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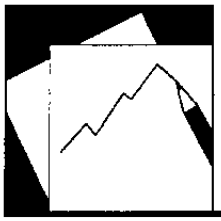

IMF Working Paper

WTO Financial Services Commitments: Determinants and Impact on Financial Stability

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WTO Financial Services Commitments: Determinants and Impact on Financial Stability

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Abstract

The paper investigates the factors that have influenced WTO members to take on their chosen level of liberalization commitments in the framework of liberalization of trade in financial services and the impact of such commitments on financial sector stability. The most important factors are economic growth, current account, trends in banking sector development, policy restrictiveness, and peer group effects. The econometric evidence suggests that more liberal commitments may be associated with greater vulnerability to currency and banking crises—most likely a short-term effect, which should be mitigated with time through increased market efficiency and better resource allocation.

JEL Classification Numbers: F13, G20, C25

Keywords: Financial services liberalization commitments, choice of commitments, banking and currency crises, financial instability, extreme bounds analysis, WTO.

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I. Introduction

1. In recent years, many countries, especially in Asia and Latin America, have been hit by financial crises, in the form of banking problems or exchange rate instability. Research to date has suggested a number of explanations for these crises: unfavorable macroeconomic conditions, unsustainable or inconsistent monetary, fiscal or industrial policy, unsound banking practices or weak supervision, short-term capital flows, speculation and contagion: see Dornbusch (2001) and IMF (1999, 2000) for recent surveys. At the same time, there has been a secular trend toward capital account liberalization and capital account convertibility (IMF, 1998), and extensive negotiations to liberalize trade in financial services have taken place (see Valckx (2002) for a brief historical overview, and Kireyev (2002a) for a detailed analysis of the WTO rules). A major achievement in the latter respect has been the General Agreement on Trade in Services (GATS) under the aegis of the World Trade Organization (WTO).

2. In contrast to the extensive work on capital account liberalization, the question of whether the level of financial services commitments under GATS has had any influence on the occurrence of financial sector instability or exchange rate crises, has received little systematic attention. Given the importance of the financial sector in promoting economic growth and its special role in intermediating between savings and investments, it is important to know the answer to this question. Of related interest is another neglected issue, namely the question of what determines a country's level of commitments in financial services. It would be interesting to identify the variables, be they economic variables such as GDP per capita or inflation, legal or other. Both issues are examined in this paper.

3. To anticipate the findings, the evidence presented here suggests that the level of commitments can be explained reasonably well by a set of macroeconomic, banking, policy and institutional variables. Furthermore, it appears that financial instability, especially during the turbulent period of 1997–99, was greater in more open countries with higher and more liberal financial sector commitments. Using a robust estimation procedure, the econometric evidence weakly supports this view. Probably reflecting foreign contagion effects, more liberal commitments on commercial presence have systematically increased the likelihood of banking crises prompted by external factors. At the same time, commitments, biased towards cross-border supply of financial services seem to increase the risk of a currency crisis as they are associated with more volatile capital flows. Hence, the evidence suggests that a better resource allocation framework created by a more liberal financial system should be safeguarded, in particular in the short run, against possible negative spillovers and international crises contagion by means of sound domestic macroeconomic and prudential policies.

II. Financial Liberalization Commitments: Theoretical Considerations

4. This section discusses the role and benefits of trade liberalization and specific financial services liberalization commitments. Some preliminary thoughts are given towards the development of a conceptual framework that relates financial liberalization commitments to the risk of a financial crisis.

5. First, trade liberalization in (financial) services can be beneficial, since it not only stimulates trade in (financial) services itself, but can also facilitate trade in goods, through the inputs from (financial) services industries required. Conversely, trade liberalization—through a reduction of regulations governing the international provision of services—can stimulate industry fragmentation and hence increase trade. As argued by Deardorff (2000), separating production processes across locations (i.e., fragmentation) requires additional service inputs (transportation, insurance, finance, etc.), a trend that is facilitated when the services market is open to international competition. Furthermore, there is ample empirical evidence documenting the positive effects of deregulation, as a particular form of liberalization, on macroeconomic performance.[2]

6. Second, financial services commitments constitute legally binding engagements under WTO rules, and therefore contribute to the creation of stable, transparent, and minimally enforceable policies. In addition, these commitments can be seen as a way of signaling a country's seriousness to potential foreign investors (Tamirisa et al., 2000). In this respect, Claessens and Laeven (2002) find that in a weaker legal environment a firm will get less external financing, and thus invest less, and also invest less in intangible assets, which negatively affects the growth in value added.

7. At the theoretical level, there are sound arguments why commitments can be considered as positive for financial and economic growth and stability. Kydland and Prescott (1977) find that clearly established and time-consistent rules allow economic agents to benefit from greater stability, certainty and transparency in their decision making. In the absence of clear rules (i.e., under discretion), an economy may suffer from greater uncertainty (possibly due to credibility problems) and, as such, may be more vulnerable to financial crises.[3] In this context, clear commitments in financial services can be seen as a

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[2] Among others, Koedijk and Kremers (1996) found that in Europe a more liberal product market regulation positively affected per capita growth, labor, and total factor productivity growth. Gwartney, Lawson and Holcombe (1999) found that a higher degree of economic freedom raises growth, for a sample of 115 countries. De Haan and Sturm (2000) noted that changes in economic freedom were what matters, rather than the absolute level. Goff (1996) found that for the United States a higher regulatory intensity reduces growth. Dutz and Hayri (1998) found that a pro-competitive policy environment fosters higher per capita growth.

[3] The conclusions may change to some extent, according to the specific elements that cause uncertainty and instability in a given economic setup.

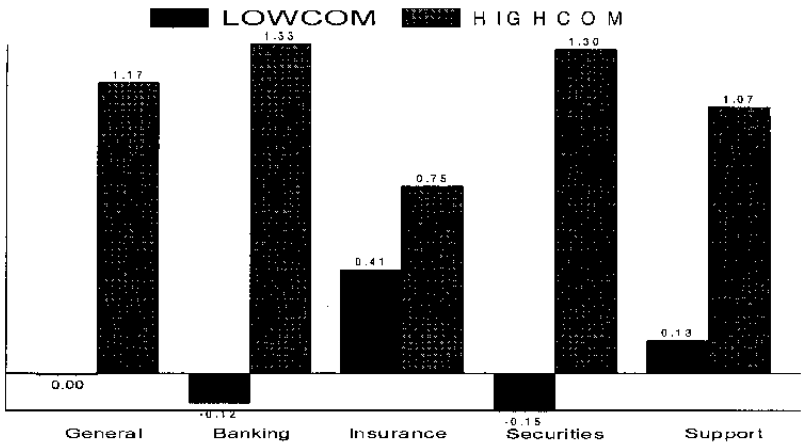
device for communicating a country's adherence to a credible rules-based financial sector regime.

8. Dixit (1992) shows that commitments can also be incorporated more directly into economic models from an investment under uncertainty perspective: a higher level of commitments directly reduces aggregate uncertainty, which is beneficial for investments that otherwise would be delayed until the uncertainty is resolved. With respect to financial sector commitments, a low level of commitments would leave international financial service providers with a great deal of uncertainty, e.g., about the scope of permitted activities, market access restrictions, different national treatment, and exposure to political regime shifts. Therefore, international financial service providers may wait to increase their participation in a country until aggregate uncertainty is reduced through clear and high levels of commitments. Liberalization and market opening may have benefits in the form of extended diversification and global (re)insurance possibilities for economic agents obtaining access to a larger pool of international liquidities and also lower and more stable prices of financial products and services. However, risks may also increase since the operations of these institutions are more difficult to regulate and supervise, and enterprise risks may become more complex to manage.[4]

9. To give greater credence to this mechanism, it is instructive to note that the presence of international financial institutions increased in high-commitment countries, but did not—or increased to a lesser extent—in low-commitment countries, and that international participation increases in line with the level of commitments (quantification of the commitments itself will be discussed below). In Figure 1, the change in financial sector openness (proxied by the value of financial services exports and imports as a percent of GDP) is depicted for low- and high-commitment countries (as given in Valckx, 2002) over the period 1995–99 versus 1990–94. As can be seen, the increase is pronounced in high-commitment countries, but less so in low-commitment countries. Figure 2 compares the level of financial services openness; it shows that, in general, higher commitments are associated with greater financial services openness.

[4] Surveys on the costs and benefits of financial services trade liberalization point out these opposite effects and also warn that sound and supportive macroeconomic, monetary and supervisory policies should be in place in order to reap the full benefits of financial sector liberalization, see IMF (1998), Tamirisa et al. (2000).

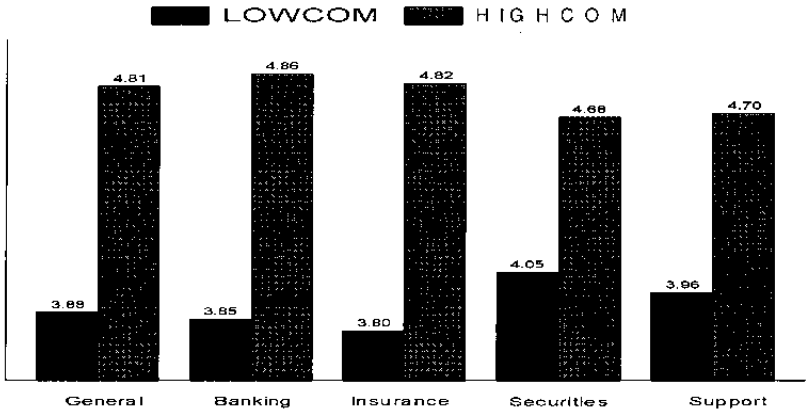
Figure 1. Changes in Financial Openness for Low- and High-Commitment Countries, 1995–99 minus 1990–94



Source: Author's calculations based on IMF *International Financial Statistics* (balance of payments statistics) and Valckx (2002).

Notes: Low- and high-commitment countries (LOWCOM and HIGHCOM) were identified as their commitment measures were below or above the median value, respectively. Financial sector commitments are presented for banking, insurance, securities and support services. "General" refers to the average of the four sectors. Financial services openness is measured by imports and exports of financial services and insurance payments as a percent of GDP. The changes compare the period average for 1995–99 and 1990–94.

Figure 2. The level of Financial Openness for Low- and High-Commitment Countries, 1999



Source: Author's calculations based on IMF *International Financial Statistics* (balance of payments statistics) and Valckx (2002).

