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Are financial crises drivers of market-oriented reforms or of a setback of liberalization?

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Abstract:

Supported by empirical studies, the conventional "crisis hypothesis" claims that a severe economic deterioration can lead to a liberalization of policies. The direction of policy responses may however depend on the institutional environment and on the initial liberalization of initial policies. The paper investigates empirically the role of financial crises and initial status of economic policy liberalization on reforms since the 1970s. We find evidence that banking crises enhance market-oriented reforms only if crises occur in a less liberalized environment. If banking crises take place in an economically free institutional environment, a setback of market-friendly reforms is more likely. While currency crises appear to have no impact at all, debt crises seem to have adverse effects on economic freedom when they occur in an initially already restricted policy environment.

Key words: crisis, market-oriented reform, economic freedom, liberalization, policy response

"Crises create a sense of urgency. *Something* needs to be done, for the crisis requires an urgent solution" (*Allan Drazen and William Easterly* 2001)

"You don't ever want to let a crisis go to waste: it's an opportunity to do important things that you would otherwise avoid." (*Rahm Emanuel*, White House chief of staff)

1 Will market-oriented economic policies survive the financial crisis?

The global financial and economic crisis caused many countries all over the world to significantly increase the role of government in the economy. In order to rescue the financial system and to fight a deep recession the recent months saw not only fiscal stimulus packages of unprecedented size but also government loans and bailouts for hard-hit firms as well as guarantees for banks and even a nationalization of financial institutions (see, e.g., *Petrovic and Tutsch* 2009). Protectionist measures have also been part of some governments' crisis responses.¹ Eventually, after the worst case scenario of a global financial market meltdown has (probably) been avoided, many countries will face enormous public debt problems.

Financial market emergency measures and short-term fiscal policy responses to the crisis have by and large been welcomed by a majority of economists, although size, composition and timing of policy responses to the economic turmoil can be criticized, too.² Yet, there is a risk that certain restrictive measures will remain in place as the crisis retreats. To date, most crisis-hit countries do not have an explicit exit strategy, and plans for a rollback of the emergency measures in the financial sector are, at best, vague (*OECD* 2009). Voices which call for a much more restrictive regulatory framework for financial markets are getting louder, and the possibility of a permanent return of more government interventions cannot be discarded. At the end of 2009, you may ask with good cause whether market-oriented policies and capitalism will survive the financial crisis (*Calvo and Loo-Kung* 2009, *Gwartney and Lawson* 2009).

Such a fear stands in contrast to traditional thinking about the link between deep economic deteriorations and policy reforms, however. According to what is now a "conventional wisdom" (*Drazen and Easterly*, 2001), crises-affected countries have a higher propensity to liberalize policies. Provided that financial crises are associated with deeper and longer-lasting economic downturns than normal recessions (*Haugh et al.*, 2009, *Reinhart and Rogoff*, 2009), after a period of temporarily restricted economic freedom and more government intervention capitalism should even end up stronger, not weaker, after the financial crisis.

This contradiction leads to the central questions the paper deals with: Are financial crises the drivers of further market-oriented reforms, or do they rather lead to a setback of liberalization? What do past experiences tell us about the link between financial crises and policy reforms? One might surmise that financial crises differ from other types of economic downturns in creating stronger incentives to revise previous market-oriented policy reforms even in the long run. Moreover, if crises

¹ For example, the *European Commission* (2009) reports an increase of potentially restrictive trade measures of major European Union's trade partners, summing up to a total of 223 new soft and hard protectionist restraints between October 2008 and October 2009.

² *Baldacci et al.* (2009) show that during crises caused by financial sector distress, fiscal expansions increase the likelihood of earlier exit from a shock episode. Expansionary fiscal policies reduced the crisis duration by almost one year.

are symptoms of policy failures, the direction of a policy response could depend on the current institutional environment, i.e. on the initial liberalization of policies in the status quo. The occurrence of a crisis in a restricted economic policy environment will probably enhance policy liberalization. But a tendency to set back liberalization might be enhanced by the perception that market-oriented reforms have gone too far. This appears to be more probable if shocks are seen as a major defect of the banking system, as a core institution of capitalism.

The paper investigates empirically the role of banking crises, currency crises and sovereign debt crises on economic policy liberalization since the 1970s, using the Economic Freedom of the World-index of the Fraser Institute (*Gwartney and Lawson 2009A*) and a recently published IMF database on financial crises (*Laeven and Valencia 2008*). In particular, we aim to test if policy responses to crises are "state dependent", i.e., if the level of economic freedom in the status quo does affect the direction and the intensity of policy changes. The empirical part is closely related to contributions by *Abiad and Mody (2005)* and *de Haan, Sturm, and Zandberg (2009)*. However, in contrast to *Abiad and Mody* we look at longer-run overall economic reforms and not only on more short-term financial market reforms, and in contrast to *de Haan et al.*, we also investigate the question of state dependency of policy responses on financial crises.

Section 2 summarizes very briefly the theoretical and empirical literature on (financial) crises and market-oriented policy reforms. Against the background of the current crisis, we also ask whether the conventional view can be re-formulated as a "crises trigger policy change"-hypothesis. We continue with a description of the data and some stylized facts in section 3. Section 4 proceeds with empirical tests of the impact of banking crises and debt crises on the intensity and direction of subsequent policy changes over the time period 1975-2005, employing dynamic panel regression techniques. Our estimates show that (i) policy responses differ between banking crises and debt crises, and (ii) policy responses are state-dependent. Section 5 summarizes and concludes.

