

# Culture and Firm Growth

**Narjess Boubakri**

Bank of Sharjah Chair

American University of Sharjah, UAE

[nboubakri@aus.edu](mailto:nboubakri@aus.edu)

**Walid Saffar**

School of Accounting and Finance, The Hong Kong Polytechnic

University

[walid.saffar@polyu.edu.hk](mailto:walid.saffar@polyu.edu.hk)

## Abstract

In this paper, we provide the first firm-level evidence on the importance of culture, and its interdependence with legal (formal) institutions, in determining firm growth. We conjecture that culture, even after taking into account its impact through political and legal institutions, has a direct effect on firm-level growth. Using an international sample of 42,377 firms from 57 countries over the period 1989 to 2012, we find support for our hypothesis even after we control for potential indirect channels of transmission. We also find that informal institutions tend to substitute to formal institutions in affecting corporate growth as the link between culture and growth becomes stronger in countries with low access to finance.

**November 2015**

**JEL classification:** G18; G32; G38; P16

**Key words:** growth, culture, legal environment.

# Culture and Firm Growth

## 1. Introduction

Because firm growth is considered to be the driver of industry-wide and overall economic growth, its dynamics has been at the core of economic policies around the world. To foster firm growth, it is now established that access to finance through well-functioning capital markets is a necessary pre-requisite. This has conditioned the design of many financial development policies across a wide set of countries aimed at fostering financial markets and banking sectors' growth to provide the vital sources of external financing needed by corporations to finance their investments (Rajan and Zingales, 1998; Levine, 2005). Formal institutions embedded in the legal environment and framework also condition firm growth as the "Law and Finance" view holds, and across- country differences in firm-growth are shown to depend indeed on the quality of these institutions (Demirgüç-Kunt and Maksimovic, 1998; 2002). However, even after taking into account the impact of access to finance and legal institutions, a full understanding of the dynamics of firm growth is yet to be achieved, since several questions remain unanswered. For instance, do informal institutions, namely culture, play a role in firms' propensity to invest and grow? If so, how do formal and informal institutions interplay in affecting firm growth? In this paper, we contribute to this debate by providing the first firm-level evidence on the importance of culture, and its interdependence with legal institutions in determining firm growth as an outcome. Specifically, we test whether culture, after taking into account its impact through political and legal institutions, has a direct

effect on firm-level growth. Our firm level approach complements evidence on the role of culture on long-term economic growth (Gorodnichenko and Roland, 2011).

North (1990) distinguishes formal institutions (which correspond to political, legal and regulating structures) from informal institutions, which he defines as follows: "They (the informal institutions) come from socially transmitted information and are part of the heritage that we call culture." It is these informal institutions (through values and preferences) that shape individuals' perceptions and incentives (Tabellini, 2006). Li and Zahra (2012) also clearly define formal institutions as "a set of political economic and contractual rules that regulate individual behavior," while culture refers to "the set of attitudes and beliefs" prevalent among individuals in a society. These perceptions embedded in national culture are found in the literature to determine economic choices and individuals' behavior (e.g., Guiso et al., 2006; Kwok and Tadesse, 2006; Chui et al., 2010). For instance, at the macro level, national culture has been linked with creditor rights and investor protection (Stulz and Williamson, 2003), and with financial development (Levine, 2005; King and Levine, 1993). Research has further established that national culture has an impact on various corporate policies and management practices at the firm level, including disclosure policies (Hope, 2003), corporate governance (Doidge et al., 2007), composition and structure of boards of directors (Li and Harrison, 2008), risk taking and innovation (Li et al., 2013), capital structure decisions (Chui et al., 2002; Li et al., 2011), and dividend policy (Shao et al., 2013).

Our interest in revisiting the determinants of corporate growth is grounded in the following observations: (1) to maintain their competitiveness, firms continually strive to identify new opportunities that generate revenue streams. In an increasingly more globalized

environment, this task has become more challenging, thus making understanding the determinants of growth a timely issue. (2) This is also a crucial question because it “[c]an provide insights into the dynamics of the competitive process, strategic behavior, the evolution of market structure, and even the growth of the aggregate economy” (Carpenter and Petersen, 2002: 298). (3) Finally, understanding firm growth determinants is important to policy-makers who seek to establish customized development strategies to encourage risk-taking, entrepreneurship, and firm growth.

As a measure of culture, we primarily focus in this paper on Hofstede’s (2001) distinction between individualism and collectivism. According to Hofstede, an individualistic society is one in “which the ties between individuals are loose. Everyone is expected to look after himself and his immediate family only,” while “collectivism stands for a society in which people from birth onwards are integrated into strong, cohesive in-groups, which throughout people’s lifetime continue to protect them in exchange for unquestioning loyalty.” Hofstede (2001) maps culture across four dimensions that include individualism, masculinity, power distance and uncertainty avoidance. He finds that the *individualism* score is the first and the most important component in the factor analysis that groups all four cultural dimensions he identifies.

Several authors establish that this specific cultural dimension is the major driver of cross-country cultural differences, affecting macroeconomic outcomes such as the country’s long-run economic growth, and note that only individualism has a robust effect, compared to the other dimensions of culture (Gorodnichenko and Roland, 2011). This result, according to the authors, derives from the fact that an individualist culture is associated with more innovation, a higher level of total factor productivity, and higher long-term growth. More related to our purposes, Li

and Zahra (2012: 99) describe individualistic societies as typically replying more on contract-based, arms length market transactions. The authors argue that “in these societies, people are motivated by personal achievement while showing less concern for compliance with societal rules, which may help promote innovation, and entrepreneurship.” By contrast “collectivist societies typically rely more on informal relationships and connections as a means of safeguarding against potential opportunistic behavior preserving order, enforcing contracts and reducing transaction costs”(Li and Zahra, 2012: 99). Although we place a particular focus on individualism in our analysis, we still consider all other three dimensions in our robustness checks, keeping in mind these other cultural aspects, uncertainty avoidance, masculinity, and power distance are strongly and significantly correlated with the individualism dimension (Gorodnichenko and Roland, 2011).

In our investigation, we differentiate between direct and indirect transmission mechanisms running from culture to firm growth, and ask whether the direct micro-level effects remain after we account for the macro-level indirect effect through formal institutions. Specifically, we argue that culture affects corporate growth directly through its effect on individual decision-making (e.g., incentives, attitude, risk-taking), and indirectly through its effect on a country’s formal institutions (e.g., investor protection and rule of law, financial structure). We control in our empirical analysis for these indirect channels so that we capture both the direct and indirect influences of culture on firm growth.

The indirect channel running from culture to firm growth is at the macro level. Indeed, culture can indirectly affect firm growth through its impact on formal institutions and financial development (which conditions the firms’ access to finance). Previous studies show that culture

is linked to the level of institutional development, specifically with creditor rights, investor protection, and judicial efficiency (Stulz and Williamson, 2003; Radenbaugh et al., 2006). Likewise, culture seems to explain cross-country variations in financial systems as demonstrated by Kwok and Tadesse (2006) who find that higher uncertainty-avoidance countries are dominated by bank-based financial systems, rather than by stock- markets. Individualism is also associated to market-based systems that provide financing to innovative and growing firms. Lee and Peterson (2000) show in this regard that countries that emphasize individualism are characterized by a strong entrepreneurial orientation, more entrepreneurship, and enhanced global competitiveness. Collectively, these arguments suggest that, since firm growth is conditioned by the quality of institutions in the country and by access to finance (Demirgüç-Kunt and Maksimovic, 2002), and since culture affects both of these formal institutions (e.g., Licht et al., 2005, 2007; Kwok and Tadesse, 2006), we postulate that culture will have an indirect effect on firm growth through these channels.

In addition, culture can have a direct impact on firm growth by shaping expectations and preferences, and affecting economic activity and managerial decisions through the choices that people make on how to allocate scarce resources. Several studies show how national culture influences capital providers and their representatives (such as corporate boards) (Griffin et al., 2014). Relatedly, Hope (2003) provides evidence that culture (as proxied by Hofstede's cultural dimensions) contributes to explain firms' disclosure practices. In fact, culture remains a significant determinant even after controlling for legal institutions, suggesting that culture has an independent effect on corporate transparency. Several studies focus on the individualism cultural dimension and its corporate outcomes. For instance, Taylor and Wilson (2012) confirm that high-levels of cultural individualism correlate with national innovation rates, implying that

individualism generally helps (and collectivism generally hurts) rates of technology patenting and scientific research publication. Research has further established that culture has an effect on the decision-making process at the individual level (Hilary and Hui, 2009; Halek and Eisenhauer, 2001; Graham et al., 2009) and provided evidence that individualistic culture norms encourage more risk-taking, while collectivistic norms tend to deter it (Li et al., 2012). Individualism directly affects firm growth because it fosters norms of self-reliance, self-interest providing individuals with incentives to accumulate wealth and invest. Collectivism in contrast can act as a disincentive to accumulate or invest since one is expected to share with the larger in-groups and because one can rely on free-riding on others (Mihet, 2013). To summarize, the individualism/collectivism dimension of culture is directly correlated with the firm's propensity to invest and hence to grow because it conditions the beliefs, incentives, and decision-making process of individuals.

