POLITICAL ECONOMY RESEARCH INSTITUTE

PERI

University of Massachusetts Amherst

Financial Market Diversity and Macroeconomic Stability

Christian Weller and Ghazal Zulfiqar

August 2013

WORKINGPAPER SERIES

Number 332

UMASS

Financial Market Diversity and Macroeconomic Stability

Christian E. Weller
Professor
Department of Public Policy and Public Affairs
McCormack Graduate School of Policy and Global Studies
University of Massachusetts Boston
100 Morrissey Boulevard
Boston, MA 02125
Email: Christian.weller@umb.edu

and

Senior Fellow
Center for American Progress
Washington, DC

and

Ghazal Zulfiqar
Department of Public Policy and Public Affairs
University of Massachusetts Boston

Abstract

Macroeconomic instability has stunted growth in many developing economies in the past two decades. As a result, the governments of these economies are looking for ways to better manage the economic factors that contribute to instability. Encouraging the creation of diverse financial markets, characterized by a wide range of financial institutions, may be one such option for better macroeconomic risk management. Greater institutional diversity could broaden the reach of financial markets, thus reducing liquidity constraints. And diversity may offer some insurance against the fallout from boom-and-bust cycles in each institutional type since each institutional type only covers a limited market segment.

But greater institutional diversity could contribute to instability. Many institutions may not fully capture economies of scale, driving up costs and fees for customers and exacerbating liquidity constraints. This may especially be the case if governments try to incentivize the creation of institutions in otherwise underserved markets through regulatory preferences and subsidies. Institutions may also compete for a limited number of creditworthy projects, potentially funding an increasing number of speculative projects. Liquidity constraints and speculation could raise economic instability. And financial market contagion may limit the insurance value of diversified financial markets.

We study the link between financial market diversity and economic instability in developing economies for the past few decades, using aggregate data from the Fraser Institute's Economic Freedom database, the International Monetary Fund's International Financial Statistics, the World Bank's Global Financial Development database, the Bank for International Settlements' international banking statistics and the BankScope database. We find that financial market diversity matters for economic stability for most subperiods during the past two decades as well as for most regions. Our research particularly suggests that greater diversity is associated with faster growth, larger credit markets, a broader deposit base, and a smaller chance of asset bubbles, all of which could contribute to more stability.

I.   Introduction

Macroeconomic instability has widespread and severe consequences. It tends to lower long-term economic growth both domestically and abroad since instability can spread to other countries due to trade and capital flows. Economic volatility also adversely affects poor households more than higher-income ones since lower-income households have fewer ways to smooth consumption over time due to lack of access to financial markets, lower savings, and limited social insurance coverage (Prasad, et al., 2007).

Governments find themselves in a dilemma in addressing macroeconomic risks. Reducing risks would require putting tighter reins on international capital flows and financial markets, but governments have liberalized these markets in an effort to lower domestic liquidity constraints. They may thus be unwilling or unable to reverse recent liberalizations. Finding ways to better manage macroeconomic risks may hence be a preferred policy alternative.

Developing diverse financial markets—several different types of financial institutions serving broad swaths of different constituencies—may be a key macroeconomic risk-management tool. Diverse financial markets may lead to broader financial market development than less diverse ones. Diverse financial markets then could lower liquidity constraints more than more institutionally concentrated markets. Fewer financial constraints could strengthen and stabilize economic growth. Diverse financial markets may also help mobilize more domestic savings than less diverse markets, thus reducing the need to attract potentially destabilizing portfolio capital inflows. And greater domestic savings mobilization may offer households more ways to smooth consumption during economic downturns, stabilizing overall economic growth.

More diverse financial markets, though, could also contribute to more instability. Greater diversity may mean that a large number of small institutions cannot take full advantage of economies of scale, raising costs for borrowers. Many institutions may also vie for too few creditworthy customers, leading to the financing of more speculative projects than otherwise would be the case. Furthermore, inefficiencies can also arise from public interventions— regulatory preferences and subsidies—for some parts of financial markets. Greater institutional diversity could lead to more instability due to persistent liquidity constraints, growing speculation, and widespread inefficiencies.

We consider the evidence for developing countries for the past few decades on the link between financial market diversity and macroeconomic stability. Financial market diversity— many substantial and different financial institutions—correlates with macroeconomic stability. The exact composition of an institutionally diverse financial market depends on a country's development path—for example, encouraging more well-supervised bank activities in market-based systems and fostering transparent and well-regulated capital markets in bank-based systems. Governments can increase their economies' stability by developing more diverse financial markets in a manner that is consistent with their financial institutional development. More diversity is associated with larger credit markets, a broader deposit base, faster growth, and a lower chance of asset bubbles.

The rest of the paper is organized as follows. Section II presents a review of the relevant literature. We discuss the data and our methodology briefly in section III. Our data analysis follows in section IV and we conclude with some tentative policy implications in section V.

II.   Literature review

Severe output shocks in developing economies have gained increasing attention since macroeconomic volatility slows long-term growth, disproportionately impacts the poor, and has become more frequent in recent decades (Prasad, et al., 2007; Laursen & Mahajan, 2005). Macroeconomic instability impacts growth adversely, thanks to the uncertainty volatility introduces into the economy (Ramey & Ramey, 1995). Macroeconomic volatility tends to have larger output and income effects in poorer countries than in rich ones (Pallage & Robe, 2003; Hnatkovska & Loayza, 2005). Similarly, volatility tends to impact lower-income households more than higher-income ones since lower-income households have less access to social insurance, have fewer savings, and have less credit market access (Harvey, 2010; Khan, 2001). Developing countries also tend to be more susceptible to macroeconomic instability than developed countries (e.g., Mendoza, 1995; Loayza et al., 2007; Ramey & Ramey, 1995; Pallage & Robe, 2003; Perry, 2009). Moreover, volatility for developing countries seems to have increased over time. One-third of developing countries, for example, experienced higher volatility in the 1990s than in the 1980s (Montiel & Serven, 2006).

Financial development and stability

Some have argued that financial development is unambiguously positive for economic growth and development. In this view, a country's rate of economic growth would accelerate as its financial structure strengthened (Goldsmith, 1969; McKinnon, 1973; Shaw, 1973). King and Levine (1993) show that a healthy financial system can promote economic development—by raising the level of domestic savings and investment growth, for example, especially among typically finance-constrained borrowers (Claessens, 2006; Beck, Levine, & Loayza, 1999); and by providing key information, monitoring corporate governance, trading, diversifying and managing risk, and simplifying the exchange of goods and services (Levine, 2005). Well-developed financial markets—those that offer a range of products and services to a wide range of clients—can reduce income and wealth inequality, possibly increasing economic stability (Beck, Demirguc-Kunt, & Levine, 2004; Honohan 2004; Jalilian & Kirkpatrick, 2002; Li, Squire, & Zou, 1998). Ahmed and Suardi (2009) find, for instance, that financial development reduces macroeconomic volatility for sub-Saharan Africa. Similarly, Jalil, Ma, and Naveed (2008) find that greater financial development leads to increased access to credit markets, which results in smoothening in both consumption and investment in Pakistan and China.

