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Legal History, Institutions and Banking System Development in Africa*

Samuel Mutarindwa[†] Dorothea Schäfer[‡] Andreas Stephan[§]

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Abstract

This paper links banking systems development to the colonial and legal history of African countries. Specifically, we investigate the impact of differing legal traditions on the development of existing investor and creditor protection, and on African banking systems. Based on a sample of 40 African countries from 2000 to 2016, our empirical findings show a significant dependence of current financial institutions on the legal origin and the colonization type. Findings also reveal that current legal financial institutions are not the major determinants of banking system development, whereas institutional and regulatory quality significantly matter for banking system development in both common and civil law countries. Strong creditor rights reduce the cost of banking in African countries.

Key Words: Legal origin, colonial history, financial institutions, banking system, Hausman-Taylor estimation

JEL codes: G21,G38,G39,K15,K40

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1 Introduction

African countries' banking systems differ remarkably from those of developing countries outside the continent. African banking systems have lower levels of development as shown by lower financial depths and access. Loans to the private sector as a percentage of GDP ratio is on average only 21% in African countries, half of the ratio in other developing countries. Bank assets to GDP is also only 57%, which is half of the amount in developing countries outside Africa (Mlachila et al., 2016). Even among African countries, there are remarkable heterogeneities in terms of private credit. For instance, private credit to GDP is 141% in South Africa, 87% in Mauritius and 61% in Cape Verde, but only 5% in Chad (Beck & Cull, 2014).

The central focus of this study is to examine what drives underdevelopment and heterogeneity of the African banking systems. According to the literature, weak institutional infrastructures are prevalent in many African countries. Creditor rights are often poor and contract enforcement is inefficient and involves a lengthy procedure (Beck, Maimbo, Faye, & Triki, 2011). In many countries financial repression is high (Andrianaivo & Yartey, 2010).

The law and finance strand of literature claims that the weak legal systems operating in modern African nations are based on and shaped through the history of European colonization (Beck, Levine, & Demirgüç-Kunt, 2002; La Porta, Lopez-de Silanes, & Shleifer, 2008; La Porta, Lopez-de Silanes, Shleifer, & Vishny, 1998). This paper's aim is to disentangle the channels through which the legal family of origin influences the development of legal institutions and, subsequently, of banking systems. In addition, we explore whether the specific type of colonization matters for institution building and banking system development. The study uses country-level data from 40 African countries for the period 2000-2016. We instrument the country-level legal financial institutions *Creditor rights*, *Investor protection* and *Contract enforcement*, and apply the Hausman-Taylor estimator to account for potential endogeneity (Hausman & Taylor, 1981).

Our empirical analysis reveals several important results. First, consistent with the law and finance proposition (e.g., Beck et al., 2002; La Porta, Lopez-de Silanes, Pop-Eleches, & Shleifer, 2004), our paper suggests that legal traditions matter. Both British and non-British common law countries are associated with stronger legal financial institutions (creditor rights, investor protection, enforcing contracts) than the countries with a French or other civil law tradition. This finding supports the view that common law jurisdictions implement law that strengthens creditor and investor rights. Interestingly, countries that were colonized by settlers, do have stronger legal financial institutions and also better developed banking systems. This result has not been reported in the literature so far.

Surprisingly, however, the econometric results do not provide strong support for the second expected channel from stronger legal financial institutions to more highly developed banking systems. Albeit we find evidence that stronger creditor rights reduce the costs of banking, the results taken together imply that current legal financial institutions are not a major determinant of banking system development in African countries. Instead, we find robust evidence that banking system development is related to the institutional and regulatory quality in the respective country.

This paper makes the following contributions. First, it provides largely missed detailed empirical evidence for Africa on the mechanisms through which laws rooted in legal traditions explain the development of legal financial institutions. In particular, the existing law and finance literature remains silent on the specific impact of colonial rule and it ignores differences within the two groups of common law and civil law countries (Beck, Demirgüç-Kunt, & Levine, 2003; Beck, Demirguc-Kunt, et al., 2005; Caprio, Laeven, & Levine, 2007; Djankov, Glaeser, La Porta, Lopez-de Silanes, & Shleifer, 2003). In contrast, the impact of the colonial regime is an important ingredient of this study. In addition, we divide civil law countries into French civil law and other civil law countries colonized by Belgium, Portugal, Italy and Spain, and Germany. Similarly, we distinguish between British common law and other common law states.

Finally, this study contributes to the research on bank-based financial systems in developing economies. Specifically, we borrow from the approaches used in Levine (1998), Levine, Loayza, and Beck (2000), Emenalo, Gagliardi, and Hodgson (2018) and Aluko and Ajayi (2018) to examine the extent to which legal institutions predict the development of African countries' banking systems (depth, breadth and intermediation).

The paper is organized as follows. Section 2 reviews the theoretical and empirical literature linking legal traditions, law development, institutions and banking development. Section 3 presents our methodology. Section 4 discusses the estimation and empirical strategy used, and presents findings. Section 5 provides the conclusions, limitations and possible avenues for future research.

2 Review of literature and research propositions

2.1 Legal traditions, legal systems and institutional development

According to law and finance theory, legal systems have their origins in either the common law or the civil law legal tradition. Most nations that exist today have either adopted independently, or acquired through conquest or colonization, one or the other of these two legal tradition (La Porta, Lopez-de Silanes, Shleifer, & Vishny, 1997; La Porta et al.,

1998). These legal traditions endure and persist over time, producing ancillary institutions that influence economic outcomes (La Porta et al., 2008). Common law originates from the British legal tradition that provides higher discretion to the courts to develop laws from already decided cases. Through this use of case law or jurisprudence, judges in common law countries establish legal precedents that are the foundations for the development of the legal system. In contrast, the civil law tradition has its historical roots in the codified laws of the Roman Empire. This canon of Roman laws is the basis for much of the legal development of the civil law countries of Europe, and places emphasis on the use of legislated codes or statutes whereby courts or judges are law enforcers but not law developers. The role of the courts is limited to interpretation and application of statutes and not to the continuing development of laws.

The law and finance literature highlights the channels or mechanisms through which legal traditions affect legal and institutional development. Beck and Levine (2005) suggest that legal origins influence the development of financial systems through political and adaptability channels that are shaped by the specific legal and institutional environment. According to the authors, the political channel reflects the extent to which a country's judiciary/courts make decisions without interference from political authorities. This independence gives the courts the power and freedom to enforce laws that protect small investors or property. Framing new rules by using previous legal cases also causes a higher degree of adaptability in the legal framework.

In contrast, in civil law countries state and legislative authorities have more power to interfere in judicial processes. In particular, the authorities have the right to appoint and tenure judges. One of the consequences of the differences between common law and civil law systems is that civil law judges are restricted from modifying laws through procedural formalism, while common law judges have more flexibility to apply existing precedent cases to a current case.

