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THE RELATION BETWEEN BANK REGULATION AND ECONOMIC PERFORMANCE: A CROSS-COUNTRY ANALYSIS

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Abstract

Global studies of banking performance and banking stability indicate these market attributes are directly related to the ability of individual markets to monitor and discipline banks. This paper empirically analyzes the association of national wealth with bank regulatory policies, as measured by the three pillars of the New Basel Capital Accord (i.e., capital regulatory oversight, supervisory oversight, and market discipline), for individual countries. Using a new database covering 153 countries, we find that countries with greater monitoring, as measured by accounting and auditing practices, financial transparency, and credit rating efficacy, are associated with greater wealth and less risk. Furthermore, we find no evidence that capital regulatory oversight or supervisory oversight influence a nation's wealth.

Key words: Banking, Basel, GDP, Market Discipline, Monitoring.
JEL Classification: F01, G21, G34.

1. Introduction

Global financial markets are a fundamental ingredient in the production and maintenance of the world's economic activity. Their purpose is to provide services that ease the costs associated with information asymmetry, internal oversight, and transactions. In general, financial systems improve overall economic conditions through five broad functions (see Levine, 2005, p. 4): the production of ex ante information about investments, the monitoring of investments for which they provide financing, the facilitation of risk management and diversification, the mobilization and pooling of resources, and the facilitation of trading goods and services[1].

One key component to any financial market is the banking system. Banks facilitate financial development by mobilizing and allocating funds to investment projects with the greatest long-term economic benefits. Moreover, it is widely acknowledged that a well structured banking system, defined by its supervisory practices, risk taking, and governance, promotes greater financial performance and economic stability (see Barth, Caprio, and Levine, 2004; Barth, Caprio, and Levine, 2006, hereafter BCL; and Levine, 2005). Promoting sound banking practices, however, has proven to be difficult. Differences with respect to corruption, democracy, and legal origin, for example, create heterogeneous regulatory environments that impede the implementation of universally effective policies. The intent of this study is to empirically evaluate the association between a country's banking system characteristics and its overall level of income and income growth.

Over the past two decades, a number of financial markets have experienced banking crises, which lead to significant economic losses around the globe. The cause of many of these can be traced to unsound banking practices, such as shifting toward non-traditional business revenue or increasing the risk profile of loans. These crises have provided the impetus for both policymakers and industry participants to rethink whether traditional management and supervisory practices are sufficient to sustain sound and stable banking systems.

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[1] These five functions are defined by Levine (2005). Levine acknowledges that there are other ways to classify functions provided by financial systems (see Merton, 1992 and Merton and Bodie, 1995, 2004). Levine states that his classifications are directed at "the history on economic thought of finance and economic development" (Levine, 2005, p. 5).

In recognition of the need for change, supervisors and regulators around the world are switching from traditional financial ratio analysis to risk-based supervision. The goal of this process is to develop tools and insights that allow supervisors and market participants to assess banks' risk profiles and risk management measures more accurately. This, in turn, would promote a more efficient allocation of financial resources. To address this, the Basel Committee has offered new recommendation, listed in the New Basel Capital Accord (Basel II). The first two pillars of Basel II emphasize the importance of improved policies for capital regulation and supervisory practices. The third pillar addresses an emerging emphasis on market discipline through better information disclosure.

Current recommendations by the Basel Committee are designed to improve banking practices, which in turn should result in greater economic benefits. To this end, we specify an empirical model to examine the relation between each of the three pillars of the Basel II Accord and income and risk under the hypothesis that they are positively related to income and inversely related to risk. Using a dataset covering 153 countries that controls for various country-specific factors, we find that the level of information disclosure is positively related to national income and inversely related to changes in national income. In addition, we find that capital regulatory oversight and supervisory oversight seem to have no influence on economic activity.

The paper is organized as follows. Section 2 undertakes a review of representative studies of banking policies and regulations. Section 3 describes our large unique cross-country database in detail and the empirical model, noting how we modeled three dimensions of market information. Section 4 discusses the empirical results, while Section 5 concludes.

2. Review of selected literature on Basel II pillars

Financial systems are fundamental to economic productivity. Productive economies are typically characterized by financial systems that facilitate information flow to promote efficient monitoring, governance, and the allocation of capital[1]. Globally, investors face an array of risks, many of which are borne from large costs associated with collecting and interpreting information. These costs hinder investors' ability to evaluate firms, managers, and market conditions before making investment decisions (Levine, 2005). As a result, investors who are averse to large amounts of risk may be unwilling to invest their funds in activities that have the highest values. Financial securities, markets, and intermediaries help alleviate these market imperfections through better information processing, as well as market innovations that ease costs of trading and risk sharing.