Financial development can contribute to macroeconomic stability by lowering credit constraints, resulting in faster economic growth, less poverty, and lower income inequality (e.g. Levine, 1997; Jalilian & Kirkpatrick, 2002; Thorsten, Demirguc, & Levine, 2004).

But financial development can be a source of instability as well. Liberalized financial systems, especially those operating without an adequate regulatory structure, can foster excessive speculation in asset and credit markets, which can translate into greater economic volatility

(Broner & Ventura, 2010; Weller, 2000; Weller & Morzuch, 2000). Thus, the relationship between financial development and macroeconomic stability can swing either way, depending on the level of development, depth of domestic financial markets, and institutional quality (Broner & Ventura, 2010).

The mixed evidence on the level of financial development and economic stability reflects the fine balance that domestic institutional development plays in fostering economic stability. Prudent regulation, for instance, is a key institution necessary for financial systems to not be destabilizing the rest of the economy (Angkinand, Sawangngoenyuang, & Whilborg, 2010). Restrictive banking regulations may create inefficiencies by protecting existing banks, erecting barriers for new entrants, and raising the chance for corruption (Evrensel, 2009; Beck, Demirguc-Kunt, & Levine, 2006). But weak regulation and supervision can make financial systems susceptible to crises (Angkinand, Sawangngoenyuang, & Whilborg, 2010) because there are more opportunities for speculative activities (Liang, 2012; Minsky, 1992).

Financial market diversity

Public policy, through regulation and public subsidies, can also create greater institutional financial market diversity. Institutional diversity can mean that a country has a range of banking institutions, differentiated by size and country of origin, and thus by clients and products. It can also mean that both banks and capital markets serve as a source of financing. Institutional diversity can contribute to more economic stability through lower liquidity constraints and hence stronger growth; a larger deposit base, which could allow households to better weather economic downturns and thus make recessions less severe; and fewer chances of speculative bubbles that could disrupt financial markets and the economy.

Diversified financial markets can result in lower liquidity constraints for a range of clients than would be the case with institutionally more concentrated markets. For one, having a larger number of smaller banks may reduce financial constraints. Larger banks tend to enjoy increasing economies of scale (Stiglitz, Jaramillo-Vallejo, & Park, 1993) and they are often unwilling to lend to clients that have little or no financial records. Smaller banks are better able to collect and act on "soft" information (Berger et al., 2005), particularly during crises (Berger & Udell, 2002), lowering credit constraints for borrowers who are underserved by larger banks.

Public policy interventions to diversify financial sectors may directly lower liquidity constraints for some borrowers. Governments have subsidized banks—postal savings unions, credit unions, and cooperatives—to overcome the inherent disadvantages of smaller banks vis-à-vis larger ones due to economies of scale. Publicly subsidized banks are often the main vehicle for the mobilization of rural savings and the provision of affordable financial services to low-income populations in many countries (McKillop, Ward, & Wilson, 2007; Scher, 2001; Huppi & Feder, 1990). Borrowers, who otherwise would be excluded from formal financial services, can get access to banking products due to public interventions, boosting economic growth and stability.

Foreign bank participation may also lower liquidity constraints for some borrowers. Foreign bank participation can enhance a financial system's efficiency through spillover effects of increased competition since foreign banks tend to be larger, better capitalized, and have more

banking experience than domestic banks in most developing economies (Barth, Caprio, & Levine, 2003; Bonin, Hasan & Wachtel, 2005; Koivu & Sutela, 2005). Evidence from India, for instance, suggests that after the entry of foreign banks, the most profitable firms were the ones located near foreign banks and received larger loans than before (Gormley, 2007). Foreign banks can also more quickly reduce capital constraints than domestic banks because they rely in part on external capital (Cetkovic, 2011; Weller & Scher, 2001).

Many countries also rely on capital markets to finance investments. Capital markets may be better at providing risk-management tools than is the case for banks. Capital markets could also lessen the chance of collusion between banks and firm managers, which would increase inefficiencies and slow growth (Rajan, 1992; Wenger & Kaserer, 1998). Finally, capital markets may lower costs and liquidity constraints for larger, better-capitalized borrowers more than banks can.

Institutionally more diverse financial markets may also lower the chance and magnitude of disruptive asset and credit market bubbles, if boom-and-bust cycles can remain relatively limited to parts of the financial market. Also, more diverse financial markets should be characterized by a larger number of smaller institutions than is the case with more concentrated markets, thus lowering the moral hazard associated with "too big to fail" (Soussa, 2005), and thus again lowering the chance of speculative financing. What's more, institutionally more diverse financial markets may be better at mobilizing domestic savings, which could reduce the need for external and potentially destabilizing portfolio capital flows (Weller and Rao, 2010). A larger deposit base may also reflect more household savings and thus an increased ability of a household to smooth consumption during an economic downturn, which could keep recessions from getting more severe (Balli & Balli, 2011).

Access to external capital that foreign banks import may help to smooth capital constraints during times of financial turmoil. This was the case in the 1994-95 crises in Argentina and Mexico (Goldberg, Dages, & Kinney, 2000). Increased capital inflows during or shortly after a crisis may lower macroeconomic volatility by accelerating an economic recovery. Foreign banks, for instance, often take advantage of depressed asset prices after a crisis, potentially accelerating a country's financial and economic recovery (Weller & Scher, 2001).

But institutionally more diverse financial systems may alternatively be characterized by a range of inefficiencies that do not plague less diverse systems. Diverse financial systems may end up with more liquidity constraints and more asset bubbles, not fewer constraints and fewer boom-and-bust cycles.

Smaller banks, for instance, may not fully exploit economies of scale, resulting in less capitalization than is the case for larger banks and thus resulting in greater liquidity constraints across developing economies. This could contribute to slower growth and potentially more economic volatility than is the case in a system characterized by fewer, larger banks (e.g. Kirkpatrick, Murinde, & Tefula, 2008; Median, Perry, & Rezvanian, 2007).

