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Financial Liberalization, Bank Crises and Growth: Assessing the Links*

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Abstract

This paper studies the effects of financial liberalization and banking crises on growth. It shows that financial liberalization spurs on average economic growth. Banking crises are harmful for growth, but to a lesser extent in countries with open financial systems and good institutions. The positive effect of financial liberalization is robust to different definitions. While the removal of capital account restrictions is effective by increasing financial depth, equity market liberalization affects growth directly. The empirical analysis is performed through GMM dynamic panel data estimations on a panel of 90 countries observed in the period 1975-1999.

JEL classification: C23, F02, G15, O11.

Keywords: Capital account liberalization, equity market liberalization, financial development, institutions, dynamic panel data.

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1 Introduction

In the last two decades an increasing number of countries have eliminated controls on international capital movements. However, the global economic crises of recent years have led many economists to reconsider the beneficial effects of financial liberalization on economic performance. Although the issue has been widely debated, there are no conclusive results on the effects of financial integration on growth¹.

In theory, international financial liberalization softens financing constraints and improves risk-sharing, thereby fostering investments. It may also have a positive impact on the functioning and development of financial systems, and on corporate governance². These arguments suggest that we should expect a positive relation between international financial liberalization and economic growth³. However, the presence of distortions may reduce the positive effects of liberalization. In fact, information asymmetries may lead to a bad allocation of capital, and weak financial and legal systems could induce capital flights towards countries with better institutions. Moreover, banking crises may come along with financial liberalization, as it is well documented in the literature⁴.

Table 1 shows mean equality tests for growth, financial development and the occurrence of banking crises across different treatment (open, bank crises) and control (closed, no crises) groups of countries, observed annually between 1975 and 1999. The results suggest that countries without restrictions on capital account or equity market transactions had, on average, higher growth rates and financial development (as measured by credit to the private sector as a ratio of GDP). The occurrence of banking crises is associated with lower growth rates and financial development. However, it is not clear whether there is correlation between openness and the occurrence of bank crises. When we consider an overall index there is no significant difference in the frequency of crises between countries with and without restrictions on capital account transactions. The picture becomes clearer once we split the index between “systemic” and “non-systemic” banking crises.

¹See Edison et al. (2003) for a review of the empirical literature.

²See Klein and Olivei (2000) and Levine (2000) for empirical evidence on the positive impact of financial liberalization on growth, .

³Evidence on the positive relation between financial development and growth is provided by a large literature (see Demirguc-Kunt and Levine, 2001 for a survey). The results in La Porta et al. (1999) suggest that good corporate governance spurs growth.

⁴See Kaminsky and Reinhart (1999) and Aizenmann (2002) for a survey.

Open countries experienced a lower number of systemic crises but a higher number of non-systemic crises. The higher frequency of non-systemic crises may be a reason for the concern of economists and governments on the effects of financial liberalization on economic performance.

In this paper we assess empirically the effects of international financial liberalization and banking crises on growth. We admit the possibility that banking crises come along with financial liberalization, as shown by previous works and by row 5 of Table 1, and investigate their joint impact on growth⁵. Kaminsky and Schmukler (2002) and Tornell et al. (2004) suggest in different ways that institutional quality may matter at shaping the relationship between financial liberalization, crises and long-run growth⁶. Therefore, we control for institutions and their interactions with financial openness and crises. To have a better understanding of the mechanism that links the variables of our interest, we assess whether liberalization and crises affect growth through financial depth. Also in this case, we control for institutional quality. Inspired by the results in Acemoglu and Johnson (2003)⁷, we distinguish between institutions aimed at contractual as opposed to property rights protection.

The empirical analysis is performed on a panel dataset that covers 90 countries over the period 1975-1999. We adopt the Dynamic Panel Data approach proposed by Arellano and Bover (1995) and Blundell and Bond (1998). We use two indicators of financial liberalization, that distinguish between capital account and equity market liberalization.

Our results show that capital account liberalization has a positive effect on growth, once we control for banking crises, whose impact is negative. The absence of capital account controls is good for growth because it fosters financial development and mitigates the harmful effects of banking crises. Capital account liberalization allows firms to raise funds more easily on the

⁵Causality between financial liberalization and banking crises is left aside from our empirical analysis.

⁶Kaminsky and Schmukler (2002) show evidence that equity market liberalization brings about financial chaos in the short-run, but has positive long-run effects, since it induces changes in institutions supporting the functioning of the domestic financial market. Tornell et al. (2004) suggest that liberalization and crises affect growth through financial development; given financial openness, good institutions make bank crises less likely, and foster capital inflows.

⁷Acemoglu and Johnson (2003) show that contractual protection affects financial structure more than property rights protection, but has limited effects on economic performance. Vice versa, property right protection affects GDP growth, productivity and investments, but not the financial structure.

international financial markets, and thus suffer less from domestic crises. Moreover, banking crises turn out to be less harmful for growth in countries where property and contractual rights are better protected. Equity market liberalization instead has a strong direct effect on growth and does not interact with banking crises.

There are many contributions in the literature on the effects of financial liberalization on long-run growth. Bekaert, Harvey and Lundblad (2003) is the closest work to this paper. These authors as well consider both capital account and equity market liberalization, and control for bank crises. They also allow for heterogeneity in the effects of liberalization depending on cross-country differences in institutional quality. The main elements that distinguish our contribution are the attention to the interaction between financial liberalization and bank crises, the analysis of the mechanism that links them to growth through financial development and the use of a different dynamic panel data technique.

The remainder of the paper is organized as follows. Section 2 describes the econometric model and the variables we used. Section 3 reports the estimation results and comments on them. Section 4 concludes.

