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A Stigler View on Banking Supervision

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Non-Technical Summary

The national systems of financial supervision in Europe are experiencing major reforms. Apart from the debate on specialised versus integrated supervision there are two "hot" issues: First, there is a controversy whether the national approach in European supervision is still justified or whether a European system of financial supervisors should be established. Second, there is no agreement about the role of central banks in future supervisory structures.

It is not the intention of this analysis to reiterate or elaborate the welfare arguments that are being used in the discussion. Instead, we try to shed more light on a neglected but important aspect: the interests of major players in supervisory reform. Since Stigler (1971) it has become well established that regulation is not solely driven by the legislators' desire to maximise the general welfare. Regulation can also be used for the benefit of influential interest groups since it offers scope for intransparent off-budget redistribution. It is the objective of this analysis to test for the relevance of Stigler's view on regulation in the context of banking supervision.

Based on a cross-section data set we test several hypotheses deduced from this private interest theory. Beforehand we assess the relevance of the public interest view that accounts for welfare enhancing regulation. The empirical results lend support to the relevance of the private interest view: The difference of supervisory systems in terms of stringency indicators has no significant impact on the likelihood of a systemic banking crisis. This leaves per se a larger scope for the private interest view following Stigler's capture theory.

In this context we differentiate between the "barriers to entry" and the "preference for laxity" hypothesis. According to the barriers to entry hypothesis one would expect banks to press for higher supervisory standards in order to reduce competition. In contrast, the preference for laxity hypothesis states that banks are interested in lax and low-cost supervisory standards since they regard supervision as a cost burden. Our empirical results concerning the barriers to entry hypothesis are not clear cut. We find some evidence that tougher supervision is associated with higher bank margins, i.e. lower competition. However, higher supervisory standards do not significantly effect concentration in the banking market. This finding allows to concentrate on the preference for laxity hypothesis which is clearly supported: The regulated banking industry exerts influence on supervisory standards in the sense that they press for lax and low-cost supervisory standards.

Finally, there is a clear message for the ongoing reform process in European banking supervision. Everybody who wants to forecast the outcome of this process has to identify the industry's interests. These interests can be expected to have a major impact for the future system.

A Stigler View on Banking Supervision

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Abstract

The system of banking supervision in Europe is undergoing substantial reforms. According to Stigler's capture theory regulation often follows the preferences of producers. Therefore, the interests of the financial industry might be a major driving force for the ongoing supervisory reform debate. This paper identifies possible interests of the regulated industries: Either they might favour strict supervision to create barriers for entry and thus to reduce competitive pressure in their market. Or they might use their political influence to press for a lax and low-cost supervisory system. A cross-country data base on supervisory systems and financial structure allows the application of a three-step testing procedure. It turns out that the private interest view on regulation is indeed relevant and that the data is more compatible with a "preference for laxity" than with a "barriers to entry" view.

JEL-Classification: G28

Keywords: banking regulation and supervision, capture theory, political economy

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1 Introduction

The national systems of financial supervision in Europe are experiencing major reforms. Structures that had been kept unchanged for decades are now undergoing substantial adjustments. Recent examples are the UK, Germany and Austria where integrated supervisory agencies have been installed replacing different former specialised agencies with their separate responsibilities for banking, insurance and securities. The ongoing reform debate goes even further. Apart from the debate on specialised versus integrated supervision there are two "hot" issues: First, there is a controversy whether the national approach in European supervision is still justified or whether a European system of financial supervisors should be established. Second, there is no agreement about the role of central banks in future supervisory structures.

It is not the intention of this analysis to reiterate or elaborate the welfare arguments that are being used in the discussion from a public interest perspective.[1] Instead, we try to shed more light on a neglected but important aspect: the interests of major players in supervisory reform. Since Stigler (1971) it has become well established that regulation is not solely driven by the legislators' desire to maximise the general welfare. Regulation can also be used for the benefit of influential interest groups since it offers scope for intransparent off-budget redistribution. It is the objective of this analysis to test for the relevance of Stigler's view on regulation in the context of banking supervision. The empirical basis is a cross-sectional data base on national supervisory systems and structural data.

Even a superficial glance at the ongoing European debate reveals that the personal interests of important actors play a role. The clearest example is given by prominent European central bankers arguing regularly in favour of an important role of central banks in the new supervisory structures. This paper's focus, however, will not be on the interests of regulating bureaucrats but – in line with the Stigler view – on the interests of the regulated industry. Furthermore, the analysis will not deal with financial market supervision in general but with banking supervision in particular. This concentration will allow for precision regarding the regulated industry's preferences.

Our political-economic view on banking supervision aims at an improved understanding of important driving forces in the supervisory system's reform

[1] For a discussion on the involvement of the central bank in banking supervision see, e.g., Goodhart and Schoenmaker (1993), Goodhart and Schonemaker (1995), Haubrich (1996), Peek et al. (1999), Goodhart (2000) and Barth et al. (2001b). For arguments concerning a single European banking supervisory structure see, e.g., Lannoo (2000) and Speyer (2001).

process. This better understanding might be helpful in forecasting the likely evolution of the system.

Our empirical results based on a large country cross-section strongly support the idea that the banking industry's interests are among the relevant factors driving the system's evolution.

The analysis proceeds in the following way: After a short survey of the relevant literature (section 2), we show the link between supervisory regulation and the interests of the banking industry (section 3). This analysis results in the formulation of hypotheses that are open for consecutive testing. In section 4 we describe the cross country database on supervisory systems and financial structure that we collected. Section 5 presents the empirical model and our estimation results. Section 6 puts forward some conclusions with a special focus on the European supervisory reform debate.

2 Banking applications of Stigler's capture theory

According to Stigler's capture view on regulation (Stigler, 1971), the interests of producers tend to be more influential in shaping regulatory legislation than consumers' interests. Consumers suffer from the high costs of organising their interest, the wide dispersion of costs and the information problem. Understanding the distributional consequences of regulation is much harder than in the case of cash redistribution. From the point of view of elected legislators this information problem on the side of consumers/voters decreases the political costs of favouring producers in terms of expected vote losses. This allows politicians to adjust regulation according to the preferences of the industry. In contrast to consumers, the regulated industry is often well-organised and faces powerful incentives to overcome information problems and to influence legislation e.g. through campaign financing, vote support or provision of biased information.

In spite of this asymmetry of influence between producers and consumers the impact of consumer interests on the regulatory outcome cannot be expected to be zero. Peltzman (1976) stresses the fact that, usually, a regulation fully in line with the solution preferred by producers will not be the political equilibrium. In price regulation, the usual vote maximising regulated prices lie somewhere below the monopoly price. In the Peltzman model regulating politicians apply a simple marginal calculus: They choose the structure and intensity of regulation in order to equalise the marginal vote losses of burdening consumers with the marginal vote gains from benefiting producers. In his contribution to the positive theory of regulation, Becker (1983) emphasises the importance of the deadweight loss which is defined as the difference between the winner's benefit minus the loser's cost resulting from regulation. With growing deadweight

losses politicians face increasing resistance from the losers, thus making the winning interest group less powerful.

To our knowledge, this view on regulation has so far not been applied to banking supervision. However, there is a closely related literature on the political economy of banking market entry regulation with empirical applications to the U.S. The guiding question of this strand of literature is whether the private interest view on regulation helps to understand the liberalisation steps that had been taken in the U.S. since the seventies.

Kroszner and Strahan (1999) focus on state-level deregulation of branching restrictions in the U.S. banking market. Prior to the 1970s, in many U.S. states there existed legislation restricting within-state branching and all states forbade interstate branching. The deregulation started in 1975 and was accomplished in the 1990s. Based on a hazard model, the authors show that interest related factors such as the relative strength of deregulation's winners and losers can help to explain the timing of deregulation in different states. Furthermore, these factors turn out to be significant in explaining voting behaviour in Congress votes on key deregulation acts. Kane (1996) looks at the same deregulation experience from a theoretical point of view. According to his approach the abolition of market entry restrictions can be explained by vanishing voters' perception of the social purpose of regulation. Furthermore, restrictions come under pressure when new technologies allow circumventing activities eroding the protective value of regulation from the industry's point of view.

Kroszner and Strahan (2000) execute a voting analysis on a 1991 Congress act modernising the U.S. deposit insurance system. The authors conclude that rivalry of interest within the industry (big versus small banks) and between industries (banks versus insurance) as well as legislators' ideology play a role: There is a significant link between a constituency's financial structure and the voting behaviour of its parliamentary representative. Ramirez (2002) applies a voting analysis to a 1998 legislation dismantling regulatory barriers between commercial banks, investment banks and insurance companies existing since the Glass-Steagall Act of 1933. Ramirez focuses on the relevance of Political Action Committee contributions from the financial industry and finds a significant impact in line with the industry's interests. This study thus supports the Stigler hypothesis: Legislators react to favours they get from the regulated industry.

