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María Abascal, Luis Carranza, Mayte Ledo and Arnoldo López Marmolejo

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Abstract

This article analyzes the potential impact of a higher level of capital and liquidity of banks on the credit penetration and the economic development in emerging countries. To do so, it employs an econometric exercise in two stages. In the first stage it is estimated the impact of capital and liquidity on the quantity and the price of credit. In the second stage it is quantified the impact of credit and its price on the GDP per capita. Thus, the impact of regulation on output is estimated using a chain rule. The article shows that in general the effects of capital and liquidity are higher in emerging countries in terms of banking penetration and GDP per capita.

JEL: G21, G28

Keywords: Basel III, capital, liquidity, banking penetration.

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1. Introduction

The purpose of this document is to analyse the potential impact on emerging countries of the changes in financial regulation currently being discussed. This is particularly important because emerging countries are not taking part in the debate and have adopted a more passive stance, being outside observers on the discussions taking place between the United States and Europe.

It is evident that changes need to be made to financial regulations. However, these changes should be implemented with a view to securing a balance between healthy credit growth (the key to recovery and long-term growth) and global financial stability.

The discussions currently underway have strayed from the path. First, because the full scope of the destabilising role played by macroeconomic policy in generating the conditions for the financial crisis remains unknown. Second, because the importance of adequate supervision also remains unknown, and as a result emphasis is being placed on increasing regulatory requirements and penalising financial activity, negatively affecting long term growth and making it more difficult for economies to emerge from recession. Lastly, the impact of these measures on emerging economies has not been addressed.

Emerging economies face a different challenge than more advanced nations, and are seeking sustained growth to bring their average income into line with developed economies. To achieve this, their financial systems need to be developed so that they can sustain credit growth at the rate they require, and, at the same time, extend access to financial services to the poorest segments of the population, as an additional tool to help eradicate inequality and poverty.

This long-term view is clouded by short-term emergencies and by the belief that a well-capitalised banking system means that regulatory changes will require neither capital increases nor changes to the make-up of banks' asset portfolios (credit vs. liquid assets). This somewhat inflexible standpoint (the result of applying the probable regulatory framework to banks' current balance sheets) does not take into account the need to achieve the necessary conditions to sustain credit growth, nor the possible effects on overall equilibrium that could arise in a global scenario where financial activity is highly penalised and where arbitrage possibilities may arise if regulation varies according to entity size and geographical area. These problems become more pronounced when the macroeconomic policies pursued by the leading world economies (especially monetary and exchange rate policy) are inconsistent.

In the next section we present a brief analysis of the origins of the crisis. We will go on to discuss the main financial regulation measures being proposed at international forums and then make a qualitative analysis of the impact on agent and market behaviour from the standpoint of incomplete contracts and general equilibrium. We will then discuss the econometric results of these measures on emerging countries and lastly, present a series of policy recommendations.

2. Origins of the Crisis

2007 saw the unfolding of the most serious financial crisis since the Second World War. The main cause of the crisis was the inadequacy of the existing macroeconomic policies, which caused a grave imbalance on the global level, compounded by the lack of adequate supervision and the need for a stricter regulatory framework. While the spread and long duration of the crisis can be explained by the growing globalisation of financial and business flows, it is also true that its scale is associated with other policy errors which allowed systemic institutions to collapse, fuelling uncertainty among agents about asset values and sparking doubts about governments' political willingness to become the "lender of last resort".

On these lines, Calvo (2009) created a model to analyse the relationship between the increase in the liquidity of an asset with fixed supply and its relative price, arguing that a correctly-timed interest rate hike of adequate proportions would have curbed the rise in asset prices. Additionally, Caballero and Krishnamurthy (2009) argue that the market acted efficiently to supply safe assets to cover the increasing demand for such assets as a result of the monetary and exchange rate policies followed by the major economies, which, from a global standpoint, proved to be inconsistent.

3. Changes in financial regulation: "killing the messenger"

Once the crisis had unfolded, policy-makers across the globe responded by creating a raft of measures that included cutting taxes, increasing expenditure and expanding liquidity. Later, while jobless rates were still high, measures focused on containing the fiscal deficit, seeking convergence at sustainable levels, although global inconsistencies persisted in the area of monetary and exchange rate policy.

