– Bachelor's Thesis –

Revisiting the impact of finance on growth:

Can the United Kingdom benefit from
further financial development?

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ABSTRACT

There has been a large debate in the literature on the impact of financial development on economic growth, with some recent publications establishing a non-linear relationship between the two variables. Recently, the results of the Brexit vote have created the fear of a reduction in the size of the British financial sector. This paper questions whether the non-linear relationship between financial development and economic growth exists and locates the optimal level of financial development for the United Kingdom. We find that the relationship between financial development and economic growth is non-linear, and that banking crises impair the effect of financial development on growth. The United Kingdom scores beyond the optimal theoretical level, meaning that it has exhausted the benefits brought by its large financial sector. Additionally, we find that differences in regulatory and legal systems affect a country's optimal level of financial development in times of banking crises.

I. Introduction

THE idea that well-functioning financial systems play an essential role in promoting economic growth is an important conclusion of 20th century literature. (Goldsmith, 1969; McKinnon, 1973; Shaw, 1973; Greenwood, 1990; Merton & Bodie, 1995; Levine, 2005). The positive influence of finance on growth can be explained by the fact that the financial sector directs capital towards the most productive uses without large transaction costs, adverse selection or moral hazard (Schumpeter, 1911). For a complete overview of how financial system influence savings and investment decisions enhancing economic growth, see Levine (2005). Čihak, Demirgüç-Kunt, Feyen and Levine (2012) provide a set of variables that accurately measure the three dimensions of finance and capture the effects of financial development put forward by Levine. Lastly, empirical evidence indicates that the direction of causality runs from financial development to economic growth (King & Levine, 1993; Demirgüç-Kunt & Maksimovic, 1996; Calderón & Liu, 2002).

In recent years, economists have started to question the linear relationship between financial development and economic growth, and argue that excessive financial development can harm economic growth. (Rousseau & Wachtel, 2011; Arcand, Berkes & Panizza, 2015; Sahay et al., 2015; Aizeman, Jinjarak & Park, 2015). The global financial crisis of 2008 has directed attention to the fact that financial systems have grown too big, too fast, representing a

danger for the stability of the world economy. Global regulatory reforms have insisted on deleveraging banks in advanced economies, implicitly implying that there had been "too much finance" (Sahay et al., 2015).

Additionally, because of the results of the Brexit vote, the United Kingdom is facing the possibility of financial institutions relocating away from London, one of the world's leading financial centres. After 30 years of increased financial development from 1980 to 2010, as shown in Figure I below, Britain is risking a decline of activity in the financial sector, and a reduced ability of the financial services industry to sell products into the European Union (Cruise, MacAskill & White, 2016). Meanwhile, Figure I also reveals a downward-sloping trend in British economic growth from 1995 to 2010. Therefore, two questions arise here. First, what impact does financial development have on economic growth? Second, could the United Kingdom still benefit from further financial development?

As a starting point, this paper uses an IMF discussion paper from 2015. Although econometrically different, we pursue the same goal, which is to reveal the non-linear relationship between financial development and economic growth. We regress the level of financial development on economic growth where financial development is defined following the database proposed by Čihak et al. (2012). We then relate our findings to the case of the United Kingdom, which has experienced increased levels of financial development in the past decades and a reduction in growth of GDP per capita. The second goal of this paper is to find which level of financial development the United Kingdom has reached and whether this level is before or beyond the theoretical optimum. This allows us to establish whether the British economy can boost the growth of its GDP by further increasing the size of its financial sector.
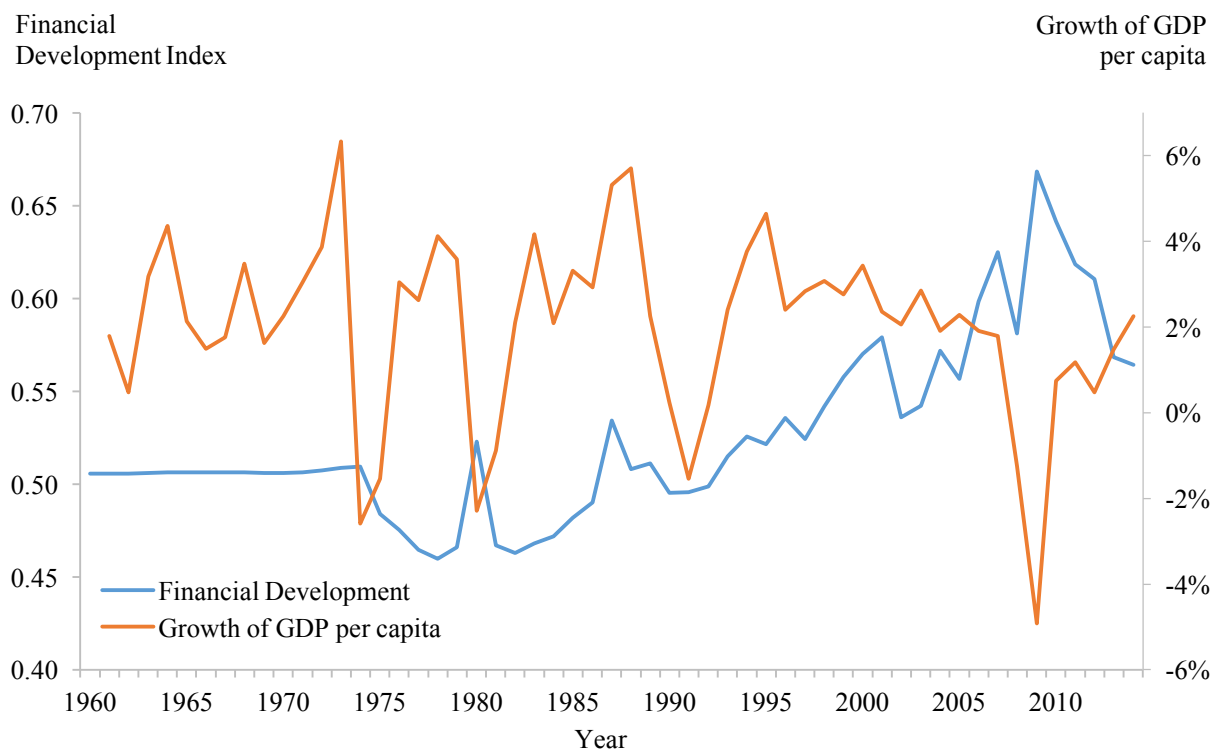
The data that is used to measure financial development is found using the World Bank Global Financial Development Database. This database includes measures of the size of financial institutions and markets, the access to financial services and the efficiency of financial intermediaries and markets in facilitating financial transactions. A list of indicators gives the means to measure the depth, access and efficiency of both financial institutions and markets, which then allows to build the Financial Development (FD) Index. We use 201 countries and data running from 1960 to 2014 to build the regression analysis. The selection of countries is based on data availability. Economic growth is measured using per capita real GDP growth. We use a set of control variables to account for the fact that differences in country characteristics affect the optimal level of finance found in the model.

Empirical results indicate a significant, bell-shaped relationship between financial development and economic growth. The positive effects of financial development on growth disappear above a score of 0.31 on the FD index. We find that the most recent score for the United Kingdom (UK) is a 0.56 on the FD index, meaning that it stands beyond the peak of the bell-shaped curve. Thus, the level of financial development of the UK is beyond the optimal level found in the model. Considering the challenge posed by the drain of the financial sector after the Brexit vote, the results found have implications for the British economy. Too much financial deepening in particular harms economic growth, and Brexit could lead to a reduction in the size of the British financial sector and create a positive impact on economic growth. However, we also argue that this paper focuses on one aspect of Brexit and does not examine the larger debate. Further research on the consequences of Brexit is needed in order to extend the results found in our model.

This paper is divided as follows. First, the literature on financial development and economic growth is presented, along with its main findings and suggestions for additional control and dummy variables. Then, the data and methodology used to build the financial development index and the regression analysis are explained, before leading to the empirical work, results and robustness checks. The last part of this paper consists of the implications for the United Kingdom and a list of shortcomings and limitations of the model.

Figure I
Financial Development and Economic Growth in the UK
This graph presents the evolution of the level of financial development and the growth of GDP per capita in the United Kingdom over our sample period, 1960 to 2014. Source: Global Financial Development Database and personal calculations.

II. Theoretical considerations

A. Defining financial development

Markets are naturally imperfect. Acquiring information, enforcing contracts and trading goods and services are costly and uncertain processes (Čihak et al., 2012). The presence of these imperfections and transaction costs creates an incentive for the emergence of particular types of financial markets, contracts and intermediaries (Levine, 2005). Indeed, financial systems help to ameliorate market efficiencies and reduce market frictions because they naturally influence the allocation of resources across entities, space and time (Merton & Bodie, 1995). Financial development therefore occurs when these financial systems, whether they are instruments, markets or intermediaries, intervene in markets and mitigate the effects of limited enforcement, transaction costs and imperfect information (Čihak et al., 2012).

Countries differ in the extent to which they experience market frictions, and they are also subjected to different types of regulation, policies and laws. Therefore, improvement in any three of these types of frictions has different implications for resource allocation and welfare depending on the national economy at hand (Levine, 2005).

Economists traditionally measure the degree of financial development in an economy with two indicators (Čihak et al., 2012). To measure the overall size of the banking sector, researchers usually divide the stock of broad money M2 by GDP (as seen in Goldsmith, 1969 and McKinnon, 1973). For financial markets, the most common choice used in the literature to approximate the size of stock markets is stock market capitalisation, found by dividing the value of listed domestic shares on domestic exchanges by GDP (Levine, 1998).

Nonetheless, these indicators are empirical proxies for financial development that do not properly capture the key features of financial systems emerging from theoretical models (Levine, 2005). The size of a market or sector does not reflect its quality nor its efficiency. Researchers are thus far from having a definite answer to the question of how finance affects economic growth. Multiple indicators are needed to properly observe the new diversity of financial systems across countries. For example, in some countries, private pension fund and life insurance assets rival banks (Beck, Demigüç-Kunt & Levine, 2001), showing the need to include nonbank institutions into measures of financial development. Each aspect of financial development has a link with broader socio-economic developments, which are themselves strongly associated with policies directly geared towards the financial sector (Čihak et al., 2012). It is therefore important for regulators to be able to understand what the consequences of financial development are.

In an attempt to provide empirical substance to the current complex and multifaceted global financial systems, Čihak et al. (2012) have put together a new Global Financial Development Database. The aim of this database and its underlying research paper is to characterise the different features of financial systems in order to be able to compare them across countries, regions and throughout time (Čihak et al., 2012). Financial development is divided into four characteristics of financial institutions and financial markets, which are their depth, access, efficiency, and stability. Financial institutions include banks and insurance companies and financial markets comprise bond and stock markets and derivative companies. Financial depth corresponds to the size of financial institutions and markets. Financial access relates the degree to which individuals use financial markets and institutions. Efficiency is defined as the ability of financial systems to properly provide financial services, and stability looks at the buffers available in a country to counter the potential for risky investments (Čihak et al, 2012). As mentioned by the authors, the financial development index does not completely capture the complexity of financial systems, but it is a basis to examine their evolution throughout time (Čihak et al, 2012). It addresses the challenge of realistically capturing the theoretical features of financial systems described by Levine in 2005. However, the dataset does not explicitly include variables describing the state of financial sector policies in a country, such as features of financial sector supervision and regulation.