A somewhat related recent work is Barth et al. (2002a): Based on a large country cross-section sample the authors test among other hypotheses for the impact of supervision on banking efficiency. They mention the possibility that supervisory regulation might not only be driven by the desire to improve systemic stability but also by the self-interest of regulating politicians and bureaucrats who create inefficient regulation in order to benefit favoured

constituents, attract campaign donations or extract bribes. This view points to the direction of our approach but relates the self-interest view only to the regulators and bureaucrats and not to the regulated interest group itself. Thus, an analysis does not yet exist that tests explicitly for a capture view on supervision.

3 The banking industry's stakes in supervision and a three stage testing procedure

Supervisory regulation offers an ideal precondition for capture: Its highly technical and complex nature makes the information problem on the side of consumers very relevant. In contrast to simple price regulation or even compared to market entry regulation it is much more difficult for consumers to understand which cost burden is associated with this type of regulation. At the same time the incentives for the regulated industry to influence regulation are substantial: Supervisory rules do not only influence administrative costs in financial enterprises, they are also relevant for a market's competition since they influence the costs of market entry.

In order to derive testable hypotheses on the impact of the industry's interest on supervisory regulation according to the capture theory we now have to become more explicit on the costs and benefits being associated with supervision. Testable hypotheses are formulated in terms of a static cross-country comparison since this corresponds to the available database.

Creating barriers to entry

Tight supervisory rules could possibly function as barriers to market entry. If the national supervisory system is particularly tough by international standards this could deter foreign institutes to enter the market. The high standards would force entrants to invest considerable effort to adjust to the specific supervisory requirements of the new market. If this is the case the domestic industry's interests can be identified in analogy to the arguments used in the literature on market entry regulation in the U.S.: Incumbent banks in fear of foreign competition can be expected to use their influence on national legislators to develop national supervision as a barrier to entry.

Preference for laxity

The domestic industry's preferences could, however, also be quite different from the "barriers to entry" hypothesis. If supervision is not effective as a protective tool, domestic banks would regard supervision first of all as a cost burden. Of course, financial companies have a non-altruistic and existential interest in financial stability. Even without any supervisory rules they would have an incentive to limit risk exposure in line with the risk preferences of the managers

or shareholders. However, legislated supervisory rules are based on the view that the banks' intrinsic and voluntary risk limiting is insufficient since individual banks do not take into account systemic externalities of bank failures. Therefore, the legislated supervisory rules normally impose binding restrictions on banks since otherwise the legislation would be redundant. With this background it can be expected that banks use their influence to alleviate the restrictions and to reduce costs imposed by supervisory rules.

Any empirical approach to test for the relevance of the private interest's view faces two problems. First, the private interest view of banking regulation has resulted in the hypotheses "barriers to entry" and "preference for laxity". These hypotheses imply opposite signs for the banking industry's potential impact on supervision. If the barriers to entry aspect is more relevant one would expect that the industry should press for tough supervisory standards while with a preference for laxity the opposite pressure should be expected.[2]

Second, we cannot a priori exclude the possibility that the public interest view is not relevant for the understanding of banking supervision. In contrast to the private interest view, the public interest view accounts for welfare-enhancing regulation. From this perspective regulation occurs primarily to correct market failures and protect poorly informed consumers from harm (Kroszner, 2000). Regulation and supervision aims mainly at the reduction of systemic risk and the safeguarding of the safety and soundness of the financial system. It might be the case that the public interest in a stable banking system is so dominant that it is driving the evolution of each single detail of the regulative system. This becomes particularly obvious in regard to preference for laxity. Optimising politicians are only willing to serve the preferences of suppliers as long as the political costs associated with the burden on consumers do not outweigh the producers advantages. This would be the case with a significant increase in the systemic risk even though the systemic risk as such is not visible for voters and consumers. An actual banking crisis would, however, be highly visible. An increasing systemic risk means that the probability of such a highly visible event would increase. For a politician maximising expected votes, this would be perceived as relevant in his optimising regulatory activity. As a consequence, with a very close link between supervisory effort and stability there would be no scope for Stigler-type activities.

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[2] Note that in a dynamic context the barriers to entry hypothesis does not necessarily contradict the preference for laxity hypothesis: In a first step, banks may press for tough supervisory standards to restrict competition and after competition is reduced they may press for lax supervisory standards. Since we hold a static view throughout the analysis, banks may either press for tougher or laxer supervisory standards.

We apply consecutive testing of three hypotheses to cope with these two problems. In a first step we try to test whether there is leeway for the private interest view on banking supervision. According to our arguments, there is a strong case for the (not necessarily exclusive) relevance of banking sector interests in supervision if no clear link between stability of the banking sector and central parameters of the supervisory system can be established. If this link is missing, there is scope for regulators to serve the regulated industry's interests without incurring major risks from system instability. Therefore, in a first step we have to test the following hypothesis.

H1: There is a significant link between the characteristics of the supervisory system and banking stability.

If this hypothesis is rejected at least for some parameters of the supervisory system there is room for political-economic maneuvers in Stigler's sense.

The next step aims at distinguishing between the two private interest view hypotheses barriers to entry and preference for laxity. The barriers to entry aspect can only be relevant if the supervisory system is indeed relevant for competition. The weaker the evidence for a link between supervisory standards and the market's competition, the larger is the case for the relevance of the preference for laxity within the private interest view. This leads to the formulation of the second hypothesis.

H2: The competition in financial services markets depends on the stringency of supervision. A high degree of supervisory stringency reduces competition.

The less support exists for this hypothesis, the more we can concentrate on the preference for laxity hypothesis which can be formulated in the following way:

H3: Countries with a relatively influential banking sector are, ceteris paribus, countries with relatively low supervisory standards and costs.

Figure 1 summarises the logic of the three-step testing procedure. Before we apply this testing design to our country cross-section sample we first describe the database and explain the choice of our proxies.

- insert figure 1 about here -

4 Variable definition and data sources

We construct several variables that serve as proxies for the strength of prudential rules and variables that represent the strength of the respective interest groups.

In addition, we construct several variables to control for other explanatory factors.

Most of the data is drawn from surveys conducted by the World Bank and the U.S. Office of the Comptroller of the Currency (OCC). The World Bank database on bank regulation and supervision contains data for 107 countries for the year 1999.[3] These 107 countries build the basis for the data set used in this paper.[4] The OCC survey focused on data for banking market structure and performance. Although the OCC survey gathered annual information from 110 countries for the years 1996-1999 we used only data referring to 1999. From these 110 countries we included only those that are also in the World Bank database.[5] Unless otherwise noted all variables refer to the year 1999.

Strength of supervisory regulation

Our main proxy for the strength of supervisory regulation is the total budget for supervision in Mill. USD (`BUDGET`) either normalised by or used in combination with an adequate control variable for the absolute size of a country's banking sector. Furthermore, the variable `EXAM` is number of onsite examinations per bank in the last 5 years. In addition, we include the variables `SUPERVISORS` that is the number of professional bank supervisors per institution and official supervisory power (`POWER`). `POWER` is an index constructed by Barth et al. (2001a) based upon yes and no responses to 16 questions from the World Bank survey indicating whether the supervisory authorities have the authority to take specific actions to prevent and correct problems.[6] `POWER` ranges from 0 to 16 with a higher value indicating more power. Data for the variables `BUDGET`, `EXAM` and `SUPERVISORS` is drawn from the World Bank database on bank regulation and supervision.

Banking industry variables

We include the following variable to serve as a proxy for the strength of the banking industry: `CLAIMSGDP` is bank claims on private sector to GDP calculated as the mean over the years 1990 to 1999. Bank claims on private sector give an indication of the dependency of the real economy on the banking industry. Therefore they represent the strength of the banking sector and its

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[3] For a detailed description of this data set see Barth et al. (2001a).

[4] For a list of countries included see table A1 in the appendix.

[5] Unfortunately, there are 25 countries that are not included in the OCC survey but are in our base data set drawn from the World Bank data set.

[6] For a list of these questions and a detailed description of the official supervisory power index see Barth et al. (2001a: 18).

political influence. It is useful to take the mean over several years instead of just 1999 data to correct for potential outlier and because the process of adjusting supervisory regulation according to the preferences of the industry takes time. Bank claims are taken from the IMF's International Financial Statistics (line 22d) and GDP from World Bank's World Development Indicators 2001.

ASSETS, DEPOSITS and LOANS is total bank assets, deposits and loans in Mill. USD, respectively. All these variables are obtained from the OCC survey.

In addition, we include the number of banks (BANKS) that is obtained from the OCC survey.

Banking competition variables

We include several variables as a measure for competition and concentration in the banking sector. These are important as endogenous variables in the context of testing *H2* and as a proxy for the ability of the banking industry to organise their interests and to succeed in the political process. According to Becker (1983) one would expect higher concentrated industries to be politically more successful.

A standard competition indicator for the banking market is the interest rate margin banks earn. The corresponding variable is DRATES calculated as lending rate minus deposit rate in 1999 taken from the IMF's Financial Statistics (lines 60l and 60p).

CONC1 and CONC2 is the percent of total assets and total deposits, respectively, accounted for by the three largest banks in 1999. Both measures of concentration are taken from the OCC survey.

