

Beck, Roland

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## The volatility of capital flows to emerging markets and financial services trade

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No. 2000/11

**The Volatility of Capital Flows to  
Emerging Markets and Financial  
Services Trade**

Roland Beck



Center for Financial Studies

an der Johann Wolfgang Goethe-Universität ■ Taunusanlage 6 ■ D-60329 Frankfurt am Main  
Tel: (+49)069/242941-0 ■ Fax: (+49)069/242941-77 ■ E-Mail: [ifk@ifk-cfs.de](mailto:ifk@ifk-cfs.de) ■ Internet: <http://www.ifk-cfs.de>

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# The Volatility of Capital Flows to Emerging Markets and Financial Services Trade

Roland Beck\*

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**Abstract:** This paper examines empirically the question whether the presence of foreign banks and a liberal trade regime with regard to financial services can contribute to a stabilization of capital flows to emerging markets. Since foreign banks, so the argument goes, provide better information to foreign investors and increase transparency, the danger of herding is reduced. Previous findings by Kono and Schuknecht (1998) confirmed empirically that such an effect does exist. This study expands their data set with respect to the length of the time period and the number of countries. Contrary to Kono and Schuknecht, it is found that foreign bank penetration tends to rather increase the volatility of capital flows. The trade regime variables are not significant in explaining cross-country variations in the volatility of capital flows. This result does not change significantly when alternative measures of volatility are considered.

**Keywords:** Financial Services Trade, Capital Flows

**JEL classification:** F13, F30, G20

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\* Center for Financial Studies, Taunusanlage 6, 60329 Frankfurt/Main, Germany, email: beck@ifk-cfs.de. This paper was presented at the conference "Financial crisis in transition countries: recent lessons and problems yet to solve" on 13-14 July 2000 at the Institute for Economic Research (IWH) in Halle, Germany. I thank Axel Weber, Beatrice Weder, Ludger Schuknecht, and the conference participants for valuable comments. All errors are mine.

# 1 Introduction

It is often claimed, with regard to the emerging market financial crisis in 1997/1998, that a lack of transparency contributed to an incorrect risk assessment in emerging markets. According to this view, the large capital inflows in the 1990s were based in part on an overly optimistic perception of investment opportunities, especially in Asia. The International Monetary Fund (1999a, p. 63) points out that a dramatic reassessment of risk in emerging markets was a "cause and a symptom" of the crisis which resulted in reversing net capital flows. The observed volatility of capital flows to emerging markets, which many observers view as only somewhat linked to economic fundamentals, have stimulated a new discussion about the risks and benefits of financial liberalization. There are at least four distinct aspects of financial liberalization which might have different impacts on the stability of capital flows and financial stability in general: capital account liberalization, liberalization of trade in financial services, domestic deregulation and the introduction of new financial instruments.

This paper focuses on the role of trade in financial services.<sup>1</sup> Following Tamirisa (1999, p. 4) *capital account liberalization* is defined as the access of residents to international financial markets and of non-residents to domestic financial markets. *Trade in financial services* is defined as the provision of financial services, such as retail and wholesale banking, securities trading and portfolio management, in exchange for fees across borders. This means that residents may use financial services of foreign financial institutions and that domestic financial institutions may provide financial services to non-residents. These two aspects of financial liberalization are distinct, but somewhat related: If financial services are provided "cross-border", capital inflows or outflows are necessarily associated.<sup>2</sup> On the other hand, if the services are supplied by a subsidiary or a local branch of the foreign bank, capital in- or outflows do not have to coincide. In that case, only the foreign direct investment to set up the local presence is a direct consequence of financial services trade. Since commitments towards financial services trade can be made in principle independently from any commitment to capital account liberalization, it does make sense to study the effect of financial services trade

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<sup>1</sup>For a survey on theoretical and empirical work on capital account liberalization, see Eichengreen and Mussa (1998). For the impact of domestic deregulation in the financial services sector on financial stability, see Demirguc-Kunt and Detragiache (1998). For an empirical investigation of the impact of the introduction of new financial instruments, see Jochum and Kodres (1998).

<sup>2</sup>"Cross-border" refers to a so-called mode of supply where the foreign supplier does not penetrate the home country. See Appendix A.1.1 for details.

separately.<sup>3</sup>

An analysis of the specific effect of opening up financial services markets to foreign competition can provide useful guidelines for the policy stance of emerging market economies towards the upcoming negotiations on a further liberalization of trade in financial services at the World Trade Organization (WTO). Despite the failure to launch a new comprehensive round of trade negotiations in December 1999, services are on the built-in agenda of the Uruguay-Round.