Banks and other financial intermediaries are major financial system components, serving as information gatherers, asset transformers, and market monitors. By pooling savings from different individuals, banks transform this capital by channeling it to valuable investments. Before they procure these savings, however, banks must first convince individuals of the bank's ability to make sound investments (see Boyd and Smith, 1992; DeLong, 1991; and Lamoreaux, 1995). To persuade investors, banks undertake the costly process of research to reduce the cost per individual of processing information (Boyd and Prescott, 1986). This process leads to positive externalities for corporate governance and investment (Caprio and Levine, 2002; and Macey and O'Hara, 2003)[2]. That is, banks, when lending to firms, become important monitors of managers and their operations (Diamond, 1984) and may be better suited to finding innovative activities that lead to greater overall wealth (De La Fuente and Marin, 1996).

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[1] This is a well known result for equity markets, in particular, when asymmetry in information exists between shareholders and managers, as well as shareholders and creditors (see Coase, 1937; Jensen and Meckling, 1976; Fama and Jensen, 1983a, b; and Myers and Majluf, 1984).

[2] The basic definition of governance here is consistent with Shliefer and Vishny (1997), who define corporate governance as the ways in which investors ensure themselves that they will receive the maximum return on their investments. For similar definitions, see Zingales (1998) and Tirole (2001).

Just as banks provide valuable services of monitoring and governing, mechanisms must be in place to ensure the banks themselves function soundly. The focus of current research has shifted toward improving the managerial and supervisory decisions for allocating bank capital. This is the impetus for Basel II (Barth, Caprio, and Levine, 2004; and BCL). While Basel II has provided three recommendations, national differences in economic policy, political structure, legal origin, and culture make the implementation of universal guidelines challenging (Barth et al., 2004). For instance, research has shown that legal origin impacts the extent to which firms seek financing from banks, rather than capital markets, as well as the relation between economic development and finance system structure (Ergungor, 2004; Ergungor, 2007).

The relation between capital regulatory policy and the extent to which banks issue credit in a given country has been examined. Specifically, BCL find a positive relation between bank development and the strength of a country's capital regulatory policy. However, other research suggests that more stringent capital requirements may not reduce the risk-taking behavior of banks (Santos, 2001; Koehn and Santomero, 1980; Kim and Santomero, 1988; Besanko and Kanatas, 1996; and Blum, 1999). BCL report mixed evidence on the relation between capital regulation and bank stability. In addition, they find supervisory oversight is positively related to bank development, even when controlling for country-specific features.

The third pillar of Basel II, market discipline, is gaining the most attention. Just as corporate governance improves the efficiency and value of firms, governance of banks makes bank managers more accountable. This should result in an increased ability of firms to borrow funds, a more optimal allocation of capital, and better monitoring of a bank's investments (Bushman and Smith, 2003; and Beck, Demirgüç-Kunt and Levine, 2003). As the predominant financial intermediary in most countries, banks are an integral factor of corporate governance.

The purpose of external governance is to allow market forces to correct poor banking practices. Reliable and accurate information about banks must be disseminated for market discipline to be effective. It is the quality of information available to the market that is essential for proper market discipline to take place. Components that are known to improve the reliability and quality of information include accounting standards (Leutz and Verrecchia, 2000), external auditing (Healy and Palepu, 2001; and Izan, 1980), transparency (Jordan, Peek and Rosengren, 1999; Llewellyn and Mayes, 2003; and Moshirian and Szegö, 2003), and credit ratings (Morgan, 2002; Morgan and Stiroh, 2000).

3. Data, Methodology, and Descriptive Statistics

This section explains the data and model used in our analyses. The uniqueness of our data requires us to not only discuss their source, but also describe the construction of our independent variables. In addition, we provide descriptive statistics.

3.1. Data

Our data come from BCL, and are arguably the most broad, country-level data currently available of global banking systems. In conjunction with the World Bank, BCL surveyed 152 central banking authorities with 262 questions from 2003 to early 2004[1]. As BCL note, the responses report the "official" government position. In addition to individual question data, BCL construct a number of indices by combining answers to related questions. These indices allow one to measure elements of regulation and governance within a country, including capital requirements, supervisory power and independence, and information disclosure. By combining these data with variables measuring economic and political structure, we are able to perform a more extensive empirical analysis than could previously be accomplished.

[1] BCL subsequently added data from China in the full sample as the 153rd country.