B. The non-linear relationship

Recent studies have shown that the conventional positive link between finance and growth weakens when post-1990 data is used (Sahay et al., 2015). In particular, these studies have shown that there is a threshold above which financial development no longer has a positive effect on economic growth. Arcand et al. (2015) call this the "too much finance effect". According to Arcand et al. (2015), financial depth starts having a negative effect on growth when credit to the private sector reaches 100% of GDP. Their result has been corroborated by many other authors who built similar models using different datasets and empirical methodologies (Cecchetti & Kharroubi, 2012; Pagano, 2012, Law and Singh, 2014; Aizenman et al., 2015). When the financial sector becomes too large relative to the underlying economy, it stops contributing to growth and starts threatening banks' solvency and systemic stability (Pagano, 2012). Aizenman et al. (2012) support this hypothesis and suggest that the impact of financial development on growth could be non-linear, meaning that it would promote economic growth only up to a certain level, after which it becomes a drag on growth[1]. Many explanations have been put forward to explain the negative impact of finance on economic growth at high levels of financial development. By promoting greater risk-sharing and leverage, finance increases the probability of a crisis as well as economic and financial volatility (Sahay et al., 2015). Cecchetti and Kharroubi (2015) also argue that rapid financial growth pushes skilled labour away from the real sector and towards the financial sector. Lastly, Dabla-Norris et al. (2015) suggest that in advanced economies, financial sector growth reallocates resources away from more productive sectors because financial frictions create impediments to efficient capital allocation. This leads to an aggregate decline in total factor productivity and to lower levels of economic growth. Thus, we expect to find a non-linear relationship between financial development and economic growth, characterised by a bell-shaped curve. This is our first hypothesis.

H1: The relationship between financial development and economic growth is non-linear.

C. The influence of external factors

Financial market development has been sequenced by a variety of external factors (Sahay et al., 2015). There is therefore no one particular optimal level of finance that holds for all countries at all times. Country characteristics such as income levels, quality of financial regulation and supervision and institutions affect the shape of the relationship between financial development and economic growth (Sahay et al., 2015).

A first group of factors that is important in determining the optimal level of financial development for a country are the standard growth determinants. These correspond to the initial income per capita, the level of education of the population, the openness to trade, the

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[1] Their paper also provides evidence of the need to complement the conventional measures of financial depth with measures of its quality, such as the spread between the lending and deposit interest rates. This suggestion ties in with our earlier result presenting the need for a new measure of financial development.

level of inflation and the government consumption as a share of GDP. They naturally affect the growth of income per capita (Sahay et al., 2015). Earlier studies support the use of these variables as a standard set of controls. Rousseau and Wachtel (2002) for example show that the relationships varies with the rate of inflation. Income per capita, government spending, education and trade are used to control for factors commonly associated with economic growth (Levine, 2005). When controlling for the initial level of investment in human capital, countries that are initially rich tend to grow more slowly than countries that are initially poor (King & Levine, 1993). Higher secondary school enrolment rates are also associated with faster growth (King & Levine, 1993). These studies explain why these variables are used as controls in this paper. They should account for other determinants of economic growth[2].

The incidence of financial crises has increased since the late 1980s, and these crises impede the positive effects of financial deepening on economic growth (Rousseau & Wachtel, 2011). Rousseau and Wachtel (2011) suggest that excessive financial deepening or a growth of bank lending that is too rapid, as manifested in a credit boom, may lead to both inflationary pressures and a weaker banking system. They test the incidence of financial and domestic banking crises by looking at a range of 84 countries that have or have not experienced any of these crises. The evidence is strong and significant. When countries experience crisis episodes, the benefits of financial deepening on economic growth shrink. The weakening of the relationship over time is a result of the increased incidence of these crises since the late 1980s (Rousseau & Wachtel, 2011). To control for the increasing occurrence of financial crises, we include a banking crisis dummy variable in the regression analysis of this paper. This dummy variable is derived from the updated Banking Crises Database created by Laeven and Valencia in 2012. This database includes all systemic currency, banking and sovereign debt crises and the data runs from 1970 to 2011. According to their criteria, a banking crisis is defined as systemic if two conditions are met. First, there must be significant signs of financial distress in the banking system, denoted by large bank runs, bank losses and bank liquidations for instance (Laeven & Valencia, 2012). Second, there must be important banking policy intervention measures to respond to the losses in the banking system (Laeven & Valencia, 2012). They consider a banking crisis to be systemic in the first year that both of these criteria are met. This research brings us to our second hypothesis. We expect banking crises to have a negative impact on economic growth and on the level of financial development itself.

H2: Banking crises impair the effect of financial development on economic growth.

Lastly, political forces have often shaped financial sector policies and the operations of financial systems (Levine, 2005). Comparing political and legal environments in which investment takes place allows to predict differences in the degree of financial development as well as economic growth (Beck, Levine & Loayza, 2000). As one could expect, a high positive correlation exists between robust institutions and financial development (Sahay et al.,

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[2] Foreign direct investment, another standard growth determinant, appears to have an ambiguous role in contributing to economic growth (Alfaro, Chanda, Kalemli-Ozcan & Sayek, 2003). We therefore exclude it.

2015). Robust institutions are characterised by strong protection of property rights, creditor rights and information, and by high quality of regulation and of the rule of law (Sahay et al., 2015). Development of equity and bond markets has been facilitated in economies that have experienced effective regulatory and legal systems (Čihak et al., 2012). These efficient securities markets allow investors to have more diversified portfolios. Risk diversification, in turn, facilitates the flow of capital to projects with a higher return, which boosts economic growth (Čihak et al., 2012). This conclusion is consistent with the findings of Levine in 2005. Thus, the purpose of effective regulation is to support the efficient allocation of resources across the economy (Čihak & Tieman, 2008). Yet, measuring regulatory quality is a difficult task, and there is no strong consensus around a single definition of institutional quality or governance (Kaufmann, Kraay & Mastruzzi, 2010). The Worldwide Governance Indicators (WGI) attempt to monitor the overall quality of governance in a country. Covering more than 200 countries form 1996 onwards, the WGI capture six dimensions of governance through six indicators. These six indicators are the voice of the citizens and accountability of the government, the political stability, the absence of violence or terrorism, the effectiveness of the government, the regulatory quality, the rule of law and the control of corruption. The WGI provide specific information about different dimensions of governance and aim to measure the implementation and actual practice of government policies (Kaufmann et al., 2010). Using these six indicators, as well as country compliance grades with various regulatory principles, Čihak and Tieman (2008) find that there are significant differences in the regulatory quality frameworks across countries. Their analysis suggests that high-income economies enjoy higher quality financial supervisory systems than medium and low economies. They however also mitigate their result by stating that financial supervisors in high-income economies also face bigger challenges associated with more complex financial systems (Čihak and Tieman, 2008). Therefore, including interactions with regulatory variables in the growth regression proposed in this paper contributes to defining the relationship between financial development and economic growth more precisely. The optimal level of financial development - where economic growth is maximised – differs across different regulatory and legal environments. It is reached at a lower level when a country's regulatory and legal systems are of good quality. This is our third and final hypothesis.

H3: The quality of institutions positively affects the relationship between financial development and economic growth.

III. Empirical work

A. *Data and the Financial Development Index*

In this paper, we introduce a broad measure of financial development, previously used by Sahay et al. (2015) and defined by Čihak et al. (2012). The data is drawn from the Global Financial Development Database (GFDD). It includes 201 countries and runs from 1960 to 2014. Additionally, we use the World Bank's World Development Indicators (WDI) as well as the GFDD to get data on our five control variables, which are the initial income per capita, the secondary school enrolment rate, the level of trade as a percentage of GDP, the inflation

of consumer prices and the general government consumption expenditure as a percentage of GDP. To measure educational attainment, we assume that each country has an equal number of men and women and average the secondary school enrolments for male and female. We find the dummy for banking crises on the GFDD. The additional control variables accounting for the quality of governance are drawn from the World Governance Indicators (WGI) database. The WGI database runs from 1996 to 2014 (data 1997, 1999 and 2001 are missing). The aggregate WGI measures are reported in standard normal units and range from approximately -2.5 to 2.5. Higher scores indicate better quality.

We draw 18 variables from the Global Financial Development Database and classify them in groups to create indicators of the depth, access and efficiency of both financial institutions and financial markets. Compiling measures for these three indicators across the two types of financial systems gives a 3x2 matrix of financial system characteristics, presented in Table VI in the appendix.

We deviate from the IMF paper in the treatment of missing data. We do not attempt to expand the existing data forward or backward like they do, but we do wish to maximise the number of observations per country and per year in order to make the final FD index more complete. Therefore, if a country has at least one score on a variable, we calculate its median value over all years and replace cells that are empty for certain years with the median value.

Subsequently, we choose to winsorise the data at the 5th and the 95th percentile to reduce the effect of extreme observations. Then, using a global min-max procedure, we normalise each variable between 0 and 1 using the formula:

$$I_X = \frac{x - x_{min}}{x_{max} - x_{min}}$$

I_X represents the normalised score of a variable on a variable I in a year.
x is the score of a particular country on a variable.
x_{min} is the minimum score of a particular country on a variable.
x_{max} is the maximum score of a particular country on a variable.

For the *net interest margin*, the *lending-deposit spread*, the *non-interest income to total income* and the *overhead costs as a percentage of total assets* variables, a higher value indicates a worse effect on the efficiency scale. These variables are therefore rescaled to match the order of the others with the formula:

$$I_X = 1 - \frac{x - x_{min}}{x_{max} - x_{min}}$$

Lastly, we build the comprehensive index of financial development. The depth, access and efficiency sub-indices of both financial institutions and financial markets are built by finding the average scores on the corresponding variables. The financial development indices for both financial institutions and financial markets and their squares are found by calculating the average scores of the corresponding sub-indices. The overall financial development index and its square are again found by averaging the scores on financial institutions and financial

markets. In order to maximise the number of countries in our sample, we calculate averages over existing data. This means that an average is calculated even if a country misses a score on one of the 18 variables of financial development. We assume that one variable at least can explain financial development.