2 Data and empirical strategies

2.1 The econometric model

We assess the growth effects of financial liberalization and banking crises by adding these variables to a dynamic version of the standard growth regression⁸. We follow the dynamic panel data approach suggested by Arellano and Bover (1995) and Bond and Blundell (1998)⁹. This methodology is preferred to the cross-sectional regressions because it allows to account for the impact of the policy changes, imbedded in the indexes of financial liberalization and of crisis episodes, on growth. This dynamic panel technique is also helpful to amend the bias induced by omitted variables in cross-sectional estimates, and the inconsistency caused by endogeneity both in cross-sectional and static panel (fixed and random effects) regressions.

We formulate the standard neoclassical growth model in a dynamic panel

⁸See among others, Barro (1997) and Barro and Sala-i-Martin(1995).

⁹The system-DPD methodology dominates the difference-DPD proposed by Arellano and Bond (1991) because it amends problems of measurement error bias and weak instruments, arising from the persistence of the regressors (as pointed out by Bond et al., 2001).

data form, and estimate the following dynamic system:

$$\Delta y_{it} = \alpha \Delta y_{it-1} + \beta' \Delta \mathbf{X}_{it} + \delta \Delta Flib_{it} + \gamma \Delta Bcr_{it} + \Delta \nu_t + \Delta \epsilon_{i,t} \quad (1)$$

$$y_{it} = \alpha y_{it-1} + \beta' \mathbf{X}_{it} + \delta Flib_{it} + \gamma Bcr_{it} + \eta_i + \nu_t + \epsilon_{i,t}, \quad (2)$$

where time indexes refer to non-overlapping five-year periods. Δy_{it} is the average annual growth rate of real per capita GDP over five years. y_{it} is the logarithm of real per capita GDP, and the coefficient on its lag, $\alpha = e^{5\lambda}$, supports conditional convergence if it implies $\lambda < 0$. Variables indexed by $t - 1$ are observed at the beginning of the five-year period, and covariates are expressed in period averages. Matrix \mathbf{X}_{it} contains determinants of GDP growth, such as human capital, population growth and other factors that account for different long-run per capita output across countries. $Flib_{i(t+k,t)}$ and $Bcr_{i(t+k,t)}$ are indicators of financial liberalization and banking crises. η_i , ν_t and ϵ_{it} are respectively the unobservable country- and time-specific effects, and the error term. The presence of country effect in equation (2) corrects the omitted variable bias. The differences in equation (1) and the instrumental variables estimation of the system are aimed at amending inconsistency problems¹⁰. We instrument differences of the endogenous and predetermined variables with lagged levels in equation (1) and levels with differenced variables in equation (2). For instance, we take y_{it-3} as instrument for Δy_{it-1} and $Flib_{it-2}$ for $\Delta Flib_{it}$ in (1) and Δy_{it-2} as instrument for y_{it-1} and $\Delta Flib_{it-1}$ for $Flib_{it}$ in (2). We estimate the system by Generalized Method of Moments with moment conditions $E[\Delta y_{it-s} (\epsilon_{it} - \epsilon_{it-1})] = 0$ for $s \geq 2$, and $E[\Delta z_{it-s} (\epsilon_{it} - \epsilon_{it-1})] = 0$ for $s \geq 2$ on the predetermined variables z , for equation (1); $E[\Delta y_{i,t-s} (\eta_i + \epsilon_{i,t})] = 0$ and $E[\Delta z_{i,t-s} (\eta_i + \epsilon_{i,t})] = 0$ for $s = 1$ for equation (2). We treat all regressors as predetermined. The validity of the instruments is guaranteed under the hypothesis that ϵ_{it} are not second order serially correlated. Coefficient estimates are consistent and efficient if both the moment conditions and the no-serial correlation are satisfied. We can validate the estimated model through a Sargan test of overidentifying restrictions, and a test of second-order serial correlation of the residuals. As pointed out by Arellano and Bond (1991), the estimates from the first step are more efficient, while the test statistics from the second step are more robust. Therefore, we will report coefficients and statistics from the first and second step respectively.

¹⁰See Temple (1999) for a survey on the methodologies used in growth regressions.

2.2 Financial liberalization and financial fragility: the data

To explore the impact of financial liberalization and banking crises on growth we need to measure these variables. The literature on financial liberalization has proposed different indicators that differ along several directions. The major distinctions are based on the *de iure* vs *de facto* definition criterion, the characterization on a zero-one vs continuous scale, and the market they refer to.

In our analysis we construct an index of liberalization of both capital account and equity market based on two different sources¹¹. The first one is a dummy variable provided by the IMF in its Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER), that is available for a maximum of 212 countries starting from 1967¹². This is the most commonly used measure of restrictions on international financial transactions. It takes value 1 if a country has experienced restrictions on capital account transactions during the year, and zero otherwise. Our yearly measure of financial liberalization, *opIMF*, equals 1 and 0 when the IMF dummy is respectively 0 and 1. The second indicator is based on Bekaert et al.'s (2003) chronology of official equity market liberalization, that is available for 95 countries from 1980. Our variable *opBHL* differs from *opIMF* because it only accounts for equity market liberalization, but not for globalization of the credit market for instance. Moreover, differently from the AREAER, Bekaert et al.'s measure does not contemplate policy reversals, so that a country is labeled as open ever since its first year of liberalization. As the IMF-based indicators, it takes value 1 and zero in case of internationally open and closed country-years, respectively. Both *opIMF* and *opBHL* are expressed as five-year averages, thereby taking values in the [0,1] interval.

There are alternative measures that are able to account for different degrees of liberalization instead of just the presence or absence thereof. Quinn's (1997) index scores the intensity of capital account controls on a scale from 0 to 4 with steps of 0.5. However, it is hardly suited for panel studies since it is available for a significant number of countries only for four years, 1958, 1973, 1982 and 1988. Other contributions have used *de facto* measures, as

¹¹We focus on *de iure* zero-one measures, that classify a country as financially liberalized if there are no legal restrictions to international trade of financial instruments.