Based on an international database capturing judicial independence and law development in 71 countries. Porta, Lopez-de Silanes, Pop-Eleches, and Shleifer (2002) propose that a common law tradition is associated with stronger judicial independence vis-à-vis a civil law tradition, and the degree of independence predicts higher economic and political freedom. Beck and Levine (2005) use the database of Porta et al. (2002) to test whether the described political and adaptability channels through which legal traditions influence the development of financial systems facilitate firms' access to finance. Using case law as a proxy for the adaptability of legal systems, and, judicial independence as a proxy for political independence, they find that the adaptability mechanism affects firms' access to finance more than the political channel. Djankov et al. (2003) use law data in a cross-country international study of 109 countries to measure the procedures that are employed

by courts and litigants in the enforcement of property rentals. The collection of bounced checks is used as a proxy for procedural formalism. Their findings suggest that procedural formalism is higher in civil law than in common law countries. They argue that judicial formalism leads to inconsistency, less honesty and corruption in dispute resolutions, particularly in developing countries. In consideration of these studies, we propose that:

Proposition 1: *The development of legal institutions protecting both investors and creditors differ in African countries and depend on their legal traditions.*

2.2 Legal financial institutions and banking systems development

La Porta et al. (1997) use corporate laws to construct the Anti-Director Rights Index (ADRI) as a measure of investor protection institutions. The index specifically measures the extent to which small or minority shareholders are protected from expropriation by corporate insiders. They empirically test this measure in 49 countries and find that common law countries protect investors better than their civil law counterparts. They also use the ADRI to examine the extent to which it explains financial development proxied by the market capitalization of listed firms divided by GDP in both common and civil countries. They find that in common laws countries the equity markets indicator responds more strongly and positively to the index than in civil law countries.

La Porta, Lopez-de Silanes, and Shleifer (2006) combine the ADRI index with laws requiring firms to improve their reporting standards and test whether the constructed scores affect the market capitalization of stock markets. They find a strong link and show the superiority of the common law legal tradition in amplifying this causality link. They infer from this evidence that the combination of ADRI index and scores representing the quality of reporting standards explain the financial development better than the ADRI index alone.

Djankov, La Porta, Lopez-de Silanes, and Shleifer (2008) improve the ADRI and develop a new index of shareholder protection called the Anti Self Dealing Index (ASDI) to measure the extent to which differences in shareholder rights explain stock market development. The cross-country study reveals significant links between the ASDI and the stock market indicator. The positive relationship is found to be stronger in common than in civil law countries.

Creditor protection is the complement to shareholder protection. La Porta et al. (1997) constructed a measure to capture the extent to which creditors are protected in solvency and bankruptcy procedures. They find that higher levels of creditor protection affect financial development more in common law than in civil law countries. Levine et al. (2000)

assess the effects of creditor rights, contract enforcement and accounting standards on financial intermediation. They find that financial intermediaries only flourish in common law countries in which competent authorities are able to ensure accurate and effective financial reporting and to enforce contracts, and in which the legal system successfully protects creditors when borrowers file for bankruptcy. [Djankov, McLiesh, and Shleifer \(2007\)](#) construct and test an international sample of 129 countries to study how financial development (measured by private credit to GDP) responds to differences in creditor laws. Their findings reveal that financial systems flourish more when the laws protecting creditors are strong, enforcement is guaranteed, and when enough credit information is available. Once again, this finding is more significant in common law than in civil law countries.

Other research, exclusively using firm-level data, focuses on the relationship between creditor institutions and banking development. These studies obtain results that are consistent with the literature explaining the institution/financial development nexus. For instance, [Haselmann, Pistor, and Vig \(2009\)](#); [Safavian and Sharma \(2007\)](#) find that creditor protection laws improve lending, reduce interest rates, and lengthen loan maturities ([Qian & Strahan, 2007](#)). Creditor laws, registries and information sharing also improve firms' access to finance in developing countries ([Peria & Singh, 2014](#)) as banks are likely to offer lower lending rates in an environment that is protective for lenders.

In sum, the law and finance literature suggests that countries with strong institutions that protect investors and creditors are associated with better and more efficient financial systems. Strong institutions are found to be more likely in common law countries than in civil law countries ([La Porta et al., 1998](#)). Accordingly, we propose for African countries:

Proposition 2: *Legal institutions protecting investors and creditors explain the development of banking systems. The countries' legal traditions amplify this relationship.*

3 Empirical approach

3.1 Data

The data comes from a variety of sources. Institutional development data, macro-economic variables, banking development, governance indicators, and population figures are all obtained from the World Bank. The data on the sub-classification of legal origins is from [Klerman, Mahoney, Spamann, and Weinstein \(2011\)](#) and [Oto-Peralías and Romero-Ávila \(2014\)](#). In addition, we use the countries' profile of legal systems in Africa provided by

the Lex Mundi Law Firm Network. Data pertaining to legal systems development (use of case law) is obtained from [Guerrero \(2016\)](#) who draws heavily on the International Encyclopedia of Comparative Law database.

The criteria for inclusion in the country sample were (1) located on the African continent and (2) is a former colony or was once occupied by a European state. We excluded North African countries since these countries experienced the influence of the Ottoman Empire, a tradition different from either civil or common law traditions. In addition, we excluded the island countries of Comoros, Seychelles and Mauritius. Although these countries were ultimately occupied by France or Britain, they already had different histories borrowed from Asian traditions. Liberia was also excluded since most of its legal tradition is borrowed from the United States of America, and originates in the period before colonization. After applying these selection criteria, our sample covers 40 African states observed over the period of 2000-2016.

3.2 Measurement of legal systems' and financial institutions' development

Similar to [La Porta et al. \(1997\)](#) and [La Porta et al. \(2008\)](#) we use categorical variables to indicate legal traditions. We differentiate between countries with British common law legal origin, mixed common law countries, French civil law and mixed civil law. Table 1 groups the sample countries into the four categories. To capture the type of colonization we distinguish between settler communities (*Settler*) and purely extractive colonization regimes (*Extraction*). We indicate the technique of developing the legal system by a dummy variable *case law* following [Beck et al. \(2002\)](#), [Guerrero \(2016\)](#) and [La Porta et al. \(2004\)](#). This variable measures whether courts apply legal precedents established by case law when adjusting legal systems to respond to new legal and economic circumstances. A value of 1 is assigned to those countries that use case law and zero otherwise.

Financial development institutions are drawn from the World Bank's Doing Business Reports (DBR) pertaining to minority investor and creditor protection rights. Minority investor's protection rights are measured by the *Investor protection* index capturing how countries' laws protect small shareholders from expropriation by block-holders and management. Creditor rights protection is measured using the index *Creditor rights*. This variable captures the extent to which regulation and laws protect creditors from losses arising from loan defaults ([Djankov et al., 2007](#)). *Enforcing contracts* measures the time that it takes creditors in a given country to enforce debt contracts. We also adopt [Kaufman and Kraay \(2008\)](#)' measures of countries institutional development namely: *Control of corruption*, and *Regulatory quality*.

3.2.1 Measurement of banking systems development

The Global Financial Development Database (GFDD) (Demirguc-Kunt, Klapper, Singer, Ansar, & Hess, 2018) provides the data for measuring the state of the country's banking system. The World Bank's typology comprises three characteristics, (1) banks' depth, (2) breadth, and (3) intermediation. Two ratios, the ratio of private credit provided by domestic banks to the private sector to Gross Domestic Product (GDP) (*Private credit*),¹ and the ratio of liquid liabilities to GDP (*Liquid liabilities to GDP*) measure bank depth. The amount of deposit resources mobilized by banks as a percentage of a country's GDP (*Deposits to GDP*) represents the banking system's breadth. Two other variables, namely *Loans to deposits* and *Net interest margins (NIM)*, indicate the level of bank intermediation. A higher value in one of these variables indicates a more developed banking system.

3.3 Control variables

We control for the macro-economic environment by using a proxy of the country's average income level, *Log (GDPpercapita)*. The size of a country's population is also included as a control variable expressed as a natural logarithm the country's population size, denoted as *Log (Population)*. Table 2 in the Appendix provides names of the variables and their description.