A useful starting point is the paper by Kono and Schuknecht (1998), hereafter KS, who have argued that financial services trade liberalization, which allows the use of a broad array of financial instruments and the presence of foreign banks, contributes to more stable capital flows to emerging markets. It is indeed remarkable that most of the Asian countries which were severely hit by the crisis had fairly restrictive and distortionary regimes with regard to trade in financial services. Alba, Bhattacharya, Claessens, Gosh, and Hernandez (1999, p. 49) point out that the limited role of foreign banks in Asia inhibited institutional development. Other countries, such as Argentina, have adopted more liberal regimes, and there is some evidence that foreign banks played a stabilizing role in these countries.<sup>4</sup>

In order to empirically test their hypothesis, KS developed various indices which measure the restrictiveness and the degree of distortion of the trade regime with regard to financial services. These are based on commitments within the General Agreement on Trade in Services (GATS).<sup>5</sup> In a sample of 26 emerging markets, including countries in Asia, Latin America, Eastern Europe and Africa, they find support for their hypothesis. In a cross-country regression of the standard deviation of annual net capital flows from 1991-1997 on financial services trade policy variables, macroeconomic and other regulatory variables, a liberal trade regime regarding financial services has a significant negative effect on the standard deviation of capital flows.

This paper argues that the theoretical case for the argument brought forward is rather ambiguous and extends the existing evidence in various ways: it is asserted that the appropriate figure to consider is the volatility

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<sup>3</sup>Under the General Agreement on Trade in Services, capital flows have to be liberalized only for cross-border supply, otherwise these commitments would be useless. For commitments allowing commercial presence, only the foreign direct investment necessary to install the presence has to be liberalized.

<sup>4</sup>Goldberg, Dages, and Kinney (2000) find that foreign banks in Argentina and Mexico contributed to a more rapid loan growth and a reduced volatility of overall banking sector loan growth.

<sup>5</sup>See Appendix A.1.1 for a brief description of financial services liberalization within the GATS.

of total net capital flows, and not of different components. The time period for the data on capital flows is expanded to include the second crisis year of 1998 which adds considerably to the overall variability of capital flows in the 1990s. Moreover, the data set is expanded to a total of 54 emerging and developing countries. Finally, it is tested whether the results are robust to alternative measures of volatility and to alternative measures for trade in financial services: foreign bank penetration and the trade regime with regard to financial services as suggested by KS.

Contrary to the findings by KS, it is found that foreign bank penetration tends to rather increase the volatility of capital flows. The trade regime variables are not significant in explaining cross-country variations in the volatility of capital flows.

The remainder of the paper is organized as follows. Section 2 reviews the arguments made in favor and against financial services trade and foreign bank penetration. Section 3 discusses methodological issues and the selection of appropriate independent and dependent variables. In section 4 the results of benchmark regressions are presented. Section 5 tests whether the results are robust to alternative specifications of volatility. Section 6 concludes.

## 2 The debate in the literature

The case for and against financial services trade is discussed controversially among policy makers and in the academic literature.<sup>6</sup> The effects are likely to depend on how the foreign services are supplied, i.e. through a local presence or through cross-border supply.

On the one hand, it is often argued that the financial services trade leads to traditional gains from trade, i.e. more competition, and thus to more efficiency in the banking sector with more services at lower prices. Secondly, financial services trade brings about a transfer of know-how, technology and skills such as proper credit risk management practices. Thirdly, it can raise pressure on local authorities to provide a better institutional framework with regard to the supervision of banks and disclosure standards. Finally, the home head offices of foreign banks can serve as a credible lender of last resort in a crisis situation. The positive effects on financial sector development are also likely to enhance growth.<sup>7</sup> These effects are likely to take place if

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<sup>6</sup>For a survey of the arguments, see Tamirisa, Sorsa, Bannister, McDonald, and Wiczorek (2000).

<sup>7</sup>Claessens, Demirguc-Kunt, and Huizinga (1998) provide extensive empirical evidence that foreign bank entry tends to improve efficiency in domestic banking markets. For the argument related to institutional capacity building, see Demirguc-Kunt and Detragiache

the services are provided through a local presence of foreign banks. A pro-competitive effect through cross-border supply will be more limited because proximity to the client is still relevant in financial services. The positive effects through know-how transfer and institutional pressures can hardly be expected for cross-border supply. With regard to the stability of capital flows, KS argue that financial services trade liberalization, which allows the use of a broad array of financial instruments and the presence of foreign banks, can contribute to more stable capital flows. One channel pointed out by KS (p. 10) works as follows. Foreign financial institutions in emerging markets can compile better information about the creditworthiness of borrowers if they have a local presence. This facilitates proper risk assessment by international investors who are, in turn, less likely to engage in herding behavior.<sup>8</sup> The pressure on local authorities to provide a better institutional framework which, in turn, leads to more transparency, works in the same direction. Recently, however, Morris and Shin (1999) showed theoretically that more information does not necessarily reduce market volatility if a strategic coordination problem among investors is at work.