¹²Classification methods have changed in 1996, so that there are 13 separate indexes now, that can hardly be compared to the previous single indicator. Miniane (2000) harmonized the classifications, though for a limited number of countries, and over a short time span. Therefore, the last observation for *opIMF* in our dataset dates back to 1996.

data on international capital flows as a ratio of GDP. The idea is that actual international capital flows are a good proxy for the degree of financial openness. A more comprehensive discussion on the available indicators can be found in Edison et al. (2002).

Banking crises are subject to various classifications as well. As for liberalization, we adopt a zero-one anecdotal indicator of bank crises, proposed by Caprio and Klingebiel (2001). The authors keep record of 117 systemic and 51 non-systemic crises occurred in 93 and 45 countries respectively, from the late Seventies on. On a yearly base, our variable *Bcr* takes value 2 if the country has experienced a systemic banking crisis, meaning that much or all of a bank's capital has been exhausted; 1 if the banking crisis involved less severe losses; and 0 otherwise. We use two alternative data reductions for robustness analysis: *Bcr012* takes value 2 if *Bcr* equals 2 at least once over the period, 1 if at least a 1 is scored, zero otherwise. *Bcr012av* instead accounts also for the duration of crisis episodes, since it equals the period average of *Bcr*.

The other covariates in our growth regressions are variables commonly accounted for in the empirical growth literature (see Barro, 1997), such as secondary school attainment, the growth rate of population, government expenditure and investments as a ratio of GDP. Other factors that we want to take into account are financial development, proxied by the ratio of credit to the private sector over GDP, and, at a further stage of the analysis, institutional quality, as measured by the government anti-diversion policy index (Hall and Jones, 1999) and by the indicator of efficiency of the judiciary system (see La Porta et al. 2003). The first indicator mainly accounts for property rights protection, while the other refers more to contractual rights.

The sample consists of data for a maximum of 90 countries over the period 1975-1999 or 1980-1999 depending on the indicator of financial liberalization adopted. Since keeping the larger sample gives us a longer time-series in the panel analysis, we will go on reporting results from the 1975-99 sample for *opIMF* and from 1980-99 for *opBHL*. Since we average over non-overlapping five-year periods, either four or five observations for each country are available. More detail on the countries in our sample and on all variables is given in the appendix.

3 Empirical evidence

3.1 Liberalization, banking crises and growth

Table 2 reports results from dynamic-panel estimations of the augmented growth regression, which includes the usual control variables (initial GDP, secondary school attainment, population growth, government spending and investments over GDP) plus indicators of financial liberalization, financial development, and banking crises. Consistently with the previous cross-country growth studies (see Barro, 1997 and Barro and Sala-i-Martin, 1995), we find significant evidence that countries with lower initial real per capita GDP have grown faster than the initially richer ones, conditional on the other variables. Our estimates imply a convergence rate of about 1.5% per year¹³. Population growth and investments have the signs predicted by growth theory (respectively negative and positive) in most of the estimates, though not always significant.

Capital account openness has zero-effect on growth. Equity market liberalization instead exhibits a significant positive coefficient (columns 1 and 5). These results are in line with Bekeart et al.'s (2003) findings. Using the same measure of financial liberalization, they show that equity market liberalization significantly affects growth, while the relation between the IMF measure and growth is fragile.

As a wide strand of literature (see Aizenmann, 2002 for a survey) points out, the removal of restrictions on capital flows may expose financial systems to turmoil and possibly crises¹⁴. If that is the case, the costly impact of financial crises¹⁵, brought about by liberalization, could be responsible for the coefficient estimates for *opIMF* in column 1. To control for this hypothesis, we include the bank crisis indicator in the regression of columns 2. Once we control for the occurrence of bank crises, the positive coefficient for *opIMF* becomes significant. As expected, banking crises strongly restrain growth. Moreover, the interaction between capital account openness and crises in column 3 is positive. This suggests that, irrespective of whether

¹³The convergence rate is computed as $\hat{\lambda} = \frac{\ln(\hat{\alpha})}{5}$.

¹⁴Among others, Kaminsky and Reinhart (1999) show that financial liberalization often precedes banking crises, Glick and Hutchison (1999) find that financially liberalized emerging market economies are more likely to experience twin crises, Demirguc-Kund and Detragiache (1998) show that banking crises occur more often in liberalized financial systems.

¹⁵A number of papers try to quantify the output costs of financial crises. See among others Edwards (1999), Honohan and Klingebiel (2001), and De Gregorio and Lee (2004).

financial liberalization triggers instability in the banking sector, countries without capital account restrictions are less prone to the negative effects of banking crises than financially closed economies. Thus, capital account liberalization has no strong direct effects on growth, but it is important to mitigate the negative effects of banking crises.

The results are slightly different if we restrict the focus on equity market liberalization. As in Bekeart et al., equity market openness and banking crises have indeed strong opposite effects, respectively positive and negative, but the introduction of the crises variable does not affect the effectiveness of equity market liberalization on growth. Moreover, we find no interaction between the two variables (see column 7). In fact, it is not so surprising that free international equity trade alone can be less of help in case domestic banks get into troubles. Firms that rely on credit may be severely hurt by banking crises, and find it difficult to shift abruptly to equity financing, even if they can sell shares on the international market. If instead they have free access to international credit markets, they might raise funds more easily there, and thus suffer less from domestic crises.

Opposite results are obtained by Eichengreen and Leblang (2002). They show that the negative effects of domestic crises are neutralized by the presence of controls on capital controls. One reason could be that they use a different indicator of crises (by Bordo et al., 2001) that encompasses both exchange and banking crises.

As a robustness check, we replicate the estimations in Table 2 using an indicator of Banking crises that accounts also for the duration of banking crises, *Bcr012av*. Table 5 reports coefficients only for liberalization, bank crises and their interaction. The results are not remarkably different from the ones we obtained using the discrete crisis indicator.

