

Effects of institutional environment on global banking development¹ Efectos del entorno institucional en el desarrollo de la banca global

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ABSTRACT

We investigated the effects of institutional environment on banking development. These effects were quantified directly for banking development as well as indirectly for financial stability and diversification activities. We used a dynamic regression model proposed by Arellano & Bond (1991) for a balanced panel of 134 countries between 1994 and 2011. Our results indicate that institutional environment improvements promote banking development. This result is observed for the institutional characteristics of both public and regulatory environments. Diversification has a positive impact on the degree of banking development, showing that banks obtain a credit benefit from economies of scale. Non-linearity observed for diversification effects indicate that positive effects are reversed at high diversification levels. Financial stability has a negative effect, which demonstrates that banking entails financial risk for the sector.

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RESUMEN

En este artículo investigamos los efectos del entorno institucional sobre el desarrollo bancario. Estos efectos se cuantifican directamente sobre el desarrollo bancario como también en forma indirecta a través de la estabilidad financiera y actividades de diversificación. Para un panel balanceado de 134 países comprendido entre 1994 y 2011 usamos un modelo de regresión dinámico de Arellano y Bond (1991). Nuestros resultados indican que las mejoras en el entorno institucional fomentan el desarrollo bancario de los países. Este resultado se observa tanto en las características institucionales del ámbito público como regulatorio. La diversificación tiene un impacto positivo sobre el grado de bancarización, lo cual demuestra que los bancos obtienen un beneficio crediticio de las economías de ámbito. La no linealidad observada en el efecto de la diversificación indica que el efecto positivo descrito se reversa para elevados niveles de diversificación. La estabilidad financiera tiene un efecto negativo que demuestra que la bancarización conlleva riesgos financieros para el sector.

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INTRODUCTION

Banking sector development has been a widely researched topic due to its relevance in access to credit by individuals and companies, as well as its effects on economic growth. However, the level of banking development itself and its effects within the economic system differ among countries due to various factors, one being institutional environments.

Institutional quality is a key factor on banking development of countries and how the banking sector itself affects the rest of the economy. Normally, countries with higher institutional quality experience a greater degree of banking development (Arestis & Demetriades, 1997; Demetriades & Law, 2006; Fergusson, 2006; Herger, Hodler & Lobsiger, 2007; Asama & Mobolaji, 2011). This higher institutional quality should reflect different elements such as respect, protection of investor rights (La Porta, López de Sinales, Shleifer & Vishny, 1997) and a stable political management (Clague, Keefer, Knack & Olson, 1996; Pagano & Volpin, 2001). These qualities of institutional environment have a direct effect on banking development.

In recent decades, the banking industry has been marked by two dynamics: revenue diversification and the fragility of the financial system post-crises. Various diversification studies have argued that as banks diversify their total income towards non-operational activities, the degree of banking development increases (Shim, 2013; Doumpos, Gaganis & Pasiouras, 2013). It is recognized that this type of strategy could increase banking risks and thereby inhibit the degree of banking development. Financial stability studies have indicated that financial stability negatively affects banking development (Sahay, Cihak, N'Diaye, Barajas, Ayala Pena, Bi, et al., 2015). The argument for this relationship indicates that higher levels of financial stability impose on banks a behavior, which mitigates risks and limits banking development. Both aspects become relevant in countries with poor institutional quality. This topic is interesting because of its implications in financial policies.

The objective of our study is to determine the effects of institutional environments, bank diversification and financial stability on banking development. Our work contributes with empirical evidence and financial policy design in three aspects. First, we evaluate the direct effects of institutional environments on banking development. Second, we assess the effects

of bank diversification and financial stability on banking development of countries. Third, we evaluate the indirect effects of institutional environments through bank diversification and financial stability on banking development.

