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WHEN DOES FINANCIAL SECTOR (IN)STABILITY INDUCE FINANCIAL REFORMS?

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When does financial sector (in)stability induce financial reforms?

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Abstract

The article studies whether financial sector (in)stability had an effect on reforms in the financial sector in a large cross-country panel from 1990 to 2005. We forward the theory that countries are more likely to liberalize their financial sectors in times of financial stability. We argue that politicians are less likely to undertake financial reforms if they face a strong lobby in the financial sector which is able to block reforms that are not in its interest.

Our empirical results suggest that financial instability leads to regulations, while financial stability is found to induce liberalizations. We also find that weaker financial lobbies are unable to block financial reforms while strong lobbies can effectively stop reforms.

JEL Classification: G10; G01; G38.

Keywords: Financial reforms; interest group theory; financial stability; financial crises.

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1 Introduction

Barely any country has the fortune of not having been affected by a financial crisis. When one of those unwanted events occurs, fingers get pointed in every direction in order to find the culprit. The rules of the game tend to be re-written once a culprit is found, in the hope that this may affect the future probability of a recurring event. During the last fifty years the financial markets have witnessed numerous changes to these rules of the game. In a large number of cases these changes have come in the form of financial reforms, with many governments liberalizing their local financial markets in order to improve their economic growth prospects. In various other cases we have, however, seen a significant tightening of regulations, with financial reform constraining the liberties of players in the financial domain. In this article we build upon the seminal work of Abiad and Mody [2] by taking a closer look at the direction of financial reform induced by financial sector (in)stability as well as the lobbying potential of large financial players.

While most researchers have focused on explaining conditions in countries' economies through the level of financial reform,[1] there exist few articles studying the determinants of financial reform itself (Abiad and Mody [2], Rajan and Zingales [54],[2] Huang [35]). Abiad and Mody [2] as well as Huang [35][3] study several determinants of financial reform, including learning, regional diffusion, balance-of-payment crises, banking crises, IMF interventions, recessions and high inflation periods, as well as political variables. In general, these authors find a significant role for the financial crises variables, for learning effects and regional diffusion, though less convincing evidence on the role of political variables and recessions. Though these authors address many important questions, this literature largely leaves the impact from the financial sector on financial reform untouched. Thus, in the light of the financial reforms that occurred during the past few years (Basel II and III, Glass-Steagal Act, exchange rate floats, etc.), the current article investigates two questions. One, does financial sector (in)stability induce financial reforms and if yes, then in which direction? Two, should we expect a lower political will for financial reforms in countries that have a politically influential financial sector? In order to answer these questions, our approach differs to the previous

[1] Examples here are numerous and the subsequent list is certainly not exhaustive. King and Levine [37] study whether financial development helps economic growth; Laeven and Levine [39] look into whether the relation between national regulations and bank risk depends on each bank's ownership structure; the effect of reform on financial fragility is analyzed in Demirgtif-Kunt and Detragiache [27]; Beck [13] finds that financially developed countries have larger GDP shares of manufacturing exports compared to less financially developed countries; Chinn and Ito [23] as well as Levine [43] show that financial liberalization improves stock markets, while Levine [43] also demonstrates a subsequent improvement in banking sector's efficiency.

[2] Rajan and Zingales [54] argue that both trade openness and capital openness are important for financial development. Baltagi et al. [10] follow up on the study in Rajan and Zingales [54] and, in contrast to Rajan and Zingales [54], conclude that the marginal effect of trade openness is negatively related to financial openness.

[3] Huang [35] follows essentially the same approach as Abiad and Mody [2], but makes use of a different dataset on reform and controls for error dependence across countries and time via Pesaran [49]'s CCEP estimator.

works in three crucial aspects.

Firstly, since we study financial regulation, which is a reduction in the financial reform index, and financial liberalization, which is an increase in the financial reform index, we need to slightly modify Abiad et al. [1]'s financial reform index. In their original definition, the category Banking Sector Supervision is coded such that an increase in supervision implies a larger financial reform index. This is the only component of the financial reform index where an increase in regulation actually increases the index. Thus, we simply invert the category Banking Sector Supervision and recode it in such a way that larger supervision reduces the financial reform index. We then reconstruct a modified financial reform index, which now consistently increases if a financial liberalization is undertaken, and decreases in case of a financial regulation.

Secondly, with respect to the financial crisis variables, in addition to those used in Abiad and Mody [2] and Huang [35], namely balance-of-payment crisis and banking crisis as well as IMF intervention, we also introduce debt crisis and a measure of potential crisis, namely zscore. Zscore is derived from the leverage ratio (equity/assets) plus the return on assets divided by the standard deviation of the return on assets. It can then be shown that a higher zscore may be inversely related to a bank's probability of default (see de Nicolo [25]). Thus, a higher zscore can be used as a proxy for more financial stability, while a low zscore can be associated with potential financial instability.

Thirdly, our study differs significantly in the econometric methodology. We use a large, unbalanced panel dataset consisting of 90 countries covering the period 1990 - 2005. The data for financial reform comes from Abiad et al. [1], an updated version of the original Abiad and Mody [2] dataset, which thus allows us to closely compare our results to those obtained by Abiad and Mody [2] as well as Huang [35]. In terms of our specification, we focus more closely on the financial crises variables and the banking structure in order to understand whether our intuition relating to the interaction of financial (in)stability and the banking sector's power in the political reform process holds up in practice. With respect to the methodology applied, we move away from the estimators of both Abiad and Mody [2] and Huang [35] since we believe that the crises variables may at least be predetermined, if not endogenous. Furthermore, it is now well-known that the correlation between unobserved time fixed effects and lagged dependent variables introduces a bias in both standard OLS and within estimators (see Nickell [46], Kiviet [38], Judson and Owen [36]).[4] To control for this, we make use of the system GMM estimator proposed in Arellano and Bover

[4]Since the dataset used in both articles consists of 35 panels with 25 time periods, a bias could be likely.

[8] and Blundell and Bond [19]. This estimator is developed for a small time dimension, large panel, unobservable fixed effects, a lagged dependent variable, possibly endogenous regressors and heteroscedasticity and autocorrelation within the panels. Each of these criteria show up in our regressions, and not controlling for these would bias our results.[5]

As a proxy for the political strength of players in the financial sector we use the variable bank concentration. This variable measures how many assets are held by a country's three largest banks relative to its banking system's total assets. Thus, the higher is the share of the assets of a country's three largest banks the more concentrated is its banking sector. In other words, a more concentrated banking sector implies a larger market power of banks (and thus the financial sector) which allows them to successfully threaten politicians into not adopting reforms. We define a dummy that takes zero for countries with a less concentrated banking sector and one for those with a highly concentrated banking sector. Then we interact this dummy with zscore and the crises variables.

