How Important is Trade in the International Spread of Crises?*

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Abstract: This paper examines the importance of trade in the international transmission of financial crises. It begins with a detailed survey of the empirical and theoretical literature. Then it explains that trade can transmit crises via three distinct, and possible counteracting, channels: a competitiveness effect (when changes in relative prices affect a country's ability to compete abroad); an income effect (when a crisis affects growth and the demand for imports); and a bargain effect (when a crisis reduces import prices and acts as a positive supply shock). Next, the paper develops a series of statistics measuring each of these trade effects for a sample of 48 countries during 16 crises between 1994 and 1999. Of particular interest is the competitiveness statistic, which uses 4-digit industry information to calculate how each crisis affects exports from other countries. Empirical results suggest that countries which compete with exports from a crisis country and which export to the crisis country (i.e. the competitiveness and income effects) had significantly lower stock market returns. Although trade does not fully explain stock market returns during recent crises, these trade effects are economically important and have a much larger impact than other macroeconomic variables.

I.   Introduction

The 1990's were punctuated by a series of financial and currency crises: the ERM attacks in 1992; the Mexican peso collapse in 1994; the East Asian crisis in 1997-98; the Russian collapse in 1998; and the devaluations in Brazil and Ecuador in 1999. One striking characteristic of many of these crises was how an initial country-specific event was rapidly transmitted to markets of very different sizes and structures around the globe. These events have prompted a surge of interest in "contagion" and how crises are transmitted internationally. Despite this interest, however, there continues to be little agreement on why many of these crises that began in relatively small economies had such large global repercussions.

One channel through which a country-specific crisis could have global repercussions is trade. If two countries trade directly, export to the same country (or countries), or even compete in the same industries, then a crisis in one country could change the relative prices and/or quantities of goods traded by that country and therefore have spillover effects in other economies. Theoretical models have shown exactly how these trade effects could transmit a crisis in one country to another country. There is an ongoing debate, however, on whether these trade effects have been large and/or significant in the propagation of recent currency crises.

Informal evidence suggests why this debate is unresolved. Argentina is one of Brazil's major trading partners. Argentina is also one of the countries most affected by Brazil's devaluation in 1999, suggesting that trade links may have been important in the transmission of the Brazilian crisis. On the other hand, there is little direct trade between Brazil and Russia, and even minimal competition in third markets between these two countries. Brazil, however, was severely impacted by the Russian crisis in 1998, suggesting that trade links may not have been important in the transmission of this crisis. Numerous other examples from the series of currency crises in the 1990's could support either of these arguments.

This paper addresses this debate on whether trade was significant in the transmission of recent currency crises. It decomposes "trade effects" into three channels by which a crisis in one country can be transmitted to other countries: a competitiveness effect (when changes in relative prices affect a country's ability to compete abroad), an income effect (when a crisis affects growth and the demand for imports), and a bargain effect (when a crisis reduces import prices and acts as a positive supply shock). Then it uses data on aggregate trade flows and 4-digit industry trade flows to measure the strength of these three channels between every country experiencing a crisis from 1994 through 1999 and a sample of developed and developing countries around the world. Using these statistics, the paper estimates how trade linkages affect a country's stock market returns during recent crises. It finds that the competitiveness and income effects are both

negative, significant, and economically important. In other words, if a country competes in the same industries as a crisis country, or exports directly to the crisis country, then the country will have significantly lower stock returns during the crisis. There is also weak evidence of a positive bargain effect. Although these trade effects cannot fully explain stock market returns during recent crises, they are important and have a much larger impact than other macroeconomic variables.

A final result from this empirical analysis is that how a country responds to a currency crisis is an important determinant of how that crisis spreads internationally. For example, some countries respond to pressure on their exchange rate by devaluing their currency (or allowing it to depreciate). Other countries attempt to maintain a stable currency value and instead increase interest rates significantly. Other countries use international reserves, or some combination of these three defenses. Empirical results suggest that the competitiveness effect is only large and significant when a crisis country allows its currency to be devalued (or depreciate) substantially. Results also suggest that the income effect is only large and significant when a crisis country raises interest rates substantially. Therefore, the importance of trade effects in the transmission of a crisis will depend on the specific characteristics of the initial crisis, and, in particular, how the country responds to the crisis.

This paper makes a number of contributions to the literature. First, it emphasizes that "trade" actually captures several different, and possibly counteracting, channels which can be divided into three distinct effects: a competitiveness, income, and bargain effect. Second, it creates a number of new and more accurate statistics to measure these three trade effects. For example, most papers attempting to measure trade competition in third markets analyze aggregate trade flows to common markets. Just because two countries are highly dependent on a common market, however, does not mean that the two countries compete directly. For example, if a high proportion of Saudi Arabia's oil and of Brazil's coffee goes to the same third market, Saudi Arabia and Brazil are not directly competing. By focusing on trade in specific industries, instead of aggregate trade flows, this paper's statistics provide more accurate measures of trade competition. Fourth and finally, by utilizing this industry-level trade data, the paper can reduce any omitted-variable bias. More specifically, several papers which find that trade helps transmit crises admit that trade flows are highly correlated with financial flows. It is extremely difficult to disentangle these linkages (and even to measure financial linkages), so estimates of the importance of trade linkages may actually be capturing the impact of financial linkages.[1] Financial linkages are generally country specific and similar across industries, however, while many trade linkages vary

across industries. Therefore, by using industry-level data, this paper can more accurately identify the impact of trade linkages and reduce any omitted-variables bias.

The remainder of this paper is as follows. Section II reviews previous empirical work assessing the importance of trade in the international transmission of crises. Section III surveys the related theoretical work and then uses this work to decompose trade into three different (and possibly opposing) effects. Section IV uses an index of exchange rates, interest rates, and reserve levels to identify the crisis events used in the rest of the paper. Section V introduces the model and data set and calculates a number of statistics measuring trade linkages across countries. It discusses these statistics, and especially the industry-based competitiveness measure, in some detail. Section VI presents regression estimates, including a series of sensitivity tests. It finds that not only are trade effects significant and economically important, but they have a larger impact than other macroeconomic variables. Section VII examines different types of crises and shows that how a country responds to a crisis determines which trade linkages are important transmission mechanisms. Finally, Section VIII summarizes the key results of the paper and concludes with several policy implications.

II.   The Empirical Literature: Is Trade Important?

A number of empirical papers have attempted to measure the importance of trade in the international transmission of crises. This section discusses the basic methodology and results of each of these papers. It begins with three empirical papers which estimate that trade linkages are important determinants of how crises spread. Then it discusses three papers which argue that trade effects were not important during recent crises. The section concludes by summarizing several recent papers which argue that trade effects exist, but are not as important as other transmission mechanisms.

One of the first empirical papers to assess the importance of trade and find strong support for this propagation mechanism was an NBER working paper by Eichengreen, Rose and Wyplosz.[2] Eichengreen et al. use a binary-probit model to test whether the probability of a crisis occurring in twenty industrial countries between 1959 and 1993 is correlated with the occurrence of a speculative attack in other countries at the same time. In one series of tests, they weight the occurrence of crises in other countries by a trade matrix (which is based on bilateral trade flows

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[1] Glick and Rose (1999) and Kaminsky and Reinhart (2000) both raise this point.
[2] Eichengreen, Rose and Wyplosz (1996a). The final version of this paper, which did not include this analysis of trade effects, is Eichengreen, Rose and Wyplosz (1996b).

in manufacturing[3]) and by a matrix of macroeconomic variables. They find that this trade-weighted matrix is highly significant and robust, while the macro-weighted matrix is insignificant. They conclude that their results lend "some support to our favored interpretation that it is trade links rather than macroeconomic similarities that have been the dominant channel for the contagious transmission in the sample period."[4]

Glick and Rose (1999) build on this framework in the most complete and thorough analysis, to date, of the role of trade in the international transmission of crises. They focus on five major currency crises between 1971 and 1997 and test if the probability of a country being attacked during a crisis is affected by trade linkages between that country and the crisis country. Glick and Rose include a much larger sample of countries than in Eichengreen et al. and use a number of different statistics to measure trade linkages. They focus on a trade statistic measuring exports to common third markets, although they also run sensitivity tests using: bilateral trade flows; a combination of these two statistics; and exports to common markets weighted by country size. These trade measures are consistently large and significant, indicating that: "a stronger trade linkage is associated with a higher incidence of currency crises."[5] Once again, macroeconomic controls are generally insignificant.

Instead of using data on aggregate trade flows, Forbes (2000) utilizes firm-level information to measure the importance of trade in the international transmission of crises. Her sample includes information on over 10,000 companies from around the world during the Asian and Russian crises. Forbes focuses on the variation in different company's stock market performance, which not only allows her to test which types of companies were most affected by these crises, but also how these crises spread internationally. She finds that companies that had sales exposure to the crisis country and/or competed in the same industries as crisis-country exports had significantly lower stock returns during these periods. Forbes concludes that direct trade effects (what she calls income effects) as well as competition in export industries (what she calls product-competitiveness effects) "were both important transmission mechanisms during the later part of the Asian crisis and the Russian crisis."[6]

Although these three papers find strong evidence for the role of trade, a number of other empirical papers argue that trade was not important in the propagation of recent crises. In one of the earliest papers classifying specific channels through which crises spread internationally,

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[3] More specifically, this weighting matrix is based on the MERM weights constructed by the International Monetary Fund and used to compute its real effective multilateral exchange rates. The weights are based on unit labor costs, use a convex combination of import and export trade flows, and are time-invariant.
[4] Eichengreen, Rose and Wyplosz (1996a), pg. 38.
[5] Glick and Rose (1999), pg. 613.