Notes: Low- and high-commitment countries (LOWCOM and HIGHCOM) were identified as their commitment measures were below or above the median value, respectively. Financial sector commitments are presented for banking, insurance, securities and support services. "General" refers to the average of the four sectors. Financial services openness is measured by imports and exports of financial services and insurance payments as a percent of GDP for the year 1999.

10. Another effect of financial services commitments may come through the level of protectionism and inefficiency in domestic financial service sectors. If a country agrees to adopt high standards of liberalization commitments, this may result in serious problems for the local financial service providers that are in a weaker position than their, presumably, more efficient international competitors. Vice versa, it could well be the case that political economy arguments favor less liberalization commitments for countries with a relatively weak domestic banking sector.

11. Finally, it is important to note that WTO financial services commitments in themselves do not directly affect financial sector vulnerability and exchange rate stability. Rather, it is actual policies that do so. However, if market participants view the WTO commitments as credible signals, then indirectly the commitments may provide relevant information about actual policy choices and therefore have an impact on stability. To illustrate this effect, and using the quantification of commitments from Valckx (2002), Table 1 displays the correlations between liberalization commitments and actual policy choices as captured by indicators of economic freedom from Heritage Foundation/Wall Street Journal. The indicators of economic freedom are scaled from 1 to 5, with 5 being most restrictive. The WTO commitments are scaled from 0 to 1, with 1 being most liberal, or refer to principal components (PC) extracted from the former scores.[5] The finding of mildly negative correlations is in line with the signaling effect of the commitments for actual policies. In particular, the very high and negative correlations between the restrictiveness indicators and PC2 capture a negative bias towards cross-border supply of services (mode 1): countries with very restrictive financial policies will generally have low commitments with respect to consumption abroad and commercial presence.[6] The (weakly positive) correlations of the policy indicators with PC3 seem to indicate that countries with stronger commitments

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[5] PC*i* (*i*=1,2,3) are the three most important principal components extracted from 39 commitments across 13 types of financial services considering modes of supply 1, 2 and 3 for 92 countries (the European Union is taken as a single observation). PC1 is a measure of the overall level of liberalization commitments, PC2 gives a modal bias towards supply under mode 3, and PC3 is a measure of bias towards insurance services commitments relative to other financial service sectors. See Valckx (2002, pp. 3-7 and 23-25) for a more detailed discussion. Heritage Foundation indicators refer to policy restrictiveness in banking, capital flows, property rights, regulation, trade restrictions, and monetary policy. Composite is an unweighted average of those six categories.

[6] Trade in services in general can take on four different forms (modes of supply). The two most important forms are cross-border supply (mode 1), which acts like traditional international trade flows, and commercial presence (mode 3), which involves foreign direct investment. In addition, there is consumption abroad (mode 2), when a resident purchases a financial service in the territory of another country, and supply through the presence of natural persons (mode 4), under the form of independent visiting financial consultants or bank staff temporarily allocated to a branch in the territory of another country.

for insurance than for other financial service sectors, generally also have slightly more liberal financial policies.

Table 1. Correlations Between Commitments and Actual Policy Choices

(Heritage Foundation policy restrictiveness indicators)

	Composite	Banking	Capital flows	Property Rights	Regulation	Trade Restriction	Monetary Policy
Average	-0.219	-0.054	0.014	-0.195	-0.201	-0.338	-0.136
Banking	-0.011	0.154	0.206	-0.031	-0.013	-0.174	-0.057
Insurance	-0.390	-0.260	-0.291	-0.295	-0.345	-0.353	-0.234
Securities	-0.162	-0.027	0.057	-0.160	-0.153	-0.261	-0.110
Support	-0.234	-0.094	0.012	-0.212	-0.218	-0.388	-0.097
PC1	-0.212	-0.041	0.021	-0.194	-0.190	-0.328	-0.140
PC2	-0.611	-0.551	-0.540	-0.510	-0.476	-0.449	-0.338
PC3	0.123	0.083	0.171	0.068	0.150	0.015	0.100

Notes: This table reports the correlations between financial services commitments (defined in Valckx, 2002) and Heritage Foundation indicators of policy restrictiveness (www.heritage.com). Commitments are calculated from banking, insurance, securities and support sector services, and averaged over all modes of supply. PCi, (i=1,2,3) refers to the first three principal components (see footnote 5).

III. Determinants of WTO Financial Services Commitments

12. An important question is whether there are any systematic factors that may have influenced the negotiations and the final agreement on the Fifth Protocol. If there are statistically significant determinants of a country's level of financial services commitments, then, clearly, there are costs and benefits involved in adopting a certain set of commitments, and deviating from the commitments would tend to be very costly.[7] Furthermore, if there are systematic determinants, one can use that structure to gauge the potential for further liberalization efforts.

13. This issue can be investigated more formally using ordered-choice models. In such models, the dependent variable is an ordered discrete variable whose value represents the countries' level of commitments (categories) from 1 to M. By considering a latent variable that linearly depends on the explanatory variables, the observed ranking is then modeled by assigning the estimates to the respective categories (depending on whether or not a specific, estimated, γ-threshold is exceeded). More formally, a latent variable y_i^* can be expressed as

[7] It would also imply that the actual level of commitments is higher than the "natural" level (i.e., absent any international agreements); see Chau and Kanbur (2001) for an elaboration of the argument in the context of labor standards.

$$y_i^* = x_i\beta' + \varepsilon_i \quad (1)$$

where ε are independent and identically distributed random variables, subscript i stands for country i, x_i is a set of explanatory variables, and β is the coefficient vector. The mapping from the unobserved y_i^* to the observed y_i commitment level for country i uses the rule

$$\begin{aligned} &y_i = 0 \quad \text{if} \quad y_i^* \quad \gamma_1 \\ &y_i = 1 \quad \text{if} \quad \gamma_1 < y_i^* \quad \gamma_2 \\ &\cdots \\ &y_i = M \ \text{if} \quad \gamma_M < y_i^* \end{aligned} \quad (2)$$

where γ_j denotes the threshold level j.

The probability functions that maps commitments onto the M classes are:

$$\begin{aligned} &P[y_i = 0 \mid x_i, \beta, \gamma] = \Phi(\gamma_1 \quad x_i\beta') \\ &P[y_i = 1 \mid x_i, \beta, \gamma] = \Phi(\gamma_2 \quad x_i\beta') \quad \Phi(\gamma_1 \quad x_i\beta') \\ &\cdots \end{aligned} \quad (3)$$

and $\quad P[y_i = M \mid x_i, \beta, \gamma] = 1 \quad \Phi(\gamma_M \quad x_i\beta')$

where $P[\cdot]$ is the probability that country i will choose commitment level j, j = 0,…, M; Φ is the cumulative normal distribution function in the case of a probit ordered-choice model, and other variables are defined above. The multinomial ordered-choice model maximizes the following log likelihood function, with respect to β and γ:

$$LogL(\beta,\gamma) = \sum_{i=1}^{N}\sum_{j=1}^{M} \log\left(P\left[y_i = j \mid x_i, \beta, \gamma\right]\right) 1(y_i = j) \quad (4)$$

with M the number of choices and N the number of countries, j denoting the level of liberalization commitments, y_i is the level of choice for country i, and 1(·) is an indicator function that takes the value 1 if the argument is true.[8]

14. To estimate the ordered-choice model, the data are partitioned using discrete classification measures of the sector averages of the financial services commitments. For the principal components, ordinary least squares (OLS) can be applied since the dependent variable is transformed into a continuous variable. The set of explanatory variables is described in more detail in Appendix III. The classification of countries across the [0,1] interval is given in Table 2: the largest number of countries are found in the low and medium categories of the table, with commitment scores below 0.20 and 0.60 yielding 40 to 50 and 70 to 90 percent of the cumulative distribution, respectively; accordingly, the high-commitment category (scores above 0.60 or 0.75) counts a much smaller number of observations. The insurance commitments scores are slightly different, in that the low category (scores below 0.20) accounts for only 30 percent of the observations; see also the distribution for PC3.

[8] See Greene (1999, pp. 875–79) for an in-depth overview of the technique.

Table 2. Classification of the Commitments Values for Financial Service Sectors

Service sectors Commitments*	Average	Bank	Insur.	Sec.	Support	PC1	PC2	PC3
[0.00,0.10]	19	20	16	37	28	15	4 (18)	5 (12)
[0.10,0.20]	19	17	13	10	9	15	5 (5)	3 (7)
[0.20,0.40]	16	13	31	7	8	19	34 (20)	33 (22)
[0.40,0.60]	21	22	22	22	15	16	39 (24)	49 (23)
[0.60,0.75]	8	11	6	6	15	13	9 (8)	1 (16)
[0.75,1.00]	9	9	4	10	17	14	1 (17)	1 (12)

Notes: This table tabulates the commitment values along the [0,1] interval as indicated. Insur.= insurance services and Sec.= securities services. The principal components (PC) measures use the following intervals: [-6,-4], [-4,-3], [-3,0], [0,3], [3,4], and [4,10]. The ranking in parentheses for PC2 and PC3 uses another interval range: [-6,-2], [-2,-1], [-1,0], [0,1], [1,2] and [2,6].

15. Tables 3 and 4 report the statistical results, using a partitioning of the average [0,1] scores in three categories: low, medium and high level of commitments, obtained from the combination of Table 2's cells in pairs. Table 5 reports the principal components OLS regression results. The selection of variables follows from a stepwise selection procedure, in which additional variables are included according to the size of the *z*-statistic, for those significant at the 5 percent level. In addition to macroeconomic determinants, the significance of institutional and fixed factors, viz., legal origins, economic freedom, political rights, main export category and peer effects (regional and income group effects), is examined. Theoretically, macroeconomic factors may account for the dynamic evolution of liberalization commitments over time and across countries, but political and institutional factors may be needed to control for different historical attitudes towards liberalization agreements. A positive coefficient for the ordered-choice model means that, ceteris paribus, a higher value of the variable will increase the probability that the country will be placed in a higher category. The full sample consists of 92 countries, but statistical deficiencies prevent the use of the full sample. The maximum feasible sample is 76 to 86 countries, depending on the series retained in the analysis. Because of concerns that the determination may be different in small island economies and least developed countries, the model is also run over a smaller sample of 68 countries made up of all countries with per capita income above US$1,000 and population above 1 million for 1997.[9]

16. The tables show that there are a number of significant factors that explain the level of countries' WTO commitments, for the whole sample and the sample without small countries, respectively. Broadly speaking, the liability position relative to the IMF quota, macroeconomic growth, balance of payments evolution and openness, population growth, banking variables, peer group effects, and policy restrictiveness indicators all seem to contribute to the explanation of the level of (some of) the financial services commitments. It is also clear that the composition of the group of statistically significant variables changes with the specific service sector commitments under examination. Statistics are generally

[9] See Milesi-Ferretti and Razin (1998), who raised this issue.

satisfactory, as evidenced by an R^2 between 0.25 and 0.60—which is typical in the context of cross-country regressions—and by the high likelihood ratio statistics. Classification measures suggest that misclassifications are very few. Furthermore, the classification into three categories is acceptable, given the statistical significance of the γ- thresholds, except for banking and securities services and PC3, where γ_2 and γ_3, respectively, are not significant.

