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Financial Supervisory Independence and Accountability – Exploring the Determinants

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Abstract

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We analyze recent trends in, and determinants of, financial supervisory governance. We first calculate levels of supervisory independence and accountability in 55 countries. The econometric analysis of the determinants indicates that the quality of public sector governance plays a decisive role in establishing accountability arrangements, more than independence arrangements. It also shows that decisions regarding levels of independence and accountability are not well-connected. The results also show that the likelihood of establishing adequate governance arrangements are higher when the supervisor is located outside the central bank.

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I. INTRODUCTION

Financial sector supervisory architectures have been under reconstruction for over a decade. This attention for the efficiency and effectiveness of the institutional architecture of supervision (inside central banks, outside central banks, sector-specific agencies, or integrated agencies) has increasingly been accompanied by interest in the governance of these agencies, with a special focus on their independence and accountability.

The public discussions regarding the establishment of the Financial Services Authority (FSA) in the United Kingdom and the Australian Prudential Regulations Authority (APRA) in Australia in the second half of the 1990s were the first ones that made explicit mention of independence and accountability issues. Around the same time, voices from the academics (Lastra, 1996 and Goodhart, 1998a) raised the issue of financial supervisory independence as a principle. They were joined by practitioners who went through financial sector crises and claimed that the lack of supervisory independence was one of the contributing factors to the crises (see e.g. de Krivoy, 2000, on the Venezuelan crisis). The Basel Core Principle for Effective Bank Supervision (Basel Committee on Banking Supervision, 1997) gave the principle of operational independence for supervisors official backing.² Finally, Quintyn and Taylor (2003), Hüpkens, Quintyn and Taylor (2005), and Quintyn and Taylor (2007) built the case for independence and accountability for supervisory agencies and spelled out the operational implications.

Furthermore, Das and Quintyn (2002) and Quintyn (2007a) argued that solid independence and accountability arrangements are essential pillars of supervisory governance, in addition to transparency and integrity arrangements. Their arguments in favor of solid governance arrangements for financial supervisors started from the finding that the job content of supervisors has been changing dramatically in response to the worldwide liberalization of financial sectors. Supervisors used to be compliance officers, checking if banks complied with various economic rules and regulations. Nowadays, supervisors are “governance supervisors” who monitor on behalf of the debt holders of the financial institutions the quality of the institutions’ governance arrangements. Quintyn (2007a) shows that good regulatory governance (governance of financial supervisors) is a precondition for implementing this task successfully. Das, Quintyn and Chenard (2004) empirically showed that the quality of regulatory governance has a positive impact on the soundness of the banking system in a cross-country analysis, and that this impact is stronger, the better public sector governance is.

In this paper, we take a closer look at the emerging independence and accountability arrangements for financial supervisors. Building on earlier work in this area (Quintyn, Ramirez and Taylor (2007)), we (i) expand the sample to analyze emerging trends in 55 countries and (ii) take a political economy view by empirically analyzing the determinants of independence and accountability arrangements. More specifically, we will test the hypothesis that the better the quality of a country’s public sector governance is, the more policymakers

² The revised “Core Principles for Effective Bank Supervision” recognize the importance of both independence and accountability (Basel Committee on Banking Supervision, 2006).

are inclined to design solid independence and accountability arrangements for their supervisors.

The paper is structured as follows: Section II provides some background to the research presented in this paper; Section III discusses current trends in independence and accountability of supervisors based on the indices computed in this paper; Section IV presents the econometric analysis of the determinants; and Section V brings together the conclusions, as well as suggestions for further research.

II. BACKGROUND

The emerging attention for the governance of financial sector supervisors stems from the convergence of a number of different developments that have marked the past two to three decades.

First, the attention for the institutional structure of supervision (inside or outside central banks, sector-specific or unified) which emerged in the 1990s, prompted policymakers to think about the governance of these newly emerging institutions. Before the 1990s, the only supervisory agency that received full attention were the bank supervisors. Other sectors (insurance and pension supervision) did not receive much attention, or were given in the hands of self-regulatory bodies (securities). And because a majority of bank supervisors were housed in central banks, the governance of supervision as such never received much interest.

Secondly, as is laid out in Quintyn (2007a), the liberalization of the financial sector since the 1970s has changed the role of financial sector regulation and supervision dramatically—an evolution that has still not achieved its final point as recent events in the international financial markets amply demonstrate. In liberalized financial system, so much more depends on the governance of the financial institutions. Supervisors play a key role in ensuring that financial institutions have the right governance incentives. They represent the financial institutions debt holders (Dewatripont and Tirole's (1994) "representation hypothesis"). In order to play their role in ensuring debt governance at the level of the financial institutions, supervisors themselves need to have high quality governance. Das and Quintyn (2002) and Quintyn (2007a) establish that supervisory governance should be built around solid arrangements for independence, accountability, transparency and integrity.

Thirdly, the quest for supervisory governance must also be seen in the context of the spread of independent regulatory agencies (IRAs) in other segments of the economy. To a great extent independent central banks were the forerunners of this development, but in recent decades, IRAs have made their appearance in several fields of economic regulation such as competition, telecommunication and utilities (Thatcher (2002) and Jordana and Levi-Faur (2004)) and are now in many parts of the world a well-recognized part of the policymaking machinery. When establishing these agencies, policymakers are also confronted with the governance attributes for these agencies (Quintyn (2007b)).

Finally, the thinking about central bank independence (CBI) is also having an impact on our thinking about the governance of supervisory agencies. First, among the IRAs, financial sector supervisors occupy a special place, close to the central banks because their mandate is

also related to financial stability. Secondly, as argued in Quintyn and Taylor (2007), decision making in the area of financial regulation and supervision is also subject to time inconsistency issues. Third, and more even more importantly, there is a growing strand in the literature that argues that thus far too much attention has been given to central bank *independence*, as opposed to central bank *governance*. It is argued that too much emphasis on the independence aspect of central bank will eventually be counterproductive for the position of the central bank (e.g., Buiters (2007)) and, thus, that more emphasis should be put on accountability and transparency in order to arrive at a balanced governance model.³ This transition from thinking in “independence-only”-terms to thinking in terms of the central bank governance model also stimulates our thinking of supervisors in these terms. Moreover, as argued in Hüpkes, Quintyn and Taylor (2005), many features of the supervisory function are so different from the monetary function of the central bank (the supervisors’ mandate is not specific, and hard to measure, their transparency needs to be weighed against confidentiality and their judicial powers are more far-reaching than for the central bank’s monetary policy function) that operational independence needs to be balanced by other incentives in their governance.

Research on supervisory governance is still in the early stages. In this paper we build upon the seminal work in Quintyn, Ramirez and Taylor (2007) (hereafter QRT) that constructed indices independence and accountability for supervisory agencies in 32 countries. The paper limited its focus to independence and accountability because the degrees at which these two governance pillars are established is the outcome of a political decision making process, while the two other elements (transparency and integrity) are to be mainly established by the agency itself. As a result, their quality and effectiveness depend in the first place on the quality of independence and accountability arrangements. In this paper, we first extend the sample to 55 countries and subsequently, take a political economy-view to analyze the determinants of independence and accountability in this set of countries.

III. ANALYSIS OF INDEPENDENCE AND ACCOUNTABILITY INDICES

This section presents the main findings with regard to the computation of governance indices, including a comparison with some of the findings on CBI.

³ Attention for accountability came from two directions. Stiglitz (1998) argued in favor of central bank accountability to counter the democratic deficit that goes hand in hand with (too) independent central banks. Buiters (2007) argues along the same lines. Recently, a number of authors have argued that (i) accountability supports independence (e.g. de Haan et al. (1999), Eijffinger et al. (2000), Eijffinger and Hoeberichts (2002), and (ii) that accountability and transparency enhance the effectiveness of an independent central bank’s monetary policy (see e.g. Eijffinger and Geraarts (2002), Silkos (2002), Crowe and Meade (2007) and Van der Cruijssen and Eijffinger (forthcoming). For a summary of the thinking on central bank governance, see Quintyn (2007b).

A. Sample and Methodology

This section applies the methodology developed in QRT (2007) for the computation of independence and accountability ratings for bank supervision agencies.⁴ While QRT compared independence and accountability ratings before and after reforms in a sample of 32 countries, this paper only analyzes the current state of affairs, but broadens the sample to 55 countries. The new sample contains 27 countries where bank supervision is part of the central bank's responsibilities and 28 countries where an agency, separate from the central bank is in charge of banking supervision (see Appendix I for country details). Among those separate agencies, 12 are unified (or integrated) supervisors (i.e., one agency supervises all segments of the financial system). In addition, two agencies located inside the central bank, are also unified supervisors.