In addition, we include among the competition related variables the percent of banks (FOREIGN1) and bank assets (FOREIGN2), respectively, that are foreign owned. These variables are obtained from the OCC survey.

Interindustry rivalry

Not just the banking industry itself has an incentive to influence supervisory regulation but also the rivalry industries, i.e. the insurance industry. If banks are also allowed to sell insurance products, insurance companies may have an interest in relative high banking supervisory standards to weaken their potential competitors. However, insurance preferences could also be contrary if insurers regard distribution of own products over the bank counter as a helpful and complementary distribution channel. In this case, one would expect the

insurance industry to press for lax supervisory standards in banking. Thus, the expected sign of the rival industry power is ambiguous.

To capture the effects of the rival insurance industry, we first constructed a dummy variable that indicates whether banks are allowed to undertake insurance activities. INSUR takes the value 1 if the insurance activity of banks is unrestricted or permitted, and 0 if it is restricted or prohibited. This information is obtained from responses to the World Bank survey.

In addition, we include the variables INSPEN and INSDEN, that is life insurance penetration (premiums/GDP) and density (premiums/population), respectively, as a proxy for the relative strength of the insurance industry. Both variables are taken form the Swiss-Re Sigma database and calculated as the mean over the years 1990 to 1999.

Public ownership

Legislators will be the more willing to follow the industry's interests the more stakes a government has in the market. Managers of public banks should therefore be particularly influential in shaping the supervisory system according to the industry's wishes. To test for this presumption we include GOVERN1 and GOVERN2, that is the percent of banks and bank assets, respectively, that are government owned. These variables are obtained from the OCC survey.

Banking system safety and soundness variables

We include two variables into our database that capture the safety and soundness of the banking system. CLOSED is the number of banks closed in the last 5 years taken from the World Bank database on the regulation and supervision of banks. CRISIS is a dummy variable that takes the value 1 if the country experienced a systemic banking crisis and 0 otherwise. CRISIS is constructed on the basis of Caprio and Klingebiel (1999) and complemented by information from Demirgüc and Detragiache (2000) and Barth et al. (2001c). We use the Caprio and Klingebiel definition of a systemic banking crisis meaning all or most of the bank capital was exhausted during the period of the crisis. Their assessments are made for the period late 1970s to early 1999.

Macroeconomic variables

We include the following macroeconomic control variables: GDP is current GDP in million USD. POP is population in million. GDPCAPITA is GDP per capita in constant 1995 USD and GDPGROWTH is annual GDP growth in percent. GDPCAPITA and GDPGROWTH are calculated as the mean over the years 1990

to 1999. All these variables are taken from the World Development Indicators database.

Supervision structure variables

As additional control variables we include two variables capturing the structure of the supervisory framework. MULTIPLE takes a value of 1 if there is more than one bank supervisory authority and 0 if there is a single bank supervisor. CB takes a value of 1 if the central bank is a bank supervisor and 0 if not. Both variables are obtained from Barth et al. (2002b).

Other variables

In addition, we include MONITOR, a private monitoring index, constructed by Barth et al. (2001a) that tries to capture to some degree the extent to which market or private "supervision" exists in different countries.[7] MONITOR is based on responses to questions from the World Bank survey and ranges from 0 to 7 with higher values indicating more private oversight.

DI is a dummy variable taking the value 1 if there exists an explicit deposit insurance scheme in the country and 0 if there is just an implicit deposit insurance. This variable is taken from the World Bank database on deposit insurance.[8]

Finally we include two regional dummy variables OECD and EU taking the value 1 if the country is an OECD or an EU member country, respectively, and 0 otherwise.

For a summarising list of variables see table A2 in the appendix. Descriptive statistics for all variables are presented in table A3 in the appendix.

5 Empirical model and estimation results

5.1 Empirical models and methodology

According to our three-step test design set up in section 3 and depicted in figure 1 we start by testing *H1* which allows us to draw conclusions about the relevance of the private interest versus the public interest view on banking supervision. For this first step, we specify the following model:

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[7] For a detailed description of the construction of the private monitoring index see Barth et al. (2001a: 22).

[8] For a description of this database see Demirgüc-Kunt and Sobaci (2000).

$$S_i = \alpha + \beta_1 SUP_i + \beta_2 C_i + \varepsilon_i \quad (1)$$

where S_i is a variable representing the safety and soundness of the banking system. SUP_i is a proxy for the supervisory standard. C_i contains control variables and ε_i is an error term. According to the public interest view one would expect higher supervisory standards to contribute positively to the stability in the banking market.

We then proceed by testing the above specified hypotheses H2 and H3 representing the private interest view. First, we test the barriers to entry hypothesis. Our empirical model to test H2 takes the following form:

$$COMP_i = \alpha + \beta_1 SUP_i + \beta_2 C_i + \varepsilon_i \quad (2)$$

where $COMP_i$ is a variable representing the competition and concentration in the banking market. SUP_i is the proxy for supervisory stringency and C_i contains control variables. If the barriers to entry hypothesis holds, higher supervisory standards should reduce competition and increase concentration in the banking market.

The final step is the testing of the preference for laxity hypothesis. Here, we have to keep in mind that this aspect of the private interest view should be more important than barriers to entry if the testing of H2 does not support a link between supervision and competition. To test H3 empirically, we employ the following model:

$$SUP_i = \alpha + \beta_1 B_i + \beta_2 I_i + \beta_3 S_i + \beta_4 C_i + \varepsilon_i \quad (3)$$

where SUP_i is the proxy for the supervisory standards. B_i contains proxies for the size and the strength of the banking industry and their ability to organise and, hence, succeed with their interests in the political decision process. I_i is an interindustry rivalry variable that is a variable representing the insurance industry. S_i represents variables that control for the safety and soundness of the banking system. Finally, C_i contains other control variables. According to the preference for laxity hypothesis one would expect the strength of the banking industry to influence supervisory stringency negatively. As mentioned above, the sign associated with the interindustry variable is ambiguous, depending on the incentives of the insurance industry to influence supervisory regulation.

We estimate several specifications of equations (1), (2) and (3) by selecting different combinations of the respective proxy variables. We use ordinary least squares regression and logit regression analysis and take the White and Huber/White heteroskedasticity consistent covariance estimates, respectively.

Looking at the specified empirical models clearly reveals a problem of causality. To cope with this endogeneity problem as well as with potential measurement errors we use instrumental variable procedures in addition to OLS regressions. The empirical results are reported in tables 1-6 – for the IV regressions in appendix B – and discussed in the next sections.

5.2 Public interest view – testing *H1*

Before coming to the private interest view hypotheses, i.e. the barriers to entry and the preference for laxity hypothesis, we try to find out whether supervision offers leeway for regulation in the industry's interest. This is likely to be the case if there is no clear link between the stability of the banking sector and the supervisory system's characteristics.

We have several specifications for testing *H1*. In a first set, we use the variable CRISIS as a proxy for the safety and soundness of the banking system (table 1). In a second set, we use the number of banks closed in the last 5 years (CLOSED) relative to the total number of banks (BANKS) as a measure of banking system stability (table 2). Unfortunately, CLOSED/BANKS may assess the stability of the banking system incorrectly since a high relative number of closed banks may indicate an anticipatory and highly successful supervision. Nevertheless, we run some regressions using this measure in addition to the regressions with the CRISIS variable. We use the variable BUDGET/ASSETS and EXAM as the proxy for the supervisory standard, respectively.[9]

We include GDPCAPITA as a control variable since one may rather expect a banking crisis in a poorer country.[10] In addition, we include in some specifications either DI or MONITOR as other control variables. Deposit insurance (DI) may encourage excessive risk taking (moral hazard) and hence influence the stability of the banking system as a whole (Demirguc-Kunt and Detragiache, 2000, Demirguc-Kunt and Kane, 2002, Barth et al., 2002a). With more private oversight, i.e. a higher private monitoring index (MONITOR) one would expect an increase in the stability of the banking system. Furthermore, by including CB and MULTIPLE, respectively, we test whether the supervisory

[9] We also ran regressions using POWER and SUPERVISORS as proxies for the supervisory stringency. The results do not differ substantially and are thus not reported.

[10] We also included GDPGROWTH as a control variable. High GDP growth should result in higher bank profits which in turn should contribute to the stability in the banking sector. However, GDPGROWTH had no significant impact on CRISIS and CLOSED/BANKS, respectively.

structure has any impact on the stability of the banking system.[11] The results are reported in tables 1 and 2 (the IV regression results in table B1).[12]

- insert table 1 about here -

The CRISIS specifications (table 1) are estimated using a logit model where coefficients are based on Huber/White robust standard errors. According to the public interest theory we would expect a higher supervisory standard to reduce the probability of a systemic banking crisis. In almost none of the logit regressions where we used CRISIS as the dependent variable do we find a significant impact of supervisory standard on the likelihood of a systemic banking crisis.[13] This result is in line with the findings by Barth et al. (2002a).[14]

In the regressions where we used BUDGET/ASSETS as a proxy for supervisory stringency we do not find a significant impact of the supervisory structure (CB and MULTIPLE) on banking system stability. However, CB has a significant negative influence on the likelihood of a crisis in some regressions where we included EXAM as a proxy for supervisory stringency. If the central bank is involved in supervision a crisis is less likely. This may reflect the ability of the central bank to act as a lender of last resort.