The theoretical case for a stability-enhancing effect of financial services trade gets even weaker if one considers that the entry of foreign banks can be harmful by itself if they start operating in a weak local banking system. Eichengreen and Mussa (1998, p. 21 and p. 27) stress that in such a situation foreign competition can provoke a banking crisis because lower margins for domestic banks can make them more vulnerable to loan losses. They call financial services trade liberalization in a weak domestic banking system a "delicate matter". Domestic banks might respond to increased competition by taking excessive risks. Moreover, there might be the danger that foreign banks promote capital flight, and that they rapidly withdraw from local markets during a financial crisis. Kaminsky and Reinhart (1999) have stressed that in such a situation, foreign banks may worsen financial distress by calling in loans and cancel credit lines to domestic financial institutions. This would have rather a destabilizing effect on the volatility of capital flows. Since financial services trade liberalization often coincidences

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(1998), KS, and Eichengreen and Mussa (1998, p. 27). On the role of foreign banks as a lender of last resort, see KS (p. 12). For evidence on positive growth effects of financial sector development, see King and Levine (1993).

<sup>8</sup>Herding in financial markets can be rational for various reasons. For a survey on theoretical foundations of herding behavior, see Devenow and Welch (1996). Recently, Calvo and Mendoza (2000) have shown that in a growing global securities market, there might be little incentives for all investors to gather costly country-specific information and herding, i.e. imitating an arbitrary market portfolio, can be the outcome of optimal portfolio decisions.



with other policy measures of deregulation, it is also necessary to keep the findings by Demirguc-Kunt and Detragiache (1998) in mind. They find that financial liberalization, measured by the deregulation of bank interest rates, which takes place in a weak institutional environment, makes banking crises more likely. Finally, it is sometimes argued that foreign banks dominate the most the most profitable market segments leaving domestic banks with the more risky projects, and thus making the domestic financial system more vulnerable to financial crises.

The controversial arguments in favor and against free financial services trade, in particular with regard to its effect on the stability of capital flows have lead many to conclude that this effect is ambiguous.<sup>9</sup>

### 3 Methodology and Data

This paper expands one type of empirical analysis carried out by KS. In a cross-country regression of a volatility measure of net capital flows on financial services trade variables, macroeconomic and other regulatory variables, it is tested whether financial services trade variables tend to reduce the volatility of capital flows.<sup>10</sup>

KS also suggest a regression of the level of net capital flows on these variables. In their sample, "other investment" (mainly bank lending), measured by the standard deviation, is more volatile than portfolio investment, and portfolio investment is more volatile than foreign direct investment. Consequently, they argue, if financial services trade variables tend to raise the level of a specific type of capital flow relative to other flows, say portfolio investment relative to other investment, this can be called a stability-promoting property. This approach is not pursued here because it is not clear whether such an inference about stability is justified. While it is true that "other investment" has historically been the most volatile component of capital flows, there is no evidence that the composition of capital flows has a systematic effect on the volatility of total net capital flows. The International Monetary Fund (1999a, p. 65) stresses that even increases in foreign direct investment

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<sup>9</sup>See Tamirisa, Sorsa, Bannister, McDonald, and Wiczorek (2000, p. 12).

<sup>10</sup>From a macroeconomic standpoint, it could be argued that it makes little sense to analyse capital flows in isolation from the current account. However, attempts to develop a full structural model of capital flows which identifies the shocks that lead to changes in the current account turned out to be difficult and there are reasons to assume that especially portfolio flows are rather exogeneous from the standpoint of the emerging market economy. See Claessens, Dooley, and Warner (1995, pp. 155) for more details about this argument and the references given there.

flows, by all measures the most stable component of capital flows, does not automatically lead to more stable net foreign financing.

### 3.1 The dependent variable

The question of how to measure the volatility of capital flows is not a trivial one. KS suggest to compute the standard deviation of various types of net capital flows as a share of GDP. Two problems arise with this approach.

Firstly, instead of examining the determinants of volatility for each type of capital flows separately, *total* net capital flows are considered here. Claessens, Dooley, and Warner (1995) have pointed out that the question about volatility is motivated by the concern of policy makers about sudden reversals in the total capital account and not just in some particular flow. They show for numerous countries that there is a high degree of substitution between various capital flows. Moreover, they find that movements in the overall capital account are little influenced by movements of specific components. Movements of one type of flow can be offset by another type of flow. Hence, it can be misleading to look at movements of one particular flow. There is no variable in the regressions which explains shifts from one type of capital flow to another. The financial services trade variables are supposed to reflect rather a more general uncertainty about investment opportunities which should be reflected in an increased volatility of the aggregate of foreign direct investment, portfolio, and other investment flows.