The basic estimation equation is drawn from Sahay et al. (2015) and the starting point for the regression analysis is of the form:

$$\dot{y}_{it} = \alpha + \beta_0 FD_{it} + \beta_1 FD_{it}^2 + \beta_2(FD_{it} \cdot Crisis_i) + \beta_3(FD_{it}^2 \cdot Crisis_i) + \beta_4 Crisis_{it} + \beta_4 X_{it}$$

where $\dot{y}_{it}$ is the growth rate of GDP per capita, α is a constant, FD_{it} is the FD index[3], a measure of financial sector development, $FD_{it} \cdot Crisis_i$ is the effect of banking crises on FD, $Crisis_{it}$ is the banking crisis dummy variable and X_{it} is the set of baseline control variables that have been shown empirically to be strong determinants of economic growth. The X_{it} variable includes the initial level of GDP per capita, the ratio of trade (imports plus exports divided by GDP), the average CPI and the general government final consumption expenditure as a percentage of GDP, all adjusted to a logarithmic scale. It also includes the secondary school enrolment rate and the overall level of governance. We choose to include the quadratic form FD^2 to identify the non-linear relationship.

B. *Empirical Results*

We regress per capita GDP growth on the overall index of financial development and on its square. We choose to take out the variable representing educational attainment because including it greatly reduces the number of observations. The results are presented in Table VII in the appendix. For the same sample size, R^2 is lower when the non-linear effect represented by FD^2 is excluded. The coefficient for the square of financial development is also highly significant when FD^2 is added to the list of independent variables. This finding is consistent with our first hypothesis. There is a significant, bell-shaped relationship between financial development and economic growth. This can be explained by the fact that the financial sector diverts resources away from more productive sectors, leading to a decrease in overall productivity and total growth (Dabla-Norris et al., 2015).

Including the dummy variable accounting for the effects of banking crises confirms our second hypothesis. Although non-significant, the coefficient representing the interaction effect between financial development and banking crises is negative, meaning that crises hinder the effect of financial development on economic growth. As seen in Table VII, the coefficient for the interaction between the square of financial development and banking crises remains positive, even though it is not significant either. These results suggest that banking crises start impairing a country´s economic growth at lower levels of financial development. When countries undergo a systemic banking crisis, they experience large bank runs and losses. This is turn creates a demand for government intervention, increased public debt and

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[3] All acronyms and their meaning are listed in Table II in the appendix.

output losses, which disrupt economic growth (Laeven & Valencia, 2012). Moreover, as demonstrated by Figure II below, the incidence of systemic banking crisis greatly increased in the late 80s. Rousseau and Wachtel (2011) explain that the disappearance of the positive effect of finance on growth over time may be related to the incidence of financial crises. They estimate that crises episodes are often associated with too-rapid a financial deepening. Therefore, we suggest that the emergence of the bell-curved regression line between finance and growth may also be due to the increased incidence of systemic banking crises since 1980.

Figure II
Incidence of systemic banking crises, 1960-2014

This graph plots the count of systemic banking crises over all countries in our sample for the period 1960-2014. Source: Global Financial Development Database.

In Table VII, we also differentiate the financial development index into its two subcomponents to find the respective effects of financial institutions and financial markets on economic growth. We find that both subcomponents are significant and that the impact of financial institutions development on economic growth is stronger. This is in part due to the presence of pension funds and insurance companies, stable investors which hold financial assets and help reduce financial uncertainty (Sahay et al., 2015).

Subsequently, the six governance variables are included as new controls in our regression analysis. Results can be found under Table VIII in the appendix. Only the level of political stability and the quality of regulation of a country have a significant effect on a country's economic growth. This reflects the need for investors to invest in stable economies where contracts are enforced and accounting standards are respected. Stronger credit rights and supportive legal systems enhance the development of financial intermediaries with positive repercussions on economic growth (Beck, et al., 2000).

As presented in Table V in the appendix, there are high levels of multicollinearity between the six governance variables. Therefore, we choose to normalise the variables and aggregate them in a new variable that encompasses the overall quality of governance in a country. We perform the regression analysis again including the banking crisis dummy

variable. We first find that a greater level of governance increases economic growth, confirming our previous finding. The second result is somewhat surprising in relation to previous literature. As shown in Table IX in the appendix, the coefficients of the interaction effects between banking crises and financial development are significant and their signs are reversed, compared to the results found in our first regression analysis. This suggest that when a banking crisis occurs, a country experiencing a lower level of financial development benefits from reduced economic growth, whereas a country with a developed financial sector could augment its economic growth by pursuing further financial development. This effect is particularly significant for financial institutions, while it is not for financial markets. A possible explanation for this finding is that for the same level of governance, two countries with different levels of financial development are differently affected by systemic banking crises. The impact of bank runs and losses, which characterise systemic banking crises, is greater on less-developed, unreliable financial institutions than on well-established, trusted financial institutions with effective governance.

Using the coefficients found in Tables VII and IX, we plot the relationships between financial development and economic growth in normal times (blue curve) and in times of crisis (orange curve) in Figure III. Deriving the equation for the effect of financial development on economic growth in normal times, we find that the infliction point is a score of approximately 0.31 on the FD index, corresponding to a 2.5% growth rate in GDP per capita. After this, the positive effects of FD on growth begin to decline. In times of a systemic banking crisis, the optimal level of financial development is a score of 0.26 on the FD index, corresponding to a growth rate of 1.4%. Lastly, in the governance model and during a banking crisis, the minimum level of financial development required to reap economic benefits is 0.59.

Determination of the optimal level of financial development in normal times:

$$\dot{y}_{it} = 0.161 * FD_{it} - 0.259 * FD_{it}^2$$
$$\dot{y}'_{it} = 0.161 - 0.518 * FD_{it}$$
$$\dot{y}'_{it} = 0 \qquad \Leftrightarrow 0.161 = 0.518 * FD_{it}$$
$$\Leftrightarrow FD_{it} \cong 0.311 \ and \ \dot{y}_{it} \cong 0.025$$

Determination of the optimal level of financial development in times of a banking crisis:

$$\dot{y}_{it} = 0.107 * FD_{it} - 0.208 * FD_{it}^2$$
$$\dot{y}'_{it} = 0.107 - 0.416 * FD_{it}$$
$$\dot{y}'_{it} = 0 \qquad \Leftrightarrow 0.107 = 0.416 * FD_{it}$$
$$\Leftrightarrow FD_{it} \cong 0.257 \ and \ \dot{y}_{it} \cong 0.014$$

Determination of the optimal level of financial development in the governance model:

$$\dot{y}_{it} = -0.251 * FD_{it} + 0.214 * FD_{it}^2$$
$$\dot{y}'_{it} = -0.251 + 0.428 * FD_{it}$$
$$\dot{y}'_{it} = 0 \qquad \Leftrightarrow 0.251 = 0.428 * FD_{it}$$
$$\Leftrightarrow FD_{it} \cong 0.586 \ and \ \dot{y}_{it} \cong \text{-0.074}$$

Figure III
Effect of Financial Development on Economic Growth

This graph plots predicted values of economic growth according to the level of financial development of a country. Source: model estimates.
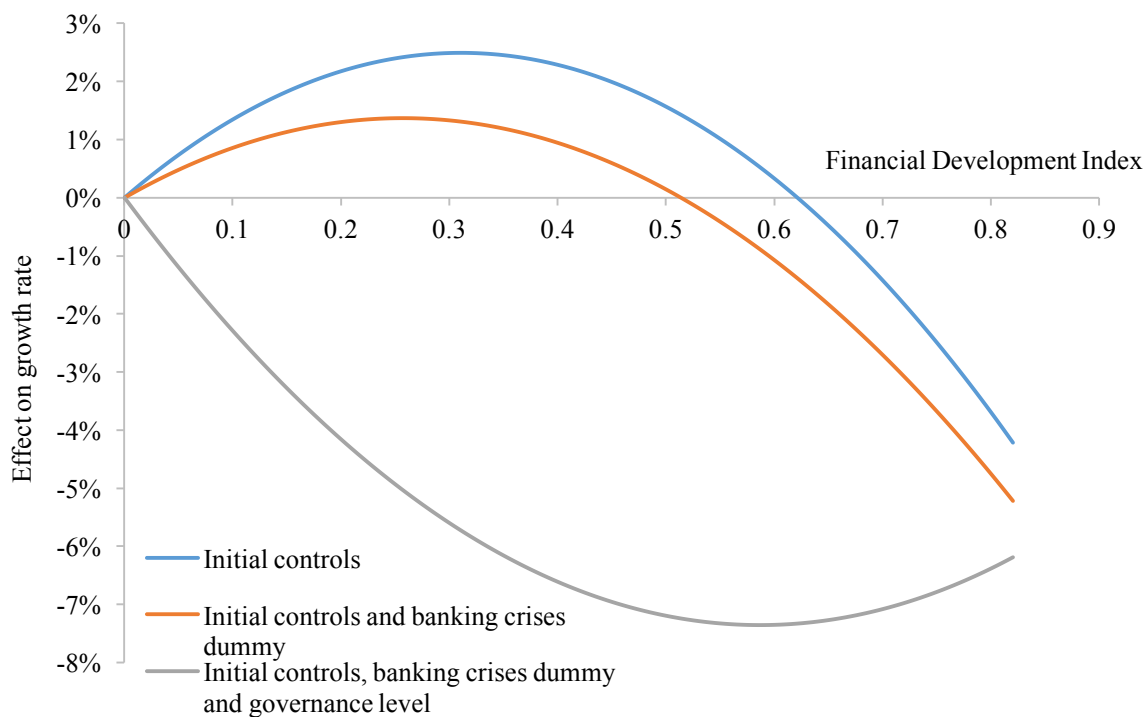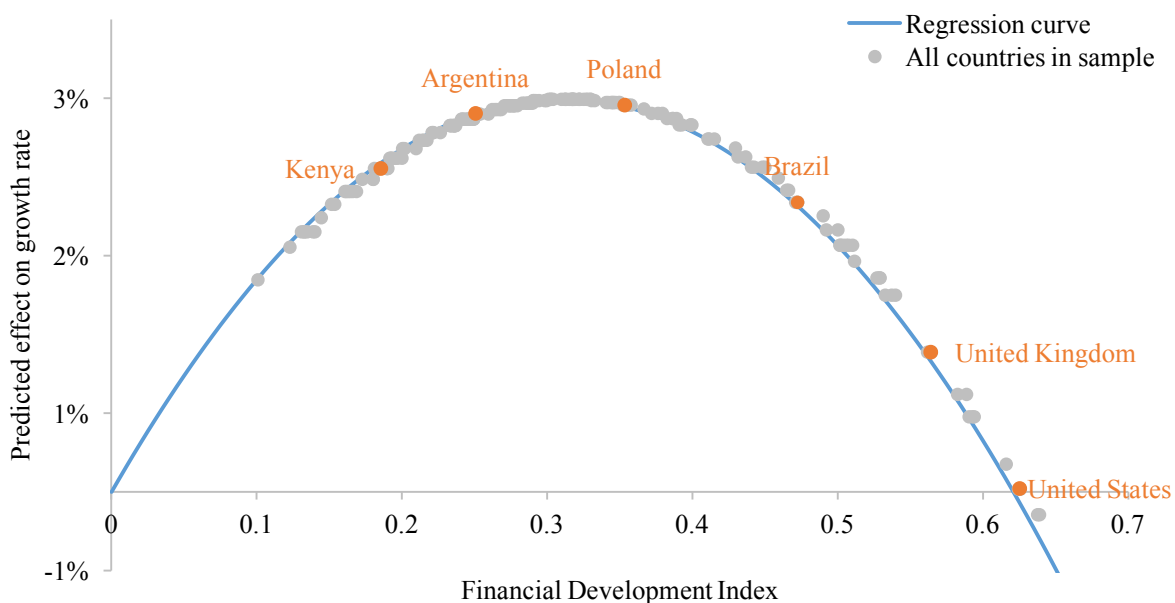

Figure IV
Effect of Financial Development on Economic Growth

This graph plots predicted values of economic growth according to the level of financial development in 2014 of the 201 countries in our sample. Source: model estimates.