17. The most important findings are as follows. Countries whose liabilities position against the IMF (in percent of the quota) increased over the years 1995–97 have typically enacted higher commitment levels. This effect is largely due to the impact of small countries, since the variable does not appear in Table 4. Long run (1991–97 or 1991–95) economic growth (of GDP per capita) has a statistically significant and negative effect, suggesting that countries with lower growth in general have higher commitments, in line with Valckx (2002, section 2.2): high-income countries have higher commitments but also have lower per capita growth rates. A positive short run growth over 1995-97, however, seems to have stimulated the larger countries (see Table 4) to adopt higher overall levels of financial sector commitments.

18. Countries whose current account openness increased between 1995 and 1997 seem to have been less keen on liberalizing financial services as a whole and banking in particular; this protectionist effect seems to be due to the small countries group, since it is only visible in Table 3.

19. The better the performance of the banking sector, in terms of increases in the dollar value of assets, deposits, or loans, the more likely it is that countries will adopt higher levels of liberalization commitments. Although the effect is most clearly reflected in Table 3, it also holds for the banking sector and support services commitments of large countries (suggested by the significance of the asset growth variable in Table 4). However, countries which were also subject to a banking crisis in 1995–96 (EIU_0 definition; see Section IV) subsequently chose a greater degree of liberalization (see the average category in Table 4 and insurance category in Tables 3 and 4).

Table 3. Determinants of the WTO Commitments: Ordered Choice Estimates

(Three classes, based on average commitment scores, full sample)

	All Sectors	Banking	Insurance	Securities	Support
Regressors	β (z-stat)	β (z-stat)	β (z-stat)	β (z-stat)	β (z-stat)
Macroeconomic					
LIAB/QUOTA UP	2.37 (4.97)	2.15 (4.68)	0.74 (2.06)	1.05 (2.98)	
GDPC growth	-0.16 (-3.41)	-0.15 (-3.28)	-0.34 (-2.92)	-0.10 (-2.11)	
GDPC short growth			0.24 (2.48)		
Openness ch.	-0.06 (-3.10)	-0.04 (-2.79)			
Current account ch.			0.006 (2.21)		
EXP gr.- IMP gr.					4.12 (3.28)
FDI/GDP ch.					0.16 (2.05)
Population growth		0.37 (2.48)			
Population/km^2 (log)					-0.30 (-2.14)
Banking (DMB)					
Deposits gr.	0.04 (2.66)			0.03 (2.73)	0.03 (2.47)
Assets gr.	0.02 (2.83)				0.01 (2.89)
Loans gr.		0.06 (3.86)			
Assets gr.-Loans gr.		0.02 (3.08)			
LOAN/DEPOSIT ch.		-0.51 (-2.54)			
EIU_0 banking crisis			1.13 (2.21)		
Institutional					
German law	-2.26 (-2.20)				
French law			-0.75 (-2.35)		
Service main export					-1.40 (-2.70)
Region/Income					
LAC	-2.47 (-5.40)	-1.85 (-4.78)		-1.23 (-3.56)	-2.54 (-4.73)
EAP			0.97 (2.02)		
OECD			-1.90 (-2.88)		
Policy/Freedom					
Trade	-0.60 (3.37)	-0.52 (-3.40)		-0.46 (-3.34)	
Banking	-0.66 (-2.72)				
(Trade)^2					-0.11 (-3.80)
(6 Financials)^2			-0.16 (-3.75)		
(ch. political rights)^2				0.08 (2.01)	
γ_1	-4.29 (-4.97)	-1.32 (-2.40)	-1.86 (-3.10)	-1.70 (-3.33)	-3.27 (-3.90)
γ_2	-2.03 (-2.83)	0.43 (0.83)	-0.91 (-1.52)	-0.36 (-0.76)	-2.08 (-2.60)
Regression stats					
McFadden R^2	0.421	0.379	0.334	0.222	0.406
LR test	72.6	66.3	52.5	37.8	66.6
Classification stats	*Act. Pred*	*Act. Pred*	*Act. Pred*	*Act. Pred*	*Act. Pred*
Rank 1	32 33	33 34	26 23	43 49	31 33
Rank 2	36 39	31 32	52 57	28 29	19 18
Rank 3	15 11	18 16	9 4	14 7	26 25

Notes: Table 3 reports ordered choice estimates (β-coefficients and z-scores) of the model in equation (1)-(4), obtained from a stepwise selection procedure. Statistical significance of the z-scores can be inferred from the standard normal distribution: 5 percent significance is at 1.96 and 1 percent significance is at 2.58. Regression statistics are McFadden $R^2 = 1\text{-}LogL/LogL_c$ with $LogL_c$ the maximized log likelihood with only the intercept terms, and a Likelihood Ratio (LR) test = $-2(LogL_c\text{-}LogL)$, which is χ^2 distributed with K degrees of freedom, K being the number of regressors included. The classification statistics compare actual commitment rankings (*Act*) with predicted rankings (*Pred*), where countries' commitments are classified under the category with the largest probability.

Explanatory variables refer to 1997 levels, percentage growth rates (gr.) or changes (ch.), respectively, and $(.)^2$ denote squared variables. Growth rates and changes are measured over the period 1995–97, unless otherwise indicated. Variables are expressed as percentages. A full account of all variables tested in the stepwise selection procedure is contained in Appendix I.

LIAB/QUOTA UP: a dummy variable that equals 1 if the ratio of a country's liabilities to (IMF) quota has risen, GDPC: growth of GDP per capita, Openness: exports (EXP) plus imports (IMP) of goods and services as a percent of GDP, FDI/GDP: the ratio of foreign direct investment to GDP. Banking variables are drawn from IFS deposit money bank (DMB) surveys. EIU0 banking crisis is a dummy variable that equals 1 when the country faced a crisis in 1995–96 (see Section IV and Appendix VI). German and French law: dummies that reflect the origin of the legal system. Dummy for main export category: services. Regional dummies for LAC: Latin America and Caribbean, EAP: East Asia and Pacific, and OECD. Policy/Freedom indicators are drawn from Heritage Foundation and Freedom House, respectively. The variable 6 Financials refers to the (squared) average of six financial policy (restrictiveness) indicators, viz. banking and finance, monetary policy, trade policy, capital flows and foreign investment, property rights, and regulation.

GDPC growth is measured over the period 1991–95 (all sectors and banking services) and 1991–97 (insurance, securities, support services and PC1). Short-term growth is GDPC growth over 1995–97. The change in political freedom and asset growth in support services commitments are measured over the period 1993–97.

Table 4. Determinants of the WTO Commitments: Ordered Choice Estimates

(Three classes, based on average commitments scores, excluding small countries)

Regressors	All Sectors β (z-stat)	Banking β (z-stat)	Insurance β (z-stat)	Securities β (z-stat)	Support β (z-stat)
Macroeconomic					
GDPC growth	0.27 (3.54)	-0.2 (-2.58)*		0.24 (3.64)	0.14 (2.26)
Level GDP (log)				0.36 (3.72)	0.23 (1.96)
Investment ratio	-0.11 (-3.39)			-0.09 (-3.12)	-0.07 (-2.54)
Inflation > 10%			-2.60 (-2.68)		
FDI/GDP ch.		-0.30 (-2.82)	0.27 (2.47)		
Population (log)	-0.28 (-1.99)				
Banking (DMB)					
Deposits (log)			-0.28 (-2.31)		
Assets gr.		0.03 (2.95)			0.02 (2.08)
RESERVE/ASSETS	-0.52 (-3.15)	-1.03 (-3.71)			
RESERVE/ASSETS ch.		0.04 (3.75)			
EIU banking crisis	1.53 (2.14)		2.01 (2.27)		
Institutional					
German law	-2.01 (-2.16)				
Region/Income					
LAC			-4.78 (-4.18)		-1.52 (-3.80)
EAP	1.80 (3.17)	1.03 (2.09)		1.10 (2.58)	
Non-OECD			-3.14 (-2.56)		
Policy/Freedom					
Trade	-0.61 (-3.33)				-0.62 (-3.68)
(Monetary policy)^2			0.24 (3.41)		
(All Financial)^2			-0.55 (-4.09)		
(Ch.political rights)^2		0.32 (3.40)			
γ_1	-8.19 (-3.01)	-1.50 (-3.41)	-7.18 (-3.79)	-2.98 (-2.97)	-5.67 (-4.07)
γ_2	-5.48 (-2.09)	0.50 (1.21)	-2.26 (-1.67)	-1.50 (-1.54)	-4.27 (-3.24)
Regression stats					
PseudoR^2	0.474	0.423	0.640	0.205	0.351
LR test	60.3	54.9	71.4	27.7	46.9
Classification stats	*Act.* *Pred*	*Act.* *Pred*	*Act.* *Pred*	*Act.* *Pred*	*Act.* *Pred*
Rank 1	22 22	24 23	20 18	31 33	19 21
Rank 2	31 32	24 26	40 44	26 27	19 15
Rank 3	10 9	13 12	5 3	10 7	23 25

Notes: See Table 3 for explanatory notes.

Variables are measured in 1997 levels, 1995–97 changes (ch.) or growth rates (gr.), respectively, and $(\cdot)^2$ denote squared variables. * GDPC growth measured over 1991–197 for banking. Asset growth in support services commitments and the change in political rights (squared) are measured over 1993–97.
Non-OECD: high-income countries that are not member states of the OECD.