We applied the GMM estimator proposed by Arellano & Bond (1991) on a balanced panel data from 134 countries for the 1994 to 2011 period. Our results indicate that improvements in institutional environments promote banking development. This result is observed in the institutional characteristics of both the political-public and regulatory environment. Our results indicate that improvements in institutional environments promote banking development. This result is observed in the institutional characteristics of both the political-public and regulatory environment. Diversification has a positive impact on banking development, while financial stability has a negative effect. When countries have low institutional quality, the positive effects of diversification are reversed, while financial stability impacts are reinforced.

Our article is structured as follows. Section two reviews literature concerning the effects of institutional environments, banking diversification and financial stability on banking development. This section also presents the hypotheses. Section three presents data and analysis methodologies used in our investigation. Section four shows the results obtained. Finally, Section five groups the article conclusions.

Theoretical framework and hypothesis

Institutional environment effects on banking development

North (1990) defines the institutionality of countries as a key factor for development, which translates into the establishment of society rules. For this reason, institutional environment can be a key factor for banking sector development. Effiong (2016) and Fernández & Tamayo (2017) point out that a higher quality institutional environment promotes financial development. This relationship derives from the fact that improvements in institutional environment reduce information asymmetries and optimize risk management for banks (Fergusson, 2006; Law & Azman-Saini, 2008, 2012). This effect eventually translates into a greater degree of economic growth and social welfare.

The institutional quality of countries can be observed in various areas. A relevant aspect is public-politi-

cal institutional. Pagano & Volpin (2001), Rajan & Zingales (2003) and Beck, Demirgüç-Kunt & Levine (2003) argue that public and political institutional has different aspects, which play roles in promoting financial development, and particularly banking development. According to Marcelin & Mathur (2014), the described effect is exclusively due to the strength of public institutions, through political stability and governability. Clague et al. (1996) and Huang (2005, 2006) suggest that countries with a stable democratic political system achieve greater degrees of banking development. The authors add that this result is explained by the confidence generated in investors by a stable political system. There are many studies to support these findings (Andrianova, Demetriades & Shortland., 2008; Girma & Shortland, 2008; Huang, 2010; Roe & Siegel, 2011). Another aspect of interest in this area is the control of political corruption. Cherif & Dreger (2016) argue that countries, which take effective measures to control corruption, achieve higher levels of banking development. Detragiache, Gupta & Tressel (2005) add that when corruption escalates, banking development declines sharply in low-income countries. In any case, extensive literature supports the described results (Mauro, 1995; Braun & Raddatz, 2008; Aggarwal & Goodell, 2009; Ayadi, Arbak, Naceur & De Groen, 2015; Mbulawa, 2015). We formulated the following hypothesis according to the above:

H1: A higher quality public-political institutional environment positively affects banking development.

Another relevant aspect in this matter is the regulatory institutional framework for private activities. This aspect is closely related to the role of public institutions in the design and implementation of regulations. Ayadi et al. (2015) and Mbulawa (2015) argue that the State is responsible for the establishment of an effective regulation that generates a solid institutional framework. Herger et al. (2007) point out that this regulation should be translated into a means of effective protection of investor rights, with which they can trust the role of the State. Normally, this type of regulation is much more effective in countries with democratic and politically stable systems (Clague et al., 1996). In addition, it is also common for the degree of investor protection to differ through the regulation itself. Thus, in countries governed by French civil law, such protection is lower and the possibility of expropriating wealth from investors is greater (La Porta et al., 1997; Beck et al., 2003). La Porta, López de Sinales, Shleifer & Vishny (1998) and Beck & Levine

(2005) argue that countries, whose regulatory systems protect investor rights and establish favorable conditions for contract fulfillment, will have a higher level of banking development. In this line, Perotti & Volpin (2007) agree with this vision and add that this effect is due to the fact that this type of regulated protection attracts foreign investors. Other research also supports these results (Claessens & Leaven, 2003; Mishkin, 2009; Marcelin & Mathur, 2014). This leads us to raise the following hypothesis:

H2: A higher quality regulatory institutional environment positively affects banking development.