The deposit insurance dummy (DI) also has a significant impact on the likelihood of a crisis. The evidence here is in line with the moral hazard argumentation, i.e. generous deposit insurance schemes create moral hazard which in turn increases the threat of a systemic banking crisis.[15] We find no significant impact of private monitoring (MONITOR) on the stability of the banking system.

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[11] For a more profound study on the relationship between the structure of banking supervision and regulation, and the resulting safety and soundness of a country's banking system see Barth et al. (2001b). Basically our results on that issue are in line with theirs.

[12] The number of observations differs from regression to regression since not all variables are available for all countries. We estimated all regressions in the paper also with a balanced data set, i.e. included only those countries for which data for all variables was available. Since the results are not different, they are not reported.

[13] Only in specification (10) EXAM, the number of onsite examinations per bank in the last five years, has a significant negative impact on CRISIS (at the 10% significance level).

[14] One explanation for this result may be that countries have learned from banking crisis and increased supervisory stringency in the aftermath of the crisis. This may be particular relevant in the light of our data set since the CRISIS dummy refers to the time period late 1970s to 1999 whereas most of our proxies for supervisory stringency refer to the year 1999.

[15] This finding is in line with Demirguc-Kunt and Detragiache (2000), Demirguc-Kunt and Kane (2002) and Barth et al. (2002a).

GDP per capita (GDPCAPITA) has in most regressions a significant negative impact. In poorer countries the likelihood of a crisis is higher than in more developed countries.[16]

- insert table 2 about here -

The results in table 2 where we used CLOSED/BANKS as the proxy for the safety and soundness of the banking system show a significant positive impact of BUDGET/ASSETS on CLOSED/BANKS. Higher supervisory standards result in more bank closures by supervisors. This finding confirms our presumption that CLOSED/BANKS does not necessarily measure banking system instability but may also indicate that supervisors are anticipatory and highly successful by shutting down problematic banks that when failing may have systemic effects.

When using EXAM as a proxy for supervisory stringency we do not find a significant impact on CLOSED/BANKS.[17]

To sum up, we do not find support for a link between stability in the banking system and the supervisory stringency. If, however, systems of different stringency are compatible with stability there is much scope for regulation targeted at fulfilling private interests. Note that we do not infer that the public interest is irrelevant. All we conclude is the following: Given the restriction that the supervisory systems have to guarantee the stability of the banking system there remain enough degrees of freedom to tailor the details according to the interests of the regulated industry. We can now concentrate on distinguishing between the two private interest view hypotheses barriers to entry and preference for laxity.

5.3 Barriers to entry – testing *H2*

We have several specifications to test whether the barriers to entry hypothesis is relevant (equation (2)). First, we include CONC1, the percent of total assets accounted for by the three largest banks as the left-hand side variable.[18] Second,

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[16] Using the OECD or the EU dummy instead of GDPCAPITA confirms this result. OECD and EU members are less likely to experience a systemic banking crisis.

[17] Neither do we find any significant link when using SUPERVISORS or POWER as a proxy for supervisory stringency. The results of the instrumental variable estimations also show no significant link between supervisory standards and CLOSED/BANKS.

[18] One problem may arise with the computation of the concentration measure, since e.g. in the U.S. concentration at the national level is relatively low (the three largest banks account for about 21 percent of total assets) whereas there may be almost a monopoly position for some banks at the regional level. Including a U.S. dummy in the regressions shows that

we use the interest rate margin (DRATES) which is a measure for the competition in the banking market. Third, by taking FOREIGN1, the percent of banks that are foreign owned, as the dependent variable we test whether supervisory regulation may be captured to prevent foreign banks from entering the banking system, hence to reduce competition from abroad. As a proxy for the strength of supervision we use total budget for supervision divided by bank assets (BUDGET/ASSETS) and EXAM, the number of onsite examinations per institution in the past five years.[19] In addition, we include in some regressions ASSETS/GDP to control for the size of the banking market. The results are presented in table 3.

- insert table 3 about here -

There is a significant impact of ASSETS/GDP on DRATES (at the 10% significance level). Higher supervisory standards increase the interest rate margin banks earn, i.e. reduce competition. In one specification where we used EXAM as the proxy for supervisory stringency, we find a significant negative impact on FOREIGN1, i.e. tougher supervision is associated with a lower percentage of banks that are foreign owned. These findings support the barriers to entry hypothesis.

However, in all other specifications we do not find a significant impact of BUDGET/ASSETS on the concentration in the banking market and the presence of foreign banks.[20].

We find ASSETS/GDP to be highly significant. The larger the banking market the lower concentration and the smaller interest margins, i.e. a relative large banking market is associated with higher competition. Presence of foreign banks increases with banking market size.

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this dummy is significant and effects CONC negatively. However, since banking supervisory standards are set national-wide this problem does not arise in our context.

[19] We used also POWER, the official supervisory power index, and SUPERVISORS, the number of bank supervisors per institution, as proxies for the supervisory stringency. The results do not differ substantially and are thus not reported.

[20] In addition to the OLS regressions, we estimate instrumental (IV) variable regressions as a robustness check concerning potential simultaneity bias and measurement errors. We use CLAIMSGDP as the instrument since it is highly correlated with BUDGET/ASSETS but contemporaneously uncorrelated with the error. The empirical findings from the IV regressions are reported in the appendix (table B2). They hardly differ from the OLS results, i.e. we find no significant impact of supervisory stringency on the concentration in the banking market and the presence of foreign banks. Only in one regression we find a weakly significant impact on DRATES.

Summing up, we find to some extent support for the barriers to entry hypothesis. However, this support holds not for many specifications. Following our testing procedure summarised in figure 1, we proceed to test the preference for laxity hypothesis (*H3*) according to which one would expect banks to press for lax regulatory standards.

5.4 Preference for laxity – testing *H3*

We have several specifications to test the preference for laxity hypothesis according to equation (3). In a first set we use BUDGET, total budget for supervision in Mill. USD, as the proxy for the supervisory standards. CLAIMSGDP is used as a proxy for the strength of the banking industry and CONC1 and CONC2, respectively, for their ability to organise their interests. As proxies for the strength of the rivalry insurance industry we include the dummy INSUR indicating whether banks are allowed to undertake insurance activities plus either insurance penetration (INSPEN) or density (INSDEN). We also interact INSUR with INSPEN or INSDEN to model the influence of insurance companies. We use GDP as a macroeconomic control variable. In addition we control for the stability in the banking market by using the dummy variable CRISIS and CLOSED/BANKS, respectively. The results for this first set of regressions are reported in table 4.[21] First, we run a regression where we include CLAIMSGDP, CONC1, INSUR, INSPEN, CRISIS and GDP as the right hand side variables. We then drop single regressors that have no significant impact, successively.

- insert table 4 about here -

In all regressions CLAIMSGDP is negatively connected with BUDGET at the 5% significance level. This result clearly supports the preference for laxity hypothesis: The stronger the banking industry the lower is supervisory stringency. Banks press for lax and low-cost supervisory standards. No influence has, however, concentration in the banking market which we included as a proxy for the ability to organise their interests.[22]

In the regressions where we included the variables INSUR and INSPEN, only the dummy INSUR has a significant impact. In countries where banks are allowed to undertake insurance activities total budget for supervision is higher, i.e. supervisory standards. This finding supports the view that insurance

[21] The results of the regressions where we included CONC2 instead of CONC1 and INSDEN instead of INSPEN are not reported since they do not differ substantially.

[22] The same result emerges when one uses CONC2 instead of CONC1.

companies press for higher supervisory standards in order to weaken their competitors. This result is confirmed when including the interaction term INSUR*INSPEN as the interindustry rivalry variable since the associated coefficient has a positive sign and is significant at the 5% level.

Both variables included to control for the safety and soundness of the banking system, CRISIS and CLOSED/BANKS, have no significant impact on BUDGET. This gives to some extent evidence that laxer supervision comes not at the costs of increasing banking market fragility. However, in this context a problem of endogeneity emerges which will be discussed below. GDP as a control variable for the overall size of the economy is highly significant with the expected positive sign.

Clearly, the high adjusted R-squared in the first set of regressions is due to the strong influence of GDP on BUDGET. To see whether the results still hold if we drop GDP as a control variable we run a second set of regressions. In this set we use total supervisory budget relative to the size of the banking market as a measure for supervisory stringency, i.e. we take BUDGET/ASSETS, BUDGET/DEPOSITS and BUDGET/LOANS, respectively, as the dependant variable. Again CLAIMSGDP, CONC1, CONC2, INSUR, INSPEN, INSDEN CRISIS and CLOSED/BANKS are taken as independent variables. The results for the regressions including BUDGET/ASSETS are shown in table 5.[23]

- insert table 5 about here -

The results do not differ much from the results obtained in the first set of regressions: In particular, we still find a significant negative relationship between CLAIMSGDP and BUDGET/ASSETS supporting the preference for laxity hypothesis. The main difference to the results of the first set of regressions is that with BUDGET/ASSETS the rivalry industry variables have no significant impact. Again, the banking system stability variables have no significant impact.

