Reforms of Financial Supervision Regimes and Central Banks: Exploring the Nexus

Donato Masciandaro♦

November 2006

Abstract

This paper assesses the nexus between the recent wave of financial supervision reforms and the role of central banks, reviewing six different views concerning the determinants of financial supervision architectures: economic view, market view, law view, political view, geography view and institutional view. The institutional view stresses the role of the existing rules of the game in explaining the features of the supervisory design, focusing on the role of central bank. The empirical tests provide first support for this view: in a setting characterized by a central bank traditionally less involved in supervision a unified model of supervision seems to be more likely to occur. The role of central bank involvement in supervision still holds when its level of monetary independence is taking in account. Furthermore, the probability that a country will move toward a unified model is higher: the smaller the overall size of the economy; when the legal framework is characterized by German and Scandinavian roots. Therefore also the economic size view and the law view matter.

♦ Full Professor in Economics, Chair in Economics of Financial Regulation, Paolo Baffi Centre, Bocconi University, Milan. Paper presented at the Conference "Macro Prudential Supervision: Challenges for Financial Supervisors", organized by the International Monetary Fund and the Korean Financial Supervisory Service/Financial Supervisory Commission, Seoul, November 7-8, 2006.

Reforms of Financial Supervision Regimes and Central Banks:

Exploring the Nexus

1. Introduction

Over the past decade, many countries have seen changes in the architecture of financial supervision. Financial supervision regimes vary significantly from country to country[1]. A review of the supervision architectures [2] indicates a trend toward a gradual concentration of powers. In Europe this trend has seemed rather strong in recent years. In addition to Norway, the first country to establish a single supervisor in 1986, and Iceland (1988), six "old" European Union member states – Austria (2002), Belgium (2004), Denmark (1988), Germany (2002), Sweden (1991) and the United Kingdom (1997) – have assigned the task of supervising the entire financial system to a single authority other than the central bank. In Ireland (2003), the supervisory responsibilities were concentrated in the hands of the central bank; the central bank increased its responsibilities in the Netherlands (2005) too. Four countries involved in the 2004 EU enlargement process – Estonia (1999), Latvia (1998), Malta (2002) and Hungary (2000) – have also reformed their structures, concentrating all powers in a single authority[3], while, outside Europe, a unified agency has been established in Kazakhstan (2004), Korea (1997), Japan (2001), Nicaragua (1999) and, among the small countries, in Bahrain, Bermuda, Cayman Islands, Gibraltar, Maldives, Netherlands Antilles, Singapore and the United Arab Emirates.

The single supervisor regime seems to be the "natural" and best answer to the challenges posed by financial market integration (*market view*). If, in the long run, the expected financial structure is a perfectly integrated and single market, the best design for the supervisory architecture would seem to be the single authority. But the answer is not that simple.

The descriptive evidence[4] seems to correct the idea that, given the blurring process in the financial landscape, there are two possible approaches to supervision: 1) unification under the roof of the central bank; and 2) unification in a different supervisory body[5]. In reality, the unification of supervision seems evident only in the case of a single financial authority. In other words, the

---

[1] Masciandaro (2005 a)
[2] A review of the trend in supervisory architectures is performed in Masciandaro (2004).
[3] De Luna Martinez and Rose (2003) claimed that at least seven other countries were considering the adoption of a form of integrated supervision: Bulgaria, Indonesia, Poland, Slovakia, Slovenia and Ukraine.
[4] Masciandaro (2004).
[5] Grunbichler and Darlap (2003).

descriptive analysis signals an interesting result: the national choices on how many agencies must be involved in supervision is strictly linked to the existing role of the central bank in supervision itself (*institutional view*). The degree of supervision unification seems to be inversely related to central bank involvement. The trade-off – and the consequent central bank fragmentation effect - was confirmed by a first analysis of the reforms in supervisory regimes[6] and then going in depth in the economics of the central bank fragmentation effect[7].

However in these studies different questions remained to be definitely addressed. First of all, following the suggestion of the recent literature on law and finance, is there any role for the legal nature of the country jurisdiction in explaining the shape of supervisory architectures (*law view*)? Does the quality of the political system matter *(political view)*? Besides, is there a direct link between the countries' neighbourhood and the features of financial supervision design (*geography view*)? The aim of this paper is to review the general determinants of supervisory setting, with an empirical analysis performed with ordered logit and probit functions on a dataset of 89 countries.

The paper is organized as follows. Section two describes the theoretical approach adopted, considering the supervisory structure as a dependent variable. The financial authorities concentration index (FAC Index) is used in section three to identify this dependent variable. In section four we estimate a model of the probability of different regime decisions as a function of structural variables, representing the market view, the political view, the law view, the geography view and the institutional view, focused on the position of the central bank in supervision. Section five shed further light on the central bank institutional setting, using monetary regime indicators. The overall empirical analysis support the institutional view. Section six attempts some conclusions.

2. Policymakers and the Shape of Financial Supervision Regimes

The recent wave of reforms proposes several issues in the debate on financial supervision architecture, but the most important one seems to be the alternative between the single authority model and the financial multi-authority model[8]. Identifying the optimal supervisory regime between the two alternatives is an interesting problem.

---

[6] Masciandaro (2005b).
[7] Masciandaro (2006).
[8] See Masciandaro (2004).

It has been correctly claimed that no "superior" model of supervision exists[9]. The quest for the optimal supervision architecture cannot be pursued through a simple traditional cost – benefit analysis. If, in fact, one proposes to compare the two models from the social welfare point of view, one realizes that each of them offers expected benefits but also expected risks, and the final outcome is actually undermine[10]. However, in our view the supervisory regime is *not* deterministic (i.e. it is an exogenous variable), nor, on the other side, accidental (i.e. it is a completely random variable).

Therefore we use a different starting point, based on two crucial hypotheses. First of all, we claim that gains and losses of a supervisory model are expected variables calculated by the policymaker in charge, who maintain or reform the supervisory regime. Secondly, the expectations of policymakers, given their own specific goals, are likely to be influenced by structural economic and institutional variables that may vary from country to country. We wish test the hypothesis that in every country, given the national economic and institutional endowment, these variables can determine, *ceteris paribus*, the gains or losses policymakers expect from a specific supervisory regime. The supervisory regime can become the dependent variable. Furthermore, the economic agents have no information on the true preferences of the policymakers: their optimal degree of financial supervision unification is a *hidden variable*.

In the economic literature, there are as yet no theoretical studies that consider the policymaker objective as a factor in financial supervisory design[11]. The crucial issue is the identification of the policymaker's preferences.

The first approach to identifying the policymaker's function could be the so-called *narrative approach*[12], in which official documents are interpreted to gauge the choices of policymakers. One drawback to this approach is that there is substantial room for differences between the pronouncements of policymakers and their actual preferences.

The second approach, which we intend to follow here, is to consider the actual choices of policymakers in determining the level of financial supervision unification (*factual approach*). At each random point in time, we observe the policymaker's decision to maintain or reform the

---

[9]Briault (2002), Schoenmaker (2003).

[10]For a survey, see Masciandaro and Porta (2004).

[11]The problem could be analysed as a model of political delegation, trying to apply in the financial supervisory field the general framework proposed in Alesina and Tabellini (2003). The delegation approach has been recently used to debate financial supervisory issues in Bjerre- Nielsen (2004). There are two theoretical models on banking supervision architecture – Repullo (2000) and Kahn and Santos (2004) - but without any explicit identification and discussion of the policymaker (lawmaker) objective function.

[12]The narrative approach has been extensively used in monetary policy literature: see Potts and Luckett (1978), Wallace and Warner (1985), Hakes (1988) and (1990), Romer and Romer (1989).

financial supervision architecture, choosing the level of unification. In other words, we consider that policymakers are faced with discrete choices.

Building in a cross country perspective an empirical analysis consistent with this discrete choice process involves claiming the existence of unobservable policymaker utilities U_{ij}, where each U_{ij} is the utility received by the *ith* national policymaker from the *jth* level of financial unification. Since the utility U_{ij} is unobservable, we represent it as a random quantity, assuming that it is composed of a systematic part U and a random error term ε. Furthermore, we claim that the utilities U_{ij} are a function of the attributes of the alternative institutional level of financial unification and the structural characteristics of the policymaker's country.

Combining the two hypotheses, we have a random utility framework for the unobservable financial unification variable. As usual, we assume that the errors ε_{ij} are independent for each national policymaker and institutional alternative, normally distributed. The independence assumption implies that the utility derived by one national policymaker is not related to the utility derived by any other national policymaker, and that the utility that a policymaker derives from the choice of a given level of financial unification is not related to the utility provided by the other alternative[13].

In the factual approach, the first crucial issue is the measurement of policymaker choices, which is the definition of the dependent variable[14].

3. Measuring the Unification of Financial Supervision

If we wish to consider financial supervision unification as a dependent variable, the first problem is to construct this variable. How can the degree of unification of financial supervision be measured? This is where the financial authorities consolidation index (FAC Index) comes in (Table 1).

This index was created through an analysis of which and how many authorities in the 89 countries examined are empowered to supervise the three traditional sectors of financial activity:

---

[13]See Maddala (1983), Greene (1997), Wooldrige (2002) and Gourieoux (2000) for in-depth discussion on the random utility models that generate discrete dependent variables.
[14]The factual approach has the drawback that there is subjectivity in the institutional measurements. However, subjectivity in interpretation is also present in the narrative approach.

banking, securities markets, insurance (Table 1)[15]. The country sample depends on the availability of institutional data[16]

To transform the qualitative information into quantitative indicators, we assigned a numerical value to each type of regime, in order to highlight the number of the agencies involved. The rationale by which we assigned the values considers simply the concept of unification of supervisory powers: the greater the unification, the higher the index value.

The index was built on the following scale: 7 = Single authority for all three sectors (total number of supervisors=1); 5 = Single authority for the banking sector and securities markets (total number of supervisors=2); 3 = Single authority for the insurance sector and the securities markets, or for the insurance sector and the banking sector (total number of supervisors=2); 1 = Specialized authority for each sector (total number of supervisors=3).

We assigned a value of 5 to the single supervisor for the banking sector and securities markets because of the predominant importance of banking intermediation and securities markets over insurance in every national financial industry. It also interesting to note that, in the group of integrated supervisory agency countries, there seems to be a higher degree of integration between banking and securities supervision than between banking and insurance supervision[17]; therefore, the degree of concentration of powers, *ceteris paribus*, is greater.

These observations do not, however, weigh another qualitative characteristic that emerges from Table 1: There are countries in which one sector is supervised by more than one authority. It is likely that the degree of concentration rises when there are two authorities in a given sector, one of which has other powers in a second sector. On the other hand, the degree of concentration falls when there are two authorities in a given sector, neither of which has other powers in a second sector.

It would therefore seem advisable to include these aspects in evaluating the various national supervisory structures by modifying the index as follows: adding 1 if there is at least one sector in the country with two authorities, and one of these authorities is also responsible for at least one

---

[15]Sources: for all countries, official documents and websites of the central banks and the other financial authorities. The information is updated to 2005.

[16]We do not include the eight very small countries and territories (Bahrain, Bermuda, Cayman Islands, Gibraltar, Maldives, Netherlands Antilles, Singapore and United Arab Emirates) with a single financial authority so as to avoid an evident bias in the empirical analysis.

[17]De Luna Martinez and Rose (2003). Furthermore, Abrams and Taylor (2002) claimed that the case for consolidating the supervision of banking and securities firms may be stronger than for including insurance firms, given that for bank and securities firms risks tend to arise on the asset side of the balance sheet, whereas for insurance firms the main risks occurs on the liability side.

other sector; subtracting 1 if there is at least one sector in the country with two authorities assigned to supervision, but neither of these authorities has responsibility for another sector; 0 elsewhere.

Finally, there are three qualitative characteristics of supervisory regimes that we decided not to consider in constructing this index. Firstly, we do not consider the legal nature – public or private – of the supervisory agencies nor their relationship to the political system (degree of independence, level of accountability[18]). Secondly, at least in each industrial country, there is an authority to protect competition and the market, with duties that impinge on the financial sectors. But, since it is a factor common to all the structures, we decided not to consider the antitrust powers account in constructing the index[19]. Finally, the financial authorities may perform different functions in the regulatory as well as in the supervisory area[20].

However, at this first stage of the institutional analysis, we prefer to consider just the number of the agencies involved in the supervisory activities.

4. Do Central Bank Involvement in Supervision Matter?

Now how do we empirically investigate the determinants of the degree of unification in the financial supervision architectures? In order to assess this relationship, we can estimate a model of the probability of different regime decisions as a function of a set of exogenous structural variables.

Supervisory regimes can be viewed as resulting from an unobserved variable: the optimal degree of financial supervision unification, consistent with the policymaker utility. Each regime corresponds to a specific range of the optimal financial supervision unification, with higher discrete FAC Index values corresponding to a higher range of financial unification values. Since the FAC Index is a qualitative ordinal variable, the estimation of a model for such a dependent variable necessitates the use of a specific technique.

---

[18]On these issues, see Quintyn and Taylor (2002).
[19]The relationship between competition policies and stability are examined in Carletti and Hartmann (2002).
[20]Llewellyn (2001) noted that the basic functions performed by regulatory and supervisory agencies cover ten main areas. For our purposes, in order to separate supervision (enforcing rules) from regulation (rulemaking with managerial discretion), we have distinguished five supervisory functions (prudential supervision of financial institutions; conduct of business supervision; administration of deposit insurance; market integrity; financial institutions crisis procedures) from four regulatory functions (management of the payment system; prudential regulation, conduct of business regulation, liquidity management). However, in certain cases it is difficult to make a clear-cut distinction between supervision and regulation. Paradigmatic from this standpoint is the overlapping between liquidity management and crisis procedures.

Our qualitative dependent variable can be classified into more than two categories, given that the FAC Index is a multinomial variable. But the FAC Index is also an ordinal variable, given that it reflects a ranking. Then the ordered model is an appropriate estimator, given the ordered nature of the policymaker alternative[21].

Let y be the policymaker ordered choices taking on the values (0, 1, 2, ... , 7). The ordered model for y, conditional on a set of K explanatory variables x, can be derived from a latent variable model. In order to test this relationship, let us assume that the unobserved variable, the optimal degree of financial supervision unification y^*, is determined by:

$$y^* = \beta' x + \varepsilon \tag{1}$$

where ε is a random disturbance uncorrelated with the regressors, and β is a 1 x K regressors' vector.

The latent variable y^* is unobserved. What is observed is the choice of each national policymaker to maintain or to reform the financial supervisory architecture: This choice is summarized in the value of the FAC Index, which represents the threshold value. For our dependent variable there are seven threshold values. Estimation proceeds by maximum likelihood, assuming that ε is normally distributed across country observations, and the mean and variance of ε are normalized to zero and one. This model can be estimated with an ordered Logit model or with an ordered Probit model[22].

