THE CONSEQUENCES OF BANKING CRISES FOR PUBLIC DEBT

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The aim of this paper is to assess the consequences of banking crises for public debt. Using an unbalanced panel of 154 countries from 1980 to 2006, the paper shows that banking crises are associated with a significant and long-lasting increase in government debt. The effect is a function of the severity of the crisis. In particular, we find that for severe crises, comparable to the most recent one in terms of output losses, banking crises are followed by a medium-term increase of about 37 percentage points in the government gross debt-to-GDP ratio. We also find that the debt ratio increased more in countries with a worse initial fiscal position (in terms of the gross debt-to-GDP ratio) and with a higher share of foreign debt.

1   Introduction

Financial crises are not only typically associated with sharp economic downturns,[1] but also with a substantial deterioration of fiscal positions. Declining revenues due to weaker economic conditions, higher expenditures associated with bailout costs and demand stimuli have historically led to a rapid deterioration of fiscal balances and increase of public debt.[2]

Analysing a panel of developed and developing economies, Reinhart and Rogoff (2009) estimate that in the 3 years after the occurrence of a banking crisis the real value of government debt rose on average by 86 per cent. However, arguably measuring the change in debt this way can be misleading because it depends on the initial level of the debt. Alternatively, if the rise in debt is measured in terms of the change in the ratio of debt to GDP, the figures becomes considerably smaller; using similar episodes to those chosen by Reinhart and Rogoff (2009), but focusing on the percentage point increase of the debt-to-GDP ratio, the historical average cumulative increase in the debt-GDP ratio 3 years after the occurrence of banking crises is about 9 percentage points of GDP (Figure 1). The effect varies considerably across the episodes presented in the figure, ranging from an almost insignificant increase in the case of Thailand in 1997 to an increase of more than 35 percentage points for Finland in 1991. In addition, countries differ not only in terms of the magnitude of the impact in the 3 years following the crisis, but also in terms of the dynamic of the response and in terms of medium-term effects. For example, three years after financial crises in Japan and Finland the effect on debt is very similar, however the medium-term evolution beyond three years is very different (Figure 2).

The current financial crisis is exceptional not only for its severity and its synchronicity across countries, but also for the policy response: monetary policy rates have been slashed, central

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[1]   See, for example, Aziz *et al.* (2000); Barro (2001); Hutchinson and Ilan (2005); Boyd *et al.* (2005); Cerra and Saxena (2008); Furceri and Mourougane (2009a, b); and Furceri and Zdzienicka (2010a, b).

[2]   See, for example, Caprio and Klingebiel (1997); Honohan and Klingebiel (2000); Laeven and Valencia (2008a); Reinhart and Rogoff (2008); Furceri and Mourougane (2009a); and OECD (2009).

bank balance sheets expanded, and most governments have taken expansive fiscal measures to counter the economic downturn. For many countries debt levels are projected to increase substantially. For example, in OECD countries (Figure 3) gross government debt-to-GDP ratios are projected to increase by more than 20 percentage points by 2011, and in some cases (Iceland, Ireland, Japan, and the United Kingdom) by more than 30 percentage points (OECD, 2010). Focusing on a longer time horizon (Figure 4), debt levels may increase even more (OECD, 2010). Based on the assumption that government consolidation measures are only gradual but sufficient to stabilise debt-to-GDP ratios over the long term, debt-GDP ratios may still increase by about 30 percentage points by 2025 compared to pre-crisis level, with the largest increase being projected for Ireland (about 100 percentage points) and the United Kingdom (about 80 percentage points).[3]

   In the context of the aftermath of the recent financial crisis this paper considers past historical episodes to

**Cumulative Increase in the Debt-to-GDP Ratio
in the Three Years Following the Banking Crises**
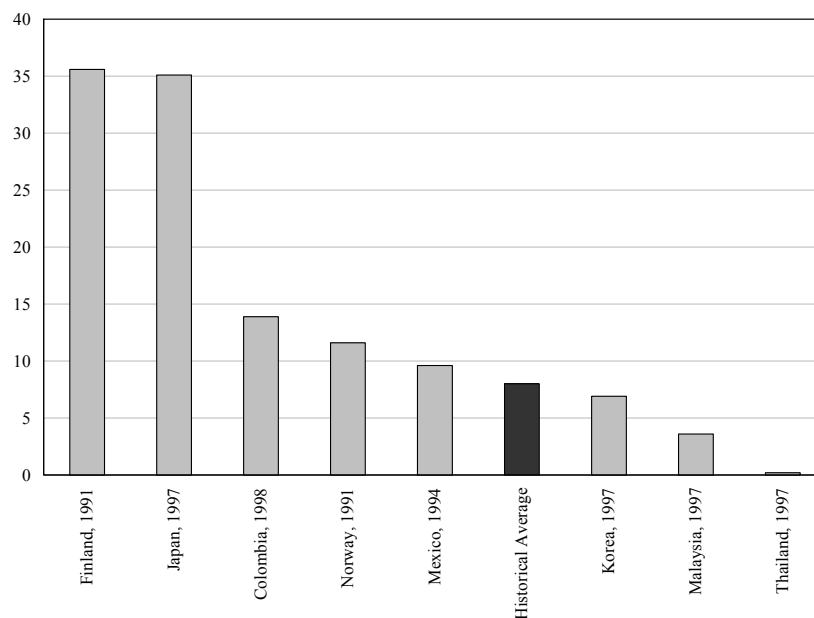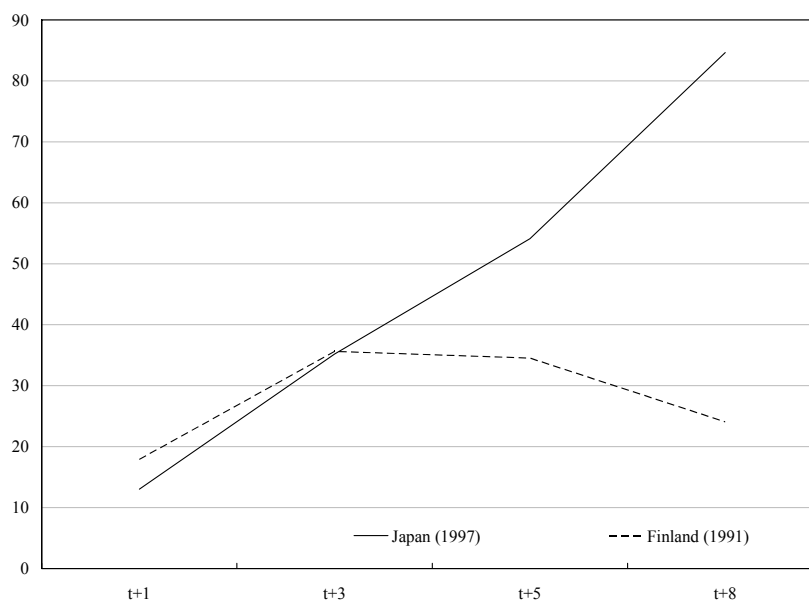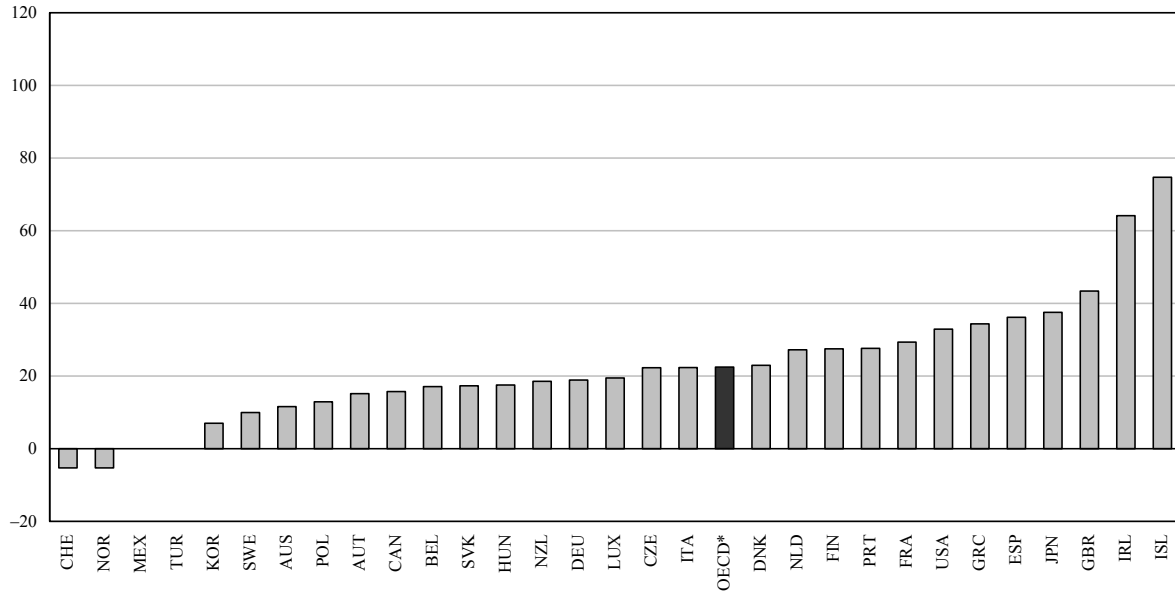*(percent of GDP)*