Protecting government banks

So far we have analysed the private interest theory from the industry's perspective. There may also be an intrinsic interest of the government if it has own stakes in the market. One should expect legislators to be the more willing to follow the industry's interests, the more stakes a government has in the market. Thus, managers of public banks should be particularly influential in shaping the supervisory system according to the industry's wishes. To test for this

[23] The results of the regressions using BUDGET/DEPOSITS and BUDGET/LOANS as the left hand side variables, respectively, do not differ substantially and are thus not reported.

presumption we include GOVERN1 and GOVERN2, that is the percent of banks and bank assets, respectively, that are government owned. The results are reported in table 6.

- insert table 6 about here -

Using BUDGET as the left hand side variable we do not find a significant impact of GOVERN1 or GOVERN2. The results for the other variables do not change: CLAIMSGDP as well as INSUR and INSUR*INSPEN, respectively, do have a significant impact supporting the preference for laxity hypothesis.

Taking BUDGET/ASSETS as the proxy for supervisory stringency gives somewhat different results.[24] GOVERN1 has now a significant impact on BUDGET. However, the positive sign indicates that the more stakes the government has in the market the higher are supervisory standards which contradicts the preference for laxity hypothesis. This result does not hold when using the variable GOVERN2. Nevertheless, the impact of the banking industry on supervisory standards is still negative and significant, although at a lower level.

To sum up, we find support for the preference for laxity hypothesis. Banks seem to exert influence on the stringency of supervision in the sense that they press for lax and low-cost supervisory standards. This result seems to be reasonable when taking into account that in most countries supervisory authorities are at least partly funded by charges to the regulated industry. Some results give evidence that also the rivalry insurance industry has a significant influence on the supervisory standards. By pressing for tougher banking supervisory stringency insurance companies try to harm competitors.

Robustness of the results

So far we used total budget for supervision or budget relative to the size of the banking market as proxies for supervisory stringency. Table 7 presents regression results when using EXAM, the number of onsite examinations per bank in the last 5 years as the dependent variable. We find in some specifications a significant negative impact of the strength of the banking industry on supervisory stringency, supporting the preference for laxity hypothesis. Furthermore, we find in some regressions a significant impact of the rivalry insurance industry in the sense that they press for tougher banking supervision in order to harm competitors.

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[24] Using BUDGET/DEPOSITS and BUDGET/LOANS instead of BUDGET/ASSETS gives basically the same results. These regressions are thus not reported.

However, when using the number of professional supervisors per institution (SUPERVISORS) and official supervisory power (POWER) as the dependent variable, respectively, we do not find a significant impact of the strength of the banking industry nor of the rivalry insurance industry.[25]

Concerning potential simultaneity bias and measurement errors we estimate instrumental variable (IV) regressions as a robustness check in addition to the OLS regressions. The empirical findings from the IV regressions are partially reported in appendix B (tables B3 and B4).[26] They hardly differ from the OLS findings.

In both regressions, with BUDGET and with BUDGET/ASSETS as the dependant variable, we find a significant negative impact of CLAIMSGDP. In two of the regressions with BUDGET as the dependent variables we find a significant impact of the concentration in the banking market (at the 10% significance level). Higher concentration, i.e. better ability to organise is associated with laxer supervisory stringency which is in line with Becker (1983). However, we do not find a significant impact of the rivalry industry variables in any regression.

Furthermore, we estimated regressions using a balanced sample of countries, i.e. we included only those countries for which data for every variable was available irrespective of whether this particular variable was actually included in the regression. The results of these regressions do not differ from the results of the regressions where the respective largest sample of countries was used for every single regression. These results are thus not reported but can be obtained upon request.

6 Summary and conclusions

This study tests for the relevance of Stigler's capture view on regulation in the context of banking supervision. According to Stigler regulation is driven by the interest of the regulated industries. Based on a cross-section data set we test several hypotheses deduced from this private interest theory. Beforehand we assess the relevance of the public interest view that accounts for welfare enhancing regulation. The empirical results lend support to the relevance of the private interest view: The difference of supervisory systems in terms of stringency indicators has no significant impact on the likelihood of a systemic

[25] These regression results are not reported but can be obtained upon request.

[26] We do not report IV results corresponding to table 6 and 7. They do not differ substantially from the OLS results.

banking crisis. This leaves per se a larger scope for the private interest view following Stigler's capture theory.

In this context we differentiate between the barriers to entry and the preference for laxity hypothesis. According to the barriers to entry hypothesis one would expect banks to press for higher supervisory standards in order to reduce competition. In contrast, the preference for laxity hypothesis states that banks are interested in lax and low-cost supervisory standards since they regard supervision as a cost burden. Our empirical results concerning the barriers to entry hypothesis are not clear cut. We find some evidence that tougher supervision is associated with higher bank margins, i.e. lower competition. However, higher supervisory standards do not significantly effect concentration in the banking market.

This finding allows to concentrate on the preference for laxity hypothesis which is clearly supported: The regulated banking industry exerts influence on supervisory standards in the sense that they press for lower supervisory stringency. This laxer supervision does, however, not come at the cost of higher fragility in the banking market. This is important for the normative conclusion: We do not find that the banking industry's influence on supervision is destabilising.

Finally, there is a clear message for the ongoing reform process in European banking supervision. Everybody who wants to forecast the outcome of this process has to identify the industry's interests. These interests can be expected to have a major impact for the future system.