The methodology is the same as in QRT (2007). A total of 19 criteria are identified to assess the degree of supervisory independence, and 21 for accountability. These criteria are derived from the work on supervisory independence and accountability in Quintyn and Taylor (2003 and 2007), and Hüpkes, Quintyn and Taylor (2005), respectively.⁵ A rating of “2” is given if the law satisfies the criteria, a “1” is given for partial compliance, and a “0” for noncompliance. In some cases, a “-1” is given for what are considered practices that undermine both independence and accountability (such as, for instance, a minister chairing the policy board or legal provisions giving the minister the right to intervene in the supervisory process). The individual ratings are summed and normalized between 0 and 1.⁶

B. Main Findings

Table 1 reports the total ratings (as an indication of the overall quality of the arrangements) and the independence and accountability rating. The table also reports the rating for CBI. They are the updated results of the Grilli, Masciandaro, Tabellini (1991)-index (hereafter GMT), reported in Arnone and others (2007). GMT use 15 criteria to define CBI.⁷ Unfortunately, no comparable data are available for central bank accountability in monetary policy. The only authors who explored this area are de Haan, Amtenbrink and Eijffinger (1999), Eijffinger and Hoeberichts (2002), and Siklos (2002) but their samples are more limited than ours.

⁴ While the importance of supervision of other segments of the financial system is constantly growing, banking supervision still remains the most important supervisory activity in most countries, not the least because the banking system remains the core part of the financial system in a great number of countries.

⁵ For the list of criteria, see QRT (2007) as well as Appendix II below.

⁶ The ratings are based on a review of the individual countries' legal documents, supplemented by assessments of the “Basel Core Principles for Effective Banking Supervision” and of the “IMF code on Transparency of Monetary and Financial Policies” published in the IMF's Financial Sector Stability Assessments (FSSA). In some cases additional information was acquired from interviews with country officials. So, this is a “de jure” approach to the quality of supervisory governance and we are aware of the fact that “de facto” situations may differ from “de jure” findings.

⁷ This paper is interested in the governance of the supervisory *function*, and not per se in the institution as such. We make a distinction between the supervisory function and the monetary policy function, even though both could be executed by one and the same agency (the central bank).

The findings on the governments' revealed preferences with respect to the grant of independence and the accountability arrangements to supervisors broadly confirm the findings of QRT (2007). The average for the total rating is 0.63, with a low of 0.35 (Guatemala) and a high of 0.86 (Bulgaria and Ireland). These total ratings mask relatively significant differences in the way policymakers look at independence and accountability separately (see also Figure 1).⁸ There is indeed an impression that in several cases the two are not considered as two sides of the same coin. The average for independence (0.69) is higher than for accountability (0.58). Independence ratings range between 0.43 (China) and 1 (Bulgaria), while accountability ranges from a low of 0.33 (Morocco and Tunisia) to a high of 0.83 (Spain). Incidentally, the average of CBI is the same as for the supervisory function, but with a slightly greater standard deviation. Figure 1 also shows a slightly upward sloped relationship, meaning that independence and accountability are rather seen as complements than in a trade-off relationship. However, the coefficient is insignificant so we find at best a weak complementarity.

⁸ Based on the arguments developed in Hupkes, Quintyn and Taylor (2005) and Quintyn and Taylor (2007) that there is no trade-off between independence and accountability, but that accountability reinforces independence by making it effective, one would in theory and ideally expect that both ratings would be in each other vicinity, that is, in a scatter plot centered around the 45 degree line.

Table 1. Ratings on Supervisory Independence and Accountability, and on Independence in Monetary Policy (55 countries)

Country	Governance Features of Supervisory Function			Governance Features of Monetary Policy Function
	Total Rating	Independence	Accountability	Independence GMT
Armenia	0.74	0.84	0.64	0.81
Australia	0.71	0.76	0.67	0.63
Austria	0.64	0.79	0.50	0.94
Bahamas, The	0.60	0.84	0.57	0.31
Belgium	0.76	0.92	0.62	0.94
Brazil	0.53	0.55	0.50	0.63
Bulgaria	0.86	1.00	0.74	0.88
Canada	0.63	0.55	0.69	0.63
Chile	0.66	0.66	0.67	0.69
China	0.36	0.34	0.38	0.56
Colombia	0.60	0.68	0.71	0.50
Cyprus	0.56	0.74	0.40	0.56
Czech Republic	0.71	0.86	0.57	0.88
Denmark	0.63	0.63	0.62	0.75
Ecuador	0.66	0.87	0.48	0.94
Egypt, Arab Rep.	0.63	0.63	0.62	0.38
El Salvador	0.55	0.61	0.50	0.81
Estonia	0.66	0.69	0.55	0.81
Finland	0.69	0.61	0.67	0.94
France	0.65	0.63	0.67	0.94
Germany	0.63	0.47	0.76	0.88
Greece	0.63	0.79	0.48	0.81
Guatemala	0.35	0.21	0.48	0.63
Hungary	0.63	0.63	0.62	0.94
India	0.55	0.63	0.48	0.50
Indonesia	0.78	0.95	0.62	0.69
Ireland	0.86	0.92	0.81	0.81
Israel	0.50	0.53	0.48	0.38
Italy	0.66	0.82	0.52	0.81
Japan	0.55	0.47	0.62	0.44
Korea, Rep. Of	0.53	0.47	0.57	0.56
Latvia	0.76	0.87	0.67	1.00
Mauritius	0.56	0.71	0.43	0.50
Mexico	0.71	0.82	0.62	0.69

Table 1. Ratings on Supervisory Independence and Accountability, and on Independence in Monetary Policy (55 countries) (continued)

Country	Governance Features of Supervisory Function			Governance Features of Monetary Policy Function
	Total Rating	Independence	Accountability	Independence GMT
Morocco	0.38	0.42	0.33	0.50
Netherlands	0.65	0.84	0.67	0.88
New Zealand	0.73	0.74	0.71	0.44
Nigeria	0.56	0.61	0.52	0.44
Norway	0.58	0.53	0.62	0.75
Peru	0.68	0.89	0.48	0.69
Philippines, The	0.56	0.61	0.43	0.63
Poland	0.59	0.55	0.62	0.88
Portugal	0.74	0.89	0.60	0.81
South Africa	0.54	0.55	0.52	0.25
Spain	0.74	0.63	0.83	0.88
Sri Lanka	0.54	0.55	0.52	0.56
Sweden	0.63	0.47	0.76	0.94
Switzerland	0.64	0.76	0.52	0.94
Trinidad and Tobago	0.63	0.74	0.52	0.44
Tunisia	0.46	0.61	0.33	0.69
Turkey	0.71	0.82	0.62	0.81
Uganda	0.59	0.66	0.52	0.56
United Kingdom	0.76	0.82	0.71	0.69
Zambia	0.59	0.45	0.71	0.44
<i>Average</i>	0.63	0.69	0.58	0.69
<i>Standard deviation</i>	0.11	0.17	0.11	0.19

Source: QRT (2007) and own calculations for supervisory independence and accountability. Arnone and others (2007) for update of GMT index on monetary policy independence.

Figure 1. Scatter Plot of Independence and Accountability Ratings
(55 countries)