4 Analysis and Results

4.1 Sample description

Table 3 summarizes means and standard deviations of the variables used. Forty percent of the sample are countries that were once French colonies and use civil law as the basis of their legal system. Countries that were colonized by other European states but still practice civil law account for 22.5% of the sample. Colonies of Great Britain practising common law account for 27.5% of the sample. Countries that were not British colonies but use common law as their legal basis make 10% of the sample. Settler colonies account for 32%, while 68% belong to the extraction colonies group. Fifty-three percent of the countries use case law as a basis for legal systems development. The institutional variables

¹It should be noted that, based on a sample of developed and emerging economies Cecchetti and Kharroubi (2012), find that the ratio of private sector credit to GDP is supporting economic growth only up to a certain point. Beyond that point, a high ratio is a drag on growth. Pineda (2017) argues that a rising private sector borrowing was an important ingredient for the Asian financial crisis in the most affected four developing Asian economies. Private sector borrowing became unsustainable as the value of financial and real assets deteriorated when the 1997/1998 Asian financial crisis unfolded.

display the following country means: the investor protection score is 4.2, the creditor rights score is 47.4, and it takes an average of 664 days to enforce debt contracts.

Table 3 shows the means of banking system indicators. Lending to private sector is on average 16% and liquid liabilities to GDP is 28.7%. These findings closely corroborate previous results in Beck, Fuchs, Singer, and Witte (2014) that private credit and liquid liabilities to GDP are on average in Africa 18% and 32% respectively, compared to 34% and 47% in other developing countries outside the continent. Additionally, loans to deposits account for 71% and the net interest margin is on average 7.14%. Deposits to GDP is on average 21.6%. For control variables, results in Table 3 show that the average annual growth rate is 4.7%, the inflation rate is at 1.67%, and GDP per capita is US\$ 1,719. The average population size is 17.5 million.

[Table 3 here]

Tables 4 and 5 summarize the indicators of the development of banking systems by country over time. There are remarkable differences in the sample with respect to private sector lending. South Africa has the highest (above 60%), while countries such as the Democratic Republic of Congo, Chad, Guinea and Guinea Bissau have the lowest ratio of private credit to GDP (below 10%). A longitudinal comparison reveals that Botswana and Cape Verde show observable improvements with respect to the private credit to GDP-variable over time, while Chad, Congo and Gabon have experienced a reduction in this ratio. Tables 4 and 5 also show that some countries have banks with extremely large liquid liabilities to GDP and a larger proportion of loans to deposits. With respect to intermediation, countries such as Angola, Central African Republic, Democratic Republic of Congo, Gabon, Ghana, Liberia, Malawi, Siera Leone, Tanzania, Uganda and Zimbabwe have relatively higher interest margins.

[Table 4 here]

[Table 5 here]

Table 6 summarizes descriptive statistics for the legal origins tradition. The results show that common law countries are more likely to use case law (93%) than civil law countries (21%). Minority shareholders and creditors are relatively more protected in common law than in civil law countries. For banking development variables, Table 4 shows that private credit to GDP in common law countries is higher than in civil law countries. Similar findings are reported for loans to deposits, and deposits to GDP. However, common law countries are more associated with higher bank intermediation costs (NIM) than their civil counterparts. For other controls, results show that civil law countries are associated with lower GDP per capita than their common law peers.

[Table 6 here]

4.2 Econometric models

Given the panel nature of our sample, two estimation techniques are employed. First, a pooled regression model is used to explain institutional development in terms of creditor and investor protection as well as in terms of enforcement of contracts. This method is chosen as it allows us to obtain the effects from time-invariant regressors that could not be identified with the fixed effects panel model. Furthermore, the pooled regression model exploits both the within and between variation for the estimation of effects. Time-invariant legal traditions and other time-varying country controls are used as explanatory variables as shown below:

$$\text{Creditor/Investor protection}_{it} = f(\text{Legal traditions}_i, \text{Controls}_{it}) + \epsilon_{it} \quad (1)$$

where the dependent variables describe the institutional legal development for countries $i = 1, \dots, N$ in year t . The variable *Legal traditions*_{*i*} represents the legal origins category consisting of common law (British), common law (mixed), civil law (French) and civil law (mixed), and the type of colonization (settler versus extraction). *Control*_{*it*} denotes the country controls including country's population size (using log) and macro-economic variables including growth rate and GDP per capita in country i at time t . ϵ_{it} denotes the error term.

We also employ the Hausman-Taylor (HT) estimator (Hausman & Taylor, 1981), which is used to obtain the effects of time-invariant regressors, while at the same time allowing for country-specific unobserved heterogeneity in terms of random effects. Furthermore, the HT estimator allows us to distinguish between endogenous and exogenous regressors, where it is assumed that endogenous regressors are correlated with the unobserved country-specific effects. The HT estimator uses the exogenous variables as instruments for the endogenous ones.

In our context, the HT estimator is applied to estimate how financial legal institutions affect the development of banking systems in the countries,

$$y_{it} = f(\text{Creditor rights}_{it}, \text{Investor protection}_{it}, \text{Enforcing Contracts}_{it}, \text{Exogenous variables}_{i/it}, \lambda_t, \mu_i) + v_{it} \quad (2)$$

where y_{it} are the indicators representing the banking system development, namely: *Private credit*, *Loan to deposits*, *Deposits to GDP*, *Liquid liabilities to GDP*, and *NIM*. We specify the indicators of the financial legal institutions, *Creditor rights*_{*it*}, *Investor protection*_{*it*} and *Enforcing Contracts*_{*it*}, as endogenous variables, and instrument them with the exogenous variables *Legal origin*, *Colonization type* and the two macro controls. Year

effects are denoted as λ_t , country-specific effects as μ_i and the error term is denoted as u_{it} .

In the Section 4.4, we also report results from robustness tests using a fixed-effects (FE) model. However, since legal origin variables are time-invariant, the FE model cannot identify the effect of the legal origin indicators.

4.3 The legal and colonial heritage shapes the banking system

4.3.1 The relationship between legal origin and financial legal institutions

We analyse the relationship between legal origin and financial legal institutions applying a pooled ordinary least squares (OLS) model. Table 7 reports the results. Our main interest is to examine whether the quality of the financial legal institutions is strongly linked to the legal origin. In addition, usage of case law is employed as the dependent variable. As is common in the La Porta et al. (1997; 1998) (LLSV) literature, in this specification the legal origin describes only the dichotomous categories of common and civil law. The significance of the legal origin coefficients strongly confirms *Proposition 1*. Common law is linked to stronger investor protection and creditor rights and to a shorter time for debt contracts to be enforced, which is not the case with civil law. Application of case law is also significantly more likely in countries from the common law origin. Not entirely surprisingly, results for the dichotomous categories of legal origin are in line with previous findings in the LLSV literature (Beck et al., 2002; Djankov et al., 2003; La Porta et al., 1997). The type of colonization (settler versus extraction) also matters. The coefficient of the variable *Colonial type: settler* is related to a higher level of investor protection. Interestingly, former settler colonies are associated with weaker contract enforcement mechanisms, in the sense that in those countries it takes on average more days to enforce a contract.

The other macro indicators are of minor relevance in the pooled regression approach. The level of economic development (measured by GDP per capita) has no significant impact on any of the dependent variables. The size of the country in terms of population only affects the existence of strong creditor rights positively.

[Table 7 here]

Table 8 reports results using the legal origins sub-groups as covariates in the pooled regression approach. It turns out that British common law judicial origins have stronger creditor rights and better investor protection than civil law countries. However, mixed civil law countries are only associated with a lower level of creditor rights, but are otherwise not statistically different from French civil law countries in terms of creditor rights.

British-style common law countries have stronger creditor rights standards than civil law countries but show otherwise no deviation from mixed common law countries. One interesting difference occurs in the duration of contract enforcement, where the average number of days it takes for enforcement is 149 days less in British common law traditions than in French civil law countries. Mixed common and civil law countries are not different from French civil law countries in this respect.