2 Crises and reform: A brief overview and some open questions

2.1 The 'crises trigger economic policy liberalization' hypothesis

The conventional view on crises and policy changes is that deep crises promote economic liberalization. The main idea behind the conjecture is that during 'normal times' market-minded governments are often unable to overcome reform resistance from powerful vested interests. A negative economic shock can shift the balance of decision-making power and thus stimulate significant policy changes towards a reduction of government interventions and market-orientation (e.g. *Alesina and Drazen 1991*, *Fernandez and Rodrik 1991*, *Drazen, 2000*). The central notion is that vested interest groups and the public bureaucracy benefit from regulations and government interventions in the status quo. Hence, we need a shock to the status quo in order to induce policy reform. Crises weaken opposition to market-oriented reforms by diminishing the relative payoffs of reform blockades and increasing the payoffs of a market-oriented policy change. Moreover, facing a severe deterioration of the status quo, vested interest groups are more likely to accept the distributional uncertainties associated with reforms, and governments might also have a higher propensity to take the political risks of temporary economic hardships during reforms – the 'J-curve effect' of structural policy changes (*Rodrik 1996*). Although market-oriented policy changes might be

economically easier during good times, crises seem to be catalysts for reforms as they strengthen political incentives for economic liberalization.

Another strand of the literature stresses that crises can also stimulate market-oriented policy changes by inducing a learning process of government officials and the electorate. Revealing that the current policy model has failed, an economic downturn might convince policy makers of the lack of sustainability of policies in the status quo, then strengthen incentives to look for policy alternatives and thus to promote a revision of policies (e.g. *Freytag and Renaud, 2006*). Such pathological policy learning is also compatible with certain theories of obstacles to reform in psychology and behavioral economics (*Heinemann and Tanz, 2008*).

2.2 Do crises drive setbacks of policy liberalization?

Commonly, the term reform is associated with a change towards less restrictive policies (*Drazen 2009*). According to the crisis hypothesis, the driver of reform is a deep failure of previous (restrictive) policies which leads to a switch of political equilibria and promotes pathological learning. But does the current global financial and economic crisis not reveal that market-oriented policies have failed, as some argue? And does this not create incentives for a permanent reversal of economic policy liberalization? Put differently, central to the arguments in favor the view that crises trigger market-oriented reforms is that political decision makers (and the electorate) perceive current policies in the status quo as unsustainable, and that – even more important – it is the restrictiveness of these policies which is identified as the major reason for an observed economic downturn.

To be sure, these are very demanding pre-conditions. Even – or is it better to say: predictably? – economists often disagree on the major causes of an economic downturn or a crisis. Currently, it is still controversially debated whether the current financial crisis is rooted in too much or too little government intervention, too little or too much economic freedom (see, e.g. *Meltzer 2009, Tanzi 2009*). *Congleton (2009)* and *Kirchgässner and Schneider (2009)* argue that the present economic and financial market turmoil is caused by multiple factors and cannot be attributed to market failure or government failure alone. But then the question arises which policy response is adequate. This problem of identification and adequate policy response is put forward by Harvard economist *Edward Glaeser*, who writes on June 9th 2009 in the *Economix* blog of the New York Times:

"Does the current crisis mean that capitalism has failed? In certain left-of-center quarters, there is an almost gleeful desire to leap from an economic downturn to the conclusion that this whole free-market thing was always a big mistake. The events of the past 18 months certainly illustrate that financiers can be venal and dishonest ... The failures of our regulators shouldn't be much more surprising than the wrongdoings of investment managers. After all, governments are made up of imperfect humans also. This crisis, like most previous crises, should remind us of the frailty both of individuals and of our institutions. Our financial markets cannot operate without strong public protection of property rights, and there are times when such protection requires restricting the actions of private entities, at least when they are publicly insured. But it is foolish to react to a governmental failure and think that the right response is to vastly increase the scope of public activity."

Most important in our context is that in public discourse it is far easier and probably more convincing to argue that government interventions and regulations have failed in a policy environment that is clearly dominated by central planning as compared to an institutional setting that is already characterized by elements of market-orientation.³ Against this background we should expect the direction of policy changes to depend on initial conditions: An economic crisis that occurs in a strongly market-oriented environment might lead to a policy changes towards more government interventions, and a crisis that occurs in a highly regulated environment might promote economic policy liberalization. Economic deterioration indicates that *something* has to be done, but not exactly *what* will be done. Crises might trigger action, but not necessarily more liberalization.⁴

2.3 An overview of the empirical evidence

A number of empirical contributions support the hypothesis that severe crises can indeed trigger market-oriented policy changes (*Drazen and Easterly 2001, Lora and Olivera 2003, Pitlik and Wirth 2003, Heinemann 2004, Duval and Elmeskov 2006, IMF 2006, Hoj et al. 2006*). Most studies find that especially high inflation rates and monetary imbalances are conducive to economic policy liberalization and structural reforms. Results for the impact of a bad growth performance on reforms are more mixed. The effects of growth crises are not always statistically significant, and sometimes severe recessions (i.e. a "growth crises") show a statistically significant, but economically only small effect on market-oriented policy changes. *Pitlik and Wirth (2003)* additionally find that the likelihood of overall economic policy liberalization, as measured by an increase of a comprehensive economic freedom index, is higher in times of severe crises or in times of no crisis, as compared to crises of only 'medium intensity'. Evidence for a state-dependency of economic policy liberalization can be found in all of these papers. The extent of a market-oriented policy change depends on the state of initial policies: Economically less free countries tend to liberalize more in general, while countries that have already reached a high level of market-orientation have less room for market-friendly policy changes and to increase economic freedom.

Pitlik (2007) also shows that learning from success is a driver of economic policy liberalization (see also *Simmons and Elkins 2004*). However, the intensity and even the direction of a policy reaction with respect to an economic downturn seem to depend on the institutional environment. *Pitlik (2008)* finds for a world-wide sample of countries that a bad growth performance is conducive to policy liberalization in democracies, but not in autocracies. Democracies on average not only carry out less restrictive economic policies in general, but they are also more responsive to growth crises. Focusing on 25 Eastern European and former Soviet Union transition economies, *Campos and Coricelli (2009)* report that in partially democratic countries financial liberalization is often reversed, because governments are weak as compared to autocratic regimes or full-fledged democracies. *Alesina, Ardagna, and Trebbi (2006)* find that stabilizations from large budget deficits and high inflation are more likely in times of crisis if a strong unified government is in power which is able to overrule political reform opposition.

³ It is not purpose of the present paper to present a 'normative' economic policy solution.