Masson (1998) categorizes trade as a "spillover" and argues that spillovers were not important during the 1994 Mexican crisis or the 1997 Asian crisis. He argues that since exports to Mexico and Thailand constituted a small proportion of total exports from their neighbors, regional spillover effects through trade would have been modest. Masson also calculates the loss in competitiveness of five Asian countries (as measured by changes in their real effective exchange rates) during the Asian crisis. Since this competitiveness effect was small (at least before the November depreciation of the won), he argues that these spillovers cannot explain the spread of the crisis from Thailand throughout Asia. Masson concludes that: spillover effects "cannot explain the coincidence of speculative pressures felt by a number of emerging market economies at the time of the Mexican and Thai crises."[7]

Baig and Goldfajn (1998) also argue that trade was not important in the spread of the Asian crisis. They calculate direct trade flows between each of the East Asian economies and assert: "…they are not adequate to account for what happened in East Asia. The trade linkages among the five countries in discussion are not very striking…The export share to Thailand constituted less than 4 percent of total exports for each of the four countries in discussion, making intra-country trade an unlikely source of pressure on financial markets." Baig and Goldfajn also consider indirect trade linkages, such as export competition in the U.S. and Japan, but "...don't find much evidence in support of this argument either. The Asia 5 countries do not share very similar third-country export profiles that would amount to severe competitiveness pressures."[8]

A final paper which argues that trade was not significant has a more limited focus. Harrigan (2000) examines how the Asian crisis affected prices and volumes in different U.S. manufacturing sectors. He concludes that: "The impact of the Asia[n] crisis on U.S. industries was small and localized. Only one sector, the steel industry, experienced falling prices and output in the wake of the crisis…"[9] Harrigan admits that there was a decreased demand for U.S. manufactured goods in Asia during the crisis, but claims that this was offset by increased demand elsewhere in the world (including within the U.S.) He also reports that U.S. import volumes from Asia only increased moderately during this period, despite the large fall in import prices, because U.S. demand for Asian imports is relatively inelastic.

These three papers argue that trade is not important in the international transmission of recent crises, and the first three papers discussed in this section argue that trade was important. Most recent empirical work, however, takes an intermediate stance and claims that trade linkages

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[6] Forbes (2000), abstract.
[7] Masson (1998), pg. 3.
[8] Baig and Goldfajn (1998), pg. 7.
[9] Harrigan (2000), pg. 79.

can have some role, but are generally overshadowed by other factors.[10] In one such paper, Kaminsky and Reinhart (2000) examine the spread of the Mexican and Asian crises. They use both bilateral and third-country trade linkages (measured by export shares in similar industries) to construct "trade cluster" statistics. Then they use these statistics to estimate how trade affects the conditional probability of an initial crisis spreading to other countries. They find that the bilateral-trade cluster for Latin America is the most important, but emphasize that all of these trade measures are less influential than financial linkages. They conclude that trade may have played some role in the transmission of the Thai crisis to Malaysia, Korea and the Philippines, but it "…can certainly not help explain Argentina and Brazil following the Mexican devaluation nor Indonesia following the Thai crisis."[11]

Wincoop and Yi (2000) also find mixed support for trade linkages, although they only examine the impact of the Asian crisis on short-run U.S. GDP growth. They argue that the Asian crisis spread to the U.S. through three channels: decreased demand for U.S. exports due to the recession in Asia; exchange rate movements which reduced the U.S. price of imports from Asia; and capital outflows from Asia which lowered the cost of capital and therefore increased demand in the U.S. They estimate that the significant negative impact on U.S. growth from the first effect was entirely counteracted by the positive impact on U.S. growth from the third effect. (The estimated impact of second effect was minor.) Therefore, Wincoop and Yi suggest that even though the Asian crisis directly affected the U.S. through trade, this effect was entirely offset by other transmission channels.

To summarize, a number of empirical papers have tested for the role of trade in the international transmission of financial crises. The results are as varied as the approaches and techniques utilized. Some papers argue that trade linkages were large and significant; others argue that they were not important, especially in the spread of the Mexican, Asian, and Russian crises. Some of the most recent papers find a small role for trade – although its relevance is often overshadowed by other propagation channels. Therefore, this debate over how important trade is in the international transmission of financial crises can only be resolved through further careful empirical work.

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[10] More recently, a number of papers have tested for the relative importance of trade flows, financial linkages, and/or macroeconomic variables in the transmission of recent crises. These papers build on one or more of the approaches outlined in this section. They generally find that trade linkages are important, but overshadowed by other transmission channels. For example, see Caramazza, Ricci and Salgado (2000), De Gregorio and Valdés (2001) or Gelos and Sahay (2000).

[11] Kaminsky and Reinhart (2000), pg. 167.

III. The Theory: Why Might Trade Be Important?

The theoretical literature modeling exactly how trade can transmit crises is much more limited than the empirical literature testing for its importance. This section begins by briefly summarizing the key theoretical papers on this subject. Then it develops a framework for the empirical analysis in the remainder of the paper. It emphasizes that "trade" incorporates three distinct channels: a competitiveness effect, an income effect, and a bargain effect. Since any two of these channels could work in opposite directions, it is necessary to simultaneously control for each of them when analyzing the importance of trade in the international transmission of financial crises.

Gerlach and Smets (1995) is the first paper to formally model how a devaluation in one country can affect trade flows and thereby cause a crisis in another country. In their model, two countries are linked through trade in merchandise and financial assets. A successful attack on one country's exchange rate causes a devaluation and improves the competitiveness of that country's merchandise exports. This produces a trade deficit in the second country and a gradual decline in its central bank's international reserves. This ultimately leads to a speculative attack on the second country's currency. Gerlach and Smets also model a secondary effect of the initial devaluation. This devaluation lowers import prices in the second country, which reduces the aggregate price level and domestic demand. Residents of the country swap domestic currency for foreign exchange, which further depletes the central bank's holdings of international reserves. As a result, the second country could shift to an equilibrium where the central bank does not hold enough reserves to withstand a speculative attack.

Corsetti, Pesenti, Roubini and Tille (2000) use micro-foundations to develop a more detailed and rigorous model of how trade can transmit crises internationally. More specifically, they model two channels through which a devaluation in one country can affect other countries. In the first channel, the devaluation lowers the relative price of a country's exports and therefore shifts demand away from countries that produce similar goods. In the second channel, the cheaper exports improve the terms-of-trade for other countries, allowing them to finance a higher level of consumption for any given level of nominal income. Either of these two effects could dominate, so that a devaluation in one country does not necessarily lead to a welfare loss in other countries. In fact, under certain situations the second channel could dominate, and the country that devalues could "beggar-thyself" while simultaneously generating a welfare improvement for the rest of the world.

These theoretical papers explain how trade can transmit crises internationally.[12,13] A key point from this literature, especially when combined with the discussion of empirical work in Section II, is that "trade" incorporates a number of distinct channels. As clearly shown in Corsetti et al. (2000) and Wincoop and Yi (2000), the various channels that constitute trade could potentially counteract each other. As a result, the aggregate impact of trade linkages may be small, even though individual trade channels are large and significant. Therefore, any empirical work testing how trade linkages transmit crises should control for each of these channels simultaneously.

The empirical analysis in the remainder of the paper follows this approach. It attempts to simultaneously measure the importance of several trade linkages in the transmission of recent currency crises. More specifically, it focuses on three trade channels: a competitiveness effect, an income effect, and a bargain effect. The "competitiveness effect" is the first channel modeled in Corsetti et al. (2000). This trade effect occurs when one country devalues its currency, reducing the relative price of that country's exports and shifting demand away from goods that compete with those exports. If exports from the crisis country are a large enough share of global production in a given industry, prices in that industry could fall worldwide. Therefore, even if a country does not directly compete with exports from the crisis country in any specific markets, its export competitiveness could be damaged through these global industry effects.[14]

The second trade channel is what this paper calls an "income effect".[15] This occurs when a crisis affects a country's average income level and growth rate, which in turn affects that country's demand for imports. Other countries that export directly to the crisis country will experience a shift in demand for their goods. Most of the empirical work discussed in Section II assumes that any income effect is negative, since recent currency crises have generated a sharp contraction in economic growth and reduction in aggregate demand (within the crisis country). The historical evidence on the impact of currency crises on growth and demand, however, is

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[12] One additional theoretical paper which deserves note is Paasche (2000). This paper does not focus on trade *per se*, but shows how a small shock to a country's terms of trade (which could be caused by a devaluation elsewhere in the world or by a reduction in demand for a country's exports) can be magnified by credit constraints and thereby have large domestic consequences. This type of model could be combined with any of the other theoretical models to amplify these trade effects.