Secondly, the coefficient of variation, computed for absolute net capital flows is used as the volatility measure in the benchmark regression of this paper. Although it is common to compare net capital flows across countries by looking at the share in GDP of these flows, such a measure might be misleading if we want to explain different volatilities across countries. If a country experiences a sharp recession during a financial crisis, the scale of outflows looks more dramatic than if the recession had been less severe. This effect will also be reflected in a higher volatility. The explanatory variables used here offer no explanation of GDP contraction during a crisis.

### 3.2 Independent variables

**Financial services trade variables:** The most straightforward variable to measure the openness of the financial sector is simply foreign bank penetration. Notice that this measure relates to a supply through a local presence, and hence more stability-enhancing effects should be expected from this variable. The following two variables are included in the regressions in order

to test whether a direct link of foreign bank penetration and the volatility of capital flows exists:

- *Share of foreign banks (number)* equals the number of foreign banks in total banks.
- *Share of foreign banks (assets)* equals the share of foreign bank assets in total banking sector assets.

However, the role that foreign banks play for the stability of capital flows might be a more complex process which requires more subtle regulatory measures, especially if one wants to capture the claim that commercial presence tends to be more stability-enhancing than cross-border supply. The following three indices developed by KS assess specific distortions and biases in the trade regime which are likely to contribute to capital flow volatility. This paper uses the assessments by KS, but adds more countries to the sample which have been classified in a similar way.

- *Bias towards cross-border supply* is an indicator (see Appendix A.1.2 for details) which measures to what extent the financial services trade regime favors cross-border supply relative to commercial presence. The desired effects on improved transparency and a diffusion of skills in risk management occur presumably only if foreign banks have a local presence. While cross-border supply generates pro-competitive effects as well, it does not contribute to more stable capital flows. Since the stability-enhancing properties of financial services trade only occur if banks establish a local presence, we would expect that a bias towards cross-border supply increases the volatility of capital flows, i.e. a positive sign of coefficient is expected.
- *Bias towards bank lending* indicates whether the trade regime favors classical bank lending/depositing services as opposed to securities-related services (see Appendix A.1.2 for details). If foreign banks are allowed to offer a broad spectrum of financial instruments, they are likely to contribute to the development of bond and stock markets. KS (p.13) claim that these, in turn, can increase transparency because they reduce information asymmetries. Stock prices and bond ratings should reflect all available information about a firm's soundness.<sup>11</sup> Moreover,

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<sup>11</sup>This is the case if capital markets are efficient. This hypothesis was subject to a long debate. If investor behavior is rather characterized by imitative strategies, bubbles can occur and market prices can substantially deviate from fundamentals. See e.g. Shiller (1992).

securities markets usually require higher standards of disclosure. Absent capital market finance also leads to an exclusive reliance on bank lending which has historically been the most volatile component of capital flows. Thus, a bias towards bank lending would lead to an increase of volatility, i.e. a positive sign of coefficient is expected.

- *Restrictions on foreign banks* measures the extent to which activities of foreign banks are limited by discriminatory regulation. KS focus on four restrictions which are likely to offset the stability-enhancing effects of commercial presence of foreign banks. These are
  - i) limits on equity participation in domestic financial institutions,
  - ii) limits on raising domestic financing,
  - iii) limits on the establishment of a branch network, and
  - iv) limits on the issuance of new bank licences.

Limited equity participation can undermine foreign banks' ability to exercise corporate control on domestic banks which would make them more transparent. When foreign banks cannot raise domestic funding, they have to rely on international capital markets. The induced capital flows might be volatile if this fund raising coincides with a lack of transparency. If foreign banks are not allowed to set up a branch network, they are deprived from engaging in retail banking. Since wholesale business tends to be more volatile than retail business, this can contribute to an increased volatility. The lack of a domestic depositor base leads to capital inflows which can, if there is a lack of transparency, exhibit high volatility. Limits on the issuance of new bank licences lowers the scope of commercial presence in general. KS construct an index for these four restrictions (see Appendix A.1.2 for details). More restrictions on foreign banks of this type will increase the volatility of capital flows, i.e. a positive sign of coefficient is expected.

### **Macroeconomic and other regulatory Variables**

- The *average inflation rate* is included because high inflation rates are related to macroeconomic instability. It is correlated with large movements in interest rates and the exchange rate. In order to achieve a parsimonious parametrization, this is the only macroeconomic variable that enters the regressions. Logarithms are taken in order to avoid a too big weight of the periods of hyperinflation in Latin America in the beginning of the 1990s.