Attention also focused on changing financial regulations in a bid to obtain permanent global financial stability. This required an appropriate global regulatory framework, with the capacity to monitor risk relating to financial innovation, and a degree of coordination between supervisory bodies. Namely, measures to ensure the health of the international financial system, spurring growth in financing sources, while preventing speculation, bubbles and regulatory arbitrage.

However, recent discussions in international forums are bringing to light a profusion of regulatory measures that are penalising financial activity, without considering the supervisory faults that existed in the past, the real economy's need to maintain healthy credit growth and the regulatory arbitrage that could emerge.

The main measures being discussed, and which are at different stages, are as follows:

- Capital requirements:
  a. Increase in the total minimum capital requirement (currently at 8% of risk weighted assets, which could rise to 10% or above);
  b. Increase in Tier 1 capital requirements (from 4% of risk weighted assets at present, to 6%);
  c. Redefinition of capital and its deductions, with the proposal that goodwill, investment in minority interests, deferred tax assets and software should be fully deductible from the Tier 1 base. The purpose of this proposal is to ensure that retained income and common equity account for the fundamental part of Tier 1 capital (approximately 85%).
- Accounting changes
  a. Incremental risk charge to reflect the risk of default by the commercial counterparty;
  b. Charge for credit migration risk, reflecting potential losses deriving from changes in internal or external rankings;
  c. Changes in Value at Risk (VaR) calculations to include factors taken during periods of significant market stress;
  d. In terms of counterparty risk, it has been proposed that it include not only the risk of non-payment by the counterparty, but also the risk that the guarantors might not be able to meet their obligations.
- Liquidity ratios
  a. Liquidity coverage ratio, which will specify the amount of high quality assets that banks need to ensure that they can withstand a short and intense stress period, manifested through exceptional negative cash flow for 30 days.
  b. Net stable funding ratio, which aims to ensure that companies manage the mismatches in their funding profile in a conservative manner over longer time horizons, de-incentivising dependence on short term wholesale funding (at production price). This imposes requirements on the long term funding structure of the banks, including assumptions regarding its customers' behaviour. Furthermore, this ratio requires reserves of one year to withstand a moderate but significant stress situation.
- Contingency countercyclical reserves
- Different requirements for financial entities considered systemically critical. Companies considered systemically relevant should have additional regulated capital and additional liquidity to reduce the probability of bankruptcy to levels that are lower than those of non-systemic banks.
- Recovery and resolution plans

- Limit size and scope, institute a transnational resolution regime.
  a. Plan Volcker to prevent depositary institutions from participating in hedge funds, private equity or proprietary trading.
  b. Limit the geographic reach of banks, restricting the activities they may engage in on other continents. This would include requirements for operations carried out through subsidiaries, and for having significant amounts of capital or liquidity in local markets, regardless of the type of organisation.
- Taxes
  a. A 0.15% tax on covered liabilities (defined as total assets minus Tier 1 capital minus FDIC insured deposits) on banks' balance sheets. Although it was designed to charge TARP costs to contributors, it has also been described as an implicit guarantee for banks with wholesale funding, thereby perpetuating the idea that certain banks are "too big to fail", and also serving as a means of disincentivising borrowing through the wholesale funding market.
  b. Taxes on the remuneration of senior executives. Both the United Kingdom and France have announced plans in this regard.
  c. Taxes on transactions or the Tobin tax. These taxes would be imposed on certain types of transactions. In the US and the UK taxes would be applied to share transactions, and these taxes, which represent only a small part of the total cost, can be collected when brokers' fees are charged.

This combination of measures has numerous problems because they excessively penalise financial activity, a key component of the recovery process, and in some cases may distort agents' incentives, encouraging undesired behaviour.

Furthermore, in all these discussions, emerging countries have been absent from the debate. Facing a different challenge than more advanced nations, emerging countries are seeking sustained growth to bring their average income into line with developed economies. To achieve this, their financial systems need to be developed in order to sustain credit growth at the rate they require, and, at the same time, extend access to financial services to the poorest segments of the population, as an additional tool to help eradicate inequality and poverty.

This long-term view is clouded by short-term emergencies and by the belief that a well capitalised banking system means that regulatory changes will require neither capital increases nor changes in the make-up of asset portfolios of banks (credit vs. liquid assets). This somewhat inflexible standpoint (the result of applying the probable regulatory framework to banks' current balance sheets) does not take into account the need to achieve the necessary conditions to sustain credit growth, nor does it factor in the possible effects on overall equilibrium that could arise in a global scenario where financial activity is highly penalised and where the possibility of arbitrage may arise if regulation is based on entity size and geographical area.

