozygosity. Then, to construct an overall measure of expected heterozygosity, one simply averages this gene-specific heterozygosity measure over multiple genes for which there is data. More formally, suppose there is a single gene, denoted as *l*, with a total of *k* observed variants or alleles in the given sample population. Then, the expected heterozygosity for that gene, denoted as H_{exp}^{l}, is given by:

$$H_{exp}^{l} = 1 - \sum_{i=1}^{k} p_i^2$$

where p_i denotes the probability of the i^{th} allele. If there are *m* different genes, then the expected heterozygosity, denoted as H_{exp}, averaged over these *m* genes can be expressed as follows:

$$H_{exp} = 1 - \frac{1}{m}\sum_{l=1}^{m}\sum_{i=1}^{k_l} p_i^2$$

other ethnic groups. Based on the data from HGDP-CEPH, the actual observed genetic variation for these 53 ethnic groups has been documented. However, there are two primary limitations with using observed genetic variation: (i) the sample using observed genetic variation would be restricted to a much smaller subset of countries (only 21) than that for which we have data on economic and financial measures, and (ii) more importantly, there may be endogeneity between observed genetic variation and the various financial market size measures since genetic variation within a country may be determined, in part, by migration patterns, which could have been influenced by a country's level of economic and/or financial development (Ashraf & Galor, 2013).

The serial-founder effect postulates that as subgroups of the population migrated over the earth, they carried with them only a subset of the overall genetic variation of the parent colony; hence, the further the migratory distance (out of East Africa), the less genetically diverse this sub-group. Consistent with the serial-founder effect, Ramachandran et al. (2005) document that migratory distance from East Africa has a significant, negative, linear effect on observed genetic variation within the 53 ethnic groups in the HGDP-CEPH data [12] Building on the findings from Ramachandran et al. (2005), Ashraf and Galor (2013) construct a measure of *predicted* genetic variation of the contemporary population for each country in year 2000 – accounting for *within*-group and *between*-group genetic variation – that is based on the ethnic composition of that country as well as migratory distance from East Africa.[13] Importantly, this predicted measure alleviates

[12] Specifically, they find that the variation in migratory distance explains 78 percent of the variation in genetic distance across the 1,378 ethnic group pairs and 86 percent of the cross-group variation in within-group diversity.

[13] To summarize, Ashraf and Galor (2013) first identify the ethnic composition of each country based on the *World Migration Matrix, 1500-2000* created by Putterman and Weil (2010), which compiles for each country the fraction of the 2000 CE population that is descended from the population of every other country in 1500 CE. Given this data on the ancestral source countries of the contemporary population within the country, Ashraf and Galor calculate the predicted level of *within*-group genetic variation based on the migratory distance of the ancestral source country from Addis Ababa, Ethiopia using the predicted coefficient of the effect of migratory distance on observed genetic variation obtained by Ramachandran et al. (2005). For the *between*-group component of genetic variation, Ashraf and Galor use the coefficient obtained by Ramachandran et al. – who document a positive correlation between pairwise genetic distances across groups and the pairwise migratory distances from East Africa – to calculate the predicted level of *between*-group genetic variation across all pairs of ethnic groups within a country. An overall measure of genetic

some of the limitations in using actual observed genetic variation, and also minimizes endogeneity concerns based on the assumption that prehistoric migratory paths out of Africa had no direct effect on Common Era development. It is this *predicted* measure of genetic variation for each country, which we denoted as *Genetic Variation,* that we adopt in our analysis.

Other Possible Factors Affecting Financial Market Size

In the existing literature, several factors have been shown to influence a country's financial markets. These possible factors include: the type of legal origins (La Porta et al., 1998; Beck et al., 2003); the degree of trade and capital openness of a country (Rajan & Zingales, 2003); the country's natural and environmental endowments (Acemoglu et al., 2001; Beck et al., 2003); the quality of the country's regulatory institutions (La Porta et al., 1997; Djankov et al., 2008), and cultural factors (Stulz & Williamson, 2003; Cline & Williamson, 2016). Below, we briefly describe the variables that we use to control for the possible influence of these other factors on the financial markets of a country.

To control for the effect of legal origins, we use data from La Porta et al. (1998) on the type of legal origin for each country. In particular, in our regressions we construct the following dummy variables: *Legal Origin UK* (British Common law), *Legal Origin FR* (French Civil law), and *Legal Origin Other* (all other legal origins), which is the excluded category in the regression analysis.[14] To control for the degree to which a country is open to trade and capital flows, which can improve financial development, we follow Rajan and Zingales (2003) and use the sum of exports and

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variation is created that is essentially a weighted average of the *within*-group and *between*-group genetic variation components, given the ethnic composition of each country in 2000 CE (the year the migration data is available) and the corresponding fraction of the population that descended from each ancestral source country. We refer interested reader back to Ashraf and Galor (2013) for a more detailed discussion of genetic variation and an unabridged description of how they construct their measure of predicted genetic variation for each country.

[14] As argued by La Porta et al. (1999), the type of legal origin can influence financial development through the priority placed on protecting property rights, and the protection of private contracting rights. The two main types of legal origins are the British Common Law system, which evolved to protect private property rights, and the French Civil Law system, which was designed to reinforce the power of the State. As a result, British Common Law systems are regarded as being more conducive for financial development (Beck et al. 2003).

imports of goods divided by GDP (averaged over the five year period from 1998-2002), which is denoted as *Openness*. To control for possible different environmental endowment levels across countries, which have been shown to shape migration and economic growth (Acemoglu et al., 2001) and the level of financial development (Beck et al., 2003), we use the percentage of the population (in 1994) that was at risk of contracting falciparum malaria, which is originally constructed by Gallup and Sachs (2001) and denoted as *Malaria*.[15] Several papers have shown that better governance and regulatory institutions within a country can foster more financial development (e.g., La Porta et al. 1997; 1998; Djankov et al., 2008; Leuz et al., 2010). To control for the overall governance quality of a country, we use data from the World Governance Indicator (WGI) project (Kaufmann et al., 2011; 2013). The data contain six different indicators to measure different aspects of governance, with each being indexed from approximately -2.5 to 2.5 where higher values correspond to better governance. For the country-level measure of governance we use in the analysis, which we denote WGI, we first average each of the six indicators over years 1998, 2000, and 2002 and then average over all six averaged indicators to generate a unique overall composite measure of governance for each country.[16] Lastly, it has been shown that religious differences across countries (specifically, countries that are predominately Catholic) can play a role in shaping differences in financial development (Stulz & Williamson, 2003). To control for

[15] Beck et al. (2003) provide evidence for both the law and endowment theories. However, their results show that initial endowments explain more of the cross-country variation in financial intermediary and stock market development across countries. While Beck et al. proxy for a country's endowment with a measure of settler mortality rate in the early nineteenth century, because of data constraints, we opt to use the *Malaria* measure as an alternative proxy for a country's endowment. Specifically, in our specification with a full set of controls, our sample sizes for each of the six financial market measures are approximately reduced in half when using settler mortality compared to *Malaria*. We also note that the *Malaria* measure to proxy for endowment is used in Acemoglu et al. (2001) and Ashraf and Galor (2013), and is highly correlated with settler mortality r = .6744 ($p < .001$).

[16] The WGI is intended to capture the overall governance quality of a country and includes six indicators to measure: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. Over the time period of 1998-2002, the data was only measured bi-annually and not available in 1999 and 2001, which is why we averaged over 1998, 2000, and 2002. Our results are robust if we instead control for institutional quality using the anti-self-dealing index developed by Djankov et al. (2008) or the Social Infrastructure index developed by Hall and Jones (1999). However, we use the WGI measure because it is available for more counties and it captures a broader snapshot of the governance quality within a country.

the possible effect of religion, we include the percentages of a country's population that is Catholic, denoted as *P_Catholic.*[17] In our analysis we also control for country-level cultural characteristics; however, we postpone our discussion of these cultural measures and the corresponding related literature to Section 4.3.

3.3 Summary Statistics and Correlations

Table 1 reports summary statistics, broken down based on the corresponding financial market measure used in the analysis, of all variables used in our analysis.[18] From Table 1, we see that for each of the six financial market measures, the mean is substantially higher than the median, which indicates the presence of substantial positive skewness and outliers at the upper end of the distribution, and justifies our approach of taking log transformations of the financial market measures in our analyses. In terms of the measure of predicted genetic variation in our sample of countries, we see that the variable *Genetic Variation* ranges from 0.63 to 0.77, with a standard deviation of 0.028; the lowest genetic variation in our sample is Bolivia, while the highest genetic variation is Uganda. For comparison, the USA ranks 42nd with *Genetic Variation* = 0.72.

Table 2 reports the pairwise correlations among the six financial market measures. From Table 2, we can see that the correlations range from 0.734 to 0.997. That fact that they are all strongly positively correlated with each other ($p < .001$ for each pairwise correlation) suggests that each of the six measures is a reasonable proxy for financial market size. At the same time, the fact that most of the correlations are not very near to one suggests that there is some variation in the

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17 We note that the results from our main specifications are generally robust if we include the fraction of the population belonging to Protestant and Muslim. Furthermore, the results are generally robust if we include the ethnic fractionalization (Beck et al., 2003) of each country as a control. That said, consistent with the finding in Beck et al., these variables seem to have little residual effect on financial markets and are rarely significant in the regression results. Given our small sample size and the relatively extensive set of control variables we consider, we report our results without the inclusion of these additional controls. In addition, if we perform a stepwise iterative approach for selecting controls, neither Protestant, nor Muslim, nor ethnic fractionalization survives as selected control variables.

18 Table 1 also includes the summary statistics for the country-level measures of culture that are incorporated into our analysis in Section 4.3. A description and detailed discussion of these culture variable is provided in Section 4.3.

components of financial market size that each of these measures is capturing. Hence, a consideration of all six different measures in our upcoming analysis will provide a robust picture of the overall relation between genetic variation and financial markets across countries.