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Figures and tables

Figure 1 – The three-step testing design

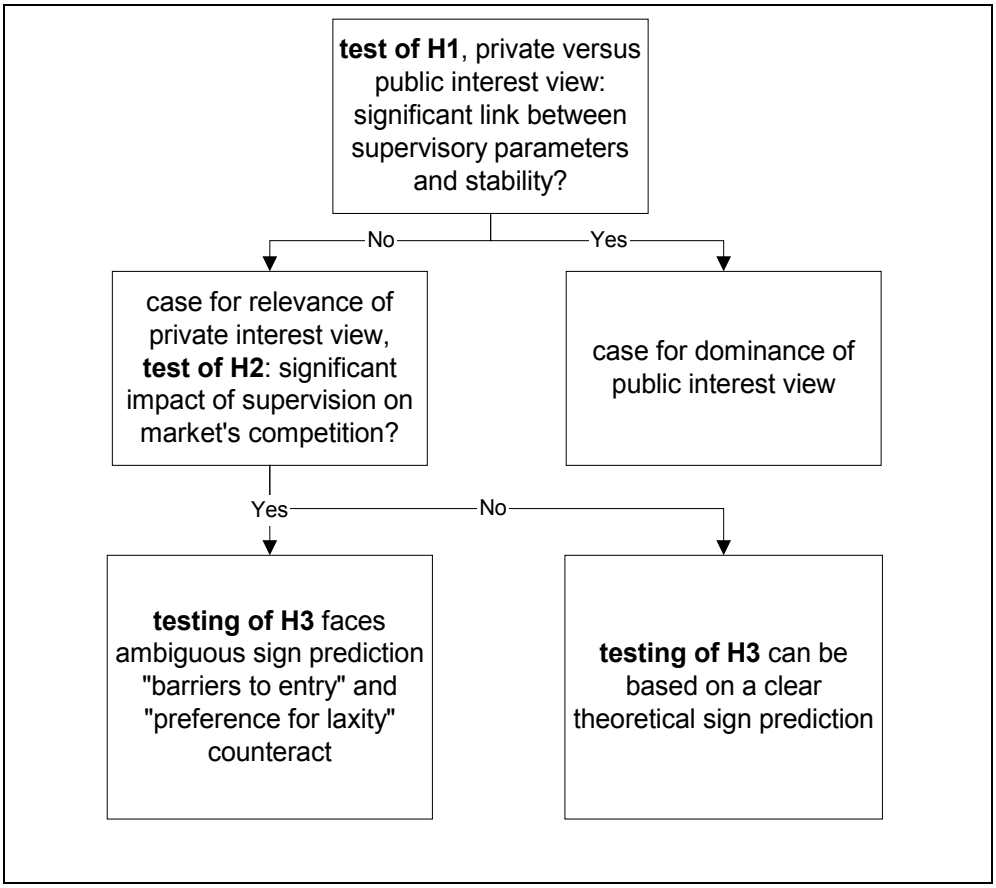

Table 1 – Testing the relevance of the private interest view (H1, dependent variable CRISIS*)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
BUDGET/ ASSETS	226.2526 (0.7402)	115.5582 (0.8627)	299.2640 (0.6571)	-176.2492 (0.7955)	239.9885 (0.7262)	-219.1771 (0.7355)				
EXAM							-0.069806 (0.3002)	-0.078256 (0.2885)	-0.129974 (0.1172)	-0.141975* (0.0937)
DI		1.827320** (0.0275)				1.747996** (0.0329)		1.551400*** (0.0079)		1.651785** (0.0137)
MONITOR			0.250335 (0.9349)							
CB				-1.484122 (0.1257)		-1.373043 (0.1382)			-1.702299** (0.0171)	-1.909693** (0.0420)
MULTIPLE					0.264357 (0.7445)					
GDPCAPITA	-6.62E-05* (0.0859)	-0.000101** (0.0321)	-5.77E-05 (0.1630)	-9.99E-06* (0.0523)	-6.74E-05* (0.0959)	-0.000129** (0.0161)	-8.58E-05** (0.0465)	-0.000115** (0.0200)	-0.00012*** (0.0033)	-0.00016*** (0.0045)
Constant	0.778839 (0.1636)	0.091577 (0.8917)	0.489893 (0.8010)	2.045046* (0.0796)	0.740585 (0.1958)	1.258721 (0.2977)	1.038343** (0.0234)	0.447692 (0.3778)	2.915769*** (0.0009)	2.516460** (0.0163)
McFadden R-squared	0.121121	0.209155	0.090846	0.177193	0.1222605	0.252840	0.110118	0.187269	0.152248	0.231515
N	35	35	33	35	35	35	66	66	66	66

Note: Logit regressions, P-values in parentheses; coefficients are based on Huber/White robust standard errors; ***, **, * indicates 1, 5, 10% significance level.

Table 2 – Testing the relevance of the private interest view (H1, dependent variable CLOSED/BANKS*)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
BUDGET/ ASSETS	102.1918** (0.0209)	96.26033** (0.0263)	100.8317** (0.0276)	108.3588** (0.0404)	111.5538** (0.0133)	105.0518** (0.0406)				
EXAM							0.004434 (0.5591)	0.002641 (0.6935)	0.005450 (0.5260)	0.003692 (0.6380)
DI		0.051576 (0.3060)				0.052749 (0.3071)		0.098337 (0.1765)		0.099283 (0.1810)
MONITOR			0.001813 (0.8910)							
CB				0.018653 (0.6598)		0.027607 (0.5474)			0.028540 (0.6289)	0.031005 (0.6326)
MULTIPLE					0.084306 (0.3048)					
GDPCAPITA	-1.09E-06 (0.5520)	-2.10E-06 (0.3564)	-1.13E-06 (0.6286)	-7.09E-07 (0.6964)	-1.25E-06 (0.5309)	-1.57E-06 (0.4777)	-4.56E-06** (0.0307)	-6.50E-06** (0.0230)	-3.91E-06* (0.0661)	-5.82E-06** (0.0233)
Constant	0.068389* (0.0476)	0.053333* (0.0654)	0.059011 (0.6004)	0.051592 (0.1805)	0.054060* (0.0820)	0.028696 (0.4475)	0.149209*** (0.0003)	0.127092*** (0.006)	0.118325* (0.0742)	0.093288 (0.2881)
Adjusted R-squared	0.144459	0.150511	0.104878	0.122272	0.174866	0.130431	0.008966	0.024558	-0.002758	0.012113
N	37	35	35	37	37	35	80	75	80	75

Note: P-values in parentheses; using heteroskedasticity-consistent standard errors from OLS regression; ***, **, * indicates 1, 5, 10% significance level.

Table 3 – Testing "barriers to entry" (H2)

	CONC1			DRATES			FOREIGN1		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
BUDGET/ ASSETS	6314.850 (0.2554)	-2751.420 (0.5305)		5444.376** (0.0233)	4256.048* (0.0923)		4821.832 (0.5657)	-4197.664 (0.4544)	
EXAM			-0.098147 (0.9072)			0.393505 (0.3670)			-1.348556* (0.0741)
ASSETS/GDP		-1.372384*** (0.0000)	-1.526169*** (0.0000)		-1.697712* (0.0589)	-2.854957*** (0.0027)		2.092148*** (0.0000)	2.118108*** (0.0000)
Constant	51.26983*** (0.0000)	54.16240*** (0.0000)	60.47675*** (0.0000)	6.034815*** (0.0001)	8.598640*** (0.0020)	8.978519*** (0.0000)	43.92110*** (0.0000)	38.35308*** (0.0000)	41.99184*** (0.0000)
Adj. R-squared	0.006696	0.032146	0.040497	0.073284	0.068663	0.074925	-0.013838	0.074492	0.084696
N	43	39	62	37	35	53	44	39	62

Note: P-values in parentheses; using heteroskedasticity-consistent standard errors from OLS regression; ***, **, * indicates 1, 5, 10% significance level.

Table 4 – Testing "preference for laxity" (H3, dependant variable BUDGET*)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CLAIMSGDP	-55.58529**	-56.18351**	-54.93925**	-54.32665**	*-40.59715***	-64.77470**	-70.26736**	-65.29533**	*-62.06044***	*-62.09727***
	(0.0218)	(0.0158)	(0.0173)	(0.0137)	(0.0193)	(0.0250)	(0.0219)	(0.0161)	(0.0213)	(0.0134)
CONC1	0.050819	0.015308				-0.024432	-0.104405	-0.040387		
	(0.8313)	(0.9475)				(0.9055)	(0.6745)	(0.8433)		
INSUR	33.64866**	31.20449**	26.62701**	25.30852**	21.90290**					
	(0.0164)	(0.0179)	(0.0182)	(0.0163)	(0.0113)					
INSPEN	-12.52122	20.01542	24.46130	49.34437						
	(0.9566)	(0.9232)	(0.9074)	(0.7829)						
INSUR*INSPEN						368.1552**	327.1414*	351.9390**	329.4164**	322.0898**
						(0.0303)	(0.0650)	(0.0476)	(0.0300)	(0.0406)
CRISIS	2.279620		-0.017789			4.089653			2.430466	
	(0.8753)		(0.9990)			(0.7495)			(0.8357)	
CLOSED/BANKS							-34.13141			
							(0.4693)			
GDP	4.24E-05***	4.17E-05***	4.09E-05***	4.06E-05***	4.03E-05***	4.03E-05***	3.99E-05***	4.00E-05***	4.00E-05***	3.99E-05***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Constant	4.422598	7.450915	12.53331	11.44378	8.360059*	23.82833	37.54308	27.43273	24.12829	25.44907**
	(0.8070)	(0.5345)	(0.4582)	(0.1580)	(0.0603)	(0.2469)	(0.1204)	(0.1065)	(0.1204)	(0.0285)
Adj. R-squared	0.812212	0.815351	0.815490	0.818604	0.820223	0.804016	0.809532	0.810948	0.812742	0.818384
N	33	34	36	37	50	33	32	34	36	37

Note: P-values in parentheses; using heteroskedasticity-consistent standard errors from OLS regression; ***, **, * indicates 1, 5, 10% significance level.

Table 5 – Testing "preference for laxity" (H3, dependant variable BUDGET/ASSETS*)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CLAIMSGDP	-0.000714**	-0.000615**	-0.000701*	-0.000668**	-0.000644**	-0.000677**	-0.000772**	-0.000725**	-0.000735**	-0.000677**
	(0.0486)	(0.0420)	(0.0504)	(0.0407)	(0.0439)	(0.0132)	(0.0335)	(0.0382)	(0.0278)	(0.0328)
CONC1	-2.37E-06	-2.11E-07	-2.92E-06				-2.14E-06	-2.70E-06		
	(0.4636)	(0.9504)	(0.3865)				(0.4825)	(0.4010)		
INSUR	5.76E-05	-7.19E-06	7.60E-05	4.10E-05	5.84E-05	0.000140				
	(0.7962)	(0.9673)	(0.6779)	(0.8543)	(0.7501)	(0.3712)				
INSPEN	-0.001462	-0.001207	-0.000665	-0.001707	-0.000923					
	(0.3522)	(0.3516)	(0.5806)	(0.3093)	(0.4502)					
INSUR*INSPEN							-0.000997	-0.000292	-0.001260	-0.000606
							(0.5028)	(0.7693)	(0.4472)	(0.5800)
CRISIS	-4.23E-05			-3.76E-05			-5.67E-05		-5.37E-05	
	(0.8350)			(0.8532)			(0.7596)		(0.7711)	
CLOSED/BANKS		0.001072								
		(0.3907)								
Constant	0.000789	0.000545	0.000715*	0.000677*	0.000574**	0.000514***	0.000823	0.000750**	0.000713**	0.000610**
	(0.1010)	(0.2263)	(0.0627)	(0.0827)	(0.0297)	(0.0100)	(0.0501)	(0.0442)	(0.0195)	(0.0148)
Adj. R-squared	0.081981	0.149408	0.096909	0.106520	0.112922	0.135004	0.110239	0.120924	0.134523	0.137640
N	32	32	34	32	34	40	32	34	32	34

Note: P-values in parentheses; using heteroskedasticity-consistent standard errors from OLS regression; ***, **, * indicates 1, 5, 10% significance level.