Effects of diversification and financial stability on banking development

Bank income diversification is a strategy adopted by banks in recent decades in order to increase their performance. Although revenues from diversification are recorded as non-operating income, their effects on banking development are measured through the credit generating capacity that banks obtain from flows received by those activities. Stiroh (2004, 2006) and Chiorazzo, Milani & Salvini (2008) argue that bank diversification increases bank performance and promotes development. More recently, Shim (2013), in an empirical study of US banks, between 1992 and 2011, concluded that diversification has a positive impact on banking development, reducing their probability of bankruptcy. Despite the above, Stiroh (2006) and Stiroh & Rumble (2006) warned that diversification may increase operational risk of banks by reducing proportion of operational revenues. This could lead banks to restrict credit and reduce banking development. In addition, if diversification increases the operational risks of banks, an institutional environment of low quality in the political-public and regulatory aspects could exacerbate risks faced by banks, a fact that could even reverse the positive effect achieved. This leads us to formulate the following hypotheses:

H3: Banking diversification positively affects banking development.

H4: Banking diversification negatively affects banking development in countries with low institutional quality.

Financial stability on the other hand is a macro-financial policy aimed at reducing banking system risks, thereby reducing the probability of bankruptcy. Normally, financial stability policies impose certain restrictions on banks regarding loan grants, mainly if

these operations carry a greater risk than stipulated, and whose effects may limit banking development. For this reason, financial stability and banking development are considered substitute policies for sector growth. Sahay et al. (2015) indicate empirically that there is a negative relationship between financial stability and banking development. However, the fragility of the institutional environment may exacerbate the indicated effect. When the institutional quality of countries is poor, it is likely that financial stability policies will further reduce the level of banking development. This is because higher institutional risks generate an increase in operational risks for banks. This fact increases the adverse selection problem and leads banks to restrict credit (Stiglitz & Weiss, 1981). Therefore, we established the following hypotheses:

H5: Financial stability negatively affects banking development.

H6: Financial stability negatively affects banking development in countries with low institutional quality.

DATA AND METHODS

Data sample

Data used in this research were extracted from various World Bank databases between 1994 and 2011. Data corresponding to institutional environment variables were obtained from the Worldwide Governance Indicators (WGI), information corresponding to banking system characteristics was extracted from the Global Financial Development Database (GFDD) and macroeconomic variables were extracted from the World Developing Indicators (WDI). A data panel was prepared for 134 countries based on this information. Table 1 shows the variables used in our study and their corresponding measurements.

Banking development (BD) is the dependent variable in our study. This variable quantifies banking development levels reached in countries through credit placements. In line with various international studies, banking development is measured by the domestic credit ratio provided by banks to GDP (La Porta et al., 1998; Beck & Levine, 2005; Herger et al., 2007; Ayadi et al., 2015; Mbulawa, 2015; Sahay et al., 2015; Effiong, 2016; Fernández & Tamayo, 2017).

The variables which measure institutional environment (IE) quality are measured in the -2.5 to 2.5 range, where positive values show a high level of institutional quality in respective indicators and

vice versa. These variables were classified into two groups. The first group considers institutional quality variables in the public-political sector, such as corruption control (CORR), government effectiveness (GOVEF) and political stability (PS). The second group of variables considers indicators that quantify regulatory institutional quality for private entities, such as regulation quality (REQL), rule of law (RLAW) and accountability (ACCOUNT). Several of these variables were suggested by previous studies (Mauro, 1995; Clague et al., 1996; La Porta et al., 1998; Pagano & Volpin, 2001; Rajan & Zingales, 2003; Beck et al., 2003; Beck & Levine, 2005; Huang, 2005, 2006; Perotti & Volpin, 2007; Aggarwal & Goodell, 2009; Marcelin & Mathur, 2014).

Several studies have mentioned that the degree of banking development in countries is related to banking system stability and diversification strategies. For this reason, we include the financial stability variable (FEST) measured by the Z-Score indicator and bank diversification (DIV) as the percentage of non-operating income in relation to total bank revenues. In this line, we also include the control variable bank returns (BRET) and operating efficiency (EFIC), measured by the gross margin. We include the economic growth (EG) variable at the macroeconomic level.