Before analysing the impact of these measures on emerging countries, we will discuss the impact of these measures on the banking system.

4. Financial regulation, Incentives and Markets

The theory of regulation states that by imposing certain restrictions or requirements, financial intermediaries can be induced to behave correctly, thereby avoiding highly risky behaviour and providing incentives an adequate ressource allocation by the public. In this vein, Dewatripont and Tirole (1994) formulated the "representation hypothesis" under which prudential supervision and regulation represent the interests of the multitude of small and uninformed depositors.

The majority of economic models which analyse the implications of this regulation on financial intermediaries' behaviour erroneously assume that the people who make the decisions are the owners of the capital. In reality, the people who make the decisions are managers contracted by many passive shareholders. These managers are changed only through a coordinated process instigated by serious management problems.

This distinction is important because we are facing a problem of incomplete contracts between shareholders and the administration.

Given that these are incomplete contracts, managers maintain control so long as they: (i) comply with regulation and there is no direct intervention by the regulator and (ii) the shareholders are satisfied with the managers, who have maintained an acceptable risk-return ratio in comparison with the market, and also ensured that no injections of new capital are needed as a result of deficient management.

In this context, the combination of strict regulation and lax supervision is an incentive for entities to engage in more risky behaviour than would be necessary in the industry, because risk-embracing managers are rewarded, while prudent ones are not. In such a scenario, prudent managers also assume more risk than would be optimal, due to the overall market bias, thereby creating a "herd instinct" mentality in the industry.

The incentive to assume more risk is due to the fact that the shareholder does not have control and that managers are remunerated in function of banks' short term performance, while shareholder have imperfect knowledge about the type of managers they have (moral hazard problem), and there are lag times between the decisions and the materialisation of risks.

In this regard, the following conclusions can be reached:

- Higher capital and liquidity requirements do not disincentivise risky behaviour by banks.

  Such regulatory measures would only catalyse a search for more capital, creating a situation more propitious for a risk-taking manager than for a prudent manager. If however the aim is to actually directly penalise the risky behaviour of managers, measures should be implemented that target such behaviour, i.e., contingent capital requirements, greater provisioning requirements based on lending volume, and/or other activities in which managers are involved.

- Capital requirements that vary in function of size or systemic characteristics could generate a more inefficient, vulnerable and procyclical system.

  The logic behind this measure is underpinned by that belief that there is a moral hazard problem in the big and/or systemic banks which believe that they will be rescued due to their "too big to fail" status and therefore engage in riskier behaviour. A paper by Francis and Osborne (2009) offers an argument in this respect, with its finding that for British banks during the 1998-2006 period, the cost of debt went up a great deal for small banks in the low part of the cycle, while for larger banks it remained unchanged. This reflects the fact, according to the authors, that there is an implicit bailout in effect for large and systemic banks.

  But this is not necessarily the case. A large or highly diversified (systemic) bank has greater economies of scale and the capacity to secure funding more quickly, while a smaller or less diversified bank does not. The probabilities of bankruptcy are much higher for a smaller bank than for a bigger bank, and this is not due to moral hazard but to the efficiency of management. One interesting data point is that during the low part of the cycle, small banks increase their capital reserves to levels far higher than the threshold mandated by regulations, while the large banks keep capital ratios relatively constant. This tells us that the managers of small banks become more cautious and have bigger capital cushions and greater liquidity during the low part of the economic cycle. Therefore, a greater proportion of small banks will tend to propagate negative shocks more quickly and intensify recessions.

- The effects on overall equilibrium of excessive taxes and regulation will result in lower growth in banks' capital and therefore a greater drag on the expansion of credit.

  Increased regulation of the financial system (capital, liquidity, taxes, etc.) will generate a decrease in profitability rates. According to a study by McKinsey (2010), the new regulatory measures will cause the industry's profitability rates to decrease by between 5 and 6 percentage points in its return on equity (RoE), basically due to the changes in capital deductions and a higher Core Tier 1, which will affect all banking segments. According to this study, investment banking will be the most affected (9 percentage points) due to the imposition of a risk-weighting approach for its trading book assets. Furthermore, excessive regulation will result in capital flight from the banking system to other less regulated sectors.