Table 6 – Testing "preference for laxity" (H3, extension: "protecting government banks")

	Dependent variable BUDGET					Dependent variable BUDGET/ASSETS				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CLAIMSGDP	-59.68040**	-56.60987**	-67.69058**	-65.74760**	-63.30485**	-0.000693*	-0.000639*	-0.000669*	-0.000611*	-0.000800**
	(0.0223)	(0.0132)	(0.0309)	(0.0155)	(0.0205)	(0.0639)	(0.0652)	(0.0762)	(0.0772)	(0.0322)
CONC1	0.002646		-0.057552		0.070878	-3.48E-06		-2.83E-06		-2.83E-06
	(0.9920)		(0.8048)		(0.7740)	(0.2324)		(0.2175)		(0.3968)
INSUR	34.95293**	30.18867**				0.000231	0.000172			
	(0.0232)	(0.0216)				(0.1911)	(0.2233)			
INSPEN	-11.11021	9.576579				0.001214	0.000720			
	(0.9661)	(0.9629)				(0.4587)	(0.5898)			
INSUR*INSPEN			348.3426*	332.8777*	405.9676**			0.001017	0.000664	-0.001299
			(0.0704)	(0.0554)	(0.0291)			(0.3756)	(0.5265)	(0.4115)
CRISIS	-0.344499		1.142771		-2.175154	8.19E-05		4.88E-05		2.09E-05
	(0.9847)		(0.9447)		(0.8713)	(0.5093)		(0.5996)		(0.9170)
GOVERN1	0.034354	0.026035	-0.037420	-0.040534		1.19E-05***	1.13E-05***	1.02E-05***	1.03E-05***	
	(0.8808)	(0.8148)	(0.8628)	(0.7352)		(0.0012)	(0.0031)	(0.0050)	(0.0050)	
GOVERN2					0.569746					-6.03E-06
					(0.3523)					(0.1609)
GDP	4.22E-05***	4.14E-05***	3.99E-05***	3.99E-05***	4.12E-05***					
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)					
Constant	9.890983	10.93444	30.42452	27.75177**	12.19873	0.000390	0.000307	0.000572*	0.000434	0.000924*
	(0.7231)	(0.2545)	(0.3182)	(0.0407)	(0.4830)	(0.1791)	(0.1425)	(0.0997)	(0.1144)	(0.0508)
Adj. R-squared	0.807994	0.817139	0.796181	0.812454	0.808931	0.200798	0.237365	0.197430	0.240427	0.102298
N	32	34	32	34	33	31	33	31	33	32

Note: P-values in parentheses; using heteroskedasticity-consistent standard errors from OLS regression; ***, **, * indicates 1, 5, 10% significance level.

Table 7 – Testing "preference for laxity" (H3, dependant variable EXAM*)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CLAIMSGDP	-4.250476 (0.1427)	-3.517918 (0.1183)	-4.127274** (0.0478)	-3.578320** (0.0356)	-4.234280* (0.0946)	-3.675193* (0.0643)	-4.307221** (0.0376)	-3.738014** (0.0220)
CONC1	0.029865 (0.3689)	0.031771 (0.3142)			0.023430 (0.5079)	0.025507 (0.4498)		
INSUR	2.458987** (0.0403)	2.166584** (0.0445)	2.013954** (0.0301)	1.857874** (0.0381)				
INSPEN	-10.82039 (0.5820)	-7.093543 (0.6767)	-7.281009 (0.6767)	-0.814940 (0.9537)				
INSUR*INSPEN					4.907134 (0.7858)	9.354781 (0.5911)	7.398699 (0.6418)	13.74072 (0.3765)
CRISIS	-1.215895 (0.4203)		-1.377719 (0.2916)		-1.043478 (0.4850)		-1.257663 (0.3340)	
CLOSED/BANKS								
Constant	3.968391 (0.1703)	2.882975 (0.1593)	5.465732*** (0.0018)	4.261368*** (0.0000)	5.270703 (0.1238)	4.186018* (0.0811)	6.277543*** (0.0020)	5.107991*** (0.0000)
Adj. R-squared	0.097716	0.073847	0.106151	0.079904	0.014526	0.018358	0.048383	0.040426
N	44	46	52	55	44	46	52	55

Note: P-values in parentheses; using heteroskedasticity-consistent standard errors from OLS regression; ***, **, * indicates 1, 5, 10% significance level.

Appendix A

Table A1 – Countries included

EU countries	*OECD countries*	*Others*
Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom	Australia, Canada, Czech Republic, Denmark, Hungary, Iceland, Japan, Korea, Mexico, New Zealand, Poland, Switzerland, Turkey, United States	Argentina, Aruba, Bahrain, Bangladesh, Belarus, Bhutan, Bolivia, Botswana, Brazil, British Virgin Islands, Burundi, Cambodia, Chile, China, Croatia, Cyprus, Egypt, Estonia, Gambia, Ghana, Gibraltar, Guatemala, Guernsey, Guyana, Honduras, India, Indonesia, Israel, Jamaica, Jordan, Kenya, Kuwait, Latvia, Lebanon, Lesotho, Liechtenstein, Lithuania, Macao, Macedonia, Malawi, Malaysia, Maldives, Malta, Mauritius, Moldavia, Morocco, Namibia, Nepal, Nigeria, Oman, Panama, Peru, Philippines, Puerto Rico, Qatar, Romania, Russia, Rwanda, El Salvador, Samoa (Western), Saudi Arabia, Seychelles, Singapore, Slovenia, Solomon Islands, South Africa, Sri Lanka, St. Kitts, Taiwan, Tajikistan, Thailand, Tonga, Trinidad & Tobago, Vanuatu, Venezuela, Vietnam, Zambia

Note: Table displays all countries that are included in at least one regression. Cayman Islands and Turks and Caicos Islands are the only two countries from the World Bank sample that do not appear in any regression due to lack of data. All EU countries are also OECD member countries.

Table A2 – Variables, definitions and sources

Variable	*Definition*	*Source*
BUDGET	Total budget for supervision (Mill. USD in 1999)	World Bank survey
EXAM	Number of onsite examinations per bank in last 5 years	World Bank survey
SUPERVISORS	Number of professional bank supervisors per institution (1999)	World Bank survey
POWER	Official Supervisory Power (index ranging from 0 to 16, with a higher value indicating more power)	Barth et al. (2001a)
CLAIMSGDP	Bank claims on private sector to GDP (1990-99 average)	IMF International Financial Statistics (line 22d)
ASSETS	Total bank assets (Mill. USD in 1999)	OCC survey
DEPOSITS	Total bank deposits (Mill. USD in 1999)	OCC survey
LOANS	Total bank loans (Mill. USD in 1999)	OCC survey

Table A3 – Variables, definitions and sources – continued

BANKS	Number of banks (1999)	Calculated from number of banks per 100,000 people (taken from Barth et al., 2002b) and POP
DRATES	Lending minus deposit rate (1999)	IMF International Financial Statistics (lines 60l and 60p)
CONC1	Percent of total assets accounted for by 3 largest banks (1999)	OCC survey
CONC2	Percent of total deposits accounted for by 3 largest banks (1999)	OCC survey
INSUR	Insurance activity of banks ("unrestricted + permitted"=1; "restricted + prohibited"=0)	World Bank survey
INSPEN	Insurance penetration: premiums as share of GDP total business (1990-99 average)	Swiss Re sigma database
INSDEN	Insurance density: premiums per capita (in USD) total business (1990-99 average)	Swiss Re sigma database
GOVERN1	Percent of banks that are government owned (1999)	OCC survey
GOVERN2	Percent of bank assets that are government owned (1999)	OCC survey
FOREIGN1	Percent of banks that are foreign owned (1999)	OCC survey
FOREIGN2	Percent of total bank assets that are foreign owned (1999)	OCC survey
CLOSED	Number of banks closed in the last 5 years	World Bank survey
CRISIS	Crisis dummy (1: systemic banking crisis since the late 1970s; "borderline crisis" is not taken as a crisis with the exception of Italy and the US)	Caprio and Klingebiel (1999), complemented by information from Demirgüc and Detragiache (2000) and Barth et al. (2001c)
GDP	Gross Domestic Product (GDP) in current USD (Mill. USD in 1999)	World Development Indicators database (World Bank)
GDPCAPITA	GDP per capita in constant 1995 USD (1990-99 average)	World Development Indicators database (World Bank)
GDPGROWTH	GDP growth (annual %; 1990-99 average)	World Development Indicators database (World Bank)
POP	Population (million in 1999)	IMF, World Bank
MULTIPLE	Multiple bank supervisory authorities predominate (1:yes, 0:no; 1999)	Barth et al. (2002b)
CB	Central bank is one of the supervisors (1:yes, 0:no; 1999)	Barth et al. (2002b)
MONITOR	Private monitoring index (index ranging from 0 to 7, with higher values indicating more private oversight)	Barth et al. (2001a)
DI	Deposit insurance (1:explicit, 0:implicit)	World Bank deposit insurance database
OECD	EU dummy (1:EU member country)	
EU	OECD dummy (1:OECD member country)	