The results are as follows. With the financial reform index being our dependent variable for all regressions, we find a significant impact of the lagged financial index with a coefficient of roughly 0.9, which suggests convergence in the financial reform process. This is in line with the result in Huang [35] when he controls for error dependence via the Pesaran CCEP estimator. It also substantiates the potential for the Nickel [46] bias and confirms us in resorting to the dynamic GMM estimator.

For countries with a low concentration of financial players we find that countries with a more stable financial sector, thus those with higher levels of zscore, are likely to see financial liberalization, while those countries with low levels of zscore, associated with financial instability, are likely to see financial regulation. We, furthermore, find that an IMF intervention leads to financial liberalization for countries with a weak financial sector (in a political economy sense), while currency and debt crises induce financial regulations. The results thus confirm our initial hypothesis and suggest that distressed markets trigger tighter regulations, while politicians make use of calm markets to liberalize their financial markets.

In contrast, countries with a sizable concentration in the financial sector, thus those countries where few players hold significant market power, tend to see no financial reforms in case of potential (in)stability or actual crises. The only variable that shows up consistently significant for countries with a high concentration of financial players is the IMF intervention. This makes

[5] Indeed, when we compare our results to those obtained from other estimators, we find that accounting for these criteria leads to sometimes significant differences from the estimators that do not account for those problems.

sense, though, since a general prerequisite for IMF funding was that a country undertakes financial liberalization. Thus, we argue that this confirms our second hypothesis, namely that banking sectors with sufficient market power also have a large degree of political power and can therefore block reforms that might otherwise be in the interest of society. A large literature in the political economy supports this finding for regulation in other industries. The classic contribution here is Stigler [61], who finds that the state weight limit on trucks is increasing in the amount of trucks on farms in the respective states. Similar results have been found with respect to political campaign contributions in Pittman [50], [51] and Andres [5], as well as Salamon and Siegfried [58] on tax avoidance rate. Clearly, the argument in these articles is similar to what we find here: the larger the political power of players the more will regulation stay shaped in their interests.

The article is structured as follows. In Section 2 we discuss the current state-of-the-art on financial reform as well as the role of interest groups in the political decision process. Section 3 introduces the sources of the data used in the econometric analysis, while section 3.1 discusses our econometric strategy for estimation. Section 3.2 presents the results, followed by section 3.3 discussing some robustness studies, and section 4 concludes.

2 Remarks on the state of play

In this section we focus on the results from the recent line of research that studied financial reform and also discuss the potential role of interest groups.

We suggest that financial reform tends to be undertaken for two particular reasons. Firstly, financial reform is carried out in order to provide stronger economic incentives for savings, for lending, and for competition in the financial sector (Bandiera et al. [11]; Quinn and Toyoda [53]; Abiad et al. [3]). The rational underlying that policy choice is, of course, a reduction in the dead-weight loss of a too highly concentrated financial sector and an expected improvement in economic growth (Henry [34]; Bekaert et al. [17]; Levine [43]; King and Levine [37]; Easterly et al. [28]; Levine [42]). However, history has proven, time and again, that not every country is in a good condition to pursue this course of liberalization (Stiglitz [63]). The reason is that, through changing the rules of the game by opening the local markets to international competition, by abandoning credit or interest rate controls, by privatizing the financial sector or by alleviating restrictions on international capital transfers, the financial sector is often faced with a time of elevated uncertainty and a not always socially profitable restructuring of the financial sector. For example, the hurried financial reforms leading up to the Asian crisis in 1997 left Indonesia, Korea,

Malaysia and Thailand in a strong recession (Stiglitz [63]). Similar effects can, at least partly, be ascribed to have arisen from financial liberalization in various other countries (see e.g. Edey and Hviding [29]). Therefore, it seems clear that a sound financial sector is a prerequisite for successful financial liberalization.

On the converse, financial reform in the form of tighter regulation often proves to be useful if the financial sector is not anymore sufficiently promoting the social interests due to elevated asymmetric information or externalities. This, very often, was the case when bankers developed new financial instruments that were so complex that many players on the markets could not fully calculate the risks involved, or if capital account liberalization led to flight of capital. In these cases, financial reform tends to be undertaken in the form of stricter regulation and mainly for macroprudential reasons. Recent examples include the Basle II and upcoming Basle III regulations.

In addition, there are strong political incentives for financial reforms in the aftermath of a crisis. A financial crisis tends to affect a country's inhabitants disproportionately, with the weaker income groups being hit hardest. Halac and Schmukler [32] studied the effect of the crises in Mexico in 1994-95 and in Argentina in 2001-02. They find that large borrowers, big companies and high income groups tend to benefit from crises, while financial transfers tend to go from the low income group to the high income one. This is the common problem of socialization of the costs of financial crises that leads to cuts in government spending and tax increases that tend to affect the poorest the most (see also Das and Mohapatra [24]). Clearly, it is then in the interests of politicians to protect their voters from the possibility of recurring events. The first question that we investigate is, thus, whether financial stability leads to financial liberalization and whether financial instability induces a tighter regulation.

Secondly, it should not come as a surprise that there are situations in which stricter regulation may be strongly challenged by the players in the financial sector. Laffont and Tirole [41] call this a political constraint that limits the scope of regulations (see also Freixas and Rochet [30]). We expect that in countries with many small-sized financial players that stand in firm competition, one would believe that politicians face little threatening opposition to financial reforms. This is expected to happen since, firstly, players in a competitive market are unlikely to coordinate sufficiently well to pressure governments against policy reforms and have too little market power to intimidate politicians (see Allen [4] and Ravenscraft [55]).[6] Secondly, financial players in a

[6]This question is well-grounded in the theories of regulation and interest groups, with early contributions by Stigler [61], Posner [52], Barro [12], Becker [16] and Peltzman [48]. They analytically study the impact of regulation on the behavior of industries and the main lesson for us to take away here is that smaller groups are likely to be the more politically successful ones due to reduced collective action problems (see also Olson [47]).