  In addition, the need to comply with all the regulations and the search for returns will result in decreased credit exposure to meet capital ratio and liquidity requirements and also in an increase in spreads, spreading the impact of these measures to the real economy through greater financial costs and lower remuneration for savings. In emerging markets, the adjustment would not be through greater costs, but rather, through less access to credit, since access to capital will be diminished, and the most affected will be the micro and small business sectors, due to their informal nature.

- Insurance funds that are under a self-regulation regime in which they monitor themselves, raise the problem of moral hazard.

  The Rescue Fund would be financed with the taxes levied on banks for that purpose. Under this scheme good banks are treated in the same manner as bad banks, i.e., banks with riskier operations are treated the same as those with prudent ones. However, by making the existence of a Rescue Fund public knowledge, the supervisor/regulator is sending a clear signal that banks will be rescued, generating moral hazard: the government will rescue me, and I´m paying for this rescue in advance, therefore I can assume greater risk. These types of measures do not discriminate between different types of banking administration (see Dewatripont et al, 2010).

5. Potential impacts of changes in financial regulations on emerging countries

Previously we attempted to determine, from a microeconomic and qualitative viewpoint, the reaction of the economic agents in the face of the potential changes that are being discussed. Now an econometric exercise will be carried out to determine the macroeconomic effects of these changes. A more detailed version of the estimates will be provided in the technical appendix.

To analyse this effect, a two step methodology is used. The first phase entails estimating the impact of regulation on the financial system. Given that there are imperfections in the financial system, price variables (net interest margin according to asset class) and amounts are analysed separately (lending to the private sector vs. GDP). Both variables reflect the development and efficiency of the financial system. Greater regulation is expected to result in wider spreads and less financial depth.

In a second phase, the impact of these variables (credit and margin) on per capita GDP will be estimated. As shown by King and Levine, 1993; Arestis and Demetriades, 1997; Beck et al., 2000; Levine et al., 2000; among others, the level of financial development in countries has a great deal of influence on countries' growth rates. Based on this premise, we can estimate, using the chain rule, the impact of regulation on GDP.

There are three types of transmission channels through which financial regulation impacts GDP. The direct channels indicate how greater regulation will affect the availability and cost of credit in emerging countries. This is the main subject of this report and has also been the main focus in the majority of other empirical papers. However, there is also an indirect channel, through the impact of regulation on capital flows to emerging countries and on growth in developed countries – which affect the terms of trade that are important for emerging countries. In addition, regulatory changes could transform the competitive landscape of domestic financial systems in emerging countries by setting the stage for greater participation of public banking with heavily subsidised financial instruments, or by discouraging foreign banks from participating in domestic systems, weakening competition and financial innovation in the long term. Although this may indeed be the case, we estimate the impacts of these variables on financial development and growth, but do not quantify the impact of regulatory changes on these variables.

Our initial conditions show that financial development in emerging countries is less than in developed countries. This is particularly true in Latin America, where private lending as a percentage of GDP is one quarter that of OECD countries and half that of emerging Asian countries. The same trend can be seen in other variables such as financial systems' deposits and capitalisation levels, both in stock markets and in private and public bond markets.

In terms of access indices, Latin America is lagging far behind. This region is behind Emerging Asian and Emerging Europe countries, with less than 40% of the total population enjoying access to credit.

In most countries in this region, only between 20% and 40% of the population have access to financial services. This statistic increases to just above 40% in only a few countries, only Chile stands at about 60%. And if the comparison is done between the access levels of the poors and non poors, the difference is even larger. In terms of Latin American companies, less than 20% finance their investments with bank loans and larger companies enjoy much greater access than smaller ones (see RED CAF, 2011).

Furthermore, spreads are quite wide in Latin America. One of the main reasons for this is that banks' operating costs as a percentage of assets are quite high, due to the fact that they do not take advantage of economies of scale. Overly severe financial regulation (greater capital requirements in Chile, for example), and legal distortions in the financial system (extremely high reserve requirements, taxes on financial transactions, portfolio requirements, among others) also have a significant impact on spreads. Other factors include the lack of transparent information, the scant effectiveness of the judicial system, and controls on interest rates.

In addition, we should mention that on the macroeconomic level. Latin America suffers from two disadvantages vis á vis Asia: the low internal savings rates, and a major lack of infrastructure.