C. Robustness checks

We check the robustness of the effect of financial development on economic growth in several ways. First, one of the salient features of our data is the supernormal growth levels of certain countries which do not have particularly high levels of financial development. Oman, for example, experiences up to 150% of growth of GDP per capita in certain years, while its level of financial development revolves around 0.27 in our sample period. To counter the effects of such outliers, we drop the top and bottom 1% of the distribution of the dependent variable, as done by Arcand et al. (2015). The regression results are presented in Table X in the appendix. The coefficients of FD and FD^2 remain significant and of similar magnitude.

Second, we look to exclude countries that might be significantly skewing the results. Offshore financial centres such as the Seychelles or Monaco, for instance, benefit from both high levels of financial development and high levels of economic growth. Therefore, we exclude from our sample 15 countries considered as offshore financial centres and run the regression analysis again[4]. Results are presented in Table XI in the appendix. Although these countries are relatively small, removing them from the sample causes a smaller effect of financial development on economic growth. The FD coefficient also loses significance, meaning that these countries contribute to the non-linear relationship previously found. This finding may be due to the fact that some offshore financial centres have captured a large part of global financial flows, and that their links with financial centres in other countries causes their activities to affect global financial stability (Sahay et al., 2015).

Then, we examine the importance of data missing in our sample. Some countries only have scores on one of the 18 financial development variables, so the results across different models could be sensitive to a country's score on one particular variable over all sample years. To lessen this instability, we test the regression analysis with the 38 countries that have data across all 18 determinants of financial development. As seen in Table XII in the appendix, all coefficients in the General Index sample are significant, and the signs of the coefficients remain the same as in our complete model with 201 countries. The magnitude of the effects is nonetheless larger.

Lastly, we test the effect of financial development on economic growth over time, and report the results in Table XIII in the appendix. We find no significance for the financial development coefficients before 1980, suggesting that the non-linear relationship between financial development and economic growth might have emerged after 1980. As demonstrated previously in Figure II, the incidence of systemic banking crisis greatly increased in the late 80s, and Rousseau and Wachtel (2011) linked the disappearance of the positive effect of finance on growth over time to the incidence of financial crises. Therefore, this result is consistent with our previous finding. The appearance of the bell-curved regression line between finance and growth could be caused by the increased incidence of systemic banking crises.

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[4] These 15 countries are Andorra, Aruba, Bahamas, Belize, Bermuda, Cayman Islands, Cyprus, Liechtenstein, Malaysia, Monaco, Palau, Panama, Samoa, Seychelles and Vanuatu and the list is drawn from the 2014 IMF staff assessments of offshore financial centres.
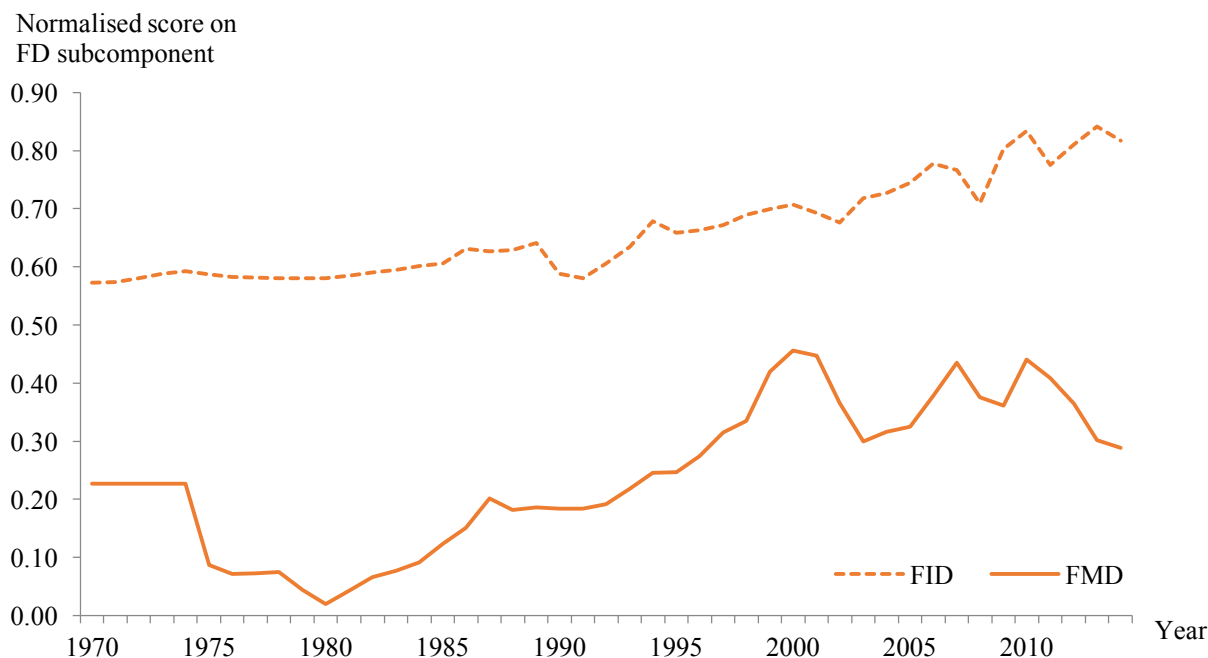
D. Implications for the United Kingdom

In June 2016, the British electorate narrowly voted in favour of "Brexit", the exit of the United Kingdom from the European Union. The result of the vote sent shockwaves through both the country and the financial system (Cruise, MacAskill & White, 2016). While consequences are still uncertain, the Brexit vote is likely to have a negative impact on house prices, on markets and on politics (Financial Times, 2016). After having massively donated to the Remain campaign, investment banks in particular are worried they will lose their "passporting" privileges which allow them to access the European single market without restrictions (Financial Times, 2016). This privilege is crucial to the presence of financial institutions in London, and several international banks have already begun to take action to shift operations away from the United Kingdom and into other European financial hotspots to counter the possibility of revoking these passporting rights. (Financial Times, 2016). For example, since the Brexit vote, large financial institutions have approached regulators to secure licences in European cities such as Dublin or Frankfurt, and leading banks with large operations in the UK have threatened to move thousands of jobs away to continental Europe (Arnold & Noonan, 2016a). The activities that are most at risk of relocation are foreign exchange trading and insurance, whose European activity is highly concentrated in the British capital (Jenkins, 2016). HSBC, for instance, stated it could move one thousand traders to Paris if Brexit were to happen (Arnold & Noonan, 2016a), and there are predictions that Asian financial centres such as Tokyo and Singapore might steal the insurance business from British companies (Jenkins, 2016).

Using the Global Financial Development Database, we find that the most recent score of the United Kingdom on the financial development index is 0.56. This score lies beyond the theoretical optimum of 0.31 found in our model. Furthermore, Figure V presents the evolution of the subcomponent of financial development in the United Kingdom. From this figure, we can observe an upward-sloping trend in the depth of both financial institutions and financial markets. Loayza and Ranciere (2006) uncover a dual effect of financial deepening on economic growth. On the one hand, financial deepening leads to a more efficient allocation of resources and savings to productive investments, leading to higher economic growth in the long-run. On the other hand, an increase in private domestic credit and liquid liabilities has a destabilising effect and is one of the best predictors of crises and economic downturns in the short-run. As economies mature, financial development can create elements of financial fragility, such as systemic banking crises, financial volatility and cycles of booms and busts (Loayza & Ranciere, 2006). Thus, maturing financial systems hinder economic growth. This result is consistent with the situation in the UK, with the British economy experiencing increased financial deepening since 1980 and a subsequent decline in economic growth from 1995 onwards. Laeven and Valencia (2012) argue that a reduction of financial volatility and output losses can happen through expansionary macroeconomic policies and bank restructurings. While macroeconomic policies have been extensively used in the aftermath of the recent crisis in advanced economies, the implementation of actual bank restructuring programmes has been slow (Laeven & Valencia, 2012). Therefore, one could argue that the United Kingdom could counter the negative consequences of increased financial development by implementing a comprehensive restructuring of its banking system.

Hence, our model and the literature suggest that the level of financial development reached by the British economy in recent years does not lead to the optimal level of economic growth anymore, and that increased financial depth in particular could be linked to the recent economic downturn. Nevertheless, one cannot conclude that revoking passporting rights and letting financial institutions relocate away from London as a result of Brexit would enhance economic growth. Relocating banking operations and people working in finance is a costly and complex process (Arnold & Noonan, 2016b). London also boasts numerous advantages for financial institutions, such as the universal language, the wide international talent pool and the flexible legal systems (Arnold & Noonan, 2016b). Moreover, the Brexit vote has other consequences which are beyond the scope of this paper. Deteriorating trade relations, political constraints and increased unemployment as a result of job cuts, for example, are undoubtedly negative aspects of Brexit. Therefore, while our result suggests that Brexit and a reduction of financial depth could boost economic growth, it is important to mention that this paper put emphasis on one specific aspect of the consequences of Brexit and does not focus on the larger debate.

Figure V
Evolution of Financial Development subcomponents in the
United Kingdom, 1970-2014

This graph presents the evolution of the depth of financial institutions (FID) and the depth of financial markets (FMD) in the United Kingdom from 1970 to 2014. Source: Personal calculations using country scores drawn from the Global Financial Development Database.

IV. Shortcomings and limitations

A. Missing data

There were a variety of challenges associated with the model presented above. The first one was how to treat missing data. The strategy chosen in this paper involved computing median values for all financial development variables per country in the sample. The goal was to compute enough data points to make the financial development index comprehensive, while avoiding the creation large jumps in the FD index that were not related to actual changes in financial development. In addition, we chose to assume that a minimum of one score on a financial development variable was enough to represent the level of financial development of a country. Computing median values and generating average scores on financial development regardless of missing data enabled us to extend the number of countries in our final sample. However, we emphasise that this strategy does not necessarily give a proper representation of the level of financial development in a country. It is for example difficult to believe that the number of ATMs per 100,000 adults and the stock market turnover ratio both affect economic growth on the same magnitude. One way to solve this issue would be to apply a principal component analysis to the data and to assign relative weights to the subcomponent of financial development.