**Evolution of the Debt-to-GDP Ratio
Following Banking Crises in Finland and Japan**
(percent of GDP)

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[3]   In particular, it is assumed that the underlying primary fiscal balance improves by ½ per cent of GDP until it is sufficient to ensure that the debt-to-GDP ratio is stable. See, Chapter 4 of OECD's *Economic Outlook 87* (2010) for more details.

Figure 3

Projected Increase in the Government Debt-to-GDP ratio, 2007-11
(percent of GDP)

Source: OECD (2010), *Economic Outlook 87 Database*.
Note: * unweighted average of OECD countries excluding Mexico and Turkey.

Figure 4

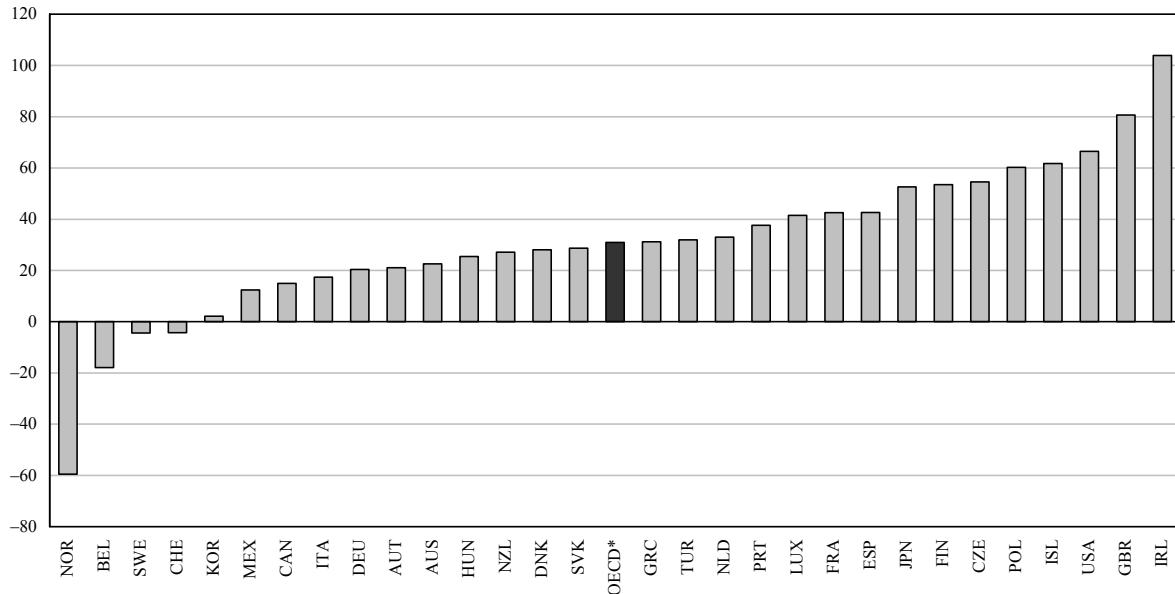**Projected Increase in the Government Debt-to-GDP Ratio, 2008-25**
(percent of GDP)

Source: OECD (2010), *Economic Outlook 87 Database*.
Note: * unweighted average of OECD countries excluding Mexico and Turkey. Projections are based on the assumption that government debt-to-GDP will stabilize by 2025 as a result of gradual consolidation measures. See the OECD's *Economic Outlook 87* (2010) for more details.

examine what has happened to public debt over the medium and long term, The paper provides estimates of the dynamic impact that banking crises episodes have typically had on the gross debt-to-GDP ratio, and of the role that structural and policy variables have had in shaping this response. The analysis complements previous work analysing the fiscal costs associated with banking crises in several respects by:

- focusing on gross public debt as a dependent variable. Several papers in the literature have instead focused on trying to estimate only the bailout costs associated with banking crises.[4] However, there are two main problems with this approach. First, estimates of fiscal bailouts depend markedly on the methodology used. As a result, the difference in the estimates across studies focusing on the same episodes is large (Frydl, 1999 and Vale, 2006). Second, bailout costs are only a part of the fiscal cost associated with banking crises. In fact, the fiscal consequences of banking crises also result from the reduced revenues associated with output losses, the increase in spending due to automatic stabilisers and from discretionary increases in the public deficit;

- the focus is on the debt-to-GDP ratio rather than the percentage change in debt levels. This is important for two reasons. First, the debt-to-GDP ratio is a better measure to assess fiscal sustainability. Second, analysing the percentage increase of debt levels in the aftermath of banking crises could lead to possible mis-interpretations since the percentage increase crucially depends on the initial level of the debt before the occurrence of the crisis. For example, consider two crises episodes: Sweden (1991) and Colombia (1998). Following Reinhart and Rogoff (2009), the increase in the gross public debt in the three years following the banking crisis as in Colombia implies that public debt increased by about 175 per cent, while in Sweden it increased by about 60 per cent. However, when the percentage point increase in the debt-to-GDP ratio is considered, as in Figure 1, the result leads to a spectacular reversal of this ranking: fiscal positions deteriorated significantly more in Sweden (27 percentage points of GDP) than in Colombia (13 percentage points of GDP);

- presenting inferential empirical evidence on the increase of the debt-to-GDP ratio in the aftermath of banking crises. The only work, to our knowledge, that tries to assess the increase in public debt (not as ratio to GDP, as discussed previously) is Reinhart and Rogoff (2009). However, in their paper, the authors present only descriptive evidence of the increase in the gross government debt 3 years after the occurrence of banking crises, without controlling for countries characteristics and other factors that could explain the increase in public debt in the short term and different responses across countries;

- estimating the effect of banking crises on the debt-to-GDP ratio both in the short and in the long-run,[5] in particular to assess whether fiscal costs associated with the crises have been permanent or if they have tended to dissipate in the long term;

- analysing the heterogeneity of responses among different countries and episodes.

Using an unbalanced panel of 154 countries from 1970 to 2006, the main findings of the paper is to show that banking crises are associated with a significant and long-lasting increase in the government debt-to-GDP ratio. The magnitude of effect is a function of the severity of the crisis. In particular, we find that for severe crises, comparable to the most recent one in terms of output loss, banking crises are on average followed by a medium-term increase of about 37 percentage points in the government gross debt-to-GDP ratio. We also find that larger increases in debt tended to occur in those countries with the worse initial fiscal positions (in terms of gross debt-to-GDP ratio) and with the highest share of foreign public debt.