- *Economic freedom* is an index published regularly by Johnson, Holmes, and Kirkpatrick (1999). The greater the score, the greater the level of government interference in the economy. Government interference, such as explicit or implicit guarantees, should decrease market transparency and thus increase the volatility of capital flows, i.e. a positive sign of coefficient is expected.
- *Rule of law* is an index which measures to which extent the law is respected in a country. Stronger institutions, in particular with regard to the enforcement of property rights are likely to reduce the volatility of capital flows.

Since the regulatory variables considered here do not vary much over time, indices which were compiled once are used as proxies for the whole time period of 1990-98.

### 3.3 The sample of countries and descriptive statistics

In order to ensure proper econometric regressions which do not suffer from a small sample bias, a large number of observations is clearly desirable. Therefore, no a priori selection of countries has been done. The sample size is determined only by data availability. All emerging markets for which data on foreign bank penetration, the financial services trade regime, the indices of economic freedom and the rule of law are available have been included in the sample. For a total of 56 countries, data on foreign bank penetration and the macroeconomic and regulatory variables are available (see table 1).

Variable	
Foreign banks (assets)	Bias cross-border
Foreign banks (number)	Bias bank lending
	Restric. foreign banks
Economic Freedom	Economic Freedom
Rule of Law	Rule of Law
Inflation	Inflation
Total net capital flows	Total net capital flows
56 countries (group 1)	36 countries (group 2)

Table 1: Data availability for two groups of variables

	Level	Share	CV	Fora	Forn	EF	Rule	Infl
Mean	1791.6	1.61	2.31	0.28	0.32	2.96	3.31	2.88
S.D.	4886.7	5.15	3.78	0.21	0.13	0.54	1.06	1.54
Min	-14854.8	-21.83	0.32	0.01	0.08	1.30	1.25	0.06
Max	21096.72	18.22	20.56	0.85	0.67	4.05	5.25	7.31

Table 2: Descriptive Statistics Group 1, 56 observations

	Level	Share	CV	Restrict	Bias1	Bias2	EF	Rule	Infl
Mean	3121.87	2.68	2.15	1.89	-0.67	1.17	2.83	3.63	2.82
S.D.	5113.26	3.64	3.47	1.38	0.83	1.54	0.55	1.14	1.44
Min	-3444.95	-8.32	0.33	0.00	-2.00	0.00	1.30	1.25	0.06
Max	21096.73	8.82	19.32	4.00	1.00	4.00	3.80	6.00	6.84

Table 3: Descriptive Statistics Group 2, 36 observations

Since not all countries have signed the GATS agreement on financial services, the total number of countries which have data on the financial services trade regime is only 36.<sup>12</sup> A list of these two groups of countries can be found in Appendix A.3. Note that group 2 is almost a perfect subset of group 1.

Table 2 and 3 show some descriptive statistics for the two groups of countries. The variable names are assigned as follows:

- Level: Time average (1990-98) of total net capital flows in mill. of dollars;
- Share: Time average (1990-98) of total net capital flows as a share in GDP;
- CV: Absolute value of the coefficient of variation of total net capital flows;
- Fora: Average share of foreign banks (assets) (1990-97), in percent;
- Forn: Average share of foreign banks (number) (1990-97), in percent;
- Bias1: Bias towards cross-border supply, index;
- Bias2: Bias towards bank lending, index;
- Restrict: Restrictions on foreign banks, index;
- EF: Economic Freedom, index;
- Rule: Rule of Law, index;
- Infl: Log of average inflation (1990-98).

## 4 Results of the benchmark regressions

Table 4 shows the results of the benchmark regressions. The dependent variable is the coefficient of variation of total net capital flows. Five regressions

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<sup>12</sup>For six more countries, GATS commitments are only available in Spanish. These countries are not included in the sample.

are run in order to test separately which of the financial services trade variables tend to affect the coefficient of variation. In all five regressions, it is controlled for the same macroeconomic and regulatory variables.<sup>13</sup>

Five key observations can be drawn from these regressions:

1. The explanatory power of the regressions is very low. The adjusted  $R^2$  is below 20% for all of the regressions. The explanatory power of the foreign bank penetration variables is higher than the one of the trade regime variables.
2. Foreign bank penetration tends to *increase* the volatility of capital flows. Here, the market share of foreign banks matters. While the share of foreign banks' assets in total assets is significant at the 5% level, the share in the total number of banks is not significant at the 10% level.
3. The trade regime variables are not significant in explaining cross-country differences in the volatility of capital flows. The  $t$ -Statistics for all three of these variables are far below common levels of significance.
4. Inflation is also not significant in explaining the differences in volatilities.
5. The degree to which the law is respected in a country does reduce the volatility of capital flows. The variable is significant at the 5% level or better in all five regressions. Economic Freedom, however, is not significant in any of the specifications.