3.2. Methodology

Our analysis relates measures of economic performance in each country (GDP and GDP growth) with variables measuring each of the three pillars of Basel II, as well as controls for economic conditions and the political economy. The model is of the following form:

$$Economic\ Performance = \alpha + \beta_1 Basel\ II + \beta_2 ECONOMY + \beta_3 POLITCAL + \varepsilon \ .(1)$$

For a formal definition of each variable, along with a citation of its source, see Table 1. In equation (1), the three Basel II pillars of capital regulatory oversight, supervisory oversight and market discipline are represented by the Basel II vector. The recommendation for capital regulatory oversight suggests that banks hold various degrees of verifiable capital relative to their risk profiles. To account for this affect, we use the capital regulatory index. The second pillar of the Basel Accord focuses on the ability of a country's banking authority to exert control over banks in its market. In general, to effectively control and police the activities of banks, regulators should be capable of exerting power over banks and the relation between regulator and banks should be independent. We proxy for this component using two separate measures: supervisory power and supervisory independence.

Measuring the level and quality of the third pillar, market discipline, is more challenging. To investigate this factor, we create a market information index using three elements that measure the reliability and existence of information reported to a banking market. In particular, the percent of the top ten banks rated by international credit rating agencies and the percent of the top ten banks rated by domestic credit rating agencies, in combination with the external governance index (see BCL) are used. Using both domestic and internal credit ratings provides a measure of information disclosure that is external to the banks. The external governance index measures the reliability and quality of information used by market participants to monitor bank activity. Components of this index are the effectiveness of external audits, the transparency of the financial statements, accounting practices (i.e., do banks use International Accounting Standards (IAS) or U.S. Generally Accepted Accounting Principles (GAAP)), and independent evaluations of individual banks by rating agencies.

To illustrate the importance and relation of these components in explaining the degree of information disclosure in a host country, one may look at how these elements are correlated. Table 2 shows that all three components are positively and significantly correlated with each other, suggesting that countries with more bank specific disclosures are also, on average, audited more by both domestic and international credit ratings. The high level of correlation also suggests the need for an index in multivariate regression analyses.

In addition to the Basel recommendations, other country-specific attributes may explain regulatory policies. Country-specific controls are introduced through two different categories: economic and political. Economic conditions are controlled for using the average inflation rate, as well as a dummy variable for income levels above the sample median. Measures of the degree of government bank ownership, legal origin, corruption, and democracy are included to control for political structure.

3.3. Descriptive Statistics

Table 3 offers descriptive statistics for our variables and indices. Statistics are presented by GDP quartile for our overall sample and for the 13 countries that comprise the Basel Committee[1]. Looking at the three pillars of the Basel II Accord, there are no statistical differences among the levels of the capital regulatory index, supervisory power and supervisory independence across income levels. For the capital regulatory index, the median country in the overall sample and in each quar-

[1] Basel member countries include: Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

tile has an index of 6, except the upper middle income countries, where the median is 7. Similarly, no monotonic relation exists between supervisory power and income or supervisory independence and income. Mean and median levels of the market information index for high income countries are statistically different from low income countries. Moreover, the market information index is monotonically decreasing with income, which indicates that lower income countries have less information disclosure, on average, than more affluent countries. Consistent with these data, Figure 1 graphs the market information index across income quartiles.

Further insights about the level of market information are seen in Figure 2. This figure examines the individual components of the market information index across income quartiles. The figure shows an inverse relation between country income and the proportion of banks rated by international and domestic credit rating agencies. Conversely, there is little difference between the strength of the external audit and financial statement transparency. Both are similar in magnitude and remain relatively stable across income levels. A more striking difference is in accounting practices and credit ratings. As one moves from higher income quartiles to lower income quartiles, the extent to which banks follow International Accounting Standards or U.S. GAAP increases, while external evaluations and incentives for future monitoring decrease.

Table 3 shows a non-monotonic relation between GDP growth and level of income, and the same is true for average inflation. Both GDP growth and average inflation increase as one moves from high income countries to upper middle income countries. Both decrease as income decreases between the lower two quartiles.

Table 3 also illustrates some interesting differences in political demographics for low and high income countries. Government-owned banks, defined as those in which the government owns at least 50 percent of the assets, hold a median 4.8 percent of a country's banking assets. This is highest in countries whose income is in the upper middle income quartile, where governments own a median 12.0 percent of the banking assets, and lowest in Basel member countries, where the median ownership is 0.0 percent. Examining legal origin, 17.7 percent of our sample are countries with Socialist/Communist laws, while 30.1 percent have English Common Law. Socialist/Communist Law countries are most concentrated in the two middle income quartiles. English Common Law countries are most concentrated in the low income quartile.

The levels of the corruption and democracy indices decrease as income decreases, but note that the median corruption level is the same for the lower three quartiles. Higher levels of the corruption index correspond to lower levels of corruption. Both measures are significantly higher for the high income quartile than the low income quartile, which indicates that high income countries tend to be less corrupt and more democratic than lower income countries.