Econometric method

We used dynamic panel data regression, proposed by Arellano & Bond (1991), to estimate the effects of different variables pertaining to institutional environment, bank diversification and financial stability. We used the following model:

$$BD_{it} = \beta_0 + \beta_1 IE_{it} + \beta_2 DIV_{it} + \beta_3 DIV_{it}^2 + \beta_4 FEST_{it} + \beta_5 FEST_{it}^2 + \beta_6 EG_{it} + \beta_7 EG_{it-1} + \beta_8 BRET_{it} + \beta_9 EFIC_{it} + \delta_1 \mu_i + \delta_2 \mu_t + \delta_3 C + \varepsilon_{it} \quad (1)$$

Where BD_{it} is the level of banking development in country i at time t . Table 1 describes variables measuring institutional environment (IE_{it}) quality, incorporated as control variables in the model. Regarding the specific financial variables of the banking industry, DIV_{it} is diversification carried out by banks of a particular country and $FEST_{it}$ is banking system stability. Note that these variables are also added to the square to evaluate a possible non-monotonous effect on countries' banking development. At the macroeconomic level we use contemporary economic growth (EG_{it}) and past economic growth (EG_{it-1}) as explanatory

Table 1. Variables.

Variable		Definition
A. Dependent variable		
BD	Banking Development	Domestic credit provided by banking sectors to GDP
B. Institutional environment variables		
CORR	Corruption control index	Index which measures perceptions regarding political corruption control.
GOVEF	Government effectiveness	Index that measures the perception regarding government credibility, public service quality and its independence from political pressure.
PS	Political stability	Political stability index.
REQL	Regulation quality	Index that measures the perception of the government's ability to formulate policies, which promote private development.
RLAW	Rule of law	Index which measures agent perceptions regarding normative quality for the execution of contracts and property rights.
ACCOUNT	Accountability	Index which measures agent perceptions regarding citizen participation and freedom of expression.
C. Banking industry-level variables		
DIV	Bank diversification	Bank non-interest income to total income
FEST	Z-Score	Financial stability Indicator
BRET	Bank return	Net income to total assets ratio
EFIC	Operating efficiency	Gross revenue Ratio
D. Macroeconomic-level variables		
EG	Economic growth	Annual GDP growth

Source: own elaboration.

variables. Bank returns ($BRET_{it}$) and bank efficiency ($EFIC_{it}$) are used as control variables, as suggested by empirical literature.

Second, we evaluated the effects of bank diversification and financial stability in countries with low institutional quality. We used the following model:

$$BD_{it} = \beta_0 + \beta_1 IE_{it} + \beta_2 DIV_{it} + \beta_3 (DIV_{it} \times DLQ) + \beta_4 FEST_{it} + \beta_5 (FEST_{it} \times DLQ) + \beta_6 EG_{it} + \beta_7 EG_{it-1} + \beta_8 BRET_{it} + \beta_9 EFIC_{it} + \delta_1 \mu_i + \delta_2 \mu_t + \delta_3 C + \varepsilon_{it} \quad (2)$$

Where BD_{it} is the level of banking development in country i at time t . Variables have the same definition, in respects to model (1). DLQ is a dummy variable which adopts a one value when a country has a low institutional standard in each of the measurements and 0 otherwise. In other words, when each indicator

has negative values. In this way, $(DIV_{it} \times DLQ)$ and $(FEST_{it} \times DLQ)$ are iterative variables which show the conditional effects of bank diversification and financial stability on banking system development in countries with low institutional quality.

Both model (1) and model (2) include dummy variables to control idiosyncratic differences of countries (μ_i) as well as temporal differences (μ_t). The models also include the dummy variable Crisis (C) that adopts the value one for periods of the Asian crisis (1997-1998) and subprime (2008-2010), and 0 otherwise. In addition, for proper application of these models, we used the Sargan test to evaluate the over-identification of instruments that correct the endogeneity problem and the first and second order autocorrelation tests to validate the consistency of GMM estimators.