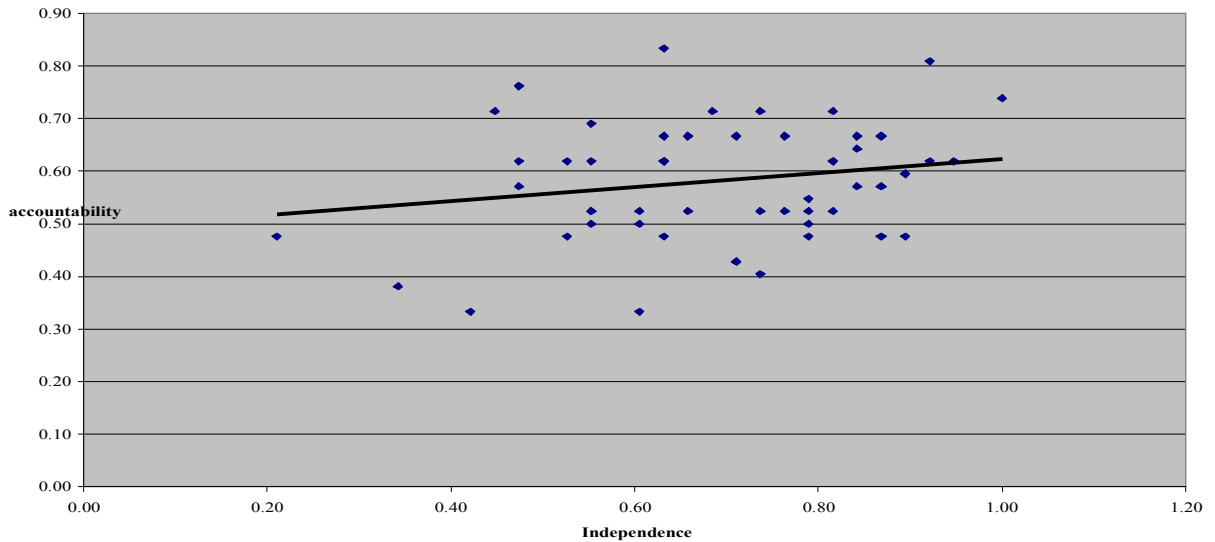
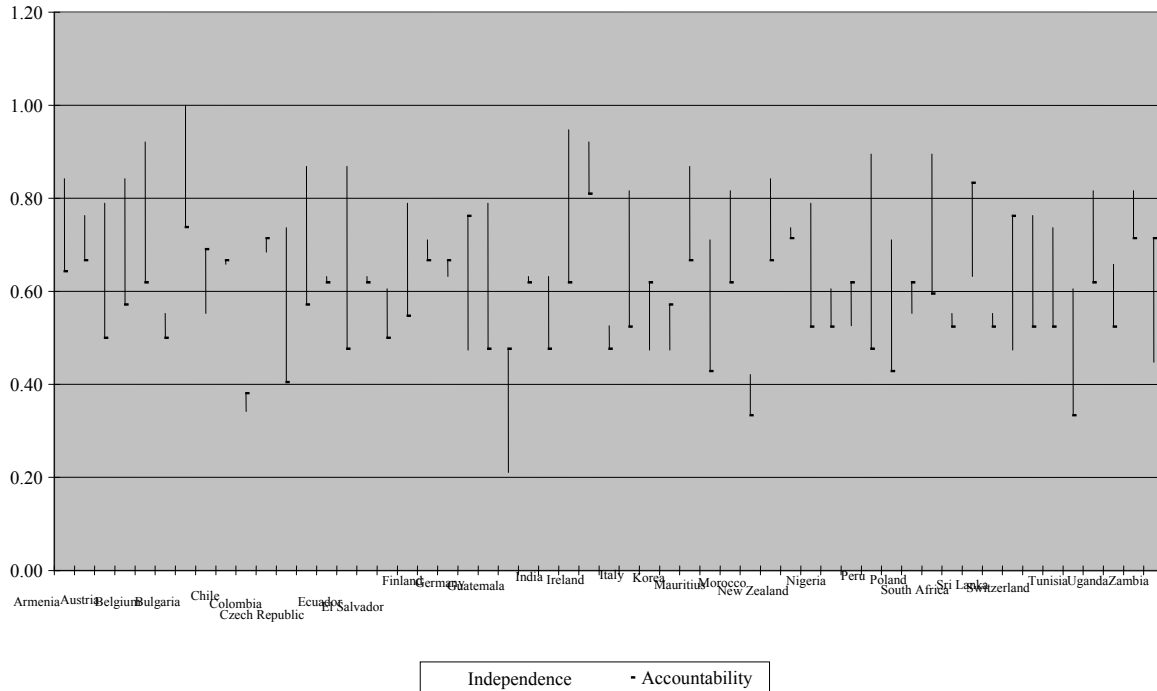


Figure 2 measures the discrepancies between independence and accountability ratings and confirms the impression that decisions regarding independence and accountability are not always taken in tandem. Three patterns appear from this Figure: first, in a number of countries the two ratings are very close to each other—typically, most of these countries are situated in the ranges between 0.5 and 0.75, never extremely high, never extremely low; second, there is a vast group of countries where the independence rating exceeds the accountability arrangements by a wide margin, up to 0.4 in most cases; and third, we find a number of countries where the accountability ratings exceed (sometimes by a wide margin) the independence ratings. QRT (2007) explained that in some of these cases the ratings reflect the fact that governments resort to some of the “control” mechanisms referred to above, but that these are “advertised” as accountability mechanisms. In our rating system such measures diminish independence and hence, widen the gap between independence and accountability.⁹

⁹ See QRT (2007) and Westrup (2007) for a “narrative” approach to, and anecdotal evidence of, some of these specific cases.

Figure 2. Spread Between Independence and Accountability Ratings
(55 countries)



C. A Look into the Individual Criteria

Appendix II shows the ratings per individual criteria across the sample and leads to some interesting findings. On independence, all agencies have an enabling law (this used to be not the case when several agencies were government departments), and nearly all can impose and enforce sanctions. Most of them have autonomy with respect to their internal organization (including staffing and salary structures). The number of agencies that have autonomy to issue regulations is at 0.75 and also funding by, mainly, fees from the supervised entities meets the 0.77 mark. The right to issue licenses and withdraw them is also around the 0.75 mark. Whereas these powers seem inherent to the supervisory process, many governments apparently want to retain some say in it.

Going further down, the critical issue of agency staff having legal immunity is at 0.69. The rating for having in the law clear dismissal criteria for the head of the agency is at 0.62. The rating for having a clear article in the law stipulating that the agency is independent, is at 0.45. Finally, a large number of agencies have government officials on their policy boards (compliance with *not* having them is 0.46) and an even larger number of laws provide for the possibility for the minister (of finance) to intervene in the supervisory process (compliance with *not* having such a provision is at 0.20). As was also noted in QRT (2007), we run into a contradiction in a number of cases, where the law states that the agency is independent, while

at the same time a government official is put in a decision-making function, or the minister is given the right to intervene.

On accountability, criteria such as the publication of an annual report on the activities of the supervisor and developments in the supervised sectors, the presence of internal and external audit processes for the agency, and procedures to disclose policies and decisions (typically through websites) are broadly met across the sample (all above 0.90). Ex-post budgetary accountability scores at 0.85, and the same rating applies to the possibility of appeal by supervised entities. Some traditional forms of accountability such as submission of the report to the legislative and the executive branch do not score extremely high (respectively 0.80 and 0.67). Obligations for accountability to the executive branch are often missing in the laws of those countries where a government official sits on the agency's policy board. Indeed, this line of accountability seems redundant in the eyes of those lawmakers, if they opt for direct control.

Lower scores on accountability apply to the issuance of a mission statement (0.64) and the requirement to consult the supervised industry in shaping the regulatory framework (0.54). Many newer forms of accountability also still need to gain ground. While the possibility for appeal to the judiciary is fairly common, few countries have special courts or procedures in place. Involving the public at large in the regulatory process is still in its infant stages. Finally, the rating for laws that provide for penalties for faulty supervision is at a low 0.09.

D. Location Has an Impact

Table 2 regroups the results according to location of the supervisors. While the total ratings are nearly identical, irrespective of the location of the supervisor, we note a number of differences in the independence and accountability ratings. Supervisors located inside the central bank have been granted the highest degree of autonomy, but also have the least elaborate accountability arrangements. Supervisors located outside the central bank have lower degrees of independence, with more developed accountability arrangements. Moreover, unified supervisors located outside the central bank are the lowest in independence and the highest in accountability. As discussed in QRT (2007), accountability arrangements in central banks are typically geared toward the monetary policy function, and miss several of the "360 degree"-features (i.e. accountability towards all stakeholders) that accountability in supervisory matters should possess.

Noteworthy too is that the degree of supervisory autonomy is higher than the degree of monetary policy autonomy for supervisors housed in the central bank, and lower in the other categories. To a great extent, this is due to the fact that GMT assigns a negative rating on monetary policy independence if the central bank is also the bank supervisor. The reason is that, in their view, supervision adds another objective to the central bank and may distract the central bank's attention from pursuing its primary objective.¹⁰ Other reasons may be that,

¹⁰ As case in point is Bulgaria. The country scores a "1" satisfaction ratio for supervisory independence. It complies with all criteria for monetary independence in the GMT index, with the exception of the bank supervision criterion. Hence, it has 0.88 for monetary policy independence.

for example, several central banks in low income countries (still) have no prohibition to grant credit to the government, while they do possess several of the features of institutional independence that count for supervisory independence.

Table 2. Governance Ratings by Location of Supervisor and Standard Deviation of Ratings in Italics

	Inside central bank	Outside central bank	
		All Agencies	Of Which Unified Supervisors
Total Rating	0.63	0.63	0.65
<i>Stand. dev</i>	<i>0.12</i>	<i>0.10</i>	<i>0.11</i>
Independence	0.71	0.67	0.64
<i>Stand. dev</i>	<i>0.16</i>	<i>0.18</i>	<i>0.20</i>
Accountability	0.57	0.60	0.65
<i>Stand. dev</i>	<i>0.13</i>	<i>0.10</i>	<i>0.09</i>
GMT	0.62	0.75	0.78
<i>Stand. dev</i>	<i>0.20</i>	<i>0.17</i>	<i>0.18</i>

Source: Own calculations.

The standard deviations for supervisory independence are greater than for accountability. So, countries, irrespective of the location of the supervisor, seem to agree less on the acceptable degree of independence than accountability. Also interesting is the fact that standard deviations are the greatest for the unified supervisors when it comes to independence, and the smallest for accountability. So, there seems to be more consensus on a desirable accountability model than an independence model. For supervisors inside the central bank, this is exactly the opposite. The other finding is that GMT show greater standard deviations than supervisory independence for the total sample and for central banks that house supervisors.