4 Results

This section reports the main results of our cross-sectional empirical investigation of the relation between genetic variation and the size of financial markets. The dependent variable in our analysis is one of the six financial market measures described in Section 3.2, and our main independent variable of interest is the measure of predicted genetic variation - *Genetic Variation.*[19]

4.1 Overall Relation Between Genetic Variation and Financial Markets

We hypothesize a hump-shaped relation between a country's degree of genetic variation and the size of its financial markets, with intermediate levels of genetic variation being associated with the largest financial markets. We first examine the overall relation of genetic variation and financial market size in our cross-section of countries. Table 3 Panel A reports the results from the unconditional cross-sectional regressions of each of the six financial market measures on *Genetic Variation* and its square, *Genetic Variation Sqr*. We also include population of the country as a control to ensure that any relation between *Genetic Variation* and financial market size is not coming merely through differences in the size of the country. From Table 3 Panel A, we see that the coefficient on *Genetic Variation* is positive and significant at the 5% level for all six measures of the financial market measures. In addition, the coefficient on *Genetic Variation Sqr* is negative and significant at the 5% level for all six measures. This establishes an overall hump-shaped relation between genetic variation and financial market size, with mid-range values of genetic

[19] In addition, we include continent dummy variables in every regression specifications to control for continent fixed effects and, hence, we will not continue to reiterate that continent dummies are included in each specification. In addition, because we are using generated genetic variation measures from an implicit first-stage regression, in our regressions, we bootstrap all standard errors with 500 replications.

variation being associated with the largest values of financial market size, and provides initial evidence consistent with our main hypothesis.[20]

Importantly, we show in Panel B of Table 3 that the overall humped shaped relation between genetic variation and financial market size documented in Panel A is generally robust if our six financial market measures are instead scaled by GDP. Namely, for five of the six measures, the coefficient on *Genetic Variation* is positive and significant at the 5% level and the coefficient on *Genetic Variation Sqr* is negative and significant at the 5% level. However, for the remainder of the analysis we will use non-GDP scaled measures of financial market size, and instead explicitly control for GDP on right hand side of the regressions as a way to proxy for economic development and the demand for finance (see also the relevant discussion in Section 3.2).

4.2 Relation Between Genetic Variation and Financial Market Size with Controls

We posit that genetic variation can play a role in shaping financial market size directly through its impact on investment behavior and flows into public financial markets and financial innovation, as well as indirectly through economic development and the demand for finance. To ensure that the hump-shaped relation between genetic variation and financial market size we documented in Section 4.1 is not being driven entirely by variation in economic development, we add a proxy for a country's overall level of economic development, *Per Capita GDP*, as a way of controlling for a country's demand for finance. In addition, we add in a full set of control variables (described in detail in Section 3.2). Table 4 displays the results of our cross-sectional regressions of our six financial markets measures on *Genetic Variation, Genetic Variation Sqr,* and *Per Capita GDP*.

An interesting pattern emerges from Table 4. In particular, when looking specifically at the

[20] Based on our coefficient estimates in Table 3 Panel A, it is possible to calculate the predicted level of genetic variation where the financial market measures are predicted to achieve their maximum. Indeed, looking across the six financial market measures, the maximum of the hump-shaped relation is at a value of Genetic Variation ranging from 0.702 to 0.709. Given that Genetic Variation ranges from 0.63 to 0.77 in our sample, this confirms that the maximum is interior in our sample countries.

three public equity market size measures – *Market Cap, Stocks Traded*, and *Stocks Listed* – the hump-shaped relation between the genetic variation proxy and these three measures persists after the inclusion of our control variables including *Per Capita GDP*. Namely, the coefficient on *Genetic Variation* is positive and significant for all three measures, while the coefficient on *Genetic Variation Sqr* is negative and significant for all three equity market size measures. However, when the dependent variables are the proxies measuring debt market size – *Private Credit*, *Domestic Credit*, and *Liquid Liability* – neither the coefficients on *Genetic Variation* nor the coefficients on *Genetic Variation Sqr* are significant at the 10% level.

The observed difference of the effect of genetic variation across the two different asset classes – equity markets and debt markets – seems puzzling at first. However, upon some reflection, this result could be explained by the fact that trust and cooperation presumably play a larger role when one invests in equity markets because there is greater uncertainty (Guiso et al., 2008), compared to investing in debt markets. Thus, there is greater scope for genetic variation to have played a larger role in shaping equities markets via its effect on trust and risk taking. We provide some empirical evidence supporting this claim in Section 4.4 below. This finding is also consistent with the notion that financial innovation in debt markets is slower, and much less, as compared to equity markets (Cardella et al., 2014).[21] Given that we hypothesize that an avenue through which genetic variation is related to financial market size is through financial innovation and the supply of finance, we would expect this relation to be stronger in equity markets, compared to debt markets, which is consistent with the results in Table 4.

In terms of the controls, as expected, the coefficient on *Per Capita GDP* is positive and highly

[21] Specifically, Cardella et al. (2014) discuss how technological innovation of the trading process has not been uniform across asset classes. In particular, equity, derivatives, and foreign exchange markets are more prone to trading innovation (e.g. computerization), while changes in the trading process due to computerization in the corporate bond market have been modest. Thus, financial innovation may be more prevalent in the in areas of the financial sector related to equities markets.

significant for all six financial market measures. For legal origin, both *Legal Origin FR* and *Legal Origin UK* are positive and significant. Importantly, the coefficient on *Legal Origin FR* is smaller than the coefficient on *Legal Origin UK*, indicating a positive effect of *Legal Origin UK* on the size of financial markets compared to *Legal Origin FR*, which is consistent with prior findings. The coefficient on *WGI* is positive in five of six specifications and significant in four of them; better overall governance is generally associated with bigger financial markets. The coefficient on *Openness* is negative and significant in all six specifications.[22] The coefficient on *Malaria* is negative in five of six specifications, although only significant in one, which is likely driven by the strong negative correlation between *Malaria* and *Per Capita GDP*. Lastly, the coefficient of *P_Catholic* is insignificant in all six specifications, which is consistent with the finding of Beck et al. (2003) who document a similar result when controlling for legal origin, as we do in Table 4.[23]

The results from Table 4 suggest that after controlling for the level of demand for financial development as proxied by *Per Capita GDP*, the hump-shaped relation between genetic variation

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[22] With regards to *Openness*, the negative and significant coefficient is surprising given the positive and significant coefficient on *Openness* reported in Rajan and Zingales (2003). Stulz and Williamson (2003), however, also find a negative and significant relation between shareholder rights index and openness, and indicate that this negative coefficient is due to a negative relation between openness and the dummy variable for cumulative or proportional voting. We take the analysis of the data further to offer a better understanding of these discrepancies. It should be noted that both Stulz and Williamson (2003) and Rajan and Zingales (2003) consider scaled measures (e.g., Market Cap / GDP), while we consider unscaled measures (e.g., Market Cap). After analyzing the correlations in the data, we find a strong negative correlation between *Openness* and GDP (the denominator of their scaled measures). We note that we are by no means implying that this negative correlation implies a causal relation. Rather, we suggest that this negative correlation is likely driving the difference in the coefficient sign on *Openness* between our results and those of Rajan and Zingales. Specifically, if we take, for example, our unscaled *Market Cap* measure, we find a negative correlation between *Openness* and *Market Cap*; hence, it is not surprising that the coefficient on *Openness* is negative and significant for the *Market Cap* measure. However, the negative relation between *Openness* and GDP dominates the negative relation between *Openness* and *Market Cap*. This pattern generates an overall positive relation between *Openness* and Market Cap/GDP. Thus, it is the difference in construction of our financial market measures (scaled vs unscaled by GDP), in combination with the observed negative relation between *Openness* and GDP, that is able to reconcile the difference in the effect of *Openness* between our results and those of Rajan and Zingales. Furthermore, consistent with Rajan and Zingales, we are able to generate a positive coefficient on *Openness* if we use Market Cap/GDP and Stocks Listed/Population as our dependent variables. This discussion also reinforces the fact that if we are interested in disentangling the two channels (the demand channel and the innovation channel) through which financial markets and genetic variation are related, we should not scale our dependent variables.

[23] Given the insignificance of *Malaria* and *P_Catholic* in the specifications in Table 4 and our relatively small sample size, we drop these two variables for all subsequent analysis to economize on degrees of freedom, although the subsequent results are all generally robust if they are included.

and financial market size only persists for the three equity market measures (*Market Cap, Stocks Traded*, and *Stocks Listed*). Genetic variation appears to have very little impact on the three debt market measures (*Private Credit*, *Domestic Credit*, and *Liquid Liability*). Said differently, with the three equity market size measures, Table 4 suggests that the relation between genetic variation and the size of equity markets is not exclusively operating through the effect of genetic variation on economic development and the corresponding demand for finance. Rather, these results provide evidence consistent with notion that genetic variation can impact financial market size through investment behavior and financial innovation. However, with the three debt market size measures, the observed relation between genetic variation and these debt market measure reported in Table 3 disappears when the demand for finance is controlled for, as reported in Table 4. Taken together, this suggests that country-level genetic variation is a factor that plays a role in explaining some of the variation in contemporary equity market size across countries. As a result, for the remainder of the paper we will focus our attention specifically on exploring the robustness of the relation between genetic variation and the three equity market size measures.

4.3 Controlling for Differences in Country-Level Culture

Recently, there is a burgeoning literature aimed at exploring the influence of culture on finance suggesting that culture can impact financial behavior, financial outcomes, and financial markets (for references see footnote 6).[24] Moreover, the linkage between culture and genetics has also been documented in the literature; namely, through a concept generally referred to as "dual inheritance theory" or "gene-culture coevolution" where genetics can influence culture over time, while at the same time there is feedback where culture can influence genetics (Cavalli-Sforza and Feldman, 1981; Boyd & Richerson, 1985; Richerson & Boyd, 2005; Spolaore & Wacziarg, 2013 for a

[24] Cultural characteristics have been shown in the literature to play a role in shaping financial markets (e.g., Stulz & Williamson, 2003; Guiso et al., 2006; Guiso et al., 2008; Kwok & Tadesse, 2006; Cline & Williamson, 2016).

review). Thus, it is possible that markets are affected by genetic variation through culture. To ensure that the robust hump-shaped relation between genetic variation and equity market size we document in Table 4 is not completely driven by cross-sectional differences in culture, which may be related to genetic variation, we include several measures of culture. In addition, adding culture controls allows us to explore the relation between these culture measures and equity market size.

For the measures of country-level culture, we consider the four original Hofstede (1980, 2001) index measures of: *Power Distance, Individualism, Uncertainty Avoidance, and Masculinity*. For the level of trust within a country, denoted as *Trust,* we use data from the World Values Survey (WVS) on the degree of interpersonal trust, which is the percentage of the surveyed respondents that reported that "most people can be trusted".[25] For brevity, we report only one table of the results for the *Market Cap* measure, although the results are generally qualitatively robust for the *Stocks Traded* and *Stocks Listed* measures. Table 5 presents the results. In all specifications we include *Trust* as a control, and we run specifications where we additionally add each of the four Hofstede culture measures individually (Columns 2-5), as well as with the inclusion of all four (Column 6).

From Table 5, we see that the coefficient on *Genetic Variation* remains positive, significant, and stable in magnitude in all six specifications. Similarly, the coefficient on *Genetic Variation Sqr* is negative, significant, and stable in magnitude in all six specifications. Hence, the hump-shaped relation between genetic variation and equity market size persists and is robust even after controlling for trust and several different country-level cultural dimensions.[26] In terms of the

[25] The WVS has compiled six waves of data: Wave 1 (1981-1984), Wave 2 (1990-1994), Wave 3 (1995-1998), Wave 4 (1999-2004), Wave 5 (2005-2009), Wave 6 (2010-2014). To be as consistent as possible to the time frame over which our financial market variables and other controls are measured, we construct the *Trust* measure using only the interpersonal trust data from Waves 3 and 4 for countries that are included in those waves (averaged over both waves if a country appears in both). For countries that are not included in either Wave 3 or Wave 4, but are included in at least one of the other waves, we proxy for the measure of *Trust* by averaging the available interpersonal trust data from those other waves in the same manner. Our results are robust if we alternatively construct the *Trust* measure by simply averaging the interpersonal trust data over all waves of the survey, as in Ashraf and Galor (2013).