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[4]   See, among others, Caprio *et al.* (2005) and Sanhueza (2001).

[5]   Previous works generally focus on a time horizon of 3 years.

The rest of the paper is organised as follows: the next section describes the data and the empirical methodology used to examine the effects of a financial crisis on debt; Section 3 describes the results; and finally, Section 4 concludes with the main findings.

2   Data and empirical methodology

2.1   Data

Data for real gross debt-to-GDP ratio are taken from the IMF's *World Economic Outlook* (2009). Data for the share of gross foreign public debt over total public debt are taken from Panizza (2008), where public foreign debt is defined as issued in foreign countries and under the jurisdiction of a foreign court. Data for banking crises episodes are taken from Laeven and Valencia (2008a). In the latter paper the authors provide detailed information on the starting date of several banking, currency and debt crises. The dataset is constructed by combining quantitative indicators measuring banking sector distress, such as a sharp increase in non-performing loans and bank runs, with a subjective assessment of the situation. In particular, the database extends and builds on the database of Caprio *et al.* (2005) and covers the universe of systemic banking crises (124 episodes) for the period 1970-2007.[6]

2.2   Empirical methodology

In order to estimate the dynamic impact of banking crises episodes on the debt-to-GDP ratio the paper follows the approach proposed by Jorda (2005) and Teulings and Zubanov (2009) which consists of estimating impulse response functions (IRFs) directly from local projections. In detail, for each future period k the following equation has been estimated on annual data:

$$b_{i,t+k} - b_{i,t} = a_i^k + \sum_{j=1}^{l} \gamma_j^k \, \Delta b_{i,t-j} + \beta_k \, D_{i,t} + \varepsilon_{i,t}^k \qquad (1)$$

with $k = 1,..8$. Where b indicates the government gross debt-to-GDP ratio, D is a dummy that takes the value equal to 1 in the occurrence of a banking crisis and zero otherwise, α_i represent country fixed effects, γ_j captures the persistence in changes of the debt ratio, and β_k measures the impact of banking crises on the change of the debt ratio for each future period k. The number of lags (l) has been tested, and the results suggest that inclusion of two lags produce the best specification.[7] Correction for heteroskedasticity, when appropriate, are applied using White robust standard errors, while the problem of autocorrelation in the errors is addressed using two lags of the explanatory variable as regressors.[8] Impulse response functions (IRFs) are then obtained by plotting the estimated coefficients β_k for $k = 1,..8$.

An alternative way of estimating the dynamic impact of banking crises on output is to estimate an ARDL equation of debt-to-GDP ratio and crises dummies and to compute IRFs from the estimated coefficients.[9] However, the IRFs derived using this approach are sensitive to the choice of the number of lags, and the inclusion of interaction terms in the equation often leads to problems of multicollinearity, thus making the IRFs unstable. In addition, the significance of

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[6]   See Tables 1 and 2 for a detailed description of crises episodes.

[7]   The results are extremely robust to the number of lags included in the specification.

[8]   Tests for autocorrelation of the residuals have been carried out and have rejected the hypothesis of serial correlation.

[9]   This approach was initially proposed by Romer and Romer (1989) and then recently applied by Cerra and Saxena (2008); Furceri and Mourougane (2009a, 2009b); and Furceri and Zdzienicka (2010b) to assess the impact of financial crises on economic activity.

long-lasting effects on the debt ratio with ARDL models can be simply driven by the use of one-type shock models (Cai and Den Haan, 2009).

Figure 5

The Effect of Banking Crises on the Debt-to-GDP Ratio
(percent of GDP)

In contrast, the approach used in this paper does not suffer from these problems because the lags of the change in the debt ratio enter only as control variables and are not used to derive the IRFs. Finally, the confidence bands associated with the estimated IRFs are easily computed using the standard deviations of the estimated coefficients β_k, and Monte Carlo simulations are not required.

The central scenario is surrounded by the intervals that reflect the uncertainty in the demography, the labour market, the benefit ratio and the business cycle.
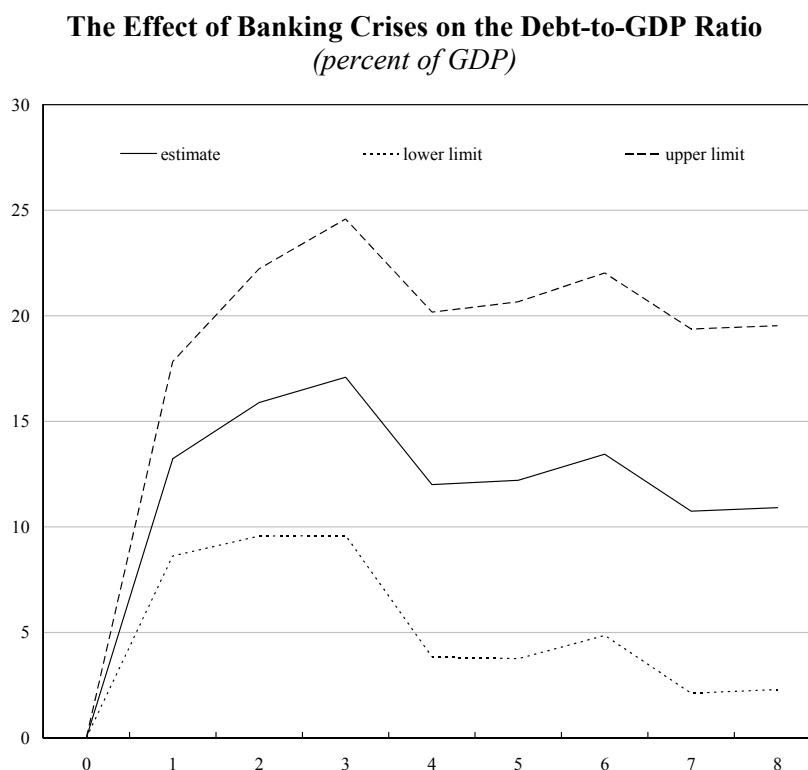Source: INE, Ministerio de Trabajo y Asuntos Sociales and own elaboration.

3   Results

3.1   Baseline

The impact of banking crises on the gross government debt-to-GDP ratio is estimated as described in equation (1). The results for each period *k* are displayed in Figure 5, together with the associated confidence bands.[10] Looking at the figure it is immediately apparent that banking crises are associated with a significant and long-lasting increase in public debt. In particular, banking crises have typically increased the government gross debt-to-GDP ratio by about 12 percentage points in the short term (1 year after the occurrence of the crisis), and by about 10 percentage points in the medium term (8 years after). In addition, we find that the largest increase in the debt ratio (17 percentage points) has typically occurred around 3 years following the occurrence of a banking crisis.

To check for the robustness of the results, equation (1) is re-estimated by alternatively including 1) time fixed effects, 2) a common time trend, 2) a country-specific time trend. Time fixed effects are included to control for specific time shocks, such as those affecting world interest rates. A time trend is used to control for common trends in the developments of debt-to-GDP ratios. Finally, a country-specific time trend is included to allow the trend in debt-to-GDP ratio to differ across countries. The results using these different controls remain statistically significant and broadly unchanged (Figure 6a-6c).

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[10]   See Table 3 for more detailed information regarding the estimated parameters in equation (1).