Appendix II allows us to form an opinion about the areas where the discrepancies in independence and accountability arise. The most striking differences are in the relations with the political class: supervisory agencies outside the Central Bank often have politicians on their policy board (parliamentarians or ministers) and in many cases the law includes a clause allowing the minister to intervene in the supervisory process. These agencies also have less autonomy than the central banks in hiring staff, setting salaries, and defining their internal organization. A number of these agencies have been established, or reformed, recently. So one hypothesis could be that these tendencies for curbing independence are the result of a growing awareness among politicians that central banks have received too much independence and that these new agencies need to be kept better “in check.” It should be noted too that supervisors outside central banks score better in terms of legal immunity for their staff, and the autonomy to issue regulations.

On accountability, the table shows that supervisors outside the central banks have higher satisfaction ratios in areas of “newer” accountability such as accountability toward stakeholders (the regulated industry, consumers, and public at large), and accountability

toward the judicial branch. We can interpret this as inertia on the side of central banks: several of these laws have not been reformed for a long time while supervisors located outside central banks have relatively newer legal frameworks. Interestingly, accountability toward the executive branch is more developed for central banks. A plausible explanation for this could be that supervisors outside central banks have comparatively more politicians in decision making positions, and hence the lawmaker does not see the need for additional reporting lines.

IV. THE DETERMINANTS OF SUPERVISORY GOVERNANCE

While the previous section reveals some of the policymaker's preferences with respect to the governance arrangements for supervisors, this section digs deeper by undertaking a first econometric analysis of the determinants of the governance arrangements for supervisors.

A. The Econometric Approach

The governance arrangements for supervisors can be viewed as resulting from an unobserved variable: the optimal combination of the degrees of independence and accountability consistent with the policymaker's utility. Each regime corresponds to a specific range of the optimal governance arrangements with higher discrete values for the total, independence and accountability corresponding to a higher range of supervisory governance. Since the governance indices are qualitative variables, the estimation of a model for such a dependent variable requires the use of a specific technique.

Our qualitative dependent variable can be classified into more than two categories, given that the governance indices are multinomial variables. But the indices are also ordinal variables, given that they reflect a ranking. For this, the ordered Logit model is an appropriate estimator, given the ordered nature of the alternatives open to the policymaker.¹¹

Let y be the policymaker's ordered choices, taking the values $(0, \dots, 1)$. The ordered model for y , conditional on a set of K explanatory variables x , can be derived from a latent variable model (Equation 1). In order to test this relationship, let us assume that the unobserved variable vector, the optimal degree of supervisory governance y^* , is determined by:

$$(1) \quad y^* = \beta'x + \varepsilon$$

where ε is a random disturbance uncorrelated with the regressors, and β is a $1 \times K$ vector of regressors.

The latent variable y^* is unobserved. What is observed is the choice of each national policymaker to endow the supervisor with a degree of independence and accountability. This choice is summarized in the value of the total, independence and accountability indices, which represent the threshold values as reported in Table 1. For our dependent variable there are 100 threshold values. Estimation is carried out by means of maximum likelihood techniques, assuming that ε is normally distributed across country observations, and its mean and variance are normalized.

¹¹ See Maddala (1983), Greene (1997), and Wooldridge (2002).

B. Model to be Tested

This section defines the potential determinants of the supervisory governance framework.¹² First of all, the analysis of the “governance nexus” developed in Das and Quintyn (2002) and Quintyn (2007a) leads us to expect that governments that promote *good public sector governance* will also be supportive of good governance arrangements for supervisors (and other regulators). These governments understand that good supervisory governance is important for financial sector governance and will therefore endow the supervisor with an appropriate degree of independence and matching accountability arrangements so that the agency can fulfill its mandate. So, public sector governance will be the key variable to be tested, together with a number of control variables to detect other influences and to test the robustness of our hypothesis. We expect a positive relationship between the quality of public sector governance and the three dependent variables to be tested, that is, the indices for the total, independence and accountability (*governance*).

The first control variable is *GDP per capita* to test for the effect of the economic size of the country and its level of economic development (the economic factor). The sign of this variable is a priori unknown (*GDP/capita*).

Next, we test for the impact of the *structure of the financial markets* (bank- versus market-dominated systems). In the literature on the determinants of supervisory architectures, the structure of the markets plays a role. Masciandaro (2006) and Freytag and Masciandaro (2007) find that countries with market-dominated systems tend to favor more the integrated supervisory model. However, with a larger sample, Masciandaro (2007) and Masciandaro and Quintyn (2007) find that the financial market structure does not matter. So far, this control variable seems to be sample sensitive. In an analysis of the drivers of governance arrangements, it is a priori not clear whether the composition of the markets will have a decisive impact and if so, whether its impact will be positive or negative (*market structure*).

The *concentration ratio of the banking system* is a measure of regulatory capture risk. The hypothesis is that more concentrated banking systems can more easily bundle their lobbying powers and influence the government’s decision with respect to the desirable degree of independence and accountability. This is an example of the grabbing hand hypothesis (Shleifer and Vishny (1998)) in which the government serves the interests of special groups.¹³ While the concentration ratio could indicate that the sector can influence government decisions, the sign of the impact on governance arrangements is not clear a priori. A negative sign would mean that the banking lobby has pushed for low independence and weak accountability in the hope of being able to influence the supervisor. However, a positive sign is also possible. Hardy (2006) shows that regulatory capture is not always negative. Bankers can also push supervisors to have strong policies so that their banks are not affected by contagion if there are weak banks in the system. In that case, these lobbying bankers would

¹² The actual variables and their sources are described in Appendix III.

¹³ Masciandaro and Quintyn (2007) only found weak evidence of the impact of the concentration ratio on the government’s decision regarding the degree of integration of the supervisory architecture.

probably prefer supervisors with high independence and good accountability (*market concentration*).

Our control variables also include the *legal factor*. Variables in this category reflect one branch of the institutional approach suggested in the literature, i.e., the “legal origin” (La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998)). We test the impact of possible common law effect—usual a proxy of a market friendly environment—as well as a specific legal factor, the German-Scandinavian law effect to estimate a possible legal neighbor effect, highlighted in Masciandaro (2006) and (2007) in the analysis of the determinants of the financial supervision architectures. The sign of the legal factor(s) is a priori undetermined (*common law* and *Ger/Scand*).

The number of countries that are revisiting their supervisory structures and the governance arrangements is increasing year after year. The Scandinavian countries were the forerunners at the end of the 1980s and early 1990s, but it was in fact the establishment of the FSA in the United Kingdom that triggered the wave of reforms that we have been witnessing since then. So, a legitimate question is whether there is a kind of *fashion effect* (or bandwagon effect) at work: are more recent reformers inspired by the type of changes in governance arrangements that were introduced by earlier reformers? The significance and the sign of this variable is a priori undetermined. A positive and significant coefficient would imply that there is some bandwagon effect, while an insignificant coefficient would mean that countries are not influenced by what others decide with respect to governance arrangements (*bandwagon effect*).

It is often stated that “it takes a crisis to reform.” Hence, the model also tests for the *impact of a crisis experience* on governance arrangements. The expected sign is not clear because governments could react in various ways to a crisis. Supervisors could be blamed for the crisis, and therefore their level of independence could be reduced, or for a given level of independence, they could be subjected to more accountability. However, other reactions are also thinkable. For instance, the government could, in the wake of a crisis, grant more independence to the supervisor because the government does not want to be blamed again in the future if another crisis erupts (*financial crisis*).

We also test for the political factor, by introducing a variable for *the political system*. It is expected that mature democracies are more comfortable in granting independence to the supervisor and introducing accountability arrangements because the system has the necessary level of checks and balances.¹⁴ Emerging democracies may be inclined to go the same way, while notions of independence and accountability are fairly alien to autocratic regimes. So the expected sign is positive with the political system variable (*polity*).

Finally, if we assume that the decision about the supervisory architecture and its governance arrangements is a two-stage process, we can separately test for the impact of two additional

¹⁴ See Moser (1999) and Keefer and Stasavage (2001) for the impact of checks and balances in the political process on the grant of independence to the central bank.

variables. In the first place, we control for the impact of the policymaker's decision to have, or keep, *the supervisor in the central bank*. The sign is a priori undetermined. The impact on supervisory governance of housing the supervisor in the central bank is somewhat ambiguous: QRT (2007) and Table 2 above indicate that supervisors housed in central banks typically have a higher degree of independence and a lower degree of accountability than their colleagues housed outside the central bank (*central bank effect*).

The other part of the decision concerns the *degree of integration of the supervisor*—the choice between sector-specific supervisors on the one extreme and fully unified (or integrated) supervisors on the other hand. So we also control for the impact of this decision on supervisory governance. QRT (2007) and Table 2 above show that governments tend to grant lower degrees of independence and more complex accountability arrangements to supervisors outside the central bank, and even more so to unified supervisors. The effect on total governance is a priori unknown (*integrated supervisor*).