⁴ One possible reason why a reversal of policy liberalization as a reaction to crises has not found too much attention in the literature is that crises appear to occur less often and less intense in countries following a market-oriented policy. Serious economic downturns seem to be more likely in more regulated economies. For example, *Shehzad and de Haan (2008)* show that that liberalization reduces the likelihood of systemic banking crises.

Focusing on financial market liberalizations only, *Abiad and Mody* (2005) provide evidence that policy responses to different types of crises are not all alike. Using a database covering 35 countries over the years 1973-96, they find in a set of ordered logit regressions that a liberalization of financial markets is triggered by balance-of-payment crises, but banking crises appear to increase the likelihood of a reversal of financial market liberalization. This should be mainly due to a nationalization of banks as part of emergency measures to maintain financial stability. Deep recessions and high inflation rates are not systematically associated with liberalization or a setback of reforms in the financial sector. Using annual data, the results of *Abiad and Mody* (2005) should not be interpreted as providing evidence for longer-run effects of crises.

Finally, and most recently, *de Haan, Sturm, and Zandberg* (2009) examine the impact of financial and economic crises on economic freedom for a sample of up to 131 countries by fixed effects panel estimates. Employing the Economic Freedom of the World-index (and several components of the index) as a measure of economic policy liberalization, *de Haan et al.* find that in the short run a banking crisis reduces economic freedom while in the long run it is associated with more liberalized economic policies. With respect to index components, the authors find that banking crises are positively related to market-oriented reforms in government size and property rights security, but not significantly associated with reforms of monetary policy, restrictions on international trade and regulation policies. Somehow surprisingly and in contrast to the conventional crisis hypothesis, they also find that deep economic downturns, as measured by a large output gap, are associated with a reversal of liberalization.⁵

In what follows we take the paper by *de Haan, Sturm, and Zandberg* (2009) as a useful starting point and extend their analysis in various ways. First, we aim to test for the possibility of state-dependent policy responses to economic crises. Second, we take into account political factors as determinants of policy, an issue that has been neglected by *de Haan et al.* Third, we examine not only banking crises but also the effects of currency crises and debt crises on policy liberalization. Finally, we control for likely endogeneity and reverse causality in the estimates. Before turning to this exercise, we take a brief look at the data and some stylized facts in the next section.

3 What do the data say? Some stylized facts

The focus of the present paper is on the effects of different types of financial crises on economic policy. Under the heading of a financial crisis we count banking crises as well as currency crises and sovereign debt crises. In a recent IMF working paper, *Laeven and Valencia* (2008) provide a comprehensive database that covers all systemically important banking, currency and debt crises⁶ for the period 1970 to 2007.

⁵ This is, however, less surprising if we consider that *de Haan et al.* (2009) use contemporary values of the output gap and do not control for endogeneity in their regressions. The negative relation between economic crisis and policy reform might then simply reflect that economically free countries observe less often and less severe crises.

⁶ One may argue that debt crises have only indirectly to do with financial crises. However, *Reinhard and Rogoff* (2008) show that real government debt rose by over 86 percent on average in the three years following a banking crisis. An enormous rise in public debt has been a characteristic of the aftermath of financial crises for over a century.

According to their definition "in a systemic banking crisis, 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". *Laeven and Valencia (2009)* do not take into account events that only affected isolated banks. In sum, the authors identify 124 systemic banking crises over the respective period.⁷ A currency crisis is 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. Finally, they count as sovereign debt crisis only cases of government debt defaults.

Figure 1: Number of crises in our sample of 123 countries, by crisis type

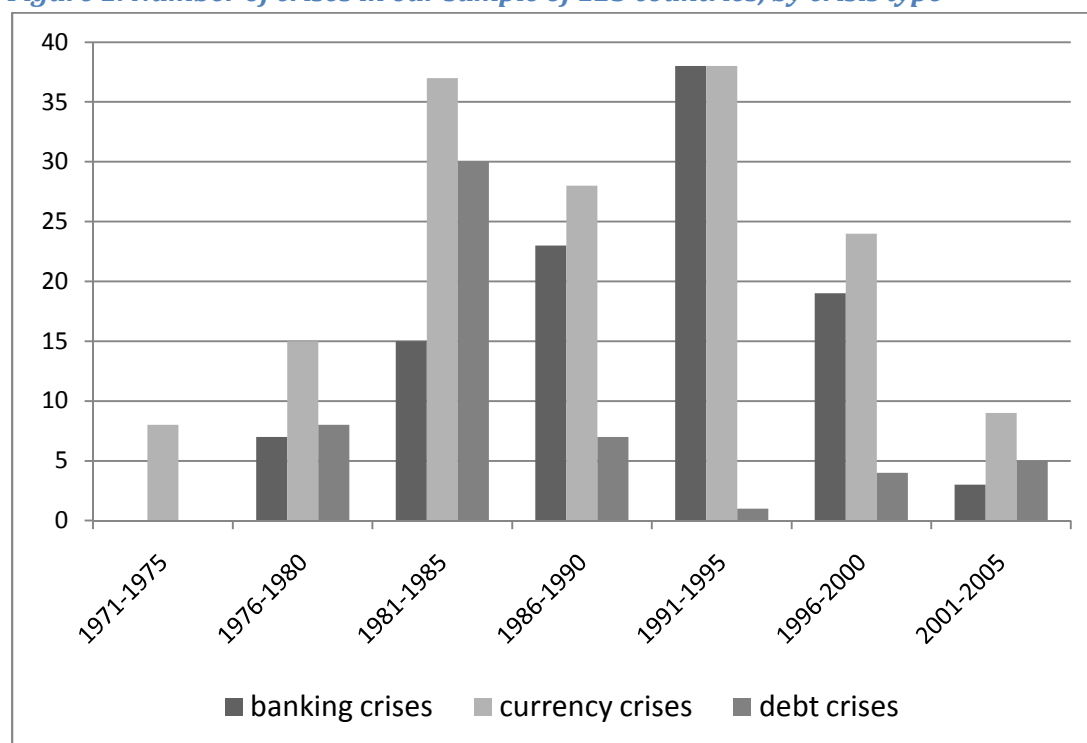


Figure 1 shows the number of country events by crisis type in a sample of 123 countries⁸ between 1971 and 2005. We divided the whole time span in 7 five-year periods. Occurrences were allocated to a five-year period according to the starting date of the crisis, as reported by *Laeven and Valencia (2008)*. The periods 1981-85 (Latin American Debt Crisis) and 1991-95 stand out with an extraordinary high number of events. Both at the beginning and at the end of the sample period the number of crises is comparably low. In total, we have 105 banking crises, 159 currency crises and 55 sovereign debt crises among a maximum of 861 observations.