Our univariate results are consistent with the view that market information is necessary to achieve better economic conditions. However, these measures of capital regulation, supervision, market discipline, economic conditions, and political environment likely do not vary independently. Table 4 presents correlations between the variables used in our model. In particular, Table 4 shows the market information index is significantly negatively correlated with income growth and inflation and significantly positively correlated with democracy, corruption, and income. Indeed, it seems that the higher the level of market information is, the better the overall performance of the economy will be. Next, we analyze the association of the Basel pillars and economic performance in a multivariate framework.

4. Empirical Results

Table 5 analyzes the relation between domestic income, as measured by average GDP in $ billions, and each of the three pillars of Basel II in a multivariate framework, controlling for country-specific attributes. Table 6 does the same for income growth, measured by the average percentage change in GDP. Model 1 in Tables 5 and 6 shows only the relation between measures of economic

performance and our measures for each of these three recommendations[1]. Neither capital regulatory oversight nor supervisory oversight significantly affects a country's economic performance. The level of information disclosure, on the other hand, is significantly associated with economic performance. Greater information disclosure, on average, is positively related to income and negatively related to income growth. This result is consistent with the view that a greater level of accurate information disclosure in a banking market insures that banks operate efficiently. This should produce an optimal allocation of funds to long-term investments, and thus, result in higher and more stable levels of domestic income.

Next, to test the robustness of our results, we begin to introduce additional controls for country-specific attributes that may also influence a country's economic performance. Model 2 in Tables 5 and 6 includes the average inflation rate and a dummy variable equal to 1 for countries with average GDP greater than the sample median. In addition, average GDP is included in Table 6. The level of income is invariant to inflation. Further, the relation between the market information index and income is not driven by high income or low income countries. However, the coefficient on the market information index loses significance in relation to income growth.

Having controlled for the economic environment, a country's political structure is now considered in model 3. We first control for government ownership of banks, and find government bank ownership is unrelated to income levels, but significantly positively related to income growth. Of the three Basel pillars, the market information index remains the only one significantly related to economic performance.

Other attributes, such as the origin of the legal system, may influence the banking regulatory structure. To control for legal origin, model 4 adds dummy variables if the legal system stems from Socialist/Communist Law or English Common Law. The legal origin of a country does not explain the level of domestic income, but countries with socialist/communist laws have a significantly positive relation to income growth, as do those with greater government bank ownership. Additionally, the level of information disclosure is still statistically significant and positively related to domestic income and negatively related to growth.

The incremental impacts of corruption and democracy are given in model 5. The model shows that neither of the first two pillars of the Basel II Accord explain economic performance, but the level of information disclosure is still significant at the 10 percent level in models determining income growth. On the other hand, the level of market information is no longer associated with the level of income level. The power of the test in model 5 is reduced due to the high correlation of the market information index with most of our measure of economic and political environment, as can be seen in Table 4.

We have empirically examined the relation between economic performance and regulatory policies, while controlling for economic and political conditions within a country. The level of market information disclosure, on average, is the one pillar of Basel II that explains economic performance. The results are consistent with the notion that better information disclosure forces banks to operate more efficiently, which yields a more optimal allocation of resources. That is, an efficiently run bank channels funds to investments with the greatest economic benefits, thereby, yielding a high level of income for the least amount of risk.

Finally, we recognize that a potential endogeneity problems may exist. In other words, market participants in countries with higher levels of income may have more wealth at risk, and therefore demand higher levels of information disclosure. Because our data do not contain a time series in which to test the extent of this issue, we have emphasized the relation between income and regulatory variables rather than causation. There is, however, some evidence in the literature to suggest an endogeneity problem may not exist. Research by Barth, Caprio, and Levine (2001) and BCL addresses the issue of endogeneity in their data of regulatory variables with variables measuring

[1] Although the data encompass 153 countries, data are not available for all variables in all countries.

bank performance and stability. Barth, Caprio, and Levine used regulatory variables from two different time periods to estimate their models. They found that the relation between the regulatory variables and banking performance and stability did not change. That is, there has been no change in these regulatory variables over time. For our model, our concern is endogeneity between BCL regulatory variables and domestic income and growth. The Barth, Caprio, and Levine (2001 and 2006) result that these variables have not changed over time implies that our market information variable has remained stable over time and there exists a smaller likelihood of an endogeneity problem.

5. Conclusions and Implications

It is widely recognized that a well functioning financial system promotes financial development within a country. Banks, in particular, help ease the allocation of capital, reduce costs associated with information asymmetry, and enforce internal oversight. By reducing these barriers, banks play a significant role in promoting financial development. In light of recent financial crises over the past two decades, an emerging consensus between policymakers and industry participants is that a new and innovative approach to supervision and regulation is needed. In response, the Basel Committee has provided risk-based guidelines addressing capital regulatory oversight, supervisory oversight, and market discipline. To date, however, there is no direct evidence on how regulatory guidelines and policy for domestic banking systems affect the economic performance of a country.