B. The FD index

Secondly, there are limitations in the construction of the financial development index. An obvious problem for all empirical studies is that the broad measure of financial development presented in this paper only partially capture the various functions of finance as defined by Levine (2005). The creation of the Global Financial Development Database was a step forward to respond to this challenge we believe the variables do not capture the full extent to which finance exerts corporate control, pools savings or facilitates risk management, for instance.

To continue, one could argue the GFDD does not provide sufficient information on particular kinds of financial institutions and activities. The rise in importance of shadow banks in emerging markets for instance is associated with a new variety of risks (Sahay et al., 2015), and these banks could influence the effect of financial development on economic growth. The role of hedge funds should also not be overlooked, as these funds might be the most important transmitters of shocks during crises, above commercial and investment banks (Adams, Füss and Gropp, 2014). Also, the total number of assets controlled by hedge funds over GDP is unfortunately not available on the GFDD. It would be interesting to repeat our regression analyses and account for the role of these activities when data coverage widens.

Lastly, the FD index might be somewhat outdated. Modern finance encompasses multiple new characteristics. New forms of payment such as direct debits, mobile banking and credit transfers for example are most definitely relevant determinants of financial access and depth in both advanced and developing economies. Although the FD index includes variables such as *mobile phone usage to pay bills* or *mobile phone usage to send money*, data for these variables is only available from 2011 onwards. It would be interesting to add or replace older

indicators such as the number of ATMs per adult by these new variables when more data is available.

C. Controls and dummy

Our model did not allow to get a full understanding of the impact of regulatory quality. Having governance data available from 1996 onwards only made it difficult to understand the impact of governance on financial development in previous years. Moreover, the effects of most governance indicators were non-significant when regressed individually. Considering the large amount of empirical research that associates stronger regulatory and legal systems with higher financial development and economic growth (Beck et al., 2000, Čihak & Tieman, 2008, Sahay et al., 2015), it is advisable to further research on the subject matter. A possible way to test the role of the institutional environment of a country would be to make use of the Financial Sector Assessment Program (FSAP) database. Established by the IMF, the FSAP database assigns overall grades for country compliance with key banking and regulatory principles. It gives an in-depth assessment of the financial sector for more than 144 countries (IMF, 2014b).

Regarding the effect of financial crises on financial development and economic growth, it could be interesting to investigate the two other types of crises put forward by Laeven and Valencia (2012), which are currency and sovereign crises. Currency crises occur when a currency suffers from a nominal depreciation vis-à-vis the USD of at least 30% and when that depreciation is also least 10 percentage points high than the rate the year before. Developing economies in particular can face large currency depreciations and capital outflows, to which they respond by tightening the money supply (Laeven & Valencia, 2012). This type of policy could well lead to reduced financial development and lower economic growth, phenomena to be confirmed by empirical studies.

V. Conclusion

In this paper, we studied the relationship between financial development and economic growth. Financial development was measured by drawing country scores on 18 variables from the Global Financial Development Database and aggregating them into a Financial Development Index. Regressing the Financial Development index for 201 countries over the 1960-2014 sample period, we come to three main conclusions.

First, the regression analysis demonstrates the existence of a statistically significant and non-linear relationship between the level of financial development of a country and its economic growth. That is to say, the relationship between the two variables is characterised by a bell-shaped curve. Financial development is beneficial to economic growth up to a score of approximately 0.31 on the Financial Development Index. Beyond this optimal level, the positive effects of finance on growth start to disappear. Our results are consistent with the view that financial development matters for economic growth, and that higher levels of financial development hinder growth.

Second, the inclusion of a dummy variable accounting for systemic banking crises in the model revealed the negative effects of banking crises on financial development. Systemic banking crises, characterised by large bank runs, bank losses and bank liquidations, as well as important banking policy intervention measures to respond to bank losses, impair the effect of financial development on economic growth. Combined with the increased incidence of banking crises after 1980, this result could explain the disappearance of the positive effect of finance on growth over time.

Third, we aggregated the six governance variables into one variable encompassing the overall level of governance in a country, which we added as an additional control variable into the model. The results suggest that countries with lower levels of financial development benefit from reduced economic growth in times of a banking crisis, whereas countries with higher levels of financial development can take advantage of further financial development. The impact of banking crises also appears to be greater in countries with ineffective governance and less-developed financial institutions.

Our data and model have implications across all countries. The existence of the non-linear relationship between financial development and economic growth encourages further financial development in countries scoring to the left of the theoretical optimum, and a reduction of the financial sector in countries scoring beyond the optimal level in the absence of a banking crisis.

The United Kingdom scores a 0.56 on the FD index and is currently facing the threat of banks moving away from London as a result of Brexit. The model presented in this paper and the literature imply that there could be potential benefits linked to the reduction of the size of the British financial sector. The relocation of major banks coupled with the restructuration of the banking system could reduce financial deepening in the UK and boost economic growth. Nevertheless, the result of the Brexit vote has additional consequences, and a reduction in the size of the British financial sector could have subsequent effects which would be detrimental to economic growth. These effects are beyond the scope of this paper, and we advise to conduct further research on the consequences of Brexit to complement the our findings.

Appendix

Table I
Financial Development Indices per country

This table presents four measures of financial development for the 201 countries in our sample. The financial development index is build using data on 18 variables drawn from the Global Financial Development Database.

Country	Financial Development Index			
	1960	1985	2000	2014
Afghanistan	0.16	0.16	0.16	0.20
Albania	0.26	0.26	0.29	0.26
Algeria	0.14	0.15	0.14	0.13
Andorra	0.59	0.59	0.65	0.59
Angola	0.23	0.23	0.17	0.27
Antigua and Barbuda	0.55	0.54	0.54	0.56
Argentina	0.23	0.22	0.26	0.25
Armenia	0.15	0.15	0.13	0.20
Aruba	0.38	0.38	0.37	0.38
Australia	0.50	0.45	0.51	0.53
Austria	0.39	0.35	0.42	0.44
Azerbaijan	0.14	0.14	0.10	0.15
Bahamas, The	0.41	0.40	0.39	0.59
Bahrain	0.29	0.29	0.28	0.34
Bangladesh	0.14	0.14	0.17	0.17
Barbados	0.28	0.28	0.26	0.33
Belarus	0.16	0.16	0.15	0.19
Belgium	0.36	0.32	0.39	0.39
Belize	0.39	0.38	0.38	0.34
Benin	0.22	0.24	0.22	0.24
Bermuda	0.30	0.30	0.34	0.33
Bhutan	0.16	0.16	0.16	0.22
Bolivia	0.14	0.14	0.14	0.19
Bosnia and Herzegovina	0.24	0.24	0.22	0.27
Botswana	0.20	0.20	0.19	0.20
Brazil	0.41	0.42	0.41	0.47
Brunei Darussalam	0.42	0.42	0.45	0.41
Bulgaria	0.33	0.33	0.31	0.31
Burkina Faso	0.22	0.23	0.20	0.23
Burundi	0.23	0.23	0.26	0.24
Cambodia	0.23	0.23	0.22	0.29
Cameroon	0.23	0.25	0.21	0.23
Canada	0.50	0.47	0.55	0.59
Cape Verde	0.40	0.38	0.41	0.45
Cayman Islands	0.32	0.32	0.34	0.32
Central African Republic	0.17	0.18	0.16	0.17
Chad	0.18	0.20	0.18	0.19

	Financial Development Index *(continued)*			
Country	1960	1985	2000	2014
Chile	0.36	0.35	0.37	0.39
China	0.42	0.42	0.47	0.51
Colombia	0.25	0.25	0.22	0.32
Comoros	0.17	0.17	0.17	0.21
Congo, Dem. Rep.	0.12	0.12	0.11	0.14
Congo, Rep.	0.45	0.41	0.42	0.50
Costa Rica	0.19	0.18	0.20	0.24
Cote d'Ivoire	0.15	0.16	0.16	0.16
Croatia	0.30	0.30	0.30	0.36
Cuba	0.63	0.63	0.62	0.64
Curacao	0.58	0.58	0.64	0.62
Cyprus	0.34	0.34	0.51	0.34
Czech Republic	0.28	0.28	0.29	0.30
Denmark	0.40	0.32	0.48	0.39
Djibouti	0.28	0.28	0.27	0.29
Dominica	0.50	0.48	0.47	0.53
Dominican Republic	0.16	0.17	0.17	0.23
Ecuador	0.17	0.16	0.21	0.23
Egypt, Arab Rep.	0.25	0.25	0.27	0.28
El Salvador	0.23	0.23	0.17	0.28
Equatorial Guinea	0.22	0.22	0.20	0.23
Eritrea	0.34	0.34	0.33	0.32
Estonia	0.26	0.26	0.25	0.25
Ethiopia	0.25	0.25	0.24	0.26
Fiji	0.21	0.20	0.20	0.24
Finland	0.36	0.35	0.48	0.35
France	0.38	0.34	0.48	0.44
Gabon	0.22	0.23	0.23	0.47
Gambia, The	0.26	0.28	0.28	0.26
Georgia	0.17	0.17	0.16	0.22
Germany	0.47	0.39	0.54	0.46
Ghana	0.13	0.13	0.15	0.17
Greece	0.38	0.38	0.47	0.34
Grenada	0.51	0.51	0.51	0.51
Guatemala	0.19	0.20	0.18	0.21
Guinea	0.19	0.19	0.17	0.20
Guinea-Bissau	0.14	0.14	0.14	0.16
Guyana	0.16	0.17	0.17	0.18
Haiti	0.18	0.18	0.20	0.24
Honduras	0.17	0.18	0.54	0.19
Hong Kong SAR, China	0.44	0.39	0.44	0.51
Hungary	0.28	0.28	0.32	0.27
Iceland	0.41	0.38	0.45	0.43
India	0.35	0.36	0.44	0.38
Indonesia	0.27	0.27	0.24	0.32
Iran, Islamic Rep.	0.36	0.36	0.37	0.40