Case law is more often used in both mixed common and civil law traditions than in French civil law origins. Because of perfect collinearity British common law countries drop out in the regression and no results for British common law appear in Column 4 of Table 8. The colonial type and the other control variables yield similar results to those shown in Table 7.

[Table 8 here]

4.3.2 Legal financial institutions and banking sector development

We turn now to our main question of interest: How do legal financial institutions shape the evolution of banking sectors in African countries and what role does the legal and colonial heritage play? In a first step, we proceed with the pooled OLS estimator. Table 9 reports the regression results. *Creditor rights* and *Enforcing contracts* seem to influence banking system development, however, creditor rights have, in contrast to *Proposition 2*, a negative effect on depth and breadth of the banking system. We also find a direct and positive influence of a common law jurisdiction and a settler-type colonial history on the depth and breadth of the country's banking system. Clearly, as many coefficients of the legal financial institutions are insignificant or have an unexpected sign, the obtained results from the pooled OLS estimation do not support *Proposition 2*. However, Table 9 only presents a preliminary and incomplete picture. This is because the variables representing the development of financial institutions (*Creditor rights*, *Investor protection* and *Enforcing contracts*) are potentially endogenous in explaining the banking sector development. Accordingly, the natural next step is accounting for the endogeneity problem. We do so by applying the Hausman-Taylor (HT) estimator.

[Table 9 here]

4.3.3 Financial institutions and banking sector development: The HT approach

The Hausman-Taylor estimator uses instruments to explain depth, breadth and the level of intermediation in the countries' banking sectors. Specifically, we instrument *Creditor rights*, *Investor protection* and *Enforcing contracts* with all exogenous variables in the

specification. By using instruments, in particular the legal origin, we follow earlier scholarly work, e.g. [Levine et al. \(2000\)](#), [La Porta et al. \(2006\)](#), [Caprio et al. \(2007\)](#) and [Beck, Demirgüç-Kunt, and Maksimovic \(2006\)](#) who use legal traditions to explain minority investor protection, creditor rights, contract enforcement and property rights. As African countries received their legal origins through colonization, the legal traditions are exogenous to the countries and their banking systems. However, they are strongly correlated with the legal financial institutions as has been shown in [Tables 7 and 8](#). When we include the colonial type as an instrument, we borrow from [Acemoglu, Johnson, and Robinson \(2001\)](#). They suggest that colonial strategies explain subsequent settlements and institutional development in the former colonies, including the achieved standards in investor and property rights institutions.

[Tables 10 and 11](#) display the evidence obtained with the Hausman-Taylor panel estimator. Using instruments change the results considerably but overall the support for *Proposition 2* remains still quite weak. We find, however, that an increase in the level of creditor rights reduces the interest rate margin. This may be a sign for a lower lending risk premia because of banks strong position as a creditor.

Furthermore, investor protection laws do not significantly improve private credit and actually lowers the ratio of liquid liabilities to GDP and of deposits to GDP. Strong debt contract enforcement is not relevant for the development of the banking system. Banks in common law countries have more trust in private credit, and collect more deposits as a share of GDP than banks in civil law jurisdictions. Despite stronger capital market financing in common law jurisdictions, the importance of lending out of deposits is similar in both common and civil law jurisdictions. Naturally, countries of the settler colonial type have deeper and broader financial systems than countries in which pure extraction was common. This is compatible with the notion that, in contrast to the native population, settlers had the power to influence political and judicial decision making in support of constructing and developing a decent banking system in the colonies. Taken together, the evidence does not provide much support for *Proposition 2*. While legal origin matters, current legal financial institutions show only a modest impact on banking system development in African countries.

[[Table 10](#) here]

Dividing the legal heritage into four groups confirms the results for the instrumented legal financial institutions indicators. At the same time it yields a more detailed picture about how legal heritage and the type of colonization affect banking system development. In terms of financial development (depth) it is the mixed common law countries that differ from all other legal heritage groups (including the British common law countries). The mixed common countries employ more private credit and have higher levels of liquid

liabilities relative to GDP. Higher private credit is also associated with the settler-type colonization. Interestingly, only the mixed common law tradition has a statistically distinguishable effect on the level of intermediation *vis-à-vis* the civil law tradition. The cost of banking is significantly higher in British common law countries, again hinting at a priority for capital market financing in those jurisdictions.

Jurisdictions that use case law to evolve their legal precedent show a better ability to convert deposits into loans than non-case law countries. Table 11 also shows that the size of the population is irrelevant for the development of the banking system. However, the depth and breadth of the banking system is lower in more wealthy countries. The latter finding is consistent with the conjecture that in high income countries, capital markets become relatively more important.

[Table 11 here]

Our final set of estimates describes the role of institutional and regulatory quality on the development of banking systems in African countries. Specifically, we employ the variables *Regulatory quality* and *Control of corruption* as measures for the overall institutional quality in the respective country. The Hausman-Taylor estimation results shown in Table 12 highlight that institutional quality matters for all dimensions of banking system development, and even renders some of the previously significant factors as insignificant. Specifically, we find that the effect of common law origin becomes insignificant for private credit and cost of banking (proxied by *NIM*), once the variables that capture institutional and regulatory quality are included in the specification. Note that, in contrast, the effect from the *Colonization type* remains significant both for private loans and for bank deposits. This shows that the positive effect on financial development from having a legal system embedded in common law tradition also captures the higher institutional quality in those countries. Interestingly, the direct measure of using case law has no significant effect in most estimations. Thus, it is not the utilization of case law in common or civil law countries that matters, but a higher institutional and regulatory quality that is conducive for banking system development.

[Table 12 here]

4.4 Robustness tests

The FE model is unable to capture the effect of the legal origin variables as they are time-invariant. Therefore, we run fixed effects models only as a test for the robustness of the Hausman-Taylor results. Note that the FE models allow for correlation between the right-hand side variables and unobserved heterogeneity across countries. Furthermore,

the effects of variables are identified from the within-country variation, while the HT estimation also captures cross-country variation.

Tables 13 and 14 show that the main conclusion regarding the low impact of the current financial legal institutions on the developmental stage of the banking systems also hold in the FE specification. Table 14 confirms that institutional and regulatory quality has a significant impact on banking system development.

Second, we split the sample into four subsamples following the legal origins classification and rerun the estimations. By and large the results are consistent with the findings in the main specification.² Specifically, the robustness test confirms that countries using civil law as a legal regime tend to have low investor protection standards, and a financial system with shallow depth and breadth.

Finally, we test the influence of the 2008 financial crisis on our main findings. For this purpose, we construct two samples covering the period before 2008 and the period from 2008 to 2016 and rerun the HT estimations again. Results for the period up to 2008 show that only the variable for the days required to enforce debt contract affects significantly banking system development. Creditor rights do lower the cost of bank intermediation, but have no impact on the depth and breadth of the banking system. This is different in the post-crisis period during which the creditor rights variable turns out to predict significantly banking system development (depth, breadth and intermediation), while the coefficients of the covariates, *Investor protection* and *Enforcing contracts* remain insignificant. This finding may indicate that the authorities in the countries included in our sample responded to the financial crisis by strengthening the rights of creditors.

5 Conclusions

The law and finance literature claims that legal traditions explain the development of legal systems, institutions and financial systems. This study examines whether this claim holds for banking system development in African countries. In addition, we hypothesize that not only is the legal heritage important, but the type of also colonization matters. We use a sample of 40 African countries and focus exclusively on banking system development instead of considering the entire financial system, as is commonly done in extant literature.