competitive market have less incentives to oppose policy reforms since rents in a competitive market are already small, such that further entry or even stronger competition is less likely (see also Berger et al. [18], Degryse and Ongena [26]). Indeed, financial liberalization might even be supported by players in more competitive markets since e.g. liberalized capital markets will allow them to extend their activities to foreign markets.[7] However, when politicians are faced with strong financial markets that are able to coordinate their incentives well, like it would be the case if few players share a significant proportion of the financial market, then politicians might not have enough power to introduce their desired, new regulations. Thus, financial reform may not be undertaken if the financial sector is sizable enough to suppress the political will for financial reforms (see Shleifer and Treisman [60], Munger [45]). Additionally, large financial firms often benefit from the current status quo of the regulatory system or even financial instability and thus have a stronger incentive to lobby politicians.[8] Georg Stigler even goes a step further and suggests that "...every industry or occupation that has enough political power to utilize the state will seek to control entry" (Stigler [61], p.5). Thus, whether a reform gets put in place depends, among others, on whether an industry has enough power to use policy makers to further its goals and objectives. Our second question, therefore, is whether countries are less likely to introduce financial reform if their financial sector is made up of few players that possess a significant share of national wealth.

3 Data

We make use of an unbalanced, annual panel dataset consisting of 90 countries covering the period 1990 - 2005.[9] The summary statistics are provided in Table I. The data for financial reform, denoted *Fin.Ref.*, comes from a new dataset by Abiad et al. [1]. They construct a financial reform index based upon seven dimensions - credit controls and excessively high reserve requirements, interest rate controls, entry barriers, state ownership in the banking sector, capital account restrictions, prudential regulations and supervision of the banking sector and finally securities market

[7] There is, though, evidence that liberalized capital markets also attract foreign competitors, see Levine [43]. On this account, domestic players are more likely to support an opening of international financial markets if their loss from fiercer competition at home may be outweighed by their profits from abroad. This will be the case if the foreign countries have a lower concentration of financial players than the home country, which would support our arguments above.

[8] On this argument see Halac and Schumkler [32] for an account of the South American financial crises, as well as Minsky [44], who argues that profit-induced innovations increase financial fragility but allow bigger players to boost profits.

[9] The use of one variable (zscore) reduces the time horizon, while in the robustness study, without that variable, we cover 91 countries with a time horizon of 1974-2005.

policy. The index ranges from 0 to 21 with a low value denoting strong repression and a high value implying a highly liberalized financial system. To our knowledge, this is the largest dataset of financial reform with an index that encompasses a very broad coverage of financial variables that are decisive for capturing the financial playground of a country. As we study financial regulation, namely a reduction in the financial reform index, and financial liberalization, which should be an increase in the financial reform index, we need to slightly modify Abiad et al. [1]'s financial reform index. The category Banking Sector Supervision in their original financial reform index is coded such that an increase in supervision implies a larger financial reform index. This is the only component of the financial reform index where an increase in regulation actually increases the index. Thus, we invert the category Banking Sector Supervision and recode it in such a way that larger supervision reduces the financial reform index. We then reconstruct a modified financial reform index, which now consistently increases if a financial liberalization is undertaken, and decreases in case of a financial regulation.

Our proxy for *potential* financial stability is *zscore*, taken from the financial institutions and markets dataset of Beck et al. [15]. Zscore is a variable that consists of the return on average assets plus the capital to assets ratio in the numerator, while the standard deviation of the return on assets is in the denominator. Given the standard definition of insolvency, which occurs if losses exceed banks' capital, it can be shown via the Chebishev inequality that the probability of this occurrence is inversely related to zscore (De Nicolo [25]). Thus, zscore represents the inverse of the probability of default for profits that follow a normal distribution. The higher zscore the more stable the banking system. The advantage of this variable is that it may capture potential (in)stability on which policy makers might wish to act. Sometimes a banking system shows signs of instability before a crisis actually occurs. The financial crises variables that we describe below are not able to take this situation into account and thereby miss system-relevant incentives for policy makers to reform a fragile banking system. We use two transformations on zscore. Firstly, because the distribution is skewed to the right, we take the logarithm. This produces a symmetric distribution so that we can be sure that larger values (or outliers) do not drive our results. Secondly, we center zscore in order to ease our interpretation later and reduce potential multicollinearity.

Our proxy for market power (or, likewise, for political power) in the financial sector is the level of banking concentration, also taken from Beck et al. [15]. It is based on Bankscope data and constructed as the assets of the three largest banks in a country relative to the country's total bank assets. The larger this variable the greater is the concentration of the financial sector.[10] Clearly, if

[10] We use banking sector analogously to the financial sector since it is difficult to clearly separate the two.

banking concentration is very low, then financial players are active in a rather competitive market, while if this variable is high, then there are few players that control most of the financial system, and one would expect that in this case collusion or oligopoly is a likely outcome with the potential to have significant influences on the political decision process. We define a dummy, labelled *Bank Conc.*, that takes the value of zero for all countries that have a financial sector concentration of below the sample mean, while it takes a one for all countries with a concentration above the sample mean. As suggested in the Introduction, our hypothesis is that financial sectors with a potentially strong impact on the political decision process may block financial reforms that are not necessarily in their interests.

The other variables related to *actual* financial crises are *IMF*, *Banking Crisis*, *Currency Crisis* and *Debt Crisis*, which are all taken from the Systemic Banking Crises database of Laeven and Velencia [40]. Laeven and Velencia [40] define a banking crisis as "a country's corporate and financial sectors experience a large number of defaults and financial institutions and corporations face great difficulties repaying contracts on time"; a currency crisis[11] as "nominal depreciation of the currency of at least 30 percent that is also at least a 10 percent increase in the rate of depreciation compared to the year before"; and a debt crisis as default of a sovereign on its debt with subsequent debt restructuring. The IMF variable is the IMF programm dummy from the IMF 'History of Lending Arrangements'. The IMF approves lending arrangements in order to support a country if that country commits to the required terms attached.

3.1 Methodology

The model that we use is a lagged dependent variable model with unobservable country fixed effects and regressors that are possibly endogenous. We study financial reform through analyzing the effect of variables that proxy for financial (in)stability or reflect actual crises. The basic specification that we, therefore, resort to is

$$\text{Fin.Ref.}_{it} = \alpha_0 + \alpha_1 \times \text{Fin.Ref.}_{i,t-1} + \text{financial stability}_{it} \times \boldsymbol{\beta} + u_i + \epsilon_{it}. \tag{1}$$

Here, Fin.Ref._{it} is the financial reform index at time t in country i; $\text{Fin.Ref.}_{i,t-1}$ is the financial reform index at time $t-1$ in country i; $\text{financial stability}_{it}$ is a vector of variables that proxy financial stability with β being the vector of coefficients; u_i are country fixed effects and ϵ_{it} is the

Furthermore, the financial reform index contains mostly banking sector relevant information.