Which economic model can be tested? Currently, to the best of our knowledge, there isn't a general model on the determinants of the policymaker's decision regarding the degree of supervision unification.

Masciandaro (2005) and (2006) claim that the choice of the optimal level of financial supervision unification could depend on the role of the central bank in the supervisory architecture.

In this manner we highlight the role of the nature of the institutions involved in supervisory responsibilities[23]. In particular, any supervisory regime will have to provide a link between

---

[21] See Maddala (1983), Greene (1997) and Wooldrige (2002) for the ordered models. See also Cramer (2003).

[22] The logit model differs from the probit model only in the cumulative distribution function that is used to define choice probabilities. The maximum likelihood estimations were carried out by a packaged-ordered Probit and ordered Logit commands in STATA. To be complete, we present both the Probit and the Logit results, given that, as usual, there is little basis for choosing between probit and logit models.

[23] Barth, Nolle, Phumiwasana and Yago (2002) claim that the key issues for banking supervision are 1) whether there should be one or multiple supervisory authorities and 2) whether the central bank should be involved in bank supervision. Here we used the same intuition to build up the two indices of financial authorities' consolidation.

supervision and the central bank, given the potential relationships between monetary stability and financial stability[24]. It has been correctly pointed out[25] that, irrespective of its role, the central bank is the ultimate authority for the systemic stability of the payment system. Thus, among the authorities that may have supervisory responsibility, the central bank is special in nature as the institution responsible for monetary policy. Furthermore, the special characteristics of the role played by the central bank have placed it in a central position with respect to the political system, the intermediaries, and the other control authorities[26].The debate on the characteristics of this link is particularly important in the European Union, where monetary policy is separated from financial supervision[27].

The policymaker's choice can be viewed as a sequential process (Figure 1) in which the institutional *status quo* counts: the supervision concentration level is decided based on the position of the central bank[28] . If the role of the central bank is limited, the supervision concentration level will be high and vice versa[29]. This central bank fragmentation effect is explained through three

---

[24]See Garcia Herrero and Del Rio (2003). On the role of central bank in banking supervision see Masciandaro (1993), Tuya and Zamalloa (1994), Goodhart and Schoenmaker (1992) and (1995), Haubrich (1996), Di Giorgio and Di Noia (1999), Peek, Rosengren and Tootle (1999), Abrams and Taylor (2002).

25 Llewellyn (2001).

26 On the historical and institution evolution of the central bank's role, see Toniolo (1988) , among others. On the legal and institutional developments at the national, EU and international levels see Lastra (2006). From the point of view of the organization theory and public management, the specialness of central banking is analyzed in Marcussen /2006).

27See Lannoo (2000). Schoenmaker (2003), Padoa Schioppa (2003), Goodhart and Schoenmaker (1995), Eijffinger (2001), Vives (2001), Goodhart, Schoenmaker and Dasgupta (2002), Oosterloo and de Haan (2003), Schueler (2003).

[28] Freytag and Masciandaro (2006) claim that, other things being equal, the central bank involvement in supervision depend on the features of the monetary regimes (monetary commitment, central bank independence).

[29] The polarization pattern seems more evident in Europ. Among the 15 members of the European Union, prior to expansion, Austria, Belgium, Denmark, Germany, Sweden, and the UK have chosen to delegate the supervision to a single authority that is different from the central bank. The single supervisor has been adopted also in four new EU member countries - Estonia, Hungary, Latvia, Malta - and in Norway and Iceland. The multiple-supervisor structure with a central bank deeply involved in supervision is particularly evident in Italy, Netherlands, Portugal, Spain, where the central banks regulate and monitor directly banking and financial non-banking intermediaries, and in France, where the central bank is involved in the governing and managing bodies of different agencies responsible for the supervision. The Banque de France supervises the banking system and investment firms through the Comité des Etablissements de Crèdit et des Entreprises d'Investissement (CECEI) and the Commission Bancaire (CB). Ireland is the only case of supervisory powers concentrated at the central bank. In May of 2003, Ireland chose the single supervisor model, the Irish Financial Services Regulatory Authority (IFSRA), established *de facto* as a department of the central bank. Going from one extreme to the other, Poland is the only country with a low concentration of supervisory powers and a low central bank involvement. Poland fits a multiple-supervisor structurel – The Commission of Banking Supervision, the Polish Securities and Exchange Commission, the State Office for Insurance Supervision, the Insurance Department of the Ministry of Finance – while the National Bank of Poland is just a co-supervisor of the banking system. The banks are supervised by the Commission of Banking Supervision (Komisja Nadzoru Bankowego) (CBS). The General Inspectorate of Banking Supervision implements the CBS decisions. The board of the CBS has a representative of the National Bank of Poland.

different channels: the moral hazard effect, the bureaucracy effect, and the reputation endowment effect.

If a low level of central bank involvement is the *status quo* (Path A in Figure 1) the policymaker is not likely to increase it, to avoid moral hazard phenomena in the controlled intermediaries (moral hazard effect), or an increase in the bureaucratic powers of the central bank (bureaucracy effect)[30]. An increased unification level may be achieved by creating a new single financial authority (Path C)[31].

Alternatively, if a high level of central bank involvement is the *status quo* (Path B), the policymaker may not wish to unify the supervision in the hands of the central bank for the same reasons (moral hazard and bureaucracy effects)[32]. At the same time, the policymaker may not be in a position to establish a new single financial authority, reducing the central bank's involvement in

---

[30] Austria adopted unified financial supervision in April 2002. In banking supervision, the existing powers of the Federal Ministry of Finance and in the Oesterreichische Nationalbank (OeNB) were combined under the Financial Market Authority (FMA) (Grunbicher 2005). In Germany, the Federal Financial Services Supervisory Authority (BaFin) was established in May 2002. BaFin replaced the three existing supervisory authorities for banking and financial services, insurance companies and securities trading (Schuler 2005).
The Danish Financial Supervisory Authority (DFSA) was established in 1988 through the merger of the Danish Banking Supervisory Authority and the Insurance Business Supervisory Authority (Bierre – Nielsen 2005). The Swedish Financial Supervisory Authority was established in 1991 through the merger of the former banking and insurance supervisory bodies (Bank Inspection Board and Private Insurance Supervisory Service, respectively); see Bonde (2005). In Norway, the Banking, Insurance and Securities Commission (BISC) was established in 1986 though a merger of the banking Inspectorate and the Insurance Council(Skogstad Aamo 2005). Mwenda and Fleming (2001) noted that in Norway, as in Denmark, the banking supervisory authority had enjoyed a long history as an agent independent of the central bank. Furthermore, Taylor and Fleming (1999) claimed that none of the three Scandinavian integrated supervisory bodies was created by removing the banking supervision function from the central bank.
The Hungarian Financial Supervisory Authority was founded on April 2000 by merging four supervisory authorities: The State Banking Supervision, the State Securities Supervision, the State Supervision on Pension Funds and the State Supervision of Insurance Companies (Balogh 2005). Mwenda and Fleming noted that from 1987 the Hungarian central bank was concentrated on addressing monetary policy. In Japan the Financial Services Agency (FSA) was established in 1998 and before that the Ministry of Finance and the Bank of Japan were in charge of regulating the banking sector and all aspects of supervision were the sole responsibility of the Ministry of Finance.
[31] Obviously, the central bank can be involved in banking supervision tasks in Single Authority regimes too. For example in Germany the Deutsche Bundesbank participates in banking supervision, in subordination to the Bundesanstalt fur Finanzdienstleistungaufsicht (BaFin) 's issues. In Austria The Oesterreichische Nationalbank co-operates with the Financial Market Authority continuing to conduct on-site inspection. The Estonian Bank has no role in supervision, but its President is a member of the Financial Authority Board, and other two members are chosen by the central bank. In the other cases the central bank remain involved in pursuing the overall financial stability. We considered these facts in building up the index of central bank involvment in supervision.
[32] In the United Kingdom case, Goodhart (2004) stressed that, among all the arguments that led the Government in 1997 to establish the Financial Services Authority (FSA), removing supervision from the Bank of England could have been a *quid pro quo* for giving it monetary independence, on the grounds that a central bank with too many functions could be too much of a power centre within the democratic system. In Norway, due to the banking crisis in the early 1990s, the possibility of merging the BISC with the central bank was considered by a committee appointed by the Ministry of Finance. But the Parliament, in order to avoid an excessive concentration of power, ruled that the BISC continue as a separated and independent agency (Halvorsen 2001; Skogstad Aamo 2005).

supervision, if the central bank's reputation is high (reputation endowment effect)[33]. On the contrary, if the reputation of the central bank is low, or decreasing, the establishment of a single financial authority could be more likely to occur, despite its involvement in supervision[34].

Since the policymaker has decide neither to increase nor reduce central bank involvement, he is choosing not to increase the level of supervision unification (Path D)[35].

Therefore the first empirical question is: does the degree of central bank presence in financial supervision matter in defining the degree of unification in that supervision (*institutional view*)? The expected sign of the relationship between central bank involvement and financial supervision consolidation is negative.

Secondly, the policymaker can choose to maintain or reform the degree of supervisory unification in response to the structure of the financial system (*market view*). The stylised fact is

[33] In France a reform was recently implemented, merging into one regulatory authority – Autorité des Marchés Financiers (AMF) – different financial supervision responsibilities, but the Banque de France prerogatives remained unchanged. In 2004, after the Parmalat scandal, the Italian Government proposed a draft text of a bill, concerning a general reform of the supervisory architectures, based on the establishment of a single financial authority (Autorità per la Tutela del Risparmio). The text has not been approved by the appropriate Parliamentary Committee. The proposed reform encountered strong opposition from a bi-partisan coalition, defending the role of the Bank of Italy in promoting financial stability. The reform was rejected. Finland has opted not to adopt the unified approach in financial supervision, in contrast with the other Scandinavian countries. Taylor and Fleming (1999) claimed that the Bank of Finland involvement in supervision has to be considered in explaining this choice. In Iceland, prior to the establishment of the single financial agency, banking supervision was conducted by the central bank. In 1996, a committee was set up by the Minister of Commerce, to look at prospects of moving toward unified supervision, given the increasing number of financial conglomerates. Mwenda and Fleming reported that only one member on the committee – the central bank official – voted against the introduction of unified financial supervision. However, the central bank obtained the ability to appoint one of the three members of the single financial authority board.

[34] The link between banking instability, central bank reputation failure and single financial authority establishment is also evident in the Baltic unified supervisory architectures and in the case of Korea. Estonia experienced a severe banking crisis in 1998 and 1999. In May 2001, the Estonian Parliament adopted the Financial Supervisory Authority. Before the Act, the supervision was split into the three traditional sets of institutions (banking, securities and insurance). The Bank of Estonia was responsible for state supervision of banking (Liive 2005). Latvia experienced banking and financial crises in 1995 and in 1998. In July 2001, the Financial and Capital Market Commission was established, as a consolidated institution replacing the Bank of Latvia as the credit institutions' supervisor, the Securities Market Commission, the Insurance Supervision Inspectorate. In Korea, until 1997, the central bank was responsible for banking supervision; however – as Lee noted – the Ministry of Finance dominated the central bank. Following the 1997 financial crisis, a presidential committee recommended a drastic overhaul of the organization of the central bank and the country's supervisory structure. As a result, the former four financial supervisory authorities were combined into one integrated financial supervisory body, the Financial Supervisory Committee. It is interesting to note that the reputation failure effect can hold regardless the nature of the agency involved. In Norway – as we noted above – after the 1990s banking crisis the Ministry of Finance considered the possibility to merge the single financial authority with the central bank.

[35] At the same time this might possibly explain the case of Ireland, where the supervisory responsibilities are actually concentrated in the hands of the central bank. In fact the central bank of Ireland is not an independent and autonomous national monetary authority, as a member of the European System of Central Banks (ESCB). The decision-making bodies of the European Central Bank (ECB) govern monetary policy. The national central banks are an integral part of the ESCB and have to act in accordance with the guidelines and instructions of the ECB. Therefore, the expected risks of moral hazard effect and bureaucracy effect are likely to be slighter in the case of countries that are members of the ESCB. The expected evolution of the Netherlands case - see Prast and Van Lelyveld 2005 - seems to be consistent with this interpretation.

the blurring effect that is taking place in the banking and financial industry[36]. There has been increasing integration of the banking, securities and insurance markets, as well as their respective products and instruments. The blurring effect has caused two interdependent phenomena: 1) the emergence of financial conglomerates[37], which is likely to produce important changes in the nature and dimensions of the individual intermediaries, as well as in the degree of unification of the banking and financial industry; and 2) growing securitisation of the traditional forms of banking activity and the proliferation of sophisticated ways of bundling, repackaging and trading risks, which weaken the classic distinction between equity, debt and loans[38], bringing changes in the nature and dimensions of the financial markets.

In the modern debate on financial structure, it is usual to compare the equity dominance model (or *market-based regime*) with the bank dominance model (or *bank-based regime*). Furthermore, recent literature has pointed out the close relationship between the financial structure model and the corporate governance model, with particular regard to the political determinants.[39] Therefore, the control variables must capture the following effect: does the financial structure model play a role in the policymaker's choices in the area of supervisory consolidation?

The expected sign of the relationship between the degree of supervision unification and the financial factor is undetermined (i.e. it can be either positive or negative).

In section two, we stressed the importance of the blurring process for banking and financial markets worldwide. The blurring process means potential changes in the nature and dimensions of intermediaries (*the financial conglomerates effect*). In a bank-based regime, if we think that the policymakers' choices depend on the features of their own regimes, we can assume a positive relationship between the kind of regime and the degree of financial supervision unification, precisely because of the financial conglomerates effect. The rationale for the creation of a single financial supervisory authority is the blurring of confines between banks, insurers and financial service providers. The increasing presence of financial conglomerates requires the unification of supervisory functions.

At the same time, however, the blurring effect also means potential changes in the nature and dimensions of the financial markets (*the securitisation effect*). Therefore, in a market-based regime we can also expect a positive relationship between the kind of regime and the degree of financial

---

[36]See Dale (1997) and White (1997).
[37]See European Commission (2002) and de Luna Martinez and Rose (2003).
[38]De Luna Martinez and Rose (2003).
[39] Pagano and Volpin (2000), Perotti and Von Thadden (2003).

supervision consolidation, this time because of the securitisation effect. The relationship between the financial factor and the degree of supervision concentration therefore remains an empirical question.