[26] It is worth noting here that there is the possibility of multi-collinearity issues in our analysis for the results presented in Table 5, stemming from the possible correlations between the independent variables; in particular, the

cultural dimensions, we see from Columns 2 and 6 that the coefficient on *Individualism* is positive and significant, suggesting that there is a positive relation between more individualistic countries and *Market Cap*. From Column 4, we see that *Masculinity* is positive and significant (but not significant when all four Hofstede measures are included in Column 6). Similarly, *Uncertainty Avoidance* is negative and significant in Column 3 (but not significant when all four Hofstede measures are included in Column 6). This suggests some marginal evidence of a positive relation between more masculine countries and *Market Cap*, and more risk taking countries and *Market Cap*. In Column 5 we see that *Power Distance* is not significant, but the positive sign is in the expected direction. In terms of the degree of interpersonal trust of the country, the coefficient on *Trust* is positive and significant in Column 1, but insignificant when any of the Hofstede culture measures are included. These results marginally support the notion that culture and trust, to an extent, affect financial markets (in the expected directions), which is consistent with prior literature that (certain) cultural dimensions can influence financial outcomes. Yet, the results from Table 5 suggest that, despite the possible linkage between genetics and culture, genetic variation can play a direct role in shaping equity market size beyond its effect coming though culture and trust.

4.4 Relation Between Genetic Variation, Trust and Equity Markets

Recall that one of the proposed channels through which genetic variation could play a role in shaping financial markets is through investment behavior; the idea being that the degree of genetic variation within a country can influence the level of trust and propensity to take risks, which can then impact investment flows into public financial markets. We documented some supportive

close relation between *Genetic Variation, Trust,* and *WGI.* However our post-hoc analysis of the Variance Inflation Factors (VIFs) reveals that for the full set of independent variables included in Specification 6, and all of the VIFs were less than 10, which is the conventional rule of thumb for assuaging possible problematic collinearity issues. Moreover, the coefficients on *Genetic Variation* and *Genetic Variation Sqr* are all robust and relatively stable in magnitude across the six specification in Table 5, as well as to the omission of either the *Trust* or *WGI* variable, which provides some additional supporting evidence that serious multi-collinearity issues are less likely.

evidence of this proposed channel in Section 4.2 where we found a more prominent relation between genetic variation and equity market size compared to debt market size; specifically, a significant hump-shaped relation only emerged between the degree of genetic variation and the three equity market size measures, which we argued was likely due to the increased risk and uncertainty in equity markets (compared to debt markets). Pursuing this idea further, in countries where there is more uncertainty, especially within financial markets, we would expect attitudes toward trust and risk-taking to play a larger role in shaping investment behavior, and thus to account for more of the variation in differences in equity market size across countries. To the extent that the degree of genetic variation within a country can impact equity markets through investment flows via differences in trust and attitudes toward risk, we predict that the hypothesized and documented hump-shaped relation between genetic variation and equity market size would be stronger in countries with more uncertain business climates.

To substantiate this hypothesis, we investigate whether genetic variation impacts equity markets based on overall degree of inherent uncertainty in the business environment within a country, measured by *WGI*. To test this, we stratify our sample of countries based on the value of their *WGI* measure, a proxy for the overall governance quality (political stability, government effectiveness and regulatory quality, rule of law, and corruption). Specifically, countries with a *WGI* value below the median have relatively worse governance and are classified as having relatively more uncertain business environments, while countries with a *WGI* value above the median are classified as having relatively better governance. Table 6 presents the results of the regression analysis of the three equity market size measures on *Genetic Variation, Genetic Variation Sqr,* and *Trust* separately for the half of the sample with below the median *WGI* values (Panels A) and the half with above the median *WGI* values (Panel B).

In Panel A of Table 6, we see that the coefficients on *Genetic Variation* are positive and significant, while the coefficients on *Genetic Variation Sqr* are negative and significant for all three equity size measures – *Market Cap*, *Stocks Traded*, and *Stocks Listed.* Thus, for the subsample of countries that have relatively lower *WGI* values we see the same significant hump-shaped relation emerges between genetic variation and equity market size. Importantly, as we predicted, the coefficients on *Trust* are also positive and significant for all three equity size measures for this subsample of countries in Panel A. Both of these findings are generally robust to specifications that include additional controls. However, in Panel B, we see that neither the coefficients on *Genetic Variation* nor the coefficients on *Genetic Variation Sqr* are significant for any of the three equity size measures, with or without additional controls. Hence, for the subsample of countries with relatively high *WGI* values, we do not see a strong relation between genetic variation and equity market size. Additionally, the coefficients on *Trust* in Panel B are also not significant, indicating a much weaker role of trust in shaping equity market size for this subsample of countries with relatively high *WGI* values.

Overall the results from this subsample analysis suggest that trust plays a more prominent role in shaping equity market size in countries with relatively more uncertain and unstable business environments (identified by lower *WGI* values). As we would expect, the hump-shaped relation between genetic variation and equity market size only emerges significantly for the subset of countries with relatively lower *WGI* values. This provides further support for our hypothesis that genetic variation can impact the size of public financial markets via differences in trust and risk taking that impact investment flows into public financial markets. This evidence is also consistent with the conjecture that better governance and a higher-quality business environment within a country can moderate the effect of genetic variation and trust on equity market size.

5 Robustness Analysis

Next, we address the possibility that the predicted measure of genetic variation that we use in the analysis is endogenous to financial market size. Recall that the genetic variation measure for each country comprises both *within-ethnic-group* and *between-ethnic-group* genetic variation. A predicted measure of each of these sources was then calculated based on prehistoric migratory distance from East Africa; thus, the predicted measure of each component of genetic variation is likely exogenous to current levels of financial market size. That said, the overall measure of predicted genetic variation (*Genetic Variation*) is determined, in part, by the number of different ethnic groups within a country and the concentration of each ethnic group. Thus, there is a possibility for *Genetic Variation* to be endogenous to financial market size, to the extent that financial markets may have impacted the post-1500 CE population flows and the current ethnic composition of each country. Said differently, it is possible for there to have been post-1500 CE migration away from less financially developed countries toward more financially developed countries, which would then increase the between-group source of genetic variation in these countries. We address this possible endogeneity issue in two ways: (i) with an alternative measure of predicted genetic variation, and (ii) with several sub-sample analyses.

5.1 Alternative Measure of Predicted Genetic Variation

Instead of using the *Genetic Variation* measure, which was ancestry adjusted to account for post-1500 migration, we use an alternative measure created by Ashraf and Galor (2013) that is based strictly on migratory distance of each country from East Africa and does not take into account the ethnic composition of the country – denoted as *Alt Genetic Variation*. Thus, there is no scope for post-1500 CE migration flows to impact the *Alt Genetic Variation* measure. As a result, we contend that this measure, predicted solely on prehistoric migratory distance, is exogenous to contemporary levels of financial market size. Furthermore, the *Alt Genetic Variation* measure is strongly correlated with the *Genetic Variation* measure ($r = 0.75$ and $p < .0001$).

Table 7 presents the results with *Alt Genetic Variation* serving as the independent variable of main interest. From Table 7, we can see that *Alt Genetic Variation* has a significant hump-shaped relation with the three equity market measures we consider, even after including the full set of control variables. Hence, our main results from Table 4 regarding the relation between genetic variation and the three equity market size measures we use are robust to this more crude measure of a country's degree of genetic variation, which is more likely to be exogenous to contemporary financial markets. The distance-only based measure of genetic variation (*Alt Genetic Variation*) is indeed a cruder and less accurate predicted measure of actual genetic variation than the ancestry-adjusted measure (*Genetic Variation*) since it does not account for between-group variation arising from migration flows;[27] thus, the main analysis in Section 4 is done using the ancestry-adjusted *Genetic Variation* measure.

5.2 Subsample Analysis

The second way we address the possibility that the *Genetic Variation* measure is endogenous to a country's current financial markets is through various subsample analyses. In particular, it is not clear or obvious whether this possible endogeneity would lead to a positive or negative bias regarding the effect of genetic variation on financial market size. In particular, more developed/advanced countries with bigger financial markets may have been more attractive to migrate to, especially for the highly skilled – often referred to as the "brain drain" (e.g., Grossmann & Stadelmann, 2011; Mountford & Rapoport, 2011; Özden et al., 2011; Artuc et al., 2015), thus increasing genetic variation; at the same time, these more developed/advanced countries could have been more effective at minimizing immigration (if they chose to do so), thus decreasing genetic variation. That being said, we test the robustness of our results using several sub-samples where we exclude various countries that *may have been* more (less) desirable to migrate away from

[27] In fact, if we regress our financial market measures on *Alt Genetic Variation, Alt Genetic Variation Sqr, Genetic Variation,* and *Genetic Variation Sqr,* then only *Genetic Variation* and *Genetic Variation Sqr* are significant. That is, the ancestry-adjusted measure does dominate the unadjusted distance-only measure.

because of smaller (larger) and less (more) developed financial markets. Table 8 presents the regression results of the three equity market measures on *Genetic Variation* and *Genetic Variation Sqr* for each different sub-sample (Panels A-E).

In Panel A of Table 8, we exclude the 30 OECD countries from our sample (i.e., those countries that may be more attractive to migrate to). From Panel A, we see that for all three measures (*Market Cap, Stocks Traded* and *Stocks Listed*) the coefficient on *Genetic Variation* is positive and significant, while the coefficient on *Genetic Variation Sqr* is negative and significant, revealing a significant hump-shaped relation. Panel B reports the results where we omit 48 Sub-Saharan African countries (i.e., those counties that may have been less attractive to migrate to and generally have more genetic variation); there is a positive and significant coefficient on *Genetic Variation*, and a negative and significant coefficient on *Genetic Variation Sqr* for all three measures.

In Panels C through E of Table 8, we attempt to control for the possible increased international flow of capital over the last several decades (Laeven, 2014). Specifically, Laeven documents "the capitalization of stock markets (relative to GDP) saw an increase of about 50 percent globally but a more than twofold increase in upper middle income countries over this period [1994-2010]" (p. 6). He further documents that the capitalization of stock markets and the number of listed companies has decreased over that period for low income countries. To ensure that our results are not being driven by this recent increase in international capital flows, we consider three additional sub-samples where we omit the 10% of highest GDP per capita countries (Panel C), the 10% of lowest GDP per capita countries (Panel D), and both the 10% of highest and lowest GDP per capita countries (Panel E). From Panels C-E, we see that the significant hump-shaped relation between genetic variation and the three equity market measures robustly persists across these various subsamples; namely, the coefficients on *Genetic Variation* are positive and significant, while the coefficients on *Genetic Variation Sqr* are negative and significant for all specifications.