In a follow up question, we examine whether the link between culture and firm growth is moderated by the firm's access to finance, proxied by the country's financial markets' development, which provides an indication of how effective the legal system is. According to Demirgüç-Kunt and Maksimovic (1998: 2108), "an effective legal system is important because a firm that wishes to obtain long term financing must be able to commit credibly to control opportunistic behavior by corporate insiders." La Porta et al. (1998) establish that legal systems and investors protection rights are directly related to financial development. Thus, in countries with low access to finance (generally related to weak formal institutions such as property rights and investor protection), we expect the link between culture and corporate growth to be more pronounced as informal norms of culture will substitute for the weakness of formal norms and hence engender a stronger effect on the firm's propensity to invest.

Using a large sample of 42,377 firms from 57 countries over the period 1989 to 2012, we find support for the conjecture that culture affects firm growth. Specifically, we find that individualism is positively related to firm growth. This result remains unchanged even when we consider the other three Hofstede cultural dimensions. Interestingly, we are able to show that culture has an *independent* direct effect on corporate growth, as our individualism measure remains significant after we control for potential indirect channels of transmission. This finding is also unaffected after we run robustness checks and control for the potential endogeneity of individualism, the use alternative proxies for individualism, alternative dependent and control variables, and running country-level regression. We additionally provide evidence that informal institutions tend to substitute to formal institutions in affecting corporate growth as the link between individualism and firm growth becomes stronger in countries with low access to finance.

Our study contributes to several strands of the literature. *First*, we add to the literature on the importance of informal norms to economic outcomes and financial decisions. *Second*, we expand the literature on cross-country differences in firm growth (Demirgüç-Kunt and Maksimovic, 1998; 2002) by adding to our understanding of the determinants of such differences. Going beyond Demirgüç-Kunt and Maksimovic (1998; 2002), we provide evidence that while legal institutions and financial development affect the ability of firms to get external financing, culture affects firm growth through the informal norms that condition managerial decision-making. *Third*, by showing how culture can affect firm outcomes, we point out that the same formal institutions can lead to different economic outcomes in culturally different societies. *Finally*, we provide firm-level evidence on how culture impacts growth complementing macroeconomic evidence in Gorodnichenko and Roland (2011). Our findings



suggest that cultural values should be accounted for when designing government policies aimed at encouraging entrepreneurship, innovation, and growth.

The remainder of the paper is organized as follows: Section 2 provides an overview of the literature and derives our testable hypotheses. Section 3 discusses our sample and variables, as well as summary statistics, while Section 4 presents the main empirical analysis. Robustness checks are reported in Section 5, and results on the interplay between informal institutions (culture) and access to finance in determining firm growth in Section 6. Section 7 concludes.

## **2. Culture and Firm Growth: Literature Review and Hypotheses Development**

The importance of effective legal and financial systems to firm growth is clearly highlighted in Demirgüç-Kunt and Maksimovic (1998) who argue that market imperfections, caused by conflicts of interest and informational asymmetries between corporate insiders and investors, constrain firms in their ability to fund investment projects. The magnitude of these imperfections depends in part on the effectiveness of the legal and financial systems. According to the authors, the existence of developed and active financial markets should make it easier for firms to raise long-term capital while an effective legal system allows firms to credibly commit to controlling insiders' opportunistic behavior, and protecting investors' rights. Demirgüç-Kunt and Maksimovic (1998; 2002) empirically show that investor protection and stock market development are associated with firm growth financed by long term external debt and equity.

Another strand of the literature however shows that these formal institutions are themselves determined by culture. For instance, Stulz and Williamson (2003) and Licht et al. (2005) find that culture affects creditor rights, investor rights protection, and judicial efficiency.

In the same vein, Li and Peterson (2000) establish that market-based systems that provide long term finance to innovative and growing firms are linked to individualism.

The theoretical framework behind this literature is found in Williamson (2000) which builds on North's (1990) distinction between formal institutions (defined as the political, legal, and regulating structures), and informal institutions (that consist of cultural values, preferences, and norms). Williamson's model of social analysis is structured around four levels that constrain each other from top to bottom. In level 1, we find informal constraints/institutions that include culture and cultural norms. Level 2 includes formal institutions such as investor protection, legal and political framework, and property rights. The next level (level 3) includes the governance structure, norms and mechanisms, while the bottom level 4 consists of observable outcomes in the economy. According to Williamson's (2000) analysis, level 1 informal institutions including culture determine formal institutions choices as recently evidenced in Licht et al. (2005), Stulz and Williamson (2003) and Radenbaugh et al. (2006). Since formal institutions themselves affect corporate governance structures at the firm level, one can conclude that culture has an indirect effect on level 4 firm outcomes, such as risk-taking, dividend policy or capital structure. Nevertheless, culture (level 1 informal institutions) may also affect firm outcomes directly through its influence on human beliefs, incentives, actions and choices.

Applied to our framework, Williamson (2000) suggest that (1) individualism/collectivism indirectly affects firm growth through the impact of formal institutions (legal and political institutions, and financial development), and (2) individualism/collectivism has a direct effect on firm growth (level 4 outcome) through its effect on individual preferences and choices. Drawing from extant literature, we can identify several

channels through which such effect can materialize. At the country-level, evidence by Kwok and Tadesse (2006) already shows how culture was material in developing financial systems around the world, while Licht et al. (2005) establishes the impact of culture on the country's investor's protection institutions. At the firm-level, culture affects the composition and structure of boards of directors (Li and Harrison, 2008), and corporate governance practices (Doidge et al., 2007; Griffin et al., 2014), both of which are determinants of firm performance, value and growth. Particularly, Griffin et al. (2014) document a positive and significant link between individualism (one of two variables of interest), and accountability, transparent disclosure and corporate behavior standards. In the same vein, recent studies similarly show that individualism is positively associated to risk-taking (e.g., Mihet, 2013; Li et al., 2013; Shao et al., 2013). Because individualism emphasizes personal achievements and competitive behavior, higher risk taking (a determinant of firm propensity to invest, grow and innovate) is more likely. Li et al. (2013) also associate higher risk taking in individualistic societies to a higher demand for transparency and investors' rights protection.

In a nutshell, while the individualism/collectivism dimension of culture may affect firm growth by constraining level 2 formal institutions and level 3 governance institutions, we argue that there is also a potential direct effect as individualistic values that emphasize competition, individual freedom, achievement, advancement and recognition will be reflected in individuals' decisions in their search for growth opportunities, and their willingness to take more risk. All of these channels through which individualism affects firm growth will result in a higher observable firm growth in individualistic, as opposed to collectivist societies. We thus formulate our first hypothesis as follows:

*H1: Individualism is positively related to firm growth.*

According to Demirgüç-Kunt and Maksimovic (2002: 339) “A financial system’s major tasks include mobilizing resources for investment, selecting investment projects to be funded, and providing incentives for the monitoring of the performance of the funded investments.” Efficient financial systems and the access to finance are particularly important to economic development/growth as highlighted by Levine (2005) and King and Levine (1993).

Pioneering the “Law and Finance” view, La Porta et al. (1998) argue that a country’s legal system is a primary determinant of the effectiveness of its financial system since it determines the enforceable contracts between firms and investors, and the extent of investors rights protection. Demirgüç-Kunt and Maksimovic (2002) find indeed that in those countries where the legal contracting environment predicts a high level of development for securities markets, more firms grow at rates requiring long-term external finance.

To the extent that (1) weak property rights and legal institutions characterize lower financial development and hence a more constrained access to long term finance required for innovation and growth, and given that (2) weaker institutions according to Demirgüç-Kunt and Maksimovic (2002) lead to lower firm growth, we expect that in countries where firms face more difficulties in securing finance, individualism and firm growth will be more strongly related. In other words, we contend that informal institutions (i.e., individualism/collectivism) will substitute to ineffective formal institutions when determining firm growth. This discussion suggests the following hypothesis:

*H2: The impact of individualism on firm growth is stronger in countries with lower access to finance.*

### 3. Sample, Variables, and Descriptive Statistics

#### 3.1 Sample Construction

Our data come from *Compustat Global* and *Compustat North America*, with a time period from 1989 to 2012. We exclude financial firms (SIC code: 6000-6999) because: (1) these firms, compared with non-financial firms, have essentially different determinants on profitability and leverage ratios and growth rate; (2) these highly regulated firms are very sensitive to institutional environment. We also exclude the firm-year observations with missing values on excess growth, individualism proxy, and other control variables. The final sample contains 413,411 firm-year observations, for 42,377 individual firms across 57 countries. These countries include Argentina, Australia, Austria, Bangladesh, Belgium, Brazil, Bulgaria, Canada, Chile, China, Colombia, Czech Republic, Denmark, Ecuador, Estonia, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Indonesia, Ireland, Israel, Italy, Jamaica, Japan, Luxembourg, Malaysia, Malta, Mexico, Morocco, Netherlands, New Zealand, Norway, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Russia, Singapore, Slovakia, South Africa, South Korea, Spain, Sweden, Switzerland, Thailand, Trinidad and Tobago, Turkey, UK, US, Venezuela and Vietnam. To eliminate survivorship bias, our final sample includes inactive firms.

#### 3.2 Variables

##### 3.2.1 Firm Growth

Following Demirgüç-Kunt and Maksimovic (1998, 2002), we estimate firm-level growth. We first define a firm's external financing need, *EFN*, as the difference between the increase in assets and additions to retained earnings, shown in Equation (1).

$$EFN_t = A_t \cdot g_t - E_t \cdot b_t \cdot (1 + g_t), \quad (1)$$

where  $t$  proxies for time,  $A$  denotes assets,  $g$  denotes growth,  $E$  denotes earnings after interest and taxes, and  $b$  denotes the plowback rate.