Using data covering 153 countries, we estimate the relation between economic strength, as measured by average GDP and the average growth rate in GDP, and measures for each of the three pillars of the New Basel Capital Accord. These measures include a capital regulatory index, official supervisory power, supervisory independence, and market information index. We find that capital regulatory oversight and supervisory oversight have seemingly no relation to these economic measures. However, we find that the degree of market information is positively related to the level of average GDP, but negatively related to the growth rate in GDP.

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Table 1

Variable Descriptions

The data come from Barth, Caprio, and Levine (2006), who gathered responses to 262 questions from central banking authorities from 153 countries in 2003 and early 2004. The responses represent the "official" government position. In addition, annual GDP, GDP growth rates, and inflation rates for 2000-2004 were collected from the World Bank and the democracy and corruption indices, as well as legal origin, are from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999).

Capital Regulatory Index	On a scale from 3 to 10, Capital Regulatory Index measures "both the amount of capital and verifiable sources of capital that a bank is required to posses" (Barth et al., p. 121). Source: Barth, Caprio, and Levine (2006)
Supervisory Power	On a scale from 4 to 14, Official Supervisory Power measures the extent to which supervisory authorities have the power to take actions to prevent and correct problems. Source: Barth, Caprio, and Levine (2006)
Supervisory Independence	On a scale from 0 to 3, Overall Supervisory Authority Independence measures "the degree to which the supervisory authority is independent from the government and legally protected from the banking industry" (Barth et al., p. 350). Source: Barth, Caprio, and Levine (2006)
Market Information Index	Market Information Index is an equally-weighted index of the following three items: (1) the percent of the largest ten banks rated by international credit rating agencies, (2) the percent of the largest ten banks rated by domestic credit rating agencies, and (3) the external governance index (EGI). The EGI is constructed by Barth, Caprio, and Levine (2006) as the sum of seven variables measuring the effectiveness of a bank's external audits, the sum of six variables measuring the transparency of a bank's financial statements, a variable measuring whether accounting practices for banks are in accordance with International Accounting Standards or U.S. Generally Accepted Accounting Standards, where yes = 1 and no = 0, and the sum of five variables measuring "the evaluations by external rating agencies and incentives for creditors of the bank to monitor bank performance" (Barth et al., p. 357). Source: Barth, Caprio, and Levine (2006)
Average GDP	Average level of GDP in U.S. dollars for the years 2000-2004, or for as many of the five years as data are available. Source: World Bank
Average GDP Growth	Average level of GDP growth in U.S. dollars for the years 2000-2004, or for as many of the five years as data are available. Source: World Bank
Average Inflation	Average percentage of annual inflation for the years 2000-2004, or for as many of the recent five years as data are available. Source: World Bank
Above Median GDP	Dummy variable equals to 1 if the country's average GDP is greater than the sample median.
Government-owned Banks	Percentage of the banking system's assets in banks that are 50 percent or more government owned as of year-end 2001. Source: Barth, Caprio, and Levine (2006)
Social-ist/Communist Law	Dummy variable is equal to 1 if the origin of the country's Company Law or Commercial Code is Social-ist/Communist laws. Source: La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999)
English Common Law	Dummy variable is equal to 1 if the origin of the country's Company Law or Commercial Code is English Common Law. Source: La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999)
Democracy Index	On a scale from 0 to 10, Democracy Index is the average democracy score for the period of 1970-1994. Lower values correspond to less democratic countries. Source: La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999)
Corruption Index	On a scale from 0 to 10, Corruption Index is the average of the April and October monthly indices for the period of 1982-1995. As stated in La Porta (1999), "Low ratings indicate 'high government officials are likely to demand special payments' and 'illegal payments are generally expected though lower levels of government.'" Source: La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999)

Table 2

Correlation Matrix for the Market Information Index

The data come from Barth, Caprio, and Levine (2006), who gathered responses to 262 questions from central banking authorities from 153 countries in 2003 and early 2004. The responses represent the "official" government position. Each cell contains the Pearson correlation coefficient, with p-values in parentheses.

	% Domestic Credit Ratings	% International Credit Ratings	EGI
% Domestic Credit Ratings	1		
% International Credit Ratings	0.3383 (0.0004)	1	
EGI	0.3625 (0.0002)	0.4490 (0.0001)	1

Table 3

Descriptive Statistics

The data come from Barth, Caprio, and Levine (2006), who gathered responses to 262 questions from central banking authorities from 153 countries in 2003 and early 2004. The responses represent the "official" government position. In addition, annual GDP, GDP growth rates, and inflation rates for 2000-2004 were collected from the World Bank and the democracy and corruption indices, as well as legal origin, are from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999). Income quartiles are based on average GDP, which is the average level of GDP in U.S. dollars for the years 2000-2004, or for as many of the five years as data are available. Medians are presented in parentheses below means. For the Low Income quartile, ***, **, and * represent significance at the 1 percent, 5 percent, and 10 percent levels, respectively, for mean and median differences with High Income countries.