Table 5. Determinants of the WTO Commitments:
OLS Estimates for the Principal Components

	Full sample			Sample excluding small countries		
	PC1	PC2	PC3	PC1	PC2	PC3
Regressors	β (t-stat)	β (t-stat)	β (t-stat)	β (t-stat)	β (t-stat)	β (t-stat)
Constant		-8.79 (-5.27)			-5.50 (-2.64)	
Macroeconomic						
GDP (log)	0.26 (3.42)	1.0 (6.23)		1.48 (6.10)	0.80 (3.03)	
GDPC long growth				-0.27 (-2.40)		
GDPC short growth	0.10 (4.43)			0.32 (3.23)		
Inflation		-0.04 (-2.69)		0.41 (4.90)		
Inflation (log)		-0.36 (-2.66)				
Inflation>20 (10^a)%				3.77 (4.04)	-0.82(-2.56)[a]	
LIAB/QUOTA UP	3.78 (4.63)			3.65 (4.86)		
LIAB/QUOTA	-0.006 (-2.3)			-0.005 (-2.5)		
AID/GDP>5%				-2.11 (-2.52)		
Openness fin.serv.					-0.09 (-2.25)	
Openness CA			-0.015 (-5.1)			
NEC main export		2.18 (3.57)		-3.53 (-2.83)		
Fuel main export		-1.77 (-3.92)		-4.07 (-3.29)		
Banking (DMB)						
Deposits gr.<0		-1.46 (-5.23)			-1.08 (-3.49)	
Assets gr.	0.062 (3.58)					
Assets (log level)			0.19 (4.38)		0.19 (2.43)	
Reserve/Assets, ch.		0.26 (2.37)				
Loans/Deposits, ch				-0.38 (-2.34)		
Banking crisis	4.24 (3.90)					
Real M2 money, gr.		-3.03 (-3.09)		1.15 (2.43)		
Savings ratio, ch.					0.13 (3.17)	
Region/Income						
LAC	-3.79 (-6.22)			-3.07 (-5.11)		
OECD	4.37 (4.21)					1.40 (2.18)
non-OECD		-1.51 (-3.25)				
Lower middle inc.					1.08 (3.32)	
Tropical					-1.52 (-4.81)	
MENA					-2.25 (-3.90)	
Population (log)		0.24 (3.68)		0.91 (6.64)		
Policy/Freedom						
Trade						
Banking				-1.70 (-4.22)		
(Capital Flows)^2		-0.21 (-6.02)			-0.11 (-2.57)	
(ch.political rights)^2				0.31 (2.33)		
Civil liberties, ch.			-0.57 (-2.47)			-0.58 (-2.40)
Regression stats						
Adjusted R^2 (obs.)	0.575 (76)	0.785 (78)	0.291 (82)	0.674 (61)	0.753 (60)	0.114 (66)
St.error regression	2.505	0.968	1.722	1.990	1.029	1.699
St.dev. DV	3.843	2.087	2.046	3.485	2.070	3.858

Notes: See Table 3 for additional explanatory notes.

Variables are measured in 1997 levels, 1995–97 changes (ch.) or growth rates (gr.), respectively, and $(\cdot)^2$ denote squared variables. GDPC long growth is measured over 1991-1997, GDPC short growth is measured over 1995–97, GDP and population in PC2 is for the year 1995. The change in political rights (squared) and civil liberties are measured over 1993–97. GDP refers to per capita GDP in 1995. MENA: Middle East-North Africa, Tropical: if absolute value of latitude is below 23. Regression statistics give the R^2 adjusted for degrees of freedom, number of observations in parentheses, standard error of the regression and standard deviation of the dependent variable.

20. Furthermore, the evidence in Tables 3 and 4 indicates that, as a whole, countries that have a legal system based on German law accepted on average less liberal commitments. Small countries with French-based legal systems assumed more limited commitments in insurance services. There are also clear peer group effects related to geographical region: Latin American and Caribbean countries as a whole have accepted lower levels of commitments, irrespective of their size. The larger East Asian and Pacific countries seem to have agreed as a group on more liberal commitments (compare with Valckx, 2002, section 2.2). After controlling for other factors, the group of OECD countries tends to have less liberal insurance service commitments, while the opposite holds for East Asian and Pacific countries (see Table 3).

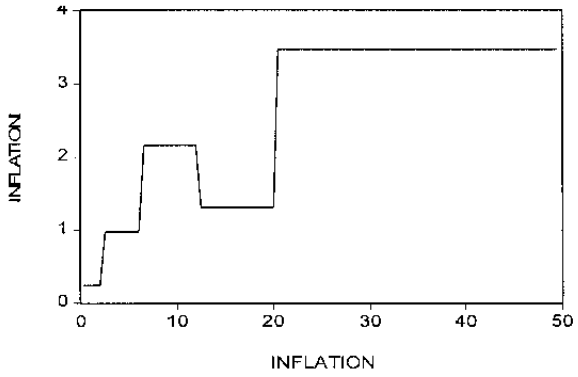
21. The various financial policy indicators suggest that countries whose policies are more restrictive engage significantly less in the liberalization process. In some cases, the effect is exponential rather than linear, suggesting even greater differences between countries with free and restrictive policy regimes in their choice of liberalization commitments (for the monetary policy effect, see below). This lends some support to the signaling effect of commitments for actual policy choices, as suggested in Section II.

22. Finally, there are several minor points that deserve some attention: the evidence in Table 3 suggests that a higher growth rate of exports over imports and an increase in the ratio of foreign direct investments (FDI) to GDP have encouraged countries to implement higher commitments in support services, such as financial information services and payments systems. These factors are relevant for the sample as a whole, while for the large economies, the FDI effect is substituted for by a domestic investment to GDP effect with the opposite sign.

23. For the larger economies, Table 4 implies that the investment to GDP ratio affects the choice of overall commitments, especially those for securities and support services: the higher the investment ratio, the lower the agreed commitments will be. An increase in foreign direct investments (FDI) relative to GDP had a negative impact on banking, but a positive impact on the choice of insurance commitments: countries that became more attractive for FDI have narrow banking services commitments but more liberal insurance commitments. In addition, a larger population and a higher deposit base seem to have had a negative impact on the average level and level of insurance commitments, respectively. Since these variables are likely to capture a size effect signaling service market opportunities, these findings seem to suggest that, in terms of these variables, the large countries have acted as if they tried to prevent foreign competitors from "cherry-picking" their domestic financial services markets (mode 3), as well as making it difficult for local residents and firms to engage in cross-border services (mode 1 and 2). In contrast, the positive coefficient on GDP in the securities and support equations suggests that positive size effects have played a role in the determination of these services commitments.

24. The negative effect of inflation on insurance commitments in Table 4 (through a dummy variable that equals 1 if inflation exceeds 10 percent in 1997) is also noteworthy. This effect should be considered jointly with the positive coefficient of the squared monetary policy indicator from Heritage Foundation, which is in fact an inflation indicator.[10] The combined effect of the inflation dummy and step variable indicates that moderate-inflation countries (between 6 and 12 percent) and very high-inflation countries (above 20 percent) had more positive coefficients than the other countries, which led, ceteris paribus, to an association with relatively more liberal commitments: see Figure 3, which displays the combined effect of the inflation dummy and step variable.

Figure 3. The combined effect of the inflation dummy and the inflation step variable in the insurance-equation in Table 4



Source: Author's calculations based on Table 4.

25. Finally, the evolution of political rights between 1993 and 1997, according to the Freedom House indicator, seems to have had a positive impact on countries' choice of commitments for securities services (Table 4) and banking (Table 5). The fact that this variable enters as a quadratic term indicates that countries that changed more rapidly have locked in to this political changeover in some of their commitments in a more liberal way.[11]

[10] The Heritage monetary policy indicator gives a grading of average inflation over 1991–97 from 1 to 5: 1 if inflation is below 3 percent; 2 if inflation is between 3 and 6 percent; 3 if inflation is between 6 and 12 percent; 4 if inflation is between 12 and 20 percent; and 5 if inflation is higher than 20 percent.

[11] The Freedom House indicator is measured on a scale from 1 to 7, from highest to lowest political freedom. From the 36 observed changes in political freedom, only nine were moves towards the upper level, and only The Gambia (+5) and Colombia (+2) moved up by more than one unit. On the lower side, it was mainly Latin American and Eastern European countries that introduced small political liberalizations (27 countries moved down one unit) and nine countries moved down by more than one unit, viz., South Africa (-4), Malawi (-4), Mozambique (-3), Haiti (-3), Ghana (-2), Estonia (-2), Latvia (-2), Romania (-2), and India (-2). Therefore, it is safe to say that it is mainly moves towards more democratic regimes that are associated with liberal commitments in banking and securities services.

26. Table 5 contains the OLS results for the determination of the principal components. The results for the overall level of commitments, captured by PC1, are in line with the AVERAGE results reported in Tables 3 and 4. In particular, PC1 for large countries is explained very well, given the R^2 of 0.67. Countries with a higher GDP and stronger economic growth over 1995-97 have assumed higher overall commitments. Countries that borrowed from the IMF during the previous years also enacted stronger overall commitments, although this effect is offset by the level of liabilities relative to a country's quota in the IMF. Interestingly, for the full sample, the results indicate that countries that faced a banking crisis in 1995 or 1996 (EIU_0 definition; see Section IV), subsequently enacted more liberal commitments. However, countries with a booming bank sector (positive asset growth, high real M2 money growth) also assumed more liberal commitments; therefore, it cannot be stated unambiguously that countries most vulnerable to financial instability saw the need to engage in market openings and greater commitments. A high population base is associated with more liberal commitments, as well as with a bias towards commercial presence (see the PC2, full sample results). As in Table 3 and 4, the evolution of political rights between 1993 and 1997 seems to be positively associated with a higher level of liberalization for the group of large countries. More restrictive banking policies had a negative impact on the level of commitments for the large countries group. As a region, Latin America had uniformly lower levels of liberalization commitments, while the opposite holds for the OECD, in line with results from Section II.

27. PC2 is explained very well, given the R^2 of 0.78 and 0.75, and the estimates indicate that countries with a weak banking system (low reserves-to-assets ratio or a decrease in bank deposits), a low GDP, a low savings ratio and/or major limitations on capital flows and FDI have weaker commitments under mode 3 (commercial presence) than under mode 1 (cross-border). High real money growth and high inflation tend to be associated with a modal bias towards mode 1 (especially for the full sample results; the left part of the table). As a group, large tropical countries and large countries in the Middle East and North Africa seem to have a bias towards cross-border supply. Finally, the results for PC3 indicate that this variable is less well explained by the given set of variables, given the R^2 of 0.29 and 0.11. For the full sample, PC3, expressing a bias towards stronger insurance sector commitments (negatively measured), seems associated with a more open economy and with a lower asset base of deposit money banks. Countries that have seen their civil liberties increase, seem to prefer stronger banking sector commitments relative to insurance services commitments.