Next, we use Equation (1) and take three different approaches to measure a firm's maximum constrained growth rate. The first approach is to measure the maximum growth rate with the only support of internal financing,  $IG$ . We assume the firm has no dividends payout ( $b=1$ ), and allow  $EFN$  to be zero. Thus, Equation (1) can be transferred into Equation (2):

$$IG_t = \frac{ROA_t}{1 - ROA_t}. \quad (2)$$

The second approach is to measure the maximum growth rate with the supports of both internal financing and short-term borrowing,  $SFG$ . We assume the firm has no dividends payout ( $b=1$ ), allow  $EFN$  to be zero, and substitute long-term capital ( $LTC$ , i.e., assets times the difference of one and the ratio of short-term liabilities to total assets) for assets. Thus, Equation (1) can be transferred into Equation (3):

$$SFG_t = \frac{ROLTC_t}{1 - ROLTC_t}. \quad (3)$$

The third approach is to measure the maximum growth rate with the supports of both internal financing and corporate borrowing (i.e., short-term and long-term debts). We still assume the firm has no dividends payout ( $b=1$ ), allow  $EFN$  to be zero, and substitute book equity for assets. Thus, Equation (1) can be transferred into Equation (4):

$$SG_t = \frac{ROE_t}{1 - ROE_t}. \quad (4)$$

According to Demirgüç-Kunt and Maksimovic (1998), we generate three variables  $XR\_IG$ ,  $XR\_SFG$ , and  $XR\_SG$ . For each firm-year observation, these variables are equal to one if the inflation-adjusted sales growth exceeds the maximum constrained growth rates  $IG$ ,  $SFG$ , and  $SG$ , respectively, and zero otherwise.

### 3.2.2 Individualism Variables

Consistent with prior studies (Chui and Kwok, 2008; Chui et al., 2010), our study uses the individualism-collectivism index designed by Hofstede (2001). Hofstede's (1983) culture dimensions, which have arguably had the greatest influence among various cultural distinctions in cross-cultural research (Schwartz, 1994; Sivakumar and Nakata, 2001; Kirkman et al., 2006), uses information collected from the international employees in a large corporation, and comprise four different measures of culture dimensions: individualism-collectivism, uncertainty avoidance ( $UAI$ ), power distance ( $PDI$ ), and masculinity-femininity ( $MAS$ ). Hofstede (2001)'s individualism-collectivism index measures the extent to which individuals target their goals over those of their groups. A higher index value means a higher degree of individualism ( $IDV$ ).

Hofstede (1983) considers culture as extremely stable over time. We also agree with Hofstede (1983) that the culture dimensions indicate the relative position of one country compared to another that rarely shifts even if culture changes. To challenge the robustness of our evidence, we also test our findings by using Tang and Koveos' (2008) updated Hofstede index on individualism ( $IDV\_TK$ ), which is based on economic mutation within a country.

### 3.2.3 Control Variables

Following existing literature (e.g., Demirgüç-Kunt and Maksimovic, 1998, 2002; Khurana et al., 2006, 2008; Boubakri et al., 2014), we control for several firm- and country-level variables that influence firm growth. At the country level, we first control for law and order (*LAW*), which measures a country's contracting environment and legal effectiveness. We next control for Henisz' (2012) political constraints index (*POLCONV*) to measure a country's soundness of political institutions. Henisz' index ranges from zero to one. A score of one indicates tight political constraints and hence strong political institutions. Henisz' index takes into account various characteristics of the political institutions, including the extent of constraints on veto players in the system and their political preferences. We then control for stock market turnover (*TURNOVER*), which equals the total value of shares traded divided by market capitalization, to measure the level of stock market activity. We further control for the size of the banking sector (*BANK*), which equals the ratio of banks' domestic deposit assets to GDP, to measure the level of financial institutions' development. In addition, we employ two other variables, inflation rate (*INFLATION*) and real GDP growth (*GDPGR*), to measure a country's economic environment. At the firm level, we control for the ratio of net fixed assets to total assets (*NFA*), leverage (*LEVERAGE*), size (*SIZE*), and profitability (*PROFIT*). Finally, we control for year and industry (Campbell's (1996) industries classification) fixed effects in all the regressions.

### 3.3 Descriptive Statistics

Table 1 reports the distribution of the firm-year observations and the country average values of the different variables presented above. The statistics show that our sample is dominated by firms from four countries, including the US (30.97%), Japan (13.27%), India (6.88%),



and China (6.44%). Each of the other countries represents less than 5% of the sample. The proxy for growth rates (*XR\_SFG*) exhibits the highest values among firms in Panama, USA, South Korea, and Canada, while a lower values among firms in Ecuador, Jamaica, Hungary, Vietnam, and Morocco. The individualism proxy is high in the US, Australia, and U.K., but very low in Ecuador. Similarly, the proxies for political institutions (*POLCONV*) and rule of law (*LAW*) demonstrate variations across countries. *POLCONV* shows a maximum of 0.89 in Belgium and a minimum of 0 in China. *LAW* is high in Western countries, Australia, and New Zealand, and low in Colombia and Venezuela. In summary, Table 1 exhibits a cross-country heterogeneity in the informal (culture), political and legal institutions, suggesting that our investigation is indeed appropriate.

**[Insert Table 1 about here]**

Table 2 Panel A reports descriptive statistics for the variables used in our analysis. The dependent variable *XR\_SFG* has a mean, median, and standard deviation of 0.520, 1, and 0.5, respectively, similar to the values reported by Demirgüç-Kunt and Maksimovic (1998, 2002) and Khurana et al. (2006, 2008). At the country-level, individualism (*IDV*) has a mean (median) of 64 (71), with a standard deviation of 27.052. The political institutions proxy (*POLCONV*) has a mean (median) of 0.709 (0.773), with a standard deviation of 0.246, implying that most countries in our sample have strong political rights. In addition, the rule of law proxy (*LAW*) has a mean (median) of 5.075 (5.00), indicating a cross-country variation in the legal institutions. Finally, the two economic factors GDP growth and inflation rate show a mean (median) of 3.354 (3.076) and 2.974 (2.227), respectively.

**[Insert Table 2 about here]**

## 4. Empirical Results

### 4.1 Univariate Analysis

Table 3 exhibits the results of the univariate tests that compare means (columns 1 and 2) of the proportion of firms with positive excess growth between two subsamples of countries from low and high *IDV*. Panel A considers *XR\_SFG*, the proportion of firms that grow at rates exceeding *SFG*. The results show that the mean of *XR\_SFG* in the high *IDV* group is 6.7% higher than that in the low *IDV* group, suggesting a higher growth rates among individualistic countries. Panels B and C demonstrate similar evidence for *XR\_SG* and *XR\_IG*, the proportion of firms that grow at rates exceeding *SG* and *IG*, respectively. These differences support our prediction that individualism promotes firm growth. The next section examines whether these results continue to hold in a set of multivariate tests.

[Insert Table 3 about here]

### 4.2 Multivariate Analysis

#### 4.2.1 The Model

To test the impact of individualism on firm growth, we estimate the following model:

$$\begin{aligned} XR_{GROWTH} = & \beta_0 + \beta_1 IDV + \beta_2 POLCONV + \beta_3 LAW + \beta_4 TURNOVER + \beta_5 BANK \\ & + \beta_6 INFLATION + \beta_7 GDPGR + \beta_8 SIZE + \beta_9 PROFIT + \beta_{10} NFA + \beta_{11} LEV \\ & + Year\ effects + Industry\ effects + \varepsilon. \end{aligned} \quad (5)$$

The dependent variable *XR\_GROWTH* is equal to one for firms with positive excess growth according to one of the three measures, including *XR\_IG*, *XR\_SFG*, and *XR\_SG*, and zero

otherwise. The independent variable *IDV* measures a country's level of individualism. The country-level control variables consist of political constraints (*POLCONV*), rule of law (*LAW*), stock market turnover (*TURNOVER*), ratio of bank deposits to GDP (*BANK*), inflation rate (*INFLATION*), GDP growth (*GDPGR*). Meanwhile, the firm-level control variables consist of size (*SIZE*), profitability (*PROFIT*), leverage (*LEV*) and ratio of net fixed assets to total assets (*NFA*).

#### 4.2.2 Main Results

To examine the impact of individualism on firm growth, we first run pooled multivariate regressions where we control for country and firm characteristics. We cluster the observations at the firm-level. Table 4 reports the results of our pooled probit regressions. In Models 1, 2 and 3, we regress *XR\_SFG*, *XR\_SG*, and *XR\_IG* on *IDV*, respectively. The country- and firm-level control variables are described in Section 3.2.3. We find that the coefficient of *IDV* is significantly positive at the 1% level, supporting our prediction that higher individualism stimulates firm growth. Furthermore, we find that firm growth is negatively associated with inflation and size while positively associated with GDP growth, law and order, political constraints, *BANK*, and *TURNOVER*. Our main results suggest that more individualistic countries have a higher proportion of firms with excess growth.

**[Insert Table 4 about here]**

## 5. Robustness Tests

We check for the robustness of our main results (Model 1 in Table 4) in several aspects: endogeneity issue, alternative proxies for individualism, addition of different cultural variables and a country-level regression.