Thirdly, the political and institutional environment can influence the ability of policymakers to implement their choices. Furthermore, we pointed before that the financial structure itself could be influenced by political factors. Then the control variables must capture a possible second relevant effect: does the quality of public governance (*political factor*) matter in defining the policymakers' choices with regard to supervisory unification? The expected sign of the relationship between the degree of supervision unification and the political factor is also undetermined.

Besides, we noted that, whatever the financial regime in the country, a policymaker may choose a higher degree of supervision in order to improve the capacity to face the challenges of the blurring process. Thus we can assume a positive relationship between good governance indicators and supervision unification.

A policymaker, however, may prefer a single authority so as to increase the probability of capturing the financial supervisory structure. Therefore, at the same time we might expect a positive relationship between bad governance indicators and supervision unification. Again, the relationship between the political factor and the degree of supervision unification remains an empirical question.

We must note, however, that the relationship between the degree of supervision unification and the characteristics of the banking and financial markets might "obscure" the importance of other variables, which are themselves determinants in explaining the characteristics of the banking and financial markets[40].

Recently, the structure of the financial markets was explained with three different institutional approaches (*legal view*)[41]: the legal-financial view, in the static and dynamic versions; the political-financial view; and the endowment view.

Then we have to insert control variables related to the legal-financial view and the endowment view, while the political-financial view was already represented by the indicator of governance.

---

[40]For example, in Demirguc-Kunt, Laeven and Levine (2003) regulation becomes insignificant in explaining banking performance when checking for institutional indicators.

[41] Different approaches have been proposed to explain the country choice between a bank-based model and a market-based model: the "legal approach" of La Porta, Lopez–de-Silanes, Shleifer and Vishny (1997) and (1998); the "economic approach" of Rajan and Zingales (2000); and the "political economy approach" of Pagano and Volpin (2000) and Verdier (2001), Rosenbluth and Schaap (2001), Carney (2002), Perotti and von Thadden (2003).

Furthermore, as the above descriptive analyses pointed out, the concentration of powers seems more peculiar to the European context. The *geographical factor* might also be important, in terms of location in Europe. Besides, also the endowment view variable indicates a geographical location.

Finally, we asked ourselves whether the decision of policymakers to increase the degree of unification of supervisory powers might depend on the dimension of their respective countries (*economic factor*). Following the same line of reasoning, we could expect a positive relationship between OECD membership, as indicative of the levels of economic growth, on one hand, and financial supervision unification on the other.

5. The Empirical Results

To test the different views concerning the determinants of financial supervision architectures we can use the following general specification (2):

$$
\begin{aligned}
(FAC)_i = \beta_0 &+ \beta_1 (CBFA)_i + \beta_2 (\text{GDP})_i \\
&+ \beta_3 (OECD)_i + \beta_4 (\text{MVB})_i + \beta_5 (\text{MCAP}) + \beta_6 (\text{GGOV}) \\
&+ \beta_7 (EU) + \beta_8 (LAT) + \beta_9 (LEN) + \beta_{10} (\text{LFR}) + \beta_{11} (LGS) + \varepsilon_t
\end{aligned}
\tag{2}
$$

with country[42] $i = 1 \ldots 88$.

Where the independent variables are the following[43]:

1. **CBFA :** variable for the institutional view. It is the index of involvement of the central bank in supervision[44];

2. **GDP = Gross Domestic Product:** quantitative variable for the economic factor[45];

3. **OECD** = qualitative variable for the economic factor. It is a dummy that signals whether a given country is a member of the OECD or not;

---

[42] The country sample depends on the availability of institutional data. Given the 267 world countries (UN members are 180), our 89 countries represent 60 percent of world GDP and 82 percent of the world population.

[43] The correlation matrix for the variables is in Table 2.

[44] Masciandaro (2005b): for each country, and given the three traditional financial sectors (banking, securities and insurance), the CBFA index is equal to: 1 if the central bank is not assigned the main responsibility for banking supervision; 2 if the central bank has the main (or sole) responsibility for banking supervision; 3 if the central bank has responsibility in any two sectors; 4 if the central bank has responsibility in all three sectors. In evaluating the role of the central bank in banking supervision, we considered the fact that, whatever the supervision regime, the monetary authority has responsibility in pursuing macro financial stability[44]. Therefore, we chose the relative role of the central bank as a rule of thumb: we assigned a greater value (2 instead of 1) if the central bank is the sole or principal institution responsible for banking supervision.

[45] World Bank, 2003, *World Development Indicators*. For each variable we calculate the mean of four time values: 1996, 1998, 2000, 2002.

4. MvB = Market vs Bank Index: qualitative variable for the market view. It is a dummy that expresses the financial system of a given country, market-based versus bank-based [46];

5. MCAP = Market capitalization/GDP: quantitative variable for the market view. It shows a measure of the securities market size, relative to GDP[47];

6. GGOV = Good Governance: quantitative variable for the political view. It shows the structural capacity of the government to formulate and implement sound policies. Furthermore the index can represent the control variable for the politics and finance view[48];

7. EU = binary variable for the geographical view. It is a dummy that signals whether a given country is European or not;

8. LAT = quantitative variable for the geographical view and for the law endowment view . The variable is calculated as the absolute value of the latitude of the country, scaled to take values between 0 and 1[49].

9-11. LEN LFR,LGS = binary variables for the law view. They are dummies that indicate the legal root of a given country, representing the control variables for the law and finance view[50];

Tables 3 and 4 show the Logit and Probit estimates of Equation (1). In the multinomial ordered models the impact of a change in an explanatory variable on the estimated probabilities of the highest and lowest of the order classifications—in our case the Single Authority model and the "pure" Multi-supervisory model—is unequivocal: If β_j is positive, for example, an increase in the value of x_j increases the probability of having the Single Authority model, while it decreases the probability of having the "pure" Multi-supervisory model.

---

[46] The index is calculated using different banking and financial variables: see Demigüç-Kunt and Levine (1999). For each variables we calculate the mean of four time values: 1996,1998, 2000, 2002.

[47] World Bank, 2003, *World Development Indicators*, Stock Markets 5.3. For each variable we calculated the mean of four time values: 1996, 1998, 2000, 2002. Note that the correlation index between the financial regime variable (MvB) and the market capitalization variable (mcap) is high, but their influence on the dependent variable is very low.

[48] The index is built using all the indicators proposed by Kaufmann et al. (2003). They define (public) governance as the exercise of authority through formal and informal traditions and institutions for the common good, thus encompassing: 1) the process of selecting, monitoring and replacing governments; 2) the capacity to formulate and implement sound policies and deliver public services; 3) the respect of citizens and the state for the institutions that govern economic and social interactions among them. Furthermore, for measurement and analysis purposes, these three dimensions of governance can be further unbundled to produce two measurable concepts for each of the dimensions above, for a total of six components: 1) voice and external accountability; 2) political stability and lack of violence; 3) government effectiveness; 4) lack of regulatory burden; 5) rule of law; 6) control of corruption. The authors present a set of estimates of these six dimensions of governance for four time periods: 1996,1998,2000,2002. For every country, therefore, we first calculate the mean of the four time values for each dimension of governance; then we build up an index of global good governance in the period 1996-2002, calculating the mean of the six different dimensions

[49] La Porta, Lopez de Silanes, Schleifer, Vishny (1999). On the endowment view, also see Beck, Demirguc-Kunt and Levine (2001).

[50] Beck, Demirguc-Kunt and Levine (2001). There are five legal roots: Anglo-Saxon Law (=Common Law), French, German and Scandinavian Laws (=Civil Laws), Socialist Law (Others); we put together German & Scandinavian roots, and we skip one root – choosing the Socialist Laws, as the least significant from an economic point of view – to avoid multi-collinearity problems.

The results of the estimates show the robustness of the role of central bank involvement in explaining the degree of supervision unification. In fact, the probability of a single financial authority is always inversely and significantly related to the involvement of the central bank.[51]

Looking at the other variables, the probability that a country will move toward a Single Authority model is higher: 1) the smaller the overall size of the economy[52]; 2) when the jurisdiction adopts the Civil Law, particularly if the legal framework is characterized by German and Scandinavian roots[53].

To test the robustness of the results, we modified the dependent variable, eliminating the weights attributed to the banking and financial markets with respect to the insurance sector[54]. Tables 5 and 6 show the Logit and Probit estimates. The central bank fragmentation effect is much more stronger, and also the German and Scandinavian roots confirm their robusteness.

We then tested the robustness of the hypothesis that the institutional factor, i.e. the central bank fragmentation effect, could be considered an independent variable. We had to reject the hypothesis that central bank involvement is endogenous, i.e. that the policymaker determines the level of both financial supervision and central bank involvement based on the same explicative model. We considered central bank involvement as a dependent variable. Tables 7 and 8 report the Logit and Probit estimates. Our conclusion is that the variables that could explain the degree of central bank involvement in financial supervision do not coincide with those we used to analyse the degree of unification. In fact, if you perform Logit and Probit regressions using CBFA as a dependent variable and the same vector of independent variables, the results are inconsistent with the previous ones.

How should the results be interpreted? First of all, the analysis confirms the rule-driven path dependence hypothesis. The prior choice of the policymaker regarding "who" should be delegated supervisory policy seems to have consequences on the choice of "how many" institutions to delegate, according to an inverse relationship. The central bank fragmentation effect holds true: The

---

[51]We contrast the qualitative statement of Nolle (2003), who claimed that there is no systematic pattern to the division between single and multiple supervisory regimes.

[52]If we consider the sample of the countries (14) with a Single Supervisor only, the UK seems to be the classic case of "outlier", i.e. the exception in the inverse relationship between the degree of financial supervision consolidation and the financial market dimension. In fact, if the same regressions are performed without the UK all the results are confirmed.

[53]We contrast the empirical results of Masciandaro (2005b), who claimed that – with a smaller sample of 68 countries – also the financial factor and the political factor are significant. Therefore the financial and political factors seem to be sample sensitive explanatory variables.

[54]We use an index (FAC Two) according to the following scale: 5 = Single authority for all three sectors (total number of supervisors = 1); 3 = Single authority for two sectors (total number of supervisors = 2); 1 = Independent specialized authority for each sector (total number of supervisors = 3).

more the central bank is involved in financial supervisory powers, the lower the degree of concentration of those powers is likely to be. The econometric analysis confirms the descriptive trade-off between supervision unification and central bank involvement. The institutional factor matters.

Secondly, the choice of the degree of supervisory unification is influenced by the dimension of the economic systems. More specifically, the lower the overall economic size, the more likely it seems that the probability of consolidation will increase, confirming the hypothesis of policymakers conditioned by the "small country" situation[55]. We confirm the size effect, using the population variable instead of the gross domestic product variable (Table 9). The small country effect captures the fact that with relatively few people the expertise in financial supervision is likely to be in short supply, so this expertise might be more effectively utilized if it is concentrated in a single financial agency. The economic size factor matters.

Thirdly, the legal factor matters. This law effect is puzzling. The legal and financial literature claims the existence of a strong relationship between market-oriented financial systems and Common Law jurisdictions. Here, we do not find that financial supervision unification is directly correlated with market-based regimes, while a link exists with the Civil Law root, in particular with the German and Scandinavian legal systems. This suggests a sort of "legal neighbour" effect. In order to test further the robustness of the legal neighbour effect, we used another country law classification[56] , with different German and Scandinavian law jurisdictions[57] (Table 10). The legal effect still holds.

6. A Further Step: Financial Supervision Unification and Central Bank Independence

Masciandaro and Freytag (2006) did a further step: they try to assess the influence of the central bank's overall institutional nature on the concentration of the financial sector supervision. Two competing hypotheses are developed:

- First, the level of monetary independence can be useful to evaluate the legal dimension of the overall central bank reputation endowment. High reputation can encourage policymakers to give

---

[55]It has been noted that the small country effect holds, notwithstanding we do not include in our sample the eight very small countries (see note 17) that introduce the unified financial authorities.
[56]Pistor (2000) instead of La Porta et al. (1998).
[57]In La Porta et al (1999) the German and Scandinavian jurisdictions are: Austria, Denmark, Finland, Germany, Iceland, Japan, Korea, Norway, and Sweden. For historical reasons Pistor (2000) also includes: Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, and the Slovak Republic.

the central bank much authority in supervision, i.e to choose the path B described in Figure 1. Thus, the higher the monetary independence, the higher central bank involvement, the lower FAC.

- Alternatively, the level of monetary independence can be utilized to measure the specific legal bureaucratic power of the central bank. If this power is high, the bank will be circumvented by the policymaker (path A in Figure 1) and not given a big role in financial supervisory setting. Therefore, the higher the monetary independence, the lower the bank's involvement, the higher FAC.

In this manner the potential role of the central bank independence can be evaluated. In fact, the central bank involvement variable may hide the importance of the central bank's degree of independence, that can alternatively enforces its reputation endowment or strengthened its bureaucratic power. Therefore, the question is: does central bank independence matter in defining the level of financial supervision consolidation? The expected sign of the relationship is an empirical question; it could be positive or negative, depending on the relative role of the bureaucracy effect respect to the reputation endowment effect

To test the robustness of the statistical relationship between central bank independence and financial supervision unification we used the three different indexes of central bank independence: the Cukierman index (CUK)[58] , the Grilli Masciandaro Tabellini index (GMT)[59] and

---

[58] Cukierman's (1992) proposed an index of central bank independence (LVAU), using 16 criteria which are grouped under four main headings:

First heading (CEO, chief executive officer): it contains proxies for (i) the length of the term of office of the governor; (ii) the entity delegated to appoint him/her; (iii) the provisions for his/her dismissal; (iv) and his/her ability to hold another office.

Second heading (PF, policy formulation): it contains proxies for (v) the entity responsible for formulating monetary policy; (vi) the rules concerning the resolution of conflicts between the central bank and the government; and (vii) the degree of the bank's participation in formulating the government budget.

Third heading (OBJ, objectives of the central bank): it contains proxies for (viii) the provisions of charters regarding primary monetary objectives—and the relative role of monetary stability.

Fourth heading (LL, limitations on central bank lending to the government): it contains proxies for (ix) advances and (x) securitized lending; (xi) the authority that has control over the terms (maturity, interest rate and amount) of lending; (xii) the size of the circle of potential borrowers from the central bank; (xiii) the types of limitations on loans, where limits exist; (xiv) the maturity of possible loans; (xv) the limitations on interest rates applicable to these loans; (xvi) and prohibitions on central bank participation in the primary market for government securities. Source: Cukierman (1992), and Arnone, Laurens and Segalotto (2006). See also Jacome and Vazquez (2005), that extended the Cukierman index to a regional sample of developing countries.

We use the CUK index calculated in Cukierman, Miller and Neyapti (2002). Total sample = 56 countries.