3.2 Institutions, Financial Liberalization and Growth

After Hall and Jones' (1999) seminal paper, a wide strand of growth literature has focused on institutions as a primary determinant of economic performance. Alfaro et al. (2004) have shown that institutions are an important determinant of capital inflows. Tornell et al. (2004), in line with this argument, suggest that in financially open countries institutional quality affects both the occurrence of banking crises and the extent of capital inflows. Banking crises may occur as a by-product of openness, as credit markets get thicker, especially if there is a poor legal environment. In open

economies, the presence of good institutions facilitates capital inflows from abroad, when domestic banking crises reduce the amount of credit available to firms¹⁶. As a result, banking crises are expected to be less harmful for growth in countries where property and contractual rights are better protected. Symmetrically, financial liberalization might turn out to be growth-restraining in countries with worse institutions. In order to assess empirically these implications we include interactive terms in our dynamic growth regressions.

Table 3 shows results from system-GMM estimations that include the same regressors in columns 1-3 of Table 2, plus the interactions of capital account liberalization with indicators of institutional quality. We also investigate the relation between liberalization, financial development and overall economic development¹⁷. Institutional quality is proxied here by the government antidiversion policy index constructed by Hall and Jones (1999). This measure varies between [0,1] and takes higher values for governments with more effective policies for supporting production¹⁸.

Growth is positively affected by financial liberalization and negatively by bank crises under every specification of the model. As reported in column 4, the effect of bank crises is indeed different across countries with good and bad institutions. The term that controls for bank crises in institutionally developed countries is strongly positive. Thus, the cost of banking crises in terms of growth is reduced by good institutions. The interaction with capital account openness, in column 3, is negligible.

As the interaction with credit market development in Column 1 shows, financial liberalization restrains economic growth in countries with small credit markets. Thus, studying the effects of capital account openness on financial development might be of help in understanding the transmission to economic growth. Column 2 shows that banking crises have a bigger impact in countries with high levels of credit market development. In fact, if firms rely more heavily on credit financing, they are more severely hurt by banking crises.

Table 3b replicates the exercise of Table 3 using the equity market liber-

¹⁶In Tornell et al. this mechanism works to a different extent across tradables and nontradables sectors. We leave this aspect aside of the analysis.

¹⁷Financial development is measured by credit market depth, while the index of overall economic development is taken from the classification in World Development Indicators.

¹⁸The index is an equal-weighted average of 5 variables: (i) law and order (ii) bureaucratic quality (iii) corruption (iv) risk of expropriation (v) government repudiation of contracts.

alization index. The most significant result, in column 5, points in the same direction as column 5 in Table 3. Good institutions reduce the destructive effects of bank crises.

Hall and Jones' (1999) indicator of institutional quality accounts mainly for property right protection, i.e. the degree of private property protections against government and elite expropriations. Inspired by Acemoglu and Johnson (2003), we assess the role of institutions aimed at protecting private contracts. Thus, we replicate the exercise in Tables 5 and 6 using the degree of efficiency of the judiciary as a different measure of institutional quality. This variable, built by La Porta et al. (2003), captures the legal costs of contract enforcement and takes values in $[0,7]$.

The evidence in columns 1 and 2 of Table 6 shows that contractual protection does not bring heterogeneity in the effects of financial liberalization and crises on growth, which remain respectively positive and negative.

3.3 Liberalization, crises and financial development

The evidence in the previous sections suggests that bank crises tend to restrain growth, but to a lesser extent if good institutions and financial openness help channelling funds into the economy. Moreover, column 4 in Table 2 indicates that capital account liberalization becomes uninfluential for growth, once we control for financial depth. These results suggest that the effect of capital account liberalization on growth is generally positive, and is possibly transmitted through the credit market. In this section, we assess how financial development (FD) is affected by international liberalization and bank crises. To this end, we estimate the following dynamic system

$$\begin{aligned}\Delta FD_{it} &= a\Delta FD_{it-1} + b\Delta Flib_{it} + c\Delta Bcr_{it} + g\Delta interaction_{it} + \Delta u_t + \Delta e_{it} \\ FD_{it} &= a(FD_{it-1}) + b(Flib_{it}) + c(Bcr_{it}) + g(interaction_{it}) + h_i + u_t + e_{it}\end{aligned}$$

with two-step GMM. The coefficients in column 1 of Table 4 strongly support the hypothesis that capital account liberalization boosts financial depth¹⁹. The estimates in columns 2 and 4 show that financial liberalization has the same effects across countries with different institutional and economic development. Column 1 does not support the view that bank crises slow

¹⁹This result is consistent with previous evidence by Levine (2001) and Klein and Olivei (2000).

down the process of financial development ²⁰. However, column 3 suggests that feedback from banking crises to credit market depth may indeed take place, with the expected positive and negative signs, respectively in countries with high and low degrees of property rights protection.

Columns 3 and 4 of Table 6 instead suggest that contractual protection plays a role in shaping the effect of openness and bank crises on financial depth. A good legal environment for business turns bank crises into expansions of the credit markets, consistent with the “bumpy path” proposed by Tornell et al. (2004). Vice-versa, where contractual rights are weak, credit markets are restrained by both openness and banking crises.

4 Conclusion

This paper provides an empirical evaluation of the effects of financial liberalization and banking crises on growth. Our analysis accounts for the interaction between liberalization and crises, and allows for unequal effects across countries with different degrees of institutional and economic development. We also investigate the transmission of these effects through financial depth.