28. To sum up, differences in the choice of financial services liberalization commitments are determined by a number of macroeconomic and institutional factors, of which GDP growth, the growth and performance of the banking sector, and peer group effects are the main explanatory variables. There is also a clear link with actual policy choices and there are noticeable differences between large and small countries.

IV. Impact of WTO Financial Services Commitments on Financial Stability

29. There is a vast literature on the causes of banking and currency crises and on the construction of early warning indicators: see IMF (1999, 2000) and Goldstein et al. (2000) for recent overviews. This section investigates whether financial sector commitments of the Fifth Protocol are statistically and significantly associated with currency and banking crises over the period 1997–99 and whether the impact is positive. The definition of Frankel and Rose (1996) is adopted to identify currency crises: a crisis is said to occur if the exchange rate depreciation is more than 25 percent per year and is at least 10 percent higher than that of the previous year. In addition, crises that occur within three years of each other are counted only once, to avoid double counting. As a check for robustness, the definition is applied to a country's exchange rate vis-à-vis the U.S. dollar and the SDR. For banking crises, two sets of crisis dates have been retained. The first set is based on an inspection of the Economist Intelligence Unit (EIU) country reports' section on banking. The second set draws on Caprio and Klingebiel (1999). Within these two sets, crisis situations are defined in a narrow and a broad way. See Valckx (2002) for a list of countries subject to currency and banking crises.

30. Before analyzing the data econometrically, the raw numbers are examined to obtain an idea of the association between the level of commitments and financial stability. Table 6 gives an overview of the commitments scores in crisis and noncrisis countries, and Figure 4 shows the number of crises in low- and high-commitment countries.

Table 6. Differences in Level of Commitments Between Crisis and Noncrisis Countries

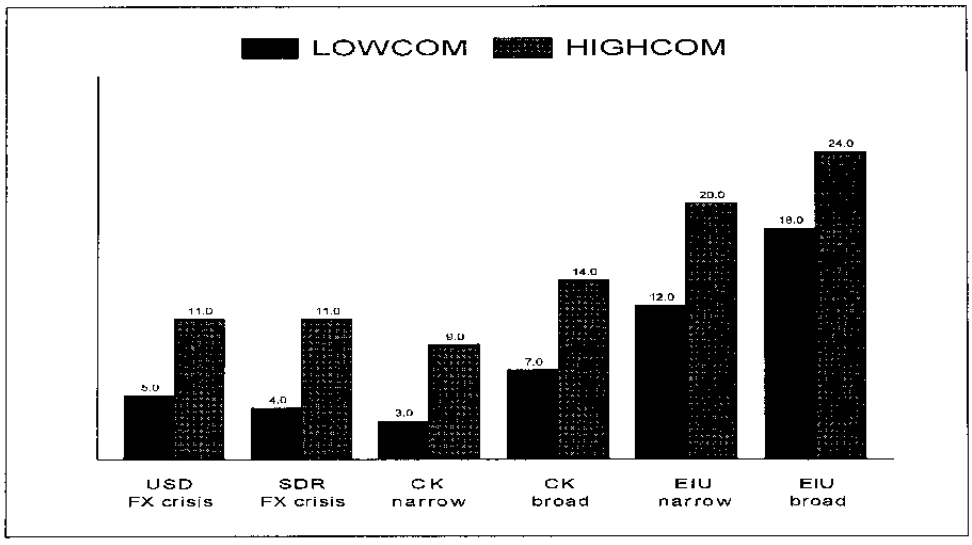
Type of Crisis (1997–99)			ALL	Bank	Insur.	Secur.	Support	PC_1	PC_2	PC_3
Currency										
USD	no crisis	(*N*=76)	0.341	0.335	0.340	0.300	0.390	-0.174	0.301	-0.192
	crisis	(*N*=16)	0.403	0.500	0.244	0.369	0.500	0.827	-1.427	0.912
SDR	no crisis	(*N*=77)	0.338	0.337	0.332	0.297	0.387	-0.213	0.241	-0.138
	crisis	(*N*=15)	0.423	0.499	0.279	0.391	0.523	1.094	-1.236	0.707
Banking										
CK-narrow	no crisis	(*N*=80)	0.341	0.359	0.313	0.307	0.385	-0.140	-0.086	0.006
	crisis	(*N*=12)	0.425	0.392	0.392	0.345	0.571	0.932	0.572	-0.039
CK-broad	no crisis	(*N*=71)	0.335	0.351	0.322	0.288	0.379	-0.243	0.047	-0.077
	crisis	(*N*=21)	0.409	0.405	0.329	0.393	0.510	0.822	-0.157	0.259
EIU-narrow	no crisis	(*N*=60)	0.315	0.325	0.305	0.257	0.372	-0.564	0.246	0.092
	crisis	(*N*=32)	0.422	0.435	0.357	0.416	0.480	1.057	-0.460	-0.172
EIU-broad	no crisis	(*N*=50)	0.331	0.336	0.316	0.279	0.394	-0.321	0.320	0.115
	crisis	(*N*=42)	0.377	0.396	0.333	0.352	0.428	0.382	-0.381	-0.137

Notes: Currency crises are defined as in Frankel and Rose (1996) and applied to USD and SDR exchange rates. CK refers to Caprio and Klingebiel (1999), from which a narrow and a broad list of countries subject to a bank crisis can be identified. EIU refers to a dating of banking crisis by inspection of the Economist Intelligence Unit country reports. Both types of financial instabilities list crises that took place in the years 1997-1999. Valckx (2002) contains a list of countries subject to a financial crisis. Insur.=insurance services, Secur.= securities services commitments.
Low- and high-commitment countries were identified as their commitment measure was below or above the median value of the all-average score, respectively. The number of crises follow from the definition of currency/banking crisis.

31. The numbers in Table 6 suggest that in countries that faced a financial crisis, commitments were on average 5 to 10 basis points higher/more liberal –with the exception of insurance commitments for currency crisis. A similar pattern holds for PC1. PC2 is negative in crisis countries and positive in non-crisis countries, suggesting that financial crises occurred most frequently in countries that were most lenient to mode-1 commitments, and the difference is greatest for currency crises. For banking crises, according to the CK-narrow definition, the opposite is true, suggesting that banking problems occurred in countries that had more liberal commitments under mode 3 than under mode 1. Finally, PC3 is positive for countries that faced a currency crisis, and negative for countries that were unaffected. As for banking crisis, the opposite holds if based on the EIU-numbers (the CK-numbers yield conflicting evidence): this would imply that countries that were affected had more liberal insurance/more restrictive banking services commitments.

32. Figure 4 shows the number of crises for low- versus high-commitment countries. As can be seen, when commitments are high, there appear to be twice as many crises compared to the situation when commitments are low, a conclusion that seems robust with respect to the definition of the crises (except for the EIU-broad definition of banking crisis, the difference is less pronounced: 24 versus 18). This seems to indicate that, if there is any impact of WTO commitments on financial stability, it will be negative: higher commitments will be associated with a greater probability of crisis. To see whether this result holds, the issue will be investigated econometrically, using a variant of the extreme bound tests typically found in the economic growth literature (see Sala-i-Martin, 1997).

Figure 4. Number of currency and banking crises according to all-average commitments



33. The idea is to estimate probit equations of the following general form:

$$P[\text{CRISIS}_i = 1] = \Phi(\alpha X_i + \beta COM_i + \gamma Z_i + \varepsilon) \quad (5)$$

where subscript i refers to country i, $P[\cdot]$ is the probability of a financial crisis in country i; $\Phi(\cdot)$ is the cumulative normal distribution function; X is a set of base variables, which, according to the empirical literature, are robustly related with financial crises; COM is the commitment variable under investigation; and Z is a varying set of up to K additional explanatory variables that may be associated with the incidence of a crisis; ε is an error term; α and γ are coefficient vectors; β is the coefficient for the commitments variable. A positive coefficient means that a higher value of the variable increases the probability of a crisis.

34. For the current application, combinations of 3 out of 60 variables were included in Z, which yielded a total of 34,220 equations per commitment variable; see Appendix II for a complete description of the 60 variables. These variables were chosen from the early warning indicators research and from previous studies on financial crises. For a part, they coincide with the set of indicators used in the specification search for determining the level of commitments. The fact that the list of variables is not uniform across the models is due to the different set of explanatory variables in the X vector and to convergence problems (multicollinearity). The X vector was constructed parsimoniously, after some experimenting with the data, and differs slightly in function of the equation to be estimated, as presented in Table 7. The estimations were performed over the full sample and over the sample excluding small economies, as in Section III.

35. Each estimation with a specific commitments variable and a given Z_i-vector yields a coefficient β_{zi}, and a corresponding standard deviation σ_{zi}. Then the lower extreme bound is defined as β_{zi} $2\,\sigma_{zi}$, for the lowest β_{zi}, and the upper extreme bound is defined as β_{zi} $+2\,\sigma_{zi}$, for the highest β_{zi}. The extreme bounds test for the specific commitments variable says that if the lower extreme bound is negative and the upper extreme bound is positive (or vice versa), then this commitment is not robust (see Sala-i-Martin, 1997, pp. 3–4). Using this criterion, there are hardly any commitments that are robust across all definitions of financial crisis, similar to the "nothing is robust" conclusion from the empirical growth literature.[12]

[12] Hence critics claim that this test is too strong for any variable to pass it, since, if the distribution of the estimators of β_z has some positive and some negative support, one is bound to find a regression that will violate the extreme bounds test. De Haan and Sturm (2000), among others, suggested analyzing the entire distribution of the t-statistics: if there is a large probability mass around or beyond the critical value, one could consider this variable as robust.