Public interventions to diversify banking systems may contribute to financial system inefficiencies, thus raising the potential for economic instability. Public interventions in banks

could increase political interference in credit allocations (Chernykh & Cole, 2011; La Porta, Lopez-De-Silanes, & Shleifer, 2002), resulting in excessively risky projects being funded and thus contributing to more economic volatility.

Foreign banks could also have a destabilizing effect (Prasad, et. al., 2007). Foreign bank entry may exacerbate credit constraints as domestic banks reduce lending (Gormley, 2007; Weller, 2000, 2005). And the presence of foreign banks can amplify economic volatility within developing countries, since they can shift their capital elsewhere if local borrowers' balance sheets deteriorate, accelerating financial and economic downturns (Cetkovic, 2011; Morgan & Strahan, 2003). This is especially important since research suggests that financial crises have increased in virulence over time (Hsu, 2012). More specifically, during the recent financial crisis, foreign bank presence correlated negatively with domestic credit creation in developing countries and foreign banks were seen reducing credit much more than domestic banks (Claessens & van Horen, 2012). Cull and Peria (2012) also find that foreign banks cut back more on credit than domestic banks did, at least in Central and Eastern Europe, while the opposite was true for Latin America. Foreign banking presence may have worsened the economic downturns in some parts of the world.

Capital markets can substantially contribute to destabilizing asset market boom-and-bust cycles (Weller & Rao, 2010). Banks, on the other hand, are often able to mobilize savings more easily, identify good investments, and encourage better corporate governance than capital markets, especially in earlier stages of development when institutions are relatively weak (Demirguc-Kunt & Levine, 1999). Banks may also be more effective in helping an economy industrialize by raising investment, growth, and per capita incomes, and lowering income inequality (Chakraborty & Ray, 2006) since they can more easily overcome asymmetric information problems (Stiglitz, 1985) especially in developing countries (Miskhin, 1996). Bank-based systems may be less prone to destabilizing asset bubbles since capital markets may be underdeveloped (Weller & Morzuch, 2000). And post-crisis banks bring stability back to the economy more quickly than markets since they are able to re-contract almost seamlessly with borrowers during an economic upturn (Allen & Gale, 2001). Capital markets thus can play a critical role in destabilizing developing economies.

The existing literature suggests that institutional diversity may contribute to more economic stability. First, diverse financial systems may increase the amount of available credit, but possibly at the expense of greater inefficiencies. Second, more diverse financial systems may increase the amount of deposits, allowing households and firms to better weather economic downturns. Third, more diverse financial systems may lower the size of disruptive asset bubbles because of the availability of more productive and fewer speculative investment opportunities and because boom-and-bust cycles may impact only part of the financial system.

III.   Data and variables

We analyze whether there is a possible connection between institutional diversity in financial markets and economic stability in developing economies. Our developing country sample consists of all countries listed in the World Bank database (2012), but excludes those defined as

"high-income OECD." This leaves 184 non-OECD countries. We only use complete observations in our analysis to allow for robustness tests, limiting our dataset to the years from 1991 to 2011. We have a balanced/unbalanced panel with 1,207 complete observations, compiled from a variety of data sources. (See Table A-1 in the appendix for details on variable definitions and data sources.)

Macroeconomic volatility

Macroeconomic volatility is our main variable of interest. We define macroeconomic volatility as the standard deviation of the GDP growth rate over time (Ramey & Ramey, 1995), by creating a five-period moving standard deviation. The economic growth data are taken from the World Bank database (2012). Table 1 summarizes the five-period moving standard deviation of macroeconomic volatility over time and across regions in our complete observation dataset. We specifically split the 21-year period in observations before and after 2000. This leaves 10 years in the earlier period, from 1991 to 2000, and 11 years in the later period, from 2001 to 2012. Annual volatility declined from the earlier period to the later period, from 3.69 percent to 3.01 percent (Table 1). We also summarize data for four major regions: Middle East and Africa; South and East Asia and the Pacific; Europe and Central Asia; and Latin America and the Caribbean.[1]

Table 1 shows again substantial variation in volatility between regions, from a high of 5 percent in the Middle East and Africa to a low of 3.5 percent in Latin America and the Caribbean (Table 1). Our empirical analysis will consequently study the link between macroeconomic volatility and institutional diversity for the entire dataset and in the subperiods and the four regions since the data suggest substantial variation of macroeconomic instability over time and region.

Table 1: Trends in macroeconomic growth volatility for non-OECD countries	
Mean annual volatility overall	3.25
Mean annual volatility by period	
1991–2000	3.69
2001–2011	3.01
Mean annual volatility by region	
Middle East and Africa	3.79
South and East Asia and the Pacific	2.89
Europe and Central Asia	3.43
Latin America and the Caribbean	2.72

Notes: All figures in percent. Macroeconomic volatility refers to the five-year moving standard deviation of real GDP growth. Authors' calculations based on World Bank data (2012).

---

[1] We use a high level of regional aggregation to preserve observations.

Institutional financial diversity

We define four aspects that could characterize an institutionally diverse financial system: bank size; private-sector banking; foreign bank participation; and capital market development.

We use BankScope's bank concentration indicator (Beck, Demirguc-Kunt, & Levine, 2000, 2012) as proxy for bank size. This measure is the share of all commercial bank assets concentrated among the three largest banks in a country. We interpret a larger value of this measure as a sign of fewer small banks operating locally.

Next, we want to capture both size and activities of private financial institutions. Privately owned banks may exist in a developing country but operate with limited banking licenses and thus provide a narrow range of products and services. We use private bank credit data to capture size, specifically the ratio of commercial banking assets to total commercial and central bank assets. Commercial banking assets include loans to the central, state, and local government and to the private nonfinancial sector (Beck, Demirguc-Kunt, & Levine, 2012).[2] The higher this ratio is, the more limited the role of the central bank and therefore the public sector in the financial market—that is, a higher ratio reflects a larger private banking sector.

We also use measures of banking regulation to proxy for the range of products and services that banks could offer. We employ the Fraser Institute's Economic Freedom database's (2012) indicator of the extent to which governments allow private ownership of banks and its indicator of the degree to which governments permit credit market competition as measures for the range of services that private banks may offer. Each indicator has a 10-point scale with 10 showing the highest level of private ownership and competition permissible, respectively. Observations are available every five years from 1970 to 2000 and we linearly interpolate for the intervening years. Data are available annually from 2000 onward. We assume that greater tolerance of private ownership and more competition result in a broader range of products and services.

We combine these two aspects of private-sector banking—size and products—into one measure of private banking activity through a factor analysis. Factor analysis is used for data reduction or for testing the interrelationship among variables (Stapleton, 1997; Floyd & Widaman, 1995). Here we use it to reduce the number of private banking variables. This is a common use of factor analysis—that is, using the technique to provide an explanation of the relationship between a set of variables in terms of a smaller number of unobserved latent variables, or factors (Daniel, 1988).