[13] Also see Harrigan (2000) and Pesenti and Tille (2000). Harrigan provides a non-technical discussion of the effect of the Asian devaluations on prices and quantities in the U.S. and Asia. Pesenti and Tille discuss the direct impact of bilateral trade flows between countries, as well as the indirect impact of competition in third markets. They provide several simple numeric examples to show how a devaluation in one country could impact other countries through competition in third markets.

[14] There could also be secondary-competitiveness effects if exports from the country which devalued are used as inputs for the production of goods in other countries. In this case, the currency crisis could improve, rather than reduce, the competitiveness of these products.

[15] Wincoop and Yi (2000) call this a domestic demand effect.

mixed.[16] In many cases, a currency crisis leads to a devaluation, which improves growth performance and aggregate demand in the crisis country. Therefore, the sign of any income effect is *a priori* indeterminate in the international transmission of crises.

The final trade channel that this paper examines is a "bargain effect".[17] This occurs when a country devalues its currency, reducing the relative price of its exports and improving the terms-of-trade in other countries. Imports into non-crisis countries are now available at a "bargain" price, potentially allowing them to finance a higher level of consumption for any given level of nominal income. This trade effect could clearly have a positive impact on a country's welfare when a crisis occurs elsewhere in the world.

To summarize, this paper tests for the importance of three trade channels, a competitiveness, income, and bargain effect, in the international transmission of recent financial crises. This paper does not test for the importance of other transmission channels, such as common bank lenders or capital flows responding to changes in interest rates. Although these other channels are undoubtedly important, and may even interact with trade flows, this paper maintains its narrow focus in order to carefully assess the significance and magnitude of these trade effects.

IV.   The Crisis Events

In order to test for the importance of trade effects in the transmission of recent crises, it is necessary to begin by defining exactly when these crises occurred. In many cases, such as the Mexican peso devaluation in December of 1994, it is not only clear that a crisis occurred, but also fairly straightforward to date when the crisis began. Other cases, however, are much harder to define. For example, in the aftermath of the Mexican devaluation, Argentina raised interest rates to 44 percent (versus about 7 percent immediately before the Mexican crisis) and still suffered a large outflow of reserves.[18] Does this qualify as a crisis? Or, even though Brazil did not devalue its currency until January of 1999 (an event which most people would agree is a crisis), how should we classify periods such as the week in early September of 1998 when Brazil raised interest rates from about 20 to 40 percent to forestall a devaluation?

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[16] For example, Gupta et al. (2000) examine the response of output during crises. They find that about 40 percent of crises have been expansionary. Also see Goldstein, Kaminsky, and Reinhart (2000, chapter 7), for a survey of the literature examining how currency crises affect a variety of economic indicators.
[17] This is also called the "bilateral trade effect" in Corsetti et al. (2000) and the "supply effect" in Wincoop and Yi (2000).
[18] Data sources are discussed below.

These situations suggest that focusing only on exchange rate movements may miss important periods of pressure on a country's currency. Therefore, I follow a convention frequently used in the currency-crisis literature and construct a "crisis index" which accounts for movements in a country's exchange rate, interest rate, and reserve levels. Although this index is somewhat *ad hoc*, it does capture the three main defenses a country has against a speculative attack (devalue its currency, raise interest rates, or use reserves to support the exchange rate.) More specifically, I construct a weighted index of exchange-market pressure (EMP) similar to that introduced in Eichengreen, Rose, and Wyplosz (1996a):

(1)
$$EMP_{nt} = \alpha \% \Delta e_{nt} + \beta \left[\left(i_{nt} - i_{Ut} \right) - \left(i_{ny} - i_{Uy} \right) \right] - \gamma (\% \Delta r_{nt} - \% \Delta r_{Ut})$$

where e_{nt} is the nominal exchange rate for country n's currency in U.S. dollars at time t; i_{nt} is the short-term interest rate for country n and i_{Ut} is the short-term interest rate for the U.S. at time t; i_{ny} and i_{Uy} are the same two interest rates calculated as rolling averages for the previous year (starting at date $t-1$)[19]; and r_{nt} and r_{Ut} are the ratio of international reserves to the money supply for country n and the U.S., respectively. Each component of the index is entered so that higher values of the index indicate greater levels of exchange-market pressure. Each component of the index is also weighted by the inverse of the standard deviation for each series in order to equalize conditional volatilities and ensure that no single series dominates the index.

In order to focus on recent currency crises (and to correspond with the trade data used in Section V), I calculate this exchange-market pressure index for five years – from July 1, 1994 through June 31, 1999. The data for U.S. dollar exchange rates and short-term interest rates is compiled on a weekly basis from Datastream. The data on reserves and the money supply (M1) is collected from the *International Financial Statistics CD-ROM* published by the International Monetary Fund. This information is only available on a monthly basis, so I interpolate to estimate weekly statistics. Also, I exclude countries with an annual rate of consumer price inflation greater than 100 percent.[20] Further information on data sources and definitions is available in the

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[19] This component of the index is generally calculated as a period-to-period change instead of a period-to-year change. I depart from this convention to adjust for the fact that a country may raise interest rates to defend its currency for longer than one period. This is particularly important for this paper's analysis since the time periods (*t*) are weeks instead of months or quarters.

[20] Adjusting this cutoff to either 50 or 150 percent has minimal impact on the results. I also exclude Pakistan, Kenya, and Russian before 1997 because none of these countries has the trade data during this period that is necessary for the analysis in the remainder of the paper.

appendix. The resulting sample used to calculate the exchange-market pressure index consists of the 47 countries listed in Table 1.[21]

The final step in defining crisis events is to specify the critical value for the EMP index such that index values above this level qualify as a crisis. I use the criteria:

$$Crisis_{n,t} = 1 \qquad if\ EMP_{n,t} > \mu_{EMP} + 5\sigma_{EMP}$$
(2)
$$= 0 \qquad otherwise$$

where $Crisis_{nt}$ is an indicator variable equal to one if a crisis occurs in country n at time t; μ_{EMP} is the mean of the EMP index; and σ_{EMP} is the standard deviation of the index. These criteria generate 41 country-week crisis periods.[22] Many of these one-week crisis periods, however, are clearly part of a single crisis event. (For example, Mexico has 3 "crises" in the 6-week period from December 19, 1994 through January 22, 1995.) Therefore, I include any crisis-week that occurs within one year of a crisis in a given country as part of a single crisis event. In other words, a country can have, at most, one crisis per year. This generates a sample of 16 recent crises that are listed chronologically in Table 1. The weeks included in each crisis event are listed in the second column of the table. The average length of a crisis is 2.6 weeks.

This list captures most of the recent events that gained attention as major financial crises, as well as a number of less publicized events. For example, the list includes the most obvious crises since mid-1994: the Mexican devaluation in December of 1994; the Thai crisis in July of 1997, the Korean devaluation in December of 1997; the Russian crisis in August of 1998; and the Brazilian devaluation in January of 1999. It also includes some less obvious "crises", such as the exchange-market pressure on Argentina in March of 1995 and on India in January of 1998. Many of these events do not include a major currency devaluation, but instead reflect a significant rise in interest rates and/or loss in reserves to counter capital outflows.[23] One interesting pattern in Table 1 is that crises tend to be bunched in time as well as by region. For example, there were a number of crises in Latin America in the end of 1994 and 1995. This was followed by a relatively

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[21] Since this paper uses weekly data and includes interest rates as one component of the exchange-market pressure index, the sample of countries is smaller than in other papers that calculate a similar crisis index. The shorter time periods are critical, however, to accurately identify the crisis windows, as well as to capture short periods of intense exchange-market pressure. Moreover, the focus of this paper is to measure how crises are transmitted internationally, and the sample used for this analysis is larger.

[22] Using more stringent criteria for a given level of the *EMP* index to be included as a crisis would exclude the Thai devaluation in July of 1997.

[23] Section VII analyzes how these different types of crises (i.e. currency devaluations versus interest rates hikes) determine how a crisis is transmitted internationally.

calm period, until the Thai devaluation in 1997 which was quickly followed by a series of crises across Asia.

V.   The Model, Data and Trade Statistics

Now that the crisis events have been identified, it is possible to estimate the importance of the three trade channels in the international transmission of recent crises. For simplicity, I refer to the country experiencing the crisis as the ground-zero country.[24] The base model, which is estimated for the entire period of 16 crises, is:

(3) $Return_{n,e} = \gamma_1 Compete_{n,e} + \gamma_2 Income_{n,e} + \gamma_3 Bargain_{n,e} + \gamma_4 \mathbf{X}_{n,e} + \gamma_5 \mathbf{P}_e + \varepsilon_{n,e}$

where $Return_{n,e}$ is the stock return for country n over the crisis event e; $Compete_{n,e}$ is a measure of any competitiveness-effect linkages between country n and the ground-zero country for the crisis event e; $Income_{n,e}$ is a measure of any income-effect linkages between country n and ground-zero country; $Bargain_{n,e}$ is a measure of any bargain-effect linkages between country n and the ground-zero country; $\mathbf{X}_{n,e}$ is a set of macroeconomic control variables for country n; and $\mathbf{P}_e$ is a set of period dummies (for each crisis event e). These period dummies are included to control for any global events or aggregate shocks that affect all countries during the crisis. Each of the independent variables is measured during the year prior to the starting date of the crisis. For example, the trade and macroeconomic variables for the Thai crisis (which occurred in June and July of 1997) are measured in 1996.[25] This timing convention is utilized so that the independent variables do not incorporate any impact of the crisis.