Table 7. List of *X* Variables for the Different Financial Instability Models

Variables	USD	SDR	EIU_0	EIU_1	CK_0	CK_1
Growth of GDP per capita, 1995-1999	*a, b*	*a, b*	*a, b*	*a*		*a, b*
Dummy if economic growth<0, 1997-1999				*b*	*a, b*	
Level of GDP, 1997	*a, b*	*a, b*	*a, b*	*a, b*		
Investment ratio, 1997			*a, b*	*a, b*		
Change in the investment ratio, 1995-1999						*a, b*
DMB assets, growth 1997-1999*			*a, b*	*a*		
Dummy if DMB deposits fell during 1995-1999	*a, b*	*a, b*			*a, b*	
M2 money growth 1997-1999						*a, b*
Current account balance, 1995-1997 (SDR)		*a, b*				
Dummy for Eastern Europe and Central Asia						*a, b*

Notes: USD and SDR: currency crisis models; EIU_0 and EIU_1: bank crisis models using EIU narrow and broad classification, respectively; CK_0 and CK_1: bank crisis models using Caprio and Klingebiel (1999) narrow and broad definition of crisis. *a*: variable is included in full sample estimations, *b*: included for the sample of big economies only.

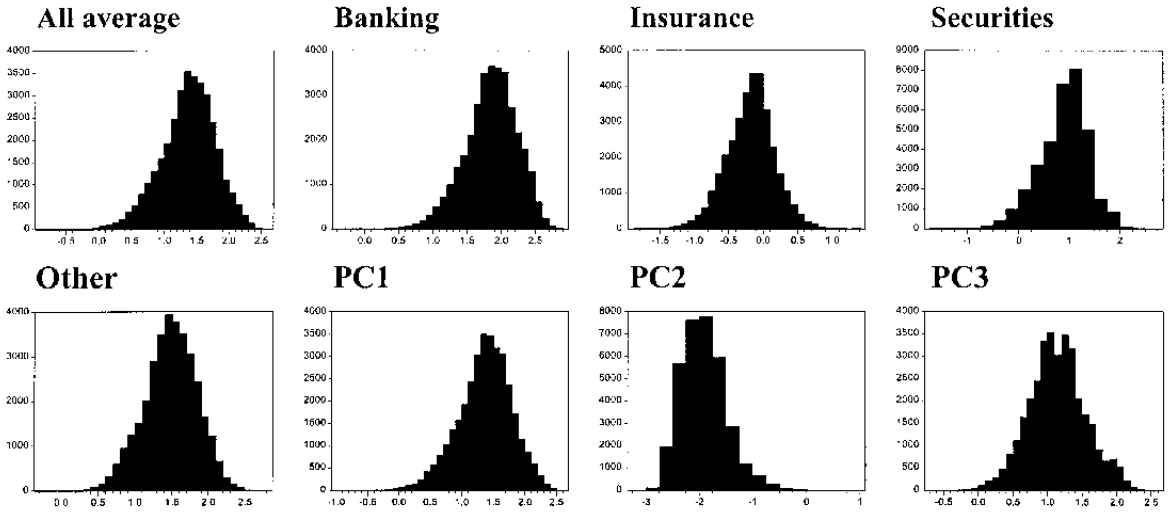
36. The complete distribution of the *z*-statistics is reported graphically for the various commitment indicators (the simple scores and the first three principal components), both for the whole sample and the large countries sample. Figures 5–20 present *z*-statistics of USD currency crisis, and Figures 21–36 and 37–52 show the distribution of *z*-statistics for EIU_0 and CK_0 banking crisis, respectively. In total, about 10 million probit estimates have been run, but for sake of brevity, only the most important results are reported here (more detailed results are available from the author, including SDR, EIU_1, and CK_1 results).

37. For currency crisis, the evidence seems to indicate that most of the financial services commitments have no robust impact on the probability of a crisis and the simple version of the extreme bounds test would be violated in (almost) all cases. As a whole, Figures 5–20 seem to indicate that more liberal commitments increased to some extent the probability of a currency crisis, given the prevalence of positive *z*-statistics, although the majority is not significant at the 5 percent level ($z = 1.96$); taking a 10 percent critical value ($z = 1.65$), a larger proportion is significant. Most interestingly, the PC2-commitments (Figure 11 and 19) seem to be very robust with a large probability mass of *z*-statistics at -2 and below. This suggests that countries with a modal bias in their commitments and with stronger commitments relating to commercial presence (mode 3) than to cross-border supply (mode 1), had a robustly lower chance of being hit by a currency crisis vis-à-vis the USD, consistent with the evidence in Table 6.

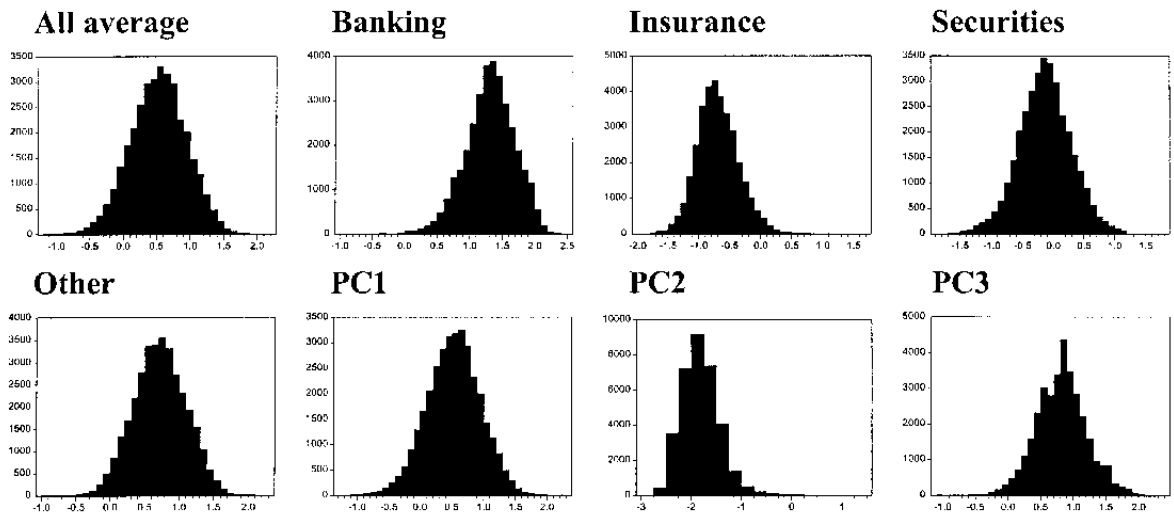
38. This may be rationalized by the fact that commercial presence results in less distorted and less volatile capital flows and more stable financial sectors than cross-border trade. As argued by Kono and Schuknecht (2000), commitments to mode 3 liberalization only require the liberalization of capital inflows related to commercial presence, whereas mode 1 requires liberalization of both inflows and outflows. A greater importance of cross-border trade also

tends to be associated with a bias towards short-term lending, which increases the volatility of capital flows and hence increases the risk of a currency crisis.

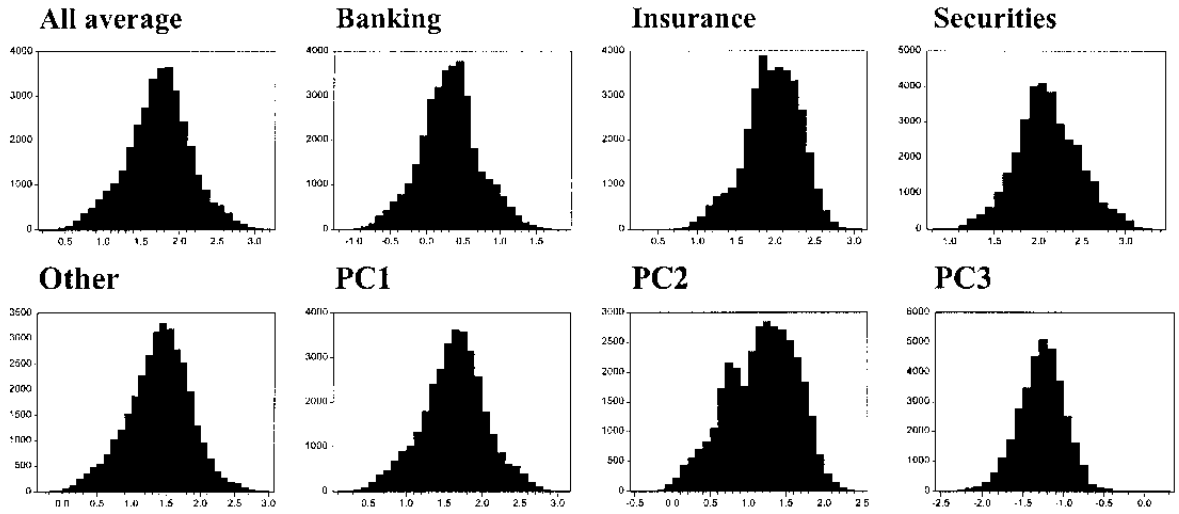
Figures 5–12. USD Currency Crisis (all countries): Distribution of *z*-statistics



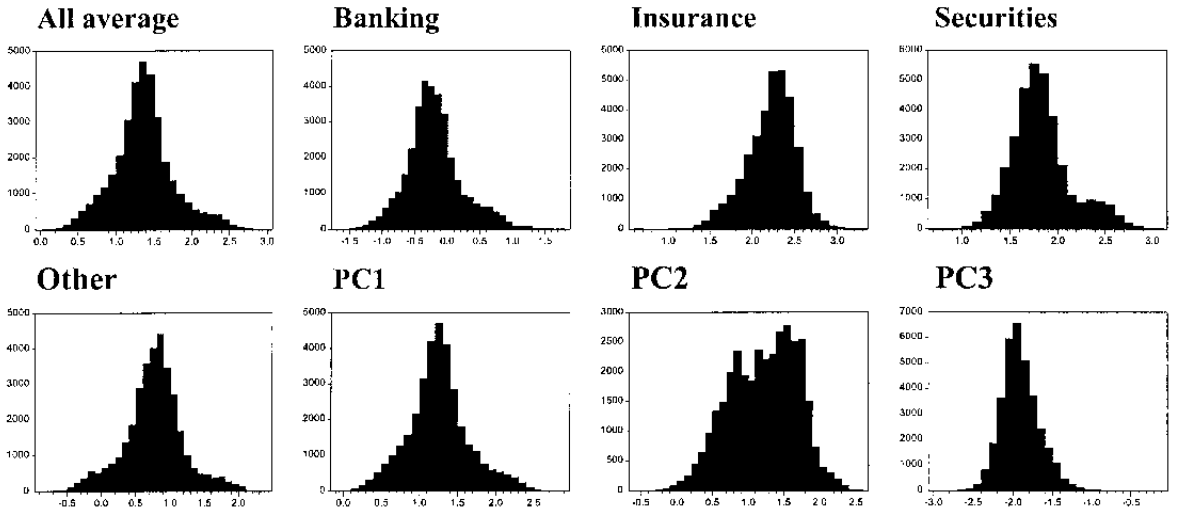
Figures 13–20. USD Currency Crisis (excluding small countries): Distribution of z-statistics