These results from Table 8 indicate that the hump-shaped relation of genetic variation and equity market size remains robustly intact when we omit sub-samples of countries that may be more or less prone to migrations, as well as the relatively high and low income counties. Taken together, this suggests that the strong, cross-sectional, hump-shaped relation between genetic variation and the three equity market size measures documented in Table 4 is not strictly an artifact of post-1500 CE migration to more financially developed countries or capital flows to higher income countries; thus providing additional evidence consistent with a country's genetic variation playing a direct role in shaping its financial markets.

6 Conclusion

Ample empirical evidence documents considerable heterogeneity in financial markets across countries, which has spurred substantial research aimed at identifying the possible factors that have contributed to this variation. Subsequently, many structural, institutional, and cultural factors have been shown to influence financial markets across countries. In this paper, we take a complementary approach by investigating the extent to which country-level genetic variation is related to financial market size, and can possibly account for some of the observed heterogeneity across countries. Building on the idea that genetic variation can impact trust and cooperation (Cesarini et al., 2008; Tabellini, 2008; Guiso et al., 2009), which in turn can impact investment behavior (Guiso et al., 2008) and productivity and innovation (Ashraf & Galor, 2013; Spolaore & Wacziarg, 2013), we hypothesize there will be an overall hump-shaped relation between a country's degree of genetic variation and the size and activity of its financial markets. We empirically test this hypothesis on a sample of roughly 150 countries using data for several proxy measures of financial market size, predicted genetic variation, as well as other controls that have been examined in the literature.

As hypothesized, our cross-sectional analysis reveals a significant hump-shaped relation between genetic variation and financial market size, which is consistent with our conjecture that intermediate levels of genetic variation (associated with moderate degrees of trust and cooperation) result in the largest investment flows into public financial markets, especially into equity markets. These results are robust across three different proxy measures for size and activity of equity markets; these results are also robust after controlling for a country's demand for financial development (as proxied for with per capita GDP), which is consistent with our hypothesis that genetic variation can influence financial market size via the influence of genetic variation on investment behavior as well as productivity and innovation in the financial sector. Our results are robust even after controlling for a myriad of other factors that have been shown to impact financial markets including: type of legal origin, degree of trade openness, initial endowments, religious composition, quality of governance, and various measures of culture. Furthermore, the relation between genetic variation and equity market size persists even when we consider subsamples where we omit countries that may be more or less desirable to migrate to, as well as omit those countries with relatively low or/and high income levels. For debt markets, we find very little relation between genetic variation and the size of debt markets, which is consistent with our expectation given that there is less risk and uncertainty associated with debt markets; hence, less scope for genetic variation to directly impact the size of debt markets though its effect on investor behavior.

It is important to note here that it is neither our opinion nor an implication of our results that genetic variation is disadvantageous. From a positive standpoint, we merely empirically document a hump-shaped, cross-sectional relation between genetic variation and proxies for equity market size (e.g., market cap, value of stocks traded, and number of listed public companies). Moreover, this hump-shaped relation only emerges in a significant way in countries with overall relatively lower quality governance (as measured by the World Governance Indicators); this suggests that the role of genetic variation in shaping public financial markets can be moderated by more certain and better functioning business environments. Additionally, recent discussions in academia have emerged that have questioned the degree to which a larger financial sector provides a net benefit to society. Specifically, the presence of large and complicated financial systems can lead to more corruption, more severe agency problems, increased risk and fragility, and a higher likelihood of a crisis, which suggests that a bigger financial sector is not always better for society (Rajan, 2005; Zingales, 2015). More broadly, it is widely accepted by the scientific community that genetic variation within a population can be extremely valuable in terms of increasing adaptability, the chance of survival, and the overall flourishing of the population, as well as reducing the frequency of unfavorable or disadvantageous traits among the population.

We conclude by acknowledging that the relations between genetics, culture, and financial and economic outcomes are quite complex, and our paper by no means fully disentangles such relations.[28] Rather, the aim of this study is to shed light on how genetic variation, in combination with cultural differences, could have played a role over time in shaping a country's financial markets. Our results show that after controlling for several country-level cultural dimensions that are widely used in the literature, the significant relation between genetic variation and financial market size persists. There exists a wide-ranging body of literature suggesting, both theoretically and empirically, that financial markets are an important component of a country's economic growth and welfare.[29] As such, it is important to understand the possible factors that have

28 Genetics is potentially rooted in a complex way in the structural, institutional, cultural, and political factors that affect country-level aggregate financial and economic outcomes. As noted by Spolaore and Wacziarg (2013), "… people and societies inherit traits from their ancestors through a complex interaction of biological [genetic and epigenetic] and cultural mechanisms [behavioral and symbolic], with an essential role played by environmental factors [e.g., social, institutional, and political environment]." (p.25)

29 Examples of papers documenting the importance of financial development include: Greenwood and Jovanovic (1990), Roubini and Sala-i-Martin (1992), King and Levine (1993), Atje and Jovanovic (1993), Pagano (1993), De Gregorio and Guidotti (1995), Jayaratne and Strahan (1996), Rajan and Zingales (1998), Demirgüç-Kunt and Maksimovic (1998), Beck et al. (2000), Beck and Levine (2002), Carlin and Mayer (2003), Aghion et al. (2005), Brown et al. (2009), and Hsu et al. (2014). See also Levine (1997), Rajan and Zingales (2001), Levine (2005), and Zingales (2015) for additional survey-style discussions. The idea that financial development spurs economic growth

contributed to the variation in contemporary financial markets across countries. Similar to the view conveyed by Rajan and Zingales (2003), we assert that the existing theories proposed and supported in the literature are not wrong; rather, they are incomplete. Our results suggest that, over time, a more deep-rooted factor – a country's genetic variation – could have contributed to the observed cross-country variation in contemporary financial markets size.

is consistent with the supply side arguments suggested by Schumpeter (1912) and Hicks (1969), where increases in the supply of financial development lead to increases in economic growth.

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Table 1 – Summary Statistics

This table reports summary statistics. Panel A reports the statistics for the subsample used when *Market Cap* is the financial market measure. *Market Cap* is the stock market capitalization in billion dollars averaged across 1998 – 2002. Panel B reports the statistics for the subsample used when *Stocks Traded* is the financial market measure. *Stocks Traded* is the total value of shares traded in billion dollars averaged across 1998 – 2002. Panel C reports the statistics for the subsample used when *Stocks Listed* is the financial market measure. *Stocks Listed* is the total number of domestically listed companies on the country's stock exchanges averaged across 1998 – 2002. Panel D reports the statistics for the subsample used when *Domestic Credit* is the financial market measure. *Domestic Credit* is the financial resource provided to the private sector in billion dollars averaged across 1998 – 2002. Panel E reports the statistics for the subsample used when *Liquid Liabilities* is the financial market measure. *Liquid Liabilities* is the liquid liabilities (M3) in billion dollars averaged across 1998 – 2002. Panel F reports the statistics for the subsample used when *Private Credit* is the financial market measure. *Private Credit* is the private credit by deposit money banks and other financial institutions in billion dollars averaged across 1998 – 2002. *Genetic Variation* is the ancestry adjusted predicted genetic variation in 2000 CE from Ashraf and Galor (2013). *Per Capita GDP* is the per capita GDP averaged across 1998 - 2002. *Population* is the country's population. *WGI* is the average of the six indicators of the World Governance Indicators project for each country over years 1998, 2000, 2002. *Legal Origin UK* and *Legal Origin FR* are dummy variables for a country's legal origin of English Common Law and French Civil Law, respectively. *Malaria* is the percentage of the population at risk of contracting malaria. *Openness* is the sum of import and export divided by GDP averaged over 1998 – 2002. *P_Catholic* is the percentage of a country's population belonging to Roman Catholic. *Trust* is the degree of self-reported interpersonal trust from the World Values Survey question about whether people can be trusted. *Individualism* is Hofstede's Individualism index. *Uncertainty Avoidance* is Hofstede's measure for a society's tolerance for uncertainty and ambiguity. *Masculinity* is Hofstede's measure that refers to the distribution of emotional roles between the genders. *Power Distance* is Hofstede's measure that refers to the extent to which the less powerful members of organizations and institutions accept and expect that power is distributed unequally.

Panel A* – Summary Statistics for *Market Cap

Variable	Mean	Median	Std	Min	Max	N
Market Cap	297.1154	6.6038	1519.5114	0.0044	14677.4870	99
Genetic Variation	0.7225	0.7313	0.0278	0.6279	0.7653	99
Per Capita GDP	12038.9981	4544.9059	15091.6173	270.9201	70438.6205	98
Openness	0.8500	0.7700	0.5150	0.2003	3.4491	98
Legal Origin UK	0.3535	0	0.4805	0	1.0000	99
Legal Origin FR	0.3434	0	0.4773	0	1.0000	99
P_Catholic	32.8838	13.1000	37.2939	0	97.3000	99
Population	53.3386	10.2377	166.4632	0.3854	1261.9130	99
Malaria	0.1517	0	0.2958	0	1.0000	96
WGI	0.2833	0.1083	0.8566	-1.1069	1.9145	99
Trust	0.2707	0.2382	0.1369	0.0380	0.6480	74
Uncertainty Avoidance	67.1746	70.0000	23.8270	8.0000	112.0000	63
Individualism	45.6032	46.0000	24.0641	6.0000	91.0000	63
Power Distance	57.6984	60.0000	22.1626	11.0000	104.0000	63
Masculinity	49.1429	50.0000	20.2651	5.0000	110.0000	63

Panel B* – Summary Statistics for *Stocks Traded						
Variable	Mean	Median	Std	Min	Max	N
Stocks Traded	348.6950	0.9034	2335.6855	0.0004	23053.1107	98
Genetic Variation	0.7226	0.7315	0.0280	0.6279	0.7653	98
Per Capita GDP	12152.7687	4642.0645	15127.7123	270.9201	70438.6205	97
Openness	0.8507	0.7550	0.5176	0.2003	3.4491	97
Legal Origin UK	0.3469	0	0.4784	0	1.0000	98
Legal Origin FR	0.3469	0	0.4784	0	1.0000	98
P_Catholic	33.2194	13.7500	37.3352	0	97.3000	98
Population	53.8771	10.2480	167.2324	0.3854	1261.9130	98
Malaria	0.1484	0	0.2957	0	1.0000	95
WGI	0.2855	0.1482	0.8607	-1.1069	1.9145	98
Trust	0.2707	0.2382	0.1369	0.0380	0.6480	74
Uncertainty Avoidance	67.1746	70.0000	23.8270	8.0000	112.0000	63
Individualism	45.6032	46.0000	24.0641	6.0000	91.0000	63
Power Distance	57.6984	60.0000	22.1626	11.0000	104.0000	63
Masculinity	49.1429	50.0000	20.2651	5.0000	110.0000	63