This model focuses on stock returns (the dependent variable) to measure a country's vulnerability to a crisis for a number of reasons. First, stock returns are available for a large sample of countries (even a larger sample than used to calculate the crisis index). Second, since stock returns are measured at a much higher frequency than most macroeconomic and trade variables, stock returns can more accurately pinpoint the effects of a specific crisis. This is particularly important when a series of crises (such as those in Thailand, the Philippines, and Korea) are bunched together in time. Third, since stock returns incorporate the immediate impact

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[24] This terminology is borrowed from Glick and Rose (1999).
[25] The one exception is the Mexican crisis (which occurred from 12/19/94 through 03/19/95). Due to data limitations, the independent variables are measured in 1994. Since the crisis occurred so close to year end, there should be minimal feedback on the annual trade and macro variables.

of a crisis as well as the expected longer-term effects, stock returns should capture the expected total impact of a crisis on a particular country. Granted, stock returns also have a number of shortcomings. Any sort of investor behavior that drives markets from their long-term equilibrium could reduce the ability of stock returns to accurately capture the long-term impact of a crisis.[26] Despite these shortcomings, stock returns are the most accurate indicator available for a broad sample of countries at the high frequency necessary to perform this analysis.

The data used to measure each of the variables in equation (3) comes from a variety of sources. For the base analysis, stock returns ($Return_{n,e}$) are measured as abnormal weekly stock returns (written as percents) for the market index in country n expressed in U.S. dollars.[27] The stock index data is from Datastream. For crisis events which last longer than one week, $Return_{n,e}$ is calculated as the average abnormal stock return over each week which qualifies as a crisis (as specified in Table 1). The macroeconomic variables are taken from the *International Financial Statistics CD-ROM* published by the International Monetary Fund and the *World Development Indicators CD-ROM* published by the World Bank. The appendix provides further information on each of these data sources and definitions.

The three trade-channel variables are calculated using data from the International Trade Centre/UN Statistics Division (1999), which reports bilateral trade flows between most countries in the world by 4-digit SITC codes between 1994 and 1998. The competitiveness variable ($Compete_{n,e}$) is calculated as a weighted product of two terms. The first term is exports from the ground-zero country in a given industry as a share of global exports in that industry. This term captures how important exports from the crisis country are to the global industry, and therefore the potential impact of the crisis on the industry as a whole. The second term is total exports from country n in the same industry, as a share of country n's GDP. This term captures the importance of each industry to country n, and therefore country n's potential vulnerability to the crisis. Finally, these products are summed across industries for each country-crisis pair and weighted by the maximum calculated value (and multiplied by 100). This creates an index that can take values from 0 to 100.[28] In other words, the competitiveness variable for a country n during crisis event e can be written:

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[26] For example, Barberis, Shleifer and Vishny (1998) show that markets tend to under-react to individual news and over-react to a long series of related news.

[27] Abnormal stock returns are calculated as stock returns during the crisis period minus average returns (i.e. normal returns) for the one year preceding the start of the crisis. One week preceding the start of the crisis is excluded from the calculation of normal returns in case there were any unusual market movements directly before the crisis.

$$(4) \qquad Compete_{n,e} = \frac{100}{Max_{Compete}} \sum_{k} \left(\frac{Exp_{0,k}}{Exp_{W,k}} * \frac{Exp_{n,k}}{GDP_n} \right)$$

where $Exp_{0,k}$ is exports from the ground-zero country for industry k; $Exp_{W,k}$ is exports from the entire world for industry k, $Exp_{n,k}$ is exports from country n for industry k, and GDP_n is gross domestic product for country n. All variables are measured in U.S. dollars for the one-year period ending before the start of the crisis event e. The k industries are 1075 4-digit SITC groups.

Since $Compete_{n,e}$ is a key variable for this paper's analysis, Tables 2 and 3 provide further information on this index. Table 2 (parts A and B) presents a sample of values for the first term in the product of equation (4). It lists the 10 largest 4-digit export industries for each ground-zero country (when measured as a share of world exports for each industry). Not surprisingly, smaller countries tend to have a smaller share of global exports in most industries. For example, the most important export industry for the Slovak Republic is flat, cold-rolled iron (SITC group 6734) which comprises only 3.5 percent of global exports in this industry. Larger countries have a larger share of export industries on average, such as Korea which exports 41 percent of the world's exports of fabric made of synthetic filament yarn (SITC group 6531). On the other hand, several small and medium-sized economies dominate specific export markets, especially for certain agricultural products and natural resources. For example, India exports 82 percent of world exports in castor oil seeds (SITC group 2235); the Philippines exports 58 percent of global exports in coconut oil fractions; the Czech Republic exports 51 percent of global exports in lignite (SITC group 3222); and Russia exports 48 percent of global exports in gaseous natural gas (SITC group 3432). Any other countries that were highly dependent on export revenues in any of these industries could have been extremely vulnerable to competitiveness effects from crises in these ground-zero countries.

Table 3 lists the calculated values of *Compete*. Parts A and B of the table report values for each of the 58 countries in the sample for each crisis event. Part C lists a number of summary statistics for the entire sample. The values of *Compete* range from almost 0 to 100, with a mean of 5.0 and standard deviation of 9.3. Larger values of *Compete* indicate that a country's economy was more dependent on industries that were most affected by the crisis. The highest value of *Compete* occurs for Singapore during the Korean crisis. Some of the four-digit industries generating this large competitiveness effect are: electronic microcircuits; input or output units; storage units for data processing; color television receivers; sound and video recording; parts for

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[28] Ideally, this competitiveness indicator would also incorporate the elasticities of substitution between

telecommunications equipment; and ships, boats and other vessels. Many of the other large values of *Compete* occur between countries dependent on natural resources and ground-zero countries that export a large share of these resources. For example, some of the larger values of *Compete* occur for oil-dependent Oman and Norway during the crises in Russia and Venezuela.

It is also worth noting several trends in *Compete* across crisis events. The average value of *Compete* fluctuates significantly across episodes and is much lower for crises that occur in small countries. For example, the mean value of *Compete* is less than 1 for crises that originate in Ecuador and the Slovak Republic, but over 12 for the crisis in Korea. The *Compete* variable is also smaller for countries that are less integrated with the rest of the world, even after adjusting for country size. For example, the Indian economy is over four times larger than the Indonesian economy (as measured by GDP), but the mean value of *Compete* for the Indonesian crisis was almost two times as large as for the Indian crisis. Both of these characteristics of *Compete* suggest that this variable captures the intuitive prediction that crises in larger and more export-oriented economies would have greater competitiveness effects on other countries.

The other two trade variables used to estimate equation (*3)* are more straightforward. The income-effect variable (*Income*) is measured as total exports from each country *n* to the ground-zero country as a percent of country *n*'s GDP. This captures the impact of the crisis on the demand for exports from other countries. Table 4 presents the calculated values of *Income*. Parts A and B of the table list the values for each of the countries in the sample, and part C lists a number of summary statistics. The values of *Income* range from 0 to 15 percent, with a mean of 0.2 and a standard deviation of 0.8. Not surprisingly, countries located in the same geographic region as the ground-zero country tend to have a higher share of exports to the crisis-country and therefore be more vulnerable to any income effect. For example, the largest value of *Income* (15 percent), measures exports from the Slovak Republic (as a share of GDP) going to the Czech Republic. The second largest value of *Income* (11.5 percent) is exports from Estonia (as a share of GDP) going to Russia.

The final trade variable, the bargain effect (*Bargain*), is measured as total imports from the ground-zero country into country *n* as a percent of private consumption and gross domestic investment in country *n*.[29] This variable captures the potential effect of lower import prices from the ground-zero country on the other countries in the sample. Table 5 lists the calculated values and summary statistics for *Bargain*. Many of the values, including the summary statistics, are

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goods from different countries, but to the best of my knowledge, these statistics do not exist.

[29] The denominator of this ratio includes private consumption and gross domestic investment in order to focus on the portion of GDP which is most affected by lower import prices. Other components of GDP, such as government consumption and net exports, are less affected by changes in import prices.

similar to those for *Income*.[30] Countries located in the same geographic region as the ground-zero country tend to have a higher share of imports from that country and therefore be more vulnerable to any bargain effects.