[59] Grilli, Masciandaro and Tabellini (1991) (GMT) proposed an index of central bank independence by building two additive legal measures: political autonomy and economic autonomy.

Political autonomy is the ability of the central bank to select the final objectives of monetary policy. GMT assign to the central banks one point for each of the following eight criteria if satisfied: (i) the governor is appointed without government involvement; (ii) the governor is appointed for more than five years; (iii) the board of directors is appointed without government involvement; and (iv) it is appointed for more than five years; (v) there is no mandatory

the Freytag index (FRE)[60]. We have indexes of central bank independence for 63 countries (Table 11).

Now the specification of the regression - where the new independent variable is the index of central bank independence - is represented by equation (3):

$$(FAC)_i = \beta_1(CBFA)_i + \beta_2(CBI\ ) \qquad\qquad + \beta_4(MvB)_i$$
$$+ \beta_5(mcap)_i + \beta_6(goodgov)_i + \beta_7(gdp) + \beta_8(OECD)$$
$$+ \beta_9(Europe) + \beta_{10}(AnglosaxonL) + \beta_{10}(FrenchL) + \beta_{11}(GermanScandL) +$$
$$\beta_{12}(Latitude) + \varepsilon_t$$

---

participation of government representatives in the board; (vi) no government approval is required in formulating monetary policy; (vii) there are requirements in the charter forcing the central bank to pursue monetary stability amongst its primary objectives; and (viii) there are legal protections that strengthen the central bank's position in the event of a conflict with the government.

The economic autonomy index is an index of autonomy in the selection of instruments, and the central bank gets one point for each of the following criteria if satisfied: (i) there is no automatic procedure for the government to obtain direct credit facilities from the central bank; (ii) direct credit facilities to the government are extended at market interest rates; (iii) the credit is extended on a temporary basis; (iv) and for a limited amount; (v) the central bank does not participate in the primary market for public debt; (vi) the central bank is responsible for setting the discount rate; and (vii) the central bank has no responsibility for overseeing the banking sector (two points) or shares this responsibility with other institutional entities (one point). Sources: Grilli, Masciandaro and Tabellini 1991, Arnone, Laurens and Segalotto (2006)

We modify the data of Arnone, Laurens and Segalotto (2006). They calculated an updated of the Grilli Masciandaro Index of political and economic independence for 40 countries. For each country, we didn't use the information on central bank responsibility for banking supervision (to avoid multi-collinearity risks with the CBFA index). Then for each country, the index is calculated as the total sum of the points the central bank earned under every criterion, divided on the total number of components (fourteen, eight for the political independence, six for the economic independence). Total sample = 28 countries.

[60] Freytag (2001) proposed an index of central bank independence, using six criteria (8 components):

Stated objectives of monetary policy. A clear definition of the objective of monetary policy in the legal foundation of monetary regime, namely price stability, makes it easier for the central bank to refuse demands to combat unemployment or to finance public spendings via money growth. Thus, commitment varies with the kind and number of legally prescribed objectives (component *obj).*

Locus of legal commitment. The commitment to stability has to be put into a legal framework. This legal framework can be fixed on different constitutional levels. The more difficult a change of the regime is for the government, the higher is the commitment (component *const).*

Discretionary power belonging to the government. The more the government keeps control over instruments such as exchange rates, interest rates, open market policy and so on, the less it commits to stability (component *gov).*

Conditions of appointment and dismissal of monetary policymakers. First, the question is who is able to become chief executive officer (CEO), especially whether only a reputed expert or any other person can be appointed (component *ceo).* Second, how is a potential dismissal organised (component *diss)?*

Conditions of lending to the government. An important factor determining the level of legal commitments is a provision on lending fresh money to the government (component *limcred).* Even central bank holding of government bonds purchased on the secondary market (component *limsec)* has fiscal effects as long as the seigniorage is added to public revenues. Thus, the level of commitment is the lower, the easier it is for the government to borrow money from the monetary institution.

Accountability of *the central bank.* The level of commitment is higher, the better the public is informed about monetary policy (component *acc).*

For each country, the index is calculated as the total sum of the points the central bank earned under every component, divided on the number of components (eight). Total sample = 47 countries.

First of all, we test the effect of the central bank independence on supervision unification, comparing the three indexes with a (small) homogeneous sample of countries: for only 22 countries (Table 11) we have all the three indexes. Looking at the correlation matrix (Table 12) we noted that there is low correlation among the indexes. The discrepancy in measurements of central bank independence was already noted[61] . The methodological spread reduces the possibility of making definite comparison of the empirical results.

Having these *caveat* in mind, Tables 13 shows the Logit estimates (the Probit results are quite similar). Now, given the small sample, without inserting any central bank independence index, the inverse relationship between central bank involvement and supervision unification still holds, but now it is not significant. The effect of the independence of central bank is mixed.

With the Cukierman index both the central bank involvement and the central bank independence are inversely and significantly related to the supervision consolidation.. With the Freytag index both the institutional indicators show an inverse relationship with the supervision unification , but only the central bank involvement is significant. Finally, with the GMT index the central bank involvement and the central bank independence are inversely related with financial unification, but the relationship it is not significant.

Secondly, in order to have more observations, we performed other regressions using for each central bank independence index all the available data (Table 13).

Now, with the Cukierman index (56 observations) both the central bank involvement and the central bank independence are inversely related to the supervision consolidation. but the relationships are not significant. With the Freytag index (47 observations) both the institutional indicators show inverse and now significant relationships with the supervision unification. With the GMT index (28 observations) only the central bank involvement matters.

In conclusion, the role of central bank involvement in supervision in explaining the consolidation process still holds when its level of monetary independence is taking in account. However in this field more empirical research is warranted.

---

[61] Mangano (1998), Arnone, Laurens and Segalotto (2006).

6. Conclusions

The objective of this paper was to review the recent literature that explores how the institutional position of the central bank can influences the recent tendency to unify the powers of financial supervision.

Looking for common determinants in the decision each country takes to maintain or reform its supervisory architecture, this empirical analysis highlights that the level of financial supervision consolidation depends on the central bank involvement in supervision In this respect, in an institutional setting characterized by a central bank deeply and credibly involved in supervision a multi-authorities model seems to be likely to occur. The central bank fragmentation effect does matter. The role of central bank involvement in supervision still holds when its level of monetary independence is taking in account. Furthermore, the probability that a country will move toward a unified model is higher: the smaller the overall size of the economy; when the legal framework is characterized by German and Scandinavian roots. Therefore also the economic size view and the law view matter.

The results seem particularly promising for future research. It will be important to make an in-depth analysis of the determinants of the central bank fragmentation effect. In this paper, the central bank fragmentation effect is an independent variable used in explaining the supervision unification level. The next step forward will be to consider the degree of central bank involvement as a dependent variable, in order to identify consistent proxies of the potential different causes (blurring hazard effect, bureaucracy effect, reputation endowment effect) that could explain the decision of policymakers to maintain or reform the supervisory responsibility of the monetary authority.

7. References

* Abrams, R.K., Taylor, M.W., 2002. Assessing the case for unified sector supervision. FMG Special Papers n.134, Financial Markets Group, LSE, London.

* Alesina, A., Tabellini, G., 2003. Bureaucrats or politicians?. Discussion Paper n.2009, Harvard Institute of Economic Research, Harvard University, MA.

* Arnone, M., B.J. Laurens and J.F. Segalotto, 2006, "Measures of Central Bank Autonomy: Empirical Evidence for OECD and Developing Countries, and Emerging Market Economies," IMF Working Paper-forthcoming, Washington: IMF.

* Balogh, L., 2005, Hungary, in D. Masciandaro (ed.), The Handbook of Central Banking and Financial Authorities in Europe, Edward Elgar, Cheltenham.

* Barth, J.R., Nolle, D.E., Phumiwasana T., Yago, G., 2003. A cross country analysis of the bank supervisory framework and bank performance. Financial Markets, Institutions & Instruments, vol. 12, n.2, 67-120.

* Bebchuk, L.A., Roe, M.J., 1999. A theory of path dependence in corporate ownership and governance. Stanford Law Review, vol.52, n.1, 127-170.

* Beck, T., Demirgüç-Kunt, A., Levine, R., 1999. A new database on financial development and structure. Policy Research Working Paper n. 2146, World Bank, Washington D.C.

* Bjerre-Nielsen, B., 2004. The Financial Regulatory and Supervisory Authority. A principal and an agent. Financial Services Authority, Copenhagen, Denmark, mimeo.

* Bjerre – Nielsen, H., 2005, Denmark, in D. Masciandaro (ed.), The Handbook of Central Banking and Financial Authorities in Europe, Edward Elgar, Cheltenham.

* Bonde, I., 2005, Sweden, in D. Masciandaro (ed.), The Handbook of Central Banking and Financial Authorities in Europe, Edward Elgar, Cheltenham.

* Briault, C., 2002. Revisiting the rationale for a single national financial services regulator. Occasional Paper n.16, Financial Services Authority, London.

* Carletti, E, Hartmann, P., 2002. Competition and stability: what's special about banking?. Working Paper Series n.146, European Central Bank, Frankfurt.

* Carney, R., 2002. The political economy of financial systems. Unpublished Ph.D. dissertation, University of California, S.Diego.

* Clark, G.L., Wojcik, D., 2005. Path dependence and the alchemy of finance: the economic geography of the German model, 1997-2003. Environment and Planning, vol. 37, n.10, 1769-1791.

* Cramer, J.S., 2003. Logit Models. Cambridge University Press, Cambridge, UK.

* Cukierman, A., 1992. Central Bank Strategy, Credibility, and Autonomy, Cambridge, Massachusetts: MIT Press.

* Cukierman, A., G. P. Miller and B. Neyapti, 2002. Central Bank Reform, Liberalization and Inflation in Transition Economies – An International Perspective, Journal of Monetary Econ*omics*, Vol. 49, pp. 237-264.

* De Luna Martinez, J., Rose, T.A., 2003. International survey of integrated financial sector supervision. Policy Research Working Paper Series, n.3096, World Bank, Washington D.C.

* Demirgüç-Kunt, A., Levine, R., 1999. Bank based and market based financial systems: cross countries comparisons. Policy Research Working Paper Series, n.2143, World Bank, Washington D.C.

* Demirgüç-Kunt, A., Laeven, L., Levine, R., 2003. Regulations, market structure, institutions, and the cost of financial intermediation.Working Paper n. 9890, National Bureau of Economic Research, Cambridge MA.

* Di Giorgio, G., Di Noia, C., 1999. Should banking supervision and monetary policy tasks be given to different agencies?. International Finance, vol.3, n.2, 361-378.

* Dress, B. and C. Pazarbasioglu, 1998, The Nordic Banking Crisis: Pitfalls in Financial Liberalization?, Occasional Papers, n.161, International Monetary Fund.

* Eijffinger, S.C.W., 2001. Should the European Central Bank be entrusted with banking supervision in Europe?. Briefing Paper on :The Conduct of Monetary Policy and an Evaluation of the Economic Situation in Europe, Committee on Economic and Monetary Affairs, European Parliament, Brussels.

* European Commission, 2002. The follow-up of the second mapping exercise on EU financial conglomerates. Mixed Technical Group on the Prudential Regulation of Financial Conglomerates, European Commission, Brussels.

* Freytag, A. 2001. Does Central Bank Independence reflect monetary commitment properly? Methodological considerations, BNL Quarterly Review, No.217, June, pp.181-208.

* Freytag, A., Masciandaro, D. 2006. Financial Supervision Fragmentation and Central Bank Independence, in D. Masciandaro and M. Quintyn (eds), Designing Financial Supervision Institutions: Independence, Accountability and Governance, Edward Elgar, Cheltenham, (forthcoming).

* Garcia Herrero, A., del Rio, P., 2003. Implication of the design of monetary policy for financial stability. 24th SUERF Colloquium, Tallin. Société Universitaire Européenne de Recherches Financières, Wien.

 * Goodhart, C.A.E, 2004, Financial Supervision from an Historical Perspective: Was the Development of Such Supervision Designed, or largely Accidental?, Conference on the Structure of Financial Regulation, Bank of Finland, mimeo.

* Goodhart, C., Shoenmaker, D, 1995. Should the functions of monetary policy and banking supervision be separated?. Oxford Economic Papers, vol.47, n.4, 539-560.

* Goodhart, C., Shoenmaker, D., 1992. Institutional separation between supervisory and monetary agencies. Giornale degli Economisti e Annali di Economia, Vol.51, n.9-12, 353-439.

* Goodhart, C., Shoenmaker, D., Dasgupta, P., 2002. The skill profile of central bank and supervisors. European Finance Review, vol.6, n.3, 397-427.

* Gourieoux, C (2000), *Econometrics of Qualitative Dependent Variables*, Cambrdige University Press, Cambridge.

* Greene, W., 1997. Econometric Analysis. Upper Saddle River, Prentice Hall, New Jersey.

* Grilli, V., D. Masciandaro, and G. Tabellini, 1991. Political and Monetary Institutions and Public Financial Policies in the Industrial Countries, Economic Policy, Vol. 13, pp. 341-92.

* Grunbicher, A., Darlap, P., 2003. Integration of European supervisory systems: harmonisation or unification?. SUERF Seminar, Malta. Société Universitaire Européenne de Recherches Financières, Wien.

* Grunbicher, Andreas, 2005, Austria: Financial Market Authority, in D. Masciandaro (ed.), The Handbook of Central Banking and Financial Authorities in Europe, Edward Elgar, Cheltenham.

* Hakes, D.R., 1988. October 1979: Did the Federal Reserve change policy objectives?. Journal of Economics and Business, vol. 40, n.2, 159-168.

* Hakes, D.R., 1990. The objectives and priorities of monetary policy under different Federal Reserve Chairman. Journal of Money, Credit and Banking, vol. 22, n.3, 327-337.

* Halvorsen, M. G., 2001, Process of Merging Different Supervisory Agencies, Conference on the Challenges of Unified Financial Supervision, Central Bank of Estonia, Tallinn, mimeo.

* Haubrich, J.G., 1996. Combining bank supervision and monetary policy. Economic Commentary, Federal Reserve Bank of Cleveland, November.

* Jacome L.I. and F. Vazquez, 2005. Any Link between Legal Central Bank Independence and Inflation? Evidence from Latin America and the Caribbean, IMF Working Paper, n. 75, Washington: IMF.

* Kahn, C.M., Santos, J.A.C., 2005. Allocating bank regulatory powers: lender of last resort, deposit insurance and supervision. European Economic Review, vol. 49, n.8, 2107-2136.

* Kaufmann, D., Kraay, A., Mastruzzi, M., 2003. Governance matters III: governance indicators 1996-2002. Policy Research Working Paper Series, n.3106, World Bank, Washington D.C.