88 Table 2. Descriptive statistics, correlations and mean difference between economies.

Variable	Total			Developed			Emerging		
	Mean	S.D	Correl.	Mean	S.D	Mean	S.D	t-statistic	
A. Dependent variable									
Banking development	59.84			55.02	1.00	112.88	65.46	44.58	40.31 (25.15)***
B. Institutional environment variables									
Corruption control Index	0.029			1.023	0.612***	1.237	0.828	-0.312	0.786 (37.61)***
Government effectiveness	0.016			1.025	0.638***	1.285	0.624	-0.343	0.808 (48.34)***
Political stability	-0.020			1.021	0.349***	0.819	0.545	-0.260	0.999 (32.10)***
Regulation quality	0.006			1.013	0.579***	1.255	0.422	-0.347	0.837 (58.79)***
Rule of law	0.015			1.003	0.610***	1.199	0.601	-0.322	0.823 (46.55)***
Accountability	0.017			1.007	0.505***	1.182	0.347	-0.313	0.879 (58.46)***
C. Banking industry-level variables									
Bank diversification	38.40			14.91	0.043**	39.82	13.02	37.92	15.47 (2.84)***
Z-Score	15.33			10.07	0.014	14.60	9.17	15.58	10.35 (-2.02)**
Bank return	1.37			3.11	0.178***	0.54	5.04	1.65	2.03 (-4.85)***
Operating efficiency	43.32			17.63	0.049**	41.31	16.48	43.99	17.95 (-3.23)***
D. Macroeconomic-level variable									
Economic growth	3.99			5.65	-0.152***	3.05	3.36	4.27	6.14 (-6.48)***

Superscripts ***, **, * indicate statistical significance at 1, 5, and 10 percent, respectively.
Source: own elaboration

RESULTS

Descriptive analysis

Table 2 shows the statistical summary, correlations and mean differences between developed and emerging countries. As can be seen, the average level of banking development indicates that bank loans amount to 59.84% of the GDP. However, developed countries exhibit a significantly higher level of banking development than emerging countries.

Institutional quality also presents relevant results and marked differences between developed and emerging economies. Regarding public-political institutional variables, countries present a positive and a moderate quality level. In this regard, corruption control (CORR) and government effectiveness (GOVEF) indexes are highlighted. However, the political stability indicator (PS) shows a certain sensitivity of the countries to their government direction. In any case, these perception indicators are significantly more favorable in developed countries, characterized by a high institutional quality of their public system, in relation to emerging countries, whose institutional environment is poorer. Regulatory institutional quality shows a similar pattern. Both private regulation quality (REQL) and accountability (ACCOUNT) present high levels in developed countries and low in emerging countries. In addition, the rule of law (RLAW) states that developed countries are mostly governed by common law, where institutions offer a high level of legal protection to investor rights, while emerging countries opt for civil law, in which case said level of protection is weak. In any case, correlation analyses show that banking development is positively related to a greater public-political and regulatory institutional quality of countries.

Banking industry characteristics show that banks from emerging countries are more stable financially, demonstrate greater performance in terms of profitability and present higher gross margins thanks to high intermediation spreads which characterize these markets. However, banks in developed countries have more diversification in their income structure than emerging countries. In general, these variables correlate positively with banking development.

Finally, we observe that there is a significant disconnection between the factors that promote economic growth in developed countries and those which favor growth in emerging economies. In addition, there is a negative correlation between banking development

and economic growth. In fact, developed countries have a higher degree of banking development, but their growth rate is lower than that observed for emerging economies. This result is an indication that banking development is more oriented to long-term credit access policies than to short-term economic cycles. Furthermore, these long-term policies may be aimed at substantial improvements in institutional environment.

Effects of institutional environments and financial characteristics

Table 3 presents the results of the regression model (1), which evaluates the effects of institutional environment and the financial characteristics of countries' banking systems. Two facts are appreciated, suggested by Arellano & Bond (1991), in terms of GMM estimator specifications. First, the Sargan test reveals that the model's instruments are overidentified. Following Judson & Owen (1999) we used all lags of the dependent variable and exogenous variables as instruments, such as institutional environment, diversification and financial stability, aspects that would not generate a greater loss of estimator efficiency. Second, the GMM estimators are consistent because the autocorrelation tests supported the presence of first-order autocorrelation (AR1), but discarded second-order autocorrelation (AR2).