The fact that foreign bank penetration increases the volatility of capital flows indicates that the concerns about foreign competition, in particular in a weak domestic banking system might be justified.<sup>14</sup> The finding that the trade regime variables are not significant raises doubts whether the stability-enhancing effects described above take place automatically and whether they offset the possibly negative impact on financial stability. They could also

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<sup>13</sup>Two outliers with an extremely high coefficient of variation have been eliminated from group 1, one outlier from group 2.

<sup>14</sup>It could also indicate that foreign presence in many countries is rather due to historical factors than to a liberal trade regime. KS (p. 30) have stressed that in these cases foreign presence in otherwise closed financial systems without the possibility of new entry is not very likely to generate any stability-enhancing effects. However, this argument is not compelling because no evidence of any stability-enhancing effects of the trade regime are found here.

	<b>Dependent Variable:</b> Volatility of total net capital flows [Coefficient of Variation]				
<b>Independent var.</b>					
Fora	2.11 (2.2)**				
Forn		2.29 (1.54)			
Bias1			0.12 (0.33)		
Bias2				0.13 (0.63)	
Restrict					0.12 (0.57)
Infl	-0.04 (-0.30)	-0.09 (-0.59)	-0.12 (-0.46)	-0.1 (-0.41)	-0.11 (-0.45)
EF	-0.05 (-0.23)	-0.06 (-0.23)	0.06 (0.18)	0.03 (0.09)	-0.02 (-0.06)
Rul	0.42 (2.82)***	0.42 (2.65)**	0.52 (2.62)**	0.48 (2.32)**	0.5 (2.53)**
Observations	54	54	35	35	35
$R^2$	0.21	0.17	0.13	0.14	0.13
Adjusted $R^2$	0.16	0.12	0.04	0.05	0.05

Table 4: Determinants of volatility measured by the coefficient of variation; Coefficients and (*t*-Statistics) of OLS estimates; \*, \*\*, \*\*\*: significant at the 10, 5, 1 % level



indicate that coordination problems which are not necessarily amended by better information are at the root of the volatility of capital flows.

However, it is important to keep in mind that GATS commitments are only a very crude measure of actual trade policies pursued. Moreover, only countries which made liberalization commitments are included in the sample. With only 36 observations, these results should be treated with a little caution.

The poor performance of the only macroeconomic variable that is included in the regressions, inflation, suggests that for long-run average figures, the regulatory environment matters more than macroeconomic factors.

Finally, it seems what matters most for differences in volatility is respect for the law. Surprisingly, however, government involvement in the economy does not increase the volatility of capital flows. Crony capitalism with explicit and implicit state guarantees that directed resources into non-profitable projects might have contributed to the financial crisis in some Asian countries, but there is no evidence of a broader relationship of economic freedom and the volatility of capital flows.

## 5 Robustness to alternative specifications

In order to make the results of this paper comparable to the findings by KS, the standard deviation of the respective shares in GDP are also used as dependent variable. Moreover, the number of sign changes is considered as an alternative measure of volatility. It counts every switch from a positive to negative value as one, i.e. it counts episodes of changes of directions of capital flows which usually coincidence with the beginning of a financial crisis or the start of (over-)optimism after a period of net outflows. Appendix A.4 contains the results of the regressions which have the same independent variables as the benchmark regressions.

If the standard deviation of shares in GDP is used as a dependent variable, only observation 2 of the benchmark regression has to be modified. All other observations are robust to this change in specification. Foreign bank penetration does not significantly influence the volatility of capital flows. This is true for both measures. The rule of law variable is even significant at the 1% level.

The same is true for regressions where the number of sign changes is the dependent variable. The  $t$ -Statistics of the coefficients of foreign bank penetration, however, are very close to the critical value of the 10% level of significance.

## 6 Conclusion

This paper has examined empirically the relation between the volatility of capital flows, foreign bank penetration and a liberal trade regime with regard to financial services. It was argued that such a relationship should be tested for total net capital flows, and not for specific components. It was found some evidence for foreign bank penetration to rather *increase* the volatility of capital flows. However, this result is not robust to alternative specifications of volatility. No evidence for any significant influence of the trade regime with regard to financial services was found. This could indicate that the volatility of capital flows to emerging markets was not primarily caused by a lack of transparency and information.