In line with several other papers (*Pitlik and Wirth 2003, de Haan and Sturm 2003, Boockmann and Dreher 2003, Heinemann 2004, Pitlik 2007, Pitlik 2008, de Haan, Sturm, and Zandberg 2009*) we proxy market-orientation of economic policy by the Fraser Institute's Economic Freedom of the World-index (*efw index*) (*Gwartney and Lawson 2009*). The *efw*-index is a comprehensive measure for the overall degree of market-friendliness of a country's policies. It consists of five areas, reflecting policy liberalization in the fields of (i) government size, (ii) legal structure and security of property rights, (iii) monetary policy, (iv) international trade, and (v) regulations of credit, business, and labor. Data are derived from various sources, and in total the index comprises 42 distinct variables. The

⁷ *Laeven and Valencia (2009)* also provide information about policies of crisis containment and resolution for a subset of 42 systemic banking crises episodes in 37 countries.

⁸ Country sample size is restricted by availability of data for economic policy liberalization.

comprehensive index score is simply an unweighted average of scores in the five policy areas. The overall *efw*-index is normalized on a scale from 0 to 10, higher values reflecting more economic freedom.

Any increase of the *efw*-index can therefore be interpreted as overall economic policy liberalization, while a decrease of the index value is a setback of previous market-oriented reforms. In its most recent edition 2009, the index reflects economic policy liberalization in 2007 and covers 131 countries. Data are available in five year steps, starting with 53 countries in 1970. For more recent years since 2000, data are also available on an annual basis. In 2007, the most liberalized economies with an *efw*-index score higher than 8 points are Hong Kong, Singapore, Switzerland, New Zealand, Chile and Ireland. Least free countries are Myanmar and Zimbabwe with an *efw*-score of smaller than 4 points.

Figure 2: Simple average of economic freedom scores, 102 countries, 1970-2007

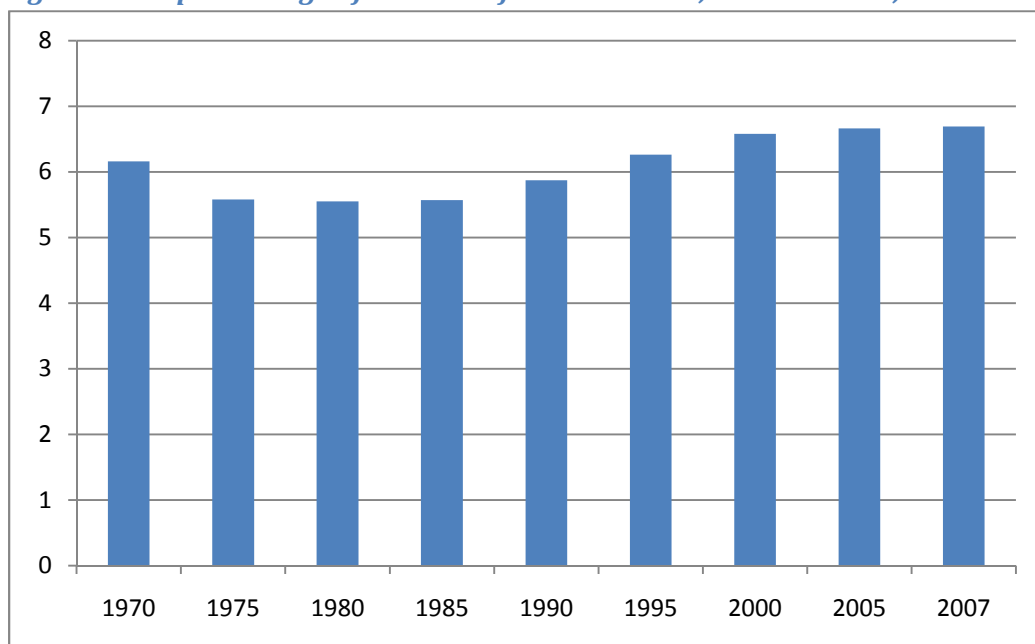


Figure 2 illustrates that in a sample of 102 countries, for which the respective data are available since 1980 at least, economic freedom on average increased from 5.6 (1980) to 6.7 (2007). Averages for 1970 and 1975 cannot be compared directly since the sample size in these years is only 53 and 70 countries.

How are economic growth performance, economic freedom and crisis types interrelated? Table 1 presents some stylized facts, showing the results of two-sample t-tests comparisons of simple averages. As could be expected, average GDP per capita growth⁹ is significantly lower if a crisis occurred in the respective five-year-period. In case of a banking crisis, contemporary GDP per capita growth had been lower by 1.7 percentage points, in case of a currency crisis by 2.4 percentage points and in case of a sovereign debt crisis by 2.9 percentage points as compared to no crisis cases. These results clearly support the view that all three types of crises are usually associated with significant

⁹ Data are from the Penn World Tables Version 6.3 (Heston, Summers, and Aten 2009)

output losses. All in all that's what the recent literature on financial crises tells us (*Haugh et al.* 2009, *Reinhart and Rogoff* 2009).¹⁰

Test results give some support to the hypothesis that the occurrence of a crisis is negatively related to the initial level of economic freedom. For all three different types of crisis the economic freedom score at the beginning of a crisis period is significantly lower than in the case of no crisis. The results hence suggest that liberalization reduces the likelihood of systemic crises.