Our factor analysis employs a polychoric correlation matrix (Stapleton, 1997; Floyd & Widaman, 1995). Factor analysis normally assumes the use of continuous variables. Since the Fraser Institute's economic freedom indicators are ordinal, however, we use a polychoric correlation matrix in our confirmatory factor analysis. Research shows that regardless of sample size and population correlation, polychoric correlations produce the most consistent and robust indicators in a factor analysis that involves ordinal variables (Holgado-Tello, et al., 2010;

---

[2] We make the simplifying assumption that all commercial banks are privately owned.

Joreskog & Sorbom, 1996). Polychoric correlation estimates the correlation between pairs of latent variables or factors from pairs of observed variables, assumed to be normally distributed and grouped into ordinal categories (Drasgow, 1986).

The three variables we use for our factor analysis include the two Fraser indicators and the commercial bank to central bank asset ratio. For each of these indicators, a higher value signifies more diversity in the private banking sector. We use the first factor, which accounts for just more than 100 percent of the variation between our private-sector banking measures and loads against all three variables in the same direction.

Our third aspect of financial market diversity turns to the capital market. We define stock market capitalization as a percentage of GDP as capital market development, taken from the World Bank database (2012). A greater ratio indicates deeper capital markets.

We finally develop an indicator of foreign bank participation, following a similar logic as we did for private bank activity. We measure foreign bank size as the proportion of total foreign bank loans to total loans extended by the financial sector. We use foreign bank loan data from the Bank for International Settlements, or BIS (2012), while the total loan data is from the International Monetary Fund's (2012) International Financial Statistics, or IFS. The BIS data are available from 1983 onward in U.S. dollars. We convert the data into local currency using end-of-period exchange rates from the World Bank database to make the BIS data consistent with the IFS data, which is reported in local currency.

We create all our explanatory variables with a five-period lag, such that we are measuring a contemporaneous effect between financial-sector diversity and macroeconomic stability. We also interpolate and extrapolate our data as long as the missing periods do not exceed five years.

We create a combined measure of overall financial diversity using polychoric factor analysis. We use the first factor, which alone accounts for 95.46 percent of the variation between our diversity measures and loads against all our financial institutional variables in the same direction. Factor analysis is often criticized for creating variables that are hard to interpret, but in this case a single factor is able to explain a much higher percentage of the variation between all six of our diversity measures.[3]

Empirical analysis

All our explanatory variables represent different parts of financial market institutions. Financial markets in developing economies have traditionally relied on public lending institutions—

---

[3] We alternatively tried a summary measure that was simply the sum of institutional financial indicators that were greater than the median in any country at any given time. This simple summary measure gave us similar results from those of our factor analysis. Factor analysis is a superior technique to this summary measure because it is statistically anchored. It also avoids the problem of multicollinearity and overlap between variables.

central banks, or publicly owned or subsidized banks. Greater reliance on private banks, on capital markets, and on foreign banks thus indicates growing financial market diversity.

We use a bivariate approach for our analysis of a potential link between financial market diversity and macroeconomic stability. We split our sample at the median for each explanatory financial institutions measure. We then report the average growth stability across regions and time below the median and above the median for each diversity measure. We also indicate if any observed differences in the value of the economic stability variable across our subsamples are statistically significant using a t-test.

Our previous discussion suggests that overall, more financial diversity should be associated with higher levels of macroeconomic stability.

Table 2 shows results for our entire sample. We repeat the tests for additional subsamples to control for the robustness of our results. We first split our sample by time periods in Table 3, specifically for the years between 1991 and 2000, and for the years 2001 and beyond. We then split our sample by developing country geographic regions as shown in Table 4.

The results in Table 2 confirm our main hypothesis. The combined financial diversity measure shows that countries with a diversity measure above the median are more economically stable—lower economic growth volatility—than countries with less financial diversity. The standard error of economic growth is 2.98 above the median for the polychoric factor and 3.51 below the median (Table 2). The difference is statistically significant at the 1 percent level.

Table 2: Volatility and financial diversity—complete observations only		
	Less diversity	More diversity
Private banking factor	3.41	3.08*
Bank concentration	2.93	3.56***
Stock market capitalization of listed companies (percent of GDP)	3.49	3.00**
Foreign bank claims to total claims	3.68	2.81***
Overall financial diversity factor	3.51	2.98***

Notes: All figures in percent. Figures are based on five-year moving standard deviation of real GDP growth. Calculations based on complete observations only. Statistical significance of differences in means is based on t-tests. The statistical significance is always indicated for the mean above the median for all financial diversity measures. *** denotes significant at the 1 percent level, ** denotes significant at the 5 percent level, and * denotes significant at the 10 percent level.

Table 2 shows that, except for the bank concentration indicator, all other individual financial institutional measures also confirm the main hypothesis. For instance, the private banking factor, which includes three measures of private banking size and products, suggests that more private banking diversity is correlated with less economic growth volatility. Moreover, larger capital markets are associated with less volatility. The ratio of foreign bank to total credits

correlates with more stability as well. A smaller proportion of commercial bank assets correlates with less stability, however—contrary to our initial expectations.

For the overall financial diversity measure, we arrive at a similar conclusion when we analyze the data for subperiods in Table 3, showing that our earlier conclusion did not depend on a particular time period. We have complete observations for two periods: 1991–2000 and 2001–2011. For the first period, economic growth volatility is 4.35 for below the median financial diversity and 3.05 for above the median financial diversity, across countries, and this is statistically significant at the 1 percent level. For the more recent period, volatility is 3.07 for financially less diverse countries and 2.95 for financially more diverse countries.

For each of the individual financial institutions measures within the first period, more diversity is always correlated with a higher degree of economic stability—that is, lower growth volatility, except for the bank concentration measure. Each of these results is significant at the 1 percent level.

The results for the later period, though, are much more mixed. For instance, while higher values of the foreign claim indicator is correlated with more economic stability, the private banking factor, the bank concentration indicator, and the stock market measure are all correlated with higher economic volatility in the period 2001 and beyond.

Table 3: Volatility and financial diversity by period—complete observations				
	1991–2000		2001–2011	
	Less diversity	More diversity	Less diversity	More diversity
Private banking factor	4.30	3.08***	2.94	3.08
Bank concentration	3.14	4.24***	2.74	3.28**
Stock market capitalization (percent of GDP)	4.34	3.05***	3.00	3.02
Foreign claims to total claims	4.18	3.20***	3.28	2.74**
Overall financial diversity factor	4.35	3.05***	3.07	2.95

Notes: All figures in percent. Figures are based on five-year moving standard deviation of real GDP growth. Calculations based on complete observations only. Statistical significance of differences in means is based on t-tests. The statistical significance is always indicated for the mean above the median for all financial diversity measures. *** denotes significant at the 1 percent level, ** denotes significant at the 5 percent level, and * denotes significant at the 10 percent level.