Bank returns (BRET) and operational efficiency (EFIC) have the expected positive effect according to empirical evidence. It should be noted that operational efficiency has a non-significant effect. Thus, as bank performance increases, its ability to place loans increases. Furthermore, in the long term, banks have a greater capacity to transform liabilities (deposits) into permanent assets (credits). On the other hand, we observe that economic growth has a positive lagged effect (EG_{t-1}) and negative effect in contemporary terms (EG_t). This fact reveals that credit cycles partially adjust to the economic growth.

The quality of institutional environment (IE) of countries has significant effects on banking development. We observed that both political-public institutional variables and those of private regulatory institutional quality have positive and significant effects on banking development. Such a result validates hypotheses H1 and H2, respectively. This result shows that the banking development level of countries responds to long-term structural qualities based on institutional functioning (Pagano & Volpin, 2001; Rajan & Zingales, 2003; Hergert et al., 2007; Andrianova et al., 2008; Ayadi et al., 2015; Mbulawa, 2015).

Table 3. GMM estimator for financial development and the direct effects of institutional environment.

Variables	Dependent variable: Banking development measured as the bank credit to GDP ratio					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-1.7216 (-6.91)***	-1.7711 (-7.16)***	-1.7515 (-7.07)***	-1.8040 (-7.23)***	-1.7674 (-7.14)***	-1.7576 (-7.06)***
<i>Institutional environment variables</i>						
CORR	0.0428 (2.02)**					
GOVEF		0.0362 (1.86)*				
PS			0.0259 (1.73)*			
REQL				0.0596 (2.97)***		
RLAW					0.0578 (3.41)***	
ACCOUNT						0.0437 (2.63)***
<i>Diversification and financial stability</i>						
DIV	0.3614 (1.99)**	0.3671 (2.02)**	0.3615 (1.99)**	0.3737 (2.06)**	0.3634 (2.00)**	0.3662 (2.02)**
DIV ²	-0.3569 (-1.96)**	-0.3573 (-1.92)*	-0.3610 (-1.94)*	-0.3668 (-1.96)**	-0.3529 (-1.89)*	-0.3581 (-1.92)*
DIV critical value	50.63%	51.37%	50.07%	50.94%	51.49%	51.13%
FEST	-0.0111 (-4.49)***	-0.0110 (-4.48)***	-0.0110 (-4.48)***	-0.0113 (-4.56)***	-0.0110 (-4.46)***	-0.0111 (-4.52)***
FEST ²	0.0002 (3.10)***	0.0001 (3.03)***	0.0001 (3.05)***	0.0002 (3.11)***	0.0001 (2.99)***	0.0001 (3.07)***
FEST critical value	32.65	34.38	39.29	37.67	39.29	39.64
<i>Other control variables</i>						
GROWTH	-0.3055 (-4.84)***	-0.3020 (-4.82)***	-0.2736 (-4.57)***	-0.2036 (-4.83)***	-0.2086 (-4.86)***	-0.2958 (-4.73)***
GROWTH _{t-1}	2.0441 (2.65)***	1.9069 (2.48)**	1.8234 (2.36)**	1.9608 (2.59)***	1.9507 (2.54)**	1.8762 (2.41)**
BRET	1.3142 (15.32)***	1.3187 (15.40)***	1.3220 (15.47)***	1.3241 (15.45)***	1.3225 (15.46)***	1.3201 (15.44)***
EFIC	0.0511 (1.44)	0.0513 (1.45)	0.0493 (1.39)	0.0510 (1.44)	0.0504 (1.42)	0.0503 (1.42)
Observations	790	790	790	790	790	790
Wald	(39.39)***	(42.32)***	(44.54)***	(37.60)***	(41.15)***	(41.56)***
Sargan test	(32.36)	(35.74)	(33.02)	(31.93)	(37.96)	(34.95)
AR1	(3.17)***	(2.94)***	(3.84)***	(2.95)***	(3.93)***	(4.02)***
AR2	(-0.77)	(-0.94)	(-1.02)	(-0.93)	(-1.12)	(-1.39)
Dummy year	Yes	Yes	Yes	Yes	Yes	Yes
Dummy country	Yes	Yes	Yes	Yes	Yes	Yes
Dummy crisis	Yes	Yes	Yes	Yes	Yes	Yes