Table 1: Crisis types, growth and economic liberalization: Simple means comparison

Type of crisis	No crisis (obs.)	Crisis (obs.)	Difference significant at 1%-level?
<i>Banking crisis</i>			
GDP per capita growth (t)	1.83 (696)	0.09 (100)	yes
<i>efw</i> index (t-1)	5.95 (563)	5.15 (92)	yes
Δ <i>efw</i> index (t+1)	0.20 (508)	0.48 (95)	yes
economically less free	0.26 (242)	0.65 (60)	yes
economically more free	0.15 (266)	0.20 (35)	no
<i>Currency crisis</i>			
GDP per capita growth (t)	2.07 (645)	-0.34 (151)	yes
<i>efw</i> index (t-1)	6.06 (518)	5.01 (137)	yes
Δ <i>efw</i> index (t+1)	0.17 (468)	0.52 (135)	yes
economically less free	0.21 (200)	0.60 (102)	yes
economically more free	0.14 (268)	0.29 (33)	no (yes at 5%)
<i>Debt crisis</i>			
GDP per capita growth (t)	1.81 (741)	-1.08 (55)	yes
<i>efw</i> index (t-1)	5.88 (610)	5.20 (45)	yes
Δ <i>efw</i> index (t+1)	0.25 (556)	0.20 (47)	no
economically less free	0.36 (264)	0.18 (38)	no
economically more free	0.15 (292)	0.24 (9)	no

Note: (t) denotes contemporary five-year period, (t-1) and (t+1) denote previous or subsequent five year period.

The relation between crises and economic reform, as measured by a change of the *efw*-index (Δ *efw*) over the subsequent five-year period (i.e., following the crisis period) is not always in line with conventional wisdom. Following a banking crisis, the *efw*-score increased on average by almost +0.5 points, while absent a banking crisis, average increase is only +0.2 points. Both size and direction of crisis effects are almost identical in the case of currency crises. During the period which follows a currency crisis, countries on average increase economic freedom by +0.52 score points, while without a currency crisis the *efw*-index goes up by only +0.17 points. These stylized facts clearly support the view that crises support economic policy liberalization. Following a debt crisis, however, our simple t-tests find no significant difference in subsequent economic reforms between crisis and no-crisis cases. On the contrary, the average increase of the *efw*-score following a crisis period is even slightly smaller (+0.25) than in the case of no crisis (+0.2).

¹⁰ Financial crises also appear to reduce the long-term growth of output. *Cerra and Saxena* (2008) find that economic contractions during financial crises are normally not counterbalanced by fast recoveries.

To get a first impression on possible state-dependent policy responses on financial crises, we split the sample into two sub-samples of (almost) identical size according to the initial level of economic freedom. "Less free" countries have an initial *efw*-index score smaller than 5.72, for "more free" countries the lagged *efw*-score is higher. As can be seen from Table 1, for all three types of crises in the free country sample crisis-affected countries tend to liberalize stronger than non-affected countries, but the difference is never statistically significant. Yet, this might also be due to the generally small number of crisis events for more liberalized countries. With respect to the sample of less free countries occurrence of a banking crisis and of a currency crisis leads to strong responses in the direction of more economic freedom as compared to the no-crisis group. In both cases, the difference is higher than +0.4 score-points of the *efw*-index. Again, debt crises are different. Following a debt crisis, the average increase of the *efw*-score in the sample of economically less free country-observations is +0.18, while in less free countries that were not affected by a debt crisis the *efw*-index rose on average by +0.36 points. The difference, however, is not statistically significant.

Summing up so far, descriptive statistics support the view that

- all types of crises are less likely in an economically free environment,
- banking crises and currency crises seem to lead to market-oriented policy reforms,
- sovereign debt crises are not associated with reforms,
- the effects of crises on economic policy liberalization are much stronger in countries with a less economically free institutional environment

These simple tests, of course, are not sufficient as a number of further factors might have an influence on economic policy liberalization. Econometric tests are subject of the next section.

4 Empirical investigation

4.1 Econometric specification

In Tables 2-4 we present the results of an empirical analysis for banking crises, currency crises and debt crises separately. The panel dataset consists of 114 countries and 591 country-period (year) observations. The econometric specification that is estimated is of the following general form

$$(1) \text{efw}_{i,t} = \varphi \cdot \text{efw}_{i,t-1} + \alpha \cdot \text{crisis}_{i,t-1} + \beta \cdot \text{pol}_{i,t-1} + \gamma \cdot \text{gdp}_{i,t-1} + \theta_t + \mu_i + \varepsilon_{i,t}$$

where *efw* is the economic freedom score, *crisis* is an indicator variable for a crisis event in the respective time period, *pol* is the Freedom House Political Freedom indicator (re-scaled to a 0 to 10 scale, higher values showing more political freedom¹¹), and *gdp* is per capita GDP (in logs). In the equations we (usually) also include period dummies θ , and fixed country effects μ to account for unobserved heterogeneity in the time and in the cross-section dimension.¹² All explanatory variables are lagged one period. The lagged dependent variable enters to account for catching up in economic policy reform and for policy persistence effects.

To this standard equation we add an interaction term of crisis event and economic freedom score:

¹¹ Note that we only use the political freedom index and not the civil liberties index, which (partly) measures the same as the property rights-sub-index of the economic freedom index.

¹² Breusch and Pagan Lagrangian multiplier tests as well as Hausman tests reject the random effects in favor of a fixed effects model.

$$(2) \text{efw}_{i,t} = \varphi \cdot \text{efw}_{i,t-1} + \alpha \cdot \text{crisis}_{i,t-1} + \beta \cdot \text{pol}_{i,t-1} + \gamma \cdot \text{gdp}_{i,t-1} + \delta \cdot (\text{efw}_{i,t-1} \cdot \text{crisis}_{i,t-1}) + \theta_t + \mu_i + \varepsilon_{i,t}$$

The coefficient δ of the interaction variable shows possible state-dependent effects of crisis events. The total effect of crises on reform activity in the subsequent period is then given by

$$(3) \frac{\partial \text{efw}_{i,t}}{\partial \text{crisis}_{i,t-1}} = \alpha + \delta \cdot \text{efw}_{i,t-1}.$$

According to the conventional "crises trigger market-oriented reforms"-hypothesis, we would expect $\alpha > 0$. State dependency of the political crisis response suggests that $\delta < 0$, i.e., the higher the initial degree of economic freedom, the higher is the probability that governments respond to a crisis with a more restrictive economic policy course.