	Overall Sample	Basel Member Countries	High Income	Upper Middle Income	Lower Middle Income	Low Income
Capital Regulatory Index	6.7152 (6.0000)	5.8333 (6.0000)	6.0909 (6.0000)	6.6364 (7.0000)	5.6774 (6.0000)	6.2121 (6.0000)
Supervisory Power	10.5033 (11.0000)	9.8462 (10.0000)	10.0303 (10.0000)	11.2973 (12.0000)	11.4714 (12.0000)	9.2778 (9.0000)
Supervisory Independence	1.5878 (2.0000)	1.5385 (2.0000)	1.5429 (2.0000)	1.7429 (2.0000)	1.5588 (2.0000)	1.4857 (2.0000)
Market Information Index	1.3648 (1.2667)	1.9847 (1.7500)	1.8690 (1.7778)	1.5226 (1.5167)	1.0597 (0.7778)	0.7867*** (0.7222)***
Average GDP	232.8342 (15.6315)	1890.2460 (796.1620)	896.0774 (269.7730)	43.5789 (27.8198)	7.7521 (6.6030)	1.3566*** (1.0272)***
Average GDP Growth	3.8992 (3.8180)	2.2111 (2.0920)	3.1037 (2.6520)	4.6294 (4.1250)	4.2444 (4.3980	3.5983 (2.9820)
Average Inflation	8.1154 (4.2620)	1.8923 (2.1420)	5.2471 (3.0860)	10.0009 (6.2440)	10.6699 (4.3540)	6.4896 (4.2620)
Government-owned Banks	16.6719 (4.8250)	5.7900 (0.0000)	16.2562 (3.8500)	21.9547 (12.000)	13.8060 (2.2650)	13.5572 (1.1000)
Socialist/ Communist Law	0.1765 (0.0000)	0.0000 (0.0000)	0.1143 (0.0000)	0.2703 (0.0000)	0.2571 (0.0000)	0.1111 (0.0000)
English Common Law	0.3007 (0.0000)	0.2308 (0.0000)	0.3429 (0.0000)	0.2162 (0.0000)	0.2000 (0.0000)	0.5000 (0.5000)
Corruption Index	6.0350 (5.4625)	8.9652 (9.0476)	7.7184 (8.5119)	5.2337 (5.0000)	5.1914 (5.0000)	4.9573*** (5.0000)***
Democracy Index	4.5150 (3.3750)	9.6159 (10.0000)	7.5060 (8.9400)	3.4893 (2.2000)	3.7013 (1.7600)	2.8613*** (0.6957)***

Table 4

Correlation Matrix

The data come from Barth, Caprio, and Levine (2006), who gathered responses to 262 questions from central banks from 153 countries in 2003 and early 2004. The responses represent the "official" government position. In addition, annual GDP, GDP growth rates, and inflation rates for 2000-2004 were collected from the World Bank and the democracy and corruption indices, as well as legal origin, are from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999). Income quartiles are based on average GDP, which is the average level of GDP in U.S. dollars for the years 2000-2004, or for as many of the five years as data are available. Each cell contains the Pearson correlation coefficient, with p-values in parentheses.