[11] The currency crisis is, essentially, the same as a balance-of-payment crisis as used in Abiad and Mody.

error term.

As is well-known, the lagged dependent variable induces a correlation between the regressors and the error term due to the fixed effects u_i (Nickell [46]). Since we have a short time dimension ($T = 16$), we are likely to see a significant bias in our estimates unless we use an estimator that is able to account for this correlation. In addition, it is likely that our variable zscore, as well as the crisis variables, are endogenous, since higher financial liberalization might induce more financial (in)stability (Beck et al. [14], Boyd and de Nicolo [21]). In this case, the regressor will be correlated with the error term.

To deal with these problems we resort to the GMM estimator suggested in Arellano and Bond [7] and extended in Arellano and Bover [8] and Blundell and Bond [19].[12] This estimator requires to difference the model and thereby purges time-invariant country specific effects. In addition, it uses lagged levels of the regressors in the differenced equation and instruments variables in the levels equation with lags of the own differences, thereby making the endogenous lagged dependent variable essentially predetermined.

We report several tests for the moment conditions that are necessary for an efficient estimation. We test for first and second order autocorrelation, where we should find an insignificant first-order autocorrelation but a significant second-order one. We also report the Sargan test (Sargan [59]) and Hansen J statistic (Hansen [33]) for over-identification, since too many instruments may re-introduce biases. As the Sargan test is not robust, we tend to rely more on the Hansen test. Since many instruments tend to weaken the Hansen test, we use the standard rule of thumb that the number of instruments should be close to or less than the number of panels. We, furthermore, compare the Difference-in-Hansen tests of exogeneity of subsets of instruments (not reported) in order to assure that each instrument subset is well-specified. We always make sure that the subset of instruments pass the tests with a sufficiently high level (on this point see Roodman [56]).

It is well-known that the OLS estimator is upwards biased when a regression includes both a lagged dependent variable and unobservable fixed effects. In contrast, in this case the within estimator is downwards biased. A less biased estimator should, therefore, have a coefficient of the lagged dependent variable that falls between that of the OLS and within estimator. We, therefore, always report the OLS and within estimates to confirm that this is the case. To account for heteroscedasticity and autocorrelation within panels we calculate the robust estimator of the covariance matrix of the estimates in order to obtain consistent standard errors. Finally, we use the

[12] This estimator is a linear one, although one could argue that our dependent variable is in theory bounded, which would require a non-linear estimator. Since our dependent variable (ΔFR) never reaches its maximum or minimum in our sample, it is safe to resort to this linear estimator.

system GMM estimator because the dependent variable is rather persistent. Thus, the approach of Blundell and Bond [19] is preferred in this case.[13]

As a last measure, we introduce time dummies in order to reduce correlation across individuals. This is important as the autocorrelation tests and the robust estimation of the standard errors require no panel correlation in the errors. Finally, all regressions are run using the Windmeijer-corrected cluster-robust errors (Windmeijer [65]), or with cluster-robust errors.

3.2 Results

In the following we present the results of our study. Table II to IV shows the regression results, while Table V summarizes the marginal effects of each variable for the relevant sub-populations of bank concentration.

In Table II the regressions (1) and (2) show the OLS and within estimators, while (3) presents the system GMM estimator and (4) the system GMM with time dummies included. We notice that the lagged dependent variable impacts financial reform positively, has the required coefficient for stability of less than one, but the point estimates vary considerably between both estimators. This is, of course, the well-known bias that arises from the correlation between the lagged dependent variable and unobservable fixed effects, as suggested in the literature (see e.g. Arellano [6], Baltagi [9]). This supports the need to resort to the GMM estimator as introduced in Arellano and Bond [7]. However, the coefficient on the lagged dependent variable suggests a persistent series, in which case the system GMM estimator of Blundell and Bond [19] is suited better. Regression (3) then provides the results of the system GMM estimator, while regression (4) presents the system GMM with time dummies. Firstly, we confirm that the coefficient of the lagged dependent variable is between the point estimates of the OLS and within estimator and highly significant. The variable Fin.Ref.$(t-1)$ shows that financial reform is subject to a converging process, a requirement for the system GMM estimator.[14] Secondly, we have a sufficiently low instrument count compared to the number of panels (between 62 to 77 instruments versus 90 countries). Throughout all regressions the Hansen tests for overidentification is safely accepted, and, based on the Arellano-Bond test, we find an AR(1) process in the first-differenced errors while we accept the AR(2) test comfortably. Thus, the errors are serially uncorrelated.

We find that, consistently among all estimators, zscore is significant and positive for countries

[13] We confirmed this since results (not reported but available from the authors) with the first-differenced GMM were strongly biased (below the within estimator) which suggests weak instruments.

[14] Though this is not in line with the results in Abiad and Mody who study the change in Fin.Ref., it is in line with Huang [35], who, like us, controls for error dependence across countries.

with low bank concentrations, while it is insignificant for countries with high bank concentrations. Therefore, we may conclude that high values of zscore, i.e. stable financial systems, tend to be associated with financial liberalization. This confirms our initial hypothesis that reforms are best undertaken when uncertainty is low or when the financial system is able to better withstand unexpected shocks that might arise in the aftermath of the reform. In addition, we may conclude that an instable financial system tends to induce financial regulation. This suggests that a country facing structural problems in the banking sector will enforce stricter regulations as an attempt to constrain the instability. This is in line with many observations in the literature on moral hazard and banking. For example, Stiglitz [62] discussed that bank managers may choose larger risks than would otherwise be socially optimal because of limited liability. More regulation is then necessary in order to control those risks to a larger extend. The same result implies that liberalization tends to be undertaken in a situation of greater financial stability. This makes sense, since liberalization introduces higher uncertainty as it usually makes it harder for any incumbent bank to keep its market power, especially if financial markets get liberalized towards international competition. If financial liberalization, thus, changes the market structure in a significant way[15] such that e.g. banks need to adjust their balance sheets, then the required adjustments may imply large losses. If these adjustments were needed to be undertaken during times of an instable financial system, this could have drastic consequences. For example, if banks have a larger maturity mismatch or a significant liquidity risk while the market is highly volatile, then market liberalization that leads to a greater competition on deposits or large capital outflows may increase the financial instability of banks. This is exactly what happened in the Asian crisis in 1997.