Table A3 – Descriptive statistics

Variable	*Mean*	*Median*	*Maximum*	*Minimum*	*Std. Dev.*	*Observations*
BUDGET	17.81862	2.005515	400	0.006964	55.97261	59
EXAM	3.519885	3	21	0	3.118676	87
SUPERVISORS	2.633511	1.5	18	0	3.034541	94
POWER	11.00952	12	16	0	2.962896	105
CLAIMSGDP	0.435698	0.3325	1.6848	0	0.331616	91
ASSETS	472554.6	18953.9	7213630	90.7	1327440	82
DEPOSITS	307066.8	12633.95	5783937	20.9	978268.7	82
LOANS	285413.5	9422.1	4730738	11	891680.5	82
BANKS	1008.738	26	87958	1	8531.151	107
DRATES	7.458547	5.25	54.42	-4.75	7.452376	86
CONC1	57.83866	57.79	100	16.2	22.26739	82
CONC2	59.75375	59.4	100	0	22.9914	80
INSUR	0.504673	1	1	0	0.502331	107
INSPEN	0.038444	0.0293	0.13048	0.004256	0.030906	70
INSDEN	598.5228	128.7119	3927.336	1.020727	868.4813	70
GOVERN1	9.788506	5	94.12	0	14.12811	87
GOVERN2	20.53414	10	81.00667	0	22.68526	103
FOREIGN1	41.7131	39.935	100	0	29.68677	84
FOREIGN2	33.2509	20	100	0	33.23179	101
CLOSED	16.16667	1	1172	0	116.0332	102
CRISIS	0.535714	1	1	0	0.501718	84
GDP	302901.7	29246.89	9237000	153.2491	1077722	96
GDPCAPITA	8567.569	3367.215	44485	147.821	11034.4	96
GDPGROWTH	2.995408	3.085	11.53	-9.62	3.078307	98
POP	45.98896	7.13	1266.8	0.0168	157.5979	107
MULTIPLE	0.158879	0	1	0	0.367283	107
CB	0.728972	1	1	0	0.446582	107
MONITOR	6.811881	7	11	3	1.572977	101
DI	0.526316	1	1	0	0.501956	95

Appendix B: Instrumental variable regressions

Obviously, looking at the specified empirical models (1), (2) and (3) reveals a problem of causality. This simultaneous equation bias implicates that the correlation between the respective exogenous and the disturbance term ε_i is nonzero. As a consequence the ordinary least squares (OLS) estimator is biased and inconsistent. To cope with this endogeneity problem as well as with potential measurement errors we use instrumental variable (IV) procedures in addition to the OLS regressions. Tables B1 to B4 present the results of the two stage least squares (TSLS) regressions. The instruments used are given in the notes to the tables, respectively.

Table B1 – Testing the relevance of the private interest view (H1) – IV regression results

	dependent variable CRISIS				*dependent variable* CLOSED/BANKS			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BUDGET/ASSETS	1504.981 (0.4787)	-98.86767 (0.9686)	1204.535 (0.5824)	-142.2212 (0.9593)	105.5670 (0.4455)	45.41753 (0.7569)	114.4284 (0.5136)	47.13840 (0.7934)
DI		1.846585** (0.0385)		1.761523** (0.0479)		0.057822 (0.2598)		0.058002 (0.2648)
CB			-1.386551* (0.0999)	-1.311376 (0.1214)			0.022916 (0.8123)	0.004785 (0.9609)
GDPCAPITA	-5.47E-05 (0.1541)	-0.000104** (0.0385)	-8.40E-05* (0.0595)	-0.000127** (0.0102)	-1.03E-06 (0.5009)	-2.84E-06 (0.1841)	-5.45E-07 (0.8542)	-2.75E-06 (0.4138)
Constant	0.295457 (0.7339)	0.172034 (0.8621)	1.432402 (0.2046)	1.170736 (0.3467)	0.067276 (0.1538)	0.072863 (0.1576)	0.046289 (0.7125)	0.068517 (0.6028)
McFadden/adjusted R-squared	0.129256	0.208776	0.181909	0.251748	0.141356	0.112256	0.118719	0.085578
N	35	35	35	35	36	35	36	35

Note: P-values in parentheses; using heteroskedasticity-consistent standard errors from TSLS regression; ***, **, * indicates 1, 5, 10% significance level. CLAIMSGDP used as an instrument.

Table B2 – Testing "barriers to entry"(H2) – IV regression results

	CONC1		DRATES		FOREIGN1	
	(1)	(2)	(3)	(4)	(5)	(6)
BUDGET/ ASSETS	31879.30 (0.1812)	20085.75 (0.3769)	13429.15* (0.0643)	18739.27 (0.1631)	-37166.92 (0.1611)	-21253.68 (0.3864)
ASSETS/GDP		-1.013753*** (0.0000)		1.700989 (0.4828)		1.773902*** (0.0000)
Constant	42.30616*** (0.0000)	46.95760*** (0.0000)	3.640800*** (0.0000)	0.315617 (0.9490)	51.93579*** (0.0000)	42.41886*** (0.0000)
Adj. R-squared	-0.544171	-0.235323	-0.145801	-0.546352	-0.328285	-0.022833
N	40	38	37	35	40	38

Note: P-values in parentheses; using heteroskedasticity-consistent standard errors from two stage least squares (TSLS) regression; ***, **, * indicates 1, 5, 10% significance level; CLAIMSGDP used as an instrument.

Table B3 – Testing "preference for laxity" (H3, dependant variable BUDGET*) – IV regression results*

	(1)	(2)	(3)	(4)	(5)	(6)
CLAIMSGDP	-82.33348** (0.0239)	-84.77666** (0.0323)	-53.74375** (0.0123)	-84.05798** (0.0259)	-62.72458** (0.0119)	-81.11137** (0.0467)
CONC1	-0.803617* (0.0860)	-1.418581* (0.0787)		-0.848776 (0.1118)		-1.475193* (0.0852)
INSUR	25.11446 (0.3302)	31.80974 (0.1919)	27.46108** (0.0304)			
INSPEN	86.83722 (0.7676)	324.6893 (0.2833)	42.61031 (0.8459)			
INSUR*INSPEN				179.9525 (0.5407)	318.5379 (0.1439)	454.9029 (0.1170)
CRISIS	-34.10297 (0.2543)		4.558150 (0.8516)	-41.52799 (0.1426)	0.286184 (0.9907)	
GDP	3.66E-05*** (0.0000)	3.45E-05*** (0.0001)	4.10E-05*** (0.0000)	3.49E-05*** (0.0000)	3.99E-05*** (0.0000)	3.50E-05*** (0.0000)
Constant	82.13572** (0.0477)	78.75113* (0.0796)	7.924770 (0.7482)	106.2960** (0.0215)	26.06551 (0.2545)	102.1078** (0.0476)
Adj. R-squared	0.701545	0.655461	0.814485	(0.667965)	0.812536	0.642640
N	32	33	36	32	36	33

Note: P-values in parentheses; using heteroskedasticity-consistent standard errors from two stage least squares (TSLS) regression; ***, **, * indicates 1, 5, 10% significance level; ASSETS/GDP and GDPCAPITA used as instruments for CONC1 and CRISIS, respectively.

Table B4 – Testing "preference for laxity" (H3, dependant variable BUDGET/ASSETS*) –IV regression results*

	(1)	(2)	(3)	(4)	(5)	(6)
CLAIMSGDP	-0.000716*	-0.000721*	-0.000662*	-0.000830**	-0.000795**	-0.000696**
	(0.0680)	(0.0607)	(0.0621)	(0.0462)	(0.0406)	(0.0434)
CONC1	-2.00E-06	-3.89E-06		-5.22E-06	-6.11E-06	
	(0.6354)	(0.4539)		(0.3130)	(0.2331)	
INSUR	4.94E-05	5.83E-05	4.47E-05			
	(0.7921)	(0.7547)	(0.8100)			
INSPEN	-0.001610	-0.000772	-0.001634			
	(0.1881)	(0.5951)	(0.1836)			
INSUR*INSPEN				-0.000711	-4.96E-05	-0.000702
				(0.6895)	(0.9695)	(0.6007)
CRISIS	-7.35E-05		-1.65E-05	-8.07E-05		6.65E-05
	(0.7392)		(0.9511)	(0.7150)		(0.7938)
GDP						
Constant	0.000802*	0.000795*	0.000656*	0.000998**	0.000945**	0.000609*
	(0.0966)	(0.0870)	(0.0772)	(0.0490)	(0.0455)	(0.0752)
Adj. R-squared	0.080813	0.095948	0.106134	0.093907	0.104081	0.122882
N	32	33	32	32	33	32

Note: P-values in parentheses; using heteroskedasticity-consistent standard errors from two stage least squares (TSLS) regression; ***, **, * indicates 1, 5, 10% significance level; ASSETS/GDP and GDPCAPITA used as instruments for CONC1 and CRISIS, respectively.