The overall lesson we draw from the results in section 3 is that the removal of capital account restrictions boosts growth mainly through indirect effects. In fact, financial liberalization has not only a beneficial impact on financial development but also allows to smooth the destructive effects of financial distress. Banking crises are indeed extremely harmful for economic performance. The cost of crises is higher in countries with bad institutions, as well as in the closed ones, while they have less impact in liberalized economies and in countries with higher quality of institutions. The effect of banking crises on growth is mainly a direct one, even though we show that feedbacks on credit market development are also possible.

The positive effects of financial liberalization are robust to different definition. In fact, we also show a positive relation between equity market liberalization and growth. Our results, consistent with Bekaert et al.(2004), point towards a direct effect of equity market integration. However, equity market openness and banking crises have strong opposite effects but do not interact. This evidence can be partly reconciled with the mechanism

²⁰Demirguc-Kunt and Detragiache (1998) also show that financial liberalization tend to push financial development while financial fragility slows down the process.

proposed by Tornell et al. (2004). In fact, firms that rely on credit may be severely hurt by banking crises, and find it difficult to shift abruptly to equity financing, even if they can sell shares on the international market. If instead they have free access to international credit markets, they might raise funds more easily there, and thus suffer less from domestic crises.

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| Table A. Countries, Financial Liberalization and Growth | | | | | | | | | | | |
|---|--------|--------|------|------|--------|----------------|--------|--------|------|------|--------|
| Country | #opIMF | #opBHL | #bc2 | #bc1 | Growth | Country | #opIMF | #opBHL | #bc2 | #bc1 | Growth |
| Algeria | 0 | 0 | 2 | 0 | 1.192 | Kenia | 0 | 1 | 9 | 4 | 0.377 |
| Argentina | 3 | 1 | 10 | 0 | 0.497 | Korea | 0 | 1 | 3 | 0 | 5.828 |
| Australia | 12 | 0 | 0 | 4 | 2.021 | Lesotho | 0 | 0 | 0 | 12 | 1.545 |
| Austria | 5 | 0 | 0 | 0 | 2.296 | Malawi | 0 | 0 | 0 | 0 | 1.237 |
| Bangladesh | 0 | 1 | 10 | 0 | 2.174 | Malaysia | 21 | 1 | 3 | 4 | 4.020 |
| Barbados | 0 | 0 | 0 | 0 | 2.664 | Mali | 0 | 0 | 3 | 0 | 0.539 |
| Belgium | 21 | 0 | 0 | 0 | 2.039 | Mauritius | 0 | 1 | 0 | 1 | 4.257 |
| Benin | 0 | 0 | 3 | 0 | 0.768 | Mexico | 7 | 1 | 15 | 0 | 0.887 |
| Bolivia | 16 | 0 | 9 | 0 | -0.295 | Mozambique | 0 | 0 | 9 | 0 | -2.361 |
| Botswana | 0 | 1 | 0 | 2 | 5.102 | Nepal | 0 | 0 | 1 | 0 | 1.959 |
| Brasil | 0 | 1 | 7 | 0 | 1.200 | Netherlands | 19 | 0 | 0 | 0 | 1.960 |
| Cameroon | 0 | 0 | 11 | 0 | 0.132 | New Zealand | 12 | 1 | 0 | 4 | 0.802 |
| Canada | 21 | 0 | 3 | 0 | 1.844 | Nicaragua | 3 | 0 | 11 | 0 | -4.073 |
| Central Africa | 0 | 0 | 24 | 0 | -2.805 | Niger | 1 | 0 | 17 | 0 | -1.321 |
| Chile | 0 | 1 | 7 | 0 | 3.459 | Norway | 1 | 0 | 7 | 0 | 2.704 |
| Colombia | 0 | 1 | 6 | 0 | 1.543 | Pakistan | 0 | 1 | 0 | 0 | 2.729 |
| Congo | 0 | 0 | 8 | 0 | 1.531 | Panama | 21 | 0 | 2 | 0 | 1.435 |
| Costa Rica | 3 | 0 | 1 | 6 | 0.805 | Papua N Guinea | 0 | 0 | 0 | 11 | -0.851 |
| Cyprus | 0 | 0 | 0 | 0 | 5.968 | Paraguay | 2 | 0 | 5 | 0 | 1.673 |
| Denmark | 8 | 0 | 0 | 6 | 1.838 | Peru | 9 | 1 | 8 | 0 | -0.697 |
| Dominican Rep | 0 | 0 | 0 | 0 | 2.722 | Philippines | 0 | 1 | 9 | 0 | 0.736 |
| Ecuador | 17 | 1 | 9 | 0 | -0.045 | Portugal | 3 | 1 | 0 | 0 | 3.042 |
| Egypt | 0 | 1 | 5 | 5 | 3.661 | Rwanda | 0 | 0 | 0 | 9 | 0.084 |