Figure 6

Robustness Tests
(percent of GDP)

a) Time-fixed Effects

b) Common-time Trend

c) Country-specific Time Trend

d) Restricted Balanced Sample
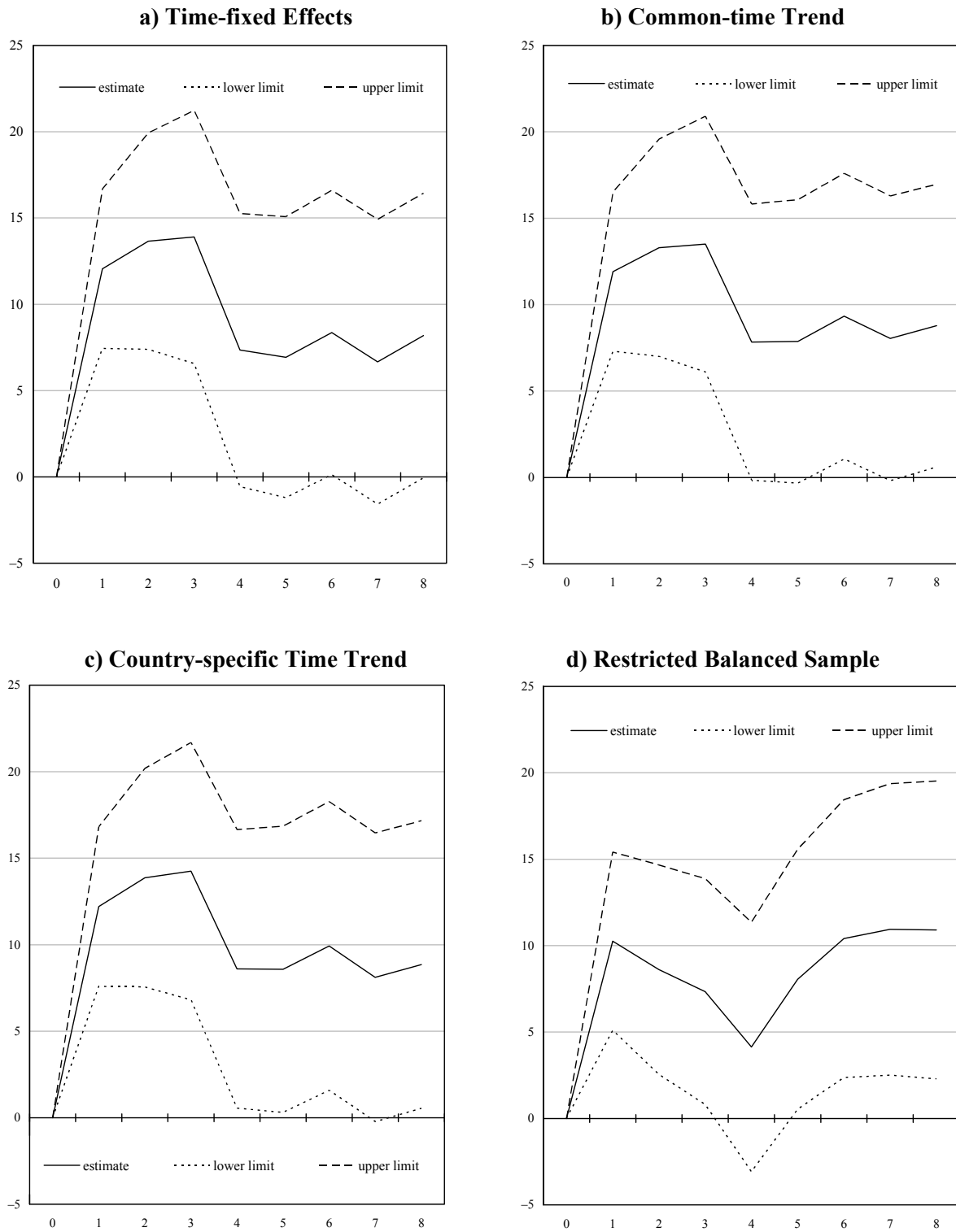
Note: dotted lines represent 90 per cent confidence bands.

As an additional robustness test the estimation sample is restricted to those countries for which data for $b_{i,t+k}$ are available for each period k. The reason for doing so is to control for a possible composition bias deriving from estimating $b_{i,t+k}$ over an unbalanced set of countries. The results for the restricted sample (displayed in Figure 6d) suggest that the short and the medium-term effects are almost identical to those estimated for the unbalanced baseline sample.

Finally, to also test whether the effect is similar between advanced and less developed economies, equation (1) is augmented by including a dummy for OECD countries as a control and as interaction term with the crisis dummy, as follows:

$$b_{i,t+k} - b_{i,t} = a_i^k + \sum_{j=1}^{l} \gamma_j^k \, by_{i,t-j} + \beta_k \, D_{i,t} + \vartheta^k \, OECD_{i,t} + \delta^k \, OECD_{i,t} \, D_{i,t} + \varepsilon_{i,t}^k \qquad (2)$$

The coefficient associated with the interaction term is statistically significant, suggesting that the effect of banking crises on public debt is not statistically difference between the two groups of countries. The unconditional effect is still positive, statistically significant and of the same order of magnitude as the one estimated in the baseline specification (Table 3).

3.2   Severity of the crises

The results presented so far have shown that on *average* banking crises have had significant and persistent effects on the government debt-to-GDP ratio. However, it is reasonable to think that fiscal policy responses, both in terms of size of fiscal stimulus packages to counter the crisis and in terms of the increase in the deficit due to automatic stabilisers, may be a function of the output losses and therefore vary with the severity of the crisis. This would imply that the baseline estimates tend to over-estimate the impact on government debt for "moderate" banking crises and to under-estimate the impact for "severe" crises.

To test for this hypothesis equation (1) is for two groups of crises: i) severe crises, *i.e.* banking crises associated with cumulative output losses (computed as the deviation of the annual growth rate from the average trend) above 4 per cent, which are comparable to the current circumstances;[11] ii) moderate crises, *i.e.* banking crises associated with output losses below 4 per cent. The results of this exercise are reported in Figure 7. Looking at the figure it is possible to observe a different response of the debt-to-GDP ratio between moderate and severe crises, both in the short and in the medium term. In particular, for moderate crises (Panel A) the maximum effect is about 15 percentage points after 4 years and it becomes insignificant in the medium term (after 8 years). For severe crises (Panel B-C), the peak effect is about 50 percentage points (three times bigger than the average effect presented in the baseline scenario) and the medium-term effect (eight years after) is about 37 percentage points.

The results for severe crises are in line with the recent IMF's *World Economic Outlook* (2010) and OECD's *Economic Outlook* (2010) medium-term projections for the debt-to-GDP ratio.

3.3   Initial debt

The rise in public debt in the aftermath of a banking crisis may be more important for countries that had at the time of the crisis a higher initial debt-to-GDP ratio. This hypothesis can be

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[11]   Output losses are computed as the deviation of the annual growth rate compared to the trend (approximated by the average of annual growth rates over time). The results are qualitatively unchanged for reasonable changes in the threshold value. This is conceptually similar to the cumulative (negative) output gap following a downturn.