## 5.1 Endogeneity

One potential concern with our analysis is that endogeneity of individualism may drive our results. We address the endogeneity of individualism by using an instrumental variable approach. The instrument must satisfy the conditions of exogeneity and relevance (Roberts and Whited, 2011). We instrument for individualism using Murray and Schaller's (2010) overall index of the historical prevalence of infectious diseases across geopolitical regions. We employ this instrument because: (1) it is unlikely to have a direct effect on firm growth over our sample period, satisfying the exogeneity requirement of an instrument; and (2) it is correlated with collectivism/individualism, and thus satisfies the relevance requirement of an instrument. Fogli and Veldkamp (2012: 25) state that "more collectivist society, with its greater propensity for network collectives, would be a more effective structure for inhibiting the spread of disease." In addition, Fincher et al. (2008) explain that collectivists are more wary of contact with outgroup members (strangers), and are less likely to eat unusual foods. They suggest that collectivism serves an antipathogen defense function, and is more likely to emerge in societies that historically suffered a greater prevalence of pathogens.

The results of the first stage regression presented in Model 1 of Table 5 confirm that the historical prevalence of diseases is negatively (positively) related to the individualism (collectivism) dimension of national culture. The second stage regression in Model 2 of Table 5 shows that the fitted values of individualism are positively related to firm growth, dispelling concerns that endogeneity is behind our main findings. We conduct two tests to assess the appropriateness of the instrument. First, we conduct the Kleibergen-Paap under-identification test to check the rank condition. In each model, the Kleibergen-Paap rk LM statistic rejects the

null hypothesis at the 1% level, indicating that the excluded instrument is correlated with *IDV*, and hence the model is well identified. Second, using an instrument that is weakly associated with endogenous explanatory variable can result in large inconsistencies in the coefficient estimates. We examine the relevance of our instrument by conducting an *F*-test of the excluded exogenous variable in the first regression, in which the null hypothesis is that the instrument does not explain the variation in *IDV*. We reject this null hypothesis at the 1% level.

## 5.2 Additional Tests

In Model 3 of Table 5, we consider alternative proxies for individualism. We replace *IDV* with Tang and Koveos' updated Hofstede's (2001) measure of individualism (*IDV\_TK*). In this model, individualism continues to be positively and significantly associated with firm growth at the 1% level alleviating concerns of measurement error in *IDV*. Next, we extend our analysis to Hofstede's (2001) three other cultural dimensions, and the results are presented in Table 5 Model 4. These dimensions include the uncertainty avoidance (*UAI*), masculinity (*MAS*), and power distance (*PDI*). We find that both *UAI* and *MAS* are positively related to firm growth, while *PDI* shows a negative association with firm growth. Meanwhile, we find that the coefficient estimate of *IDV* remains significantly positive. We further run the regression by dropping countries with less than one hundred observations. Again, the results in Table 5 Model 5 show that the coefficient estimate of *IDV* remains significantly positive.

Finally, to mitigate the potential bias raised by the large variation in the number of firms across countries, we run a country-level regression by using only the country-level average of the firm-level observations. Thus, we give each country an equal weight. The results in Table 5

Model 6 show that the coefficient estimates of *IDV* is significantly positive, implying that the choice between a country- or a firm-level measure does not affect our results.

**[Insert Table 5 about here]**

### 5.3 Alternative Dependent Variable

The financial planning model used to generate our excess growth measures assumes that the marginal and average profit rates are equal, that is, the resources generated from new growth are equal to the resources generated from sales to existing customers. To assess the sensitivity of our results to this assumption, we expand the definition of *SFG* to accommodate a lower marginal profit rate. In particular, following Demirgüç-Kunt and Maksimovic (1998), we specify the maximum growth rate that can be financed by relying only on internal funds and short-term borrowing as:

$$SFG_t = \frac{ROLTC_t}{1 - z * ROLTC_t} \quad (6)$$

where *z* is the ratio of the marginal profit rate to the average profit rate. In Table 6 Models 1, 2 and 3, the values of *SFG* are considered, given *z* equals to 0.25, 0.5, and 0.75, respectively. Accordingly, we find that *IDV* is still positively related to firm growth, indicating that our conclusions are not affected by the assumption of equality between the marginal and average profit rates.

The financial planning model also assumes that assets and sales grow at the same rate. However, Demirgüç-Kunt and Maksimovic (1998) argue that sales may grow faster than assets

due to technological progress. Thus, the financial planning model may incorrectly attribute sales growth to the availability of internal funds. We therefore re-estimate Table 4 Model 1 after substituting the realized rate of asset growth for the realized rate of sales growth. The new results in Table 6 Model 4 show that the coefficient estimate of *IDV* continues to be significantly positive, suggesting that the assumption of equivalence between asset and sales growth does not affect our conclusions.

**[Insert Table 6 about here]**

#### *5.4 Additional Control Variables*

We control for additional omitted variables to ensure that their omission will not alter our findings, and present the results in Table 7. In Model 1, we control for assets intensity, measured by the ratio of sales to assets (*SALES/ASSETS*). The results show that firm growth is positively related to assets intensity. More importantly, including this new variable of assets intensity does not affect the positive relation between individualism and firm growth.

In Model 2, we control for Kurtzman et al.'s (2004) measure of the country-level accounting transparency (*ACC*). Consistent with Khurana et al. (2006), we find that better transparency is positively related to firm growth. In addition, the positive relation between individualism and firm growth continue to hold in this model.

In Model 3, we control for the ICRG assessment of the investment profile in a given country (*INVESTPROF*).<sup>1</sup> A higher level of *INVESTPROF* means better country-level investment

---

<sup>1</sup>This index is: " . . . [A]n assessment of factors affecting the risk to investment that are not covered by other political, economic and financial risk components." The subcomponents are: Contract Viability/Expropriation; Profits Repatriation; Payment Delays.

profile. We find the coefficient estimate of *INVESTPROF* is significantly positive, indicating that firm growth is fostered in countries with lower expropriation risk. Also, including this country-level variable does not affect the positive relation between individualism and firm growth.

In Model 4, we control for the three additional variables, including *SALES/ASSETS*, *ACC* and *INVESTPROF*. We continue to find a positive association between individualism and firm growth, suggesting that omitted variables are not likely to be behind our evidence.

**[Insert Table 7 about here]**

## **6. The impact of Access to Finance**

With our main evidence, we establish that there is a positive relation between individualism and firm growth. We extend our analysis above to study the impact of firm's access to finance on the relationship between firm growth and individualism. To test this hypothesis and capture the firm's access to finance at the country-level, we rely on three measures, namely, *BANK*, *PVCREDIT*, and *MARKETCAP*. These variables capture the easiness of the firm's access to finance. *BANK* is described in Section 3.2.3. *PVCREDIT* and *MARKETCAP*, both derived from Beck et al. (2009), are the ratio of private credit to GDP, and the market capitalization over GDP, respectively.

To study the effect of these different variables on the relation between firm growth and individualism, we include them in our baseline regression in Table 4 Model 1 as well as their interactions with individualism. We expect that the interaction terms will enter the regressions negatively. In Table 8 Models 1, 2 and 3, when we include the interaction terms between individualism and bank access, private credit access, and market size, respectively, we find that



the interaction terms are negative and significant at the 1% level. These results suggest that the weaker the firm's access to finance in a given country, the higher the impact of the individualism dimension of national culture on firm's growth. Firm's access to finance is thus likely to condition the relation between individualism and firm growth.

**[Insert Table 8 about here]**

In summary, the results in this section suggest that although individualism tends to impact the firm growth, all things being equal, this relation is stronger in countries with weak access to finance.

## **7. Conclusion**

That firm growth is the driver of industry and economic growth is a well established fact and an article of faith. Academicians and policy makers alike have strived to identify the constraints on and determinants of corporate growth around the world. To date, we know that legal institutions, the business environment, and access to finance are the most important determinants of growth. In this paper, we add to this literature by providing the first firm-level evidence on the importance of informal institutions, namely culture, and its interdependence with legal (formal) institutions, in determining firm growth. We specifically posit that culture, even after taking into account its impact through political and legal institutions, has a direct effect on firm-level growth. Using an international sample of 42,377 firms from 57 countries over the period 1989 to 2012, we find support for our hypothesis that the individualism dimension of culture affects firm's propensity to invest and thus to grow. This finding is also unaffected after we run robustness checks and control for the potential endogeneity of culture, alternative proxies for individualism, alternative dependent and control variables, and country-level

regression. This result suggests that in an individualistic society where the emphasis is on individual goals, welfare, entrepreneurship and innovation, the firms' propensity to invest and hence grow is higher. We rationalize this finding as evidence that these cultural norms affect growth through the individual decision-making at the micro level, mainly through their conditioning impact on risk-taking and corporate governance, as previously shown in the literature. We additionally provide evidence that informal institutions tend to substitute to formal institutions in affecting corporate growth as the link between culture and growth becomes stronger in countries with low access to finance.