As expected, we find confirmation for the legal traditional channel, and show that a common law heritage leads to stronger legal financial institutions (*Proposition 1*). Surprisingly, however, we find little evidence that the second expected channel of stronger

²The Tables using subsamples of legal origin and pre- and post financial crisis are not reported but are available from the authors upon request.

legal financial institutions leads to a more highly developed banking system (*Proposition 2*). Despite this, one finding that emerges is that stronger creditor rights reduce the cost of banking in African countries.

Overall, our study confirms the conjecture that legal history matters for the quality of current institutions in African countries, and that both the legal origin and the type of colonization determine the strength of current legal financial institutions, e.g., creditor rights and investor protection. The results also highlight that institutional and regulatory quality significantly promotes banking system development in African countries. Whether or not current institutional quality itself is related to the legal origin and colonial history is a question left for future research.

These findings have important policy implications. Although the law and finance literature concludes that there are differences in financial outcomes from the two legal traditions with the emphasis on the superiority of the common law tradition, findings from our study indicate that the quality of institutions that emerge from these legal systems matter for banking system development in Africa in both civil and common law traditions. Our results indicate that policy makers and regulators would do well to pay less attention to strengthening the existing legal financial institutions, e.g., creditor rights or investor protection, but rather focus on improving the overall institutional and regulatory quality in order to promote banking system development.

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Appendices

Tables

Table 1: Legal traditions classifications

Civil-French	Civil-mixed	Common-British	Common-Mixed
Benin	Angola (Portugual)	Gambia	Botswana (British+ Dutch)
Burkina Faso	Burundi (Belgium)	Ghana	Namibia (British + Dutch)
Cameroon	Cape Verde (Portugual)	Kenya	South Africa (British + Dutch)
Central African Rep.	Democratic Rep. of Congo (Belgium)	Lesotho	Swaziland* (British + Dutch)
Chad	Equatorial Guinea (Spain)	Malawi	Zimbabwe (British + Dutch)
Cote d'Ivoire	Eritrea (Italy)	Nigeria	
Djibouti	Guinea Bissau (Portugual)	Sierra Leone	
Gabon	Mozambique (Portugual)	Tanzania	
Guinea-Conakry	Rwanda (Belgium)	Uganda	
Madagascar		Zambia	
Mali			
Mauritania			
Niger			
Senegal			
Togo			

Source: [Oto-Peralías and Romero-Ávila \(2014\)](#); [Klerman et al. \(2011\)](#) and, Lex Mundi. Swaziland changed its name in 2018 to Eswatini.

Table 2: Variables description

Variable	Descriptions	Source
Case law	A dummy variable with the value 1 if a country uses case law in its judicial processes and decisions; and 0 otherwise.	(c)
Civil law (French)	Dummy variable with the value 1 if the country was a direct French colony; and 0 otherwise.	(b)
Civil law (mixed)	Dummy variable with the value 1 if the country uses civil-law but not formerly colonized by France; and 0 otherwise.	(b)
Colonial type	Dummy variable for colonization approaches with the value 1 if the country was a settler colony; and 0 if the country was an extraction colony.	(b)
Common law (British)	Dummy variable with the value 1 if the country is a direct British colony; and 0 if a country was colonized by a country using British common law.	(b)
Common law (mixed)	Dummy variable with the value 1 if the country uses common-law but not formerly colonized by Britain; and 0 otherwise.	(b)
Control of corruption	A measure of the extent to which politicians and policy makers use their power and influence for private gains and measured using a scale from -2.5 to +2.5.	(a5)
Creditor rights	Assesses the extent to which credit laws protect both lenders and borrowers to simplify lending, and is measured on a scale of 1 to 10, where 10 is the highest score.	(a2)
Deposits to GDP	This measures banks' customer deposits as a percentage of a country's GDP.	(a1)
Enforcing contracts	Measured in number of days required to enforce contracts.	(a2)
Investor protection	A composite of measures showing the extent to which minority investors are protected from expropriation with the value of 1 for the weakest and 10 the strongest.	(a2)
Liquid liabilities to GDP	Liquid, currency, demand and interest-bearing liabilities a percentage of a country' GDP	(a1)
Loans to deposits	Ratio of lending size to total bank deposits.	(a1)
Log (GDPpercapita)	Gross domestic product per capita population, expressed in natural logarithm form.	(a3)
Log (Population)	Population size of a given country and expressed in natural logarithm form.	(a4)
NIM	Net interest margin is a measure of the difference between bank interest income and interest expenses. It is expressed as a percentage.	(a1)

... continued

Variable	Descriptions	Source
Private credit to GDP	Loans to private sector as a percentage of GDP.	(a1)
Regulatory quality	A measure of the extent to which states and governments are able to develop and execute policies that incentivize private sector development measured on a scale of -2.5 to +2.5.	(a5)

Notes: Sources (a1) Global Financial Development Database; (a2) Doing Business projects; (a3) World Development Indicators; (a4) World Population estimates; (a5) World Governance Indicators (b) [Maoz and Henderson \(2013\)](#) [Klerman et al. \(2011\)](#); [La Porta et al. \(1997\)](#); [Oto-Peralías and Romero-Ávila \(2014\)](#); (c) [Guerrero \(2016\)](#)

Table 3: Descriptive statistics (country-year observations)

Variable	Obs	Mean	Std. Dev.	Min	Max
Bank credit to deposits	661	71.34	26.81	13.75	164.6
Bank deposits to GDP	636	21.57	15.96	0.93	93.3
Case law	577	0.530	0.500	0	1
Civil law-French	679	0.400	0.490	0	1
Civil law-Mixed	679	0.225	0.418	0	1
Colonial type (Settler type)	679	0.325	0.469	0	1
Common law-British	679	0.275	0.447	0	1
Common law-Mixed	679	0.100	0.300	0	1
Control of corruption	601	-0.570	0.617	-1.84	2
Creditor rights	384	47.4	22.61	10	100
Enforcing contracts	496	663	279	230	1785
Investor protection	374	4.195	1.382	2	8
Legal origins	680	0.375	0.484	0	1
Liquid liabilities to GDP	651	28.72	21.1	1.53	137.7
Population (in million)	674	17.5	26.3	0.438	190
GDPpercapita	674	1,719	2,763	113	22,942
NIM	609	7.14	3.25	0.03	23.32
Private credit	658	16.20	14.23	0.33	128.6
Regulatory quality	640	-0.650	0.565	-2.261	0.791

Table 4: Banking system development indicators by country (2000 and 2010)