Figure 7

The Effect of Moderate and Severe Banking Crises on the Debt-to-GDP Ratio
(percent of GDP)

a) Moderate Crises
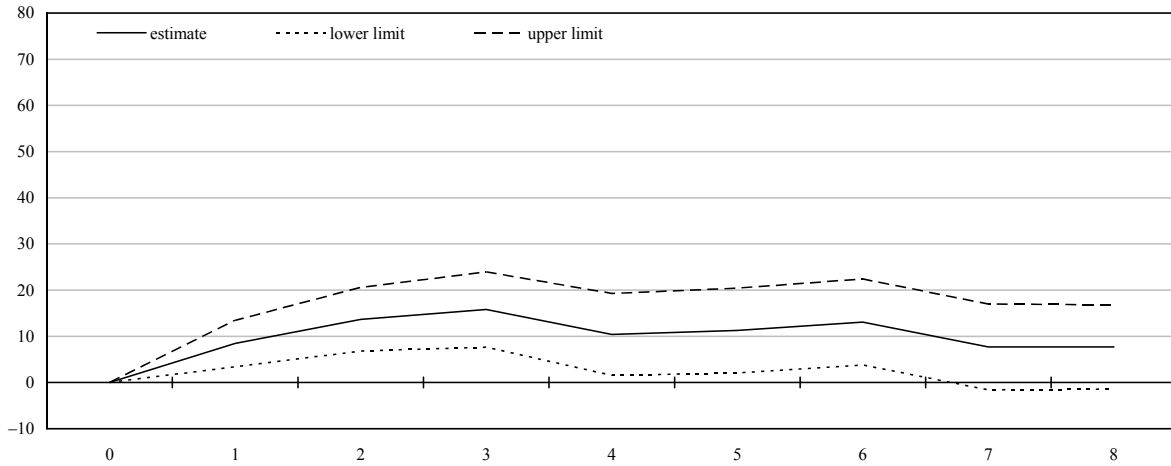
b) Severe Crises – Full Unbalanced Sample

c) Severe Crises – Restricted Unbalanced Sample

Note: dotted lines represent 90 per cent confidence bands.

explained by the fact that a higher initial level of debt affects the debt accumulation through debt service.[12] In times of crisis, deb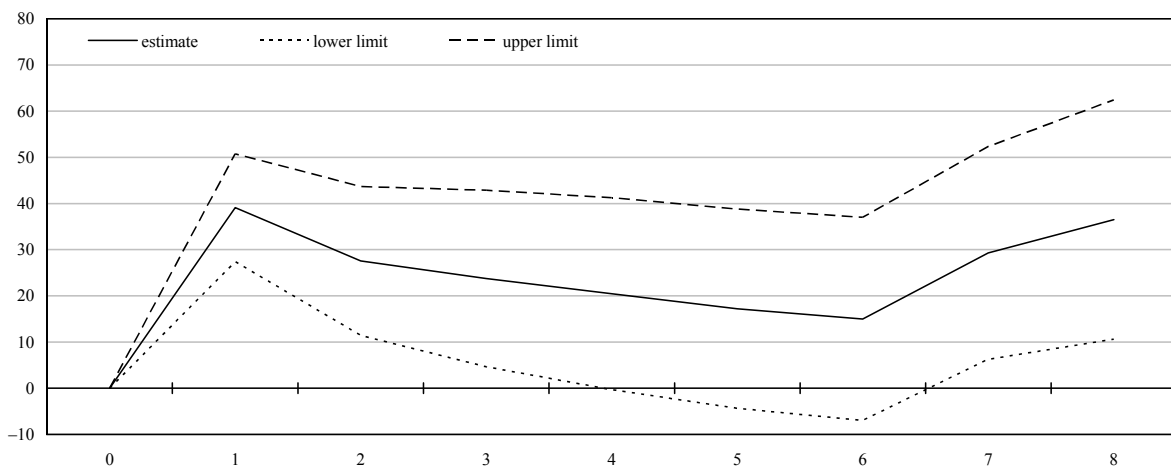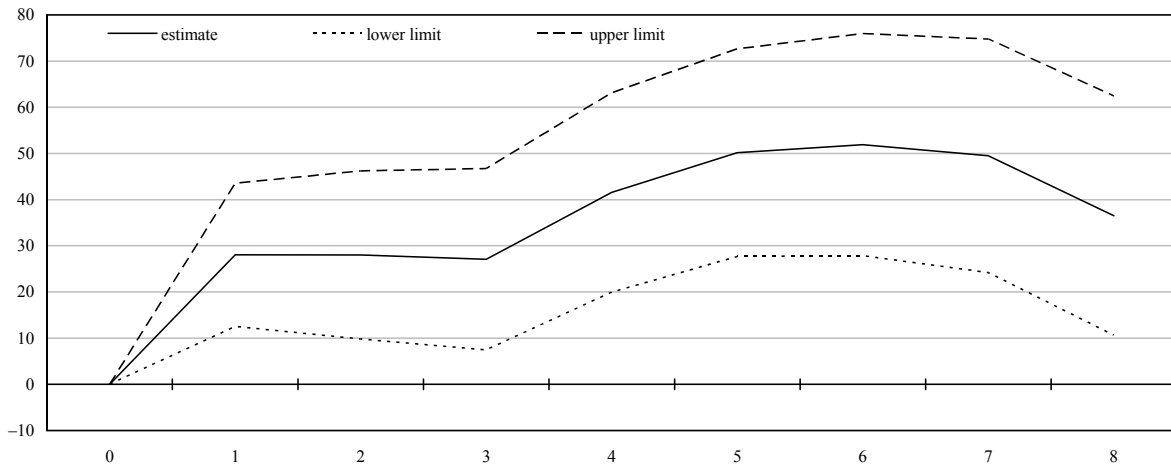t service burdens increase due to reduced government revenues and increased risk premia. This last factor tends to be generally more important for countries with a higher initial level of public debt.[13]

To assess the impact of the initial debt-to-GDP ratio on shaping the dynamic response of the government debt-to GDP ratio to banking crises, equation (1) is augmented by including the initial debt-ratio as a control variable and as an interaction term with the crises dummy:

Figure 8

**The Effect of Banking Crises on Debt-to-GDP Ratio
Controlling for the Initial Debt Ratio**
(percent of GDP)
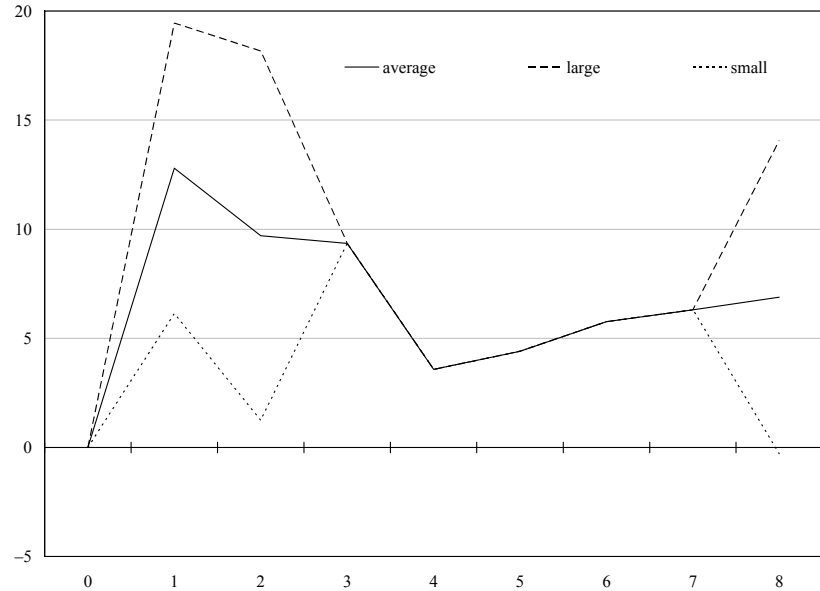
Note: Large and small identify the first and the third quartile of the initial debt-to-GDP ratio distribution. Dotted lines differ from the average response only when the interaction term is statistically significant.

$$b_{i,t+k} - b_{i,t} = a_i^k + \sum_{j=1}^{l} \gamma_j^k \, by_{i,t-j} + \beta_k \, D_{i,t} + \vartheta^k \, X_{i,t} + \delta^k \, (b_{i,t} - \overline{b})D_{i,t} + \varepsilon_{i,t}^k \qquad (2)$$

The interaction term $(b_{i,t} - \overline{b})D_{i,t}$ is centred on the (over-time and cross-country) mean to make the interpretation of unconditional effects easier. Based on equation (2), for each period *k,* the impact of banking crises on the debt-to-GDP ratio is measured by $\beta_k + \delta^k (b_{i,t} - \overline{b})$. This implies that the effect will increase as a function of the initial debt ratio if $\delta^k > 0$.