Our study contributes to the literature on the "Law and Finance" of cross-country differences in firm growth (Demirgüç-Kunt and Maksimovic, 1998; 2002) by adding to our understanding of the determinants of such differences. Going beyond Demirgüç-Kunt and Maksimovic (1998; 2002), we provide evidence that while legal and financial institutions affect the ability to firms to get external financing, culture affects the ability of firms to grow through the informal norms that condition managerial decision-making. We also add to the recent growing strand of studies on the role of culture in shaping firm outcomes. These findings strengthen the argument that the same institutional rules can produce different economic outcomes in culturally different societies. In evaluating the dynamics of firms' growth it is thus imperative that the impact of culture be taken into account

Our findings have broad implications for policy-makers interested in stimulating firm growth, and in turn overall economic growth. Specifically, government policies designed to encourage entrepreneurship, innovation, and growth should be keeping in mind that formal institutions need not be the only focus. The impact of cultural influences on corporate growth

(either through risk-taking or corporate governance at the micro level, or through formal institutions at the macro level) would allow policy-makers to better customize their policies to enhance firms' growth, thus promoting more competitive business environments.

## References

- Beck, T., Demirgüç-Kunt, A., and Levine, R., 2009. Financial institutions and markets across countries and over time: Data and analysis. *Policy research working paper no 4943*, World Bank.
- Boubakri, N., El Ghouli, S., and Saffar, W., 2014. Firm growth and political institutions. Working Paper, The Hong Kong Polytechnic University.
- Campbell, J., 1996. Understanding risk and return. *Journal of Political Economy* 104: 298-345.
- Carpenter, R. and Petersen, B., 2002. Is the growth of small firms constrained by internal finance? *Review of Economics and Statistics* 84: 298-309.
- Chui, A., and Kwok, C., 2008. National culture and life insurance consumption. *Journal of International Business Studies* 39: 88-101.
- Chui, A., Lloyd, A. E., and Kwok, C., 2002. The determination of capital structure: Is national culture a missing piece to the puzzle? *Journal of International Business Studies* 33: 99-127.
- Chui, A., Titman, S., and Wei, J., 2010. Individualism and momentum around the World. *Journal of Finance* 65: 361-392.
- Demirgüç-Kunt, A. and Maksimovic, V., 1998. Law, finance, and firm growth. *Journal of Finance* 53: 2107-2137.
- Demirgüç-Kunt, A. and Maksimovic, V., 2002. Funding growth in bank-based and market based financial systems: evidence from firm-level data. *Journal of Financial Economics* 65: 337-363.
- Doidge, C., Karolyi, G., and Stulz, R., 2007. Why do countries matter so much for corporate governance? *Journal of Financial Economics* 86: 1-39.
- Fincher, C. L., Thornhill, R., Murray, D. R., and Schaller, M., 2008. Pathogen prevalence predicts human cross-cultural variability in individualism/collectivism. *Proceedings of the Royal Society B: Biological Sciences* 275: 1279-1285.
- Fogli, A., and Veldkamp, L., 2012. Germs, social networks and growth. Unpublished working paper. New York University.
- Guiso, L., Sapienza, P., and Zingales, L., 2006. Does culture affect economic outcomes? *Journal of Economic Perspectives* 20: 23-48.
- Gorodnichenko, Y., and Roland, G., 2011. Which dimensions of culture matter for long-run growth? *American Economic Review* 101: 492-498.
- Graham, J. R., Huang, H., and Harvey, C., 2009, Investor competence, trading frequency, and home bias, *Management Science* 55: 1094-106.

- Griffen, D., Guedhami, O., Kwok, C., Li, K., and Shao, L., 2014. National culture, corporate governance practices, and firm performance. Working paper, University of South Carolina.
- Halek, M., and Eisenhauer, J. G., 2001. Demography of risk aversion. *The Journal of Risk and Insurance* 68: 1-24.
- Henisz, W., 2012. The Political Constraint Index (POLCON) Data Set. Wharton: University of Pennsylvania.
- Hilary, G., and Hui, K.W., 2009. Does religion matter in corporate decision making in America? *Journal of Financial Economics* 93: 455-473.
- Hofstede, G., 1983. The cultural relativity of organizational practices and theories. *Journal of International Business Studies* 14: 75-89.
- Hofstede, G., 2001. *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations*. 2<sup>nd</sup> edition. Thousand Oaks, CA: Sage Publications.
- Hope, O. K., 2003. Disclosure practices, enforcement of accounting standards and analysts' forecast accuracy: An international study. *Journal of Accounting Research* 41: 235-272.
- King, R. G., and Levine, R., 1993. Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics* 108: 717-738.
- Kirkman, B. L., Lowe, K. B., and Gibson, C. B., 2006. A quarter century of cultures consequences: A review of empirical research incorporating Hofstede's cultural values framework. *Journal of International Business Studies* 37: 285-320.
- Khurana, I., Martin, X., and Pereira, R., 2008. Cross-listing and firm growth. *Review of Finance* 12: 293-322.
- Khurana, I., Pereira, R and Martin, X., 2006 Firm growth and disclosure: An empirical analysis. *Journal of Financial and Quantitative Analysis* 41: 356-380.
- Kurtzman, J., Yago, G., and Phumiwasana, T., 2004. The global costs of opacity. *MIT Sloan Management Review* 46: 38-44.
- Kwok, C., and Tadesse, S., 2006. National culture and financial systems. *Journal of International Business Studies* 37: 227-247.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., and Vishny, R., 1998. Law and finance. *Journal of Political Economy* 106: 1113-1150.
- Lee, S. M., and Peterson, S., 2000. Culture, entrepreneurial orientation, and global competitiveness. *Journal of World Business* 35: 401-416.
- Levine, R., 2005. *Finance and Growth: Theory and Evidence*. In Handbook of Economic Growth, ed. Philippe Aghion and Steven N. Durlauf, 865-934. Amsterdam: Elsevier.

- Li, K., Griffin, D., Yue, H., and Zhao, L., 2011. National culture and capital structure decisions: evidence from foreign joint ventures in China. *Journal of International Business Studies* 42: 477-503.
- Li, K., Griffin, D., Yue, H., and Zhao, L., 2013. How does culture influence corporate risk-taking? *Journal of Corporate Finance* 23: 1-22.
- Li, J. and Harrison, J. R., 2008, National culture and the composition and leadership structure of boards of directors. *Corporate Governance: An International Review* 16: 375-85.
- Li, Y., and Zahra, S. A., 2012. Formal institutions, culture, and venture capital activity: A cross-country analysis. *Journal of Business Venturing* 27: 95-111.
- Licht, A., Goldschmidt, C., and Schwartz, S., 2005. Culture law and corporate governance. *International Review of Law and Economics* 25: 229-255.
- Licht, A., Goldschmidt, C., and Schwartz, S., 2007. Culture rules: The foundations of the rule of law and other norms of governance. *Journal of Comparative Economics* 35: 659-688.
- Mihet, R., 2013. Effects of culture on firm risk-taking: a cross-country and cross-industry analysis. *Journal of Cultural Economics* 37: 109-151.
- Murray, D., and Schaller, M., 2010. Historical prevalence of infectious diseases within 230 geopolitical regions: A tool for investigating origins of culture. *Journal of Cross-Cultural Psychology* 41: 99-108.
- North, D., 1990. *Institutions, Institutional Change, and Economic Performance*. New York: Cambridge University Press.
- Radebaugh, L., Gray, S., and Black, E, 2006, *International Accounting and Multinational Enterprises*. 6<sup>th</sup> edition, Hoboken, NJ: John Wiley and Sons.
- Rajan, R. G., and Zingales, L., 1998. Financial Dependence and Growth. *American Economic Review* 88: 559 - 86.
- Roberts, M. R., and Whited, T. M., 2011. Endogeneity in empirical corporate finance. Unpublished working paper. University of Pennsylvania.
- Schwartz, S. H., 1994. Beyond individualism/collectivism: New cultural dimensions of values. In Uichol, K. et al. (eds.), *Individualism and Collectivism: Theory, Method, and Applications*. Thousand Oaks, CA: Sage.
- Shao, L., Kwok, C., and Guedhami, O., 2010. National culture and dividend policy. *Journal of International Business Studies* 41: 1391-1414.
- Sivakumar, K., and Nakata, C., 2001. The stampede toward Hofstede's framework: Avoiding the sample design pit in cross-cultural research. *Journal of International Business Studies* 32: 555-574.

- Stulz, R., and Williamson, R., 2003. Culture, openness and finance. *Journal of Financial Economics* 70: 313-349.
- Tabellini, G. 2006. Culture and institutions: Economic development in the regions of Europe. IGIER Working Paper.
- Tang, L., and Koveos, P. E., 2008. A framework to update Hofstede's cultural value indices: Economic dynamics and institutional stability. *Journal of International Business Studies* 39: 1045-1063.
- Taylor, M.Z., and Wilson, S. 2012. Does culture still matter? The effects of individualism on national innovation rates. *Journal of Business Venturing* 27: 234-247.
- Williamson, O. E., 2000. The new institutional economics: Taking stock, looking ahead. *Journal of Economic Literature* 38: 595-613.