| Table A (cont'd). Countries, Financial Liberalization and Growth | | | | | | | | | | | |
|--|--------|--------|------|------|--------|-------------------|--------|--------|------|------|--------|
| Country | #opIMF | #opBHL | #bc2 | #bc1 | Growth | Country | #opIMF | #opBHL | #bc2 | #bc1 | Growth |
| El Salvador | 0 | 0 | 1 | 0 | -0.036 | Senegal | 0 | 0 | 4 | 0 | 0.003 |
| Fiji | 0 | 0 | 0 | 0 | 1.216 | Sierra Leone | 0 | 0 | 10 | 0 | -2.047 |
| Finland | 5 | 0 | 4 | 0 | 2.007 | Singapore | 18 | 0 | 0 | 1 | 5.486 |
| France | 6 | 0 | 0 | 2 | 1.843 | South Africa | 0 | 1 | 0 | 12 | -0.053 |
| Gambia | 5 | 0 | 0 | 7 | -0.310 | Spain | 2 | 1 | 9 | 0 | 1.852 |
| Germany | 21 | 0 | 0 | 3 | 2.095 | Sri Lanka | 0 | 1 | 5 | 0 | 2.677 |
| Ghana | 0 | 1 | 8 | 3 | 0.212 | Sweden | 3 | 0 | 1 | 0 | 1.404 |
| Greece | 0 | 1 | 0 | 5 | 1.253 | Switzerland | 4 | 0 | 0 | 0 | 0.968 |
| Guatemala | 12 | 0 | 0 | 4 | 0.485 | Syria | 0 | 0 | 0 | 0 | 1.892 |
| Haiti | 0 | 0 | 0 | 0 | 4.066 | Thailand | 0 | 1 | 8 | 0 | 4.765 |
| Honduras | 8 | 0 | 0 | 0 | 0.098 | Togo | 0 | 0 | 3 | 0 | -0.967 |
| Hong Kong | 21 | 0 | 0 | 6 | 4.622 | Trinidad & Tobago | 2 | 1 | 0 | 12 | 1.620 |
| Iceland | 0 | 1 | 0 | 3 | 2.158 | Tunisia | 0 | 1 | 0 | 5 | 2.483 |
| India | 0 | 1 | 0 | 7 | 3.298 | Turkey | 0 | 1 | 4 | 1 | 1.688 |
| Indonesia | 21 | 1 | 3 | 0 | 3.801 | Uganda | 0 | 0 | 6 | 0 | 1.719 |
| Iran | 3 | 0 | 0 | 0 | 0.504 | United Kingdom | 17 | 0 | 0 | 22 | 2.073 |
| Ireland | 4 | 0 | 0 | 0 | 4.324 | United States | 21 | 0 | 0 | 8 | 2.404 |
| Israel | 0 | 1 | 7 | 0 | 1.676 | Uruguay | 15 | 0 | 4 | 0 | 1.723 |
| Italy | 6 | 0 | 0 | 6 | 2.273 | Venezuela | 9 | 1 | 2 | 5 | -1.046 |
| Jamaica | 0 | 1 | 6 | 0 | -0.268 | Zaire | 0 | 0 | 0 | 0 | -5.585 |
| Japan | 16 | 1 | 9 | 0 | 2.528 | Zambia | 0 | 0 | 1 | 0 | -1.818 |
| Jordan | 0 | 1 | 0 | 2 | 2.141 | Zimbabwe | 0 | 1 | 5 | 0 | 0.200 |

| Table B. Variables: definitions and sources | | | |
|---|--|-----------------|---------------------------------|
| Variable | Definition | Availability | Sources |
| <i>y</i> | Beginning of period real per capita GDP | yearly, 1975-99 | Penn World Tables 6.1 |
| <i>sec 25</i> | Percentage of population aged 25 or above with some secondary education | 5-year, 1975-99 | Barro and Lee (2001) |
| <i>grpop</i> | average yearly population growth rate | yearly, 1975-99 | Penn World Tables 6.1 |
| <i>gov</i> | government share of <i>y</i> | yearly, 1975-99 | Penn World Tables 6.1 |
| <i>inv</i> | investment share of <i>y</i> | yearly, 1975-99 | Penn World Tables 6.1 |
| <i>privo</i> | Private credit by deposit money banks and other financial institutions to GDP | yearly, 1975-99 | Beck et al. (2003) |
| <i>opIMF</i> | Equals 0 if restrictions on capital account transactions are in place, 1 otherwise. <i>n</i> -year period average | yearly, 1975-99 | AREAER, IMF |
| <i>opBHL</i> | Equals 1 ever since the year of official equity market liberalization, 0 elsewhere. <i>n</i> -year period average | yearly, 1980-99 | Bekaert et al. (2003) |
| <i>Bcr</i> | Equals 2 if systemic banking crises, 1 if non-systemic crises, 0 if no crises have occurred in the year. | yearly, 1975-99 | Caprio and Klingebiel (2003) |
| <i>Bcr012</i> | Equals 2 if systemic banking crises, 1 if non-systemic crises, 0 if no crises have occurred in the period | | CK (2003) |
| <i>Bcr012av</i> | Average of <i>Bcr</i> over the period | | CK (2003) |
| <i>GADP</i> | Government anti-diversion policy index. Accounts for: law and order, bureaucratic quality, risk of expropriation, corruption, government repudiation of contracts. Values in [0,1] | average 1986-95 | Hall and Jones (1999) |
| <i>LDC</i> | Dummy for developing countries | | WDI |
| <i>eff_jud</i> | Assessment of the efficiency and integrity of the legal environment as it affects business, particularly foreign firms. Values in [0,10] | average 1980-83 | La Porta et al (2003), from ICR |

| Table 1. Financial Liberalization, Banking Crises, Financial Development and Growth | | | | | |
|--|----------------------|----------------------|---------------------|-------------------------|-----------------------------|
| Mean equality tests - 90 countries | | | | | |
| | Open vs Closed CA | Open vs Closed SM | BC vs No BC | Systemic BC vs No BC | Non-systemic BC vs No BC |
| Growth | .008 *** (.002) | .016 *** (.002) | -.019 *** (.003) | -.023 *** (.003) | -.05 (.005) |
| Financial Development | .034 *** (.009) | .039 *** (.007) | -.039 *** (.011) | -.057 *** (.017) | -.001 (.011) |
| Bank Crises | .009 (.025) | -.057 ** (.025) | | | |
| Systemic BC | -.098 *** (.018) | -.099 *** (.021) | | | |
| Non-Systemic BC | .107 *** (.021) | .043 *** (.017) | | | |
| Period | 1975-99 | 1980-99 | 1975-99 | 1975-99 | 1975-99 |
| This table reports the differences in mean between treated (open, bank crisis) and control (closed, no bank crisis) groups, and their standard errors (in parenthesis). *** and ** indicate rejection of the null of zero-difference at 1 and 5 % significance level. The test is performed on annual data for the countries in Table A. The variables of interest are the growth rate of real per capita GDP, the growth rate of credit to the private sector, and the 0-1 indicators of occurrence of bank crises. | | | | | |