Country	Financial Development Index (continued)			
	1960	1985	2000	2014
Iraq	0.25	0.25	0.29	0.25
Ireland	0.39	0.38	0.41	0.53
Israel	0.40	0.42	0.42	0.40
Italy	0.48	0.48	0.56	0.53
Jamaica	0.25	0.21	0.21	0.28
Japan	0.53	0.50	0.55	0.64
Jordan	0.29	0.29	0.29	0.32
Kazakhstan	0.19	0.19	0.18	0.21
Kenya	0.17	0.18	0.16	0.19
Kiribati	0.36	0.36	0.38	0.35
Korea, Dem. Rep.	0.38	0.38	0.35	0.35
Korea, Rep.	0.51	0.45	0.57	0.59
Kosovo	0.32	0.32	0.32	0.40
Kuwait	0.30	0.30	0.26	0.30
Kyrgyz Republic	0.23	0.24	0.36	0.29
Lao PDR	0.21	0.21	0.20	0.22
Latvia	0.24	0.24	0.27	0.27
Lebanon	0.28	0.28	0.29	0.31
Lesotho	0.32	0.32	0.32	0.33
Liberia	0.15	0.15	0.11	0.15
Libya	0.28	0.28	0.27	0.27
Liechtenstein	N.A.	N.A.	N.A.	N.A.
Lithuania	0.24	0.24	0.22	0.29
Luxembourg	0.34	0.33	0.39	0.36
Macao SAR, China	0.58	0.58	0.61	0.58
Macedonia, FYR	0.22	0.22	0.45	0.25
Madagascar	0.24	0.24	0.24	0.24
Malawi	0.13	0.14	0.13	0.13
Malaysia	0.41	0.40	0.44	0.44
Maldives	0.30	0.27	0.31	0.35
Mali	0.21	0.22	0.19	0.22
Malta	0.28	0.28	0.32	0.30
Marshall Islands	0.16	0.16	0.16	0.16
Mauritania	0.21	0.23	0.18	0.23
Mauritius	0.29	0.29	0.30	0.32
Mexico	0.28	0.32	0.27	0.31
Micronesia, Fed. Sts.	0.27	0.27	0.30	0.29
Moldova	0.27	0.27	0.26	0.30
Monaco	0.53	0.53	0.52	0.54
Mongolia	0.25	0.25	0.25	0.29
Montenegro	0.28	0.28	0.28	0.29
Morocco	0.25	0.26	0.26	0.29
Mozambique	0.22	0.22	0.18	0.24
Myanmar	0.22	0.21	0.22	0.21
Namibia	0.28	0.28	0.27	0.28
Nepal	0.15	0.15	0.16	0.18

Country	Financial Development Index *(continued)*			
	1960	1985	2000	2014
Netherlands	0.36	0.30	0.55	0.39
New Zealand	0.36	0.37	0.40	0.38
Nicaragua	0.27	0.29	0.29	0.30
Niger	0.18	0.19	0.15	0.19
Nigeria	0.13	0.13	0.13	0.14
Norway	0.34	0.34	0.39	0.31
Oman	0.33	0.33	0.33	0.33
Pakistan	0.24	0.24	0.39	0.24
Palau	0.28	0.28	0.28	0.32
Panama	0.27	0.25	0.30	0.32
Papua New Guinea	0.19	0.19	0.15	0.19
Paraguay	0.13	0.14	0.14	0.18
Peru	0.27	0.27	0.27	0.35
Philippines	0.26	0.25	0.26	0.33
Poland	0.33	0.32	0.33	0.35
Portugal	0.44	0.44	0.51	0.47
Puerto Rico	N.A.	N.A.	N.A.	N.A.
Qatar	0.32	0.32	0.31	0.32
Romania	0.21	0.22	0.20	0.25
Russian Federation	0.31	0.31	0.32	0.34
Rwanda	0.20	0.20	0.25	0.24
Samoa	0.33	0.33	0.35	0.41
San Marino	0.67	0.69	0.80	0.81
Sao Tome and Principe	0.21	0.21	0.20	0.29
Saudi Arabia	0.33	0.32	0.29	0.43
Senegal	0.22	0.22	0.21	0.25
Serbia	0.21	0.21	0.24	0.26
Seychelles	0.42	0.41	0.42	0.39
Sierra Leone	0.19	0.21	0.19	0.20
Singapore	0.44	0.41	0.47	0.45
Slovak Republic	0.24	0.24	0.26	0.27
Slovenia	0.34	0.34	0.37	0.49
Solomon Islands	0.22	0.22	0.22	0.24
Somalia	N.A.	N.A.	N.A.	N.A.
South Africa	0.41	0.39	0.43	0.47
South Sudan	0.25	0.25	0.25	0.25
Spain	0.48	0.44	0.65	0.50
Sri Lanka	0.27	0.27	0.27	0.30
St. Kitts and Nevis	0.32	0.30	0.34	0.32
St. Lucia	0.48	0.47	0.49	0.54
St. Vincent and the Grenadines	0.44	0.44	0.45	0.46
Sudan	0.10	0.10	0.06	0.10
Suriname	0.34	0.34	0.28	0.37
Swaziland	0.15	0.15	0.14	0.16
Sweden	0.36	0.27	0.50	0.41

Country	Financial Development Index *(continued)*			
	1960	1985	2000	2014
Switzerland	0.50	0.50	0.55	0.51
Syrian Arab Republic	0.27	0.25	0.26	0.27
Tajikistan	0.18	0.18	0.15	0.18
Tanzania	0.12	0.13	0.13	0.13
Thailand	0.40	0.39	0.37	0.50
Timor-Leste	0.26	0.26	0.26	0.28
Togo	0.23	0.24	0.25	0.25
Tonga	0.37	0.33	0.40	0.37
Trinidad and Tobago	0.24	0.23	0.25	0.24
Tunisia	0.18	0.18	0.20	0.19
Turkey	0.36	0.36	0.43	0.50
Turkmenistan	0.32	0.32	0.36	0.33
Tuvalu	0.63	0.63	0.64	0.62
Uganda	0.12	0.12	0.12	0.12
Ukraine	0.19	0.19	0.19	0.23
United Arab Emirates	0.27	0.26	0.27	0.32
United Kingdom	0.51	0.52	0.57	0.56
United States	0.57	0.49	0.70	0.63
Uruguay	0.20	0.20	0.17	0.25
Uzbekistan	0.20	0.20	0.16	0.19
Vanuatu	0.39	0.38	0.38	0.49
Venezuela, RB	0.23	0.21	0.22	0.28
Vietnam	0.20	0.20	0.19	0.25
West Bank and Gaza	0.18	0.18	0.18	0.19
Yemen, Rep.	0.23	0.23	0.23	0.24
Zambia	0.10	0.11	0.09	0.13
Zimbabwe	0.12	0.12	0.14	0.14

Table II
Acronyms

Variable	Meaning
FI	Financial Institution
FM	Financial Markets
FID	Financial Institution Depth
FIA	Financial Institutions Access
FIE	Financial Institutions Efficiency
FMD	Financial Markets Depth
FMA	Financial Markets Access
FME	Financial Markets Efficiency
FDI	Financial Development Index
FD	Financial Development

Table III
Description of variables

This table gives the description of the variables used for the financial development index and for the regression analysis.

Variable	Name	Definition and original source	Database
Financial Development Index variables			
ATMs per 100,000 adults	FIACC2	For each country calculated as: 100,000*Number of ATMs/adult population in the reporting country.	GFDD
Bank branches per 100,000 adults	FIACC1	For each country calculated as: 100,000*reported number of commercial bank branches/adult population in the reporting country.	GFDD
Bank net interest margin (%)	FIEFF1	Calculated from underlying bank-by-bank unconsolidated data from Bankscope. Data2080[t] / ((data2010[t] + data2010[t-1])/2). Numerator and denominator are aggregated on the country level before division. Note: banks used in the calculation might differ between indicators.	GFDD
Bank noninterest income to total income (%)	FIEFF3	Calculated from underlying bank-by-bank unconsolidated data from Bankscope. Data2085 / (data2080 + data2085). Number is only calculated when net-interest income is not negative. Note: banks used in the calculation might differ between indicators.	GFDD
Bank overhead costs to total assets (%)	FIEFF4	Calculated from underlying bank-by-bank unconsolidated data from Bankscope. Data2090[t] / ((data2025[t] + data2025[t-1])/2). Numerator and denominator are first aggregated on the country level before division. Note: banks used in the calculation might differ between indicators.	GFDD
Bank return on assets (%, after tax)	FIEFF5	Calculated from underlying bank-by-bank unconsolidated data from Bankscope. Data2115[t] / ((data2025[t] + data2025[t-1])/2). Numerator and denominator are first aggregated on the country level before division. Note: banks used in the calculation might differ between indicators.	GFDD

Variable *(continued)*	Name	Definition and original source	Database
Bank return on equity (%, after tax)	FIEFF6	Calculated from underlying bank-by-bank unconsolidated data from Bankscope. Data2115[t] / ((data2055[t] + data2055[t-1])/2). Numerator and denominator are first aggregated on the country level before division. Note: banks used in the calculation might differ between indicators.	GFDD
Bank lending-deposit spread	FIEFF2	Raw data are from the electronic version of the IMF's International Financial Statistics. Difference between lending rate and deposit rate. Lending rate is the rate charged by banks on loans to the private sector and deposit interest rate is the rate offered by commercial banks on three-month deposits.	GFDD
Life insurance premium volume to GDP (%)	FIDEP4	Premium data is taken from various issues of Sigma reports (Swiss Re). Data on GDP in US dollars is from the electronic version of the World Development Indicators.	GFDD
Nonlife insurance premium volume to GDP (%)	FIDEP5	Premium data is taken from various issues of Sigma reports (Swiss Re). Data on GDP in US dollars is from the electronic version of the World Development Indicators.	GFDD
Market capitalization excluding top 10 companies to total market capitalization (%)	FMACC1	Value of listed shares outside of the top ten largest companies to total value of all listed shares.	GFDD
Stock market capitalization to GDP (%)	FMDEP1	Value of listed shares to GDP, calculated using the following deflation method: $\{(0.5)*[F_t/P\_e_t + F_{t-1}/P\_e_{t-1}]\}/[GDP_t/P\_a_t]$ where F is stock market capitalisation, P_e is end-of period CPI, and P_a is average annual CPI. End-of period CPI and average annual CPI is calculated using the monthly CPI values.	GFDD
Mutual fund assets to GDP (%)	FIDEP3	Data taken from a variety of sources such as Investment Company Institute and national sources.	GFDD

Variable (continued)	Name	Definition and original source	Database
Outstanding international public debt securities to GDP (%)	FMDEP3	Amount of public international debt securities (amounts outstanding), as a share of GDP. It covers long-term bonds and notes and money market instruments placed on international markets. End of year data (i.e. December data) are considered for debt securities. The figures are deflated using the following methodology: $\{(0.5)*[F_t/P\_e_t + F_{t-1}/P\_e_{t-1}]\}/[GDP_t/P\_a_t]$ where F is the level international public debt, P_e is end-of period CPI, and P_a is average annual CPI. GDP is from World Development Indicators. End-of period CPI and average annual CPI is calculated using the monthly CPI values.	GFDD
Pension fund assets to GDP (%)	FIDEP2	Ratio of assets of pension funds to GDP. A pension fund is any plan, fund, or scheme that provides retirement income. Data taken from a variety of sources such as OECD, AIOS, FIAP and national sources.	GFDD
Private credit by deposit money banks to GDP (%)	FIDEP1	Private credit by deposit money banks and other financial institutions to GDP, calculated using the following deflation method: $\{(0.5)*[F_t/P\_e_t + F_{t-1}/P\_e_{t-1}]\}/[GDP_t/P\_a_t]$ where F is credit to the private sector, P_e is end-of period CPI, and P_a is average annual CPI. Raw data are from the electronic version of the IMF's International Financial Statistics. Private credit by deposit money banks; GDP in local currency; end-of period CPI; and average annual CPI is calculated using the monthly CPI values.	GFDD
Stock market total value traded to GDP (%)	FMDEP2	Total value of all traded shares in a stock market exchange as a percentage of GDP. Following deflation method is use: $\{(0.5)*[F_t/P\_e_t + F_{t-1}/P\_e_{t-1}]\}/[GDP_t/P\_a_t]$ where F is stock market capitalization, P_e is end-of period CPI, and P_a is average annual CPI. End-of period CPI and average annual CPI are calculated using the monthly CPI values.	GFDD