Finally, we also estimate a further revised version, which is based on *Pitlik* (2008)

$$(4) \text{efw}_{i,t} = \varphi \cdot \text{efw}_{i,t-1} + \alpha \cdot \text{crisis}_{i,t-1} + \beta \cdot \text{pol}_{i,t-1} + \gamma \cdot \text{gdp}_{i,t-1} + \delta \cdot (\text{pol}_{i,t-1} \cdot \text{crisis}_{i,t-1}) + \theta_t + \mu_i + \varepsilon_{i,t}$$

to test for possible non-linearity in the policy response of democratic or autocratic regimes.

In a first step, the models are estimated with a simple Fixed Effects ("within") estimator as in *de Haan et al.* (2009). The use of country fixed effects in a dynamic model specification however carries with it a problem. In a model that includes a lagged dependent variable on the RHS of the estimation equation and which has only a limited length of the time series, an ordinary least-square dummy variable (LSDV) estimator can be seriously biased (*Nickell* 1981).

In order to address these and further possible endogeneity problems, we therefore make use of the System GMM-estimator by *Blundell and Bond* (1998). All explanatory variables are treated as endogenous. To keep the number of instruments smaller than the number of observations in the cross section, we restricted the number of lags for instrument to 2.

4.2 Impact of banking crises

Table 2 reports results for a first set of regressions of the impact of banking crises on policy reform. In equation (1) we do not account for time fixed effects. The banking crisis variable is positive and significant at the 1%-level, showing that in case of a banking crisis economic freedom in the subsequent period increases by +0.2 points. This is almost an exact replication of the findings of *de Haan, Strum, and Zandberg* (2009).

Yet, exclusion of time dummies renders these estimates to be somewhat problematic, as the crisis variable may reflect effects of a common (unknown) time-dependent factor. As we have seen in figure 1, there had been periods with a significantly higher number of banking crises. If these accidentally coincide with more reform activity in the following period, the effect of crises are over-estimated. Adding time period dummies in equation (2) increases the adjusted R-squared by almost 10 percentage points and leaves the banking crisis dummy still positive, but the coefficient is now only +0.07 and insignificant. The time dummies are always jointly significant at the 5% level. We therefore include them throughout all following equations.

When we add the interaction term of banking crisis and initial economic freedom in equation (3), the banking crisis variable becomes positive and significant again, and the interaction term is negative and significant close to the 5% level. This suggests that banking crises lead to an increase of economic freedom in the subsequent period up to an initial level of the *efw*-index of approximately 5.8; at a higher level of economic policy liberalization, countries appear to respond with more restrictive policies and with a reduction of economic freedom. This clearly supports a state-dependent crisis hypothesis, i.e. policy responses on banking crises depend on initial policy formation.

Table 2: Banking crises and market-oriented reform

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	within	within	within	within	System GMM	System GMM	System GMM
<i>efw</i> -index (t-1)	0.64	0.45	0.47	0.45	0.68	0.72	0.69
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Banking crisis (t-1)	0.22	0.07	0.76	-0.01	0.11	0.90	0.15
	(0.003)	(0.296)	(0.040)	(0.937)	(0.171)	(0.036)	(0.364)
Log GDP per cap. (t-1)	-0.19	-0.55	-0.54	-0.54	0.06	0.05	0.04
	(0.177)	(0.000)	(0.000)	(0.000)	(0.495)	(0.531)	(0.591)
Political Freedom (t-1)	0.08	0.05	0.05	0.04	0.09	0.08	0.08
	(0.000)	(0.002)	(0.003)	(0.002)	(0.000)	(0.000)	(0.000)
(<i>efw</i> *Banking crisis) (t-1)			-0.13			-0.14	
			(0.053)			(0.059)	
(Political freedom* Banking crisis) (t-1)				0.02			-0.01
				(0.452)			(0.637)
Observations	591	591	591	591	591	591	591
Number of coid	114	114	114	114	114	114	114
R-squared	0.491	0.592	0.597	0.600			
R2 (adj.)	0.488	0.586	0.590	0.593			
No. instruments					64	76	76
Hansen-Test (p-value)					0.087	0.121	0.117
AR2-test					0.223	0.370	0.225
Time dummies	No	Yes	Yes	Yes	Yes	Yes	Yes

Equations (1) – (4) estimated by Fixed Effects "within" estimator. Equations (5) – (8) estimated by Blundell and Bond (1998) System-GMM estimator. Robust p-values in parentheses. Coefficients for fixed country effects, time dummies and constant not reported.

To deal with the problem of endogeneity we re-estimated equations (2) – (4) using a System-GMM estimator. The increased coefficient of the lagged dependent variable in equations (5) to (7) shows that the Nickell bias might indeed be non-negligible.

In principle, the previous findings for state-dependent policy reactions to banking crises are nevertheless confirmed. In equation (5) where interaction effects are not accounted for, the banking crisis coefficient is positive but not statistically different from zero. The crisis dummy becomes significant when combined with interaction effects of crisis and initial policy liberalization level. Calculating the theoretical turning point, we should expect negative effects on market-oriented policy reforms when the initial *efw*-index is above 6.4 score points.

(The log of) GDP per capita is negatively related to economic policy liberalization in the within-estimates, but loses significance in the System-GMM estimates. As regressions (1) – (4) only reflect within variation and not cross-country variation, this should be interpreted that a reduced GDP growth rate (Δgdp) is associated with more economic policy reform in the subsequent period. However, we do not find any difference between rich and poor countries in the cross-section.