The general specification is represented by equations (2) and (3):

$$(2) \quad (supgov)_i = \beta_1 (governance)_i + \beta_2 (gdp/capita)_i + \beta_3 (market\ structure)_i + \beta_4 (concentration)_i + \beta_5 (common\ law)_i + \beta_6 (ger/scand)_i + \beta_7 (bandwagon)_i + \beta_8 (crisis)_i + \beta_9 (polity)_i + \beta_{10} (cb\ effect)_i + \varepsilon$$

$$(3) \quad (supgov)_i = \beta_1 (governance)_i + \beta_2 (gdp/capita)_i + \beta_3 (market\ structure)_i + \beta_4 (concentration)_i + \beta_5 (common\ law)_i + \beta_6 (ger/scand)_i + \beta_7 (bandwagon)_i + \beta_8 (crisis)_i + \beta_9 (polity)_i + \beta_{11} (integrated\ supervisor)_i + \varepsilon$$

with country $i = 1 \dots 50$.¹⁵

The dependent variables (represented here by “*supgov*”) are the total rating, the independence rating and the accountability rating.¹⁶

C. The Results

In 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 governance ratings—is unequivocal: if β_j is positive, for example, an increase in the value of x_j increases the probability of having higher governance ratings.

Tables 3, 4 and 5 present the results for the total rating, independence and accountability. They reveal highly interesting results. First of all, for the overall ratings in Table 3, we find that supervisory governance arrangements are strongly driven by the quality of the country's public sector governance, which confirms our hypothesis. The significance of this variable is highly robust in all specifications. In addition, we note that a bandwagon effect is at play, and

¹⁵ Due to data limitations, only 50 countries were withheld for the econometric analysis.

¹⁶ The correlation matrix for the variables is in Appendix IV.

fairly significantly. Polity also plays a significant role, meaning that the more mature a democracy is, the more the government is willing to grant independence, with accompanying accountability. The impact of past crises is significant but less so than for the other significant variables. The only other variable with significance is the German-Scandinavian law factor, but with a negative sign. This is hard to explain and we will come back to this phenomenon. All other variables, including GDP per capita do not have a significant impact on the probability of having high quality governance arrangements.

From equations (8) and (9) in Table 3, we also learn that the presence of supervisors in the central bank has a significant and negative impact on governance arrangements. On the other hand, to more integrated the supervisory function is, the greater the probability of higher governance ratings.

When we dissect the results and look at the determinants of independence and accountability separately (Tables 4 and 5), we see that the findings with the overall ratings mask a number of remarkable differences in the determinants. First of all, and very interestingly, public sector governance does not seem to have a significant impact on the independence ratings. So, the probability that supervisors have good independence ratings seems less to depend on the quality of a country's public sector governance than on factors such as the country's economic size, its political system, as well as a demonstration effect. The latter implies that, as the idea of independent agencies continues to spread around the world, more countries are willing to embrace it. Another finding from the independence-equations is that neither the role of the central bank as a supervisor, nor the degree of unification of supervision seem to have an impact on the degree of independence.

The probability of having elaborate accountability arrangements, on the other hand, is very strongly driven by the quality of the country's public sector governance. This variable is highly significant, and robust across specifications. Other important determinants are the crisis experience and, again, polity. We also find that the presence of the central bank has a negative, though insignificant impact on accountability, but the more unified the supervisory function is, the more likely it is that the institution will have elaborate accountability arrangements.

In sum, what we learn from this analysis of the drivers of supervisory governance arrangements is that: (i) good public sector governance has a decisive impact, but nearly exclusively on accountability. Independence seems to be driven by other factors; (ii) policymakers apparently do not see independence and accountability as two sides of the same coin. This impression was already raised in QRT (2007) and surfaced again from the analysis of the tables and figures in this chapter. It is fairly strongly confirmed by our econometric analysis. Politicians' decisions on the degree of independence and accountability of their supervisors seem to be driven by a different set of considerations. Only polity is present in both, meaning that the more mature a democracy is, the more likely it is that higher degrees of independence and accountability will be granted. Accountability is additionally driven by crisis experiences, while independence is influenced by a kind of demonstration effect; and (iii) the location of the supervisor has an influence. We modeled a two-stage decision making process by the policymaker (inside or outside central bank, unified or not). Location and

functional integration do not seem to have a great impact on the probability of high independence, but they do have an impact on the degree of accountability. Indeed, the likelihood for more elaborate accountability increases when the central bank is not the supervisor. This is obviously related to the fact that central bank accountability arrangements are and remain predominantly geared toward monetary policy, which is less demanding than supervision.¹⁷

To further test the finding under (ii) above, that decisions regarding the degrees of independence and accountability are not really taken in tandem, we re-ran the independence and accountability regressions and included the accountability rating in the independence regression and vice versa. This step is somewhat tricky because of the risk of simultaneity bias. The results—with this caveat in mind—confirm our impression that policymakers are driven by different considerations when deciding on independence and accountability. In both case the coefficients were positive but insignificant, consistent with the finding presented in Figure 1. The positive sign could hint at a weak view of complementarity between both (a negative sign would have indicated that the trade-off view between independence and accountability prevailed).

The results also confront us with the puzzling strong impact of the German-Scandinavian law factor. This finding needs further analysis. A likely explanation is that this variable captures some other effect as it is very unlikely that the German legal tradition has a bias against independence—witness the high degree of the Bundesbank. Inspection of the data shows that all the countries that fall under this law tradition have fairly low rates of supervisory independence for a variety of unrelated reasons.¹⁸ If this is the case, it means that law-traditions have no impact on governance arrangements, and that we need to look for another variable to capture the effects that we see in the German law-variable.

¹⁷ See Hüpkens, Quintyn and Taylor (2005) on this topic.

¹⁸ The Scandinavian countries were the first ones to unify their supervisors in the late 1980s and early 1990s, and in those days, there was no talk about supervisory governance, let alone independence. They have relatively modest independence ratings. QRT (2007) discussed the reasons why Austria, Germany and Korea also have below-average independence ratings.

Table 3. Ordered Logit Estimates with Total Governance as the Dependent Variable
(50 observations)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Governance	1.01	1.04	1.04	1.93	1.48	1.74	1.24	1.30	1.08
St. error	(0.39)	(0.40)	(0.40)	(0.49)	(0.53)	(0.56)	(0.60)	(0.60)	(0.60)
P>z	0.011***	0.009***	0.01***	0.00***	0.005***	0.002***	0.039**	0.029**	0.072*
GDP/capita	0.004	0.004	0.004	0.006	0.006	0.004	0.003	0.003	0.003
St. error	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
P>z	0.17	0.17	0.17	0.08*	0.06**	0.27	0.33	0.40	0.29
Market structure	-0.004	-0.002	-0.002	-0.018	-0.013	-0.025	-0.026	-0.035	-0.023
St. error	(0.025)	(0.026)	(0.026)	(0.026)	(0.027)	(0.027)	(0.027)	(0.028)	(0.026)
P>z	0.88	0.92	0.95	0.50	0.61	0.35	0.34	0.22	0.38
Market concentration		-0.011	-0.011	-0.017	-0.017	-0.021	-0.019	-0.015	-0.019
St. error		(0.012)	(0.013)	(0.013)	(0.013)	(0.013)	(0.014)	(0.013)	(0.013)
P>z		0.35	0.38	0.17	0.19	0.01*	0.17*	0.24	0.13
Common law			-0.12	-0.74	-0.48	-0.27	-0.53	-0.40	-0.60
St. error			(0.59)	(0.63)	(0.65)	(0.67)	(0.70)	(0.71)	(0.68)
P>z			0.21	0.23	0.46	0.69	0.44	0.57	0.37
Ger/Scand				-2.63	-2.65	-3.59	-3.59	-4.22	-5.12
St. error				(0.82)	(0.84)	(1.01)	(1.02)	(1.09)	(1.23)
P>z law				0.001***	0.002**	0.0000***	0.0000***	0.0000***	0.0000***
bandwagon effect					0.11	0.10	0.12	0.13	0.13
St. error					(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
P>z					0.003***	0.004***	0.001***	0.001***	0.001***
Financial crisis						1.56	1.46	1.10	1.80
St. error						(0.85)	(0.84)	(0.85)	(0.87)
P>z						0.066***	0.082*	0.194	0.038**
Polity							0.23	0.25	0.23
St. error							(0.1)	(0.11)	(0.1)
P>z							0.021**	0.017***	0.025**
Central bank effect								-1.21	
St. error								(0.66)	
P>z								0.067*	
Integrated supervisor									1.83
St. error									(0.72)
P>z									0.011***
LR χ^2	8.91	9.77	9.81	20.48	29.74	33.15	38.50	41.95	45.12
Prob> χ^2	0.0305	0.0405	0.0808	0.0023	0.0001	0.0001	0.0000	0.0000	0.0000
Log likelihood	-143.31	-142.87	-142.85	-137.52	-132.89	-131.2	-128.50	-126.78	-125.19
Pseudo R^2	0.03	0.03	0.03	0.07	0.10	0.11	0.13	0.14	0.15

Source: Own calculations.