Variable *(continued)*	Name	Definition and original source	Database
Stock market total value traded to GDP (%)	FMDEP2	Total value of all traded shares in a stock market exchange as a percentage of GDP. Following deflation method is use: {(0.5)*[Ft/P_et + Ft-1/P_et-1]}/[GDPt/P_at] where F is stock market capitalization, P_e is end-of period CPI, and P_a is average annual CPI. End-of period CPI and average annual CPI are calculated using the monthly CPI values.	GFDD
Stock market turnover ratio (%)	FMEFF1	Ratio of the value of total shares traded to average real market capitalization, the denominator is deflated using the following method: Tt/P_at/{(0.5)*[Mt/P_et + Mt-1/P_et-1] where T is total value traded, M is stock market capitalization, P_e is end-of period CPI. Annual CPI is drawn from the IMF's International Financial Statistics.	GFDD
Control variables			
Inflation, consumer prices (annual %)	CPI	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.	WDI
GDP per capita (Constant 2005 USD)	GDPCAP	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2005 U.S. dollars.	WDI

Variable *(continued)*	Name	Definition and original source	Database
General government final consumption expenditure (% of GDP)	GOV	General government final consumption expenditure includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defence and security, but excludes government military expenditures that are part of government capital formation.	WDI
Trade (% of GDP)	TRADE	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	WDI
School enrolment, secondary, male and female (% net)	SCHOOL	Average of net enrolment rate for males and females. Net enrolment rate is the ratio of children of official school age who are enrolled in school to the population of the corresponding official school age. Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers.	WDI
Dummy variables			
Banking crisis dummy (1=banking crisis, 0=none)	CRISIS	A banking crisis is defined as systemic if two conditions are met: a. Significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and/or bank liquidations), b. Significant banking policy intervention measures in response to significant losses in the banking system. The first year that both criteria are met is considered as the year when the crisis start becoming systemic. The end of a crisis is defined the year before both real GDP growth and real credit growth are positive for at least two consecutive years.	GFDD

Variable *(continued)*	Name	Definition and original source	Database
Governance variables			
Voice and Accountability	ACCOUNT	Voice and Accountability captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.	WGI
Control of Corruption	CORRUP	Control of Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.	WGI
Government Effectiveness	GOVEFF	Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.	WGI
Rule of Law	LAW	Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.	WGI

Variable *(continued)*	Name	Definition and original source	Database
Political Stability and Absence of Violence/Terrorism	POLSTA	Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.	WGI
Regulatory Quality	REGUL	Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.	WGI
Quality of governance	GOVERN	Average of control of corruption, government effectiveness, political stability, regulatory quality, rule of law and voice and accountability.	WGI
Dependent variable			
Growth of GDP per capita (Constant 2005 USD)	GROWTH	Annual percentage growth rate of GDP per capita in constant 2005 USD. See the definition of the GDPCAP variable.	GFDD

Table IV
Summary Statistics

This table reports summary statistics for our variables. The sample period is 1960 to 2014.

Variable	Observations	Mean	Std. Dev.	Min	Max
Controls					
CPI	7,189	34.581	487.186	-35.837	24411.03
GDPCAP	8,312	9160.822	15322.290	69.579	158603
GOV	7,591	16.071	7.774	0.000	156.532
TRADE	7,911	78.292	51.453	0.021	531.737
SCHOOL	2,079	62.966	27.433	0.099	99.619
ACCOUNT	3,178	-0.042	1.005	-2.286	1.826
CORRUP	3,120	-0.039	1.008	-2.057	2.586
GOVEFF	3,114	-0.037	1.005	-2.487	2.431
LAW	3,171	-0.053	0.994	-2.669	2.120
POLSTA	3,129	-0.060	1.000	-3.324	1.663
REGUL	3,114	-0.038	1.001	-2.675	2.247
GOVERN	3,180	-0.037	0.921	-2.491	1.985
Dummy					
CRISIS	10,348	0.044	0.206	0	1
Dependent variable					
GROWTH	8,117	0.021	0.066	-0.650	1.824
Financial Development Index					
FID	10,285	0.203	0.175	0.000	0.841
FIA	10,285	0.282	0.245	0.000	0.994
FIE	10,780	0.605	0.089	0.127	0.999
FMD	7,260	0.141	0.120	0.000	0.819
FMA	2,750	0.470	0.210	0.000	1.000
FME	6,325	0.137	0.168	0.000	1.000
FI	10,890	0.372	0.144	0.049	0.816
FI2	10,890	0.159	0.120	0.002	0.665
FM	7,260	0.179	0.146	0.001	0.819
FM2	7,260	0.053	0.080	0.000	0.670
FDI	10,890	0.296	0.125	0.049	0.816
FDI2	10,890	0.103	0.090	0.002	0.665

Table V
Correlation Matrix of Governance variables

This table presents the correlations between the six governance variables. There are 3,093 observations.

	ACCOUNT	CORRUP	GOVEFF	LAW	POLSTA	REGUL
ACCOUNT	1					
CORRUP	0.776	1				
GOVEFF	0.781	0.931	1			
LAW	0.819	0.937	0.936	1		
POLSTA	0.685	0.735	0.694	0.783	1	
REGUL	0.795	0.864	0.932	0.894	0.646	1

Table VI
The 3x2 Matrix of Financial System Characteristics

The variables presented in this matrix are based on the selection made by the IMF in the discussion paper from 2015. Three variables are missing because of a lack of data availability[5].

	Financial Institutions	Financial Markets
Depth	1. Private sector credit (% of GDP) 2. Pension fund assets (% of GDP) 3. Mutual fund assets (% of GDP) 4. Life Insurance premiums (% of GDP) 5. Non-life insurance premium (% of GDP)	1. Stock market capitalisation (% of GDP) 2. Stocks traded (% of GDP) 3. International debt securities government (% of GDP)
Access	1. Branches of commercial banks per 100,000 adults 2. ATMs per 100,000 adults	1. % of market capitalisation outside the top 10 largest companies
Efficiency	1. Net interest margin 2. Lending-deposit spread 3. Non-interest income to total income 4. Overhead costs (% of total assets) 5. Return on assets 6. Return on equity	1. Stock market turnover ratio (stocks traded/capitalisation)

[5] The three missing variables are the *total number of issuers of debt (domestic and external, nonfinancial corporations, and financial corporations)* which provide additional information on financial markets access, the *total debt securities of nonfinancial corporations (% of GDP)* and the *total debt securities of financial corporations (% of GDP)*, which both give supplementary information on the depth of financial markets.

Table VII
Growth on Financial Development, 1960-2014

This table presents the parameter estimates obtained by OLS regression. The dependent variable is growth of GDP per capita. Controls are the log of consumer price index, the log of general government final consumption expenditure, the log of trade openness and the log of initial GDP per capita. FD corresponds to the Financial Development Index (FDI), the subcomponent for Financial Institutions (FI) or the subcomponent for Financial Markets (FM), as indicated. All variables are lagged. All regressions include a constant term and fixed effects as indicated in the table. Coefficients for fixed effects are not reported. Standard errors are presented in parentheses and clustered at the year and country levels. ***, **, and * denote significance at 1%, 5% and 10% levels, respectively.

	General Index – Financial Development			Financial Institutions	Financial Markets
	(1)	(2)	(3)	(4)	(5)
FD	-0.039 **	0.161 **	0.151 **	0.202 *	0.061 **
	(0.018)	(0.061)	(0.063)	(0.112)	(0.025)
FD^2		-0.259 ***	-0.233 **	-0.360 **	-0.105 **
		(0.075)	(0.075)	(0.120)	(0.036)
CRISIS			-0.005	-0.039 *	-0.002
			(0.014)	(0.021)	(0.007)
CRISIS x FD			-0.054	0.144	-0.077
			(0.076)	(0.098)	(0.053)
CRISIS x FD^2			0.051	-0.185 *	0.090
			(0.095)	(0.103)	(0.078)
Log(CPI)	-0.005 ***	-0.005 ***	-0.005 ***	-0.005 ***	-0.007 ***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(GOV)	-0.017 **	-0.016 **	-0.016 **	-0.016 **	-0.027 ***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)
Log(TRADE)	0.027 ***	0.027 ***	0.027 ***	0.027 ***	0.038 ***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)
Log(GDPCAP)	-0.043 **	-0.043 ***	-0.043 ***	-0.042 ***	-0.039 ***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.005)
Constant	0.235 ***	0.207 ***	0.205 ***	0.197 ***	0.249 ***
	(0.054)	(0.054)	(0.054)	(0.057)	(0.042)
Year F.E.	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes
Observations	5,459	5,459	5,459	5,459	4,394
R^2	0.247	0.248	0.252	0.254	0.290

Table VIII
Growth on Financial Development, 1996-2014

This table presents the parameter estimates obtained by OLS regression. The dependent variable is growth of GDP per capita. Controls are the log of consumer price index, the log of general government final consumption expenditure, the log of trade openness, the log of initial GDP per capita, control of corruption, government effectiveness, political stability, regulatory quality, rule of law and voice and accountability. FD corresponds to the Financial Development Index (FDI), the subcomponent for Financial Institutions (FI) or the subcomponent for Financial Markets (FM), as indicated. All variables are lagged. All regressions include a constant term and fixed effects as indicated in the table. Coefficients for fixed effects are not reported. Standard errors are presented in parentheses and clustered at the year and country levels. ***, **, and * denote significance at 1%, 5% and 10% levels, respectively.