The results reported in Figure 8 tend to confirm the hypothesis that in countries with larger initial level of debt-to-GDP ratio (corresponding to the 3rd quartile of the distribution, *i.e.* above 76 per cent) the increase in the debt-to-GDP ratio, both in the short (1 and 2 years after) and in the medium term (8 years after), is about 15 percentage points higher than in countries with lower initial debt (the 1st quartile, *i.e.* below 20 per cent).

3.4   *Foreign public debt*

Another factor that may affect the pattern of the public debt-to-GDP ratio in the aftermath of

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[12]   See Figure 10 and 11 for the estimated impact of banking crises on government debt service.

[13]   See, for example, Haugh *et al.* (2009), Schuknecht *et al.* (2009), Codogno *et al.* (2003), Gale and Orzag (2003), Gomez-Puig (2006), Manganelli and Wolswijk (2007).

banking crises is the ratio of public foreign debt to total public debt (public foreign debt ratio). First, countries with an high share of foreign public debt may face higher interest payments on debt coming due as capital markets become unwilling to continue rolling debt over. Second, when foreign exposure is heavy, expectations that debt might not be repaid in the case of depreciation may lead to a self-fulfilling liquidity crunch, and eventually to public debt default. Third, in countries with a high foreign public debt ratio currency depreciation may lead to a substantial increase in the debt burden because of the *original sin* and lead to debt crises (Flandreau, 2003; Bordo, 2006; Bordo and Meisser, 2006). Fourth, a high level of foreign public debt may lead to significant output losses, especially in emerging economies, since sudden stops or reversals in capital inflows are more likely.[14]

An approach to test whether countries with a higher foreign public debt ratio have been characterised by an higher rise in the debt-to-GDP ratio in the aftermath of banking crises is to re-estimate equation (2) using the initial level of the foreign public debt ratio as control and interaction term with the banking crises dummy. However, a problem with this approach in this case is that the probability of banking crises is endogenous to the share of foreign public debt.[15]

A way to mitigate this problem is to estimate our baseline equation for different levels of the foreign public debt ratio. For simplicity, and homogeneity with the rest of the results presented, we estimate equation (1) for three groups of countries (observations): i) those with a foreign debt ratio lower than the first quartile of the distribution, *i.e.* below 34 per cent (*low foreign debt ratio*); ii) those with a foreign debt ratio higher than the third quartile of the distribution, *i.e.* above 83 per cent (*high foreign debt ratio*); iii) those with a foreign debt between the first and the third quartile (*average foreign debt ratio*). The IRFs corresponding to the three groups are displayed in Figure 9. The results suggest that the public debt-to-GDP ratio increased more in those countries with a higher share of foreign debt. In particular, in countries with low foreign debt ratio the increase in the debt ratio is not statically significant different from zero. In countries with average foreign debt ratio, the results point to a long term increase of the debt ratio of about 10 percentage points (which is similar to the baseline effect presented in Figure 5). Finally, in countries with high foreign debt ratio the peak effect is close to 30 percentage points, while the long-term effect is about 20 percentage points.[16]

4   Conclusions

Financial crises are typically associated with sharp economic downturns but also with a substantial deterioration of fiscal positions. Declining revenues due to weaker economic conditions, higher expenditures associated with bailout costs and demand stimuli have historically led to a rapid deterioration of fiscal balances and increase of public debt. Focusing on the debt-to-GDP ratio and several episodes of banking crises from 1980 to 2006 this paper aims to quantify the evolution of the government gross debt-to-GDP ratio in the aftermath of banking crises. In particular, using a sample of 154 countries the paper estimates impulse response functions of public debt to banking crises.

The results of this exercise suggest that banking crises have produced a significant and long-lasting increase in the government debt-to-GDP ratio, with the effect being a function of the

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[14]   See, for example, Calvo *et al.* (2004) and Bordo *et al.* (2008).

[15]   Bordo and Meisser (2006) find that, especially if mismanaged, foreign debt can significantly increase the probability of financial crises.

[16]   The results obtained by estimating equation (2), using the initial level of the foreign debt ratio as control and interaction term with the banking crises dummy, broadly confirm these results.

Figure 9

**The Effect of Banking Crises on the Debt-to-GDP Ratio
for Different Level of Foreign Debt Ratio**
(percent of GDP)

a) Low Ratio
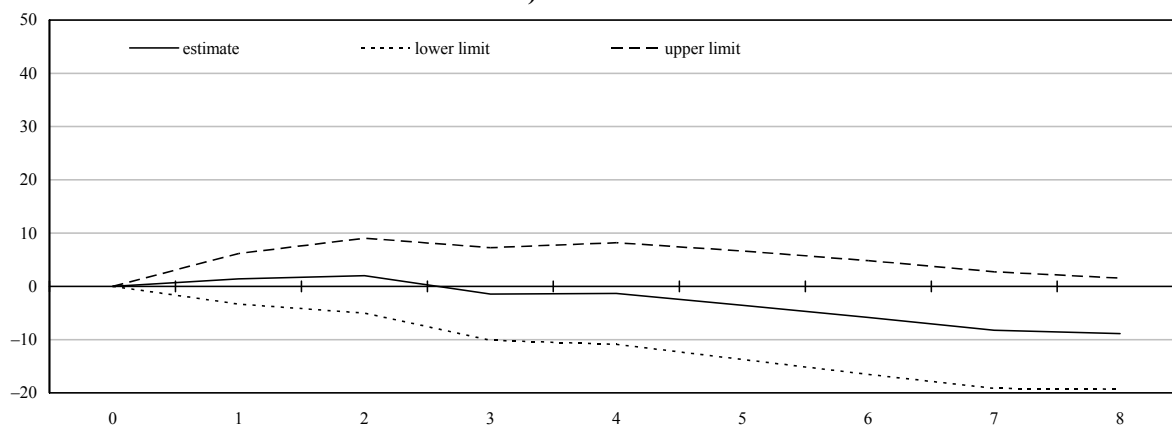
b) Average Ratio
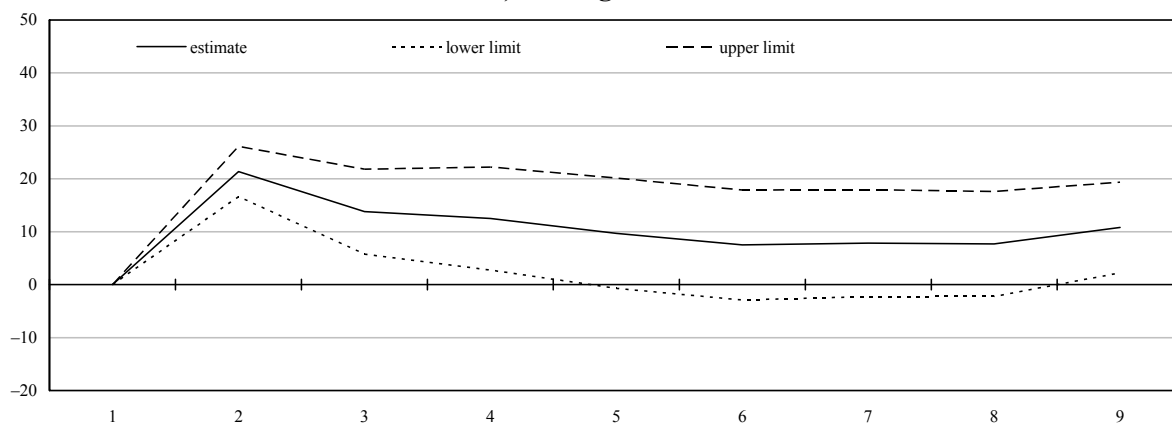
c) High Ratio
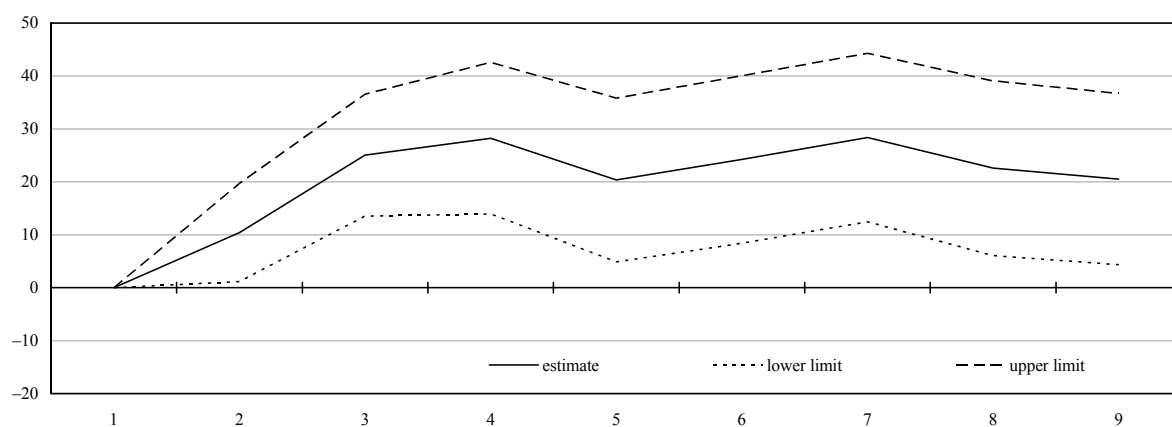
Note: dotted lines represent 90 per cent confidence bands. Low ratio corresponds to a level of the foreign debt ratio lower than 34 percentage points (1st quartile of the distribution); Average ratio corresponds to a level of foreign debt ratio higher than 32 percentage points and lower than 75 percentage points; High ratio corresponds to a level of foreign debt ratio higher than 75 percentage points (3rd quartile of the distribution).