Nevertheless, we only find this result for those countries that have a low concentration of financial players, implying a competitive financial sector, while for countries with large bank concentrations we find no significant effect from zscore on financial reform (see Table V for the marginal effects). Therefore, we may conclude that banking sectors with sufficient market power also have enough political power to block reforms that would otherwise have been undertaken. In Table III we introduce the actual crises variables and continue to confirm the result of regressions (3) and (4). Furthermore, the variables IMF and currency crisis show up significantly. Thus, we find IMF interventions induce financial liberalization, while there is some evidence for financial regulation in the aftermath of a currency crisis. We, thus, strengthen the results found in Abiad and Mody [2] and Huang [35], who found IMF interventions to be marginally significant. It is likely

[15] Financial reforms may also erode trust in markets (see Goodhart et al. [31]). If financial markets are already fragile, then reforms may completely shut down liquidity or demand. The implications of such a liquidity crush have been clearly felt in the financial crisis of 2007-2010.

that the IMF program shows up more significantly in our case since we, firstly, have a larger panel and, secondly, since the IMF had more programs during our sample (1990-2005) than during theirs (1973-1997). Nearly whenever IMF programs were put in place they were tight to demands for financial liberalizations (Stiglitz [64]). Thus, not finding a significant positive sign could indicate a problem with the analysis at hand. Jumping ahead, we find IMF interventions to be significant in every regression, which one could also view as a check-up for the consistency of the regression. Furthermore, in contrast to Abiad and Mody [2] and Huang [35], we find that actual currency crises induce financial regulations, and not financial liberalizations. Stricter government controls, thus, seem to follow currency crises. One reason for the discrepancy in results should be that our variable *currency crises* is taken from a different dataset compared to both other articles.[16]

In Table IV we interact the actual crises variables with the concentration dummy. For a low concentration in the financial sector we continue to confirm that high values of zscore induce financial liberalizations, while low values of zscore induce financial regulations. Thus, we find that highly concentrated financial sectors are able to block reforms even though countries are faced with potential financial instability. The IMF program variable shows up significantly in both concentration samples, which we would expect based on the IMF policies. However, the coefficient of IMF is lower[17] for countries with a strong financial sector, indicating that less financial reform might be undertaken in that subsample thanks to the political power exerted by the highly concentrated financial sector. Currency crises show up significantly and negatively in both concentration samples. Just like in the case for the variable IMF, the coefficient on the currency crisis is lower (though not statistically significantly) for the high concentration subsample, indication a potential interest group effect. This interest group effect is certainly the strongest for the variable debt crises, which is negative and significant only for the low concentration group.

3.3 Robustness

We now present some of the main robustness checks that we undertook.

In system GMM, the inclusion of dummies with few non-zero observations (or few zeros) may bias the results towards the within estimator. This could be the case for banking crisis, currency crisis and debt crisis, since all three variables have relatively few non-zero observations. However,

[16] Abiad and Mody [2] and Huang [35] take their variable from the Bordo et al. [20] dataset, while ours is from Laeven and Valencia [40]. Bordo et al. define a currency crisis as "a forced change in parity, abandonment of a pegged exchange rate, or an international rescue", while Laeven and Valencia define a currency crisis as a "nominal depreciation of the currency of at least 30 percent that is also at least a 10 percent increase in the rate of depreciation compared to the year before".

[17] Though we cannot confirm that it is statistically significantly lower.

given that we always first investigate zscore alone and then introduce the actual crises variables, we are able to see whether the inclusion of the crises variables leads to a shift of the results towards the within estimator. Indeed, we do not find that this is the case. The reason for this is most likely that our time dimension is sufficiently large (see Roodman [57]).

Another problem is that the Arellano-Bond AR(1) and AR(2) tests and the robust estimates of the standard errors require no unaccounted autocorrelation across individuals. In order to minimize potential autocorrelation across individuals we introduce time dummies into the regressions and as instruments as further robustness checks (see Roodman [57]). Nevertheless, the results are qualitatively the same as without time dummies, with some slight changes to the size of some of the coefficients.

In Table VI we include further controls. We add political controls since one would presume that they are important determinants as the progress of financial reforms is partly driven by political powers. In terms of our previous analysis, we find that currency and debt crises are both significant and with the expected sign for the low bank concentration sample, while they are insignificant for the high bank concentration sample, just like we had expected. The IMF variable, as expected, shows up significant for both the high and low concentration group, although it is not significant for the high concentration group in regression (R3). We include as a political control variable the orientation of the government in power. In line with both Abiad and Mody and Huang we do not find a significant role for political orientation of the government.[18] Similarly, the variables *years in office*, which should indicate a sort of reform tiredness of politicians that have ruled for a long time, shows up insignificant. Finally, the variable *Population65*, which gives the percent of the population that is older than 65 years, shows up positively and significantly. Overall, the inclusion of these controls makes the impact of the potential crisis variable zscore disappear, though all other results continue to be robust.

An additional robustness check is to exclude the variable zscore, which reduced the sample size by approximately half. Excluding zscore allows us to have a time dimension of 31 years. This should reduce the Nickel bias to a certain extent, though regressions (R5) and (R6) in Table VII seem to suggest that it is still non-negligible. We find that IMF programs continue to be significant in countries with both small and large bank concentrations (although in the low bank concentration of regression (R7) the IMF program is just insignificant), confirming our results from above. Debt crises are significant and induce financial regulation only in countries with banking

[18]This is in contrast to Burgoon et al. [22], who find a significant role for political variables in the financial reform process.

sectors that do not have sufficient political power, while we confirm that bank crises and currency crises are insignificant for both subsamples.

One point of criticism that could be raised is that we should, in effect, be using a non-linear estimator since our dependent variable is a count variable. In order to study whether our analysis is driven by the fact that financial reform is a count variable, we run a panel data Poisson fixed effects model. The results, presented in Table VIII, indicate that our previous results stay unchanged if we use an estimator that is better able to account for the count characteristic of our dependent variable.