	Capital Regulatory Index	Supervisory Power	Supervisory Independence	Market Information Index	Average GDP	Average GDP Growth	Average Inflation	Above Median GDP	Government-owned Banks	Socialist/ Communist Law	English Common Law	Corruption Index
Capital Regulatory Index	1											
Supervisory Power	0.0774 (0.3723)	1										
Supervisory Independence	-0.0208 (0.8108)	0.1030 (0.2162)	1									
Market Information Index	-0.0459 (0.6602)	0.1099 (0.2740)	-0.1079 (0.2855)	1								
Average GDP	-0.0221 (0.8031)	0.0434 (0.6090)	-0.0308 (0.7187)	0.3438 (0.0006)	1							
Average GDP Growth	-0.0091 (0.9185)	0.0403 (0.6379)	0.0581 (0.4999)	-0.2999 (0.0032)	-0.0886 (0.2959)	1						
Average Inflation	-0.0679 (0.4448)	0.0631 (0.4605)	-0.1407 (0.1011)	-0.2163 (0.0353)	-0.0693 (0.4144)	-0.1524 (0.0713)	1					
Above Median GDP	0.1255 (0.1548)	0.0577 (0.4970)	0.0708 (0.4078)	0.5483 (0.0001)	0.2283 (0.0061)	-0.0078 (0.9268)	-0.0261 (0.7586)	1				
Government-owned Banks	-0.1195 (0.1898)	-0.0306 (0.7253)	-0.1368 (0.1189)	0.0583 (0.5829)	-0.0442 (0.6218)	0.2808 (0.0015)	0.0884 (0.3268)	0.1148 (0.1989)	1			
Socialist/Communist Law	-0.0375 (0.6639)	-0.0181 (0.8255)	0.1651 (0.0450)	-0.2013 (0.0436)	-0.0653 (0.4387)	0.4620 (0.0001)	0.0957 (0.2588)	0.0145 (0.8636)	0.1413 (0.1009)	1		
English Common Law	-0.0051 (0.9528)	-0.0440 (0.5917)	0.0881 (0.2869))	0.1009 (0.3155)	0.0781 (0.3540)	-0.0706 (0.4054)	0.0474 (0.5764)	-0.0800 (0.3420)	-0.0918 (0.2879)	-0.3035 (0.0001)	1	
Corruption Index	0.0028 (0.9788)	-0.1980 (0.0507)	0.0870 (0.3966)	0.3417 (0.0033)	0.2582 (0.0103)	-0.1635 (0.1096)	-0.1476 (0.1490)	0.2990 (0.0028)	-0.2248 (0.0331)	0.0559 (0.5805)	0.0380 (0.7073)	1
Democracy Index	-0.0221 (0.8164)	-0.1550 (0.0883)	0.1047 (0.2550)	0.2862 (0.0062)	0.2464 (0.0062)	-0.2602 (0.0038)	-0.0921 (0.3129)	0.2641 (0.0033)	-0.2990 (0.0015)	-0.0444 (0.6244)	0.1461 (0.1055)	0.6730 (0.0001)

Table 5

Determinants of Average Income

The data come from Barth, Caprio, and Levine (2006), who gathered responses to 262 questions from central banking authorities from 153 countries in 2003 and early 2004. The responses represent the "official" government position. In addition, annual GDP, GDP growth rates, and inflation rates for 2000-2004 were collected from the World Bank and the democracy and corruption indices, as well as legal origin, are from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999). Income quartiles are based on average GDP, which is the average level of GDP in U.S. dollars for the years 2000-2004, or for as many of the five years as data are available. Coefficients from OLS estimations are presented, with p-values in parentheses. The dependent variable is the average GDP measured in $ billions. ***, **, and * represent significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-598.7230 (0.3927)	-533.2842 (0.4744)	-410.0935 (0.6172)	-471.9438 (0.5727)	-956.4447 (0.4815)
Capital Regulatory Index	-22.4262 (0.7594)	-22.7923 (0.7615)	--25.4435 (0.7764)	-15.0530 (0.8691)	14.1661 (0.9130)
Supervisory Power	10.2397 (0.8292)	8.3047 (0.8688)	9.7999 (0.8670)	3.4771 (0.9530)	47.4476 (0.5760)
Supervisory Independence	36.9638 (0.8121)	41.5333 (0.8083)	-14.2895 (0.9412)	-17.0464 (0.9337)	--34.3440 (0.8981)
Market Information Index	598.5997*** (0.0015)	582.9852** (0.0173)	589.0146** (0.0329)	588.0787** (0.0350)	567.0110 (0.1205)
Average Inflation		-5.7030 (0.7435)	-4.5492 (0.8130)	-3.0219 (0.8769)	-14.1908 (0.6191)
Above Median GDP		12.2058 (0.9702)	43.0142 (0.9081)	19.8283 (0.9580)	161.6619 (0.7624)
Government-owned Banks			-6.7938 (0.3503)	-7.3412 (0.3184)	-14.2907 (0.2156)
Socialist/Communist Law				77.4272 (0.8454)	171.9099 (0.8373)
English Common Law				436.3351 (0.2358)	448.4847 (0.3621)
Corruption					-99.2343 (0.5203)
Democracy					111.2228 (0.1687)
Number of Observations	89	88	78	78	57