Panel C* – Summary Statistics for *Stocks Listed						
Variable	Mean	Median	Std	Min	Max	N
Stocks Listed	442.4265	116.0000	1072.2166	2.0000	7133.0000	107
Genetic Variation	0.7221	0.7313	0.0281	0.6279	0.7653	107
Per Capita GDP	12227.9330	4646.6101	15503.7041	270.9201	70438.6205	106
Openness	0.8402	0.7700	0.5000	0.2003	3.4491	106
Legal Origin UK	0.3364	0	0.4747	0	1.0000	107
Legal Origin FR	0.3645	0	0.4836	0	1.0000	107
P_Catholic	33.3271	13.1000	37.7089	0	97.3000	107
Population	50.1513	10.2122	160.4734	0.3854	1261.9130	107
Malaria	0.1411	0	0.2866	0	1.0000	104
WGI	0.2437	0.0845	0.8621	-1.3642	1.9145	107
Trust	0.2645	0.2350	0.1351	0.0380	0.6480	79
Uncertainty Avoidance	67.6000	70.0000	23.5914	8.0000	112.0000	65
Individualism	44.7385	41.0000	24.2044	6.0000	91.0000	65
Power Distance	58.1385	60.0000	22.0127	11.0000	104.0000	65
Masculinity	49.1846	50.0000	20.3400	5.0000	110.0000	65

Panel D* – Summary Statistics for *Domestic Credit						
Variable	Mean	Median	Std	Min	Max	N
Domestic Credit	265.0303	3.8670	1584.6810	0.0096	17309.9335	154
Genetic Variation	0.7267	0.7342	0.0273	0.6279	0.7743	154
Per Capita GDP	8833.5957	2238.5055	13889.2432	135.2309	70438.6205	153
Openness	0.8395	0.7287	0.5321	0.2003	3.7604	151
Legal Origin UK	0.2876	0	0.4541	0	1.0000	153
Legal Origin FR	0.4575	0	0.4998	0	1.0000	153
P_Catholic	31.3804	14.0000	35.8640	0	97.3000	153
Population	38.2280	8.5357	135.0547	0.2385	1261.9130	154
Malaria	0.3144	0.0012	0.4243	0	1.0000	148
WGI	-0.0722	-0.2780	0.9061	-1.9626	1.9145	154
Trust	0.2571	0.2310	0.1334	0.0380	0.6480	88
Uncertainty Avoidance	67.3676	70.0000	23.8001	8.0000	112.0000	68
Individualism	45.2794	43.5000	24.4314	6.0000	91.0000	68
Power Distance	58.2941	60.5000	21.5712	11.0000	104.0000	68
Masculinity	48.8971	48.5000	19.9298	5.0000	110.0000	68

Panel E* – Summary Statistics for *Liquid Liabilities						
Variable	Mean	Median	Std	Min	Max	N
Liquid Liabilities	205.0329	4.9988	1006.4985	0.0344	9565.9592	141
Genetic Variation	0.7267	0.7337	0.0273	0.6279	0.7743	141
Per Capita GDP	8689.9397	2212.9343	13613.1206	135.2309	70438.6205	140
Openness	0.8405	0.7278	0.5468	0.2003	3.7604	139
Legal Origin UK	0.2979	0	0.4590	0	1.0000	141
Legal Origin FR	0.4539	0	0.4996	0	1.0000	141
P_Catholic	31.8596	14.4000	35.8867	0	97.3000	141
Population	41.1885	9.5616	140.8013	0.2385	1261.9130	141
Malaria	0.3217	0.0134	0.4254	0	1.0000	136
WGI	-0.0573	-0.2605	0.9163	-1.9626	1.9145	141
Trust	0.2628	0.2370	0.1368	0.0380	0.6480	81
Uncertainty Avoidance	67.3125	70.0000	24.3022	8.0000	112.0000	64
Individualism	45.8125	43.5000	24.5944	6.0000	91.0000	64
Power Distance	57.4375	60.0000	21.1449	11.0000	104.0000	64
Masculinity	48.1875	48.5000	18.4613	5.0000	95.0000	64

Panel F* – Summary Statistics for *Private Credit						
Variable	Mean	Median	Std	Min	Max	N
Private Credit	280.6361	3.4322	1618.7388	0.0128	16849.9632	142
Genetic Variation	0.7269	0.7342	0.0272	0.6279	0.7743	142
Per Capita GDP	8736.4533	2305.4999	13549.4608	135.2309	70438.6205	141
Openness	0.8454	0.7282	0.5461	0.2003	3.7604	140
Legal Origin UK	0.2887	0	0.4548	0	1.0000	142
Legal Origin FR	0.4507	0	0.4993	0	1.0000	142
P_Catholic	32.1704	16.2000	35.9213	0	97.3000	142
Population	40.9420	9.2210	140.3317	0.2385	1261.9130	142
Malaria	0.3160	0.000171	0.4254	0	1.0000	137
WGI	-0.0479	-0.2525	0.9173	-1.9626	1.9145	142
Trust	0.2621	0.2370	0.1352	0.0380	0.6480	83
Uncertainty Avoidance	66.9545	69.0000	24.0253	8.0000	112.0000	66
Individualism	46.1212	46.0000	24.2871	6.0000	91.0000	66
Power Distance	57.8788	60.0000	21.7068	11.0000	104.0000	66
Masculinity	48.8485	48.5000	19.8434	5.0000	110.0000	66

Table 2 – Pearson Correlation Coefficients of Transformed Financial Market Measures

This table reports the correlation matrix of six financial market measures. *Log(Market Cap)* is the logarithm of the stock market capitalization averaged over 1998 - 2002. *Log(Stocks Traded)* is the logarithm of the total value of shares traded averaged over 1998 - 2002. *Log(Stocks Listed)* is the logarithm of the number of domestically listed companies averaged over 1998 – 2002. *Log(Domestic Credit)* is the logarithm of the financial resources provided to the private sector averaged across 1998 – 2002. *Log(Liquid Liabilities)* is the logarithm of the liquid liabilities (M3) averaged across 1998 – 2002. *Log(Private Credit)* is the private credit by deposit money banks and other financial institutions averaged across 1998 – 2002.

	Log(Stocks Traded)	*Log(Stocks Listed)*	*Log(Domestic Credit)*	*Log(Liquid Liabilities)*	*Log(Private Credit)*
Log(Market Cap)	0.9497	0.7340	0.9641	0.9593	0.9614
	(p<.001)	(p<.001)	(p<.001)	(p<.001)	(p<.001)
Log(Stocks Traded)		0.7355	0.9357	0.9280	0.9351
		(p<.001)	(p<.001)	(p<.001)	(p<.001)
Log(Stocks Listed)			0.7596	0.7923	0.7560
			(p<.001)	(p<.001)	(p<.001)
Log(Domestic Credit)				0.9861	0.9965
				(p<.001)	(p<.001)
Log(Liquid Liabilities)					0.9899
					(p<.001)

Table 3 – Financial Markets and Genetic Variation

This table reports the unconditional relation between genetic variation and the six measures of financial market size. Panel A reports the regression of the logarithm of six financial market measures on genetic variation, its square and logarithm of population. Panel B reports the regression of the six financial market measures scaled by GDP on genetic variation, its square and logarithm of population. *Log(Market Cap)* is the logarithm of the stock market capitalization averaged over 1998 - 2002. *Log(Stocks Traded)* is the logarithm of the total value of shares traded averaged over 1998 - 2002. *Log(Stocks Listed)* is the logarithm of the number of domestically listed companies averaged over 1998 – 2002. *Log(Domestic Credit)* is the logarithm of the financial resources provided to the private sector averaged across 1998 – 2002. *Log(Liquid Liabilities)* is the logarithm of the liquid liabilities (M3) averaged across 1998 – 2002. *Log(Private Credit)* is the private credit by deposit money banks and other financial institutions averaged across 1998 – 2002. *Genetic Variation* is the ancestry adjusted predicted genetic variation in 2000 CE from Ashraf and Galor (2013), and *Genetic Variation Sqr* is its square. *Log(Population)* is the logarithm of the country's population. Bootstrapped standard errors are reported in the parentheses. (*), (**) and (***) indicate the coefficients are statistically significant at the 10%, 5%, and 1% levels, respectively. For the results presented in Panel B for *Stocks Listed/GDP* GDP is rescaled to millions of dollars for ease of reporting coefficients.

***Panel A* – Log Transformed Financial Market Measures**

	Log(Market Cap)	*Log(Stocks Traded)*	*Log(Stocks Listed)*	*Log(Domestic Credit)*	*Log(Liquid Liabilities)*	*Log(Private Credit)*
Genetic Variation	1178.1***	1778.8***	580.0**	633.4**	637.0***	796.9***
	(432.6)	(548.0)	(232.7)	(248.8)	(217.1)	(253.4)
Genetic Variation Sqr	-836.0***	-1260.2***	-410.2**	-446.7**	-451.4***	-567.4***
	(309.0)	(389.2)	(165.1)	(176.3)	(153.8)	(179.8)
Log(Population)	1.043***	1.332***	0.606***	1.004***	0.987***	0.991***
	(0.163)	(0.189)	(0.0689)	(0.111)	(0.105)	(0.126)
Continent Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	99	98	107	154	141	142
Adj R^2	0.392	0.484	0.467	0.544	0.580	0.545

***Panel B* – GDP Scaled Financial Market Measures**

	Market Cap/GDP	*Stocks Traded/GDP*	*Stocks Listed/GDP*	*Domestic Credit/GDP*	*Liquid Liabilities/GDP*	*Private Credit/GDP*
Genetic Variation	194.6**	162.6**	2.64	112.4**	81.1**	131.7**
	(77.3)	(64.4)	(6.86)	(52.5)	(37.8)	(54.4)
Genetic Variation Sqr	-139.3**	-115.9**	-1.93	-80.8**	-59.2**	-94.9**
	(55.5)	(45.4)	(4.99)	(36.9)	(27.0)	(38.3)
Log(Population)	0.005	0.066**	-0.004	0.033	-0.010	0.026
	(0.033)	(0.030)	(0.003)	(0.025)	(0.031)	(0.027)
Continent Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	99	98	107	154	141	142
Adj R^2	0.024	0.121	0.002	0.175	0.133	0.180

Table 4 – Financial Markets and Genetic Variation with Demand for Finance Proxy and Controls

This table reports the relation between genetic variation and the six measures of financial market size. *Log(Market Cap)* is the logarithm of the stock market capitalization averaged over 1998 - 2002. *Log(Stocks Traded)* is the logarithm of the total value of shares traded averaged over 1998 - 2002. *Log(Stocks Listed)* is the logarithm of the number of domestically listed companies averaged over 1998 – 2002. *Log(Domestic Credit)* is the logarithm of the financial resources provided to the private sector averaged across 1998 – 2002. *Log(Liquid Liabilities)* is the logarithm of the liquid liabilities (M3) averaged across 1998 – 2002. *Log(Private Credit)* is the private credit by deposit money banks and other financial institutions averaged across 1998 – 2002. *Genetic Variation* is the ancestry adjusted predicted genetic variation in 2000 CE from Ashraf and Galor (2013), and *Genetic Variation Sqr* is its square. *Per Capita GDP* is the per capita GDP averaged across 1998 - 2002. *WGI* is the average of the six indicators of the World Governance Indicators project for each country over years 1998, 2000, 2002. *Legal Origin UK* and *Legal Origin FR* are dummy variables for a country's legal origin of English Common Law and French Civil Law, respectively. *Malaria* is the percentage of the population at risk of contracting malaria. *Openness* is the sum of import and export divided by GDP averaged over 1998 – 2002. *P_Catholic* is the percentage of a country's population belonging to Roman Catholic. Bootstrapped standard errors are reported in the parentheses. (*), (**) and (***) indicate the coefficients are statistically significant at the 10%, 5%, and 1% levels, respectively.