| Table 2. Financial Liberalization, Bank Crises and Growth | | | | | | | | |
|---|-----------------------|------------------------|------------------------|------------------------|-----------------------|------------------------|------------------------|------------------------|
| Dynamic Panel Data - System GMM | | | | | | | | |
| | GMM | GMM | GMM | GMM | GMM | GMM | GMM | GMM |
| <i>y_{t-5}</i> | .954 (.036) | .929 (.034) | .933 (.033) | .906 (.034) | .972 (.035) | .946 (.032) | .946 (.032) | .923 (.037) |
| sec 25 | -.044 (.025) | -.016 (.028) | -.021 (.028) | -.015 (.027) | -.045 (.032) | -.004 (.029) | -.003 (.029) | -.002 (.029) |
| <i>grp_{pop}</i> | .317 (.2.311) | -1.284 (2.178) | -1.401 (2.101) | -.998 (2.014) | 1.563 (2.464) | 1.156 (2.168) | 1.142 (2.08) | 1.136 (2.201) |
| <i>gov</i> | -.002 (.002) | .001 (.002) | .001 (.002) | .001 (.002) | -.001 (.002) | .002 (.002) | .002 (.002) | .002 (.002) |
| <i>inv</i> | .015 (.002) | .014 (.002) | .014 (.002) | .013 (.002) | .015 (.002) | .013 (.002) | .014 (.002) | .013 (.002) |
| <i>privo</i> | | | | <i>.086</i> (.050) | | | | <i>.052</i> (.057) |
| <i>opIMF</i> | .037 (.046) | .087 (.041) | .027 (.044) | .055 (.040) | | | | |
| <i>opBHL</i> | | | | | .012 (.006) | .013 (.006) | .011 (.007) | .012 (.006) |
| <i>Bcr012</i> | | -.041 (.018) | -.044 (.017) | -.043 (.016) | | -.051 (.016) | -.054 (.019) | -.053 (.015) |
| <i>opIMF * Bcr012</i> | | | <i>.064</i> (.039) | | | | | |
| <i>opBHL * Bcr012</i> | | | | | | | .002 (.006) | |
| Countries | 90 | 89 | 89 | 89 | 82 | 81 | 81 | 81 |
| Period | 1975-99 | 1975-99 | 1975-99 | 1975-99 | 1980-99 | 1980-99 | 1980-99 | 1980-99 |
| <i>m</i> ₂ | .246 | .119 | .105 | .100 | .264 | .201 | .200 | .197 |
| Sargan | .418 | .635 | .677 | .713 | .160 | .381 | .541 | .660 |
| System-GMM estimates. Dependent variables: log and log-difference of real per capita GDP. Regressors are log and log-differences of: lagged real per capita GDP, secondary attainment, government and investments share of GDP, indicators of financial liberalization and bank crises. Instruments: lagged levels for differences, lagged differences for levels. Two-steps estimations. Coefficients and standard errors (in parenthesis) are from the first step. 5 and 10 per cent significance coefficients in bold and italics. P-values for Sargan overidentification test and <i>m</i> ₂ test for second-order serial correlation of residuals are from the second step. | | | | | | | | |

| Table 3. Capital Account Liberalization, Bank Crises and Growth | | | | | | |
|--|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Dynamic Panel Data - System GMM - Interactions | | | | | | |
| | GMM | GMM | GMM | GMM | GMM | GMM |
| <i>opIMF</i> | .099 (.045) | .082 (.041) | .127 (.052) | <i>.074</i> (.043) | .114 (.054) | <i>.078</i> (.044) |
| <i>Bcr012</i> | -.049 (.017) | -.049 (.020) | -.047 (.018) | -.144 (.052) | -.049 (.018) | -.060 (.019) |
| <i>opIMF * privol_l</i> | <i>-.115</i> (.06) | | | | | |
| <i>Bcr012 * privo_h</i> | | .001 (.031) | | | | |
| <i>opIMF * GADP_l</i> | | | -.214 (.149) | | | |
| <i>Bcr012 * GADP_h</i> | | | | .134 (.068) | | |
| <i>opIMF * LDC</i> | | | | | -.062 (.100) | |
| <i>Bcr012 * (1 - LDC)</i> | | | | | | .058 (.043) |
| Countries | 89 | 89 | 88 | 88 | 89 | 88 |
| Period | 1975-99 | 1975-99 | 1975-99 | 1975-99 | 1975-99 | 1975-99 |
| m_2 | .108 | .091 | .08 | .237 | .091 | .09 |
| Sargan | .670 | .623 | .568 | .300 | .487 | .405 |
| System-GMM estimates. Dependent variables: log and log-difference of real per capita GDP. Regressors are log and log-differences of: lagged real per capita GDP, secondary attainment, government and investments share of GDP, capital account liberalization, bank crises and interactions with financial development, insitutional quality, economic development. Subscripts l and h indicate that the variable is below and above cross-sectional average. Instruments: lagged levels for differences, lagged differences. Two-steps estimations. Coefficients and standard errors (in parenthesis) are from the first step. 5 and 10 per cent significant coefficients in bold and italics. P-values for Sargan overidentification test and m_2 test for second-order serial correlation of residuals are from the second step. | | | | | | |