In short, it is clear that emerging countries in general and Latin America in particular are starting from a position of lower relative development. Even though emerging countries have substantial capital and liquidity cushions, and conventional wisdom says that more regulation will not affect them, this is a simplistic view of the problem that gives too much weighting to mere accounting figures (relating to these cushions) and ignores larger issues. A more dynamic vision paints a picture in which greater regulation will result in large cushions over a sustained period, which will limit credit growth. In the long term, this will have negative effects on financial depth and access to financial services for the population at large.

Phase I: Financial Regulation and Development of the Financial System

To explore the effects of financial regulation on the development of the financial system, two regressions are estimated, the first in which the dependent variable is lending to the private sector as a proportion of GDP, and the second in which the dependent variable is the net interest margin – assets relationship. The explicative variables reflect the direct channels (capital/assets weighted for risk) liquid reserves/ assets; and the index of the regulatory quality of capital) and induced channels (concentration and financial freedom index), and other structural variables (inflation and business environment). The indirect effects will only be considered in the second phase.

Our findings indicate that greater capital and liquidity requirements will have a negative effect on lending to the private sector as a proportion of GDP. This effect will be greater in the case of emerging countries for the capital component, while for the liquidity component our findings were not as conclusive (is not the same for both regressions). This conclusion was obtained by introducing a dummy variable which takes on the value of 1 if the country is an emerging economy, and the value of zero if that is not the case, and by then multiplying it by the capital and liquidity variable (see table 1).

Table 1

Determinants of the credit provided by the banking sector (% of GDP)

	OLS (1)	FGLS (2)	FGLS (3)	FGLS (4)	FGLS (5)	FGLS (6)	FGLS (7)
Bank capital to assets ratio	-6.755*	-2.099*	-1.842*	-2.686*	-1.908*	-2.435*	-1.319*
	(-8.23)	(-8.52)	(-8.50)	(-10.28)	(-9.36)	(-9.19)	(-7.15)
Bank capital to assets ratio*dummy EMEs	-1.470*	-1.885*	-0.611*	-2.130*	-1.649*	-2.080*	-0.904*
	(-2.48)	(-7.31)	(-2.33)	(-8.46)	(-7.20)	(-8.57)	(-3.57)
Bank liquid reserves to bank assets ratio	-0.563	-0.554*	-0.347*	-0.614*	-0.759*	-0.912*	-0.481*
	(-1.18)	(-4.44)	(-3.24)	(-4.85)	(-6.87)	(-6.42)	(-4.67)
Bank liquid reserves to bank assets ratio*dummy EMEs	-0.409	-0.301*	-0.417*	-0.216	0.0828	0.305**	-0.400*
	(-0.80)	(-2.02)	(-2.96)	(-1.36)	(0.59)	(1.82)	(-2.92)
Bank concentration	-59.95*	-32.90*		-40.63*	-25.23*	-9.104*	-28.82*
	(-5.30)	(-7.88)		(-9.58)	(-7.47)	(-2.04)	(-8.30)
Inflation	-0.0718*	-0.0198**	-0.0382*		-0.0311*	-0.00860	-0.0134**
	(-2.06)	(-1.65)	(-2.60)		(-3.11)	(-0.45)	(-1.74)
Regulatory capital index	13.40	41.58*	41.80*	47.78*		26.00*	52.24*
	(0.85)	(5.67)	(4.31)	(6.73)		(3.17)	(8.67)
Business enviroment	-0.631*	-0.834*	-0.704*	-0.687*	-0.655*		-0.963*
	(-7.95)	(-19.39)	(-13.17)	(-18.10)	(-19.03)		(-27.39)
Financial freedom index	-0.274*	-0.0617	0.0186	-0.0816**	-0.00486	0.192*	
	(-1.97)	(-1.36)	(0.39)	(-1.95)	(-0.12)	(3.57)	
Constant	255.9*	166.4*	124.2*	162.4*	165.6*	81.18*	152.7*
	(9.06)	(21.03)	(13.41)	(22.01)	(28.43)	(10.04)	(27.48)
Observations	547	545	553	548	621	549	608
Countries	69	69	69	70	81	70	78
Adjusted R-squared	0.496	0.418	0.383	0.442	0.431	0.380	0.390

t statistics in parentheses, ** p<0.10; * p<0.05
Source: BBVA Research

It is notable that the quality of capital (measured by the regulatory quality index) has a positive impact on lending/GDP. That is to say: quality is more important than the amount of capital. This result is important since it shows that if regulations focus on imposing higher capital requirements, the impact on lending will be significant, and may even be greater in emerging countries in the long term. In the short term, this can be absorbed in terms of the accounting, but will decrease the depth of the financial system and reduce access to credit. This is particularly true in Latin America, where access levels are already low.