The bottom line of our period analysis is that we cannot identify a clear pattern among the individual institutional measures related to economic stability, even though our overall financial diversity measure shows that more diversity is related to a higher degree of economic stability. We interpret this as confirmation that institutional financial diversity depends on contextual factors such as time period and region.

Table 4 presents our summary by region. Overall, greater financial diversity correlates with more economic stability in most regions, except for South and East Asia and the Pacific, where greater diversity does not imply more economic stability. As far as individual financial institution measures are concerned, the ratio of foreign to total credits is the most consistently correlated measure with economic stability, except for South and East Asia and the Pacific. In terms of regions, the Middle East and Africa region and the Europe and Central Asia region appear to be mostly consistent with our hypothesis that higher levels of financial diversity are correlated with greater economic stability.

The bank concentration measure again indicates that higher levels of bank concentration are correlated with a greater economic stability, rather than the other way around as we might have expected (Table 4).

Table 4: Volatility and financial diversity by region—complete observations only								
	Middle East and Africa		South and East Asia and the Pacific		Europe and Central Asia		Latin America and the Caribbean	
	Less diversity	More diversity	Less diversity	More diversity	Less diversity	More diversity	Less diversity	More diversity
Private banking factor	4.27	3.31**	2.60	3.19	3.93	2.92**	2.69	2.75
Bank concentration	2.95	4.63***	3.08	2.71	3.19	3.67	2.84	2.60
Stock market capitalization (percent of GDP)	4.36	3.22***	2.15	3.64***	4.05	2.80***	2.68	2.76
Foreign claims to total claims	4.86	2.72***	2.30	3.49**	3.98	2.87***	2.75	2.69
Overall financial diversity factor	3.92	3.58	2.84	2.93	3.92	2.92**	2.91	2.62

Notes: All figures in percent. Figures are based on five-year moving standard deviation of real GDP growth. Calculations based on complete observations only. Statistical significance of differences in means is based on t-tests. The statistical significance is always indicated for the mean above the median for all financial diversity measures. *** denotes significant at the 1 percent level, ** denotes significant at the 5 percent level, and * denotes significant at the 10 percent level.

Intervening effects of financial market diversity

So far we have analyzed the relationship between financial diversity and economic stability. We now take a deeper look at the relationship between overall financial market diversity and its possible intervening impact on deposits, credit, and capital markets. Table 5 shows the possible impact of overall financial diversity for non-OECD countries against three financial market indicators during the 1991–2011 period, taken from the World Bank dataset (2012). Data are interpolated and extrapolated when the missing periods are less than or equal to 5. Further, only complete observations are used—that is, only those countries and years are considered when data are available for all three indicators.

Table 5: Financial market diversification		
	Less diversity	More diversity
Ratio of financial institution deposits to GDP	35.23	44.42***
Total private credit as a percentage of GDP	42.92	49.69***
Stock market volatility	8.30	5.10***

Notes: All figures in percent. Stock market volatility refers to the standard deviation of the return on the national stock market index. Calculations based on complete observations only. Statistical significance of differences in means is based on t-tests. The statistical significance is always indicated for the mean above the median for all financial diversity measures. *** denotes significant at the 1 percent level, ** denotes significant at the 5 percent level, and * denotes significant at the 10 percent level.

We measure diversity using the overall financial diversity indicator we developed earlier using polychoric factor analysis. When it falls below the median, we consider the market as being less diverse, otherwise we refer to it as being more diverse.

The first indicator is the ratio of financial institution deposits to GDP. The term "financial institutions" refers to commercial banks, as well as other bank and non-bank financial institutions. We see that a greater deposit base is associated with more diverse financial markets. The result is statistically significant at the 1 percent level. Deposit taking is an important financial institution activity and a larger deposit base is usually seen as a sign of a more mature financial market.

The second indicator shows the percentage of private credit against a country's GDP. This too confirms that diverse markets have generally speaking a higher level of debt market development than non-diverse markets. This result too is statistically significant at the 1 percent level.

Finally, we use stock market volatility data. Volatility is measured as the 360-day standard deviation of the return on the national stock market index. This indicator also shows that volatility in the stock market is less likely to occur in markets that are more financially diverse than markets that are less diverse.

Thus, the analysis of the intervening impact of financial diversity shows that diversity helps stabilize economic growth by encouraging more deposit taking, greater debt market development, and reducing the likelihood of stock market bubbles.

As we did with our previous results, we extend this discussion by conducting a period- and region-specific analysis. Table 6 shows the breakdown by time and institutional diversity of the same indicators as in Table 5, while Table 7 shows how these measures vary by region and diversity.

Table 6 confirms our hypothesis that more financially diverse systems have a greater proportion of deposits and debt market development and lower rates of stock market volatility, regardless

of time period. Specifically, for both periods in our analysis, the intervening impact of financial diversity are as clear, and for the most part as statistically significant, as they were for the overall analysis in Table 5.

Table 6: Financial market diversification				
	1991–2000		2001–2011	
	Less diversity	More diversity	Less diversity	More diversity
Ratio of financial institution deposits to GDP	28.63	36.65***	40.64	51.15***
Total private credit as a percentage of GDP	39.82	51.95***	45.46	47.74
Stock market volatility	6.66	4.03**	9.65	6.03***

Notes: All figures in percent. Stock market volatility refers to the standard deviation of the return on the national stock market index. Calculations based on complete observations only. Statistical significance of differences in means is based on t-tests. The statistical significance is always indicated for the mean above the median for all financial diversity measures. *** denotes significant at the 1 percent level, ** denotes significant at the 5 percent level, and * denotes significant at the 10 percent level.

Table 7 below shows region-specific results. The correlation of financial diversity with the intervening variables of financial market diversification exhibits the same patterns as in Tables 5 and 6. There is only one exception to this: The private credit indicator for South and East Asia and the Pacific shows more credit with less diversity. In all other cases, greater diversity implies more deposit taking, more private credit creation, and less stock market volatility. Nearly all indicators are statistically significant across regions.