* Lannoo, K., 2000. Challenges to the structure of financial supervision in the EU. 22nd SUERF Colloquium, Wien. Société Universitaire Européenne de Recherches Financières, Wien.

* La Porta, R., Lopez de Silanes, F., Shleifer, A., Vishny, R.W., 1998. Law and finance, Journal of Political Economy, vol. 106, n.6, 1113-1155.

* La Porta, R., Lopez de Silanes, F., Shleifer, A., Vishny, R.W., 1997. Legal determinants of external finance, Journal of Finance, vol. 52, n.3, 1131-1150.

* Lastra, R, 2006. Legal Foundation of International Monetary Stability, Oxford University Press, Oxford.

* Liive, L., 2005, Estonia, in D. Masciandaro (ed.), The Handbook of Central Banking and Financial Authorities in Europe, Edward Elgar, Cheltenham,.

* Llewellyn, D.T., 2004. Institutional structure of financial regulation and supervision: the basic issues. In: Fleming A., Llewellyn D.T. and Carmichael J. (Eds.), Aligning Financial Supervision Structures with Country Needs, World Bank Publications, Washington D.C, pp. 19-85.

* Maddala, G.S., 1983. Limited Dependent and Qualitative Variables in Econometrics. Cambridge University Press, Cambridge, UK.

* Mangano G., 1998. Measuring Central Bank Autonomy: A Tale of Subjectivity and of its Consequences, Oxford Economic Papers, Vol.50, pp.468-492.

* Marcussen M., 2006. Institutional Transformation? The Scientization of Central Banking as a Case Study, in T. Christensen and P. Laegreid (eds.), Autonomy and Regulation, Edward Elgar, Cheltenham, pp. 81-109.

* Masciandaro, D. 2006. Divide et Impera: Financial Supervision Unification and the Central Bank Fragmentation Effect, European Journal of Political Economy, (forthcoming).

* Masciandaro, D (ed.). 2005a. Handbook of Central Banking and Financial Supervision in Europe, Edward Elgar, Cheltenham, pp. 160-175.

* Masciandaro, D., 2005b. E pluribus unum? Authorities design in financial supervision: trends and determinants. Open Economies Review, vol.17,n.1, 73-102.

* Masciandaro, D., 2004. Unification in financial sector supervision: the trade off between central bank and single authority. Journal of Financial Regulation and Compliance, vol.12, n.2, 151-169.

* Masciandaro, D., 1993. Central bank independence, banking supervision and inflation. Working Paper n.53, IGIER, Bocconi University, Milan.

* Masciandaro, D., Porta, A., 2004. Single authority in financial market supervision: lessons for EU enlargement. In: Masciandaro, D. (Ed.), Financial Intermediation in the New Europe. Edward Elgar, Cheltenham, pp. 284-320.

* Mwenda, K. and A. Fleming, 2001, International Development in the Organizational Structure of Financial Services Supervision, Conference on the Challenges of Unified Financial Supervision, Central Bank of Estonia, Tallinn, mimeo.

* Nolle, D.E., 2003. The structure, scope, and independence of bank supervision: an international comparison. Quarterly Journal, Office of the Comptroller of the Currency, vol.22, n.1, pp.21-33.

* Oosterloo, S., De Haan, J., 2003. A survey of institutional frameworks for financial stability. Occasional Studies, vol. 1, n. 4, De Nederlandsche Bank, Amsterdam.

* Padoa Schioppa, T., 2003. Financial supervision: inside or outside central banks. In: Kremers, J., Shoenmaker, D. and Wierts, P. (Eds.), Financial Supervision in Europe, Edward Elgar, Cheltenham, pp. 160-175.

* Pagano, M., Volpin, P., 2005. The political economy of corporate governance. American Economic Review, vol. 95, n.4, 1005-1030.

* Peek, J., Rosengren, E.S., Tootle, G.M.B., 1999. Is bank supervision central to central banking?. Quarterly Journal of Economics, vol.114, n.2, 629-653.

* Perotti, E., von Thadden, E.L., 2003. The political economy of bank and equity dominance. Discussion Paper n.3914, CEPR, London.

* Pistor, K., 2000. Patterns of legal change: shareholder and creditor rights in transition economies. EBRD Working Paper, n. 49, European Bank for Reconstruction and Development, London.

* Potts, G.T., Luckett, D.G., 1978. Policy objectives of the Federal System. Quarterly Journal of Economics, vol.92, n.3, 525-5234.

* Prast, H. and I. Van Lelyveld, 2005. The Netherlands, in D. Masciandaro (ed.), The Handbook of Central Banking and Financial Authorities in Europe, Edward Elgar, Cheltenham.

* Quintyn, M., Taylor, M., 2002. Regulatory and supervisory independence and financial stability. IMF Working Paper, n.02/46, International Monetary Fund, Washington D.C.

* Rajan, R., Zingales, L., 2003. The great reversals: the politics of financial developments in the 20th century. Journal of Financial Economics, vol.69, n.1, 5-50.

* Repullo, R., 2000. Who should act as lender of last resort? An incomplete contracts model. Journal of Money, Credit and Banking, vol.32, n.3, 580–605.

* Romer, C., Romer, D., 1989. Does monetary policy matter? A new test in the spirit of Friedman and Schwartz. In: NBER Macroeconomic Annual 1989, MIT Press, Cambridge MA., 121-170.

* Rosenbluth, F., Schaap, R., 2002. The domestic politics of banking regulation. International Organization, vol. 57, n. 2, 307-336.

* Schoenmaker, D., 2003. Financial supervision: from national to European?. Financial and Monetary Studies, NIBE - SVV, vol. 22, no. 1, Amsterdam.

* Schuler, M., 2003. How do banking supervisors deal with Europe-wide systemic risk?. ZEW Discussion Paper, n.03-03. Centre for European Economic Research, Mannheim.

* Schuler, M., 2005, Germany, in D. Masciandaro (ed.), The Handbook of Central Banking and Financial Authorities in Europe, Edward Elgar, Cheltenham.

* Skogstad Aamo, B. , 2005, Norway, in D. Masciandaro (ed.), *The Handbook of Central Banking and Financial Authorities in Europe*, Edward Elgar, Cheltenham.

* Taylor, M. W. and Fleming A., 1999, Integrated Financial Supervision: Lessons from Northern European Experience, Policy Research Working Paper n.2223, The World Bank.

* Toniolo, G., (Ed.), 1988. Central Bank Independence in Historical Perspective. de Gruyter, Berlin–New York.

* Tuya, J., Zamalloa, L., 1994. Issues on placing banking supervision in the central bank. In: Balino, T. and Cottarelli, C. (Eds.), Frameworks for Monetary Stability: Policy Issues and Country Experiences. International Monetary Fund, Washington D.C, pp. 663-690.

* Verdier, D., 2001. Financial capital mobility and the origin of stock markets. International Organization, vol.55, n.2, 327-356.

* Vives, X., 2001. Restructuring financial regulation in the European Monetary Union. Journal of Financial Services Research, vol.19, n.1, 57-82.

* Wallace, M., Warner, J.T., 1985. Fed policy and presidential elections. Journal of Macroeconomics, vol. 6, n.1, 79-88.

* Wooldridge, J.M., 2002. Econometric Analysis of Cross Section and Panel Data. MIT Press, Cambridge MA.

6. Figures and Tables

Figure 1

Determing the Level of Financial Supervision Unification: the Policy Maker Decision Tree

FIRST CHOICE   *SECOND CHOICE*

CBFA level   *FAC level*

HIGH

CB

HIGH

Path D

SFA

LOW

Path B

CB

Policy Maker

HIGH

Path C

SFA

Path A

LOW

LOW
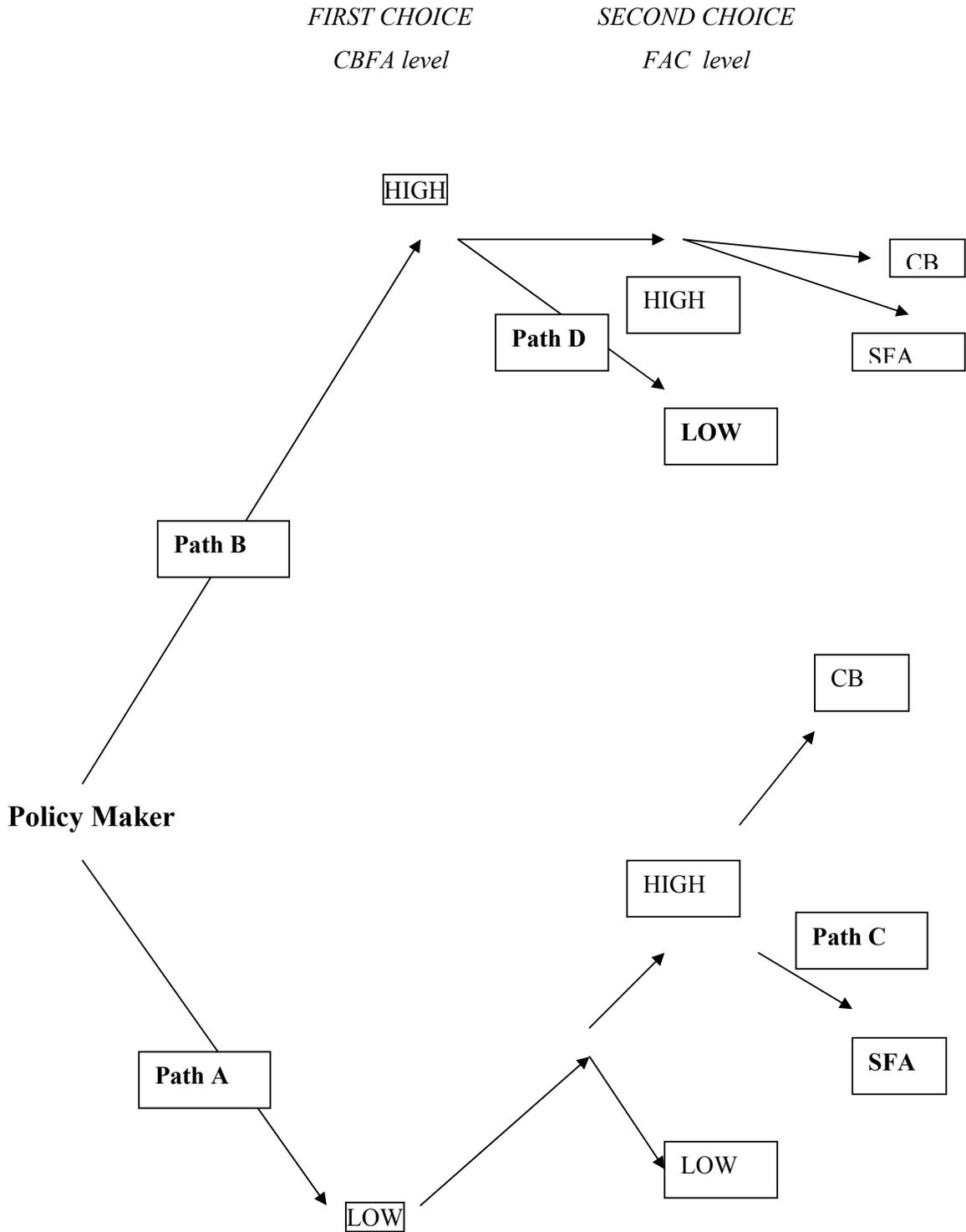
Table 1 Supervisory Authorities in 91 countries: Fax Index and CBFA Index
(year: 2005)

	Countries	Banking Sector (b)	Securities Sector (s)	Insurance Sector (i)	Rating	Weight	FAC INDEX	CBFA INDEX
1	Albania	CB	S	I	1	0	1	2
2	Argentina	CB	S	I	1	0	1	2
3	Australia	BI,S	BI,S	BI,S	5	1	6	1
4	Austria	U, CB	U	U	7	-1	6	1
5	Bahamas	CB	S	I	1	0	1	2
6	Belarus	CB	S	I	1	0	1	2
7	Belgium	U	U	U	7	0	7	1
8	Bolivia	B	SI	SI	3	0	3	1
9	Bosnia	CB,B1,B2	S	I	1	-1	0	2
10	Botswana	CB	S	I	1	0	1	1
11	Brazil	CB	S	CB,I	1	1	2	3
12	Bulgaria	CB	S	I	1	0	1	2
13	Cameroon	B	S	I	1	0	1	1
14	Canada	BI	Ss(**)	BI	3	0	3	1
15	Chile	B	SI	SI	3	0	3	1
16	China	B	S	I	1	0	1	1
17	Colombia	BI	S	BI	3	0	3	1
18	Costa Rica	B	S	I	1	0	1	1
19	Croatia	CB	S	I	1	0	1	2
20	Cyprus	CB	S	I	1	0	1	2
21	Czech Republic	CB	S	I	1	0	1	2
22	Denmark	U	U	U	7	0	7	1
23	Ecuador	BI	S	BI	3	0	3	1
24	Egypt	CB	S	I	1	0	1	2
25	El Salvador	BI	S	BI	3	0	3	1
26	Estonia	U	U	U	7	0	7	1
27	Finland	BS	BS	I	5	0	5	1
28	France	BC,B1,B2,B3	CB,S	I	1	-1+1	1	3
29	Georgia	CB	S	I	1	0	1	2
30	Germany	U,CB	U	U	7	-1	6	1
31	Greece	CB	S	I	1	0	1	2
32	Guatemala	BI	S	BI	3	0	3	1
33	Hong Kong	MA	S	I	1	0	1	_
34	Hungary	U	U	U	7	0	7	1
35	Iceland	U	U	U	7	0	7	1
36	India	CB,B	S	I	1	-1	0	2
37	Iran	CB	CB	I	5	0	5	3