Table 4. Ordered Logit Estimates with Independence as the Dependent Variable
(50 observations)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Governance	1.25	0.65	0.78	0.33	1.13	0.33	0.21
St. error	(0.45)	(0.49)	(0.51)	(0.54)	(0.51)	(0.54)	(0.54)
P>z	0.006***	0.185	0.12	0.54	0.027**	0.54	0.69
GDP/capita	0.007	0.007	0.006	0.006	0.011	0.006	0.006
St. error	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)
P>z	0.037**	0.02**	0.062*	0.084*	0.008***	0.097*	0.071*
Market structure	-0.034	-0.028	-0.033	-0.038	-0.007	-0.041	-0.033
St. error	(0.26)	(0.26)	(0.27)	(0.27)	(0.31)	(0.28)	(0.27)
P>z	0.19	0.29	0.22	0.17	0.82	0.14	0.22
Market concentration	-0.002	-0.001	-0.003	-0.002	-0.01	-0.004	-0.004
St. error	(0.01)	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
P>z	0.87	0.89	0.98	0.86	0.41	0.75	0.77
Common law	-0.53	-0.23	-0.13	-0.47	-3.79	-0.36	-0.50
St. error	(0.59)	(0.6)	(0.61)	(0.64)	(0.81)	(0.65)	(0.63)
P>z	0.37	0.70	0.83	0.46	0.000***	0.58	0.43
Ger/Scand law	-3.43	-3.91	-4.49	-4.77		-5.03	-5.43
St. error	(0.88)	(0.96)	(1.15)	(1.19)		(1.25)	(1.34)
P>z	0.000***	0.000***	0.000***	0.000***		0.000***	0.000***
Bandwagon effect		0.14	0.13	0.14	0.03	0.14	0.14
St. error		(0.038)	(0.038)	(0.036)	(0.036)	(0.037)	(0.037)
P>z		0.000***	0.000***	0.000***	0.21	0.000***	0.000***
Financial crisis			0.79	0.69	-0.99	0.50	0.79
St. error			(0.82)	(0.82)	(0.81)	(0.85)	(0.83)
P>z			0.33	0.40	0.22	0.55	0.34
Polity				0.23	0.14	0.23	0.23
St. error				(0.09)	(0.07)	(0.10)	(0.09)
P>z				0.013***	0.054**	0.014***	0.014***
Central bank effect						-0.53	
St. error						(0.66)	
P>z						0.42	
Integrated supervisor							0.77
St. error							(0.69)
P>z							0.26
<i>LR chi2</i>	<i>18.74</i>	<i>33.71</i>	<i>34.63</i>	<i>41.20</i>	<i>41.46</i>	<i>41.85</i>	<i>42.46</i>
<i>Prob>chi2</i>	<i>0.0046</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.000</i>	<i>0.0000</i>
<i>Log likelihood</i>	<i>-135.36</i>	<i>-127.88</i>	<i>-127.42</i>	<i>-124.13</i>	<i>-98.11</i>	<i>-123.81</i>	<i>-123.5</i>
<i>Pseudo R²</i>	<i>0.06</i>	<i>0.12</i>	<i>0.12</i>	<i>0.14</i>	<i>0.17</i>	<i>0.14</i>	<i>0.15</i>

Source: Own calculations.

Table 5. Ordered Logit Estimates with Accountability as the Dependent Variable
(50 observations)

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Governance	1.64	1.59	1.91	1.46	1.47	1.35
St. error	(0.48)	(0.51)	(0.54)	(0.60)	(0.61)	(0.61)
P>z	0.001***	0.002****	0.000***	0.015***	0.015***	0.026**
GDP/capita	-0.0003	-0.0004	-0.003	-0.004	-0.004	-0.004
St. error	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
P>z	0.91	0.89	0.35	0.29	0.23	0.27
Market structure	-0.006	-0.006	-0.016	-0.014	-0.019	-0.014
St. error	(0.02)	(0.02)	(0.026)	(0.026)	(0.027)	(0.025)
P>z	0.80	0.80	0.54	0.57	0.46	0.57
Market concentration	-0.029	-0.029	-0.03	-0.03	-0.03	-0.03
St. error	(0.013)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)
P>z	0.032**	0.032**	0.026**	0.042**	0.054***	0.061**
Common law	0.12	0.15	0.34	0.21	0.44	0.32
St. error	(0.63)	(0.64)	(0.65)	(0.67)	(0.69)	(0.67)
P>z	0.85	0.82	0.59	0.75	0.52	0.63
Ger/Scand law	-0.19	-0.18	-1.23	-1.13	-1.39	-1.92
St. error	(0.78)	(0.78)	(0.96)	(0.96)	(0.98)	(1.08)
P>z	0.81	0.82	0.20	0.24	0.15	0.076*
bandwagon effect		0.008	0.005	0.014	0.020	0.024
St. error		(0.026)	(0.22)	(0.27)	(0.27)	(0.27)
P>z		0.74	0.83	0.60	0.45	0.38
Financial crisis			1.67	1.56	1.33	1.89
St. error			(0.83)	(0.83)	(0.84)	(0.86)
P>z			0.043**	0.058**	0.11	0.028**
Polity				0.16	0.19	0.16
St. error				(0.10)	(0.10)	(0.10)
P>z				0.104*	0.064**	0.12
Central bank effect					-0.92	
St. error					(0.61)	
P>z					0.131	
Integrated supervisor						1.11
St. error						(0.63)
P>z						0.079*
<i>LR chi2</i>	20.98	21.08	25.21	27.94	30.23	31.03
<i>Prob>chi2</i>	0.0019	0.0037	0.0014	0.001	0.0008	0.0006
<i>Log likelihood</i>	-119.04	-118.98	-116.92	-115.56	-114.41	-114.01
<i>Pseudo R²</i>	0.08	0.08	0.10	0.11	0.12	0.12

Source: Own calculations.

V. CONCLUSIONS

Unlike the monetary policy function which is nowadays invariably the core function of a central bank, the supervisory function is being performed by a variety of institutions for whom there is as yet no consensus about the governance model. This paper analyzes recent trends in, and determinants of, financial supervisory governance.

The empirical analysis of the determinants of emerging independence and accountability arrangements (based on indices of independence and accountability) indicates that the quality of public sector governance plays a decisive role in establishing accountability arrangements, more than independence arrangements. The results also show that the likelihood for establishing governance arrangements suitable for the supervisory task seems to be higher when the supervisor is located outside the central bank and when the country has decided to establish an integrated supervisor. Since these integrated supervisors are typically entirely new agencies, i.e. established from scratch, their creation seems to give the policymakers the opportunity to devote more attention to the design of appropriate governance arrangements. We are also confronted with the evidence that policymakers do not consider independence and accountability as two sides of the same coin. Several empirical observations in our sample indicate that decisions on the degrees of independence and accountability are not connected. At best we find that both are seen as weakly complementary to each other.

So one lesson from this analysis is that the dynamics between independence and accountability are not clearly understood. A second lesson is that central banks that are also supervisors, may wish to revisit some of their governance arrangements to better meet the requirements posed by financial sector supervision.

Appendix I. Countries Selected for the Survey

Country	Year of Last Reform (Legislative or Institutional)	Banking Crisis (Year)	Location Bank Supervision
Armenia			CB
Australia	1998		OCB, U ^{3/}
Austria	2002		OCB, U
Bahamas (The)	2000		CB
Belgium	2004		OCB, U
Brazil			CB
Bulgaria			CB
Canada	2006		OCB, U
Chile	1997		OCB
China, PR	2004	Distress throughout 1990s	OCB
Colombia	2003/2005 ^{4/}		OCB, U
Cyprus			CB
Czech Republic			CB, U
Denmark	1988	Distress in early 1990s	OCB, U
Ecuador	2001	2000	OCB
Egypt			CB
El Salvador			OCB
Estonia	1998		OCB
Finland	1993/2003 ^{4/}	1991	OCB, U ^{2/}
France			OCB ^{2/}
Germany	2002		OCB/CB, U ^{1/}
Greece			CB
Guatemala	2002		OCB, U
Hungary	2000/2004 ^{4/}		OCB, U
India			CB
Indonesia	2004	1997	CB ^{5/}
Ireland	2003		CB, U
Israel			CB
Italy			CB
Japan	2000	Distress throughout 1990s	OCB/CB ^{1/}
Korea	1997	1997	OCB
Latvia	2001		OCB, U
Mauritius	2004		CB
Mexico	1995	1994	OCB
Morocco			CB
Netherlands	2004		CB ^{3/}
New Zealand			CB
Nicaragua	2004	2000	OCB, U
Nigeria			CB
Norway	1988/2003 ^{4/}	1991	OCB, U
Peru			OCB
Philippines (The)			CB
Poland	1997		CB ^{6/}
Portugal			CB

Appendix I. Countries Selected for the Survey (continued)

Country	Year of Last Reform (Legislative or Institutional)	Banking Crisis (Year)	Location Bank Supervision
South Africa	1991		CB
Spain			CB
Sri Lanka			CB
Sweden	1991/2003 ^{4/}	1991	OCB, U
Switzerland			OCB
Trinidad and Tobago	2005		CB
Tunisia			CB
Turkey	2001	2000	OCB
Uganda	2004		CB
United Kingdom	1997		OCB, U
Zambia			CB

Notes: CB = in central bank; OCB = outside central bank; U = unified.