4 Conclusion

In this article we analyzed whether and under what conditions potential financial (in)stability and actual financial crises induce financial reforms. We argued that countries in times of potential financial stability should be more inclined to liberalize their financial markets, while countries in times of financial instability would tend to regulate their markets. Potential, or expected, financial stability is required for a successful liberalization since financial market reforms tend to induce uncertainty and changes in market structures that might lead to unforeseen consequences or costs that can exacerbate an otherwise already existing instability. Thus, if countries wish to liberalize their financial markets in order to provide stronger incentives for savings, lending and competition, i.e. growth promoting reforms, then a sound financial position is a useful prerequisite (see Stiglitz [63]).

On the converse, we have often seen stricter regulation as a direct consequence of a financial crisis. This happens because bailouts tend to socialize the costs of a crisis with low income groups losing out to a significant extent, wherefore politicians have incentives to protect their voters. We, therefore, hypothesized that financial instability induces tighter regulations. Thus, the incentives as well as the macroeconomic environment underlying financial regulation and liberalization are assumed to be different.

An additional hypothesis that we raised was that countries with a high concentration of financial players might also have a strong financial lobby in the political decision-taking process, since in this case a few players essentially monopolize a country's financial system and can therefore threaten the ruling party. We would expect that financial reform might potentially be blocked by a strong financial lobby. This arises since financial reforms change the rules of the game and either lead to higher costs, more competition or further constraints on financial players' balance sheets.

Under these circumstances, any change to the status quo of incumbent players may potentially induce significant lobbying activities. In countries with a lower concentration in the financial sector we would expect that players would not have the political power to sufficiently influence the political decision-making process.

To study these hypotheses, we used a large panel dataset consisting of 90 countries covering essentially the period 1990 - 2005.[19] The data for financial reform is taken from Abiad et al. [1], while the other data comes from different sources (Laeven and Velencia [40], Beck et al. [15], IMF 'History of Lending Arrangements'). The measure for potential financial (in)stability is zscore, which is increasing in assets/equity and the return on assets, but decreasing in the standard deviation of the return on assets. Our measures for financial instability are crises dummies for IMF program, banking crises, debt crises and currency crises.

The results are as follows. We consistently find that, for countries with low bank concentration, potential financial stability induces financial liberalization, while potential financial instability induces financial regulation. For countries with high bank concentration, potential financial (in)stability does not induce financial reforms. Thus, financial sectors with a large concentration of financial players can effectively block financial reforms, while those with lower concentrations are unable to lobby the ruling party into ceasing their reform plans. The problem is that financial reform is generally in the interest of society, while financial players monopolizing their country is not. To be more specific, we effectively find that a highly concentrated financial sector is able, by lobbying the political power, to block a financial liberalization that is supposed to e.g. improve competitiveness and thereby promote economic growth.[20]

We also found that the IMF program variable leads to financial liberalization, which is expected since the IMF policy in general was to ask countries to liberalize their markets if they wanted to obtain funding from the IMF program. Debt and currency crises lead to significant reforms in the financial markets, but only for countries with lower concentrations, as we had expected. In contrast to this, we concluded that banking crises tend to be insignificant drivers of financial reforms. We also conducted a series of robustness tests that address various potential weaknesses of our analysis but did not find evidence that might induce us to re-think our analysis or results.

In terms of lessons to take away and future research perspectives, we suggest the following additional points. Since lobbying tends to be socially harmful activity, it would be of advantage

[19] The use of one variable reduces the time horizon, while in the robustness study, without that variable, the time horizon is 1974-2005.

[20] This could explain why countries with high bank concentrations also have higher unemployment and inflation rates. This result comes from a tabulation of the quartiles of unemployment and inflation with bank concentration within our dataset.

to break the link between policy makers and lobbyists. One could, for example, take the way of pecuniary measures by obliging politicians to rely on industry-independent election funding or to undertake financial reforms on an international level. Disallowing industry-specific election funding could help separate politicians' interests from those of potential lobbyists. This is clearly of advantage not only in the banking sector but also in general. Recent financial reforms are more and more undertaken at an international level (e.g. Basel III), but mostly in order to level the playing field. Obviously, our results suggest that international financial reforms could help in minimizing lobbying activities and thus social costs. We would emphasize, though, that this does not imply that the actual supervision should also move to an international level. Local supervisors tend to know their home market best and should continue to supervise their local market, though at the constraints of the international regulations.

Our results, furthermore, suggest that financial reforms tends to move in cycles that are closely linked to the underlying market situation. This, certainly, cannot be optimal, as this implies that regulation itself is lagging instability. Similarly, if financial liberalization is a consequence of an extended period of financial stability, then one would be inclined to believe that policy makers that liberalize may have forgotten the reasons for which the regulation was introduced in the first place.[21] A prominent example that is under constant discussion is the Glass-Steagal Act. In terms of future research we suggest to further study the dynamic interactions and feedback loops between financial reform and financial (in)stability.

A further suggestion that this article brings across is that policy makers might wish to regulate the size of banks. This is likely to lead to a reduced dead-weight loss, a diminished lobbying potential and would, at the same time, address the relevant issue of too-big-to-fail that is so very much at the heart of the current policy debate.

In terms of future research we would advocate the difficult yet rewarding task of quantifying the social dead-weight loss associated with different levels of bank concentration. This would provide us with an understanding of the lobbying potential and the benefits of regulations.

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5 Appendix

Table I: Summary statistics

Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**	**N**
Fin. Ref.	15.302	2.836	5.25	20	894
log(zscore)	0	0.693	-3.191	2.33	894
Bank.Conc.	0.506	0.5	0	1	894
IMF	0.369	0.483	0	1	894
Banking Crisis	0.026	0.158	0	1	894
Currency Crisis	0.018	0.133	0	1	894
Debt Crisis	0.007	0.082	0	1	894

Table II: The benchmark model

VARIABLES	(1) Fin.Ref.	(2) Fin.Ref.	(3) Fin.Ref.	(4) Fin.Ref.
Fin.Ref.(t-1)	0.910***	0.663***	0.826***	0.896***
	(0.0122)	(0.0176)	(0.0506)	(0.0385)
log(zscore)	0.129*	0.139*	0.288**	0.259**
	(0.0731)	(0.0782)	(0.143)	(0.115)
Bank Conc.	0.0844	-0.0932	-0.0314	-0.00810
	(0.0628)	(0.103)	(0.147)	(0.120)
log(zscore)*Bank Conc.	-0.158	-0.120	-0.204	-0.187
	(0.0978)	(0.112)	(0.182)	(0.147)
Constant	1.527***	5.343***	2.843***	1.593***
	(0.202)	(0.271)	(0.808)	(0.617)
Time dummies				yes
Observations	894	894	894	894
R^2	0.910	0.617		
Countries		90	90	90
Instruments			62	77
Sargan p-value			2.63e-07	2.32e-05
Hansen p-value			0.620	0.630
AR(1) p-value			3.05e-07	1.52e-07
AR(2) p-value			0.840	0.998