38	Ireland	CB	CB	CB	7	0	7	4
39	Israel	CB	S,I	I	1	1	2	2
40	Italy	CB,S	CB,S	I	1	1	2	3
41	Jamaica	CB	SI	SI	3	0	3	2
42	Japan	U,CB	U	U	7	-1	6	1
43	Jordan	CB	S	I	1	0	1	2
44	Kazakhstan	BC	S	BC	3	0	3	3
45	Kenya	CB	S1, S2	I	1	-1	0	2
46	Korea	U	U	U	7	0	7	1
47	Latvia	U	U	U	7	0	7	1
48	Lebanon	B, CB	CB	I	1	1	2	3
49	Libya	CB	SI	SI	3	0	3	2
50	Lithuania	CB	S	I	1	0	1	2
51	Luxembourg	BS	BS	I	5	0	5	1
52	Macedonia	CB	S	-	1	0	1	2
53	Malaysia	CB	S	CB	3	0	3	3
54	Malta	U	U	U	7	0	7	1
55	Mauritius	CB	SI	SI	3	0	3	2
56	Mexico	BS	BS	I	5	0	5	1
57	Moldova	CB	S	I	1	0	1	2
58	Morocco	CB, BI	S	BI	3	-1	2	2
59	Netherlands	CB,S	CB,S	I,S	1	1	2	3
60	New Zealand	CB	S	I	1	0	1	2
61	Nicaragua	U	U	U	7	0	7	1
62	Norway	U	U	U	7	0	7	1
63	Pakistan	CB	SI	SI	3	0	2	3
64	Panama	B	S	I	1	0	1	1
65	Peru	BI	S	BI	3	0	3	1
66	Philippines	CB	CB,S	I	1	1	2	3
67	Poland	B	B,S	I1,I2	1	1-1	1	1
68	Portugal	CB	CB,S	I	1	1	2	3
69	Romania	CB	S	I	1	0	1	2
70	Russia	CB	S	I	1	0	1	2
71	Saudi Arabia	MA	MA	MA	7	0	7	_
72	Singapore	MA	MA	MA	7	0	7	_
73	Slovak Republic	CB	SI	SI	3	-1	2	2
74	Slovenia	CB	S	I	1	0	1	2
75	South Africa	CB	SI	SI	3	0	3	2
76	Spain	CB.Bs(**)	CB,S	I	1	1-1	1	3
77	Sri Lanka	CB	S	I	1	0	1	2
78	Sweden	U	U	U	7	0	7	1
79	Switzerland	BS	BS	I	5	0	5	1
80	Thailand	CB	S	I	1	0	1	2
81	Trinidad Tobago	CB	S	I	1	0	1	2
82	Tunisia	CB	S	I	1	0	1	2
83	Turkey	B	S	I	1	0	1	1

84	Ukraine	CB	S	-	1	0	1	2
85	UAE	CB	S	I	1	0	1	2
86	UK	U	U	U	7	0	7	1
87	USA	CB,B	S,Ss**	I,Is(**)	1	-1	0	2
88	Uruguay	BS, BC	BS, BC	I, BC	5	1	6	4
89	Venezuela	B	S	I	1	0	1	1
90	Vietnam	CB	S	I	1	0	1	2
91	Zimbabwe	CB	S	I	1	0	1	2

The initials have the following meaning: B = authority specialized in the banking sector; BI = authority specialized in the banking sector and insurance sector;   CB = central bank; G= government; I = authority specialized in the insurance sector; MA = Monetary Authority; S = authority specialized in the securities markets; U = single authority for all sectors ; BS = authority specialized in the banking sector and securities markets;; SI = authority specialized in the insurance sector and securities markets.

(*) (b) = banking or central banking law; (s) = security markets law; (i) = insurance law

(**) = state or regional agencies

Table 2 Correlation Matrix

	fac	cbfa	mvb	mktcap	goodgov	gdp	eu	ocse	common	civil	latitude
fac	1.0000										
cbfa	-0.3332	1.0000									
mvb	0.0986	0.0173	1.0000								
mktc.	0.2480	0.0052	0.5043	1.0000							
goodg.	0.4529	-0.0955	0.1997	0.6142	1.0000						
gdp	-0.0116	-0.0137	0.2156	0.2931	0.2675	1.0000					
eu	0.3150	0.0083	-0.0145	0.2252	0.5719	0.0109	1.0000				
ocse	0.3987	-0.1424	0.3045	0.4616	0.7491	0.3262	0.5569	1.0000			
com.l.	-0.0695	0.2045	0.2928	0.2955	0.1543	0.1732	-0.1320	-0.0081	1.0000		
civil	0.2598	-0.2026	-0.1181	-0.0121	0.1437	-0.0149	0.0613	0.1755	-0.5188	1.0000	
latit.	0.3218	-0.0639	0.0886	0.1975	0.4941	0.0924	0.5492	0.5417	-0.2062	-0.1529	1.0000

Table 3 Ordered Logit Estimates with Different Model Specification

Ordered logit estimates

	LR chi2(3)	=	21.75			
	Prob > chi2	=	0.0001			
Log likelihood = -138.81489			Pseudo R2	=	0.0727	

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.6613361	.2893015	-2.29	0.022**	-1.228357	-.0943156
gdp	-.000502	.0002124	-2.36	0.018***	-.0009184	-.0000857
oecd	1.636629	.4590119	3.57	0.000***	.7369821	2.536276

Ordered logit estimates

	LR chi2(5)	=	24.03			
	Prob > chi2	=	0.0002			
Log likelihood = -137.67466			Pseudo R2	=	0.0803	

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.6937398	.2924015	-2.37	0.018***	-1.266836	-.1206434
gdp	-.0005383	.0002163	-2.49	0.013***	-.0009622	-.0001143
oecd	1.369436	.4944646	2.77	0.006***	.4003032	2.338569
mvb	-.1446852	.5362871	-0.27	0.787	-1.195789	.9064182
mcap	.7375556	.516741	1.43	0.153	-.2752381	1.750349

Ordered logit estimates

	LR chi2(6)	=	27.77	
	Prob > chi2	=	0.0001	

Log likelihood = -135.80782   Pseudo R2   =   0.0927

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.6826936	.2926257	-2.33	0.020**	-1.256229	-.1091578
gdp	-.0005381	.0002174	-2.47	0.013***	-.0009643	-.000112
oecd	.4731604	.6727706	0.70	0.482	-.8454457	1.791767
mvb	.185423	.562584	0.33	0.742	-.9172213	1.288067
mcap	.0750232	.6116156	0.12	0.902	-1.123721	1.273768
ggov	.864617	.4518116	1.91	0.056**	-.0209174	1.750151

Ordered logit estimates   Number of obs =   88

LR chi2(8)   =   28.02

Prob > chi2   =   0.0005

Log likelihood = -135.68201   Pseudo R2   =   0.0936

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.7181027	.303544	-2.37	0.018***	-1.313038	-.1231674
gdp	-.0005231	.0002217	-2.36	0.018***	-.0009576	-.0000885

	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
oecd	.3610558	.7550083	0.48	0.632	-1.118733	1.840845
mvb	.2519746	.5790772	0.44	0.663	-.8829959	1.386945
mcap	.0935159	.6130718	0.15	0.879	-1.108083	1.295115
ggov	.8225638	.4723871	1.74	0.082*	-.103298	1.748426
eu	.3247743	.6538537	0.50	0.619	-.9567555	1.606304
lat	-.2831383	1.384304	-0.20	0.838	-2.996324	2.430048

Ordered logit estimates Number of obs = 88

LR chi2(11) = 43.15

Prob > chi2 = 0.0000

Log likelihood = -128.11797 Pseudo R2 = 0.1441

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.5469927	.3202533	-1.71	0.088*	-1.174678	.0806923
gdp	-.0006181	.0002351	-2.63	0.009 ***	-.0010788	-.0001573
oecd	-.0856546	.808181	-0.11	0.916	-1.66966	1.498351
mvb	.2726525	.6227045	0.44	0.661	-.9478258	1.493131
mcap	.6775869	.6378848	1.06	0.288	-.5726443	1.927818
ggov	.1887665	.5255518	0.36	0.719	-.8412962	1.218829
eu	.4574519	.6961968	0.66	0.511	-.9070686	1.821973
lat	1.342584	1.788981	0.75	0.453	-2.163755	4.848923
len	1.050421	.7972013	1.32	0.188	-.5120653	2.612907
lfr	1.447424	.6550381	2.21	0.027 **	.1635731	2.731275
lgs	3.732267	1.06465	3.51	0.000 ***	1.645591	5.818943

Note: * indicates statistical significance at 1 percent; ** indicates statistical significance at 5 percent; * indicates statistical significance at 10 percent.**

Table 4 Ordered Probit Estimates with Different Model Specification

Ordered probit estimates Number of obs = 88

LR chi2(3)   =   22.50

Prob > chi2   =   0.0001

Log likelihood = -138.44242 Pseudo R2   =   0.0751

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.354302	.1521682	-2.33	0.020**	-.6525462	-.0560578
gdp	-.0002973	.000125	-2.38	0.017***	-.0005424	-.0000523
oecd	.9819397	.2693512	3.65	0.000***	.4540211	1.509858

Ordered probit estimates   Number of obs =   88

LR chi2(5)   =   24.89

Prob > chi2   =   0.0001

Log likelihood = -137.24617   Pseudo R2   =   0.0831

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.3708952	.1530135	-2.42	0.015***	-.6707961	-.0709943
gdp	-.0003199	.0001256	-2.55	0.011***	-.0005661	-.0000737
oecd	.8364305	.2918346	2.87	0.004***	.2644453	1.408416
mvb	-.1646299	.3097014	-0.53	0.595	-.7716335	.4423736
mcap	.4773177	.310231	1.54	0.124	-.1307239	1.085359

Ordered probit   estimates   Number of obs =   88

LR chi2(6)   =   29.51

Prob > chi2   =   0.0000

Log likelihood   = -134.93445   Pseudo R2   =   0.0986

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]

	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.3801745	.153554	-2.48	0.013***	-.6811349	-.0792141
gdp	-.0003184	.000125	-2.55	0.011***	-.0005633	-.0000734
oecd	.2795786	.390951	0.72	0.475	-.4866713	1.045829
mvb	.0421757	.3250798	0.13	0.897	-.594969	.6793205
mcap	.0562881	.367344	0.15	0.878	-.6636929	.7762692
ggov	.5490904	.2562975	2.14	0.032**	.0467565	1.051424

Ordered probit   estimates   Number of obs =   88

                             LR chi2(8)   =   29.75

                           Prob > chi2 =   0.0002

Log likelihood   = -134.81504   Pseudo R2   =   0.0994

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.3901655	.1554915	-2.51	0.012***	-.6949232	-.0854077
gdp	-.0003058	.0001276	-2.40	0.017***	-.0005559	-.0000557
oecd	.1947848	.4281151	0.45	0.649	-.6443054	1.033875
mvb	.0644794	.3305185	0.20	0.845	-.583325	.7122838
mcap	.0779471	.3703495	0.21	0.833	-.6479246	.8038189
ggov	.5100276	.2685427	1.90	0.058**	-.0163063	1.036362

eu	.1260332	.3686625	0.34	0.732	-.5965321	.8485985
lat	.1845704	.8008823	0.23	0.818	-1.38513	1.754271

Ordered probit   estimates   Number of obs = 88

LR chi2(11) = 43.24

Prob > chi2 = 0.0000

Log likelihood = -128.07073   Pseudo R2 = 0.1444

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.28307	.1632141	-1.73	0.083*	-.6029637	.0368237
gdp	-.0003621	.0001446	-2.50	0.012***	-.0006455	-.0000786
oecd	-.1214031	.44373	-0.27	0.784	-.9910979	.7482917
mvb	.093148	.3430982	0.27	0.786	-.5793121	.7656081
mcap	.3261519	.3798723	0.86	0.391	-.4183842	1.070688
ggov	.2049159	.3009822	0.68	0.496	-.3849984	.7948301
eu	.268889	.3870119	0.69	0.487	-.4896404	1.027418
lat	1.043016	1.026108	1.02	0.309	-.9681181	3.05415
len	.5038029	.4549164	1.11	0.268	-.3878168	1.395423
lfr	.804417	.3718932	2.16	0.031**	.0755198	1.533314
lgs	1.996772	.5875939	3.40	0.001 ***	.8451091	3.148435

Note: *** indicates statistical significance at 1 percent; ** indicates statistical significance at 5 percent; * indicates statistical significance at 10 percent.

Table 5 Ordered Logit Estimates with Different Dependent Variable: FAC Two

Ordered logit estimates   Number of obs =   88

                          LR chi2(3)   =   27.11

                          Prob > chi2   =   0.0000

Log likelihood = -73.273841   Pseudo R2   =   0.1561

fac2	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-1.294572	.3681852	-3.52	0.000***	-2.016201	-.5729421
gdp	-.0001245	.0002174	-0.57	0.567	-.0005506	.0003016
oecd	1.391962	.5021836	2.77	0.006***	.4077005	2.376224

Ordered logit estimates   Number of obs =   88

                          LR chi2(5)   =   27.99

                          Prob > chi2   =   0.0000

Log likelihood = -72.834034   Pseudo R2   =   0.1612

fac2	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-1.298356	.3674798	-3.53	0.000***	-2.018603	-.5781088
gdp	-.0001434	.0002201	-0.65	0.515	-.0005748	.0002879
oecd	1.248737	.5610262	2.23	0.026**	.1491455	2.348328
mvb	-.2934323	.6220051	-0.47	0.637	-1.51254	.9256752
mcap	.5371573	.5817747	0.92	0.356	-.6031	1.677415

Ordered logit estimates   Number of obs =   88

                          LR chi2(6)   =   30.02

                          Prob > chi2   =   0.0000

Log likelihood = -71.818295   Pseudo R2   =   0.1729

fac2	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-1.290546	.3669208	-3.52	0.000***	-2.009697	-.5713943
gdp	-.000137	.0002191	-0.63	0.532	-.0005664	.0002924
oecd	.5364585	.7457163	0.72	0.472	-.9251185	1.998035
mvb	-.0107184	.6482856	-0.02	0.987	-1.281335	1.259898
mcap	-.0377398	.7028886	-0.05	0.957	-1.415376	1.339897
ggov	.7018134	.4950395	1.42	0.156	-.2684463	1.672073

Ordered logit estimates   Number of obs =   88

                        LR chi2(8)   =   31.23

                  Prob > chi2   =   0.0001

Log likelihood = -71.211851   Pseudo R2   =   0.1799

fac2	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-1.386832	.3811116	-3.64	0.000***	-2.133797	-.6398669
gdp	-.00009	.0002242	-0.40	0.688	-.0005295	.0003494
oecd	.2684627	.7893485	0.34	0.734	-1.278632	1.815557
mvb	.1260285	.6616515	0.19	0.849	-1.170785	1.422842

mcap	.0374977	.7061731	0.05	0.958	-1.346576	1.421572
ggov	.5487001	.5222509	1.05	0.293	-.4748927	1.572293
eu	.7040807	.6721399	1.05	0.295	-.6132893	2.021451
lat	.0117859	1.554831	0.01	0.994	-3.035626	3.059198

Ordered logit estimates   Number of obs = 88

         LR chi2(11) = 46.30

         Prob > chi2 = 0.0000

Log likelihood = -63.677208   Pseudo R2 = 0.2666

fac2	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-1.257641	.4036666	-3.12	0.002***	-2.048814	-.4664694
gdp	-.000237	.0003187	-0.74	0.457	-.0008618	.0003877
oecd	-.2261123	.8738556	-0.26	0.796	-1.938838	1.486613
mvb	.0854618	.7450651	0.11	0.909	-1.374839	1.545763
mcap	.698955	.7187138	0.97	0.331	-.7096981	2.107608
ggov	-.2128258	.5875038	-0.36	0.717	-1.364312	.9386604
eu	1.41158	.7988496	1.77	0.077**	-.1541364	2.977296
lat	.5859334	1.979399	0.30	0.767	-3.293617	4.465484
len	1.378126	.9044008	1.52	0.128	-.3944671	3.150719
lfr	.8732954	.7331861	1.19	0.234	-.563723	2.310314
lgs	4.639878	1.465798	3.17	0.002***	1.766967	7.512789

Note: *** indicates statistical significance at 1 percent; ** indicates statistical significance at 5 percent; * indicates statistical significance at 10 percent.