Table 7: Financial market diversification by region								
	Middle East and Africa		South and East Asia and the Pacific		Europe and Central Asia		Latin America and the Caribbean	
	Less diversity	More diversity	Less diversity	More diversity	Less diversity	More diversity	Less diversity	More diversity
Ratio of financial institution deposits to GDP	25.81	30.97**	46.56	69.84**	40.10	44.41	35.23	44.42***
Total private credit as a percentage of GDP	28.97	29.80	71.77	55.30**	49.00	66.85*	42.92	49.70***
Stock market volatility	3.86	1.70***	17.83	11.10**	10.04	5.07**	8.30	5.10***

Notes: All figures in percent. Stock market volatility refers to the standard deviation of the return on the national stock market index. Calculations based on complete observations only. Statistical significance of differences in means is based on t-tests. The statistical significance is always indicated for the mean above the median for all

financial diversity measures. *** denotes significant at the 1 percent level, ** denotes significant at the 5 percent level, and * denotes significant at the 10 percent level.

IV.   Conclusion

We consider the link between financial market diversity and economic stability in this paper. Our results indicate that countries that have a more overall diverse financial sector—more private banks and more foreign bank participation—are also economically more stable.

Greater stability from more diverse financial markets appears to arise due to a larger deposit base, fewer credit constraints, and possibly a lower chance of speculative asset bubbles. Increased institutional financial diversity appears to lower credit constraints, to allow for more consumption smoothing than is the case in less diverse financial systems and reduces the chance of disruptive speculative bubbles.

Our results suggest that countries can use financial market policy as a means to stabilize their economies. The key lesson from our analysis, though, indicates that countries need to consider financial market diversity in their own historical and development context. There is no one-size-fits-all approach supported by our data.

References

Ahmed, A. & Suardi, S. (2009). Do Financial and Trade Liberalization Cause Macroeconomic Volatility in Sub-Saharan Africa? Working Paper No. 44, Center for Strategic Studies, Victoria University: Melbourne.

Allen, F., & Gale, D. (2001). Comparing Financial Systems. Cambridge: MIT Press.

Allen, F., & Gale, D. (2003). Competition and Financial Stability. Journal of Money, Credit and Banking , 453-480.

Angkinand, A; Sawangngoenyuang, W. & Wihlborg, C. (2010). Financial Liberalization and Banking Crises: A Cross-Country Analysis. International Review of Finance. Vol. 10(2). 263-292.

Arestis, P., & Demetriades, P. (1997). Financial Develoment and Economic Growth: Assessing the Evidence. *The Economic Journal, Volume 107, #442* , 783-799.

Balli, F. & Balli, H. O. (2011). Income and consumption smoothing and welfare gains across Pacific Island countries: The role of remittances and foreign aid. MPRA Paper from the University Library of Munich, Germany.

Bank for International Settlements. (2012, December). *Consolidated banking statistics*. Retrieved December 16, 2012, from Bank for International Settlements: http://www.bis.org/statistics/consstats.htm

Barth, J. R., Caprio, G., & Levine, R. (2003). Bank Regulation and Supervision: Lessons from a New Database. Cambridge, MA: National Bureau of Economic Research.

Beck, T., Demirguc-Kunt, A., & Levine, R. (2000). A New Database on Financial Development and Structure. *World Bank Economic Review 14* , 597-605.

Beck, T., Demirguc-Kunt, A., & Levine, R. (2012). Financial Institutions and Markets Across Countries and over Time: Data and Analysis. *World Bank Policy Research Working Paper No. 4943* .

Beck, T., Demirguc-Kunt, A., & Levine, R. (2006). Bank Supervision and Corruption in Lending. Journal of Monetary Economics, 2131-63.

Beck, T., Levine, R., & Loazya, N. (1999). Finance and the Sources of Growth. Washington DC: The World Bank Development Research Group.

Berger, A. N., & Udell, G. F. (2002). Small Business Credit Availability and Relationship Lending: The Importance of Bank Organizational Structure. The Economic Journal , F32-F53.

Berger, A. N., Miller, N. H., Petersen, M. A., Rajan, R. G., & Stein, J. C. (2005). Does function follow organizational form? Evidence from the lending practices of large and small banks. Journal of Financial Economics , 237-269.

Bernanke, B. S., & Lown, C. S. (1991). The Credit Crunch. Brookings Papers on Economic Activity , 205-247.

Bikker, J. A. (2001). Efficiency and Cost Differences Across Contries in a Unified European Banking Market. Amsterdam: De Nederlandsche Bank.

Bonin, J. P., Hasan, I., & Wachtel, P. (2005). Bank performance, efficiency, and ownership in transition countries. Journal of Banking & Finance , 31-53.

Brickley, J. A., Linck, J. S., & Smith Jr., C. W. (2003). Boundaries of the firm: evidence from the banking industry. Journal of Financial Economics , 351.

Broner, F.A. & Ventura, J. (2010). Rethinking the Effects of Financial Liberalization. NBER Working Paper No. 16640.

Capiro, G., & Honohan, P. (2002). Banking Policy and Macroeconomic Stability. Washington D.C.: The World Bank, Development Research Group.

Cetkovic, P. (2011). Credit Growth and Instability in Balkan Countries: The Role of Foreign Banks. London, UK: Research on Money and Finance Discussion Papers, Department of Economics, School of Oriental and African Studies.

Chakraborty, S., & Ray, T. (2006). Bank-based versus market-based financial systems: A growth-theoretic analysis. Journal of Monetary Economics , 329-350.

Chernykh, L., & Cole, R. A. (2011). Does Deposit Insurance Improve Financial Intermediation? Evidence from the Russian Experiment. Journal of Banking and Finance, 388-402.

Claessens, S. & van Horen, N. (2012). Foreign Banks: Trends, Impact and Financial Stability. IMF Working Paper.

Claessens, S. (Fall 2006 21(2)). Access to Financial Services. World Bank Observer , 207-240.

Cull, R. & Peria, M.S.M (2012). Bank Ownership and Lending Patterns during the 2008-09 Financial Crisis. World Bank Policy Research Working Paper No. 6195.

Daniel, L.G. (1988). Comparisons of exploratory and confirmatory factor analysis. Paper presented at the annual meeting of the Southwest Educational Research Association, Little Rock. (ERIC Document Reproduction Service No. ED 314 447)

Demirguc-Kunt, D., & Levine, R. (1999). Bank-Based and Market-Based Financial Systems: Cross-Country Comparisons. World Bank Policy Working Paper No. 2143 .

Drasgow, F. (1986) Polychoric and polyserial correlations. Pp. 68–74 in S. Kotz and N. Johnson, eds., The Encyclopedia of Statistics, Volume 7. Wiley.

Easterly, W., Islam, R., & Stiglitz, J. (2000). Shaken and Stirred: Explaining Growth Volatility. Washington D.C.: The World Bank.