In regard to the variables that seek to reflect the induced effects, such as concentration or the financial freedom index, in the first case, we find a negative effect. The greater the concentration, the less the financial development, while in the case of financial freedom, the effects are not significant or robust.

On the structural side, we would highlight the strong and positive influence of a better business environment (equivalent to a lower index) on financial depth. In contrast, the calculation related to the inflation rate comes out negative, meaning that the higher the inflation rate, the greater the fall-off in lending.

For the net interest margin equation, we found a positive and significant relationship between capital and liquidity, and this margin. We would highlight that in this case, the effect on emerging countries disappears for capital (the multiplier dummy is not significant), but in the case of liquidity the final impact on the margin ends up being offset. This is an interesting finding, because it demonstrates that in emerging countries, the fundamental adjustment mechanism manifests itself through quantities and not through prices. Similarly interesting is the fact that an improvement in the quality of regulatory capital implies a lower margin (see table 2).

Table 2

Determinants of the net interest margin

	OLS (1)	FGLS (2)	FGLS (3)	FGLS (4)	FGLS (5)	FGLS (6)	FGLS (7)	FGLS (8)
Bank capital to assets ratio	0.00164*	0.00161*	0.00159*	0.00162*	0.00141*	0.00155*	0.00182*	0.00120*
	(6.48)	(12.92)	(10.64)	(13.26)	(11.65)	(11.48)	(16.16)	(10.23)
Bank capital to assets ratio*dummy EMEs	0.000216	-0.0000993	0.0000626	-0.000109	-0.000124	0.0000196	-0.0000204	-0.000133
	(0.97)	(-0.84)	(0.39)	(-0.95)	(-1.06)	(0.17)	(-0.13)	(-1.14)
Bank liquid reserves to bank assets ratio	0.000273**	0.000191*	0.000162*	0.000226*	0.000181*	0.000182*	0.000252*	0.000328*
	(1.66)	(3.14)	(2.51)	(3.52)	(3.01)	(2.93)	(3.36)	(4.11)
Bank liquid reserves to bank assets ratio*dummy EMEs	-0.000207	-0.000187**	0.0000305	-0.000201*	-0.000195*	-0.000145**	-0.0000747	-0.000336*
	(-1.12)	(-1.91)	(0.28)	(-2.05)	(-2.11)	(-1.80)	(-0.67)	(-3.09)
Efficiency	0.510*	0.263*		0.265*	0.283*	0.377*	0.314*	0.340*
	(7.02)	(10.80)		(11.01)	(11.57)	(16.34)	(11.44)	(14.46)
Bank concentration	-0.00401	-0.000989	0.00398**		-0.00152	0.00273**	0.00170	-0.00123
	(-1.02)	(-0.56)	(1.72)		(-0.97)	(1.87)	(0.69)	(-0.81)
Inflation	-0.00000724	-0.0000154	-0.0000222	-0.0000213		-0.00000239	-0.0000186	0.00000470
	(-0.40)	(-1.04)	(-1.24)	(-1.46)		(-0.18)	(-1.11)	(0.30)
Regulatory capital index	-0.0113*	-0.0186*	-0.0334*	-0.0193*	-0.0158*		-0.0332*	-0.0209*
	(-2.42)	(-5.39)	(-6.96)	(-5.78)	(-4.59)		(-7.15)	(-5.83)
Business enviroment	0.000132*	0.000178*	0.000264*	0.000166*	0.000199*	0.000190*		0.000219*
	(4.42)	(11.87)	(10.94)	(12.37)	(14.61)	(12.83)		(15.16)
Financial freedom index	-0.000109*	-0.0000969*	-0.0000772*	-0.0000973*	-0.000121*	-0.000120*	-0.000116*	
	(-2.42)	(-4.86)	(-3.31)	(-4.99)	(-6.45)	(-6.39)	(-5.30)	
Constant	0.0125*	0.0213*	0.0321*	0.0226*	0.0200*	0.00381	0.0389*	0.0129*
	(2.33)	(6.29)	(6.18)	(6.75)	(7.33)	(1.62)	(8.54)	(4.07)
Observations	560	559	559	560	562	634	573	631
Countries	71	71	71	71	72	83	73	81
Adjusted R-squared	0.581	0.551	0.359	0.552	0.549	0.589	0.558	0.573

t statistics in parentheses, ** p<0.10; * p<0.05.
Source: BBVA Research

In regard to the "induced" channel, it appears that the level of concentration does not have a stable relationship. However, this is a case where the financial freedom index is significant, showing that with greater freedom we have lower margins.