	Log(Market Cap)	*Log(Stocks Traded)*	*Log(Stocks Listed)*	*Log(Domestic Credit)*	*Log(Liquid Liabilities)*	*Log(Private Credit)*
Genetic Variation	715.8*	1233.8***	618.5***	35.95	13.93	65.98
	(410.3)	(473.1)	(239.1)	(255.1)	(257.37)	(279.6)
Genetic Variation Sqr	-534.0*	-907.6***	-452.7***	-39.74	-21.50	-60.89
	(291.7)	(336.0)	(170.5)	(181.1)	(183.4)	(199.0)
Log(Per Capita GDP)	1.864***	1.784***	0.0818	0.933***	1.075***	1.082***
	(0.386)	(0.450)	(0.229)	(0.197)	(0.203)	(0.181)
WGI	-0.309	0.366	0.575	0.822***	0.375	0.711**
	(0.646)	(0.725)	(0.367)	(0.286)	(0.305)	(0.308)
Legal Origin FR	1.377**	1.728**	0.448	0.893*	1.042**	1.073***
	(0.622)	(0.766)	(0.457)	(0.487)	(0.491)	(0.417)
Legal Origin UK	2.034***	2.886***	0.907**	1.250**	1.346**	1.629***
	(0.776)	(0.937)	(0.447)	(0.539)	(0.585)	(0.449)
Malaria	0.302	-0.240	-0.691	-0.938*	-0.636	-0.760
	(1.274)	(1.583)	(0.748)	(0.553)	(0.539)	(0.578)
Openness	-2.004***	-3.102***	-1.208***	-1.671***	-1.658***	-1.797***
	(0.596)	(0.773)	(0.352)	(0.331)	(0.326)	(0.315)
P_Catholic	-0.00322	-0.0102	-0.00741	0.00418	0.00142	0.00363
	(0.00723)	(0.00905)	(0.00545)	(0.00489)	(0.00501)	(0.00531)
Continent Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	94	93	102	145	133	134
Adj R^2	0.580	0.635	0.316	0.703	0.677	0.738

Table 5 – Financial Markets, Genetic Variation and Culture Variables

This table reports the relation between genetic variation and equity market size, are controlling for several cultural dimensions. *Log(Market Cap)* is the logarithm of the stock market capitalization averaged over 1998 - 2002. *Genetic Variation* is the ancestry adjusted predicted genetic variation in 2000 CE from Ashraf and Galor (2013), and *Genetic Variation Sqr* is its square. *Per Capita GDP* is the per capita GDP averaged across 1998 - 2002. *WGI* is the average of the six indicators of the World Governance Indicators project for each country over years 1998, 2000, 2002. *Legal Origin UK* and *Legal Origin FR* are dummy variables for a country's legal origin of English Common Law and French Civil Law, respectively. *Openness* is the sum of import and export divided by GDP averaged over 1998 – 2002. *Individualism* is Hofstede's Individualism index. *Uncertainty Avoidance* is Hofstede's measure for a society's tolerance for uncertainty and ambiguity. *Masculinity* is Hofstede's measure that refers to the distribution of emotional roles between the genders. *Power Distance* is Hofstede's measure that refers to the extent to which the less powerful members of organizations and institutions accept and expect that power is distributed unequally. *Trust* is the degree of self-reported interpersonal trust from the World Values Survey question about whether people can be trusted. Bootstrapped standard errors are reported in the parentheses. (*), (**) and (***) indicate the coefficients are statistically significant at the 10%, 5%, and 1% levels, respectively.

	Log(Market Cap)					
	1	2	3	4	5	6
Genetic Variation	1917.1***	2300.5***	2115.9***	2235.4***	2087.0***	2027.1***
	(687.6)	(748.4)	(712.5)	(776.5)	(696.6)	(702.0)
Genetic Variation Sqr	-1378.4***	-1655.8***	-1515.8***	-1598.3***	-1489.7***	-1453.4***
	(487.6)	(533.5)	(506.3)	(549.8)	(496.8)	(501.2)
Log(Per Capita GDP)	1.755***	2.171***	2.316***	2.063***	2.279***	2.169***
	(0.459)	(0.635)	(0.686)	(0.696)	(0.650)	(0.642)
WGI	-0.561	-1.567	-1.137	-1.004	-0.804	-0.963
	(0..869)	(1.115)	(1.278)	(1.241)	(1.203)	(0.695)
Legal Origin FR	1.473***	0.610	1.085*	0.847	0.658	0.908
	(0..524)	(0.598)	(0.610)	(0.588)	(0.606)	(0.695)
Legal Origin UK	2.145***	1.311	1.291	1.554	1.807*	1.078
	(0.750)	(1.054)	(0.965)	(0.987)	(0.981)	(1.016)
Openness	-1.819***	-1.563***	-2.284***	-1.726***	-1.986***	-2.061***
	(0.555)	(0.592)	(0.536)	(0.545)	(0.462)	(0.481)
Trust	4.797**	0.480	-0.829	3.138	2.939	-0.221
	(2.323)	(2.780)	(2.947)	(2.418)	(2.712)	(2.879)
Individualism		0.040**				0.032*
		(0.019)				(0.018)
Uncertainty Avoidance			-0.030*			-0.024
			(0.018)			(0.021)
Masculinity				0.021*		0.012
				(0.013)		(0.016)
Power Distance					0.026	0.027
					(0.020)	(0.024)
Continent Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	73	55	55	55	55	55
Adj R^2	0.703	0.674	0.661	0.662	0.652	0.709

Table 6 – Financial Markets, Genetic Variation and Trust: Sub-sample Analysis

This table reports the relation between genetic variation, trust and the three measures of equity market size. Regressions are estimated on subsamples of countries with low and high governance quality of a country as measured by *WGI*. In Panel A, we include only the countries with a *WGI* value less than the median. In Panel B, we include only the countries with a *WGI* value greater than or equal to the median. *Log(Market Cap)* is the logarithm of the stock market capitalization averaged over 1998 - 2002. *Log(Stocks Traded)* is the logarithm of the total value of shares traded averaged over 1998 - 2002. *Log(Stocks Listed)* is the logarithm of the number of domestically listed companies averaged over 1998 – 2002. *Genetic Variation* is the ancestry adjusted predicted genetic variation in 2000 CE from Ashraf and Galor (2013), and *Genetic Variation Sqr* is its square. *Per Capita GDP* is the per capita GDP averaged across 1998 - 2002. *Trust* is the degree of self-reported interpersonal trust from the World Values Survey question about whether people can be trusted. *WGI* is the average of the six indicators of the World Governance Indicators project for each country over years 1998, 2000, 2002. *Legal Origin UK* and *Legal Origin FR* are dummy variables for a country's legal origin of English Common Law and French Civil Law, respectively. *Openness* is the sum of import and export divided by GDP averaged over 1998 – 2002. Bootstrapped standard errors are reported in the parentheses. (*), (**) and (***) indicate the coefficients are statistically significant at the 10%, 5%, and 1% levels, respectively.

Panel A – Countries with Relatively Low _WGI_ Values

	Log(Market Cap)		*Log(Stocks Traded)*		*Log(Stocks Listed)*	
Genetic Variation	2025.4***	1903.2***	2937.7***	2891.5***	1139.4***	998.6**
	(682.3)	(652.0)	(950.8)	(1006.7)	(423.8)	(508.9)
Genetic Variation Sqr	-1436.5***	-1352.0***	-2091.9***	-2065.0***	-802.3***	-709.3**
	(485.1)	(464.9)	(671.2)	(711.0)	(301.2)	(362.8)
Log(Per Capita GDP)	1.249***	1.295**	1.233**	1.068	0.067	-0.271
	(0.460)	(0.539)	(0.584)	(0.657)	(0.288)	(0.322)
Trust	13.10***	11.27**	10.77*	7.314	6.670**	5.667**
	(4.887)	(4.768)	(6.536)	(6.609)	(3.142)	(2.713)
WGI		0.228		0.992		1.645*
		(1.315)		(2.094)		(0.905)
Legal Origin FR		2.656		3.984*		0.820
		(1.768)		(2.224)		(1.063)
Legal Origin UK		2.901**		3.345*		0.453
		(1.316)		(1.832)		(0.919)
Openness		-3.658**		-4.907**		-2.880***
		(1.479)		(2.937)		(1.067)
Continent Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	37	36	37	36	39	38
Adj R^2	0.520	0.709	0.376	0.602	0.200	0.487

Panel B **– Countries with Relatively High *WGI* Values**

	Log(Market Cap)		*Log(Stocks Traded)*		*Log(Stocks Listed)*	
Genetic Variation	-539.6	2418.1	-1328.6	3479.7	213.9	585.9
	(5111.9)	(7274.5)	(7557.8)	(10115.8)	(1719.6)	(2903.1)
Genetic Variation Sqr	351.9	-1719.2	896.4	-2474.7	-169.1	-443.1
	(3501.6)	(4983.3)	(5367.8)	(6919.5)	(1193.3)	(1992.6)
Log(Per Capita GDP)	2.708***	2.478*	2.929**	2.940	0.564	0.506
	(0.846)	(1.308)	(1.147)	(1.846)	(0.459)	(0.739)
Trust	-0.340	-2.138	1.541	-1.367	1.715	0.345
	(3.540)	(3.390)	(5.207)	(4.568)	(1.975)	(2.459)
WGI		0.342		-0.189		0.065
		(1.830)		(2.540)		(1.337)
Legal Origin FR		0.196		-0.284		-0.218
		(1.065)		(1.476)		(0.613)
Legal Origin UK		1.216		2.031		1.547
		(1.691)		(2.518)		(0.968)
Openness		-1.819**		-2.624**		-1.305**
		(0.876)		(1.187)		(0.575)
Continent Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	37	37	37	37	40	40
Adj R^2	0.528	0.632	0.397	0.561	0.145	0.391

Table 7 – Financial Markets and Alternative Measure of Genetic Variation

This table reports the relations between genetic variation and financial market size using an alternative genetic variation measure. *Log(Market Cap)* is the logarithm of the stock market capitalization averaged over 1998 - 2002. *Log(Stocks Traded)* is the logarithm of the total value of shares traded averaged over 1998 - 2002. *Log(Stocks Listed)* is the logarithm of the number of domestically listed companies averaged over 1998 – 2002. *Alt Genetic Variation* is the Migratory distance only predicted measure of genetic variation from Ashraf and Galor (2013), and *Alt Genetic Variation Sqr* is its square. *Per Capita GDP* is the per capita GDP averaged across 1998 - 2002. *WGI* is the average of the six indicators of the World Governance Indicators project for each country over years 1998, 2000, 2002. *Openness* is the sum of import and export divided by GDP averaged over 1998 – 2002. *Legal Origin UK* and *Legal Origin FR* are dummy variables for a country's legal origin of English Common Law and French Civil Law, respectively. Bootstrapped standard errors are reported in the parentheses. (*), (**) and (***) indicate the coefficients are statistically significant at the 10%, 5%, and 1% levels, respectively.