A stable effect on political freedom on economic freedom can also be found in all estimates. On average, an increase of the political freedom-index score of 5 points – which is approximately the difference between the U.S. and Colombia – increases the economic freedom index by 0.3 – 0.8 points. A state-dependency of policy responses cannot be found for the interaction of crisis dummy and political freedom (equations (4) and (7)). While political rights seem to have a consistently positive impact on the state of market-oriented policy reforms, democracies do not appear to react differently to crises as compared to less democratic regimes. This contradicts findings in *Pitlik* (2008), where democracies responded to growth crises with stronger policy liberalization than autocratic regimes.

4.3 Impact of currency crises

Estimates for the impact of currency crises are reported in table 3. In total, we observe 133 currency crisis cases in the sample, of which 39 occurred in countries with a (lagged) *efw*-index score > 5.7. While the control variables (GDP per capita and political freedom) perform as expected, we cannot find any positive or negative impact of currency crises on the liberalization of economic policy, neither in the simple within-estimates nor in the System-GMM-estimates. Only in equation (1), where no time period effects are included, the crisis dummy shows a positive sign that is statistically different from zero. This is even more surprising as the descriptive statistics showed a clear currency crisis effect that also appeared to be state-dependent.

Table 3: Currency crises and market-oriented reform

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	within	within	within	within	System GMM	System GMM	System GMM
<i>efw</i> -index (t-1)	0.68	0.45	0.44	0.45	0.71	0.68	0.72
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
currency crisis (t-1)	0.22	0.02	-0.20	-0.03	0.05	-0.09	0.10
	(0.003)	(0.739)	(0.510)	(0.869)	(0.538)	(0.804)	(0.553)
Log GDP per cap. (t-1)	-0.18	-0.55	-0.54	-0.55	0.04	0.07	0.05
	(0.182)	(0.000)	(0.000)	(0.000)	(0.594)	(0.349)	(0.506)
Political Freedom (t-1)	0.07	0.04	0.05	0.04	0.08	0.08	0.06
	(0.000)	(0.003)	(0.003)	(0.006)	(0.000)	(0.000)	(0.000)
(<i>efw</i> *currency crisis) (t-1)			0.04			0.02	
			(0.415)			(0.707)	
(Political freedom* currency crisis) (t-1)				0.01			-0.01
				(0.706)			(0.755)
Observations	591	591	591	591	591	591	591
Number of coid	114	114	114	114	114	114	114
R-squared	0.491	0.591	0.591	0.591			
R2 (adj.)	0.487	0.584	0.584	0.584			
No. instruments					66	80	80
Hansen-Test (p-value)					0.132	0.116	0.135
AR2-test					0.186	0.178	0.199

Time dummies	No	Yes	Yes	Yes	Yes	Yes	Yes
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Equations (1) – (4) estimated by Fixed Effects "within" estimator. Equations (5) – (8) estimated by Blundell and Bond (1998) System-GMM estimator. Robust p-values in parentheses. Coefficients for fixed country effects, time dummies and constant not reported.

How could this be explained? The definition of a currency crisis is related to a strong nominal depreciation of the local currency. We might therefore speculate that at least in some cases the lack of an empirical link between currency crises and economic policy reform is caused by an attempt to restore (or enhance) international competitiveness through a devaluation policy instead of a fundamental policy change, as measured by an increase or a decrease of the *efw*-index score.

4.4 Impact of debt crises

Finally, the estimation results for the impact of debt crises can be seen in table 4. A first, theoretically unexpected result is that the coefficient of the debt crisis dummy variable is negative throughout all regressions. It is statistically significant at the 10%-level in 4 out of 7 cases. The negative sign implies that following a debt crisis, governments tend to reduce economic freedom in the subsequent period, which stands in stark contrast to conventional thinking about crises and reform. However, this result corresponds with our simple descriptive statistics in table 1.

Table 4: Debt crises and market-oriented reform

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	within	within	within	within	System GMM	System GMM	System GMM
<i>efw</i> -index (t-1)	0.62	0.44	0.43	0.44	0.65	0.60	0.66
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
debt crisis (t-1)	-0.23	-0.21	-1.04	-0.24	-0.21	-1.71	-0.21
	(0.066)	(0.051)	(0.183)	(0.221)	(0.059)	(0.024)	(0.305)
Log GDP per cap. (t-1)	-0.15	-0.53	-0.51	-0.53	0.07	0.12	0.08
	(0.283)	(0.000)	(0.000)	(0.000)	(0.403)	(0.117)	(0.325)
Political Freedom (t-1)	0.08	0.04	0.04	0.04	0.08	0.08	0.06
	(0.000)	(0.002)	(0.002)	(0.004)	(0.000)	(0.000)	(0.001)
(<i>efw</i> *debt crisis) (t-1)			0.17			0.30	
			(0.248)			(0.033)	
(Political freedom* debt crisis) (t-1)				0.01			-0.00
				(0.869)			(0.926)
Observations	591	591	591	591	591	591	591
Number of coid	114	114	114	114	114	114	114
R-squared	0.485	0.596	0.599	0.596			
R2 (adj.)	0.482	0.590	0.592	0.591			
No. instruments					64	75	75
Hansen-Test (p-value)					0.073	0.059	0.157
AR2-test					0.335	0.490	0.361
Time dummies	No	Yes	Yes	Yes	Yes	Yes	Yes

Equations (1) – (4) estimated by Fixed Effects "within" estimator. Equations (5) – (8) estimated by Blundell and Bond (1998) System-GMM estimator. Robust p-values in parentheses. Coefficients for fixed country effects, time dummies and constant not reported.

Our estimates also point to a state-dependent policy response, at least the System GMM regressions. In the debt crisis case, the effect is yet turned on its head: Countries that already have a high level of economic freedom tend to respond to a debt crisis with a liberalization of economic policies, while countries with an initially low level appear to restrict economic freedom even further as a response

to a debt crisis. The theoretical turning point of the direction of policy responses is an *efw*-level of 5.7. An important caveat applies, as the number of country cases of debt crisis events with an initial level of economic freedom above 5.7 is limited to only 9 (out of 591) in our sample. The total number of debt crisis events in the estimation sample is 47.