In regard to structural variables, once again we see that a better business environment plays an important role in reducing the margin. In addition, an efficiency variable was introduced (administrative expenses/assets), showing that at greater efficiency levels (lower ratio), we obtain lower margins. However, in this case, inflation was not significant.

Phase II: Financial development and Economic effort

In this second phase of the estimation strategy, a regression is carried out on per capita GDP based on the two variables that reflect the economic development (lending to the private sector/GDP and net margin/assets) and other variables that reflect structural items, and the variables that reflect the indirect channels (terms of trade and capital flows). The results, consistent with economic theory, are presented in table 3. When lending as a proportion of GDP increases, this has a positive effect on per capita GDP. In contrast, net interest margin has a negative effect. The coefficients of the control variables show that the business environment, the terms of trade, gross capital formation, and the net flows on external debt have a positive effect on per capita GDP.

Table 3

Determinants of GDP per capita

	OLS (1)	FGLS (2)	FGLS (3)	FGLS (4)	FGLS (5)	FGLS (6)
Domestic credit provided by banking sector	18.68*	5.290*	14.97*	5.744*	6.758*	19.53*
	(8.03)	(4.34)	(9.50)	(4.62)	(5.62)	(10.21)
Net interest margin	-8219.5*	-2296.6*	-4595.8*	-1973.4*	-3076.6*	-5002.9*
	(-2.99)	(-3.94)	(-6.12)	(-3.40)	(-4.83)	(-5.16)
Business enviroment	-57.36*	-72.91*		-74.00*	-64.67*	-146.9*
	(-15.74)	(-35.89)		(-38.15)	(-39.62)	(-39.63)
Terms of trada	-0.649	4.740*	11.11*		6.511*	15.36*
	(-0.26)	(4.77)	(8.95)		(7.93)	(9.87)
Gross capital formation	-37.57*	6.837*	0.524	6.461*		4.443
	(-3.25)	(2.56)	(0.16)	(2.46)		(1.18)
Net flows on external debt	26562.3*	4328.7*	4595.5*	4479.4*	5433.1*	
	(7.00)	(5.73)	(5.03)	(6.01)	(6.95)	
Constant	10593.3*	10758.7*	2764.4*	11281.9*	10193.7*	18550.2*
	(17.06)	(42.79)	(16.51)	(48.45)	(44.50)	(40.17)
Observations	920	916	916	924	956	1286
Countries	96	96	96	93	93	129
Adjusted R-squared	0.364	0.305	0.151	0.309	0.300	0.514

t statistics in parentheses, ** p<0.10; * p<0.05.
Source: BBVA Research

Using the previous estimates, we estimate the effect on per capita GDP of a 1% increase in the variables of capital and liquidity. First we obtain the elasticities of bank lending and net interest margin with respect to capital and liquidity, which are presented below. The following table shows that a 1% increase in capital reduces bank lending/GDP by -0.53% in emerging countries, while the effect for the entire sample is less, -0.30%. In terms of liquidity, we see that a 1% increase in liquid reserves reduces bank lending/GDP by -0.13% in emerging countries, and by -0.08% for the entire sample. In sum, the effects of capital and liquidity are stronger in emerging countries in terms of their effects on bank lending/GDP. The business environment appears to be a very important variable for explaining banking penetration.

Table 4
Elasticy of the banking credit with respecto to the following variables

	Total	EMEs
Bank capital to assets ratio	-0.30	-0.53
Bank liquid reserves to bank assets ratio	-0.08	-0.13
Regulatory capital index	0.41	0.37
Business enviroment	-1.22	-0.99

* Using values of 2008 and the coefficients of the column (2).
Source: BBVA Research

Our results also indicate that a 1% increase in capital generates an increase in net interest margin of about 0.30% and that there do not appear to be major differences between emerging countries and the rest of the countries. The elasticity of the net interest margin with respect to liquid reserves is 0.03% for the entire sample, while for emerging economies it is very close to zero.