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table III: The interaction model

VARIABLES	(5) Fin.Ref.	(6) Fin.Ref.	(7) Fin.Ref.	(8) Fin.Ref.
Model	OLS	FE	sysGMM	sysGMM
Fin.Ref.(t-1)	0.915***	0.673***	0.859***	0.896***
	(0.0120)	(0.0187)	(0.0451)	(0.0474)
log(zscore)	0.133*	0.153**	0.306**	0.228**
	(0.0680)	(0.0711)	(0.142)	(0.112)
Bank Conc.	0.0820	-0.0715	-0.0613	-0.0499
	(0.0633)	(0.101)	(0.123)	(0.108)
log(zscore)*Bank Conc.	-0.152	-0.125	-0.205	-0.133
	(0.0959)	(0.110)	(0.196)	(0.148)
IMF	0.127**	0.235**	0.537**	0.404**
	(0.0599)	(0.108)	(0.225)	(0.191)
Banking Crisis	0.0531	-0.00952	0.266	0.145
	(0.231)	(0.192)	(0.319)	(0.318)
Currency Crisis	-0.645***	-0.481*	-0.782**	-0.772**
	(0.238)	(0.254)	(0.319)	(0.374)
Debt Crisis	-0.841*	-0.461	-0.478	-0.213
	(0.452)	(0.491)	(0.505)	(0.417)
Constant	1.426***	5.119***	2.180***	1.510**
	(0.200)	(0.305)	(0.731)	(0.766)
Time dummies				yes
stand. errors	robust/cluster	robust/cluster	robust	robust
Observations	894	894	894	894
R^2	0.912	0.624		
Countries		90	90	90
Instruments			99	90
Sargan p-value			2.58e-09	7.57e-06
Hansen p-value			0.698	0.526
AR(1) p-value			9.60e-08	6.41e-08
AR(2) p-value			0.771	0.927

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table IV: The interaction model 2

VARIABLES	(9) Fin.Ref.	(10) Fin.Ref.	(11) Fin.Ref.	(12) Fin.Ref.
Model	OLS	FE	sysGMM	sysGMM
Fin.Ref.(t-1)	0.917***	0.674***	0.864***	0.889***
	(0.0121)	(0.0184)	(0.0487)	(0.0485)
log(zscore)	0.106	0.118*	0.287*	0.231*
	(0.0652)	(0.0651)	(0.156)	(0.131)
Bank Conc.	0.0514	-0.138	0.121	0.0378
	(0.0674)	(0.113)	(0.250)	(0.183)
log(zscore)*Bank Conc.	-0.116	-0.0795	-0.195	-0.129
	(0.0883)	(0.103)	(0.186)	(0.176)
IMF	0.120	0.184	0.724**	0.524*
	(0.101)	(0.144)	(0.356)	(0.310)
Banking Crisis	-0.117	-0.136	0.105	0.192
	(0.287)	(0.250)	(0.424)	(0.411)
Currency Crisis	-0.824**	-0.762**	-0.952**	-0.681*
	(0.376)	(0.364)	(0.467)	(0.392)
Debt Crisis	-1.980***	-1.716***	-2.141***	-2.486***
	(0.349)	(0.365)	(0.828)	(0.613)
IMF*Bank Conc.	0.0133	0.0694	-0.473	-0.0826
	(0.140)	(0.175)	(0.359)	(0.341)
Banking Crisis*Bank Conc.	0.640	0.555	0.529	0.493
	(0.458)	(0.379)	(0.546)	(0.590)
Currency Crisis*Bank Conc.	0.280	0.548	0.608	0.119
	(0.413)	(0.426)	(0.518)	(0.442)
Debt Crisis*Bank Conc.	1.549***	1.662***	2.114**	2.703***
	(0.406)	(0.449)	(0.845)	(0.680)
Constant	1.411***	5.133***	2.029**	1.507*
	(0.198)	(0.302)	(0.794)	(0.770)
Time dummies				yes
stand. errors	robust/cluster	robust/cluster	robust	robust
Observations	894	894	894	894
R^2	0.913	0.631		
Countries		90	90	90
Instruments			106	92
Sargan p-value			2.35e-08	0.000156
Hansen p-value			0.818	0.577
AR(1) p-value			1.86e-07	1.82e-07
AR(2) p-value			0.811	0.865

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table V: Interaction effects

Bank conc. Sample	Regr.	Time dummies	log(zscore)	IMF	Banking Crisis	Currency Crisis	Debt Crisis
low	(3)	no	0.288**				
high	(3)	no	0.084				
low	(7)	no	0.306**	0.537**	0.266	-0.782**	-0.478
high	(7)	no	0.101				
low	(11)	no	0.287**	0.724**	0.105	-0.952**	-2.141***
high	(11)	no	0.092	0.25*	0.635	-.345*	-0.027
low	(4)	yes	0.259**				
high	(4)	yes	0.073				
low	(8)	yes	0.228**	0.404**	0.145	-0.772**	-0.213
high	(8)	yes	0.096				
low	(12)	yes	0.231*	0.524*	0.192	-0.681*	-2.486***
high	(12)	yes	0.337	0.442***	0.685	-0.562**	0.217