VI.   Estimation Results and Sensitivity Tests

Table 6 reports results when these measures of *Compete, Income,* and *Bargain* are used to estimate the model specified in equation (*3*). Column 1 reports results when only the trade variables (and no macroeconomic controls) are included in the model. Columns 2 through 7 add a variety of macroeconomic controls that are frequently used in this literature. Column 6 uses the same control variables as in the base specification in Glick and Rose (1999), and column 7 includes all of the control variables simultaneously.[31] Each of the trade variables has the predicted sign in Table 6, although each is not consistently significant across columns. More specifically, the coefficient for the competitiveness effect is always negative and significant at the 1 percent level. The coefficient for the income effect is also always negative and significant at the 5 percent level, as long as some macro controls are included in the specification. The coefficient for the bargain effect is always positive, although frequently insignificant.

These estimates also suggest that the magnitude of these trade effects can be large. Since the point estimates fluctuate across columns, I focus on the estimates in column (2). This specification includes the control variables most frequently cited in the literature, as well as the greatest number of observations (for any specification that includes macroeconomic controls). The point estimate for the competitiveness effect in column 2 is -0.05. This indicates that if a county's competitiveness index was 10 points higher, its abnormal weekly stock return is predicted to be 0.5 percentage points lower, on average, during each week of the crisis. Moreover, since the average length of a crisis in Table 1 is 2.6 weeks, and the Russian crisis is defined as lasting for 8 weeks, the cumulative impact on a country's stock market index could be much greater. A concrete example can help clarify the magnitude of this competitiveness effect. During the Thai crisis, the competitiveness index for Korea was 6.7 and for Malaysia was 40.4. Therefore, during the 1 week of the Thai crisis, the competitiveness effect is correlated with a 0.3

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[30] The correlation between *Income* and *Bargain* is 87 percent.
[31] Column 7 does not, however, simultaneously include control variables that measure similar statistics. For example, it does not include controls for both the growth in domestic credit and the growth in private credit.

percent decline in the Korean stock market and a 2 percent decline in the Malaysian market (holding everything else constant).

The point estimate for the second trade variable, the income effect, is -1.04. This implies that if a country's ratio of exports to the crisis country (as a share of GDP) was 1 percentage point higher, its abnormal stock return is predicted to be about 1 percentage point lower, on average, during each week of the crisis. To put these numbers in a more meaningful context, Poland's ratio of exports to Russia during the Russian crisis was 1.5 percent and Finland's ratio was 2.5 percent. Assume that both stock market indices were equal to 100 at the start of the Russian crisis, and that these two countries were otherwise identical. By the end of the 8-week Russian crisis, the income effect predicts a decline in the Polish market of about 12 percent and in the Finn market of about 20 percent. This suggests that small differences in export exposure to a crisis country (such as the 1 percentage point difference between Finland and Poland) can significantly affect a country's vulnerability to a crisis when accumulated over time (an 8 percentage point difference in returns between the two markets).

Potentially counteracting this income effect, however, is the bargain effect. The point estimate for the bargain effect is 0.59. This implies that if a country's import penetration ratio was 1 percentage point higher, the country's abnormal stock return is predicted to be 0.59 percentage points higher, on average, during each week of the crisis. To put this in context, during the Brazilian crisis the import penetration ratio was 1.5 for Chile and 2.6 for Argentina. According to the regression results, after the 1-week Brazilian crisis the bargain effect is correlated with an increase in the Chilean and Argentine stock market indices of 0.9 and 1.5 percentage points, respectively (again holding everything else constant).

Since these trade variables are highly correlated (especially the income and bargain effects), it is more meaningful to examine the combined impact of all three variables rather than focus on one effect in isolation. Table 7 performs this analysis for the countries and crises discussed above. It uses the estimation results from column 2 of Table 6 and assumes that the stock market index for each country is 100 directly before the crisis.[32] More specifically, columns 1 through 3 report the predicted weekly impact on each country's stock market index from each of the trade effects. Column 4 combines these into the aggregate predicted impact of the trade variables, and column 5 reports the aggregate predicted impact of all the other macro control variables. Column 6 lists the sum of the predicted trade and macro effects, and column 7 reports the actual, abnormal stock market return for each country during the given period.

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[32] To simplify this comparison, it also assumes that the normal return for each market is zero.

The statistics in this table make a number of key points. First, the simple regression model in equation 3 only has partial success in predicting stock market movements. In most of the examples in the table, predicted stock market returns are much lower (in absolute value) than actual returns. Second, despite the limited explanatory power of the model as a whole, the predicted impact of the trade variables can be large. For example, trade effects during the Thai crisis were predicted to reduce Malaysia's weekly stock return by 3.6 percentage points. Moreover, for longer crises (such as the 8-week Russian crisis) the cumulative impact of these trade effects can be much larger. Third, the predicted impact of the trade variables is much larger than the predicted impact of the macro variables. For example, during the Brazilian crisis the macro variables predicted a slight increase in Argentina's stock market index, while the trade variables predicted a decrease of 1.5 percentage points (about one-third of the actual decrease.)

These estimates and central results could be influenced by a number of factors such as: sample selection; variable definitions; and model specification. Therefore, this section closes by describing a number of sensitivity tests. Results are highly robust, so I only report a selection of these results in Table 8.[33] First, I test for the impact of sample selection. I drop one country at a time, one crisis at a time, and the five extreme observations for each variable. Next, since Venezuela and Ecuador each have more than one crisis (which could place too much weight on events in these countries), I only include the first crisis-event for each country in the sample. Then, since many of the extreme values for the competitiveness effect occur in oil-exporting countries during crises in oil-producing regions, I exclude the major oil exporters from the sample. These results are reported in column 2 of Table 8. In each of these tests, the coefficients on the competitiveness and income effects are negative and significant. The bargain effect is always negative, but its significance fluctuates.

As a second series of sensitivity tests, I examine the effect of using alternate variable definitions. I begin by redefining the income effect as exports from country n to the crisis country as a share of total exports from country n (instead of as a share of country n's GDP). Then I recalculate the bargain effect as imports into country n from the crisis country as a share of total imports into country n (instead of the sum of consumption and investment in country n). Finally, I use normal returns instead of abnormal returns for the dependent variable. (In other words, I no longer subtract each country's average stock market return for the year preceding the crisis.) This series of results is reported in columns 3 through 5 of Table 8. The coefficients for the competitiveness and income effects remain negative and significant in each of these tests.

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[33] Full results are obviously available from the author.

As a final set of robustness tests, I estimate a number of variations to the base model specification. Since there is no reason to believe that the relationship between the trade variables and stock returns is linear, I include squared and/or cubed terms for each of the trade variables. In most cases, the linear model outperforms the extended models, although there is weak evidence that the income effect may decrease for higher values of this variable. Next, I add a number of additional control variables, such as: GDP, GDP per capita, an OECD dummy, and an oil-exporter dummy. Finally, since the trade variables (and especially the income and bargain effects) may be capturing regional effects, I add a series of regional-dummy variables to the base specification. A sample of these results is reported in columns 6 and 7 of Table 8. In each case, the coefficients for the competitiveness and income effects remain negative and significant. Moreover, it is worth emphasizing the results in the last column that include the regional dummy variables. These regional dummy variables are jointly significant and several are individually significant. Even after controlling for these regional effects, however, the competitiveness and income effects are still negative and highly significant. This suggests that the trade variables are not simply capturing regional effects, such as financial linkages or regional learning.

VII.   Do Different Types of Crises Generate Different Trade Effects?

The previous analysis used an exchange-market pressure index, which incorporated changes in exchange rates, interest rates, and reserve levels, to define a series of crises from 1994 through 1999. There are, however, significant differences across these crises, especially in the relative importance of each component of the exchange-market pressure index. Many of these crises, such as those in Mexico and Thailand, involved substantial currency devaluations. During other crises, such as that in Argentina, the currency's value remained fairly stable and the government responded by raising interest rates and paying international reserves.

Moreover, how a country responds to increased pressure on its exchange rate could determine how the crisis is transmitted to other countries. For example, if a crisis includes a large currency devaluation, then exports from the crisis country will become relatively cheaper on international markets and the crisis could spread through competitiveness and bargain effects. On the other hand, if the currency's value remains fixed, there would not be significant competitiveness or bargain effects. Similarly, if the crisis includes a large increase in interest rates, this is likely to slow investment and growth in the crisis region. This could lead to a larger income effect than would occur if interest rates were left unchanged and/or decreased.

To test if differences across crises affect how these crises spread, I divide the sample of crises identified in Table 1 into two subgroups. The first subgroup is any crisis that includes a currency devaluation of 10 percent or more during at least one week of the crisis. The second subgroup is any crisis that includes an increase in the interest rate spread of 30 percent or more during at least one week of the crisis.[34] The crises that qualify in these subgroups are listed in Table 9. As shown in the table, slightly over half of the crises include a major currency devaluation, and three-quarters of the crises include a major increase in interest rates.