severity of the crisis. In particular, for severe crises, comparable to the current one in terms of output losses, we find that government debt-to-GDP ratios increased up to 50 percentage points at the peak, and by 37 percentage points in the medium term (eight years after the crises onset). The effect is considerably lower for moderate crises.

We also find that the increase in public debt in the aftermath of banking crises depends not only on the severity of the crises but also on countries heterogeneity. In particular, analysing a set of structural and policy variables we find that larger increases in debt occurred in countries with worse initial fiscal positions (in terms of debt-to-GDP ratio) and with a larger share of foreign debt.

Summarising, the results of the paper suggest that financial crisis have a significant and long-lasting impact on public debt. This implies that, given the unprecedented severity of the current financial crisis and the associated fiscal policy response, countries urge to take current and further actions in order to avoid temporary stimuli to increase permanently debt levels, thus putting debt sustainability at risk.

ANNEX

Figure 10

The Effect of Banking Crises on Debt Service
Interest Expenditure Over Total Revenue
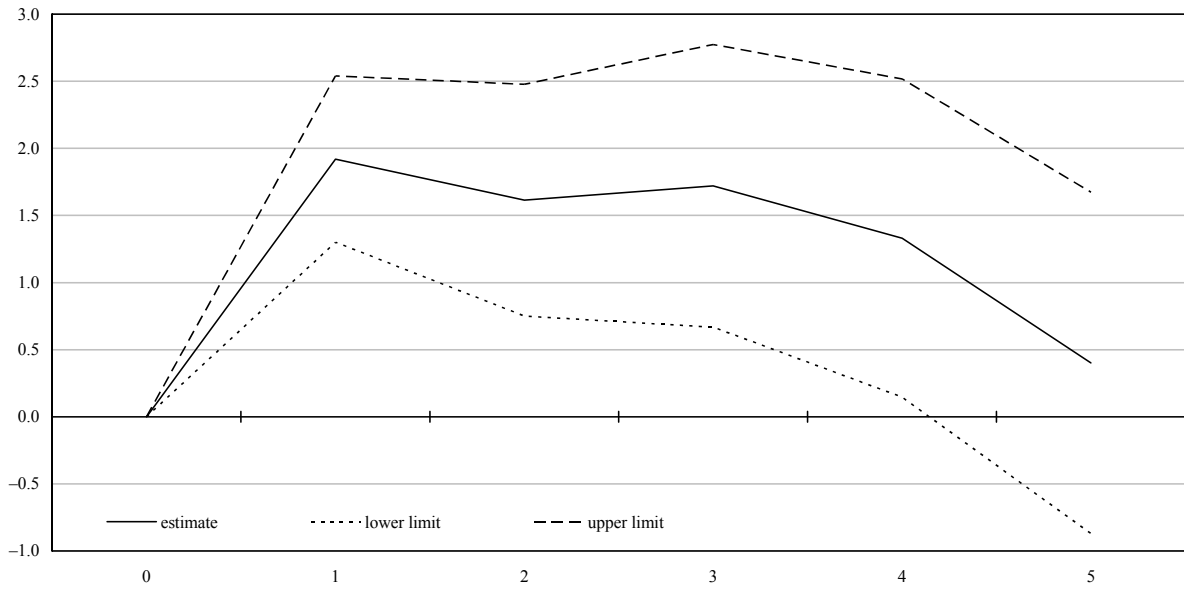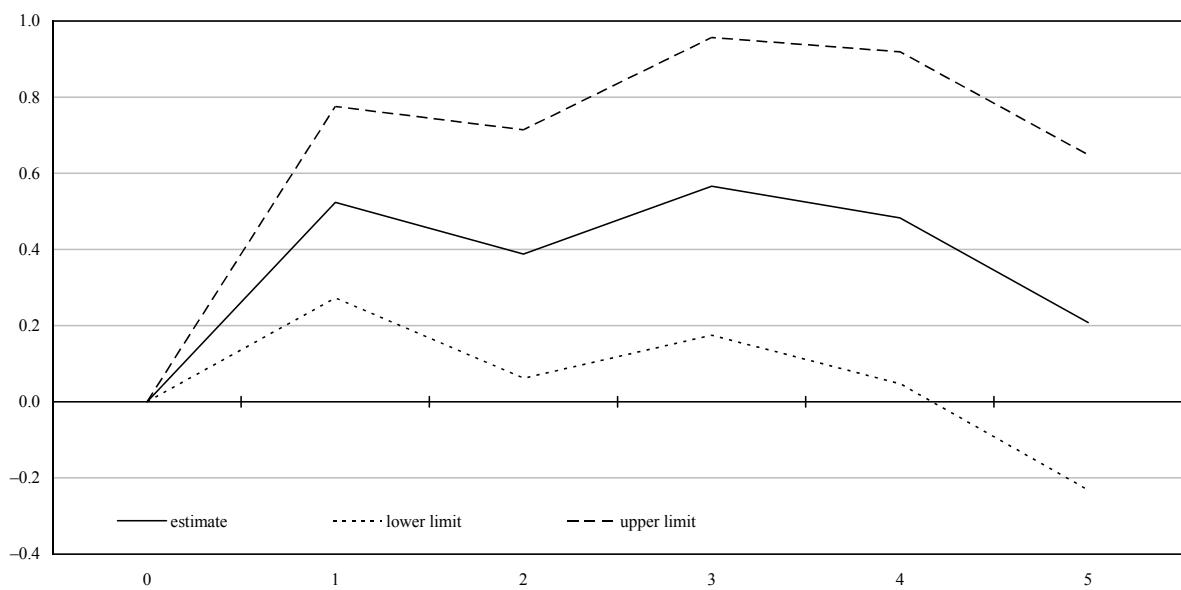*(percent)*

Figure 11

Interest Expenditure Over GDP
(percent)

Note: dotted lines represent 90 per cent confidence bands.