1/ Central bank in charge of on-site inspections.

2/ Affiliated with the central bank.

3/ Part of a “twin peak” arrangement.

4/ Two reforms—last one is taking into account.

5/ Bank supervision will be transferred to unified supervisor in 2010.

6/ Bank supervision was transferred to unified supervisor January 1, 2008.

Appendix II. Ratings by Criteria Across the Sample

Criteria	Ratings for Sample	Ratings for Supervisors Outside central banks	Ratings for Supervisors in central banks
Independence (19)			
1. Institutional Independence			
The agency has a legal basis (law, act, ...)	1.00	1.00	1.00
The law states that the institution is independent	0.45	0.48	0.43
The chairman and senior executives appointed by two branches of government	0.45	0.46	0.43
The decision-making body a board (not a single person)	0.75	0.78	0.71
All agency staff has legal immunity for actions done in good faith	0.69	0.76	0.63
No parliamentarians are sitting on policy board of agency	0.89	0.78	1.00
There is no government official on the agency policy board	0.46	0.35	0.57
The law/act does not give the minister of finance the right to intervene in policy decisions made by the agency	0.20	0.02	0.38
The law defines clear criteria for dismissal of the president of the agency	0.62	0.57	0.66
2. Regulatory Independence			
The agency can autonomously issue legally binding prudential regulations for the sector	0.75	0.76	0.64
3. Supervisory Independence			
The agency has the sole right to issue licenses	0.75	0.76	0.73
The agency has the sole right to withdraw licenses	0.74	0.72	0.75
The agency has the sole right to impose sanctions on supervised institutions	0.96	0.96	0.96
The agency has the right to enforce supervisory sanctions	0.87	0.91	0.84
4. Budgetary Independence			
The agency is funded through fees from the supervised entities	0.77	0.83	0.71
The agency need not submit the budget to the government for a priori approval	0.51	0.65	0.38
The agency has autonomy in defining salaries and salary structure of staff	0.68	0.65	0.71
The agency can autonomously hire staff	0.75	0.70	0.80
The agency can autonomously define the internal organizational structure	0.79	0.70	0.88

Appendix II. Ratings by Criteria Across the Sample (continued)

Criteria	Ratings for Sample	Ratings for Supervisors Outside central banks	Ratings for Supervisors in central banks
Accountability (21)			
1. Mandate			
The agency's mandate is defined in the enabling legislation	0.95	0.96	0.95
2. Accountability to the legislative branch			
There is an obligation in the law to present annual report to legislative branch	0.80	0.85	0.75
The law provides for possibility of regular hearings before committees (e.g., quarterly)	0.27	0.26	0.29
Accountability to the legislature is not delegated to finance minister (i.e., not the chair of the agency presents the report to parliament but the minister of finance).	0.53	0.48	0.57
3. Accountability to the executive branch			
There an obligation in the law to present annual report to executive branch	0.67	0.44	0.89
The law provides for a possibility of regular briefing meetings with minister of finance (e.g., quarterly, ...)	0.32	0.30	0.34
The law provides for the possibility for ad hoc hearings	0.29	0.26	0.32
4. Accountability to the judiciary branch			
Supervised entities have the right to appeal supervisory decision to courts	0.85	0.87	0.82
Distinct judicial processes are in place to handle these appeals	0.25	0.33	0.16
Appeals are handled by specialized judges	0.14	0.15	0.13
The law provides for penalties for faulty supervision	0.09	0.11	0.07
5. Budgetary accountability			
There is a process whereby the agency presents and discusses its budget ex post	0.85	0.93	0.79
6. Transparency			
There is a practice of disclosure of supervisory policies and of decisions (website)	0.95	0.93	0.98
The agency has issued a mission statement	0.64	0.74	0.54
The annual report is available to the general public	0.98	0.96	1.00
There is a possibility for inquiries by the general public (email, ombudsman)	0.81	0.93	0.70
The law provides for a consumer consultation board in the framework of regulation and supervision	0.14	0.24	0.04
7. Other			
The law requires a formal ex ante consultation process with the industry about new regulations	0.54	0.74	0.34
The law requires a formal consultation process with the public at large about new regulations	0.22	0.30	0.14
The agency has an internal audit process in place	0.95	1.00	0.91
The agency has an external audit process in place	0.98	1.00	0.96

Appendix III. Definition and Sources of Variables

The independent variables are the following:

gov = Public Sector Governance: quantitative variable for the public sector governance factor. It shows the structural capacity of the government to formulate and implement sound policies;¹⁹

gdp/cap = Gross Domestic Product per head of population. A quantitative variable for the economic size factor;²⁰

mcap = Market capitalization/GDP: quantitative variable for the structure of the financial market and the private governance factor. It shows a measure of the securities market size, relative to GDP;²¹

conc = degree of concentration in the banking system: percentage of the total deposits held by the five major banks of the country;²²

anglosaxonL, *GermanScandL* = binary variables for the law factor. They are dummies that indicate the legal roots of a given country, representing the control variables for the law and finance view;²³

bandwagon = the year of the latest reforms in the law(s) governing the country's supervisory activities. Is used to identify if reforms in later years are triggered by demonstration effect of reforms earlier on in other countries;

crisis = year of a banking crisis in the country, to identify if reforms in governance arrangements are triggered by a financial sector crisis;

¹⁹ The index is built using all the indicators proposed by Kaufmann, Kraay and Mastruzzi (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; and (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 comprise 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; and (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 1996–2004, calculating the mean of the six different dimensions.

²⁰ See World Bank (2003), *World Development Indicators*. For each variable we calculate the mean of five time values: 1996, 1998, 2000, 2002, 2004.

²¹ World Bank (2003), *World Development Indicators*, Stock Markets 5.3. For each variable we calculate the mean of five time values: 1996, 1998, 2000, 2002, 2004.

²² Barth, Caprio, Levine (2003).

²³ Beck, Demirgüç-Kunt and Levine (2003). The legal roots are five: Anglo-Saxon Law (= Common Law), French, German and Scandinavian Laws (= Civil Laws), Socialist Law (Others). In this analysis for theoretical reasons we limited ourselves to the common law and the German/Scandinavian law.

polity = is a measure of the political system of a country. See University of Maryland, 2006 for further details;²⁴

Equation (2) tests for impact of central bank as the supervisor (*cb*). This is a 0–1 dummy with 0 when central bank is not the supervisor, 1 otherwise.

Equation (3) tests the impact of the presence of a single financial authority (*sfa*), or the degree of concentration of supervisory activities. This index is calculated in Masciandaro (2007), and distinguishes 7 degrees of integration (0 being separate agencies, 7 fully integrated).

²⁴ As Appendix III with the correlation coefficients shows, the correlation between public sector governance and *polity* is 0.53 indicating that these two variables measure different things.

Appendix IV. Correlation Matrix of Variables

	gov	gdpcap	mcap	conc	anglo	gerscan	polity	bandwg	crisis
gov	1.0000								
gdpcap	-0.0814	1.0000							
mcap	0.5083	-0.0570	1.0000						
conc	0.0718	-0.0084	0.1108	1.0000					
anglo	0.1542	-0.0699	0.2289	0.1452	1.0000				
gerscan	0.4359	0.0394	0.0412	-0.0942	-0.2453	1.0000			
polity	0.5304	0.0530	0.2583	-0.0072	0.2088	0.1995	1.0000		
bandwg	0.4159	-0.0203	0.1776	0.0060	-0.0644	0.1808	0.1485	1.0000	
crisis	0.0636	0.3337	0.0370	0.0530	-0.2633	0.5055	0.0943	0.0766	1.0000