Next, I re-estimate equation 3 for each of these crisis subgroups, using the same methodology, definitions and specification as the base results reported in Section VI. Table 10 reports results. Column 1 repeats estimates for the entire sample of 16 crises. Columns 2 and 3 report results for crises that include and do not include, respectively, a major currency devaluation. Columns 4 and 5 report results for crises that include and did not include, respectively, a major increase in interest rates. Most of the estimates in Table 10 support the predictions discussed above. The competitiveness effect is negative and significant during crises that include a major devaluation, but highly insignificant during crises that do not include a major devaluation. The income effect is negative and significant during crises that include a major rise in interest rates, but is highly insignificant during crises that do not include a major rise in interest rates. Estimates for the bargain effect are the only coefficients that do not follow the above predictions. The bargain effect is insignificant during crises that include a major devaluation, but borderline significant for crises which do not include a major devaluation. This is not surprising, however, given the lack of robustness for this coefficient in the sensitivity tests reported above.

These results have an important implication. When a country's exchange rate is under pressure during a crisis, the country's response is a critical determinant of how the local crisis is transmitted to the rest of the world. If the country responds by devaluing its currency (or allowing its currency to depreciate), then other countries that compete with the crisis country's exports will be affected by the change in relative export prices. On the other hand, if the country responds by raising interest rates, this will directly affect countries that export to the crisis country, probably through a contraction in income and investment. Therefore, how a country responds to a crisis is an important factor determining how that crisis spreads internationally.

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[34] Both statistics are calculated as described in Section IV. More specifically, the exchange rate is calculated as the nominal U.S. dollar exchange rate. The interest rate is calculated as the short-term interest rate spread (versus the U.S. rate) less the same spread averaged over the previous year.

VIII. Summary and Conclusions

This paper analyzed the importance of trade effects in the international transmission of financial crises. It began by discussing a series of empirical papers that test for the importance of trade effects. Most of these papers use macro data on bilateral trade flows between countries. Results are mixed. Some papers argue that trade patterns are important determinants of a country's vulnerability to a crisis, while others argue that trade is not important, especially in the spread of recent currency crises. A serious limitation of this macro-level work is that trade flows between countries are highly correlated with other cross-country linkages, such as financial flows, that are extremely difficult to measure. Therefore, these papers could suffer from omitted-variables bias and estimates of the effect of trade linkages could actually be capturing the impact of other cross-country linkages.

Next, this paper surveyed several theoretical papers that explain why trade could transmit crises internationally. More specifically, it explained that "trade" incorporates three different channels: a competitiveness effect; an income effect; and a bargain effect. A competitiveness effect occurs when one country devalues its currency, increasing the relative competitiveness of its exports and hurting the competitiveness of exports from other countries. An income effect occurs when a crisis affects income and growth within the crisis country, thereby affecting (and probably reducing) purchases of imports from abroad. A bargain effect occurs when a country devalues its currency, reducing the relative price of its exports and thereby reducing prices in countries that import these goods. Although each of these three trade effects could help transmit a crisis internationally, these various effects may not all work in the same direction. For example, the income effect could partially counteract the bargain effect. Therefore, when measuring the importance of trade in the spread of crises, it is necessary to isolate each of these effects and measure them independently.

This was the main goal of the paper. It attempted to measure the significance and magnitude of each of these three trade effects in the international transmission of recent currency crises. To do this, it used data on 4-digit industry trade flows, as well as aggregate trade flows, across countries. By utilizing the variation across countries in their industry-composition of exports, this analysis was less likely to suffer from omitted-variables bias due to unmeasured regional linkages such as common-bank lenders. In order to perform this analysis, the paper constructed a number of statistics measuring the importance of trade linkages during 16 crises between 1994 and 1999. These statistics included a competitiveness variable that measured the importance of each export industry to the crisis country as well as how dependent other countries were on those export industries.

Estimation results suggested that trade effects were highly significant in the international transmission of recent crises. Countries that competed in the same industries as major exports from the crisis country had significantly lower stock market returns during these crises. Countries that had large shares of exports going to the crisis countries also had significantly lower stock returns. These competitiveness and income effects both remained highly significant and economically important during a series of robustness tests. Estimates of the third trade effect, the bargain effect, always had the expected sign, but significance fluctuated. Countries that had a large share of imports from the crisis country had slightly higher stock returns during these events. Taken as a whole, these trade effects were highly significant determinants of a country's abnormal stock returns during recent currency crises.

Another series of results from this empirical analysis was on the relative importance of trade and other macro variables in explaining different countries' vulnerability to financial crises that originate elsewhere in the world. Although trade and macro variables were significant and economically important determinants of a country's abnormal stock returns during a crisis, these variables can only explain a portion of stock market movements. For example, in the base regression results, trade and macroeconomic variables explained about one-quarter of the variation in countries' abnormal stock returns during recent crises. This suggested that other factors, such as financial linkages and investor behavior, may also be important. These results also suggested that trade effects were much more important than a country's macroeconomic characteristics in explaining its vulnerability to a crisis.

A final empirical result is that when crises are classified by how the crisis country responded to the pressure on its exchange rate, the importance of these trade effects becomes even more apparent. When a country responded to exchange-market pressure by devaluing its currency (or allowing it to depreciate), the competitiveness effect was negative and highly significant. If the country maintained a relatively stable exchange rate, there was no significant competitiveness effect. On the other hand, when a country responded to exchange-market pressure by raising interest rates substantially, the income effect was negative and highly significant. If the country kept interest rates fairly steady (or only raised them by a small amount), there was no significant income effect. Therefore, how a country responded to a financial crisis had a significant impact on how the crisis spread internationally, and in particular, which trade effects were important.

This series of results has important implications for the role of international institutions in responding to future financial crises. Real linkages between countries, such as trade, are important determinants of how a crisis spreads internationally. Multilateral assistance and/or

bailout packages will have limited success in reducing these cross-country linkages. On a more positive note, however, multilateral institutions could provide a crisis country with a wider variety of options than otherwise available. Therefore, even though multilateral institutions could not prevent the inevitable transmission of a crisis through these real linkages, they might influence how the country responds to any exchange-market pressure and therefore influence which countries are most affected by the crisis.

Appendix
Data Sources and Definitions

I.   **Data to Calculate the Exchange-Rate Pressure Index**

a)   *Nominal Exchange Rates:* Exchange rates expressed as the local currency per U.S. dollar as reported by Datastream.

b)   *Short-Term Interest Rates:* Short-term interest rates as reported by Datastream. The short-term rate is measured by the interbank rate (preferred) or the call rate. If neither of these is available, then the shortest-term rate available is used. The U.S. interest rate is the Federal Fund's rate.

c)   *International Reserves to the Money Supply:* The ratio of total international reserves less gold divided by narrow money (M1). Reserve data is line 1L.dzf and M1 data is line 34..zf from the *International Financial Statistics.* Weekly data is interpolated from the monthly data.

d)   *Inflation:* Annual percentage change in consumer prices. Data is from line 64.xzf from the *International Financial Statistics.*

II.   **Data to Calculate the Trade-Effect Regressions**

a)   *Stock Market Returns:* Based on stock market indices in U.S. dollars as reported by Datastream. Abnormal returns are calculated as the weekly stock return during the given time period minus the average weekly return (i.e. normal return) for the previous year. Calculation of the normal return excludes one week prior to the start date for the calculation of the abnormal return, in order to exclude any unusual market movements directly before a crisis.

b)   *Competitiveness Effect:* The weighted product of two terms: exports from the ground-zero country in a given industry as a share of global exports in that industry; and total exports from country *n* in the same industry, as a share of country *n*'s GDP. These products are summed across industries for each country-crisis pair and weighted by the maximum calculated value (and multiplied by 100). This creates an index that can take values from 0 to 100. All trade data is in U.S. dollars and is reported by the International Trade Centre/UN Statistics Division (1999).

c)   *Income Effect:* Calculated as the ratio of total exports to the ground-zero country to GDP. Export data is from the International Trade Centre/UN Statistics Division (1999). GDP is reported in the *World Development Indicators.*

d)   *Bargain Effect:* Calculated as the ratio of total imports from the ground-zero country to the sum of private consumption and gross domestic investment. Private consumption is the market value of all goods and services, including durable products purchased or received as income in kind by households, but excluding purchases of dwellings. Gross domestic investment consists of outlays on additions to the fixed assets of the economy, plus net changes in the level of inventories. Import data is from the International Trade Centre/UN Statistics Division (1999). Statistics in the denominator are reported in the *World Development Indicators.*

e)   *Private Credit Growth:* Average annual growth in credit to the private sector. This excludes credit to governments and public enterprises. Data from line 32d..zf of the *International Financial Statistics.*

f)   *Government Consumption / GDP:* The ratio of general government consumption to GDP as reported in the *World Development Indicators.* General government consumption includes all current spending for purchases of goods and services (including wages and salaries.) It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation.

g)   *Current Account Surplus / GDP:* The current account balance as a percent of GDP, where a positive value indicates a surplus. The current account is taken from line 78ald of the *International Financial Statistics* and GDP data is taken from the *World Development Indicators.*

h)   *Bank Reserves / Assets:* The ratio of domestic currency holdings and deposits with the monetary authorities to claims on other governments, non-financial public enterprises, the private sector, and other banking institutions. Reported in the *World Development Indicators.*

i) *Private Capital Inflows / GDP:* The ratio of gross private capital flows to GDP as reported in the *World Development Indicators*. Gross private capital flows are the sum of the absolute values of direct, portfolio, and other investment inflows and outflows recorded in the balance of payments financial account, excluding changes in the assets and liabilities of monetary authorities and general government. The indicator is calculated as a ratio to GDP converted to the international dollars using purchasing power parities.