**APPENDIX**  
*Variable Definitions and Data Sources*

<b>Variable</b>	<b>Definition</b>	<b>Source</b>
<b>Panel A. Firm-level variables</b>		
<i>XR_IG</i>	The proportion of firms whose inflation-adjusted growth rate in sales exceeds IG, the maximum growth rate that can be financed by relying only on internal funds.	Authors' calculations based on Compustat data.
<i>XR_SFG</i>	The proportion of firms whose inflation-adjusted growth rate in sales exceeds SFG, the maximum growth rate that can be financed by relying only on internal funds and short-term borrowing.	As above
<i>XR_SG</i>	The proportion of firms whose inflation-adjusted growth rate in sales exceeds SG, the maximum growth rate that can be financed by relying only on internal funds and (short-term and long-term) debt financing.	As above
<i>NFA</i>	Net fixed assets over total assets.	As above
<i>SIZE</i>	Logarithm of total assets denominated in \$US	As above
<i>PROFIT</i>	Net income over total assets	As above
<i>SALES/ASSETS</i>	Total sales over total assets	As above
<i>LEV</i>	Long term debt over assets	As above
<b>Panel B. Country-level Variables</b>		
<i>IDV</i>	Hofstede's cultural index on Individualism.	Hofstede (2001)
<i>UAI</i>	Hofstede's cultural index on Uncertainty Avoidance.	Same as above
<i>PDI</i>	Hofstede's cultural index on Power Distance.	Same as above
<i>MAS</i>	Hofstede's cultural index on Masculinity.	Same as above
<i>POLCONV</i>	Measures the degree of political constraints of a country. It is constructed by Henisz (2000); variable <i>POLCONV</i> . The measure is derived from a simple special model of political interaction that incorporates information on the number of independent branches of governments with veto power and the distribution of preferences across and within those branches. The government branches considered are chief executives, lower house of legislature, higher house of legislature, judiciary, and sub-federal branches. Higher scores indicate stronger political constraints and sound political institutions.	Henisz (2012)
<i>LAW</i>	Assessment of the law and order tradition in the country. This variable ranges from 0 to 6. Higher scores indicate higher rule of law in the country.	ICRG
<i>INVESTPROF</i>	An index assessing the "risk of a modification in a contract taking the form of a repudiation, postponement, or scaling down" due to "budget cutbacks, indigenization pressure, a change in government, or a change in government economic and social priorities." This index ranges from 0 to 10, with higher scores indicating lower risk.	As above
<i>TURNOVER</i>	Stock market turnover ratio (value traded over capitalization)	Beck et al. (2009)
<i>BANK</i>	Deposit money bank assets over GDP	As above
<i>PVCREDIT</i>	Bank private credit over GDP	As above
<i>MARKETCAP</i>	Stock market capitalization over GDP	As above
<i>INFLATION</i>	Realized inflation rate over the next year.	Economist Intelligence Unit



<b>Variable</b>	<b>Definition</b>	<b>Source</b>
<i>GDPGR</i>	Real GDP growth	World Development Indicators
<i>DISEASES</i>	An overall index of the historical prevalence of nine diseases within different geopolitical regions worldwide. The nine diseases coded include leishmanias, schistosomes, trypanosomes, leprosy, malaria, typhus, filariae, dengue, and tuberculosis. A 4-point coding scheme was employed: 0 = completely absent or never reported, 1 = rarely reported, 2 = sporadically or moderately reported, 3 = present at severe levels or epidemic levels at least once. All nine disease prevalence ratings were standardized by converting them to z scores. The overall index was computed as the mean of z scores for nine diseases. The mean of the overall index is approximately 0; positive scores indicate disease prevalence that is higher than the mean, and negative scores indicate disease prevalence that is lower than the mean.	Murray and Schaller (2010)
<i>ACC</i>	An assessment of the quality of countries' corporate accounting standards.	Kurtzman et al. (2004)

**TABLE 1. Descriptive Statistics by Country**

	Observations	%	IDV	XR_SFG	INFLATION	GDPGR	LAW	POLCONV	BANK	TURNOVER	SIZE	NFA	PROFIT	LEV
Argentina	557	0.13	46	0.53	11.99	2.57	3.51	0.51	31.72	13.39	5.49	0.52	0.06	0.20
Australia	16,877	4.08	90	0.56	3.47	3.19	5.73	0.86	103.20	77.58	3.42	0.33	-0.38	0.56
Austria	1,262	0.31	55	0.52	1.66	1.95	6.00	0.75	126.06	46.03	5.87	0.31	0.03	0.28
Bangladesh	284	0.07	20	0.44	7.08	6.22	2.21	0.23	57.50	117.47	4.12	0.48	0.12	0.14
Belgium	1,606	0.39	75	0.45	2.02	1.65	5.16	0.89	115.81	36.95	5.85	0.29	0.05	0.23
Brazil	4,121	1.00	38	0.49	19.73	3.04	2.10	0.73	68.76	54.04	6.12	0.38	0.06	0.73
Bulgaria	161	0.04	30	0.42	5.40	3.15	2.99	0.57	32.18	14.02	5.48	0.43	0.07	0.19
Canada	14,168	3.43	80	0.61	2.40	2.68	6.00	0.85	108.51	61.99	4.64	0.43	-0.20	0.23
Chile	408	0.10	23	0.49	4.71	5.70	4.53	0.73	67.14	18.31	6.09	0.42	0.07	0.31
Colombia	366	0.09	13	0.45	9.45	3.76	1.61	0.33	35.30	10.81	6.45	0.45	0.07	0.19
Czech Rep.	260	0.06	58	0.34	2.76	2.64	5.04	0.74	49.27	52.17	6.07	0.59	0.06	0.15
Denmark	2,255	0.55	74	0.44	2.17	1.38	6.00	0.72	99.00	70.24	5.09	0.32	0.02	0.20
Ecuador	19	0.00	8	0.00	6.82	4.45	2.59	0.16	24.78	5.33	6.07	0.44	0.21	0.02
Estonia	185	0.04	60	0.41	5.10	4.28	4.00	0.77	70.68	22.40	4.36	0.43	0.10	0.17
FRG/Germany	10,633	2.57	67	0.52	1.06	1.38	5.25	0.85	135.52	122.34	5.29	0.24	0.01	0.28
Finland	2,025	0.49	63	0.45	1.77	2.19	6.00	0.77	76.29	95.28	5.69	0.28	0.05	0.24
France	9,681	2.34	71	0.47	1.75	1.39	5.07	0.86	112.01	86.30	5.53	0.18	0.04	0.22
Greece	2,292	0.55	35	0.48	2.67	0.50	4.09	0.64	104.30	54.35	5.30	0.37	0.04	0.19
Hong Kong	249	0.06	25	0.37	6.98	4.92	5.21	0.67	141.95	43.61	6.39	0.45	0.08	0.12
Hungary	279	0.07	80	0.34	6.72	2.31	4.38	0.75	46.08	81.25	5.57	0.47	0.07	0.13
India	28,432	6.88	48	0.50	6.21	7.11	4.00	0.71	55.21	112.49	3.38	0.35	0.07	0.20
Indonesia	3,896	0.94	14	0.46	13.29	4.59	2.80	0.29	37.14	50.47	4.66	0.40	0.06	0.22
Ireland	595	0.14	70	0.51	1.53	2.77	6.00	0.76	172.47	50.17	5.51	0.30	-0.01	0.24
Israel	2,457	0.59	54	0.52	3.33	3.91	5.00	0.78	96.95	56.41	4.86	0.20	-0.01	0.20
Italy	3,543	0.86	76	0.51	2.37	0.61	4.49	0.71	108.84	128.54	6.36	0.25	0.03	0.22
Jamaica	122	0.03	39	0.20	10.56	-0.35	2.20	0.37	39.87	2.95	4.39	0.38	0.12	0.15
Japan	54,826	13.26	46	0.49	-0.74	1.08	5.26	0.76	191.91	84.80	6.11	0.30	0.04	0.17

	Observations	%	IDV	XR_SFG	INFLATION	GDPGR	LAW	POLCONV	BANK	TURNOVER	SIZE	NFA	PROFIT	LEV
Luxembourg	354	0.09	60	0.52	3.11	2.81	6.00	0.77	148.08	0.83	6.82	0.36	0.05	0.28
Malaysia	12,227	2.96	26	0.46	4.00	4.99	3.82	0.70	120.84	35.34	4.37	0.36	0.02	0.11
Malta	90	0.02	59	0.37	2.87	2.00	5.07	0.73	142.65	3.42	4.78	0.44	0.08	0.22
Mexico	1,632	0.39	30	0.44	9.62	2.74	2.46	0.43	31.54	30.64	6.90	0.47	0.08	0.24
Morocco	553	0.13	46	0.32	1.57	4.42	5.19	0.63	75.96	21.13	4.75	0.28	0.11	0.12
Netherlands	2,451	0.59	80	0.40	2.23	1.98	6.00	0.77	156.09	112.07	6.14	0.26	0.04	0.21
New Zealand	1,337	0.32	79	0.43	2.62	2.48	5.79	0.72	121.36	43.03	4.49	0.41	0.02	0.23
Norway	1,744	0.42	69	0.55	4.85	2.80	6.00	0.77	73.21	89.19	5.08	0.34	0.00	0.29
PRC	26,610	6.44	20	0.54	4.32	9.88	4.38	0.00	117.08	149.65	5.30	0.34	0.01	0.07
Pakistan	2,506	0.61	14	0.38	11.74	4.14	3.15	0.15	36.07	198.61	3.84	0.46	0.10	0.23
Panama	14	0.00	11	0.79	3.69	8.94	3.00	0.36	82.11	1.42	7.53	0.60	0.10	0.41
Peru	975	0.24	16	0.43	3.47	5.45	3.11	0.20	23.94	8.05	5.00	0.51	0.10	0.17
Philippines	1,874	0.45	32	0.43	5.62	4.46	2.61	0.44	44.63	22.49	4.56	0.38	0.00	0.21
Poland	3,531	0.85	60	0.52	3.13	4.04	4.40	0.74	32.50	45.09	3.87	0.33	0.04	0.12
Portugal	810	0.2	27	0.47	2.74	1.39	5.06	0.74	143.43	61.71	6.14	0.36	0.04	0.27
ROK	8,366	2.02	18	0.57	2.58	3.96	4.80	0.75	93.41	210.69	5.84	0.35	0.04	0.17
Russia	1,762	0.43	39	0.40	14.98	4.31	3.92	0.67	36.42	74.92	6.91	0.50	0.09	0.17
S. Africa	3,559	0.86	65	0.36	7.50	3.25	2.40	0.44	74.43	41.98	5.05	0.31	0.09	0.16
Singapore	7,845	1.90	20	0.48	1.35	5.82	5.26	0.08	118.69	67.88	4.51	0.30	-0.07	0.10
Slovakia	93	0.02	52	0.53	3.71	4.12	4.22	0.77	65.68	30.70	5.41	0.36	0.03	0.15
Spain	2,199	0.53	51	0.44	3.04	2.30	4.87	0.85	147.09	147.40	6.69	0.36	0.06	0.25
Sweden	5,414	1.31	71	0.53	1.76	2.39	6.00	0.76	72.98	105.59	4.41	0.20	-0.04	0.19
Switzerland	3,508	0.85	68	0.39	1.01	1.65	5.40	0.87	169.85	90.49	6.13	0.34	0.04	0.25
Thailand	5,655	1.37	20	0.42	3.08	3.69	3.27	0.50	117.24	84.61	4.36	0.41	0.05	0.16
Trinidad-Tobago	95	0.02	16	0.37	5.28	2.55	2.59	0.75	38.07	2.22	5.19	0.35	0.14	0.23
Turkey	1,727	0.42	37	0.43	19.91	4.17	4.09	0.62	48.96	160.97	5.65	0.33	0.07	0.15
UK	25,472	6.16	89	0.48	2.55	2.12	5.71	0.74	144.25	101.05	4.71	0.29	-0.06	0.25
USA	128,048	30.97	91	0.57	2.21	2.65	5.62	0.85	59.20	140.68	4.76	0.29	-0.65	0.36
Venezuela	26	0.01	12	0.38	29.97	2.66	1.00	0.29	22.39	0.99	5.74	0.39	0.04	0.13