Table 1

Banking Crises Episodes

Country	Time	Country	Time	Country	Time
Albania	1994	Ecuador	1982	Nicaragua	1990
Algeria	1990	Ecuador	1998	Nicaragua	2000
Argentina	1980	Ecuador	1998	Niger	1983
Argentina	1989	Egypt	1980	Nigeria	1991
Argentina	1995	El Salvador	1989	Norway	1991
Argentina	2001	Equatorial Guinea	1983	Panama	1988
Armenia	1994	Eritrea	1993	Paraguay	1995
Azerbaijan	1995	Estonia	1992	Peru	1983
Bangladesh	1987	Finland	1991	Philippines	1983
Belarus	1995	Georgia	1991	Philippines	1997
Benin	1988	Ghana	1982	Poland	1992
Bolivia	1986	Guinea	1985	Romania	1990
Bolivia	1994	Guinea	1993	Russian Federation	1998
Bosnia and Herzegovina	1992	Guinea-Bissau	1995	São Tomé and Príncipe	1992
Brazil	1990	Guyana	1993	Senegal	1988
Brazil	1994	Haiti	1994	Sierra Leone	1990
Bulgaria	1996	Hungary	1991	Slovak Rep.	1998
Burkina Faso	1990	India	1993	Slovenia	1992
Burundi	1994	Indonesia	1997	Spain	1977
Cameroon	1987	Israel	1977	Sri Lanka	1989
Cameroon	1995	Jamaica	1996	Swaziland	1995
Cape Verde	1993	Japan	1997	Sweden	1991
Central African Republic	1976	Jordan	1989	Tanzania	1987
Central African Republic	1995	Kenya	1985	Thailand	1983
Chad	1983	Kenya	1992	Thailand	1997
Chad	1992	Korea	1997	Togo	1993
Chile	1976	Kuwait	1982	Tunisia	1991
Chile	1981	Kyrgyz Republic	1995	Turkey	1982
China	1998	Latvia	1995	Turkey	2000
Colombia	1982	Lebanon	1990	Uganda	1994
Colombia	1998	Liberia	1991	Ukraine	1998
Congo, Dem. Republic	1983	Lithuania	1995	United Kingdom	2007
Congo, Dem. Republic	1991	Macedonia, FYR	1993	United States	1988
Congo, Dem. Republic	1994	Madagascar	1988	United States	2007
Congo, Republic	1992	Malaysia	1997	Uruguay	1981
Costa Rica	1987	Mali	1987	Uruguay	2002
Costa Rica	1994	Mauritania	1984	Venezuela	1994
Cote d'Ivoire	1988	Mexico	1981	Vietnam	1997
Croatia	1998	Mexico	1994	Yemen	1996
Czech Republic	1996	Morocco	1980	Zambia	1995
Djibouti	1991	Mozambique	1987	Zimbabwe	1995
Dominican Republic	2003	Nepal	1988		

Source: Laeven and Valencia (2008a).

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<div align="right">**Table 2**</div>

<div align="center">**Banking Intervention Policies**</div>

Country	Time	Nationalization	Blanket Guarantees	Liquidity Support
Argentina	1980	1	0	1
Argentina	1989	0	0	1
Argentina	1995	0	0	0
Argentina	2001	1	0	1
Bolivia	1994	0	0	1
Brazil	1990	0	0	1
Brazil	1994	0	0	1
Bulgaria	1996	1	0	1
Chile	1981	0	0	1
Colombia	1982	1	0	1
Colombia	1998	1	0	1
Cote d'Ivoire	1988	0	0	1
Croatia	1998	1	0	0
Czech Rep	1996	0	0	0
Dominican Republic	2003	0	0	1
Ecuador	1998	1	1	1
Estonia	1992	1	0	1
Finland	1991	1	1	1
Ghana	1982	0	0	0
Indonesia	1997	1	1	1
Jamaica	1996	1	1	1
Japan	1997	1	1	0
Korea	1997	1	1	1
Latvia	1995	0	0	0
Lithuania	1995	1	0	0
Malaysia	1997	1	1	1
Mexico	1994	1	1	1
Nicaragua	1990	0	1	1
Norway	1991	1	0	1
Paraguay	1995	0	0	1
Philippines	1997	0	0	0
Russian Federation	1998	1	0	1
Sri Lanka	1989	0	0	0
Sweden	1991	1	1	1
Thailand	1997	1	1	1
Turkey	2000	1	1	1
Ukraine	1998	0	0	1
Uruguay	2002	1	1	0
Venezuela,	1994	1	0	1
Vietnam	1997	0	0	0

Note: "1" refers to the adoption of the policy.
Source: Laeven and Valencia (2008b).

Table 3

Estimates

K	Baseline	Time FE	Time Trend	Country Time Trend	Severe	Moderate	OECD
1	13.226	12.065	11.908	12.206	39.078	8.447	15.176
	(4.72)***	(4.30)***	(4.25)***	(4.35)***	(5.51)***	(2.77)***	(4.69)***
2	15.893	13.657	13.291	13.869	27.563	13.694	17.372
	(4.13)***	(3.58)***	(3.48)***	(3.61)***	(2.81)***	(3.27)***	(3.98)***
3	17.084	13.903	13.500	14.246	23.746	15.795	19.808
	(3.75)***	(3.12)***	(3.00)***	(3.15)***	(2.04)**	(3.19)***	(3.76)***
4	12.002	7.351	7.832	8.602	20.470	10.410	13.445
	(2.42)**	(1.53)	(1.61)*	(1.76)*	(1.62)*	(1.93)**	(2.34)**
5	12.206	6.937	7.872	8.581	17.220	11.246	13.706
	(2.37)**	(1.4)	(1.58)*	(1.71)*	(1.31)	(2.02)**	(2.30)**
6	13.441	8.365	9.331	9.928	15.012	13.102	16.109
	(2.57)**	(1.67)*	(1.86)*	(1.96)**	(1.12)	(2.31)**	(2.66)***
7	10.747	6.671	8.050	8.116	29.299	7.684	13.233
	(2.05)**	(1.33)	(1.61)*	(1.60)*	(2.09)**	(1.36)	(2.12)**
8	10.910	8.191	8.783	8.856	36.526	7.681	13.499
	(2.08)**	(1.63)*	(1.77)*	(1.75)*	(2.32)**	(1.38)	(2.14)**

Note: *t*-statistics in parenthesis. ***, **, * denote significance at 1, 5, and 10 per cent, respectively.

Table 3 (continued)

Estimates

K	Severe	Moderate	Small Foreign Debt	Average Foreign Debt	Large Foreign Debt	Debt
1	39.078	8.447	1.420	21.358	10.430	12.794
	(5.51)***	(2.77)***	(0.49)	(7.39)***	(1.85)*	(4.84)***
2	27.563	13.694	2.000	13.793	25.029	9.706
	(2.81)***	(3.27)***	(0.47)	(2.83)***	(3.35)***	(2.99)***
3	23.746	15.795	-1.431	12.493	28.246	9.348
	(2.04)**	(3.19)***	(-0.27)	(2.11)**	(3.25)***	(2.60)***
4	20.470	10.410	-1.334	9.719	20.361	3.575
	(1.62)*	(1.93)**	(-0.23)	(1.54)	(2.17)**	(0.96)
5	17.220	11.246	-3.538	7.503	24.237	4.407
	(1.31)	(2.02)**	(-0.57)	(1.19)	(2.52)**	(1.18)
6	15.012	13.102	-5.846	7.861	28.374	5.765
	(1.12)	(2.31)**	(-0.90)	(1.28)	(2.93)***	(1.53)
7	29.299	7.684	-8.216	7.705	22.579	6.309
	(2.09)**	(1.36)	(-1.24)	(1.28)	(2.25)**	(1.65)*
8	36.526	7.681	-8.872	10.820	20.526	6.883
	(2.32)**	(1.38)	(-1.40)	(2.08)**	(2.09)**	(1.79)*

Note: *t*-statistics in parenthesis. ***, **, * denote significance at 1, 5, and 10 per cent, respectively.

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