z-statistics in brackets. Superscripts ***, **, * indicate statistical significance at 1, 5, and 10 percent, respectively. Source: own elaboration.

Table 4. GMM estimator for financial development and the indirect effects of institutional environment

Variables	<i>Dependent variable: Banking development measured as the bank credit to GDP ratio</i>					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-1.6675 (-6.57)***	-1.7168 (-6.89)***	-1.7739 (-7.10)***	-1.6833 (-6.71)***	-1.5521 (-6.26)***	-1.7506 (-6.92)***
<i>Institutional environment variables</i>						
CORR	0.0388 (1.85)*					
GOVEF		0.0485 (2.63)***				
PS			0.0251 (1.99)**			
REQL				0.0460 (2.84)***		
RLAW					0.0429 (2.96)***	
ACCOUNT						0.0386 (2.28)**
<i>Diversification and financial stability in low institutional quality countries</i>						
DIV	0.4599 (2.57)***	0.4461 (2.47)**	0.4857 (2.76)***	0.4833 (2.70)***	0.4030 (2.22)**	0.5243 (2.95)***
DIV × DLQ	-0.0506 (-2.68)***	-0.0629 (-2.81)***	-0.0535 (-3.07)***	-0.0411 (-2.31)**	-0.0553 (-2.48)**	-0.0752 (-3.09)***
FEST	-0.0101 (-4.17)***	-0.0106 (-4.38)***	-0.0104 (-4.45)***	-0.0092 (-3.77)***	-0.0091 (-3.82)***	-0.0101 (-4.15)***
FEST × DLQ	-0.0108 (-1.73)*	-0.0122 (-2.03)**	-0.0117 (-2.23)**	-0.0128 (-2.61)***	-0.0124 (-2.23)**	-0.0111 (-1.83)*
<i>Other control variables</i>						
GROWTH	-0.3979 (-2.84)***	-0.3148 (-2.23)**	-0.4788 (-3.28)***	-0.3457 (-2.32)**	-0.3530 (-2.63)***	-0.4823 (-3.03)***
GROWTH _{t-1}	0.1114 (1.94)*	0.1821 (2.66)***	0.1791 (2.46)**	0.2008 (3.15)***	0.2198 (3.39)***	0.1915 (2.23)***
BPER	1.2836 (15.26)***	1.2901 (15.37)***	1.2987 (15.48)***	1.2450 (14.92)***	1.2243 (14.63)***	1.2894 (15.41)***
EFIC	0.0587 (1.66)*	0.0619 (1.75)*	0.0568 (1.71)*	0.0575 (1.74)*	0.0587 (1.68)*	0.0576 (1.73)*
Observations	790	790	794	783	771	794
Wald	(30.32)***	(37.74)***	(63.51)***	(84.24)***	(92.04)***	(62.44)***
Sargan test	(29.93)	(31.03)	(28.90)	(30.92)	(32.37)	(29.01)
AR(1)	(2.17)***	(2.02)**	(2.94)***	(3.15)***	(2.84)***	(3.28)***
AR(2)	(-0.45)	(-0.27)	(-0.38)	(-0.41)	(-0.39)	(-0.51)
Dummy year	Yes	Yes	Yes	Yes	Yes	Yes
Dummy country	Yes	Yes	Yes	Yes	Yes	Yes
Dummy crisis	Yes	Yes	Yes	Yes	Yes	Yes

z-statistics in brackets. Superscripts ***, **, * indicate statistical significance at 1, 5, and 10 percent, respectively. Source: own elaboration