	Observations	%	<i>IDV</i>	<i>XR_SFG</i>	<i>INFLATION</i>	<i>GDPGR</i>	<i>LAW</i>	<i>POLCONV</i>	<i>BANK</i>	<i>TURNOVER</i>	<i>SIZE</i>	<i>NFA</i>	<i>PROFIT</i>	<i>LEV</i>
Vietnam	1,375	0.33	20	0.32	13.72	6.28	4.00	0.21	105.97	67.04	3.55	0.29	0.09	0.11
Total	413,411	100	64	0.52	2.97	3.35	5.08	0.71	100.48	108.52	4.94	0.32	-0.21	0.26

Notes: This table presents the distribution of our sample and means of our key variables by country. The sample comprises 413,411 firm-year observations from 57 countries for the period 1989-2012. The Appendix outlines definitions and data sources for all variables.

**TABLE 2: Descriptive Statistics**

	Mean	Median	STD	Min	Max
<i>XR_SFG</i>	0.520	1.000	0.500	0.000	1.000
<i>IDV</i>	64.001	71.000	27.052	14.000	91.000
<i>INFLATION</i>	2.974	2.227	11.490	-2.164	15.538
<i>GDPGR</i>	3.354	3.076	3.239	-5.527	12.700
<i>LAW</i>	5.075	5.000	0.969	2.000	6.000
<i>POLCONV</i>	0.709	0.773	0.246	0.000	0.873
<i>BANK</i>	100.482	87.710	52.116	25.630	240.900
<i>TURNOVER</i>	108.525	92.480	69.393	17.570	393.300
<i>SIZE</i>	4.936	4.934	2.235	-0.390	10.223
<i>NFA</i>	0.315	0.272	0.235	0.001	0.907
<i>PROFIT</i>	-0.209	0.052	38.916	-1.750	0.341
<i>LEV</i>	0.261	0.141	11.048	0.000	1.054

Notes: This table presents descriptive statistics for our regression variables. The sample comprises 413,411 firm-year observations from 57 countries for the period 1989-2012. The Appendix outlines definitions and data sources for all variables.

**TABLE 3. Univariate Tests**

	Means		(2)-(1) [T-stat]
	Low <i>IDV</i> (1)	High <i>IDV</i> (2)	
<b>Panel A</b>			
<i>XR_SFG</i>	0.489	0.556	0.067 [43.60]***
<b>Panel B</b>			
<i>XR_SG</i>	0.438	0.511	0.073 [47.12]***
<b>Panel C</b>			
<i>XR_IG</i>	0.536	0.583	0.046 [30.28]***

Notes: This table presents mean difference tests for the three estimates of firms' excess growth across subsamples of low (below-median) and high (above-median) *IDV*. The sample comprises 413,411 firm-year observations from 57 countries for the period 1989-2012. The Appendix outlines definitions and data sources for all variables. The superscript asterisk \*\*\* denotes statistical significance at the 1% level.

**TABLE 4. Individualism and Firm Growth**

Variable	<i>XR_SFG</i>	<i>XR_SG</i>	<i>XR_IG</i>
	(1)	(2)	(3)
<i>IDV</i>	0.001*** (3.874)	0.001*** (3.295)	0.001*** (5.268)
<i>INFLATION</i>	-0.000** (-2.002)	-0.000 (-0.424)	-0.001*** (-2.825)
<i>GDPGR</i>	0.028*** (24.480)	0.018*** (15.084)	0.039*** (35.212)
<i>LAW</i>	0.052*** (11.091)	0.062*** (12.716)	0.040*** (9.154)
<i>POLCONV</i>	0.178*** (10.438)	0.043** (2.506)	0.161*** (9.737)
<i>BANK</i>	0.000** (2.281)	0.000 (1.565)	0.000*** (5.860)
<i>TURNOVER</i>	0.001*** (13.508)	0.001*** (12.067)	0.001*** (13.419)
<i>SIZE</i>	-0.037*** (-24.497)	-0.065*** (-42.325)	-0.018*** (-12.581)
<i>NFA</i>	0.028** (2.006)	-0.085*** (-5.802)	-0.073*** (-5.395)
<i>PROFIT</i>	-0.000 (-0.581)	-0.000 (-0.510)	-0.000 (-0.605)
<i>LEV</i>	0.000 (0.594)	-0.000 (-0.831)	0.002 (1.046)
<i>Intercept</i>	-0.525*** (-17.886)	-0.357*** (-11.770)	-0.557*** (-19.787)
Industry Effects	YES	YES	YES
Year Effects	YES	YES	YES
N	413,411	413,411	413,411
Pseudo R <sup>2</sup>	0.024	0.028	0.026

Notes: This table presents firm-level panel estimation results from regressing different measures of firm growth on individualism (*IDV*) and controls. The sample comprises 413,411 firm-year observations from 57 countries for the period 1989-2012. Beneath each coefficient estimate is reported the z-statistic. The Appendix outlines definitions and data sources for all variables. The superscript asterisks \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

**TABLE 5: Additional Tests**

<i>Variable</i>	<b>Endogeneity</b>		<b>Alternative and Additional Cultural Variables</b>		<b>Exclude Small Countries</b>	<b>Country-Level Regression</b>
	First Stage	Second Stage	Alternative Individualism Variable	Additional Cultural Variables		
	<i>IDV</i>	<i>XR_SFG</i>	<i>XR_SFG</i>	<i>XR_SFG</i>	<i>XR_SFG</i>	<i>XR_SFG</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>IDV</i>		0.002*** (4.197)	0.003*** (18.090)	0.001*** (3.125)	0.001*** (3.864)	0.049** (2.547)
<i>INFLATION</i>	-0.009 (-0.401)	-0.000* (-1.904)	0.000 (1.092)	-0.000 (-1.310)	-0.000* (-1.939)	-0.221 (-1.293)
<i>GDPGR</i>	0.202 (0.446)	0.029*** (24.919)	0.034*** (25.854)	0.033*** (27.004)	0.028*** (24.390)	1.292*** (4.273)
<i>LAW</i>	5.609** (2.128)	0.041*** (6.549)	-0.013** (-2.322)	0.061*** (11.989)	0.052*** (11.093)	0.221 (0.739)
<i>POLCONV</i>	33.912*** (3.784)	0.143*** (6.359)	0.258*** (11.793)	0.099*** (4.678)	0.177*** (10.400)	1.520 (0.890)
<i>BANK</i>	-0.075** (-2.023)	0.000*** (3.350)	0.000*** (2.955)	-0.000*** (-4.304)	0.000** (2.285)	-0.014 (-1.253)
<i>TURNOVER</i>	0.026 (0.829)	0.001*** (12.520)	0.000*** (7.405)	0.001*** (11.521)	0.001*** (13.481)	0.001 (0.088)
<i>SIZE</i>	-0.373 (-1.036)	-0.037*** (-24.435)	-0.045*** (-28.730)	-0.039*** (-25.796)	-0.037*** (-24.526)	1.382** (2.501)
<i>NFA</i>	-4.121* (-1.857)	0.033** (2.322)	0.037** (2.476)	0.028** (2.027)	0.028** (1.973)	-3.679 (-1.321)
<i>PROFIT</i>	0.000 (0.133)	-0.000 (-0.597)	-0.000 (-0.839)	-0.000 (-0.721)	-0.000 (-0.589)	-103.968*** (-3.546)
<i>LEV</i>	0.004 (1.370)	0.000 (0.586)	0.000 (0.584)	0.000 (0.587)	0.000 (0.594)	6.591 (1.536)
<i>DISEASES</i>	-17.076*** (-4.536)					
<i>PDI</i>				-0.001*** (-2.780)		
<i>UAI</i>				0.002*** (7.294)		
<i>MAS</i>				0.002*** (7.642)		
<i>Intercept</i>	18.034 (1.296)	-0.515*** (-17.345)	-0.433*** (-13.588)	-0.594*** (-13.049)	-0.525*** (-17.836)	-9.266** (-2.551)
Industry Effects	YES	YES	YES	YES	YES	NO
Year Effects	YES	YES	YES	YES	YES	NO
N	413,411	413,411	377,779	413,411	413,074	57
Pseudo/Adj R <sup>2</sup>	0.810	0.024	0.028	0.025	0.024	0.560