Table 6 Ordered Probit Estimates with Different Dependent Variable: FAC Two

Ordered probit   estimates   Number of obs =   88

                           LR chi2(3)   =   26.15

                           Prob > chi2 =   0.0000

Log likelihood   = -73.751627   Pseudo R2   =   0.1506

fac2	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.623279	.1725601	-3.61	0.000***	-.9614905	-.2850675
gdp	-.000092	.0001364	-0.67	0.500	-.0003593	.0001753
oecd	.8988691	.2925159	3.07	0.002***	.3255484	1.47219

Ordered probit   estimates   Number of obs =   88

                           LR chi2(5)   =   27.32

                           Prob > chi2 =   0.0000

Log likelihood   = -73.16911   Pseudo R2   =   0.1573

fac2	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.6359874	.1736034	-3.66	0.000***	-.9762438	-.2957311
gdp	-.0001033	.000138	-0.75	0.454	-.0003738	.0001673
oecd	.8223962	.3195926	2.57	0.010***	.1960063	1.448786
mvb	-.2345268	.3619638	-0.65	0.517	-.9439628	.4749092
mcap	.3513451	.3312888	1.06	0.289	-.297969	1.000659

Ordered probit   estimates   Number of obs =   88

                           LR chi2(6)   =   29.97

                           Prob > chi2 =   0.0000

Log likelihood   = -71.845853   Pseudo R2   =   0.1726

fac2	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.6420781	.174057	-3.69	0.000***	-.9832235	-.3009327
gdp	-.0000991	.0001367	-0.72	0.469	-.000367	.0001688
oecd	.34435	.4346345	0.79	0.428	-.5075179	1.196218
mvb	-.0329023	.3820229	-0.09	0.931	-.7816534	.7158489
mcap	-.0115137	.4007189	-0.03	0.977	-.7969084	.7738809
ggov	.462583	.2852295	1.62	0.105	-.0964565	1.021622

Ordered probit   estimates   Number of obs =   88

                     LR chi2(8)   =   30.81

                     Prob > chi2   =   0.0002

Log likelihood   = -71.42178   Pseudo R2   =   0.1774

fac2	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.6668167	.17631	-3.78	0.000***	-1.012378	-.3212555
gdp	-.0000738	.0001385	-0.53	0.594	-.0003452	.0001976
oecd	.2070865	.4685172	0.44	0.658	-.7111904	1.125363

mvb	.0300883	.3884021	0.08	0.938	-.7311659	.7913424
mcap	.0192854	.4056844	0.05	0.962	-.7758413	.8144122
ggov	.39068	.3006592	1.30	0.194	-.1986012	.9799612
eu	.3461358	.3998716	0.87	0.387	-.4375981	1.12987
lat	.0167954	.9321746	0.02	0.986	-1.810233	1.843824

Ordered probit   estimates   Number of obs =   88

                           LR chi2(11)   =   44.89

                           Prob > chi2   =   0.0000

Log likelihood   = -64.384963   Pseudo R2   =   0.2585

fac2	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.5833578	.1887702	-3.09	0.002***	-.9533407	-.2133749
gdp	-.0001391	.0001775	-0.78	0.433	-.000487	.0002088
oecd	-.0168885	.4917328	-0.03	0.973	-.980667	.9468901
mvb	-.0871383	.4188613	-0.21	0.835	-.9080913	.7338147
mcap	.271682	.419	0.65	0.517	-.5495429	1.092907
ggov	-.033162	.3395431	-0.10	0.922	-.6986543	.6323303
eu	.6895392	.4364643	1.58	0.114	-.1659151	1.544994
lat	.3715277	1.185666	0.31	0.754	-1.952336	2.695391
len	.8098356	.5184605	1.56	0.118	-.2063283	1.825999
lfr	.5034533	.4219953	1.19	0.233	-.3236424	1.330549
lgs	2.447427	.706226	3.47	0.001***	1.06325	3.831605

Note: *** indicates statistical significance at 1 percent; ** indicates statistical significance at 5 percent; * indicates statistical significance at 10 percent.

Table 7 Ordered Logit Estimates with Different Dependent Variable: CBFA

Ordered logit estimates

	Number of obs	=	88
LR chi2(3)	=	21.95	
Prob > chi2	=	0.0001	
Log likelihood = -83.43459	Pseudo R2	=	0.1163

cbfa	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
fac	-.4787359	.1277558	-3.75	0.000***	-.7291327	-.2283391
gdp	-.0000342	.0001896	-0.18	0.857	-.0004058	.0003374
oecd	.0137281	.5734157	0.02	0.981	-1.110146	1.137602

Ordered logit estimates

	Number of obs	=	88
LR chi2(5)	=	24.46	
Prob > chi2	=	0.0002	
Log likelihood = -82.182081	Pseudo R2	=	0.1295

cbfa	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
fac	-.5297366	.1393848	-3.80	0.000***	-.8029259	-.2565474
gdp	-.0001203	.0002017	-0.60	0.551	-.0005155	.000275
oecd	-.2617554	.6017599	-0.43	0.664	-1.441183	.9176724
mvb	.2707578	.5936765	0.46	0.648	-.8928268	1.434342
mcap	.7467068	.6115787	1.22	0.222	-.4519653	1.945379

Ordered logit estimates

	Number of obs	=	88
LR chi2(6)	=	24.57	
Prob > chi2	=	0.0004	
Log likelihood = -82.122976	Pseudo R2	=	0.1301

cbfa	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
fac	-.536816	.1406162	-3.82	0.000***	-.8124188	-.2612133
gdp	-.0001231	.000202	-0.61	0.542	-.000519	.0002728
oecd	-.4168286	.7514395	-0.55	0.579	-1.889623	1.055966
mvb	.3252119	.6144761	0.53	0.597	-.8791392	1.529563
mcap	.6288623	.7012161	0.90	0.370	-.745496	2.003221
ggov	.162458	.4730513	0.34	0.731	-.7647054	1.089621

Ordered logit estimates			Number of obs	=	88
	LR chi2(8)	=	27.73		
	Prob > chi2	=	0.0005		
Log likelihood = -80.546458			Pseudo R2	=	0.1468

cbfa	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
fac	-.5623966	.140744	-4.00	0.000****	-.8382498	-.2865434
gdp	-.000046	.0002097	-0.22	0.826	-.000457	.000365
oecd	-.9780707	.8202523	-1.19	0.233	-2.585736	.6295942
mvb	.4817198	.6301577	0.76	0.445	-.7533666	1.716806
mcap	.813678	.7142264	1.14	0.255	-.58618	2.213536
ggov	-.0987557	.4998557	-0.20	0.843	-1.078455	.8809435
eu	1.210676	.7563042	1.60	0.109	-.2716533	2.693005
lat	.2253799	1.468842	0.15	0.878	-2.653498	3.104257

Ordered logit estimates   Number of obs   =   88

LR chi2(11)   =   34.64

Prob > chi2   =   0.0003

Log likelihood = -77.091171   Pseudo R2   =   0.1834

cbfa	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
fac	-.4888376	.1481069	-3.30	0.001	-.7791218	-.1985534
gdp	-.0000871	.0002194	-0.40	0.691	-.000517	.0003429
oecd	-.7633922	.8469823	-0.90	0.367	-2.423447	.8966626
mvb	.2658614	.6943129	0.38	0.702	-1.094967	1.62669
mcap	.6726121	.7446222	0.90	0.366	-.7868205	2.132045
ggov	-.2688234	.5399781	-0.50	0.619	-1.327161	.7895142
eu	1.271503	.793117	1.60	0.109	-.2829782	2.825983
lat	1.91368	1.963907	0.97	0.330	-1.935506	5.762866
len	1.229999	.8426695	1.46	0.144	-.4216031	2.881601
lfr	.4390666	.6812874	0.64	0.519	-.8962322	1.774365
lgs	-33.90102	1.39e+07	-0.00	1.000	-2.72e+07	2.72e+07

note: 9 observations completely determined. Standard errors questionable.

Note: * indicates statistical significance at 1 percent; ** indicates statistical significance at 5 percent; * indicates statistical significance at 10 percent.**

Table 8 Ordered Probit Estimates with Different Dependent Variable: CBFA

Ordered probit   estimates   Number of obs =   88

LR chi2(3)   =   15.24

Prob > chi2   =   0.0016

Log likelihood   = -86.792079 Pseudo R2   =   0.0807

cbfa	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
fac	-.2189376	.0643722	-3.40	0.001***	-.3451047	-.0927705
gdp	-.0000204	.000118	-0.17	0.863	-.0002516	.0002108
oecd	-.0651406	.3056309	-0.21	0.831	-.6641661	.5338849

rdered probit estimates   Number of obs =   88

LR chi2(5)   =   16.64

Prob > chi2   =   0.0052

Log likelihood = -86.088877   Pseudo R2   =   0.0881

cbfa	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
fac	-.2320785	.066301	-3.50	0.000***	-.3620261	-.102131
gdp	-.0000521	.000122	-0.43	0.670	-.0002912	.0001871
oecd	-.1832191	.3229993	-0.57	0.571	-.816286	.4498479
mvb	.0214204	.3359336	0.06	0.949	-.6369974	.6798382
mcap	.3633258	.3492176	1.04	0.298	-.3211282	1.04778

Ordered probit   estimates   Number of obs =   88

LR chi2(6)   =   16.90

Prob > chi2   =   0.0096

Log likelihood   = -85.958418   Pseudo R2   =   0.0895

cbfa	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
fac	-.238899	.0676584	-3.53	0.000***	-.3715069	-.106291
gdp	-.0000539	.0001223	-0.44	0.659	-.0002936	.0001858
oecd	-.3175436	.4167821	-0.76	0.446	-1.134421	.4993342
mvb	.0681752	.3488519	0.20	0.845	-.6155619	.7519123
mcap	.2628009	.4016671	0.65	0.513	-.5244521	1.050054
ggov	.1400218	.2741808	0.51	0.610	-.3973628	.6774063

Ordered probit	estimates		Number of obs	=	88
	LR chi2(8)	=	19.26		
	Prob > chi2	=	0.0135		
Log likelihood	= -84.7798		Pseudo R2	=	0.1020

cbfa	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
fac	-.2420002	.0676394	-3.58	0.000***	-.374571	-.1094295
gdp	-.0000129	.0001267	-0.10	0.919	-.0002613	.0002355
oecd	-.6291356	.469404	-1.34	0.180	-1.549151	.2908793
mvb	.1417056	.3560038	0.40	0.691	-.5560491	.8394602

	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
mcap	.3375264	.4103141	0.82	0.411	-.4666744	1.141727
ggov	.0163587	.2883803	0.06	0.955	-.5488562	.5815737
eu	.5661786	.4193738	1.35	0.177	-.255779	1.388136
lat	.2276961	.8538476	0.27	0.790	-1.445814	1.901207

Ordered probit estimates   Number of obs =   88

LR chi2(11)   =   29.41

Prob > chi2   =   0.0020

Log likelihood = -79.703754   Pseudo R2   =   0.1558

cbfa	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
fac	-.1995448	.0728563	-2.74	0.006	-.3423405	-.0567492
gdp	-.0000299	.0001351	-0.22	0.825	-.0002948	.0002349
oecd	-.483664	.4872426	-0.99	0.321	-1.438642	.4713139
mvb	.0671589	.3759024	0.18	0.858	-.6695963	.8039141
mcap	.1859194	.4255368	0.44	0.662	-.6481174	1.019956
ggov	-.071429	.3167818	-0.23	0.822	-.6923098	.5494519
eu	.5721314	.4507114	1.27	0.204	-.3112467	1.455509
lat	1.249012	1.117816	1.12	0.264	-.941868	3.439891
len	.8073559	.4823435	1.67	0.094	-.1380201	1.752732
lfr	.2690116	.3916124	0.69	0.492	-.4985346	1.036558
lgs	-9.177505	2.94e+08	-0.00	1.000	-5.76e+08	5.76e+08

note: 9 observations completely determined. Standard errors questionable.

Note: *** indicates statistical significance at 1 percent; ** indicates statistical significance at 5 percent; * indicates statistical significance at 10 percent.

Table 9 Estimates with Different Variable Specification: Population

Ordered logit estimates   Number of obs   =   88

　　　　　　　　　　LR chi2(11)   =   40.76

　　　　　　　　　　Prob > chi2   =   0.0000

Log likelihood =   -129.31   Pseudo R2   =   0.1362

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.6663577	.3209026	-2.08	0.038 **	-1.295315	-.0374
pop	-.0030921	.0014164	-2.18	0.029 **	-.0058682	-.0003159
oecd	-.5928051	.7689305	-0.77	0.441	-2.099881	.914271
mvb	.4964797	.6131763	0.81	0.418	-.7053238	1.698283
mcap	.5429346	.6307176	0.86	0.389	-.6932492	1.779118
ggov	.1432654	.5242583	0.27	0.785	-.884262	1.170793
eu	.7008643	.6668897	1.05	0.293	-.6062154	2.007944
lat	1.476362	1.766938	0.84	0.403	-1.986772	4.939497
len	.8745485	.7915647	1.10	0.269	-.6768899	2.425987
lfr	1.3302	.651171	2.04	0.041 **	.0539287	2.606472
lgs	3.193341	.9976396	3.20	0.001 ***	1.238003	5.148679

Ordered probit   estimates   Number of obs   =   88

　　　　　　　　　　LR chi2(11)   =   40.72

　　　　　　　　　　Prob > chi2   =   0.0000

Log likelihood   = -129.33235   Pseudo R2   =   0.1360

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.3253459	.1633519	-1.99	0.046 **	-.6455097	-.005182
pop	-.0017707	.0007767	-2.28	0.023 **	-.003293	-.0002484
oecd	-.434783	.4303412	-1.01	0.312	-1.278236	.4086703

mvb	.2465967	.3475701	0.71	0.478	-.4346281	.9278215
mcap	.2144728	.3784362	0.57	0.571	-.5272484	.9561941
ggov	.1546323	.3007953	0.51	0.607	-.4349157	.7441803
eu	.4515306	.3774499	1.20	0.232	-.2882575	1.191319
lat	1.058089	1.021529	1.04	0.300	-.9440712	3.060249
len	.4556303	.4546047	1.00	0.316	-.4353785	1.346639
lfr	.7559751	.3724543	2.03	0.042 **	.0259781	1.485972
lgs	1.813589	.5712879	3.17	0.002 ***	.693885	2.933293

Note: *** indicates statistical significance at 1 percent; ** indicates statistical significance at 5 percent; * indicates statistical significance at 10 percent; (a) World Bank, 2003, *World Development Indicators*. For each variables we calculate the mean of four time values: 1996,1998,2000, 2002.