Country	2000					2010				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Angola	1.1	10.2	8.3	13.8	3.5	18.7	32.3	29.8	62.6	7.22
Benin	9.8	23.6	13.1	74.8	4.1	21	35.5	25.3	83.0	3.78
Botswana	13.4	24.9	22.9	58.6	6.6	25.9	47.3	44.9	57.8	5.8
Burkina Faso	10.7	20.1	12.2	87.9	4.8	16.2	25.8	20.4	79.2	3.9
Burundi	14.1	16.3	10.9	129.9	11.7	15.4	25.0	19.5	78.9	5.2
Cameroon	7.7	13.9	10.1	76.7	3.9	10.5	21.0	16.9	62.2	5.2
Cape Verde	34.3	55.0	46.2	74.2	-	58.6	78.2	72.2	81.2	4.9
Central African	-	-	-	-	-	7.6	17.1	8.3	90.6	8.1
Chad	3.0	9.8	3.2	94.4	7.5	3.7	10.4	4.5	82.4	5.4
Congo Republic	5.7	11.8	6.5	87.7	-	4.4	19.9	12.5	35.2	2.9
Côte d'Ivoire	14.8	22.1	13.8	107.2	5.4	15.8	30.9	18.7	84.3	4.1
Democratic Rep of Congo	0.3	1.5	0.9	35.2	-	3.4	8.13	6.0	56.1	10.1
Djibouti	29.9	53.1	43.7	68.3	5.5	31	90.8	80.6	38.4	3.7
Equatorial Guinea	3.0	5.1	3.4	86.8	-	5.88	10.8	9.0	65.7	4.4
Eritrea	26.5	130.8	0.0	24.4	-	14.4	115	0	15.6	-
Gabon	7.8	12.7	9.8	80.1	5.2	7.4	18.0	14.5	51.3	7.8
Gambia, The	8.0	22.2	16.3	49.1	6.9	14.8	47	39.3	37.5	8.6
Ghana	7.2	14.3	8.8	81.7	8.9	13.8	26.6	20.7	66.5	12.0
Guinea	2.7	8.7	3.8	72.2	11.0	3.0	19.8	11.7	25.3	4.0
Guinea Bissau	4.5	21.7	7.6	59.8		5.7	25.5	11.1	51.4	5.1
Kenya	23.0	31.4	26.3	87.4	6.5	24.6	36.3	32.6	75.5	8.2
Lesotho	13.4	27.5	25.0	53.4	16.1	10.4	30.5	28.5	36.6	7.9
Madagascar	8.0	24.8	13.0	61.6	7.3	11.1	22.4	16.4	67.7	4.6
Malawi	2.6	8.6	6.6	39.5	12.9	11.3	19.2	16.5	68.9	11.9
Mali	13.5	18.3	11.8	114.3	6.8	15.0	23.1	17.2	87.3	4.2
Mauritania	-	-	-	-	9.9	20.9	24.5	17.4	120.6	4.3
Mozambique	13.2	20.9	17.5	75.7	5.9	21.7	35.1	30.4	71.3	7.0
Namibia	36.9	37.7	36.0	102.6	11.3	46.3	60.7	59.1	78.3	5.1
Niger	4.6	8.4	5.4	85.2	4.0	11.5	18.3	10.8	106	5.1
Nigeria	7.5	12.7	9.1	82.4	10.6	16.6	20.5	17.5	94.9	6.7
Rwanda	9.5	15.7	12.1	78.8	14.2	11.1	14.8	12.4	89.4	8.8
Senegal	16.5	22.5	17.1	96.5	6.3	24.4	37.2	28.8	84.7	5.5
Sierra Leone	1.3	10.6	5.9	22.5	18.6	6.8	19.3	14.1	47.9	11.2

South Africa	63.3	51.4	48.9	129.6	3.8	69.6	40.2	57.4	121.3	3.0
Swaziland	10.7	18.3	16.6	64.7	6.5	19.0	24.5	23.4	81.1	6.3
Tanzania	3.2	13.6	9.4	34.6	9.6	10.8	22.7	18.6	57.7	5.8
Togo	16.1	25.3	15.3	105.5	4.7	20.2	41.2	30.7	65.8	3.9
Uganda	5.1	13.8	10.3	48.9	13.4	10.5	18.1	14.6	72.0	8.6
Zambia	6.7	18.9	16.3	38.9	6.7	8.6	16.4	14.4	59.7	9.9
Zimbabwe	0.5	27.5	16.5	95.3	16.5	11.4	-	-	64.3	10.7
Total	15.1	28.8	20.3	73.3	7.5	20.2	37.0	29.4	67.9	6.1

Notes: (1) Private credit to GDP, (2) Liquid liabilities to GDP, (3) Deposits to GDP, (4) Loans to deposits, (5) NIM.

Table 5: Banking system development indicators (2016)

Country	2016				
	(1)	(2)	(3)	(4)	(5)
Angola	22.4	40.8	38.2	58.8	6.0
Benin	21.2	42.0	30.7	69.2	1.7
Botswana	30.4	40.6	39.6	76.9	5.3
Burkina Faso	26.6	35.2	31.0	85.7	2.2
Burundi	15.1	21.3	17.0	88.8	9.3
Cameroon	16.4	22.2	17.2	95.9	4.0
Cape Verde	59.9	98.9	93.3	64.2	3.1
Central African Republic	-	-	-	-	4.8
Chad	-	-	-	-	8.2
Congo Republic	-	-	-	-	
Cote	22.0	36.6	25.9	85.0	2.9
Democratic Rep of Congo	5.7	11.0	8.9	64.1	6.6
Djibouti	27.7	87.2	77.7	35.6	2.0
Equatorial Guinea	18.7	21.2	17.8	104.7	
Eritrea	-	-	-	-	
Gabon	14.3	25.0	20.1	71.3	10.3
Gambia, The	-	-	-	-	9.6
Ghana	17.8	32.1	25.5	69.6	11.9
Guinea	9.6	24.8	16.7	57.7	9.8
Guinea-Bissau	7.8	47.0	16.5	47.6	2.3
Kenya	31.3	37.9	34.3	91.4	9.0
Lesotho	16.7	30.1	27.0	62.1	9.9
Madagascar	12.5	20.8	17.4	72.2	7.9
Malawi	10.0	20.9	17.7	56.5	12.8
Mali	22.6	26.9	21.8	103.9	2.7
Mauritania	-	-	-	-	3.5
Mozambique	31.8	50.6	45.5	69.9	6.2
Namibia	51.8	47.1	51.1	101.4	5.0
Niger	14.8	26.6	13.7	107.6	4.3
Nigeria	14.7	19.5	17.3	84.9	5.6
Rwanda	19.7	20.0	17.8	110.7	8.8
Senegal	31.8	46.1	36.2	87.9	3.4
Sierra Leone	5.1	23.3	18.3	27.7	2.5
South Africa	66.1	43.1	59.5	111.0	3.5
Swaziland	20.4	27.2	25.8	78.9	6.9

Tanzania	13.7	21.8	17.6	77.9	10.1
Togo	36.4	52.5	42.8	85.2	2.0
Uganda	13.4	16.0	16.9	79.3	10.2
Zambia	12.7	18.2	19.1	66.7	9.6
Zimbabwe	22.0	32.1	31.5	69.7	6.4
<hr/>					
Total	27.3	48.0	39.6	75.1	6.1

Notes: (1) Private credit to GDP, (2) Liquid liabilities to GDP, (3) Deposits to GDP, (4) Loans to deposits; (5) NIM.

Table 6: Descriptive statistics by legal family of origin, country-year observations

Variable	Obs.	Civil	Common	Total	<i>t</i> -test
Case law	577	0.21	0.93	0.53	-24.77***
Control of corruption	793	-0.36	-0.32	-0.24	-3.11***
Creditor rights	501	5.2	7.4	6.06	-11.33***
Deposits to GDP	799	25.7	29.3	27.1	-2.24**
Enforcing contracts (days)	603	699	646	680	2.33***
Growth rate	660	4.80	4.65	4.68	0.13
Inflation	616	8.79	7.99	0.98	0.38
Investor protection	466	3.56	5.17	4.15	-13.7***
Log (GDPpercapita)	674	6.67	7.03	6.81	-4.45***
Log (Population)	674	15.7	16.2	15.9	-4.08***
Liquid liabilities to GDP	814	36.4	32.4	34.9	2.05**
Loans to deposits	827	71.7	67.4	70.0	2.15**
NIM	751	5.46	8.06	6.52	-11.05***
Private credit to GDP	822	18.2	21.5	19.5	-2.53***
Regulatory quality	793	-0.8	-0.448	0-.66	-8.31***

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Relationship between legal origins, case law and investor/creditor protection (pooled regressions)

	(1) Creditor rights	(2) Investor protection	(3) Enforcing contracts (days)	(4) Case law
Legal origin: common law	33.50*** (9.76)	1.374*** (4.01)	-162.7** (-2.35)	2.579*** (3.81)
Colonial type: settler	2.890 (0.61)	0.773** (2.07)	225.9*** (3.19)	-0.668 (-1.01)
Log (GDPpercapita)	1.467 (0.64)	0.0981 (0.43)	-20.77 (-0.39)	0.270 (0.66)
Log (Population)	3.518** (2.19)	0.229 (1.38)	-50.73 (-1.07)	0.311 (1.38)
Cons	-31.95 (-0.91)	-0.842 (-0.22)	1605.7 (1.51)	-7.344 (-1.44)
Year effects	Yes	Yes	Yes	Yes
Country effects	No	No	No	No
N	380	371	491	577
No. countries	40	40	40	34
R ²	0.705	0.503	0.175	—

Notes: Cluster robust t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Models (1)-(3) are based on pooled OLS, (4) is based on a pooled probit model. Reference categories: Legal origin: Civil law (French), Colonial type: extraction, Case law = no.