	Log(Market Cap)	*Log(Stocks Traded)*	*Log(Stocks Listed)*
Alt Genetic Variation	485.8**	695.4**	275.9**
	(219.0)	(286.4)	(129.0)
Alt Genetic Variation Sqr	-385.2**	-546.5***	-218.5**
	(157.2)	(204.1)	(93.70)
Log(Per Capita GDP)	1.820***	1.784***	0.154
	(0.327)	(0.378)	(0.218)
WGI	-0.569	0.0778	0.462
	(0.606)	(0.670)	(0.382)
Legal Origin FR	1.663***	1.827***	0.275
	(0.569)	(0.664)	(0.363)
Legal Origin UK	1.971***	2.544***	0.566
	(0.717)	(0.784)	(0.432)
Openness	-2.147***	-3.305***	-1.301***
	(0.574)	(0.694)	(0.369)
Continent Dummies	Yes	Yes	Yes
N	99	98	107
Adj R^2	0.584	0.629	0.302

Table 8 – Financial Markets and Genetic Variation: Sub-sample Analysis

This table presents the relation between genetic variation and financial market size for each different sub-sample (Panels A-E) with the inclusion of *Per Capita GDP* and other controls. In Panel A of Table 7 we exclude the 30 OECD countries from our sample. Panel B reports the results where we omit 48 Sub-Saharan African countries. Panel C, D, and E reports the sub-samples where we omit the 10% of highest GDP per capital countries (Panel C), the 10% of lowest GDP per capital countries (Panel D), and both the 10% of highest and the 10% of lowest GDP per capita countries (Panel E). *Log(Market Cap)* is the logarithm of the average stock market capitalization over 1998 - 2002. *Log(Stocks Traded)* is the logarithm of the average total value of shares traded over 1998 - 2002. *Log(Stocks Listed)* is the logarithm of the average number of domestically listed companies over 1998 – 2002. *Genetic Variation* is the ancestry adjusted predicted genetic variation in 2000 CE from Ashraf and Galor (2013), and *Genetic Variation Sqr* is its square. *Per Capita GDP* is the per capita GDP averaged across 1998 - 2002. *WGI* is the average of the six indicators of the World Governance Indicators project for each country over years 1998, 2000, 2002. *Legal Origin UK* and *Legal Origin FR* are dummy variables for a country's legal origin of English Common Law and French Civil Law, respectively. *Openness* is the sum of import and export divided by GDP averaged over 1998 – 2002. Bootstrapped standard errors are reported in the parentheses. (*), (**) and (***) indicate the coefficients are statistically significant at the 10%, 5%, and 1% levels, respectively.

***Panel A* – Non OECD Countries**			
	Log(Market Cap)	*Log(Stocks Traded)*	*Log(Stocks Listed)*
Genetic Variation	786.9*	1364.7**	611.6**
	(435.5)	(546.2)	(250.3)
Genetic Variation Sqr	-583.7*	-1004.0***	-449.7**
	(311.8)	(390.5)	(179.6)
Log(Per Capita GDP)	1.596***	1.459***	-0.012
	(0.383)	(0.477)	(0.239)
WGI	-1.128	-0.655	0.271
	(0.821)	(0.942)	(0.439)
Legal Origin FR	2.072	2.451	0.453
	(1.336)	(1.690)	(0.795)
Legal Origin UK	2.360*	3.252**	0.682
	(1.288)	(1.457)	(0.711)
Openness	-1.206	-2.001*	-0.777
	(1.152)	(1.231)	(0.538)
Continent Dummies	Yes	Yes	Yes
N	68	67	76
Adj R^2	0.298	0.406	0.175

Panel B **– Non Sub-Saharan African Countries**			
	Log(Market Cap)	*Log(Stocks Traded)*	*Log(Stocks Listed)*
Genetic Variation	910.4*	1423.4**	501.7*
	(502.2)	(601.5)	(257.9)
Genetic Variation Sqr	-675.5*	-1044.6**	-366.9**
	(358.9)	(430.3)	(184.2)
Log(Per Capita GDP)	1.873***	1.722***	0.004
	(0.428)	(0.519)	(0.222)
WGI	-0.114	0.757	0.879**
	(0.756)	(0.886)	(0.384)
Legal Origin FR	1.086*	1.070	-0.060
	(0.594)	(0.740)	(0.385)
Legal Origin UK	1.822**	2.529***	0.744
	(0.805)	(0.935)	(0.490)
Openness	-2.033***	-3.168***	-1.270***
	(0.547)	(0.742)	(0.394)
Continent Dummies	Yes	Yes	Yes
N	84	83	92
Adj R^2	0.590	0.628	0.280

Panel C **– Non Highest 10% GDP Countries**			
	Log(Market Cap)	*Log(Stocks Traded)*	*Log(Stocks Listed)*
Genetic Variation	721.4*	1269.1***	580.2**
	(401.9)	(466.5)	(243.5)
Genetic Variation Sqr	-539.5*	-933.5***	-425.2**
	(286.6)	(333.5)	(173.9)
Log(Per Capita GDP)	1.783***	1.714***	0.281
	(0.353)	(0.435)	(0.208)
WGI	-0.272	0.435	0.458
	(0.662)	(0.802)	(0.370)
Legal Origin FR	1.280**	1.413*	0.114
	(0.623)	(0.744)	(0.454)
Legal Origin UK	1.912**	2.463***	0.594
	(0.804)	(0.930)	(0.496)
Openness	-2.110***	-3.102***	-1.249***
	(0.750)	(0.945)	(0.457)
Continent Dummies	Yes	Yes	Yes
N	88	87	95
Adj R^2	0.536	0.594	0.321

***Panel D* – Non Lowest 10% GDP Countries**			
	Log(Market Cap)	*Log(Stocks Traded)*	*Log(Stocks Listed)*
Genetic Variation	965.3*	1558.9**	617.1**
	(537.4)	(666.4)	(270.2)
Genetic Variation Sqr	-712.4*	-1139.6**	-448.2**
	(384.3)	(476.5)	(193.4)
Log(Per Capita GDP)	1.707***	1.411***	-0.114
	(0.504)	(0.533)	(0.258)
WGI	-0.0604	0.878	0.874**
	(0.821)	(0.935)	(0.385)
Legal Origin FR	1.216**	1.535**	0.0351
	(0.591)	(0.715)	(0.403)
Legal Origin UK	1.694*	2.913***	0.679
	(0.894)	(0.871)	(0.542)
Openness	-2.197***	-3.556***	-1.433***
	(0.570)	(0.757)	(0.404)
Continent Dummies	Yes	Yes	Yes
N	88	87	95
Adj R^2	0.541	0.608	0.303

***Panel E* – Non Lowest and Highest 10% GDP Countries**			
	Log(Market Cap)	*Log(Stocks Traded)*	*Log(Stocks Listed)*
Genetic Variation	951.3*	1526.5**	556.5*
	(529.8)	(659.2)	(288.1)
Genetic Variation Sqr	-704.2*	-1118.5**	-406.5**
	(379.8)	(471.3)	(206.0)
Log(Per Capita GDP)	1.721***	1.446***	0.0490
	(0.507)	(0.528)	(0.270)
WGI	-0.196	0.696	0.693*
	(0.807)	(0.970)	(0.403)
Legal Origin FR	1.260*	1.669*	0.0572
	(0.675)	(0.853)	(0.430)
Legal Origin UK	1.629*	2.830***	0.634
	(0.956)	(1.027)	(0.541)
Openness	-2.105***	-3.307***	-1.387***
	(0.791)	(1.007)	(0.507)
Continent Dummies	Yes	Yes	Yes
N	79	78	85
Adj R^2	0.492	0.568	0.294

Appendix A – List of Countries Included in Our Sample

Below is the list of countries that comprise our sample. The table includes the name of the country as well as the 3 letter World Bank country code identifier. We indicate with an "X" which of the six financial market size measure we have data for each country. In total, our sample consists of 155 countries, although the sample size for each regression specification varies based on which financial market size measure is used and which set of control variable are included.

Country Code	***Country***	***Market Cap***	***Stocks Traded***	***Stocks Listed***	***Liquid Liabilities***	***Domestic Credit***	***Private Credit***
AGO	Angola				X	X	X
ALB	Albania				X	X	X
ARE	United Arab Emirates			X		X	
ARG	Argentina	X	X	X	X	X	X
ARM	Armenia	X	X	X	X	X	X
AUS	Australia	X	X	X	X	X	X
AUT	Austria	X	X	X	X	X	X
AZE	Azerbaijan			X	X	X	X
BDI	Burundi				X	X	X
BEL	Belgium	X	X	X	X	X	X
BEN	Benin				X	X	X
BFA	Burkina Faso				X	X	X
BGD	Bangladesh	X	X	X	X	X	X
BGR	Bulgaria	X	X	X	X	X	X
BHR	Bahrain	X	X	X	X	X	X
BIH	Bosnia and Herzegovina					X	
BLR	Belarus				X	X	X
BLZ	Belize				X	X	X
BOL	Bolivia	X	X	X	X	X	X
BRA	Brazil	X	X	X	X	X	X
BTN	Bhutan	X		X	X	X	
BWA	Botswana	X	X	X	X	X	X
CAF	Central African Republic				X	X	X
CAN	Canada	X	X	X	X	X	X
CHE	Switzerland	X	X	X	X	X	X
CHL	Chile			X		X	
CHN	China	X	X	X	X	X	X
CIV	Côte d'Ivoire	X	X	X	X	X	X
CMR	Cameroon				X	X	X
COG	Congo, Rep.				X	X	X
COL	Colombia	X	X	X	X	X	X
COM	Comoros				X	X	X
CPV	Cape Verde				X	X	X
CRI	Costa Rica	X	X	X	X	X	X