Table 10 Estimates with Different Variable Specification: German & Scandinaviam Law

Ordered logit estimates   Number of obs =   88

                          LR chi2(11)   =   36.24

                          Prob > chi2   =   0.0002

Log likelihood = -131.57298   Pseudo R2   =   0.1210

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.5629898	.3180557	-1.77	0.077*	-1.186368	.0603879
gdp	-.0005351	.0002188	-2.45	0.014 ***	-.0009639	-.0001062
oecd	-.05767	.7955711	-0.07	0.942	-1.616961	1.501621
mvb	.2592699	.6003316	0.43	0.666	-.9173584	1.435898
mcap	.6031824	.636126	0.95	0.343	-.6436016	1.849966
ggov	.5754109	.5116156	1.12	0.261	-.4273374	1.578159
eu	-.2286403	.6906104	-0.33	0.741	-1.582212	1.124931
lat	1.001626	1.77914	0.56	0.573	-2.485425	4.488678
len	.8872583	.8326588	1.07	0.287	-.7447229	2.519239
lfr	1.548337	.7404584	2.09	0.037 **	.0970657	2.999609
nlgs	2.395392	.9302029	2.58	0.010 ***	.572228	4.218557

Ordered probit   estimates   Number of obs =   88

                          LR chi2(11)   =   36.73

                          Prob > chi2   =   0.0001

Log likelihood   = -131.32706   Pseudo R2   =   0.1227

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
cbfa	-.2978162	.1641943	-1.81	0.070 *	-.619631	.0239986
gdp	-.0003141	.0001303	-2.41	0.016 ***	-.0005696	-.0000587
oecd	-.0729256	.4449227	-0.16	0.870	-.944958	.7991068

mvb	.075816	.3435073	0.22	0.825	-.5974459	.749078
mcap	.3472888	.390524	0.89	0.374	-.4181242	1.112702
ggov	.3871593	.292287	1.32	0.185	-.1857128	.9600314
eu	-.1072083	.3856902	-0.28	0.781	-.8631473	.6487307
lat	.8947875	1.027482	0.87	0.384	-1.11904	2.908615
len	.4043321	.4741675	0.85	0.394	-.525019	1.333683
lfr	.8243299	.4166454	1.98	0.048 **	.00772	1.64094
nlgs	1.189594	.5082363	2.34	0.019 ***	.1934693	2.185719

Note: * indicates statistical significance at 1 percent; ** indicates statistical significance at 5 percent; * indicates statistical significance at 10 percent.**

Table 11 Central Bank Independence in 63 countries

	Countries	CUKIERMAN INDEX	GRILLI MASCIANDARO TABELLINI INDEX	FREYTAG modified INDEX
1	Albania	0.51		
2	Argentina	0.44		0.74
3	Australia	0.31	0.66	0.35
4	Austria	0.58	1	0.58
5	Belarus	0.73		
6	Belgium	0.19	1	0.62
7	Bolivia			0.39
8	Bosnia Herzegovina			0.83
9	Botswana	0.36		
10	Brazil		0.46	0.22
11	Bulgaria	0.55		0.83
12	Canada	0.46	0.66	0.6
13	Chile	0.49		0.27
14	Croatia	0.44		0
15	Czech Republic	0.73		0.62
16	Denmark	0.47	0.8	0.47
17	Egypt, Arab Rep.	0.53	0.33	
18	Estonia	0.78		0.83
19	Finland	0.27		0.62
20	France	0.28	1	0.74
21	Georgia	0.73		
22	Germany	0.66	0.93	0.56
23	Greece	0.51	0.86	0.62
24	Hungary	0.67		0.53
25	Iceland			0.56
26	India	0.33	0.4	
27	Iran, Islamic Rep.			
28	Ireland	0.39	0.86	0.33
29	Israel	0.42	0.4	0.33

30	Italy	0.22	0.86	0.08
31	Japan	0.16	0.46	0.31
32	Kazakhstan	0.44		
33	Korea,	0.23		0.67
34	Latvia	0.49		0.64
35	Lithuania	0.78		0.71
36	Macedonia	0.41		0.56
37	Malaysia	0.34		
38	Mexico	0.36	0.6	0.31
39	Moldova	0.73		
40	Morocco		0.46	
41	Netherlands	0.42	0.93	0.37
42	New Zealand	0.27	0.46	0.6
43	Norway	0.14		0.18
44	Panama	0.16		
45	Peru	0.43	0.53	0.54
46	Philippines	0.42	0.6	0.45
47	Poland	0.89	0.73	0.64
48	Portugal		0.86	
49	Romania	0.34		0.47
50	Russian Federation	0.49		0.6
51	Slovak Republic	0.62		0.39
52	Slovenia	0.63		0.43
53	South Africa	0.3	0.2	
54	Spain	0.21	0.93	0.7
55	Sweden	0.27		0.51
56	Switzerland	0.68	1	0.29
57	Thailand	0.26		
58	Turkey	0.44		0.49
59	Ukraine	0.31		0.14
60	United Kingdom	0.42	0.73	0.2
61	United States	0.22	0.8	0.47
62	Uruguay	0.51		0.27
63	Venezuela	0.37		

Table 12 Correlation Matrix

	cuk	gmt	fre
cuk	1.0000		
gmt	0.3135	1.0000	
fre	0.1463	0.2378	1.0000

Table 13

Ordered Logit Estimates with Central Bank Independence: Homogeneous Cross Country Sample

Ordered logit estimates   Number of obs =   22

                    LR chi2(11)   = 31.37

                    Prob > chi2   = 0.0010

Log likelihood = -24.864826   Pseudo R2   = 0.3868

fac	Coef.	Std. Err. z	z	P>z	[95% Conf.	Interval]
cbfa	-1.190883	.8365393	-1.42	0.155	-2.83047	.4487042
gdp	-.0023868	.0012317	-1.94	0.053**	-.0048009	.0000272
oecd	8.743367	4.195317	2.08	0.037**	.5206963	16.96604
mvb	-3.776106	2.719322	-1.39	0.165	-9.105879	1.553667
mcap	14.66284	6.713031	2.18	0.029**	1.505536	27.82014
ggov	-10.80042	4.375046	-2.47	0.014 ***	-19.37535	-2.225482
eu	4.540287	3.121194	1.45	0.146	-1.577141	10.65772
lat	-4.018498	6.300808	-0.64	0.524	-16.36785	8.330859
len	18.56947	8.948992	2.08	0.038**	1.029766	36.10917
lfr	9.806755	7.353414	1.33	0.182	-4.605673	24.21918
lgs	22.61252	11.11698	2.03	0.042**	.8236444	44.4014

Ordered logit estimates   Number of obs =   22

                    LR chi2(12)   = 39.76

                    Prob > chi2   = 0.0001

Log likelihood = -20.665275   Pseudo R2   = 0.4903

fac	Coef.	Std. Err. z	z	P>z	[95% Conf.	Interval]
cuk	-20.71804	8.295092	-2.50	0.013***	-36.97613	-4.459963
cbfa	-2.187326	1.031222	-2.12	0.034**	-4.208484	-.166168
gdp	-.0043346	.0017178	-2.52	0.012***	-.0077014	-.0009679
oecd	8.182434	4.542574	1.80	0.072*	-.7208478	17.08572
mvb	-2.774445	2.715416	-1.02	0.307	-8.096562	2.547671
mcap	21.50959	8.200697	2.62	0.009***	5.436516	37.58266
ggov	-16.67786	5.816584	-2.87	0.004***	-28.07816	-5.277569
eu	9.313825	4.529659	2.06	0.040**	.4358572	18.19179

lat	.7875122	7.223705	0.11	0.913	-13.37069	14.94571
len	22.16864	10.00461	2.22	0.027**	2.559964	41.77731
lfr	7.786426	7.655386	1.02	0.309	-7.217854	22.79071
lgs	31.49554	13.36116	2.36	0.018***	5.308147	57.68293

Ordered logit estimates   Number of obs =   22

LR chi2(12)   = 34.25

Prob > chi2   = 0.0006

Log likelihood = -23.421465   Pseudo R2   = 0.4224

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
fre	-7.320032	5.47846	-1.34	0.182	-18.05762	3.417552
cbfa	-1.61528	.9664624	-1.67	0.095*	-3.509512	.278951
gdp	-.0029648	.0021975	-1.35	0.177	-.0072717	.0013422
oecd	7.343912	5.879752	1.25	0.212	-4.18019	18.86801
mvb	-4.219901	4.442786	-0.95	0.342	-12.9276	4.4878
mcap	14.8909	10.55819	1.41	0.158	-5.802773	35.58458
ggov	-9.73893	6.005741	-1.62	0.105*	-21.50997	2.032106
eu	2.83417	3.724384	0.76	0.447	-4.465487	10.13383
lat	.3063905	7.108399	0.04	0.966	-13.62582	14.2386
len	20.83966	14.74605	1.41	0.158	-8.062064	49.74139
lfr	13.88977	13.16746	1.05	0.291	-11.91799	39.69752
lgs	26.79268	19.30546	1.39	0.165	-11.04533	64.63068

Ordered logit estimates   Number of obs   =   22

                         LR chi2(12)   = 31.69
                         Prob > chi2   =   0.0015
Log likelihood = -24.703154   Pseudo R2   =   0.3908

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
gmt	-4.277474	7.678849	-0.56	0.577	-19.32774	10.77279
cbfa	-1.276117	.8574218	-1.49	0.137	-2.956633	.4043985
gdp	-.0024978	.0013063	-1.91	0.056**	-.0050581	.0000624
oecd	9.374258	4.469368	2.10	0.036**	.6144586	18.13406
mvb	-3.681473	2.768882	-1.33	0.184	-9.108382	1.745437
mcap	15.84685	7.31733	2.17	0.030**	1.50515	30.18856
ggov	-11.64685	4.793368	-2.43	0.015***	-21.04168	-2.25202
eu	6.511329	4.796816	1.36	0.175	-2.890258	15.91292
lat	-4.991051	6.500254	-0.77	0.443	-17.73131	7.749212
len	18.75216	9.282378	2.02	0.043**	.5590367	36.94529
lfr	9.671065	7.615539	1.27	0.204	-5.255117	24.59725
lgs	22.89467	11.57818	1.98	0.048 **	.2018584	45.58748

Table 14

Ordered Logit Estimates with Central Bank Independence: Different Country Samples

Ordered logit estimates

				Number of obs =	56

LR chi2(12) = 32.66

Prob > chi2 = 0.0011

Log likelihood = -73.418215   Pseudo R2 = 0.1819

fac	Coef.	Std. Err. z	P>z	[95% Conf.	Interval]
cuk	-1.144642	2.15873 -0.53	0.596	-5.375675	3.086391
cbfa	-.6808061	.4551917 -1.50	0.135	-1.572965	.2113533
gdp	-.0007077	.0002565 -2.76	0.006***	-.0012103	-.000205
oecd	.0275858	.9524635 0.03	0.977	-1.839208	1.89438
mvb	-.2549451	.8254008 -0.31	0.757	-1.872701	1.362811
mcap	1.061611	.8500311 1.25	0.212	-.6044198	2.727641
ggov	.1524793	.7485495 0.20	0.839	-1.314651	1.619609
eu	.8273758	.8959171 0.92	0.356	-.9285896	2.583341
lat	2.11935	2.512344 0.84	0.399	-2.804753	7.043453
len	1.12499	1.165761 0.97	0.335	-1.15986	3.409839
lfr	.9193587	.9912899 0.93	0.354	-1.023534	2.862251
lgs	2.915774	1.284841 2.27	0.023***	.3975322	5.434015

Ordered logit estimates

				Number of obs =	47

LR chi2(12) = 40.79

Prob > chi2 = 0.0001

Log likelihood = -60.797602   Pseudo R2 = 0.2512

fac	Coef.	Std. Err. z	P>z	[95% Conf.	Interval]
fre	-4.5238	1.783558	-2.54	0.011***	-8.019509	-1.028091
cbfa	-1.111381	.4925472	-2.26	0.024***	-2.076755	-.1460059
gdp	-.0007063	.0002769	-2.55	0.011***	-.0012491	-.0001636
oecd	-.9843409	1.030669	-0.96	0.340	-3.004416	1.035734
mvb	1.112069	.8487013	1.31	0.190	-.5513551	2.775493
mcap	-.9421107	1.223416	-0.77	0.441	-3.339962	1.455741
ggov	1.492006	1.069699	1.39	0.163	-.6045663	3.588578

eu	1.246409	.959742	1.30	0.194	-.6346508	3.127469
lat	-1.101035	3.076951	-0.36	0.720	-7.131748	4.929679
len	1.057553	1.382589	0.76	0.444	-1.652272	3.767379
lfr	1.082733	1.006135	1.08	0.282	-.889256	3.054723
lgs	3.189182	1.436444	2.22	0.026***	.3738039	6.004559

Ordered logit estimates   Number of obs   =   28

                          LR chi2(11)   = 15.81

                          Prob > chi2   = 0.1482

Log likelihood = -43.864129   Pseudo R2   = 0.1527

fac	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
gmt	-5.426015	3.935623	-1.38	0.168	-13.13969	2.287664
cbfa	-1.596465	.7445894	-2.14	0.032**	-3.055834	-.1370971
gdp	-.0003477	.0002483	-1.40	0.161	-.0008344	.000139
oecd	-.5634228	1.896008	-0.30	0.766	-4.279531	3.152685
mvb	.3575603	1.130623	0.32	0.752	-1.858419	2.57354
mcap	.5698642	1.01349	0.56	0.574	-1.416539	2.556267
ggov	2.163608	1.437217	1.51	0.132	-.6532851	4.9805
eu	2.644467	1.556914	1.70	0.089	-.4070281	5.695963
lat	-5.733363	4.660831	-1.23	0.219	-14.86842	3.401697
len	-1.447871	1.458294	-0.99	0.321	-4.306075	1.410333
lfr	.4029399	1.452052	0.28	0.781	-2.44303	3.24891