Table 6

Determinants of Average Income Growth

The data come from Barth, Caprio, and Levine (2006) for 153. In addition, annual GDP, GDP growth rates, and inflation rates for 2000-2004 were collected from the World Bank and the democracy and corruption indices, as well as legal origin, are from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999). Income quartiles are based on average GDP, which is the average level of GDP in U.S. dollars for the years 2000-2004, or for as many of the five years as data are available. Coefficients from OLS estimations are presented, with p-values in parentheses. The dependent variable is the average GDP growth. ***, **, and * represent significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	5.3166*** (0.0023)	4.6239** (0.0111)	4.1590** (0.0155)	3.2331** (0.0476)	1.9122 (0.1536)
Capital Regulatory Index	-0.0935 (0.5980)	-0.0851 (0.6355)	-0.1828 (0.6092)	0.0033 (0.9850)	0.0842 (0.5053)
Supervisory Power	0.0461 (0.6916)	0.0567 (0.6377)	0.0470 (0.6948)	0.0339 (0.7650)	0.1126 (0.1776)
Supervisory Independence	0.2874 (0.4584)	0.2863 (0.4848)	0.5124 (0.1990)	0.1102 (0.7794)	0.1589 (0.5433)
Market Information Index	-1.2126*** (0.0076)	-0.9774 (0.1035)	-1.1353* (0.0513)	-0.9369* (0.0886)	-0.6518* (0.0752)
Average GDP		-0.0000 (0.9051)	0.0001 (0.8032)	0.0000 (0.9010)	-0.0001 (0.6201)
Average Inflation		0.0552 (0.1877)	0.0296 (0.4541)	0.0163 (0.6637)	0.0062 (0.8237)
Above Median GDP		-0.2395 (0.7594)	-0.3586 (0.6386)	-0.1371 (0.8497)	1.0132 (0.0564)*
Government-owned Banks			0.0466*** (0.0026)	0.0411*** (0.0049)	-0.0102 (0.3687)
Socialist/Communist Law				2.4843*** (0.0017)	0.4831 (0.5535)
English Common Law				1.0703 (0.1352)	1.4339*** (0.0044)
Corruption					0.0558 (0.7107)
Democracy					-0.1849 (0.0237)
Number of Observations	88	88	78	78	57

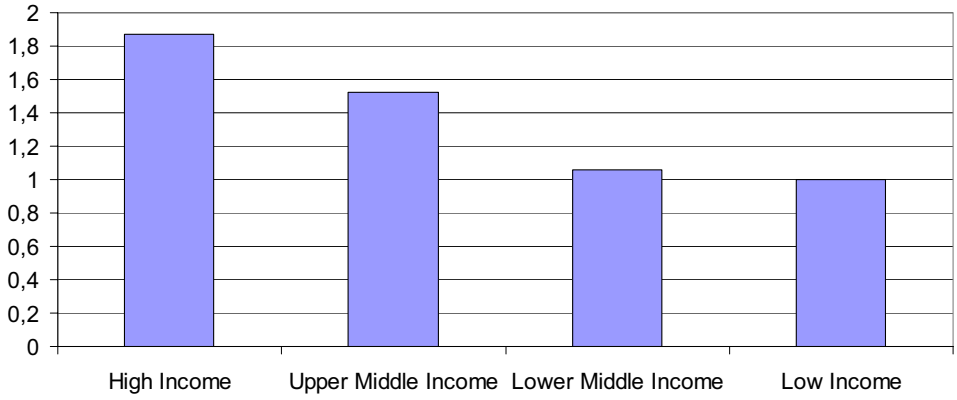

Fig. 1. Market information index by GDP quartile

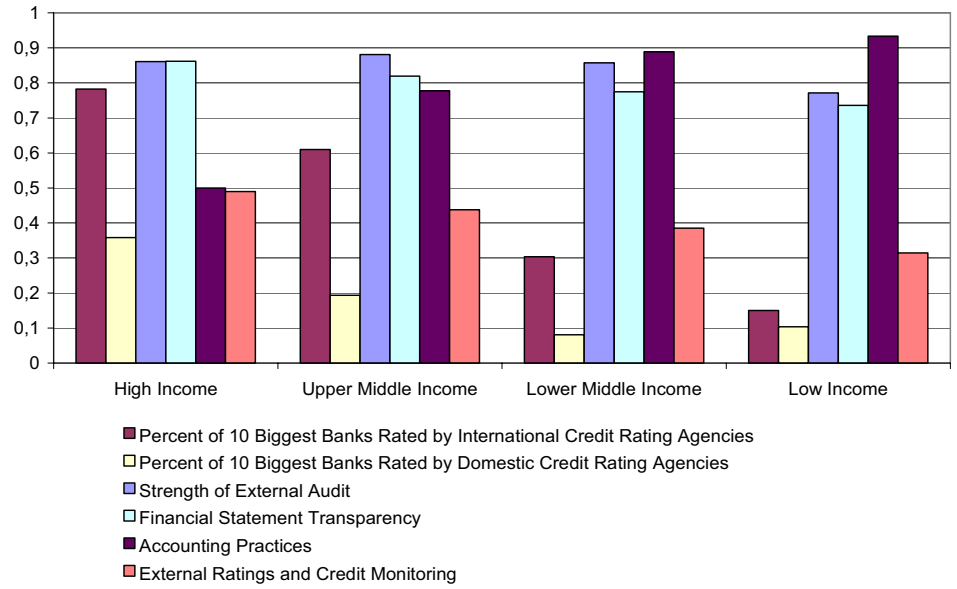

Fig. 2. Components of market information index by GDP quartile