Allowedly, these results are somewhat surprising. Especially the major debt crisis in Latin America during the 1980s is frequently said to have triggered a rush to economic policy liberalization (*Lora and Olivera 2003*). In fact, Argentina, Brazil, Chile and Mexico responded to the debt crisis with significant market-oriented policy reforms. These prominent cases of reform yet seem to cover other cases where previous policy reforms had been reversed as a response to a crisis.

4.5 Sensitivity tests

The results we obtained so far are more puzzling than enlightening. Banking crises appear to foster economic freedom, but only up to a medium level of initial policy liberalization. Currency crises do not seem to have any impact at all, while following a debt crisis, government responses seem to be dominated by increasing restrictions on economic freedom when the initial liberalization level is low.

In table 5 we checked whether these results hold when we split our total sample into two distinct sub-sample of equal size, according to the initial level of economic freedom. The splitting point is an *efw*-index score of 5.72, while observations with a score < 5.72 are labeled as "not free". The estimation method is again System-GMM.

Table 5: Estimates with split samples

	(1)	(1a)	(2)	(2a)	(3)	(3a)
	not free	free	not free	free	not free	free
<i>efw</i> -index (t-1)	0.65	0.37	0.66	0.40	0.63	0.40
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Banking crisis (t-1)	0.19	-0.06				
	(0.043)	(0.638)				
Currency crisis (t-1)			0.11	-0.09		
			(0.254)	(0.369)		
Debt crisis (t-1)					-0.29	-0.10
					(0.021)	(0.575)
Log GDP per cap. (t-1)	0.24	0.09	0.23	0.09	0.23	0.09
	(0.015)	(0.305)	(0.023)	(0.282)	(0.044)	(0.259)
Political Freedom (t-1)	0.09	0.06	0.06	0.05	0.07	0.04
	(0.001)	(0.058)	(0.005)	(0.083)	(0.000)	(0.093)
Observations	296	295	296	295	296	295
Number of coid	89	91	89	91	89	91
No. instruments	64	64	66	65	64	60
Hansen-Test	0.191	0.347	0.128	0.318	0.231	0.286
AR2-test	0.119	0.837	0.079	0.694	0.302	0.818
Time dummies	yes	yes	yes	yes	yes	yes

Estimated by Blundell and Bond (1998) System-GMM estimator. Robust p-values in parentheses. Coefficients for fixed country effects, time dummies and constant not reported.

In general, the tests confirm our previous results. In the sample of initially "not free" countries, banking crises tend to be followed by economic policy liberalization (equation (1)). Currency crises are not related to policy reforms (equation (2)) and sovereign debt crises are related to a decline of economic freedom in the subsequent period (equation (3)). We also find a positive impact of GDP per capita and political liberty on economic freedom in this sub-sample.

In the sample of above-average economic freedom observations ("free"), the crisis dummy variables always show a negative sign, but the effects are statistically not different from zero (see equations (1a), (2a), (3a)). Differences in GDP per capital are also not related to differences in economic freedom. Only an increase of political freedom is still (weakly) related to policy liberalization in this sample.

These estimates suggest that the results might somehow be driven by industrialized countries. In table 6 we re-estimated the models for a sample where 23 high-income OECD countries are omitted. This only slightly reduces the number of banking and currency crises in the estimation sample, as until currently high-income OECD countries hardly ever were affected by such crises. Some notable exceptions are the Nordic Banking Crises in Sweden, Norway and Finland during the early 1990s. Sovereign debt crises cases did not occur at all.

Table 6: Estimates excluding high-income OECD countries

	(1)	(2)	(3)
	no high income oecd	no high income oecd	no high income oecd
efw-index (t-1)	0.69	0.72	0.66
	(0.000)	(0.000)	(0.000)
Banking crisis (t-1)	0.13		
	(0.115)		
Currency crisis (t-1)		0.06	
		(0.404)	
Debt crisis (t-1)			-0.16
			(0.141)
Log GDP per cap. (t-1)	0.10	0.09	0.13
	(0.254)	(0.305)	(0.124)
Political Freedom (t-1)	0.07	0.06	0.07
	(0.000)	(0.001)	(0.000)
Observations	453	453	453
Number of coid	91	91	91
No. instruments	64	66	64
Hansen-Test	0.299	0.272	0.232
AR2-test	0.215	0.172	0.283
Robust p values in parentheses			

Estimated by Blundell and Bond (1998) System-GMM estimator. Robust p-values in parentheses. Coefficients for fixed country effects, time dummies and constant not reported.

Table 6 confirms our results in principle. Note, however, that none of the crisis dummies is now statistically significant at a conventional level. While the banking crisis dummy is negatively related to economic policy liberalization (p-value = 0.115), the currency crisis and debt crisis variables are not statistically related to reforms.

5 Summary and some concluding remarks

The paper investigates empirically the role of banking crises, currency crises and sovereign debt crises on economic policy liberalization since the 1970s, using the Economic Freedom of the World-index of the Fraser Institute and a recently published IMF database on financial crises. In particular, we tested if policy responses to crises are "state dependent", i.e., if the level of market-orientation of

economic policies in the status quo does affect the direction and the intensity of medium to long run policy changes.

Results of our empirical tests suggest that banking crises enhance market-oriented reforms if crises occur in a less liberalized environment. If banking crises take place in an economically free institutional environment, a setback of market-friendly reforms is more likely. While we do not find any impact of currency crises on economic policy liberalization, sovereign debt crises appear to be negatively related to market-friendly reforms in the subsequent period. There is some evidence for state-dependent policy responses to debt crises, but the effects should not be overstated due to a very limited number of debt crisis events in countries with an already high level of economic liberalization.

In this respect, the results of our empirical investigations leave more than just a few questions open. Why are the effects of sovereign debt crises so different from the effects of banking crises? And why is there no clear pattern observable for currency crises? As Allan *Drazen* (2009) recently put forward, existing models of crisis and reform should be modified to better explain real world behavior of governments.

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