Nevertheless, regarding the policy stance of emerging markets towards a further liberalization of trade in financial services, it should be kept in mind that the efficiency losses from a closed financial sector are possibly large.<sup>15</sup> In order minimize the risks, liberalization should only take place in an appropriate institutional environment such an efficient bank supervision and proper disclosure standards. A transparent licensing process should ensure that only sound foreign banks enter the domestic market. There might be the case for solving problems of non-performing loans prior to liberalization. However, foreign banks could also be helpful in this process if they participate in mergers and privatization. With regard to the liberalization of cross-border supply even more caution is needed since it necessarily involves capital flows. It should only take place as part of a coherent, well-sequenced liberalization strategy within a consistent macroeconomic framework and exchange rate regime. Free cross-border supply does not in general preclude the introduction of temporary capital controls. These policies have probably not been pursued in the past. Therefore, in some countries, financial liberalization did indeed coincidence with financial crises. This might be an additional reason why stability-enhancing effects are difficult to find empirically.

Further research should include in cross-country regressions additional variables which measure specifically more aspects of financial liberalization and other macroeconomic variables which are used in the prediction literature on currency crises. Moreover, a panel data analysis where observations of changes in capital flows are the dependent variable would be probably fruitful because dynamic interactions could be examined. Such an analysis would be especially interesting if data on financial liberalization in time were available.

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<sup>15</sup>Some of these recommendations draw on Tamirisa, Sorsa, Bannister, McDonald, and Wiczorek (2000).

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## A Appendix

### A.1 Financial services trade regime variables

#### A.1.1 Financial services liberalization in the GATS

Financial services were integrated into the GATS framework in December 1997. After difficult negotiations, the financial services agreement (FSA) was signed by 102 WTO members. The commitments came into force in March 1999. However, most of the FSA is a formalization of the status quo.<sup>16</sup> Therefore, KS use the FSA commitments, as proxies for actual policies in the 1990s.

The GATS distinguishes four modes of supply (see table 5). Differential commitments across different modes of supply are allowed.

Mode 1	Cross-border supply
Mode 2	Consumption abroad
Mode 3	Commercial Presence
Mode 4	Presence of natural persons

Table 5: Modes of supply in the GATS

Cross-border supply and commercial presence are the two most relevant modes of supply of financial services. Whereas the first refers to a service which is provided without the foreign bank entering the country, e.g. by telephone or on-line, the second takes place if the service is provided by a the domestic subsidiary or branch of a foreign bank.

#### A.1.2 The KS Indicators of the financial services trade regime

**Bias towards cross-border supply** The index reflects the relative level of commitments under mode 1 and mode 3 (see table 6).

The bias index is the sum of the two columns. It ranges from -2 to 2 where -2 means no commitments in mode 1, full liberalization in mode 3 while an index value of 2 means just the opposite: no commitments under mode 3, full liberalization of mode 1. The lower the index, the more stability-enhancing the trade regime.

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<sup>16</sup>See Dobson and Jacquet (1998, p. 2) and KS.

	Mode 1	Mode 3
No commitment	0	0
Partial liberalization	1	-1
Full liberalization	2	-2

Table 6: Assigned scores for the bias towards cross-border supply

**Bias towards bank lending** This index assigns a higher score to the trade regime if the commitments are biased towards bank lending relative to capital market finance. The more severe the bias, the higher the score (see table 7).

Equal commitments or bias towards securities	0
Weak bias for bank lending	2
Strong bias for bank lending	4

Table 7: Assigned scores for the lending bias

**Restrictions on foreign banks** The index counts the number of the described four restrictions and ranges therefor from 0 to 4.

## A.2 Data Sources and computational remarks

**Annual capital flow data** for the sample countries are obtained in US dollars for the time period of 1990-1998. The IFS distinguishes three types of capital flows: foreign direct investment (FDI), portfolio investment and other investment. Net flows are calculated by netting the respective assets and liabilities. The sum of all three types of net flows is called total net capital flows, the IFS refer to this figure as the financial account. As is explained above, this is the aggregated variable which will be considered here. The coefficient of variation is computed as the absolute value of the standard deviation divided by the mean.

**Inflation** is the average from 1990-98 of the year-on-year percentage change in the consumer price index.

Annual **data on the share of foreign banks** in the total number and total assets of the domestic financial sector are obtained from the Database on Financial Development and Structure, which was recently published by

	Source	Published by
Total net capital flows	IFS, line 78bjd	IMF (1999b)
Inflation	IFS, line 64	IMF (1999b)
GDP in U.S. dollars	WEO database	IMF (1999c)
Foreign banks assets/number	World Bank database	Beck et al. (1999)
Index of Economic Freedom		Johnson et al. (1999)
GATS commitments	GATS schedules, KS	WTO (1998), KS

Table 8: Data sources

the World Bank.<sup>17</sup> A bank is defined as foreign if at least 50% of the equity is owned by foreigners.