Table 8: Relationship between differentiated legal origins, case law and investor/creditor protection (pooled regressions)

	(1) Creditor rights	(2) Investor protection	(3) Enforcing contracts (days)	(4) Case law
Common law: British	34.94*** (8.34)	1.613*** (4.43)	-149.1** (-2.45)	—
Common law: mixed	24.74*** (6.32)	1.576** (2.19)	-41.95 (-0.26)	2.102* (1.73)
Civil law: mixed	-2.567 (-0.65)	0.688* (1.80)	110.4 (0.75)	1.289** (2.00)
Colonial type: settler	3.340 (0.74)	0.771* (1.92)	220.3*** (3.14)	-0.894 (-1.08)
Log (GDPpercapita)	2.820 (1.32)	0.0949 (0.52)	-35.37 (-0.59)	0.594 (1.47)
Log (Population)	3.338** (2.10)	0.241 (1.34)	-47.46 (-1.09)	0.401* (1.69)
Cons	-38.27 (-1.06)	-1.333 (-0.38)	1613.7 (1.64)	-11.31** (-2.06)
Year effects	Yes	Yes	Yes	Yes
Country effects	No	No	No	No
N	380	371	491	487
No. countries	40	40	40	29
R ²	0.717	0.536	0.205	—

Notes: Cluster robust t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Models (1)-(3) are based on pooled OLS, (4) is based on a pooled probit model. Reference categories: Legal origin: Civil law (French), Colonial type: extraction, Case law: no. For model (4), Case law = yes is perfectly collinear with Common British = 1, therefore corresponding countries are dropped from the regression.

Table 9: Institutional determinants of banking system development in African countries 2005-2015 (pooled OLS regressions)

	Depth		Breadth	Intermediation	
	Private credit	Liquid liab to GDP	Deposits to GDP	Loans to deposits	NIM
Creditor rights	-0.171 (-1.50)	-0.380** (-2.11)	-0.360** (-2.13)	0.285* (1.81)	0.00210 (0.13)
Investor protection	2.226 (0.94)	-1.378 (-0.60)	-0.0134 (-0.01)	3.704 (1.31)	0.128 (0.41)
Enforcing contracts	-0.0125** (-2.05)	-0.0199* (-1.87)	-0.0136* (-2.00)	-0.0149 (-1.11)	0.000246 (0.22)
Legal origin: common law	10.27* (1.72)	17.28* (1.89)	18.78** (2.18)	-2.512 (-0.22)	1.759** (2.06)
Colonial type: settler	6.749 (1.30)	16.99*** (2.98)	13.31** (2.45)	-2.974 (-0.42)	0.450 (0.61)
Case law: yes	-9.554* (-1.83)	-9.132 (-1.40)	-6.291 (-1.08)	-27.56** (-2.33)	0.872 (1.09)
Log (GDPpercapita)	3.870 (1.07)	-3.186 (-0.93)	1.151 (0.33)	5.446 (1.24)	-1.341*** (-3.17)
Log (Population)	-0.773 (-0.29)	-7.204*** (-3.03)	-4.491* (-1.70)	4.750 (1.48)	-0.0182 (-0.05)
Cons	-0.866 (-0.01)	175.6*** (2.92)	86.42 (1.39)	-63.46 (-0.82)	13.54* (1.76)
Year effects	Yes	Yes	Yes	Yes	Yes
Country effects	No	No	No	No	No
<i>N</i>	341	335	329	344	326
No. countries	40	39	38	40	40
R ²	0.355	0.342	0.405	0.265	0.362

Notes: Cluster robust *t* statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Ref. category Legal origin: Civil law (French), Reference categories: Legal origin: Civil law (French), Colonial type: extraction, Case law: no.

Table 10: Institutional determinants of banking system development (Hausman-Taylor panel model)

	Depth		Breadth	Intermediation	
	Private credit	Liquid liab to GDP	Deposits to GDP	Loans to deposits	NIM
Creditor rights	-0.000322 (-0.01)	0.0352 (1.00)	0.0137 (0.45)	0.0135 (0.13)	-0.0254** (-2.29)
Investor protection	0.158 (0.38)	-0.985* (-1.66)	-1.031** (-2.44)	2.781 (1.50)	0.170 (0.59)
Enforcing contracts	0.000707 (0.14)	0.00571 (0.65)	0.00609 (0.74)	0.00276 (0.23)	-0.00139 (-0.64)
Legal origin: common law	7.067** (2.34)	7.255 (0.88)	9.807** (2.12)	5.238 (0.59)	2.528** (1.97)
Colonial type: settler	11.80*** (2.72)	5.345 (0.75)	10.28** (2.18)	7.722 (0.79)	0.716 (0.71)
Case law: yes	-4.190* (-1.80)	-11.17 (-1.15)	-3.012 (-0.62)	-16.69* (-1.76)	0.654 (0.51)
Log (GDPpercapita)	-2.550** (-1.97)	-6.932** (-2.32)	-2.008 (-1.15)	-2.202 (-0.28)	-0.562 (-1.40)
Log (Population)	-3.439 (-1.51)	3.148 (0.60)	-2.687 (-0.86)	-3.558 (-0.63)	-0.390 (-1.04)
Cons	79.34** (2.00)	18.48 (0.23)	67.85 (1.29)	123.3 (1.15)	14.83** (2.14)
Year effects	Yes	Yes	Yes	Yes	Yes
Country effects (RE)	Yes	Yes	Yes	Yes	Yes
N	341	335	329	344	326
No. countries	40	39	38	40	40
χ^2 statistic	889.4***	194.3***	199.4***	3251.6***	733.4***

Notes: Cluster robust t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Endogenous variables: Creditor rights, Investor protection, Enforcing contracts. Instruments: log(GDPpercapita), log(Population), Legal origin, colonial type, case law. Reference categories: Legal origin: Civil law (French), Colonial type: extraction, Case law: no.