j) *Domestic Credit Growth:* Average annual growth in domestic credit. Data from line 32..zf of the *International Financial Statistics*.

k) *Government Surplus / GDP:* The government budget surplus as a percent of GDP, where a positive value indicates a surplus. The government budget surplus is taken from line 80 of the *International Financial Statistics* and GDP data is taken from the *World Development Indicators*.

l) *Money Supply / Reserves:* The ratio of money and quasi money (M2) to gross international reserves as reported in the *World Development Indicators*. Money and quasi money is the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government (which corresponds to the sum of lines 34 and 35 of the *International Financial Statistics*.) Gross international reserves are holdings of monetary gold, special drawing rights, reserves of IMF members held by the IMF, and holdings of foreign exchange under the control of the monetary authorities.

m) *Openness:* The ratio of total trade to GDP, expressed as a percent. Total trade is calculated as the sum of all imports and exports as reported by the International Trade Centre/UN Statistics Division (1999). GDP is reported in the *World Development Indicators*.

n) *Exchange Rate Overvaluation:* Average dollar exchange rate for the three years preceding the relevant crisis minus the exchange rate from the month before the crisis. Exchange rates are weekly dollar exchange rates versus the U.S. dollar and reported by Datastream. A positive value indicates overvaluation of the exchange rate before the crisis.

o) *Growth in GNP per capita:* Average annual growth in GNP per capita. Data taken from the *World Development Indicators*.

p) *Inflation:* Domestic CPI inflation as reported in line 64 of the *International Financial Statistics*.

References

Baig, Taimur and Ilan Goldfajn. 1998. "Financial Market Contagion in the Asian Crisis." International Monetary Fund Working Paper No. WP/98/155.

Barberis, Nicholas, Andrei Shleifer, and Robert Vishny. 1998. "A Model of Investor Sentiment." *Journal of Financial Economics* 49: 307-343.

Caramazza, Francesco, Luca Ricci, and Ranil Salgado. 2000. "Trade and Financial Contagion in Currency Crises." International Monetary Fund Working Paper No. WP/00/55.

Corsetti, Giancarlo, Paolo Pesenti, Nouriel Roubini, and Cédric Tille. 2000. "Competitive Devaluations: Toward a Welfare-Based Approach." *Journal of International Economics* 51: 217-241.

De Gregorio, José and Rodrigo Valdés. 2001. "Crisis Transmission: Evidence from the Debt, Tequila, and Asian Flu Crises." In Stijn Claessens and Kristin Forbes, eds. *International Financial Contagion.* Boston, MA: Kluwer Academic Publishers, forthcoming.

Eichengreen, Barry, Andrew Rose, and Charles Wyplosz. 1996a "Contagious Currency Crises." NBER Working Paper No. 5681.

Eichengreen, Barry, Andrew Rose, and Charles Wyplosz. 1996b. "Contagious Currency Crises: First Tests." *Scandinavian Journal of Economics* 98(4): 463-484.

Forbes, Kristin. 2000. "The Asian Flu and Russian Virus: Firm-Level Evidence on How Crises are Transmitted Internationally." NBER Working Paper No. 7807.

Gelos, Gaston and Ratna Sahay. 2000. "Financial Market Spillovers: How Different are the Transition Economies?" In Stijn Claessens and Kristin Forbes, eds. *International Financial Contagion.* Boston, MA: Kluwer Academic Publishers, forthcoming.

Gerlach, Stefan and Frank Smets. 1995. "Contagious Speculative Attacks." *European Journal of Political Economy* 11: 45-63.

Glick, Reuven and Andrew Rose. 1999. "Contagion and Trade: Why Are Currency Crises Regional?" *Journal of International Money and Finance* 18: 603-617.

Goldstein, Morris, Graciela Kaminsky and Carmen Reinhart. 2000. *Assessing Financial Vulnerability: An Early Warning System for Emerging Markets.* Washington, D.C.: Institute for International Economics.

Gupta, Poonam, Deepak Mishra, and Ratna Sahay. 2000. "Output Response During Currency Crises." International Monetary Fund, mimeo.

Harrigan, James. 2000. "The Impact of the Asia Crisis on U.S. Industry: An Almost-Free Lunch?" *Federal Reserve Bank of New York Economic Policy Review* 6(3): 71-79.

International Monetary Fund. 2000. *International Financial Statistics.* Database on CD-ROM, June.

International Trade Centre / UN Statistics Division. 1999. *Trade Analysis System for Personal Computers.* Database on CD-ROM.

Kaminsky, Graciela and Carmen Reinhart. 2000. "On Crises, Contagion, and Confusion." *Journal of International Economics* 51: 145-168.

Masson, Paul. 1998. "Contagion: Monsoonal Effects, Spillovers, and Jumps Between Multiple Equilibria." International Monetary Fund Working Paper No. WP/98/142.

Paasche, Bernhard. 2000. "Credit Constraints and International Financial Crises." Carnegie Mellon University, mimeo.

Pesenti, Paolo and Cédric Tille. 2000. "The Economics of Currency Crises and Contagion: An Introduction." *Federal Reserve Bank of New York Economic Policy Review* 6(3): 3-16.

Wincoop, Eric van and Kei-Mu Yi. 2000. "Asia Crisis Post-Mortem: Where Did the Money Go and did the United States Benefit?" *Federal Reserve Bank of New York Economic Policy Review* 6(3): 51-70.

World Bank. 2000. *World Development Indicators.* Database on CD-ROM.

Table 1
Crisis Events

Country	Crisis Dates
Mexico	12/19/94-12/25/94; 01/16/95-01/29/95; 02/27/95-03/05/95; 03/13/95-03/19/95
Ecuador (1)	01/23/95-02/12/95; 10/30/95-11/05/95
Argentina	03/06/95 - 03/12/95
Venezuela (1)	12/11/95-12/17/95; 04/15/96-04/21/96
Venezuela (2)	05/12/97-05/18/97
Czech Republic	05/19/97-05/25/97
Thailand	06/30/97-07/06/97
Philippines	07/07/97-07/13/97; 09/29/97-10/05/97
Indonesia	08/11/97-08/17/97; 08/25/97-08/31/97; 09/29/97-10/05/97; 12/08/97-12/14/97; 01/19/98-01/25/98; 03/02/98-03/08/98; 05/18/98-05/24/98
Korea	12/29/97-01/04/98
India	01/19/98-01/25/98
Russia	05/18/98-05/31/98; 07/06/98-07/12/98; 08/10/98-09/06/98; 09/14/98-09/20/98
Venezuela (3)	06/15/98-06/21/98; 09/14/98-09/20/98
Slovak Republic	09/28/98-10/04/98
Ecuador (2)	10/19/98-10/25/98; 1/11/99-1/17/99; 03/01/99-03/07/99
Brazil	01/11/99-01/17/99

NOTE: Countries included in the sample which did not experience a crisis are: Australia, Austria, Belgium, Canada, Chile, Colombia, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, Ireland, Israel, Italy, Japan, Luxembourg, Malaysia, Morocco, Netherlands, New Zealand, Norway, Peru, Poland, Portugal, Singapore, South Africa, Spain, Sri Lanka, Sweden, Switzerland, the UK. The US is included in the sample but cannot experience a crisis due to the definition of the crisis index.