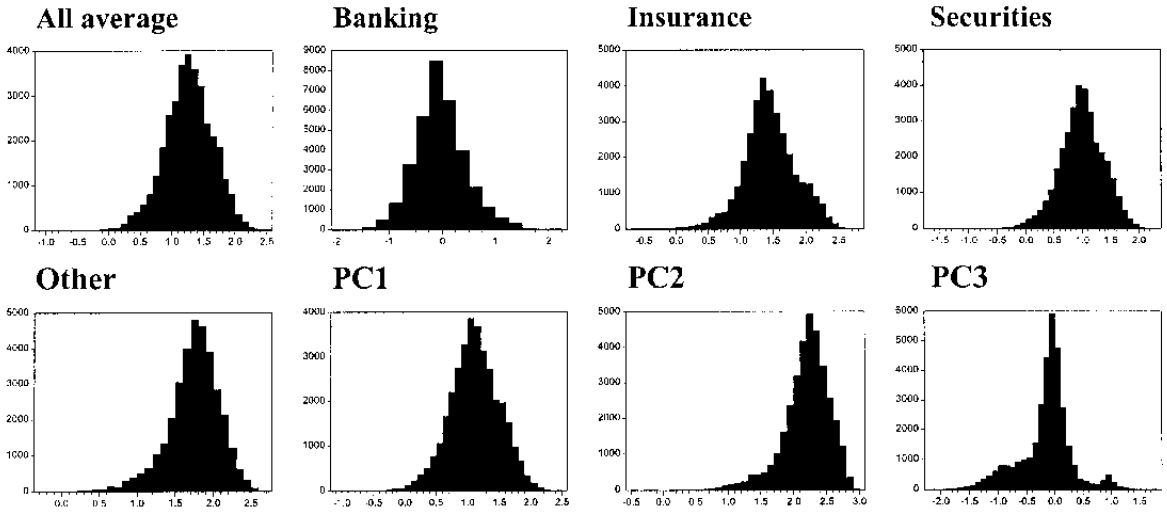
Figures 21–28 EIU_0-Banking Crisis (all countries): Distribution of *z*-statistics



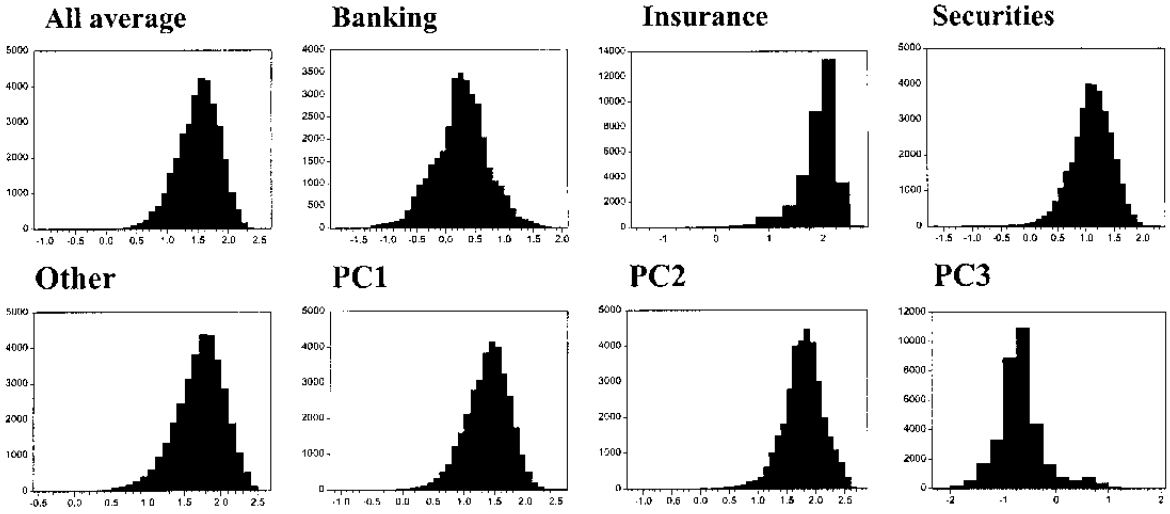
Figures 29–36 EIU_0 Banking Crisis (excluding small countries): Distribution of z-statistics



Figures 37–44 CK_0 Banking Crisis (all countries): Distribution of *z*-statistics



Figures 45-52 CK_0 Banking Crisis (excluding small countries): Distribution of *z*-statistics



39. As for banking crises, there are more cases in which the extreme bounds test would be passed, as an inspection of Figures 21–52 reveals that the z-statistics generally are all on the positive side. In all, the evidence suggests that more liberal commitments also increased the probability of a banking crisis, and robustly so for insurance services commitments (for both the EIU_0 samples and CK_0 large countries sample: Figures 23, 31 and 47). For the EIU_0 definition of banking problems, the PC3 also seems robustly negative for the large countries sample, signaling the fact that countries with stronger insurance services commitments, compared to other financial services, had a higher risk of being hit by a banking crisis (Figure 36). Alternatively, if commitments were more liberal in banking and securities than in insurance, countries had a smaller risk of banking crisis, consistent with the numbers in Table 6. This also holds for the broader EIU_1 definition of banking problems (not reported).

40. For the CK_0 definition of banking crisis, a higher PC2 seems robustly associated with banking crisis (Figures 43 and 51). Hence, if countries had a modal bias in their commitments and allowed for more liberal commitments towards commercial presence than towards cross-border supply, they had an increased probability of domestic banking problems. This could stem from the fact that commercial presence of foreign financial institutions negatively affects the health of the domestic institutions, as noted in Section II (the claim that older domestic banks are less efficient and lose their franchise value causing a "gamble for resurrection" strategy), as these foreign competitors engage in "cherry-picking" the most profitable activities of local financial service providers. However, in the long run, commercial presence may be beneficial through the introduction of new services and deepening of the market, enhanced access to foreign savings, the generation of local employment, the transfer of skills and technology and through learning effects by domestic institutions (Kono and Schuknecht, 2000, and Aizenman, 2002).

41. To sum up, most evidence indicates that the WTO commitments on financial services, as given in the Fifth Protocol, did not contribute very strongly or robustly to financial vulnerability, although the results tend slightly to favor the view that higher liberalization and more openness may be associated with a higher risk of financial instability. The latter would be consistent with earlier evidence about the effect of financial liberalization on financial fragility, see, e.g., Aizenman (2002), Weller (2001), Demergic-Kunt and Detragiache (1998).

42. The findings in this paper could stem from the fact that an open economic system is inherently more prone to international spillovers and contagion effects compared with a closed system, although an open economic system is commonly believed to be superior in terms of resource allocation and should be able to mitigate the possible short-term adverse effects of liberalization. Along these lines, the negative short-term impact effect may operate only at the early stages of liberalization and for a limited period of time; hence, as more experience of managing a liberalized system is accumulated, the negative impact may be supplanted by the positive and superior effects of financial liberalization/development on economic growth (see Aizenman, 2002, for a description of this trade-off and for proposals to prevent such crises; notably, adequate safeguard and prudential supervision/sequencing measures are required). Alternatively, the findings could simply reflect the fact that the commitments merely codified the status quo of the mid-1990s and did not reflect any

effective liberalization (see also Dobson and Jacquet, 1997, Chang et al., 1999). Hence, the finding of increased vulnerability may suggest that the regulatory framework then in existence and the pace of liberalization of financial services were not adequately tailored to the overarching need to preserve financial sector stability, and that this could be improved through a more thoughtful and prudent negotiating process, currently evolving in the WTO (see also Kireyev, 2002a-b, and Hoekman, 2002).

V. Conclusions

43. This paper has examined several aspects related to financial services liberalization commitments in the framework of the WTO negotiations on trade in services. The aim has been to detect empirical regularities, which could be used in future theoretical work. From a theoretical point of view, commitments may be worthwhile since they allow economic agents to benefit from greater certainty and stability. These WTO commitments could also act as a signal of actual financial and banking policies, and hence indirectly be associated with financial sector vulnerability. The empirical results suggested that a country's choice of commitment levels was influenced by macroeconomic variables, such as economic growth, inflation and openness, banking performance, size, and by institutional variables. Countries with higher economic growth, negative growth in the banking sector, and with restrictive financial policies were found to have lower liberalization commitments, sustaining an argument of protectionism and a signaling effect of actual policies. There are also clear "peer group" effects, in the sense that countries from the same region or income group opt for a similar level of commitments. Finally, the contribution of these commitments to the occurrence of financial instability was examined. Casual evidence indicated that a larger number of crises occurred in high-commitment countries. This claim was checked by using a variant of extreme bounds tests. Econometric evidence indicates that the commitment indicators did not have a strong statistical impact on financial crises, although there were signs that the more liberal the commitments, the more likely it was that financial stability would be threatened, in line with earlier evidence on the effects of financial liberalization on financial fragility. If the commitments favored commercial presence (mode 3) over cross-border supply (mode 1) of financial services, this tended to increase the likelihood of banking problems, but reduce the risk of a currency crisis. The former was explained by the negative and possibly short-run effects of greater international competition on domestic financial institutions, while the latter was motivated by the need for more comprehensive liberalization of capital flows under mode 1, which could give rise to an increased risk of volatile and destabilizing capital outflows. Finally, the evidence suggested that countries were successful in preventing banking crises if their banking services commitments were more restrictive.

44. A few practical lessons follow from the above analysis: First, according to the measurement of liberalization commitments, there is still a wide dispersion between countries and regions in terms of their commitments; in particular, mode 1 and securities and insurance services are least liberalized (see Valckx, 2002, pp. 3-7). This indicates that further financial services negotiations can be expected to take place, possibly within a framework of broader trade liberalization negotiations. However, as revealed in this study, the success of

these negotiations will depend on the evolution of the underlying macroeconomic variables, banking sector performance, actual policies, and the political economy.

45. Second, it should be acknowledged that commitments make sense only if they are properly sequenced and only if an adequate financial supervision and/or regulatory framework is in place. Although the current commitments may not constitute a major reason for concern about currency or banking crises, countries must be aware of the implications of a possible bias in their commitments and the risk of allowing more liberalization under mode 3 and in banking and securities services (as opposed to insurance).