See table 8 for a complete list of data sources.

### A.3 List of countries

#### A.3.1 Group 1

ARGENTINA  
 BAHAMAS  
 BAHRAIN  
 BANGLADESH  
 BOLIVIA  
 BOTSWANA  
 BRAZIL  
 BULGARIA  
 CAMEROON  
 CHILE  
 CHINA,P.R.  
 COLOMBIA  
 CONGO, REPUBLIC OF  
 COSTA RICA  
 CYPRUS  
 CZECH REPUBLIC  
 DOMINICAN REPUBLIC  
 ECUADOR  
 EGYPT

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<sup>17</sup>See Beck, Demirguc-Kunt, and Levine (1999) for a description of the database.

EL SALVADOR  
GUATEMALA  
GUYANA  
HONDURAS  
HUNGARY  
INDIA  
INDONESIA  
KENYA  
KOREA  
MADAGASCAR  
MALAYSIA  
MALI  
MEXICO  
MOROCCO  
NAMIBIA  
NICARAGUA  
NIGERIA  
PAKISTAN  
PANAMA  
PAPUA NEW GUINEA  
PARAGUAY  
PERU  
PHILIPPINES  
POLAND  
ROMANIA  
RUSSIA  
SENEGAL  
SIERRA LEONE  
SINGAPORE  
SOUTH AFRICA  
TANZANIA  
THAILAND  
TUNISIA  
TURKEY  
UGANDA  
URUGUAY  
VENEZUELA



### **A.3.2 Group 2**

ARGENTINA  
BAHRAIN  
BOLIVIA  
BRAZIL  
BULGARIA  
CHILE  
CHINA,P.R.  
COSTA RICA  
CZECH REPUBLIC  
ECUADOR  
EGYPT  
GHANA  
HONDURAS  
HUNGARY  
INDIA  
INDONESIA  
JAMAICA  
KENYA  
KOREA  
MALAYSIA  
MALTA  
MEXICO  
MOROCCO  
NEW ZEALAND  
NIGERIA  
PAKISTAN  
PHILIPPINES  
POLAND  
ROMANIA  
SENEGAL  
SINGAPORE  
SOUTH AFRICA  
SRI LANKA  
THAILAND  
TURKEY  
VENEZUELA

## A.4 Further regression results

	<b>Dependent Variable:</b> Volatility of total net capital flows [Standard deviation of shares in GDP]				
<b>Independent var.</b>					
Fora	0.39 (0.28)				
Forn		1.33 (0.61)			
Bias1			0.28 (0.67)		
Bias2				-0.09 (-0.34)	
Restrict					-0.044 (-0.16)
Infl	0.12 (0.57)	0.11 (0.53)	0.07 (0.22)	0.03 (0.11)	0.04 (0.14)
EF	0.10 (0.33)	0.05 (0.16)	0.09 (0.21)	0.09 (0.22)	0.10 (0.22)
Rule	0.83 (3.9)***	0.8 (3.53)***	1.01 (3.98)***	0.99 (3.89)***	0.98 (3.88)***
Observations	49	49	32	32	32
$R^2$	0.11	0.12	0.19	0.18	0.18
Adjusted $R^2$	0.05	0.06	0.1	0.09	0.09

Table 9: Determinants of volatility, measured by the standard deviation of shares in GDP; Coefficients and ( $t$ -Statistics) of OLS estimates; \*, \*\*, \*\*\*: significant at the 10, 5, 1 % level

	<b>Dependent Variable:</b> Volatility of total net capital flows [Number of Sign Changes]				
<b>Independent variables</b>					
Fora	1.47 (1.63)				
Forn		1.65 (1.15)			
Bias1			0.36 (1.36)		
Bias2				-0.15 (-0.93)	
Restrict					0.03 (0.17)
Infl	0.08 (0.58)	0.05 (0.33)	0.06 (0.33)	0.01 (0.07)	0.04 (0.19)
EF	0.04 (0.17)	0.05 (0.24)	0.15 (0.59)	0.17 (0.63)	0.11 (0.4)
Rule	0.26 (1.85)*	0.24 (1.59)	0.3 (1.90)*	0.3 (1.88)*	0.27 (1.67)
Observations	49	49	32	32	32
$R^2$	0.15	0.13	0.18	0.15	0.12
Adjusted $R^2$	0.09	0.07	0.09	0.05	0.03

Table 10: Determinants of volatility measured by the number of sign changes; Coefficients and ( $t$ -Statistics) of OLS estimates; \*, \*\*, \*\*\*: significant at the 10, 5, 1 % level