Bank diversification (DIV) has a positive and non-linear effect on banking development. This result supports hypothesis H3. Banking development increases significantly as banks diversify income towards non-operational activities. This fact is in line with several studies (Stiroh, 2004, 2006; Chiorazzo et al., 2008; Shim, 2013). Furthermore, a relevant implication of this result reveals that banking development benefits from the predominance of scope economies over scale economies, a fact that leads banks to develop diversification strategies. However, the non-linear effect observed suggests that the previously described impact is not persistent and is reversed when the degree of diversification is high. This second effect is consistent with the idea that excessive diversification can increase bank risks through adverse selection problems, a fact that leads banks to constrain domestic credit and systemically reduce banking levels.

Financial stability (FEST) has a negative and significant effect on banking development, a fact that agrees with Sahay et al. (2015). This result supports hypothesis H5. In addition, financial stability effect is non-linear and reversed for high levels of stability. Thus, when countries have high levels of stability in their banking system, banking development increases significantly and bank risks are mitigated. Otherwise, the initial negative relationship describes that banking development can be a systemic risk factor for banking industries which are not conditioned to support high levels of loan placements.

Table 4 shows the results of model (2). In accordance with GMM estimator specification, the instruments over-identification and their consistency were verified through Sargan and autocorrelation tests results. Control variables such as bank profitability, operating efficiency and economic growth exhibited similar results to those described in Table 3.

DLQ is a dummy variable defined with a one value for countries whose institutional environment indicators account for a low level of quality and 0 otherwise. The interactive variable ($DIV_{it} \times DLQ$) only demonstrates that the positive effect of diversification on banking sector development is reversed when countries have a poor institutional environment. Thus, when countries are characterized by a low level of institutional quality, diversification reduces the capacity of banks to grant loans. This result supports hypothesis H4. In addition, the interactive effect of financial stability with low institutional quality ($FEST_{it} \times DLQ$) reveals that the process of credit expansion entails a significant increase in

systemic risk, which reinforces the substitute effect of financial stability on banking development through credit restriction (Stiglitz & Weiss, 1981). These results validate hypothesis H6. In both cases, institutional environment has indirect channels that, through diversification and financial stability, affect the degree of banking development of economies.

CONCLUSIONS

Banking sector development has been a widely researched subject and its scope is systemically relevant because of its repercussions on consumption of private household and businesses. Normally, a greater degree of banking development bring about benefits which translate into greater access of individuals and companies to finance investments or replace liabilities, to obtain significant reductions in financing costs and lower collateral requirements. Our study focuses on the effect of institutional and financial characteristics on banking development and thereby contributes to the design of macroeconomic policies, which encourage it.

Our results and their implications can be summarized in three points. First, improvements in institutional environment promote greater banking development. On the one hand, a better public and political environment encourages banking. On the other hand, institutions that regulate activity of private companies also promote banking development. These results indicate that policies promoting banking development must be subject to previous improvements in the institutional environment of countries.

Second, income diversification strategies developed by banks promote banking development. However, this effect is not persistent. When banks diversify more than 50% of their income, the positive effect initially observed on banking development is reversed, which leads us to state that excessive diversification is a source of risk and adverse selection, which leads banks to constrain credit. In any case, the positive effect of diversification is quite broad if we compare it with the average diversification made by banks from developed (39.82%) and emerging (37.92%) countries. This effect can also be amplified (reduced) if banks operate in countries with high (low) institutional quality.

Third, banking system stability has a negative impact on credit market development, an effect that would

be reversed only if bank stability improves significantly. In any case, when countries have low (high) institutional quality, the negative effect of financial stability is reinforced (reversed). This fact assumes that the financial fragility associated with bank credit is replaced by a better quality institutional environment.

Our results have implications for banking regulatory institutions and countries' financial policy design. Countries with high institutional development allow compatibility between financial stability policies and banking development. Even these policies can be supported by banks' diversification strategies, which would reduce the risk associated with non-traditional banking activities and would not have significant effect either credit expansion or on economic growth.

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