CYP	Cyprus	X	X	X	X	X	X
CZE	Czech Republic	X	X	X	X	X	X
DEU	Germany	X	X	X	X	X	X
DNK	Denmark	X	X	X	X	X	X
DOM	Dominican Republic				X	X	X
DZA	Algeria				X	X	X
ECU	Ecuador	X	X	X	X	X	X
EGY	Egypt, Arab Rep.	X	X	X	X	X	X
ERI	Eritrea					X	
ESP	Spain	X	X	X	X	X	X
EST	Estonia	X	X	X		X	X
ETH	Ethiopia				X	X	X
FIN	Finland	X	X	X	X	X	X
FJI	Fiji	X	X	X	X	X	X
FRA	France	X	X	X	X	X	X
GAB	Gabon				X	X	X
GBR	United Kingdom	X	X	X	X	X	X
GEO	Georgia	X	X	X	X	X	X
GHA	Ghana	X	X	X	X	X	X
GIN	Guinea					X	
GMB	Gambia, The				X	X	X
GNB	Guinea-Bissau				X	X	X
GNQ	Equatorial Guinea				X	X	X
GRC	Greece	X	X	X	X	X	X
GTM	Guatemala	X	X	X	X	X	X
GUY	Guyana				X	X	X
HKG	Hong Kong, China	X	X	X	X	X	X
HND	Honduras			X	X	X	X
HRV	Croatia	X	X	X	X	X	X
HTI	Haiti				X	X	X
HUN	Hungary	X	X	X	X	X	X
IDN	Indonesia	X	X	X	X	X	X
IND	India	X	X	X	X	X	X
IRL	Ireland	X	X	X	X	X	X
IRN	Iran, Islamic Rep.	X	X	X	X	X	X
ISR	Israel	X	X	X	X	X	X
ITA	Italy	X	X	X	X	X	X
JAM	Jamaica	X	X	X	X	X	X
JOR	Jordan	X	X	X	X	X	X
JPN	Japan	X	X	X	X	X	X
KAZ	Kazakhstan	X	X	X	X	X	X
KEN	Kenya	X	X	X	X	X	X
KGZ	Kyrgyz Republic	X	X	X	X	X	X
KHM	Cambodia				X	X	X
KOR	Korea, Rep.	X	X	X	X	X	X

KWT	Kuwait	X	X	X	X	X	X
LAO	Lao PDR				X	X	X
LBN	Lebanon			X		X	
LBR	Liberia				X	X	X
LBY	Libya				X	X	X
LKA	Sri Lanka	X	X	X	X	X	X
LSO	Lesotho				X	X	X
LTU	Lithuania	X	X	X	X	X	X
LUX	Luxembourg	X	X	X	X	X	X
LVA	Latvia	X	X	X	X	X	X
MAR	Morocco	X	X	X	X	X	X
MDA	Moldova	X	X	X	X	X	X
MDG	Madagascar				X	X	X
MEX	Mexico	X	X	X	X	X	X
MKD	Macedonia, FYR	X	X	X	X	X	X
MLI	Mali				X	X	X
MLT	Malta	X	X	X	X	X	X
MNG	Mongolia	X	X	X	X	X	X
MOZ	Mozambique				X	X	X
MUS	Mauritius	X	X	X	X	X	X
MWI	Malawi				X	X	X
MYS	Malaysia	X	X	X	X	X	X
NAM	Namibia	X	X	X	X	X	X
NER	Niger				X	X	X
NGA	Nigeria	X	X	X	X	X	X
NIC	Nicaragua				X	X	X
NLD	Netherlands	X	X	X	X	X	X
NOR	Norway	X	X	X	X	X	X
NPL	Nepal	X	X	X	X	X	X
NZL	New Zealand	X	X	X	X	X	X
OMN	Oman	X	X	X	X	X	X
PAK	Pakistan	X	X	X	X	X	X
PAN	Panama	X	X	X	X	X	X
PER	Peru	X	X	X	X	X	X
PHL	Philippines	X	X	X	X	X	X
PNG	Papua New Guinea	X	X	X	X	X	X
POL	Poland	X	X	X	X	X	X
PRT	Portugal	X	X	X	X	X	X
PRY	Paraguay	X	X	X	X	X	X
QAT	Qatar			X		X	
ROM	Romania	X	X	X	X	X	X
RUS	Russian Federation	X	X	X	X	X	X
RWA	Rwanda				X	X	X
SAU	Saudi Arabia	X	X	X	X	X	X
SDN	Sudan				X	X	X

SEN	Senegal				X	X	X
SGP	Singapore	X	X	X	X	X	X
SLE	Sierra Leone					X	
SLV	El Salvador	X	X	X	X	X	X
SVK	Slovak Republic	X	X	X		X	X
SVN	Slovenia	X	X	X	X	X	X
SWE	Sweden	X	X	X	X	X	X
SWZ	Swaziland	X	X	X	X	X	X
SYR	Syrian Arab Republic				X	X	X
TCD	Chad				X	X	X
TGO	Togo				X	X	X
THA	Thailand	X	X	X	X	X	X
TJK	Tajikistan				X	X	X
TKM	Turkmenistan					X	
TMP	Timor-Leste					X	
TTO	Trinidad and Tobago	X	X	X	X	X	X
TUN	Tunisia	X	X	X	X	X	X
TUR	Turkey	X	X	X	X	X	X
TZA	Tanzania	X	X	X	X	X	X
UGA	Uganda	X	X	X	X	X	X
UKR	Ukraine	X	X	X	X	X	X
URY	Uruguay	X	X	X	X	X	X
USA	United States	X	X	X	X	X	X
UZB	Uzbekistan			X			
VEN	Venezuela, RB			X		X	
VNM	Vietnam				X	X	X
YEM	Yemen, Rep.				X	X	X
ZAF	South Africa	X	X	X	X	X	X
ZAR	Congo, Dem. Rep.				X	X	X
ZMB	Zambia	X	X	X	X	X	X
ZWE	Zimbabwe	X	X	X	X	X	X

Appendix B – Variable Descriptions and Data Sources

Market Cap Stock market capitalization averaged across 1998 – 2002; Source: World Bank Global Financial Development Database;

Stocks Traded	Total value of shares traded averaged across 1998 – 2002; Source: World Bank Global Financial Development Database;
Stocks Listed	Total number of domestically listed companies on the country's stock Exchanges averaged across 1998 – 2002; Source: World Bank Global Financial Development Database;
Domestic Credit	Financial resource provided to the private sector averaged across 1998 – 2002; Source: World Bank Global Financial Development Database;
Liquid Liabilities	The liquid liabilities (M3) averaged across 1998 – 2002; Source: World Bank Global Financial Development Database;
Private Credit	Private credit by deposit money banks and other financial institutions averaged across 1998 – 2002; Source: World Bank Global Financial Development Database;
Genetic Variation	Ancestry adjusted measure of predicted genetic variation in 2000 CE; Source: Ashraf and Galor (2013);
Alt Genetic Variation	Migratory distance only ;predicted measure of genetic variation; Source: Ashraf and Galor (2013)
Population	Population of the country; Source: World Bank Global Financial Development Database;
Legal FR	Dummy variable for a country's legal origin of French Civil Law; Source: Ashraf and Galor (2013);
Legal UK	Dummy variable for a country's legal origin of English Common Law; Source: Ashraf and Galor (2013);
P_Catholic	Percentage of a country's population belonging to Roman Catholic; Source: Ashraf and Galor (2013);
Openness	Sum of import and export divided by GDP averaged across 1998 – 2002; Source: World Bank Open Data;
Per Capita GDP	Per capita GDP averaged across 1998 – 2002; Source: World Bank Global Financial Development Database;
Individualism	Degree to which individuals are integrated into groups; Source: Hofstede's website;
Uncertainty Avoidance	The extent to which a culture programs its members to feel either uncomfortable or comfortable in unstructured situations; Source: Hofstede's website;
Power Distance	The extent to which the less powerful members of organizations and institutions (like the family) accept and expect that power is distributed unequally; Source: Hofstede's website;
Masculinity	The distribution of emotional roles between the genders; Source: Hofstede's website;
Trust	Measure of inter-personal trust which is the percentage of the surveyed respondents in the World Value Survey that reported that "most people can be trusted"; it is constructed using only Waves 3 and 4 for countries that are included in those waves. For other countries that are included in at least one of the other waves, it is constructed from those other waves in the same manner. Source: WVS Waves 1-6 http://www.worldvaluessurvey.org;
WGI	The average of the six world governance indicators for each country, which are each individually averaged over 1998, 2000, and 2002 ; Source: World Bank Worldwide Governance Indicators Database;
Malaria	Percentage of the population at risk of contracting malaria; Source: Ashraf and Galor (2013);

Appendix C – Interpersonal Trust and Genetic Variation

This table reports the empirical, country-level relation between genetic variation and trust. *Trust* is the degree of self-reported interpersonal trust from the World Values Survey question about whether people can be trusted. *Genetic Variation* is the ancestry adjusted predicted genetic variation in 2000 CE from Ashraf and Galor (2013). *WGI* is the average of the six indicators of the World Governance Indicators project for each country over years 1998, 2000, 2002. *Legal Origin UK* and *Legal Origin FR* are dummy variables for a country's legal origin of English Common Law and French Civil Law, respectively. *Malaria* is the percentage of the population at risk of contracting malaria. *Openness* is the sum of import and export divided by GDP averaged over 1998 – 2002. *P_Catholic* is the percentage of a country's population belonging to Roman Catholic. *Individualism* is Hofstede's Individualism index. *Uncertainty Avoidance* is Hofstede's measure for a society's tolerance for uncertainty and ambiguity. *Masculinity* is Hofstede's measure that refers to the distribution of emotional roles between the genders. *Power Distance* is Hofstede's measure that refers to the extent to which the less powerful members of organizations and institutions accept and expect that power is distributed unequally. Heteroskedasticity-robust standard errors are reported in the parentheses. (*), (**) and (***) indicate the coefficients are statistically significant at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: Trust		
	1	2	3
Genetic Variation	-1.274*	-1.370***	-1.391
	(0.766)	(0.626)	(1.037)
Log(Per Capita GDP)	0.026***	0.006	0.024
	(0.010)	(0.021)	(0.027)
WGI		0.070**	0.031
		(0.032)	(0.042)
Legal Origin FR		0.007	0.019
		(0.039)	(0.043)
Legal Origin UK		-0.052	-0.070
		(0.043)	(0.062)
Malaria		0.076	0.116
		(0.075)	(0.184)
Open		-0.040	-0.075*
		(0.032)	(0.039)
P_Catholic		-0.002***	-0.001
		(0.001)	(0.001)
Individualism			0.001
			(0.001)
Uncertainty Avoidance			-0.003***
			(0.001)
Masculinity			-0.001
			(0.001)
Power Distance			-0.000
			0.001
Continent Dummies	Yes	Yes	Yes
N	90	87	56
Adj R^2	0.302	0.415	0.605