| Table 3b. Equity Market Liberalization, Bank Crises and Growth | | | | | | |
|--|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Dynamic Panel Data - System GMM - Interactions | | | | | | |
| | GMM | GMM | GMM | GMM | GMM | GMM |
| <i>opBHL</i> | .012 (.006) | .010 (.005) | -.005 (.009) | .008 (.006) | .006 (.011) | .010 (.005) |
| <i>Bcr012</i> | -.048 (.015) | -.067 (.020) | -.056 (.016) | -.195 (.052) | -.053 (.016) | -.063 (.015) |
| <i>opBHL * privo_l</i> | -.006 (.007) | | | | | |
| <i>Bcr012 * privo_h</i> | | <i>.042</i> (.026) | | | | |
| <i>opBHL * GADP_l</i> | | | .057 (.037) | | | |
| <i>Bcr012 * GADP_h</i> | | | | .148 (.064) | | |
| <i>opBHL * LDC</i> | | | | | .005 (.012) | |
| <i>Bcr012 * (1 - LDC)</i> | | | | | | .056 (.035) |
| Countries | 81 | 81 | 80 | 80 | 81 | 81 |
| Period | 1980-99 | 1980-99 | 1980-99 | 1980-99 | 1980-99 | 1980-99 |
| m_2 | .151 | .208 | .218 | .527 | .194 | .218 |
| Sargan | .486 | .458 | .245 | .342 | .285 | .306 |
| System-GMM estimates. Dependent variables: log and log-difference of real per capita GDP. Regressors are log and log-differences of: lagged real per capita GDP, secondary attainment, government and investments share of GDP, capital account liberalization, bank crises and interactions with financial development, insitutional quality, economic development. Subscripts <i>l</i> and <i>h</i> indicate that the variable is below and above cross-sectional average. Instruments: lagged levels for differences, lagged differences. Two-steps estimations. Coefficients and standard errors (in parenthesis) are from the first step. 5 and 10 per cent significant coefficients in bold and italics. P-values for Sargan overidentification test and m_2 test for second-order serial correlation of residuals are from the second step. | | | | | | |

| Table 4. Capital Account Liberalization, Bank Crises and Financial Development - Dynamic Panel Data - System GMM | | | | | |
|---|-----------------------|-----------------------|------------------------|-----------------------|------------------------|
| | GMM | GMM | GMM | GMM | GMM |
| <i>privo</i> _{<i>t</i>-1} | .725 (.078) | .709 (.078) | .731 (.080) | .719 (.086) | .734 (.077) |
| <i>opIMF</i> | .516 (.134) | .654 (.199) | .469 (.158) | .584 (.217) | .399 (.154) |
| <i>Bcr</i> 012 | .02 (.063) | .025 (.063) | <i>-.390</i> (.224) | .021 (.063) | <i>-.073</i> (.069) |
| <i>opIMF</i> * <i>GADP</i> _{<i>l</i>} | | -.618 (.439) | | | |
| <i>Bcr</i> 012 * <i>GADP</i> _{<i>h</i>} | | | .602 (.313) | | |
| <i>opIMF</i> * <i>LDC</i> | | | | -.165 (.342) | |
| <i>Bcr</i> 012 * (1 - <i>LDC</i>) | | | | | .528 (.249) |
| Countries | 79 | 78 | 78 | 79 | 79 |
| Period | 75-99 | 75-99 | 75-99 | 75-99 | 75-99 |
| <i>m</i> ₂ | .216 | .275 | .384 | .276 | .185 |
| Sargan | .394 | .501 | .451 | .432 | .411 |
| System-GMM estimates. Dependent variables: log and log-difference of private credit to GDP. Regressors are log and log-differences of: lagged private credit to GDP, capital account liberalization, bank crises and interactions with financial development, insitutional quality, economic development. Subscrips <i>l</i> and <i>h</i> indicate that the variable is below and above cross-section average. Instruments: lagged levels for differences, lagged differences for levels. Two-steps estimations. Coefficients and standard errors (in parenthesis) are from the first step. 5 and 10 per cent significant coefficients in bold and italics. P-values for Sargan test and <i>m</i> ₂ test for second-order serial correlation of residuals from the second. | | | | | |

| Table 5. Financial Liberalization, Bank Crises and Growth | | | | | | |
|---|-----------------------|-------------------------|----------------------------------|------------------------|-------------------------|----------------------------------|
| Robustness analysis | | | | | | |
| | <i>opIMF</i> | <i>Bcr012av</i> | <i>opIMF*</i> <i>Bcr012av</i> | <i>opBHL</i> | <i>Bcr012av</i> | <i>opBHL*</i> <i>Bcr012av</i> |
| <i>sys – GMM</i> | .084 (.039) | –.037 (.024) | | .012 (.006) | – .049 (.022) | |
| <i>sys – GMM</i> | .022 (.043) | – .048 (.025) | <i>.133</i> (.072) | <i>.014</i> (.0086) | – .046 (.007) | –.002 (.009) |

OLS rows replicate Table 1 (columns 2-3, 6-7) with *Bcr012av* instead of *Bcr012*, FE rows Table 2 (columns 2-3, 6-7), GLS Table 2b (columns 2-3, 6-7), diff-GMM Table 3 (columns 2-3, 6-7), sys-GMM Table 4 (columns 2-3, 6-7). Standard errors within parenthesis, 5% and 10% significant coefficients respectively in bold and italics.

| Table 6. Capital Account Liberalization, Bank Crises Financial Development and Growth | | | | |
|--|-------------------------|-----------------------|--------------------------|-----------------------|
| | Growth | Growth | FD | FD |
| <i>opIMF</i> | .025 (.040) | .061 (.027) | .873 (.118) | .444 (.118) |
| <i>Bcr012</i> | – .034 (.013) | –.040 (.026) | .109 (.093) | –.126 (.125) |
| <i>opIMF * eff_jud_t</i> | .093 (.083) | | – 1.001 (.448) | |
| <i>Bcr012 * eff_jud_h</i> | | .019 (.043) | | .500 (.184) |
| Estimates in column 1-2 replicate columns 4-5 of Table 5, with <i>eff_jud</i> instead of <i>GADP</i> ; column 3-4 replicate columns 2-3 of Table 6. Standard errors in parenthesis, 5 and 10 per cent significant coefficients respectively in bold and italics. | | | | |