*** p<0.01, ** p<0.05, * p<0.1

Table VI: Robustness A: Additional controls

VARIABLES	(R1) Fin.Ref.	(R2) Fin.Ref.	(R3) Fin.Ref.	(R4) Fin.Ref.
Model	OLS	FE	sysGMM	sysGMM
Fin.Ref(t-1)	0.899***	0.664***	0.791***	0.841***
	(0.0149)	(0.0183)	(0.0409)	(0.0672)
log(zscore)	0.0933	0.117	0.114	-0.0613
	(0.0588)	(0.0743)	(0.107)	(0.0969)
Bank Conc.	-0.0441	0.0757	0.129	0.118
	(0.0652)	(0.0795)	(0.123)	(0.130)
log(zscore)*Bank Conc.	-0.125	-0.0540	-0.161	0.0119
	(0.133)	(0.136)	(0.172)	(0.134)
IMF	0.205**	0.205	0.616***	0.364**
	(0.0925)	(0.129)	(0.196)	(0.165)
Banking Crisis	0.0236	-0.0323	0.234	0.393
	(0.224)	(0.200)	(0.318)	(0.286)
Currency Crisis	-0.669**	-0.513*	-0.741*	-0.944***
	(0.270)	(0.305)	(0.381)	(0.360)
Debt Crisis	-2.340***	-1.921***	-2.640***	-2.203***
	(0.260)	(0.258)	(0.588)	(0.421)
IMF*Bank Conc.	0.0511	0.0754	-0.276	0.0307
	(0.149)	(0.150)	(0.268)	(0.185)
Banking Crisis*Bank Conc.	0.580	0.873	0.880	-0.149
	(0.904)	(0.701)	(0.729)	(0.714)
Currency Crisis*Bank Conc.	0.209	-0.0664	0.256	0.722*
	(0.434)	(0.476)	(0.582)	(0.411)
Debt Crisis*Bank Conc.	1.810***	1.637***	2.709***	2.146***
	(0.460)	(0.430)	(0.639)	(0.577)
Population aged ≥65 (% of total)	0.0279***	0.0443	0.0520**	0.0382*
	(0.00876)	(0.0381)	(0.0233)	(0.0197)
Years in Office	-0.00260	-0.00805*	-0.00658	-0.0222
	(0.00520)	(0.00409)	(0.0158)	(0.0162)
Leftist Government	0.0410	0.0839	0.190	0.185
	(0.0671)	(0.113)	(0.222)	(0.264)
Constant	1.447***	4.800***	2.620***	1.988*
	(0.226)	(0.466)	(0.663)	(1.038)
Observations	871	871	871	871
R^2	0.913	0.630		
Instruments			85	53
Sargan p-value			5.37e-06	0.0519
Hansen p-value			0.503	0.706
AR(1) p-value			3.37e-07	1.81e-07
AR(2) p-value			0.988	0.926
Countries		88	88	88

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table VII: Robustness B: excluding zscore for sample size

VARIABLES	(R5) Fin.Ref.	(R6) Fin.Ref.	(R7) Fin.Ref.	(R8) Fin.Ref.
Model	OLS	FE	sysGMM	sysGMM
Fin.Ref.(t-1)	0.909***	0.732***	0.779***	0.862***
	(0.0154)	(0.0192)	(0.0380)	(0.0623)
Bank Conc.	0.0687	-0.211*	-0.0378	-0.224
	(0.0672)	(0.109)	(0.129)	(0.138)
IMF	0.0892	0.148	0.409*	0.327
	(0.0967)	(0.128)	(0.226)	(0.200)
Banking Crisis	-0.320	-0.454	-0.103	-0.349
	(0.302)	(0.326)	(0.425)	(0.503)
Currency Crisis	-0.545	-0.692*	-0.706**	-0.525
	(0.343)	(0.356)	(0.330)	(0.386)
Debt Crisis	-1.989***	-1.697***	-1.329**	-1.463**
	(0.336)	(0.376)	(0.636)	(0.677)
IMF*Bank Conc.	0.0738	0.0778	-0.162	0.114
	(0.121)	(0.132)	(0.253)	(0.183)
Banking Crisis*Bank Conc.	0.142	0.188	0.205	0.214
	(0.388)	(0.419)	(0.502)	(0.584)
Currency Crisis*Bank Conc.	0.272	0.374	0.696	0.408
	(0.489)	(0.458)	(0.447)	(0.560)
Debt Crisis*Bank Conc.	2.129***	2.331***	1.564**	1.691**
	(0.531)	(0.566)	(0.704)	(0.768)
Constant	1.533***	4.253***	3.430***	2.099**
	(0.252)	(0.307)	(0.599)	(1.018)
Observations	1270	1270	1270	1270
R^2	0.916	0.752		
Instruments			81	90
Sargan p-value			1.36e-10	3.50e-06
Hansen p-value			0.722	0.432
AR(1) p-value			2.62e-08	2.03e-08
AR(2) p-value			0.524	0.737
Countries		91	91	91

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table VIII: Robustness C: Fixed-effect Poisson regression

VARIABLES	(R9) Fin.Ref.	(R10) Fin.Ref.
Model	FE Poisson	FE Poisson
Fin.Ref.(t-1)	0.046***	0.045***
	(0.003)	(0.002)
log(zscore)	0.008*	0.010**
	(0.005)	(0.005)
Bank Conc.	-0.011	-0.010
	(0.007)	(0.009)
log(zscore)*Bank Conc.	-0.005	-0.006
	(0.008)	(0.008)
IMF	0.014	0.014
	(0.013)	(0.011)
Banking Crisis	-0.015	-0.010
	(0.017)	(0.017)
Currency Crisis	-0.049*	-0.046*
	(0.029)	(0.027)
Debt Crisis	-0.107***	-0.114***
	(0.036)	(0.033)
IMF*Bank Conc.	0.003	0.003
	(0.016)	(0.013)
Banking Crisis*Bank Conc.	0.040	0.038
	(0.063)	(0.034)
Currency Crisis*Bank Conc.	0.036	0.038
	(0.039)	(0.033)
Debt Crisis*Bank Conc.	0.108**	0.113***
	(0.054)	(0.043)
Time dummies	No	Yes
Observations	894	894
log-likelihood	-1750.699	-1750.379

*** p<0.01, ** p<0.05, * p<0.1

Table IX: Robustness: Interaction effects

Bank conc. Sample	Regr.	Time dummies	zscore	IMF	Banking Crisis	Currency Crisis	Debt Crisis
low	(R3)	no	0.114	0.616***	0.234	-0.741*	-2.64***
high	(R3)	no	-0.047	0.34	1.11	-0.485	0.069
low	(R7)	no		0.409*	-0.103	-0.706**	-1.463**
high	(R7)	no		0.247	0.102	-0.01	0.235
low	(R9)		0.008*	0.014	-0.015	-0.049*	-0.107***
high	(R9)		0.003	0.017	0.025	-0.013	-0.001
low	(R4)	yes	-0.0613	0.364**	0.393	-0.944***	-2.203***
high	(R4)	yes	-0.049	0.395**	0.244	-0.222	-0.057
low	(R8)	yes		0.327	-0.349	-0.525	-1.463**
high	(R8)	yes		0.441**	-0.135	-0.117	0.228
low	(R10)		0.01**	0.014	-0.01	-0.046*	-0.114***
high	(R10)		0.004	0.017	0.028	-0.008	-0.001

*** p<0.01, ** p<0.05, * p<0.1