Table 5
Elasticy of the net interest margin with respecto to the following variables

	Total	EMEs
Bank capital to assets ratio	0.29	0.31
Bank liquid reserves to bank assets ratio	0.03	0.00
Regulatory capital index	-0.22	-0.23
Business enviroment	0.31	-0.29

* Using values of 2008 and the coefficients of the column (2).
Source: BBVA Research

To determine and quantify the transmission process and impact of capital and liquidity on per capita GDP, we need the elasticity of per capita GDP vis á vis bank lending and net interest margin. These elasticities are presented in the following table.

Table 6
Elasticy of the GDP per capita with respecto to the following variables

	Low interval	High interval
Credit provided by banking sector	0.05	0.19
Net interest margin	-0.03	-0.07
Business enviroment	-1.42	-2.86

* Using values of 2008 and the coefficients of the column (2) for the low interval and the column (6) for the high interval because this estimation has the highest R-squared.
Source: BBVA Research

The above-mentioned elasticities allow the effect of capital and liquidity on per capita GDP to be disaggregated into one of the two transmission channels: bank lending and net interest margin. The breakdown for each channel was as follows:

Channel of the banking credit

Table 7
Effect on the GDP per capita of a 1% increase in the following variables

	Total		EMEs	
	Low interval	High interval	Low interval	High interval
Bank capital to assets ratio	-0.02	-0.06	-0.03	-0.10
Bank liquid reserves to bank assets ratio	0.00	-0.02	-0.01	-0.02
Regulatory capital index	0.02	0.08	0.02	0.07

*Using values of 2008
Source: BBVA Research

Channel of the net interest margin

Table 8

Effect on the GDP per capita of a 1% increase in the following variables

	Total		EMEs	
	Low interval	High interval	Low interval	High interval
Bank capital to assets ratio	-0.01	-0.02	-0.01	-0.02
Bank liquid reserves to bank assets ratio	0.00	0.00	0.00	0.00
Regulatory capital index	0.01	0.02	0.01	0.02

*Using values of 2008
Source: BBVA Research

Lastly, both effects can be aggregated, thereby allowing the quantification of the total effect on per capita GDP. The results show that a 1% increase in both capital and liquid reserves generates a decrease in per capita GDP of between -0.04% and -0.15% in emerging countries. This contrasts with a reduction of between -0.03% and -0.10% for the entire sample.

Agregation of the channel of the banking credit and the channel of the net interest margin

Table 9

Efecto sobre el PIB per cápita de un aumento de 1% en las siguientes variables

	Total		EMEs	
	Low interval	High interval	Low interval	High interval
Bank capital to assets ratio	-0.02	-0.08	-0.04	-0.13
Bank liquid reserves to bank assets ratio	-0.01	-0.02	-0.01	-0.02
Regulatory capital index	0.03	0.10	0.03	0.09
Capital and liquid reserves	-0.03	-0.10	-0.04	-0.15

*Using values of 2008
Source: BBVA Research

This implies that if capital/assets increased 20%, the impact on per capita GDP would be -1.6% for the sample, and -2.5% for emerging countries (in the upper interval). Furthermore, if the liquid reserves/assets also increased 20%, the effect on per capita GDP would be -0.4% for the sample, and -0.5% for emerging countries (in the upper interval).

6. Final thoughts

The recent financial crisis requires modifications to the regulatory framework, and this process should address reductions in leverage levels. However, the importance of the financial system to long term growth should be borne in mind, and excessively stringent regulatory regimes must be avoided because they penalise investment in the system and distort incentives, which would end up having a greater impact on emerging economies, and within these countries, on segments of the population that currently do not have access to formal financial services.

The negative effects on emerging countries will be transmitted through indirect channels (worse terms of trade) and could also affect, through public policies that impede foreign investment and incentivise non-competitive participation in the public sector, the banking efficiency and penetration levels over the long term (greater concentration and less financial freedom).

Lastly, it is important to remember that excessive regulation of capital and liquidity levels do not compensate for the macroeconomic imbalances generated by imprudent fiscal or monetary policies. They will nor compensate for a lax or incomplete supervision regime.

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Contact details

BBVA Research
Paseo Castellana, 81 - 7th floor
28046 Madrid (Spain)
Tel.: +34 91 374 60 00 and +34 91 537 70 00
Fax: +34 91 374 30 25
bbvaresearch@grupobbva.com
www.bbvaresearch.com