Evrensel, A. Y. (2009). Differences in Bank Regulations: The Role of Governance and Corruption. Journal of Economic Policy Reform, 91-110.

Holgado-tello, F. P.; Chacon-mosoco, S.; Barbero-garcia, I. & Vila-abad, E. (2010). Polychoric Versus Pearson Correlations in Exploratory and Confirmatory Factor Analysis of Ordinal Variables. Quality and Quantity 44.1: 153-66.

Floyd, F.J., & Widaman, K.F. (1995) Factor Analysis in the Development and Refinement of Clinical Assessment Instruments. Psychological Assessment 7.3. 286-299.

Fraser Institute. (2010). 2010 Economic Freedom Dataset. *Economic Freedom of the World:2010 Annual Report.* Economic Freedom Network. URL: http://www.freetheworld.com/datasets_efw.html20.

Goldberg, L., Dages, G., & Kinney, D. (2000). Foerign and Domestic Bank Pariticipation in Emerging Markets: Lessons from Mexico and Argentina. Economic Policy Review

Goldsmith, R. (1969). Financial Structure and Development. New Haven, Conneticut: Yale University Press.

Gormley, T. A. (2010). Banking Competition in Developing Countries: Does Foreign Bank Entry Improve Credit Access? Journal of Financial Intermediation , 26-51.

Grabel, I. (1995). Speculation-Led Economic Development: A post-Keynesian Interpretation of Financial Liberalization Programes in the Third World. International Review of Applied Economics, Volume 9 , 127-149.23.

Greenwald, B., & Stiglitz, J. (1993). Financial Market Imperfections and Business Cycles. The Quarterly Journal of Economics , 77-114.

Greenwood, J., & Jovanovic, B. (1990). Financial Development, Growth, and the Distribution of Income. Journal of Political Economy , 1076-1107.

Harvey, J.T. (2010). Neoliberalism, neoclassicism and economic welfare. Journal of Economic Issues Vol. 44(2). 359-368.

Hawkins, J., & Mihaljek, D. (2001). The banking industry in the emerging market economies: competition, consolidation and systemic stability: an overview. Meeting of senior officials from central banks (pp. 1-44). Basel, Switzerland: Bank for International Settlements.

Hnatkovska, V., & Loayza, N. (2005). Volality and Growth. In J. Aizenmann, & B. Pinto, Managing Economic Volatility and Crises. Cambridge, United Kingdom: Cambridge University Press.

Hoggarth, G., Reis, R., & Saporta, V. (2001). Costs of Banking System Instability: Some Empirical Evidence. EFA 2001 Barcelona Meetings, Bank of England Working Paper No. 144.

Honohan, P. (2000). Banking System Failures in Developing and Transition Countries: Diagnosis and Prediction. Economic Notes , 83-109.

Honohan, P. (2004). Financial Development, Growth and Poverty: How Close are the Links? Washington D.C.: World Bank Policy Research Working Paper 3203.

Honohan, P., & Klingebiel, D. (2003). The fiscal cost implications of an accommodating approach to banking crises. Journal of Banking & Finance , 1539-1560.

Hsu, S. (2012). The Increasing Virulence of Man-Made Crises: Financial Crises and Global Instability. Journal of Economic Issues Vol. 46(2). 491-498

Huppi, M., & Feder, G. (1990). The Role of Groups and Credit Cooperatives in Rural Lending. The World Bank Research Observer , 187-204.

International Monetary Fund (2012). International Financial Statistics (Dec-17,2012). ECDS, University of Manchester. http://dx.doi.org/10.5257/imf/ifs/2012-12

Jalil, A., Ma, Y. & Naveed, A. (2008). The Finance: Fluctuation nexus: Further Evidence from Pakistan and China. International Research Journal of Finance and Economics (14). 212-231.

Jalilian, H., & Kirkpatrick, C. (2002). Financial Development and poverty reduction in developing countries. International Journal of Finance and Economics , 97-108.

Jöreskog, K.G., Sörbom, D. (1996). LISREL 8: User's reference guide. Scientific Software International. Chicago

Khan, M. H. (2001). Rural Poverty in Developing Countries – Implications for Public Policy. Economic Issues No. 26. The International Monetary Fund.

King, R. G., & Levine, R. (1993). Finance and Growth: Schumpeter Might be Right. Quarterly Journal of Economics , 717-737.

Kirkpatrick, C., Murinde, V., & Tefula, M. (2008). The Measurement and Determinants of X-Inefficiency in Commercial Banks in Sub-Saharan Africa. The European Journal of Finance , 625-639.

Klagge, B., & Martin, R. (2005). Decentralized versus centralized financial systems: is there a case for local capital markets? Journal of Economic Geography , 387-421.

Koivu, T., & Sutela, P. (2005). Financial Systems in Transition: Could Small Actually Be Beautiful? Eastern Economic Journal , 265-283.

La Porta, R., Lopez-De-Silanes, F., & Shleifer, A. (2002). Government Ownership of Banks. Journal of Finance , 265-301.

Laursen, T., & Mahajan, S. (2005). Volatility, income distribution and poverty. In Managing economic volatility and crises: A practitioner's guide, Eds. Joshua Aizenman and Brian Pinto, 101–36. Cambridge: Cambridge University Press.

Levchenko, A. (2005). Financial Liberalization and Consumption Volatility in Developing Countries. IMF Staff Papers , 237-259.

Levine, R. (2002). Bank-Based or Market-Based Financial Systems: Which is Better? Journal of Financial Intermediation , 398-428.

Levine, R. (2005). Finance and Growth: Theory and Evidence. In P. Aghion, & S. N. Durlauf, Handbook of Economic Growth. Volume IA (pp. 224-255). Oxford, UK: Elsevier.

Levine, R. (1997). Financial Development and Economic Growth: Views and Agenda. Journal of Economic Literature , 688-726.

Li, H., Squire, L., & Zou, H.-f. (1998). Explaining International and Intertemporal Variations in Income and Inequality. The Economic Journal , 26-43.

Liang, Y. (2012). Global Imbalances and Financial Crises: Financial Globalization as a Common Cause. Journal of Economic Issues Vol. 46(2). 353-362

Loayza, N. V., Ranciere, R., Serven, L., & Ventura, J. (2007). Macroeconomic Volatility and Welfare in Developing Countries: An Introduction. World Bank Economic Review , 347-357.

Loayza, N., & Ranciere, R. (2006). Financial Development, Financial Fragility, and Growth. Journal of Money, Credit and Banking , 1051-1076.

McKillop, D. G., Ward, A.-M., & Wilson, J. O. (2007). The Development of Credit Unions and Their Role in Tackling Financial Exclusion. Public Money and Management , 37-44.