46. Third, further research is needed into the general finding that more liberal commitments imply a slightly larger risk of financial crisis. Two possibilities were offered: one was that this finding demonstrates a short-lived effect, which would gradually disappear as more experience with management of liberalized commitments was gained, adequate safeguard measures taken, and a prudential sequencing of liberalization set up. The other was that the analyzed commitments merely reflected the status quo policies of the mid-1990s, instead of *real* liberalization of financial services, and that these policies were not conducive to financial stability during the period of the mid-1990s with highly volatile financial markets. Instead, it may be argued that the commitments should be improved through a process of considerate and prudent multilateral negotiations currently evolving at the WTO.

47. Finally, it should be stressed that these WTO financial services schedules provide a powerful commitment device and a useful tool for assessing the transparency and the development of regulatory policy in the financial sector. Given the widely held view that financial development stimulates economic growth (Levine, 2001), countries should be aware of the (indirect) importance of financial services commitments.

Data Series Used in the Ordered-Choice Models

Category (source)	Variables
Fiscal policy (World Bank, IMF)	Present value of debt to export and debt to GNI (1999) Long term debt (1997, millions of USD) Short term debt (1997, percent of total debt) Change in short term debt (1995-1997, percentage of GDP) Government deficit (1995;1997; change 1995-1997, percent of GDP) Interest payments on debt (1997, percent of exports) Ratio of liabilities to IMF quota (1995, percentage) Ratio of liabilities to IMF quota (1997, percentage) Change in liabilities to IMF quota (1995-1997, percentage) Dummy if ratio of liabilities to quota increased (1995-1997) Official aid as a percentage of GDP higher than 5 percent in 1997 (dummy)
Region/Income group (World Bank)	South Asia; Latin America-Caribbean; Sub-Saharan Africa; Middle East-North Africa; East Asia-Pacific; Eastern Europe-Central Asia; Western Europe-North America Low income; lower-middle income; upper-middle income; developing (low and middle income); OECD high income; non-OECD high income; transition economy; tropical
Policy Restrictiveness (Heritage Foundation/WSJ)	Banking, capital flows, property rights, regulation, trade restrictions, monetary policy, and average of these 6 indicators (1997)
Political economy (Freedom House)	Corruption (1997 level and square; www.transparency.org) Civil liberties (1993, 1997, change1993-1997) Political rights (1993, 1997, change 1993-1997) French, Socialist, German, U.K., Scandinavian law system (World Bank)
Macroeconomic (World Bank/IMF)	Growth of GDP and GDP per capita (1991-1997; 1993-1997; 1995-1997; percentage) Average inflation (1995-1999, percentage and log percentage) Inflation higher than 10 or 20 percent in 1997 (dummy) Investment ratio (1997, percent of GDP)
Balance of Payments and Openness (World Bank/IMF)	Openness (1997, current exports plus imports as a percent of GDP) Change in openness of the current account (1995-1997) Openness in terms of financial services (1990-1994, 1995-1999, 1990-1999, financial services and insurance payments, percent of GDP) Foreign direct investments (FDI: 1997, percentage of GDP) Change in FDI (1995-1997 percentage of GDP) Current account balance (1997 and 1993-1997, percentage of GDP) Dummy if CA balance as a percentage of GDP decreased (1995-1997) Growth imports over exports of goods and services (1995-1997, percentage) Main export category: primary goods, services, diversified, fuel, manufacturing, not classified
Size (World Bank)	Population density (1997, inhabitants per square km, in logs) GDP (1997, millions of USD at PPP, in logs) GDP (1995, millions of USD at PPP, in logs) Population (1997, in logs) Area (in square kilometres, in logs: CIA World Fact Book)

Category (source)	Variables
Money	M2 nominal money growth (1995-1997)
(World Bank/IMF)	M2 real money growth (1995-1997)
	Ratio of M2 to GDP (1995, 1997, percentage)
	Domestic savings ratio (1997, percent of GDP)
	Change in domestic savings ratio (1995-1997, percentage)
Banking	Assets (1997, millions of USD, in logs)
(IMF: deposit money banks)	Deposits (1997, millions of USD, in logs)
	Loans (1997, millions of USD, in logs)
	Assets growth rate (1995-1997, percentage)
	Deposits growth rate (1995-1997, percentage)
	Loans growth rate (1995-1997, percentage)
	Dummy if asset growth rate is negative over 1995-1997
	Dummy if deposit growth rate is negative over 1995-1997
	Excess growth of assets over loans
	Excess growth of assets over deposits
	Excess growth of loans over deposits
	Reserves to assets (1997)
	Change in reserves to assets ratio (1995-1997)
	Loans to deposits ratio (1997)
	Change in loans to deposits ratio (1995-1997)
	Banking crisis in 1995 or 1996 (before the start of negotiations of the Fifth Protocol: EIU definitions, see Appendix VI)

Notes: IMF data are extracted from *International Financial Statistics* (August 2001). World Bank data are extracted from Global Development Network Growth Database (www.worldbank.org/research/growth/GDNdata.htm).
For the European Union, macroeconomic data were created (synthetically) using data of the 15 member states (GDP weighted where appropriate, using variable exchange rate weights).

List of Variables Used in the Financial Crisis Probit Estimations

Variables	USD	SDR	EIU	CK1	CK2
Fiscal policy					
Short term debt (1995, percent of total debt)				×	×
Change in short term debt (1995-1999, percentage of GDP)	×	×	×	×	×
Interest payments on debt (1995, percent of exports)				×	×
Interest payments on debt (change 1995-1997, percent of exports)				×	
Government deficit (1997, percent of GDP)			×		×
Dummy if government deficit increased (1995-1999)	×	×	×	×	×
Dummy if government deficit increased (1997-1999)	×	×	×	×	×
Ratio of liabilities to IMF quota (1995, percentage)	×	×	×	×	×
Ratio of liabilities to IMF quota (1997, percentage)	×	×	×	×	×
Change in liabilities to IMF quota (1995-1999, percentage)	×	×	×	×	×
Dummy if ratio of liabilities to quota increased (1995-1997)	×	×	×	×	×
Official aid and development assistance (1997, percentage of GDP)	×	×	×	×	×
Region/Income Group					
Latin America-Caribbean	×	×	×	×	×
Sub-Saharan Africa	×	×	×	×	×
East Asia-Pacific	×	×	×	×	×
South Asia	×	×			
Eastern Europe-Central Asia	×	×	×	×	
Low income	×	×	×	×	×
Lower-middle income	×	×	×	×	×
Upper-middle income	×	×	×	×	×
Policies and Political Economy					
Banking policies (1997)	×	×	×	×	×
Property rights (1997)	×	×	×	×	×
Regulatory policy (1997)	×	×	×	×	×
Trade restrictions (1997)	×	×	×	×	×
Average of 6 financial policy restrictiveness indicators (1997)	×	×	×	×	×
Corruption (1997)				×	×
Civil liberties (1997)	×	×	×	×	×
Civil liberties (change, 1993-1997)	×	×	×	×	×
Political rights (1997)	×	×	×	×	×
Political rights (change, 1993-1997)	×	×	×	×	×
French law system	×	×	×	×	×
U.K. law system	×	×	×	×	×
German law system	×	×	×		
Socialist law system	×	×	×		
Macroeconomy					
Growth of GDP per capita (1995-1999, percentage)				×	×
Population growth (1995-1999, percentage)		×			
Dummy if GDP growth negative over 1997-1999			×		×
Average inflation (1995-1999, percentage)	×	×	×	×	×
Average inflation (1995-1999, log percentage)	×	×	×	×	×
Investment ratio (1997, percentage of GDP)	×	×			

Variables	USD	SDR	EIU	CK1	CK2
Balance of Payments / Openness					
Openness (1997, current exports plus imports as a percent of GDP)	×	×	×	×	×
Change in openness of the current account (1995-1997)	×	×	×	×	×
Openness (1990-1994, financial services and insurance payments exports plus imports, percentage of GDP)			×	×	×
Foreign direct investments (FDI: 1997, percentage of GDP)	×	×	×	×	×
Change in FDI (1995-1997, percentage of GDP)	×	×	×	×	×
Current account balance (1997, percentage of GDP)	×		×	×	×
Dummy if current account to GDP ratio decreased (1995-1997)	×	×	×	×	×
Change in current account balance (1995-1997, percentage of GDP)	×	×	×	×	×
Growth imports minus growth exports of goods and services (1995-1997, percentage)	×	×		×	×
Main export category: primary goods	×	×	×	×	×
Main export category: manufacturing	×	×	×	×	×
Main export category: services	×	×	×	×	×
Main export category: diversified	×	×	×	×	×
Money					
M2 nominal money growth (1995-1997)	×	×	×	×	
M2 real money growth (1995-1997)	×	×	×	×	
Domestic savings ratio (1997, percentage)	×	×			
Change in domestic savings ratio (1995-1997, percentage)	×	×	×	×	
Banking					
Assets growth rate (1997-1999, percentage)	×	×			
Assets growth rate (1995-1997, percentage)	×	×	×	×	×
Deposits growth rate (1997-1999, percentage)	×	×	×	×	×
Deposits growth rate (1995-1997, percentage)	×	×	×	×	×
Loans growth rate (1997-1999, percentage)	×	×	×	×	×
Loans growth rate (1995-1997, percentage)	×	×	×	×	×
Reserves to assets (1997)	×	×	×	×	×
Change in reserves to assets ratio (1995-1997)	×	×	×	×	×
Change in reserves to assets ratio (1995-1997)	×	×			
Loans to deposits ratio (1997)	×	×	×	×	×
Change in loans to deposits ratio (1997-1999)	×	×	×	×	×
Change in loans to deposits ratio (1995-1997)	×	×	×	×	×
Dummy if asset growth rate is negative over 1997-1999			×	×	×
Dummy if deposit growth rate is negative over 1995-1999			×		×

Notes: The table displays the *Z*-variables used in combinations of three out of 60 (a total of 34,220 combinations), in the estimation of equation (5) for each of the crisis models. USD: USD currency crisis model, SDR: SDR currency crisis model, EIU: banking crisis model according to Economist Intelligence Unit dating, CK1 and CK2: banking crisis model according to the dating of Caprio and Klingebiel (1999), narrow and broad, respectively.

× indicates that the variable is used in the respective model.

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