	General Index	Financial Institutions	Financial Markets
	(1)	(2)	(3)
FD	0.304 **	0.564 **	0.075
	(0.116)	(0.185)	(0.044)
FD^2	-0.397 **	-0.703 **	-0.108 *
	(0.163)	(0.214)	(0.055)
CRISIS	0.083 *	0.090 **	-0.013
	(0.042)	(0.041)	(0.015)
CRISIS x FD	-0.510 **	-0.414 **	-0.028
	(0.185)	(0.151)	(0.070)
CRISIS x FD^2	0.566 **	0.352 **	0.054
	(0.190)	(0.132)	(0.094)
ACCOUNT	0.011	0.011	0.008
	(0.010)	(0.010)	(0.006)
CORRUP	-0.005	-0.007	0.009
	(0.007)	(0.008)	(0.006)
GOVEFF	0.035 **	0.035 **	0.008
	(0.015)	(0.015)	(0.007)
LAW	-0.013	-0.011	-0.018
	(0.009)	(0.009)	(0.011)
POLSTA	0.006 **	0.006 **	0.004
	(0.003)	(0.003)	(0.003)
REGUL	0.008	0.009	-0.005
	(0.009)	(0.008)	(0.010)
Constant	0.806 ***	0.821 ***	0.360 **
	(0.193)	(0.192)	(0.160)
Controls	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes
Observations	1,973	1,973	1,510
R^2	0.477	0.481	0.486

Table IX
Growth on Financial Development, 1996-2014

This table presents the parameter estimates obtained by OLS regression. The dependent variable is growth of GDP per capita. Controls are the log of consumer price index, the log of general government final consumption expenditure, the log of trade openness and the log of initial GDP per capita. FD corresponds to the Financial Development Index (FDI), the subcomponent for Financial Institutions (FI) or the subcomponent for Financial Markets (FM), as indicated. GOVERN is a continuous variable corresponding to a country's overall score on the control of corruption, government effectiveness, political stability, regulatory quality, rule of law and voice and accountability variables. All variables are lagged. All regressions include a constant term and fixed effects as indicated in the table. Coefficients for fixed effects are not reported. Standard errors are presented in parentheses and clustered at the year and country levels. ***, **, and * denote significance at 1%, 5% and 10% levels, respectively.

	General Index	Financial Institutions	Financial Markets
	(1)	(2)	(3)
FD	0.295 **	0.521 **	0.079 *
	(0.115)	(0.162)	(0.044)
FD^2	-0.384 **	-0.637 **	-0.114 *
	(0.160)	(0.187)	(0.057)
CRISIS	0.089 *	0.095 *	-0.015
	(0.046)	(0.044)	(0.015)
CRISIS x FD	-0.546 **	-0.441 **	-0.022
	(0.203)	(0.163)	(0.068)
CRISIS x FD^2	0.598 **	0.372 **	0.039
	(0.206)	(0.142)	(0.089)
GOVERN	0.037 ***	0.037 ***	0.008
	(0.007)	(0.007)	(0.008)
Constant	0.804 ***	0.815 ***	0.389 **
	(0.187)	(0.187)	(0.164)
Controls	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes
Observations	1,984	1,984	1,514
R^2	0.469	0.472	0.481

Table X
Growth on Financial Development, 1960-2014

This table presents the parameter estimates obtained by OLS regression. The dependent variable is growth of GDP per capita. The bottom and top 1% of the distribution have been excluded from the sample. Controls are the log of consumer price index, the log of general government final consumption expenditure, the log of trade openness and the log of initial GDP per capita. FD corresponds to the Financial Development Index (FDI), the subcomponent for Financial Institutions (FI) or the subcomponent for Financial Markets (FM), as indicated. All variables are lagged. All regressions include a constant term and fixed effects as indicated in the table. Coefficients for fixed effects are not reported. Standard errors are presented in parentheses and clustered at the year and country levels. ***, **, and * denote significance at 1%, 5% and 10% levels, respectively.

	General Index	Financial Institutions	Financial Markets
	(1)	(2)	(3)
FD	0.124 **	0.140	0.057 **
	(0.059)	(0.103)	(0.021)
FD^2	-0.206 **	-0.295 **	-0.102 **
	(0.068)	(0.107)	(0.031)
CRISIS	0.001	-0.028	-0.003
	(0.013)	(0.023)	(0.007)
CRISIS x FD	-0.076	0.102	-0.065
	(0.076)	(0.111)	(0.048)
CRISIS x FD^2	0.072	-0.147	0.070
	(0.093)	(0.116)	(0.073)
Log(CPI)	-0.004 ***	-0.004 ***	-0.006 ***
	(0.001)	(0.001)	(0.001)
Log(GOV)	-0.017 ***	-0.017 ***	-0.024 ***
	(0.004)	(0.004)	(0.004)
Log(TRADE)	0.025 ***	0.025 ***	0.037 ***
	(0.004)	(0.004)	(0.003)
Log(GDPCAP)	-0.033 ***	-0.032 ***	-0.036 ***
	(0.005)	(0.005)	(0.004)
Constant	0.140 ***	0.136 **	0.232 ***
	(0.039)	(0.041)	(0.034)
Year F.E.	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes
Observations	5,338	5,338	4,332
R^2	0.282	0.284	0.312

Table XI
Growth on Financial Development, 1960-2014

This table presents the parameter estimates obtained by OLS regression. The dependent variable is growth of GDP per capita. Countries considered off-shore financial centres are excluded. Controls are the log of consumer price index, the log of general government final consumption expenditure, the log of trade openness and the log of initial GDP per capita. FD corresponds to the Financial Development Index (FDI), the subcomponent for Financial Institutions (FI) or the subcomponent for Financial Markets (FM), as indicated. All variables are lagged. All regressions include a constant term and fixed effects as indicated in the table. Coefficients for fixed effects are not reported. Standard errors are presented in parentheses and clustered at the year and country levels. ***, **, and * denote significance at 1%, 5% and 10% levels, respectively.

	General Index	Financial Institutions	Financial Markets
	(1)	(2)	(3)
FD	0.116 *	0.135	0.046 **
	(0.059)	(0.103)	(0.022)
FD^2	-0.206 **	-0.285 **	-0.092 **
	(0.069)	(0.107)	(0.033)
CRISIS	0.000	-0.030	-0.003
	(0.013)	(0.023)	(0.007)
CRISIS x FD	-0.069	0.113	-0.057
	(0.075)	(0.109)	(0.047)
CRISIS x FD^2	0.065	-0.159	0.059
	(0.093)	(0.114)	(0.072)
Log(CPI)	-0.004 ***	-0.004 ***	-0.006 ***
	(0.001)	(0.001)	(0.001)
Log(GOV)	-0.017 ***	-0.017 ***	-0.024 ***
	(0.004)	(0.004)	(0.004)
Log(TRADE)	0.025 ***	0.025 ***	0.037 ***
	(0.005)	(0.004)	(0.004)
Log(GDPCAP)	-0.032 ***	-0.031 ***	-0.035 ***
	(0.005)	(0.005)	(0.004)
Constant	0.137 ***	0.133 **	0.226 ***
	(0.040)	(0.042)	(0.035)
Year F.E.	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes
Observations	5,090	5,090	4,116
R^2	0.285	0.287	0.315

Table XII
Growth on Financial Development, 1960-2014

This table presents the parameter estimates obtained by OLS regression. The dependent variable is growth of GDP per capita. Controls are the log of consumer price index, the log of general government final consumption expenditure, the log of trade openness and the log of initial GDP per capita. FD corresponds to the Financial Development Index (FDI), the subcomponent for Financial Institutions (FI) or the subcomponent for Financial Markets (FM), as indicated. Only countries with full information across all financial development variables are included. There are a total of 38. All variables are lagged. All regressions include a constant term and fixed effects as indicated in the table. Coefficients for fixed effects are not reported. Standard errors are presented in parentheses and clustered at the year and country levels. ***, **, and * denote significance at 1%, 5% and 10% levels, respectively.

	General Index – Financial Development			Financial Institutions	Financial Markets
	(1)	(2)	(3)	(4)	(5)
FD	0.018	0.555 ***	0.589 ***	0.303 *	0.203 ***
	(0.041)	(0.147)	(0.157)	(0.152)	(0.049)
FD^2		-0.606 ***	-0.639 ***	-0.436 **	-0.262 ***
		(0.146)	(0.160)	(0.133)	(0.058)
CRISIS			0.007 **	-0.018	0.005
			(0.038)	(0.035)	(0.012)
CRISIS x FD			-0.489 **	0.025	-0.152 **
			(0.195)	(0.158)	(0.075)
CRISIS x FD^2			0.570 **	-0.043	0.212 **
			(0.222)	(0.161)	(0.099)
Log(CPI)	-0.007 ***	-0.006 ***	-0.005 ***	-0.005 ***	-0.007 ***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(GOV)	-0.028 ***	-0.026 ***	-0.024 **	-0.032 **	-0.026 ***
	(0.006)	(0.007)	(0.007)	(0.006)	(0.006)
Log(TRADE)	0.025 ***	0.026 ***	0.027 ***	0.033 ***	0.031 ***
	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)
Log(GDPCAP)	-0.026 ***	-0.026 ***	-0.027 ***	-0.040 ***	-0.029 ***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Constant	0.255 ***	0.148 **	0.140 **	0.234 ***	0.233 ***
	(0.046)	(0.050)	(0.051)	(0.053)	(0.045)
Year F.E.	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes
Observations	1,558	1,558	1,558	2,504	1,837
R^2	0.339	0.348	0.368	0.361	0.327

Table XIII
Growth on Financial Development, 1960-2014

This table presents the parameter estimates obtained by OLS regression. The dependent variable is growth of GDP per capita. Controls are the log of consumer price index, the log of general government final consumption expenditure, the log of trade openness and the log of initial GDP per capita. FD corresponds to the Financial Development Index (FDI), the subcomponent for Financial Institutions (FI) or the subcomponent for Financial Markets (FM), as indicated. All variables are lagged. All regressions include a constant term and fixed effects as indicated in the table. Coefficients for fixed effects are not reported. Standard errors are presented in parentheses and clustered at the year and country levels. ***, **, and * denote significance at 1%, 5% and 10% levels, respectively.

	General Index – Financial Development		Financial Institutions		Financial Markets	
	1960-1980 (1)	1981-2014 (2)	1960-1980 (3)	1981-2014 (4)	1960-1980 (5)	1981-2014 (6)
FD	-0.085	0.169 **	-0.923	0.282 **	0.004	0.053 *
	(0.500)	(0.070)	(1.849)	(0.114)	(0.083)	(0.029)
FD^2	-0.242	-0.252 **	0.188	-0.435 ***	0.165	-0.091 **
	(0.573)	(0.081)	(1.790)	(0.120)	(0.155)	(0.040)
CRISIS	1.476 **	0.004	0.823 **	-0.026	-1.322	-0.002
	(0.798)	(0.013)	(0.338)	(0.022)	(1.919)	(0.007)
CRISIS x FD	-6.993 *	-0.110	-2.912 **	0.083	9.900	-0.078
	(4.032)	(0.071)	(1.264)	(0.101)	(14.538)	(0.052)
CRISIS x FD^2	8.125	0.121	2.457 **	-0.124	-18.495	0.092
	(5.050)	(0.086)	(1.148)	(0.105)	(27.216)	(0.077)
Constant	0.639 ***	0.300 ***	0.872 ***	0.286 **	0.659 **	0.346 ***
	(0.161)	(0.084)	(0.399)	(0.084)	(0.188)	(0.065)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,273	4,186	1,273	4,186	1,114	3,280
R^2	0.262	0.290	0.263	0.292	0.287	0.346

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