McKinnon, R. I. (1973). Money and Capital in Economic Development. Washington D.C.: Brookings Institution.

Median, S. M., Perry, M. J., & Rezvanian, R. (2007). The Effect of Globalization on Efficiency Chance, Technological Progress and the Prodcutivity Growth of U.S. Small and Large Banks. North American Journal of Finance and Banking Research .

Mendoza, E. G. (1995). The Terms of Trade, the Real Exchange Rate, and Economic Fluctuations. International Economic Review , 101-137.

Minsky, H. (1992). The Financial Instability Hypothesis. The Jerome Levy Economics Institute Working Paper No. 74, Bard College, Annandale-on-Hudson, New York.

Mishkin, F. S. (1999). Global FInancial Instability: Framework, Events, Issues. The Journal of Economic Perspectives , 3-20.

Mishkin, F. (1996). Understanding Financial Crises: A Developing Country Perspective. Cambridge, Massachusetts: National Bureau of Economic Research.

Montiel, P., & Serven, L. (2006). Macroeconomic Stability in Developing Countries: How Much Is Enough? The World Bank Research Observer , 151-178.

Morgan, D., & Strahan, P. (2003). Foreign Bank Entry and Business Volatility: Evidence from U.S. States and Other Countries. Cambridge, Massachusetts: National Bureau of Economic Research.

Ocampo, J. A. (2002). A Broad View of Macroeconomic Stability. New York: Columbia University .

Pallage, S., & Robe, M. A. (2003). On the Welfare Cost of Economic Fluctuations in Developing Countries. International Economic Review , 677-698.

Perry, G. (2009). Beyond Lending - How Multilateral Banks Can Help Developing Countries Manage Volatility. Washington, DC: Center for Global Development - Brookings Institution Press.

Prasad, E.S., Rogoff, K., Wei, S., & Kose, A. (2007). "Financial Globalization, Growth and Volatility in Developing Countries" in Globalization and Poverty – Editor: Harrison, A. University of Chicago Press.

Rajan, R. G. (1992). Insiders and Outsiders: The Choice Between Informed and Arms Length Debt. Journal of Finance , 1367-1400.

Ramey, G., & Ramey, V. A. (1995). Cross-County Evidence on the Link Between Volatility and Growth. The American Economic Review , 1138-1151.

Schaeck, K., Cihak, M., & Wolfe, S. (2009). Are Competitive Banking Systems More Stable? Journal of Money, Credit and Banking , 711-734.

Scher, M. J. (2001). Postal Savings and the Provision of Financial Services: Policy Issues and Asian Experiences in the Use of the Postal Infrastructure for Savings Mobilization. New York: United Nations, Department of Economic and Social Affairs.

Soussa, F. (2005). Too big to fail: moral hazard and unfair competition. *Financial Stability and Central Banks,* 5.

Stapleton, C.D. (1997). Basic Concepts and Procedures of Confirmatory Factor Analysis. Texas A&M University.

Stever, R. (2007). Bank size, credit and the sources of bank market risk. Basel, Switzerland: Bank for International Settlements Working Papers.

Stewart, D.W. (1981). The Application and Misapplication of Factor Analysis in Marketing Research. 18.1. 51-62.

Stiglitz, J. E. (1985). Credit Markets and the Control of Capital. Journal of Money, Credit and Banking , 133-152.

Stiglitz, J. E., Jaramillo-Vallejo, J., & Park, Y. C. (1993). The Role of the State in Financial Markets. World Bank Research Observer, Annual Conference on Development Economics Supplement , 19-61.

Thorsten, B., Demirguc, A., & Levine, R. (2004). Finance, Inequality, and Poverty: Cross-Country Evidence. NBER Working Paper Series.

Weller, C. E. (Levine, R. 2000). Financial Liberalization, Multinational Banks and Credit Suply: the case of Poland. International Review of Applied Economics , 193-211.

Weller, C. E. (2007). The Presence of Multinational Banks and the Supply and Quality of Credit in Emerging Economies. International Review of Applied Economics , 273-292.

Weller, C. E., & Morzuch, B. (2000). International financial contagion - Why are Eastern Europe's banks not failing when everybody else's are? Economies of Transition , 639-663.

Weller, C.E. & Rao, M. (2010). Progressive Tax Policy and Economic Stability. Journal of Economic Issues. Vol .44(3). 629-659.

Wenger, E., & Kaserer, C. (1998). The German System of Corporate Governance: A Model Which Should Not be Imitated. In E. S. Moersch, Competition and Convergence in Financial Markets: The German and Anglo-American Models (pp. 41-78). New York: North-Holland Press.

World Bank. (2012). *Country and Lending Groups*. Retrieved January 10, 2013, from World Bank: http://data.worldbank.org/about/country-classifications/country-and-lending-groups

Appendix A

Table 4: Variable description			
Variable name	Explanation	Data sources	Available time period
Macroeconomic volatility	A five period moving average of the standard deviation of annual GDP growth.	World Bank	1960–2011
Bank ownership	A 10-point scale, 10 being the highest. Reflects the degree to which private ownership of banks is allowed by the government.	Fraser Institute's Economic Freedom Index	1970–2010
Bank competition	A 10-point scale, 10 being the highest or best score. Reflects the degree to which foreign banks can participate in the financial market.	Fraser Institute's Economic Freedom Index	1995–2010
Deposit money bank to central bank assets	Commercial bank loans as a proportion of commercial bank and central bank loans to the public and private non-financial sector.	Beck, Demirguc-Kunt, & Levine's Financial Development and Structure database (2009, updated 2012); and International Financial Statistics, or IFS, from the International Monetary Fund	1960–2010
Bank concentration	Assets of the three largest banks as a share of assets of all commercial banks.	BankScope data from Beck, Demirguc-Kunt, & Levine's Financial Development and Structure database (2009, updated 2012)	1987–2007
Stock market capitalization (as percent of GDP)	The share price times the number of shares outstanding of domestically listed companies on the country's stock exchange.	World Bank	1988–2010
Foreign bank claims to total claims	The ratio of foreign bank loans to total loans extended by the financial sector as a whole.	IFS; Bank for International Settlements; the World Bank	1983–2010
Ratio of financial institution deposits to GDP	The ratio of deposits of commercial banks and all other bank and non-bank financial institutions to GDP.	World Bank	1960–2010
Total private credit as percentage of GDP	The ratio of total private credit to GDP in percentage terms.	World Bank	1960–2011
Stock market volatility	360-day standard deviation of the return on the national stock market index.	World Bank	1960–2010