---

Notes: This table presents firm-level panel estimation from regressing different measures of firm growth on individualism (*IDV*) and controls. Endogeneity is addressed in Models 1 and 2. In Models 3 and 4 we consider alternative and additional cultural variables, respectively. In Model 5 we exclude small countries and in Model 6 we consider a country-level regression. The sample comprises 413,411 firm-year observations from 57 countries for the period 1989-2012. Beneath each coefficient estimate is reported the z-statistic. The Appendix outlines definitions and data sources for all variables. The superscript asterisks \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

---

**TABLE 6: Alternative Dependent Variable**

Variable	ALTERNATIVE XR_SFG			ASSET GROWTH
	XR_SFG1	XR_SFG2	XR_SFG3	AXR_SFG
	(1)	(2)	(3)	(4)
<i>IDV</i>	0.001*** (4.503)	0.001*** (4.547)	0.001*** (4.160)	0.005*** (11.847)
<i>INFLATION</i>	-0.001** (-2.301)	-0.001** (-2.094)	-0.000** (-2.016)	0.000 (0.937)
<i>GDPGR</i>	0.031*** (26.846)	0.030*** (25.892)	0.029*** (24.874)	-0.034*** (-12.683)
<i>LAW</i>	0.055*** (11.788)	0.054*** (11.629)	0.054*** (11.544)	0.050*** (4.612)
<i>POLCONV</i>	0.161*** (9.612)	0.164*** (9.739)	0.169*** (9.933)	-0.215*** (-4.648)
<i>BANK</i>	0.000 (1.084)	0.000* (1.701)	0.000* (1.821)	-0.000 (-0.014)
<i>TURNOVER</i>	0.000*** (11.452)	0.001*** (12.539)	0.001*** (13.063)	-0.000 (-0.074)
<i>SIZE</i>	-0.030*** (-20.171)	-0.035*** (-23.267)	-0.037*** (-24.421)	-0.235*** (-74.765)
<i>NFA</i>	-0.019 (-1.381)	-0.006 (-0.415)	0.008 (0.588)	-0.169*** (-6.513)
<i>PROFIT</i>	0.000 (0.434)	0.000 (0.106)	-0.000 (-0.537)	-0.000 (-0.620)
<i>LEV</i>	0.000 (0.495)	0.000 (0.661)	0.000 (0.661)	0.001 (0.787)
<i>Intercept</i>	-0.523*** (-17.887)	-0.510*** (-17.413)	-0.512*** (-17.462)	-1.104*** (-17.955)
Industry Effects	YES	YES	YES	YES
Year Effects	YES	YES	YES	YES
N	413,411	413,411	413,411	411,608
Pseudo R <sup>2</sup>	0.024	0.025	0.025	0.198

Notes: This table presents firm-level panel estimation results from regressing alternative measures of firm growth on individualism (*IDV*) and controls. The sample comprises 413,411 firm-year observations from 57 countries for the period 1989-2012. Beneath each coefficient estimate is reported the z-statistic. The Appendix outlines definitions and data sources for all variables. The superscript asterisks \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

**TABLE 7. Additional Control Variables**

Variable	<i>XR_SFG</i>	<i>XR_SFG</i>	<i>XR_SFG</i>	<i>XR_SFG</i>
	(1)	(2)	(3)	(4)
<i>IDV</i>	0.001*** (4.999)	0.001*** (4.024)	0.001*** (3.234)	0.001*** (4.703)
<i>INFLATION</i>	-0.000* (-1.889)	-0.000 (-0.762)	-0.000** (-1.971)	-0.000 (-0.600)
<i>GDPGR</i>	0.028*** (24.260)	0.030*** (24.818)	0.029*** (24.875)	0.030*** (24.802)
<i>LAW</i>	0.052*** (11.105)	0.057*** (11.940)	0.048*** (9.913)	0.056*** (11.036)
<i>POLCONV</i>	0.175*** (10.216)	0.067*** (3.119)	0.174*** (10.157)	0.064*** (2.960)
<i>BANK</i>	0.000*** (2.979)	0.000** (2.347)	0.000** (2.283)	0.000*** (3.011)
<i>TURNOVER</i>	0.001*** (13.394)	0.000*** (11.022)	0.001*** (13.557)	0.000*** (10.923)
<i>SIZE</i>	-0.043*** (-28.099)	-0.038*** (-24.847)	-0.037*** (-24.573)	-0.044*** (-28.434)
<i>NFA</i>	0.016 (1.097)	0.023 (1.639)	0.030** (2.112)	0.011 (0.779)
<i>PROFIT</i>	-0.000 (-0.539)	-0.000 (-0.700)	-0.000 (-0.601)	-0.000 (-0.468)
<i>LEV</i>	0.001 (0.751)	0.000 (0.594)	0.000 (0.594)	0.001 (0.733)
<i>SALES/ASSETS</i>	0.000*** (3.181)			0.000*** (3.177)
<i>ACC</i>		0.003*** (7.772)		0.003*** (7.527)
<i>INVESTPROF</i>			0.006** (2.499)	0.003* (1.418)
<i>Intercept</i>	-0.474*** (-15.843)	-0.358*** (-10.035)	-0.560*** (-17.348)	-0.329*** (-8.338)
Industry Effects	YES	YES	YES	YES
Year Effects	YES	YES	YES	YES
N	410,707	406,029	413,411	403,341
Pseudo R <sup>2</sup>	0.026	0.025	0.024	0.026

Notes: This table presents firm-level panel estimation results from regressing firm growth on individualism (*IDV*) and controls. In Models 1, 2 and 3 we include *SALES/ASSETS*, *ACC*, and *INVESTPROF* as additional control variables, respectively. Model 4 controls for the three variables simultaneously. The sample comprises 413,411 firm-year observations from 57 countries for the period 1989-2012. Beneath each coefficient estimate is reported the z-statistic. The Appendix outlines definitions and data sources for all variables. The superscript asterisks \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

**TABLE 8. Access to Finance, Individualism and Firm Growth**

Variable	<i>BANK</i>	<i>PVCREDIT</i>	<i>MARKETCAP</i>
	(1)	(2)	(3)
<i>IDV*BANK</i>	-0.000*** (-16.806)		
<i>IDV*PVCREDIT</i>		-0.000*** (-14.599)	
<i>IDV*MARKETCAP</i>			-0.000*** (-2.857)
<i>IDV</i>	0.006*** (16.692)	0.006*** (16.318)	0.001** (2.551)
<i>INFLATION</i>	0.000 (0.030)	0.000 (0.495)	-0.000* (-1.806)
<i>GDPGR</i>	0.028*** (24.043)	0.029*** (24.549)	0.028*** (24.087)
<i>LAW</i>	0.036*** (7.572)	0.042*** (8.632)	0.046*** (9.290)
<i>POLCONV</i>	0.158*** (9.347)	0.110*** (6.231)	0.185*** (10.838)
<i>BANK</i>	0.003*** (16.915)	0.002*** (10.132)	0.000** (2.004)
<i>TURNOVER</i>	0.000*** (10.501)	0.000*** (9.926)	0.000*** (4.304)
<i>SIZE</i>	-0.039*** (-25.941)	-0.039*** (-25.644)	-0.038*** (-25.065)
<i>NFA</i>	0.039*** (2.746)	0.039*** (2.796)	0.031** (2.206)
<i>PROFIT</i>	-0.000 (-0.818)	-0.000 (-0.818)	-0.000 (-0.689)
<i>LEV</i>	0.000 (0.598)	0.000 (0.606)	0.000 (0.597)
<i>PVCREDIT</i>		0.001*** (2.844)	
<i>MARKETCAP</i>			0.001*** (5.612)
<i>Intercept</i>	-0.755*** (-22.794)	-0.728*** (-22.230)	-0.507*** (-16.978)
Industry Effects	YES	YES	YES
Year Effects	YES	YES	YES
N	413,411	409,830	413,333
Pseudo R <sup>2</sup>	0.025	0.026	0.025

Notes: This table presents firm-level panel estimation results from regressing firm growth on individualism (*IDV*) and controls. In Models 1, 2 and 3 we interact *IDV* with *BANK*, *PVCREDIT*, and *MARKETCAP*, respectively. The sample comprises 413,411 firm-year observations from 57 countries for the period 1989-2012. Beneath each coefficient estimate is reported the z-statistic. The Appendix outlines definitions and data sources for all variables. The superscript asterisks \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.