References

- Arnone, Marco, Bernard Laurens, and Jean-François Segalotto, 2006a, “The Measurement of Central Bank Autonomy: Survey of Models, Indicators, and Empirical Evidence,” IMF Working Papers No. 227 (Washington: International Monetary Fund).
- , 2006b, “Measures of Central Bank Autonomy: Empirical Evidence for OECD and Developing Countries, and Emerging Market Economies,” IMF Working Papers No. 228 (Washington: International Monetary Fund).
- , Bernard J. Laurens, Jean-François Segalotto, and Martin Sommer, 2007, “Central Bank Autonomy: Lessons from Global Trends,” IMF Working Paper No. 88 (Washington: International Monetary Fund).
- Barth, James, Gerard Caprio, and Ross Levine, 2003, “Bank Supervision and Regulation: What Works Best?” *Journal of Financial Intermediation*, Vol. 13, pp. 205–248.
- Basel Committee on Banking Supervision, 1997, “Core Principles for Effective Banking Supervision” (Basel: Bank for International Settlements).
- , 2006, “Core Principles for Effective Banking Supervision” (Basel: Bank for International Settlements).
- Beck, Thorsten, A. Demirgüç-Kunt, and R. Levine, 2003, “The Financial Structure Database,” in *Financial Structure and Economic Growth: A Cross Country Comparison of Banks*, ed. by A. Demirgüç-Kunt, and R. Levine (Cambridge, Massachusetts: MIT Press).
- Boot, Arnoud W.A., and Anjan V. Thakor, 1993, “Self-Interested Bank Regulation,” *American Economic Review*, No. 83, Vol. 2, pp. 206–12.
- Crowe, Christopher and Ellen E. Meade, 2007, “Central Bank Governance: What is it and Does it Matter?” *Journal of Economic Perspectives*, Vol. 21, No. 4, Fall.
- Das, Udaibir, and Marc Quintyn, 2002, “Financial Crisis Prevention and Crisis Management—The Role of Regulatory Governance,” in *Financial Sector Governance: The Roles of the Public and Private Sectors*, ed. by Robert Litan, Michel Pomerleano, and V. Sundararajan (Washington: Brookings Institution Press).
- , Quintyn, Marc, and Kina Chenard, 2004, “Does Regulatory Governance Matter for Financial System Stability? An Empirical Analysis,” *The Evolving Financial System and Public Policy* (Ottawa: Bank of Canada).
- De Haan, Jacob, Amtenbrink, Fabian, and Sylvester Eijffinger, 1999, “Accountability of Central Banks: Aspects and Quantification,” *Banca Nazionale del Lavoro Quarterly Review*, No. 209, pp. 167–93.

- De Krivoy, Ruth, 2000, *Collapse. The Venezuelan Banking Crisis of 1994* (Washington: Group of Thirty).
- Eijffinger, Sylvester, M. Hoeberichts, and E. Schaling, 2000, "A Theory of Central Bank Accountability," CEPR Discussion Paper Series, No. 2354.
- , and Petra Geraarts, 2006, "How Transparent are Central Banks?" *European Journal of Political Economy*, Vol. 22, pp. 1–21.
- , and Marco Hoeberichts, 2002, "Central Bank Accountability and Transparency: Theory and Some Evidence," *International Finance*, Vol. 1, pp. 73–96.
- Freytag, Andreas, and D. Masciandaro, 2007, "Financial Supervision Architecture and Central Bank Independence," in *Designing Financial Supervision Institutions: Independence, Accountability and Governance*, ed. by Donato Masciandaro, and Marc Quintyn M. (Cheltenham, United Kingdom; North Hampton, Massachusetts: Edward Elgar).
- Goodhart, Charles, ed., 1998a, *The Emerging Framework of Financial Regulation*, Financial Markets Group (London: London School of Economics, Central Banking Publications Ltd.).
- , 1998b, *The Evolution of Central Banks* (Cambridge, Massachusetts: MIT Press).
- Greene, W., 1997, *Econometric Analysis*, (Upper Saddle River; New Jersey: Prentice Hall).
- Grilli, Vittorio, Donato Masciandaro, and Guido Tabellini, 1991, "Political and Monetary Institutions and Public Financial Policies in the Industrial Countries," *Economic Policy*, Vol. 13, pp. 341–92.
- Hardy, Daniel, 2006, "Regulatory Capture," IMF Working Papers No. 34 (Washington: International Monetary Fund).
- Hassan, Iftexhar, and Loretta Mester, "Corporate Governance and Effective Central Banking: Cross-Country Empirical Evidence," in *Challenges in Central Banking*, ed. by P. Siklos, M. Bohl, and M. Wohart (forthcoming; Cambridge University Press, Cambridge UK).
- Hayo, Bernd and Carsten Hefeker, 2001, "Do We Really Need Central Bank Independence? A Critical Re-examination," WWZ Discussion Papers No. 3 (Basel, Switzerland: University of Basel).
- Hughes, Hallet A., and Jan Libich, 2006, "Central Bank Independence, Accountability and Transparency: Complements or Strategic Substitutes?" CEPR Discussion Paper No. 5470 (London: Centre for Economic Policy Research).

- Hüpkens, Eva H.G., Marc Quintyn, and Michael Taylor, 2005, "The Accountability of Financial Sector Supervisors: Theory and Practice," *European Business Law Review*, Vol. 16, pp. 1575–620.
- Jordana, Jacinta and David Levi-Faur, 2004, "The politics of regulation in the age of governance," in *The Politics of Regulation*, Jordana, J., and D. Levi-Faur, eds., (Cheltenham, United Kingdom; Northampton, Massachusetts: Edward Elgar), pp 1–28
- Kaufmann, D., A. Kraay, and M. Mastruzzi, 2003, *Governance Matters III: Governance Indicators 1996–2002*, World Bank Policy Research Department Working Paper, (Washington: World Bank).
- Keefer, Philip, and David Stasavage, 2001, *Bureaucratic Delegation and Political Institutions: When Are Independent Central Banks Irrelevant?* (mimeo).
- La Porta, R., Lopez-de-Salinas, A. Shleifer, and R. Vishny, 1998, "Law and Finance," *Journal of Political Economy*, No 106, pp. 1113–55.
- Lastra, Rosa Maria, 1996, *Central Banking and Banking Regulation*, Financial Markets Group (London: London School of Economics).
- Maddala, G.S., 1983, *Limited Dependent and Qualitative Variables in Econometrics* (New York: Cambridge University Press).
- Masciandaro, Donato, 2006, "E Pluribus Unum? Authorities Design in Financial Supervision: Trends and Determinants," *Open Economies Review*, Vol. 17, pp. 73–102.
- , 2007, "Divide et Impera: Financial Supervision Unification and the Central Bank Fragmentation Effect," *European Journal of Political Economy*, Vol. 23, pp. 285–315.
- , and Marc Quintyn, 2007, "Helping Hand or Grabbing Hand? Supervision Architecture, Financial Structure and Market View," *IMF Working Paper WP/08/47*.
- , Marc Quintyn, and Michael Taylor, "Independence and Accountability in Supervision: Comparing Central Banks and Financial Authorities," in *Challenges in Central Banking*, ed. by P. Siklos, M. Bohl, and M. Wohart (forthcoming; Cambridge University Press, Cambridge UK).
- Moser, Peter, 1999, "Checks and Balances, and the Supply of Central Bank Independence," *European Economic Review*, Vol. 43, pp. 1569–93.
- Quintyn, Marc, 2007a, "Governance of Financial Supervisors and its Effects—A Stocktaking Exercise", SUERF Studies 2007/4.

- Quintyn, Marc, 2007b, “*Independent Agencies – More than a Cheap Copy of Independent Central Banks?*” paper presented at Conference on “Separation of Powers: New Doctrinal Perspectives and Empirical Findings”, University of Haifa, Israel, December 19–21.
- , and Michael W. Taylor, 2003, “Regulatory and Supervisory Independence and Financial Stability,” *CESifo, Economic Studies*, Vol. 49, pp. 259–94.
- , and Michael W. Taylor, 2007, “Robust Regulators and Their Political Masters,” in *Designing Financial Supervision Institutions: Independence, Accountability and Governance*, ed. by D. Masciandaro, and M. Quintyn M. (Cheltenham, United Kingdom; Northampton, Massachusetts: Edward Elgar).
- , Silvia Ramirez, and Michael W. Taylor, 2007, “The Fear of Freedom. Politicians and the Independence and Accountability of Financial Supervisors,” in *Designing Financial Supervision Institutions: Independence, Accountability and Governance*, ed. by D. Masciandaro, and M. Quintyn (Cheltenham, United Kingdom; Northampton, Massachusetts: Edward Elgar).
- Shleifer, Andrei, and Robert Vishny, 1998, *The Grabbing Hand* (Cambridge: Harvard University Press).
- Siklos, Pierre L., 2002, “The Changing Face of Central Banking. Evolutionary Trends since World War II” (Cambridge, United Kingdom: Cambridge University Press).
- Stiglitz, Joseph, 1998, “Central banking in a democratic society.” *De Economist*, Vol. 146, p. 199–226.
- Thatcher, Mark 2002, “Regulation after delegation: Independent Regulatory agencies in Europe” *Journal of European Public Policy*, Vol. 9, No. 6, p. 954–972.
- University of Maryland, 2006, *Polity IV Project*. Available via the internet: <http://www.cidcm.umd.edu/polity>.
- Van der Crujsen, Carin and Sylvester Eijffinger, “The Economic Impact of Central Bank Transparency: A Survey,” in *Challenges in Central Banking*, ed. by P. Siklos, M. Bohl, and M. Wohart (forthcoming; Cambridge University Press, Cambridge UK).
- Westrup, Jonathan, 2007, “Independence and Accountability: Why Politics Matter, in *Designing Financial Supervision Institutions: Independence, Accountability, and Governance*, ed. by Donato Masciandaro and Marc Quintyn (Cheltenham, United Kingdom: Edward Elgar).
- Woolridge, J.M., 2002, *Econometric Analysis of Cross Section and Panel Data* (Cambridge, Massachusetts: MIT Press).