Table 11: Institutional determinants of banking system development with differentiated legal origin (Hausman-Taylor panel model)

	Depth		Breadth	Intermediation	
	Private credit	Liquid liab to GDP	Deposits to GDP	Loans to deposits	NIM
Creditor rights	-0.00168 (-0.05)	0.0350 (0.99)	0.0131 (0.43)	0.0117 (0.11)	-0.0254** (-2.29)
Investor protection	0.169 (0.40)	-0.991* (-1.67)	-1.026** (-2.40)	2.819 (1.52)	0.167 (0.58)
Enforcing contracts	0.000599 (0.12)	0.00558 (0.63)	0.00603 (0.73)	0.00307 (0.25)	-0.00135 (-0.63)
Common law: British	-0.679 (-0.09)	7.268 (0.47)	5.300 (0.53)	-16.09 (-0.97)	4.512*** (2.89)
Common law: mixed	26.48** (2.23)	34.77* (1.72)	23.26 (1.64)	15.69 (0.87)	-0.0768 (-0.05)
Civil law: mixed	2.771 (0.49)	15.84 (0.96)	3.225 (0.34)	-15.80 (-1.34)	0.567 (0.44)
Colonial type: settler	7.860** (2.32)	1.045 (0.13)	7.317 (1.61)	3.287 (0.39)	1.309 (1.46)
Case law: yes	-1.688 (-0.28)	-13.06 (-0.86)	-1.914 (-0.22)	-6.551 (-0.50)	-0.219 (-0.15)
Log (GDPpercapita)	-3.135*** (-2.72)	-7.083** (-2.32)	-2.250 (-1.27)	-2.872 (-0.36)	-0.473 (-1.17)
Log (Population)	-1.779 (-0.73)	3.555 (0.69)	-2.057 (-0.65)	-2.080 (-0.33)	-0.527 (-1.51)
Cons	56.78 (1.43)	8.851 (0.11)	59.07 (1.14)	109.4 (0.99)	16.18** (2.50)
Year effects	Yes	Yes	Yes	Yes	Yes
Country effects (RE)	Yes	Yes	Yes	Yes	Yes
N	341	335	329	344	326
No. countries	40	39	38	40	40
χ^2 statistic	1047.8***	277.6***	297.4***	4091.7***	776.9***

Notes: Cluster robust t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Endogenous variables: Creditor rights, Investor protection, Enforcing contracts. Instruments: log (GDPpercapita), log(Population), civil French, civil mixed, common British, colonial type, case law. Reference categories: Legal origin: Civil law (French), Colonial type: extraction, Case law = no.

Table 12: Institutional determinants of banking system development with institutional quality controls (Hausman-Taylor panel model)

	Depth		Breadth	Intermediation	
	Private credit	Liquid liab to GDP	Deposits to GDP	Loans to deposits	NIM
Creditor rights	-0.0223 (-0.68)	0.0103 (0.26)	-0.00547 (-0.16)	-0.00455 (-0.04)	-0.0275** (-2.43)
Investor protection	-0.321 (-0.64)	-0.821 (-1.45)	-0.918** (-2.13)	1.183 (0.60)	0.108 (0.36)
Enforcing contracts (days)	0.00136 (0.27)	0.00720 (0.81)	0.00711 (0.86)	0.00190 (0.16)	-0.00128 (-0.60)
Legal origin: common law	3.387 (1.31)	5.681 (0.66)	8.527** (2.06)	-2.178 (-0.22)	2.150 (1.51)
Colonial type: settler	10.52*** (2.75)	4.390 (0.59)	9.446** (2.00)	5.204 (0.61)	0.578 (0.60)
Case law: yes	-0.893 (-0.41)	-9.479 (-0.97)	-1.840 (-0.40)	-11.12 (-1.12)	0.996 (0.76)
Log (GDPpercapita)	-3.089*** (-2.67)	-7.095** (-2.40)	-2.182 (-1.32)	-3.714 (-0.53)	-0.649 (-1.48)
Log (Population)	-2.666 (-1.32)	3.909 (0.73)	-2.085 (-0.68)	-1.515 (-0.30)	-0.286 (-0.86)
Regulatory quality	4.173* (1.92)	-2.485 (-0.96)	-1.733 (-0.70)	15.75** (2.17)	0.593 (0.43)
Control of corruption	3.337* (1.78)	5.366** (1.96)	4.067* (1.82)	0.0285 (0.00)	0.214 (0.26)
Cons	77.80** (2.13)	8.645 (0.11)	60.73 (1.21)	119.1 (1.17)	14.50** (2.14)
Year effects	Yes	Yes	Yes	Yes	Yes
Country effects (RE)	Yes	Yes	Yes	Yes	Yes
N	341	335	329	344	326
No. countries	40	39	38	40	40
χ^2 statistic	520.0***	199.2***	233.5***	1185.4***	821.1***

Notes: Cluster robust t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Endogenous variables: Creditor rights, Investor protection, Enforcing contracts. Instruments: log (GDPpercapita), log(Population), Legal origin, Regulatory quality, Control of Corruption. Reference categories: Legal origin: Civil law (French), Colonial type: extraction, Case law: no.

Table 13: Institutional determinants of banking system development (fixed effects panel regressions)

	Depth		Breadth	Intermediation	
	Private credit	Liquid liab to GDP	Deposits to GDP	Loans to deposits	NIM
Creditor rights	-0.000655 (-0.02)	0.0233 (0.64)	0.00664 (0.21)	0.0402 (0.41)	-0.0215** (-2.03)
Investor protection	0.206 (0.47)	-0.908 (-1.36)	-0.965** (-2.03)	2.723 (1.39)	0.136 (0.53)
Enforcing contracts	0.00155 (0.30)	0.00554 (0.64)	0.00620 (0.75)	0.00365 (0.31)	-0.00129 (-0.62)
Log (GDPpercapita)	-3.507 (-1.28)	-10.91*** (-2.78)	-4.650* (-1.82)	3.691 (0.31)	0.890 (1.06)
Log (Population)	-3.154 (-0.39)	18.02* (1.91)	6.416 (0.90)	-32.92 (-1.13)	-5.479** (-2.18)
Cons	85.03 (0.74)	-189.7 (-1.49)	-52.44 (-0.53)	542.4 (1.39)	87.27** (2.45)
Year effects	Yes	Yes	Yes	Yes	Yes
Country effects (FE)	Yes	Yes	Yes	Yes	Yes
N	341	335	329	344	326
No. countries	40	39	38	40	40
R ²	0.469	0.491	0.550	0.143	0.206

Notes: Cluster robust t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 14: Institutional determinants of banking system development with institutional and regulatory quality controls (fixed effects panel regressions)

	Depth		Breadth	Intermediation	
	Private credit	Liquid liab to GDP	Deposits to GDP	Loans to deposits	NIM
Creditor rights	-0.0220 (-0.68)	-0.00109 (-0.03)	-0.0114 (-0.33)	0.0167 (0.16)	-0.0244** (-2.18)
Investor protection	-0.246 (-0.49)	-0.821 (-1.36)	-0.855* (-1.89)	1.320 (0.62)	0.0916 (0.33)
Enforcing contracts (days)	0.00219 (0.42)	0.00696 (0.80)	0.00728 (0.88)	0.00340 (0.29)	-0.00121 (-0.59)
Log (GDPpercapita)	-4.499* (-1.80)	-11.12*** (-2.79)	-4.857* (-1.91)	1.243 (0.11)	0.762 (0.79)
Log (Population)	-0.758 (-0.10)	18.76* (1.93)	7.063 (0.96)	-27.42 (-0.96)	-5.185* (-1.97)
Regulatory quality	4.034* (1.75)	-1.669 (-0.62)	-1.648 (-0.66)	13.87* (1.76)	0.420 (0.28)
Control of corruption	2.924 (1.57)	5.064* (1.93)	3.846* (1.75)	0.645 (0.08)	0.356 (0.44)
Cons	59.98 (0.58)	-198.6 (-1.54)	-60.43 (-0.60)	486.9 (1.27)	84.09** (2.32)
(2.45)					
Year effects	Yes	Yes	Yes	Yes	Yes
Country effects (FE)	Yes	Yes	Yes	Yes	Yes
N	341	335	329	344	326
No. countries	40	39	38	40	40
R ²	0.497	0.504	0.559	0.161	0.208

Notes: Cluster robust *t* statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.