Table 2: Part A
Major Exports from the Crisis Countries

SITC Code	SITC Definition	% World Exports	SITC Code	SITC Definition	% World Exports
Mexico: 1994			**Czech Republic: 1996**		
7511	Typewritrs,wd-proc machs	24.9%	3222	Lignite	50.6%
2667	Syn.staple fibr,spinning	20.0	6576	Hat-shapes,forms,bodies	13.1
2832	Copper mattes, etc.	19.6	2784	Asbestos	9.5
2313	Other natural gums	19.6	6999	Articls.tungsten,etc.nes	8.4
0544	Tomatoes,fresh,chilled	16.4	2516	Chem.wood pulp,sulphite	8.3
7474	Safety, relief valves	15.7	2237	Oil seeds, etc. nes	7.7
7731	Insultd wire,etc.condctr	14.9	6659	Glass articles, nes	7.6
7611	Colour televisn receiver	14.7	5811	Artific. Sausage casings	7.1
2483	Wood,conif,worked,shaped	14.3	3250	Coke,semi-coke,ret.carbn	6.9
6973	Dom.cook.heat.app,n-elec	11.3	8913	Non-military arms	6.5
Ecuador: 1994			**Thailand: 1996**		
2655	Abaca,Manila hemp,waste	34.1%	2311	Natural rubber latex	47.2%
0573	Bananas, fresh or dried	22.5	0548	Veg.products,roots,tubrs	38.2
6576	Hat-shapes,forms,bodies	12.8	0423	Rice,milled,semi-milled	37.8
0721	Cocoa beans	9.8	2312	Natural rubber exc.latex	36.5
0361	Crustaceans, frozen	6.3	6129	Oth.leather articles nes	27.5
0593	Juice,other citrus fruit	5.0	0372	Crustacea,mollc.prpd nes	27.4
0723	Cocoa paste	4.7	6673	Precious,semiprec.stones	23.6
0711	Coffee, not roasted	4.3	0471	Other cereal flours	22.4
0713	Extracts,etc. of coffee	2.6	0621	Fruit,etc.prsvd.by sugar	20.7
0371	Fish,prepard,presrvd,nes	2.4	2732	Gypsum,limestone etc.	20.1
Argentina: 1994			**Philippines: 1996**		
4215	Sunflower seed oil, etc.	35.5%	2655	Abaca,Manila hemp,waste	58.4%
4211	Soya bean oil, fractions	27.6	4223	Coconut oil, fractions	58.3
2224	Sunflower seeds	24.9	2231	Copra	15.9
0176	Bov.meat,prpd,prsrvd,nes	23.3	2657	Coconut fibre and waste	14.9
4213	Groundnut oil, fractions	22.4	2841	Nickel ores,concentrates	12.9
0124	Meat of horses,mules,etc	18.6	2891	Prec.mtl.ore,concentrats	12.8
0813	Oil-cake,oilseed residue	18.4	8451	Babies'garmnts,clths acc	8.9
0616	Natural honey	17.1	8437	Shirts,mens boys,knit	8.3
0171	Extract,juice meat,fish	17.1	8944	Festive articles etc.nes	7.3
4212	Cotton seed oil,fraction	16.8	3442	Gas.hydrocarbon,liq.,nes	6.7
Venezuela: 1994			**Indonesia: 1996**		
6724	Ingots of iron or steel	17.0%	6343	Plywood,solely of wood	44.8%
6713	Pellets,etc.pig iron,etc	12.8	3431	Natural gas, liquefied	44.8
2239	Flour,meal,from oilseeds	11.8	4224	Palm kernel oil, fractns	44.3
6932	Barbed wire,etc.iron,stl	9.4	0721	Cocoa beans	35.4
3330	Crude petroleum	8.1	2831	Copper ores,concentrates	32.0
5984	Mixed alkylbenzs.etc.nes	5.3	2312	Natural rubber exc.latex	31.6
6841	Alum.,alum.alloy,unwrght	4.8	4223	Coconut oil, fractions	27.2
4218	Sesame oil, fractions	4.7	8512	Sports footwear	26.9
0471	Other cereal flours	4.4	6344	Oth.plywood,venrd.panels	24.4
6733	Flat,cold-rolld,prod.irn	3.7	6871	Tin,tin alloys,unwrought	20.2

Table 2: Part B
Major Exports from the Crisis Countries

SITC Code	SITC Definition	% World Exports	SITC Code	SITC Definition	% World Exports
Korea: 1996			**Slovak Republic: 1997**		
6531	Fabric,synth.filmnt.yarn	40.8%	6734	Flat,cold-rolld,prod.irn	3.5%
6118	Leather,special finish	32.1	6714	Ferro-manganese	3.3
6562	Labels,badge etc.not emb	29.3	2112	Whole bovin.hide<8kg dry	3.1
7917	Rail,tram.coach,etc.n.sp	27.1	7468	Othr.ball,roller bearing	2.9
8831	Cine film,35mm+,devloped	26.6	7918	Rail,tram.frght cars etc	2.9
6132	Heads, tails, paws etc.	25.6	6611	Quicklime etc.excl.522.6	2.8
7932	Ships,boats,othr.vessels	23.8	8731	Gas,liquid,electr.meters	2.3
7863	Transport containers	23.0	6715	Other ferro-alloys	2.1
6551	Pile fabric,knit,crochet	23.0	7912	Othr.locomotives,tenders	2.1
6965	Oth.articles of cutlery	22.7	6732	Flat,hot-rolld,prod.iron	1.9
India: 1997			**Brazil: 1998**		
2235	Castor oil seeds	81.9%	2654	Sisal,agave fibres,waste	78.2%
4225	Castor oil, fractions	80.3	2851	Aluminium ore,concentrat	55.8
6121	Leather belting etc.	56.6	4314	Waxes,animal,veg. origin	48.3
6116	Goat or kid skin leather	36.5	0611	Sugars,beet or cane, raw	39.6
6545	Fabric,wvn.jute,oth.txtl	34.1	0591	Orange juice	39.5
0741	Tea	31.0	2815	Iron ore,concntr.not agg	39.1
2922	Natural gums,resins,etc.	29.9	4225	Castor oil, fractions	38.0
2225	Sesame (sesamum) seeds	27.4	2816	Iron ore agglomerates	33.5
6585	Curtains,oth.furnishings	26.9	0176	Bov.meat,prpd,prsrvd,nes	29.5
6513	Cotton yarn,excl. thread	25.6	6712	Pig iron,etc.primry.form	28.4
Russia: 1997					
3432	Natural gas, gaseous	47.9%			
6727	Semi-fin.iron,etc..25%+c	40.0			
6831	Nickel,nckl.alloy,unwrgt	36.4			
7187	Nuclear reactors,pts nes	29.8			
2723	Natural calc.phosphates	23.2			
2224	Sunflower seeds	22.5			
6726	Semi-finish.iron,steel	21.8			
2481	Railway,tramway sleepers	20.7			
2474	Wood,conif,rough,untrted	20.1			
6841	Alum.,alum.alloy,unwrght	19.9			

Table 3A: Competitiveness-Effect Statistics

	CRISIS EVENT															
Country _n_	**Mexico 1994**	**Ecuad. 1995**	**Argent. 1995**	**Venez. 1995**	**Venez. 1997**	**Czech 1997**	**Thail. 1997**	**Philip. 1997**	**Indon. 1997**	**Korea 1997**	**India 1998**	**Russia 1998**	**Venez. 1998**	**Slovak 1998**	**Ecuad. 1998**	**Brazil 1999**
Argentina	1.69	0.21	.	0.84	1.49	0.52	1.61	0.34	1.48	2.35	2.63	3.25	1.77	0.27	0.35	7.67
Australia	2.43	0.31	2.44	2.06	1.52	1.30	2.88	0.72	6.29	6.28	2.67	7.41	2.03	0.39	0.35	8.34
Austria	8.23	0.11	1.14	0.45	0.41	3.56	4.29	1.41	3.47	11.20	2.63	8.11	0.46	1.25	0.13	4.80
Bangladesh	1.71	0.89	0.98	0.08	0.11	0.93	6.26	1.90	5.97	5.14	9.18	0.95	0.14	0.46	1.28	1.31
Belgium	15.26	0.79	3.39	1.41	1.37	5.99	11.19	2.39	7.32	28.50	19.46	17.85	1.66	3.10	2.14	13.88
Brazil	2.06	0.50	3.46	0.63	0.45	0.55	1.37	0.36	1.47	2.17	1.96	2.65	0.40	0.28	0.13	.
Canada	9.11	0.47	2.14	2.73	3.04	3.30	3.88	1.92	5.89	12.76	1.87	26.29	3.87	1.37	0.65	8.75
Chile	7.48	0.34	2.29	0.53	0.31	0.99	3.68	4.79	19.37	6.34	1.78	15.54	0.37	0.41	0.44	4.72
China	7.46	0.33	2.03	0.87	0.82	2.14	8.24	2.59	6.29	11.80	5.49	3.97	0.99	0.69	0.31	3.16
Colombia	5.38	5.44	0.66	2.45	4.39	0.82	3.34	1.11	6.36	2.86	2.73	6.97	5.02	0.25	4.04	13.13
Croatia	7.24	0.33	2.17	0.66	0.67	2.79	5.36	2.11	5.01	17.71	3.68	4.15	1.06	1.32	0.40	4.44
Cyprus	1.36	0.04	1.55	0.17	0.18	0.53	1.45	0.50	1.09	1.02	1.34	0.46	0.25	0.25	0.05	0.85
Czech Rep.	9.05	0.18	2.04	1.35	1.18	.	6.96	1.79	6.10	16.55	4.99	10.80	1.32	2.41	0.20	9.25
Denmark	5.40	0.52	1.72	0.67	0.90	2.33	5.93	1.28	3.78	8.90	3.17	7.11	1.49	0.89	0.75	3.98
Ecuador	17.01	.	3.33	12.52	13.73	0.57	18.10	9.45	21.30	5.29	10.11	20.17	16.99	0.24	.	5.41
Egypt	2.88	0.56	1.06	2.62	2.14	0.42	2.01	0.23	2.94	0.91	3.38	3.44	2.12	0.15	0.29	0.62
Estonia	.	.	.	.	0.99	7.67	14.60	4.33	18.19	17.36	9.21	20.89	1.88	2.94	4.68	.
Finland	6.78	0.35	0.76	0.45	0.42	3.02	3.62	1.67	8.12	17.95	1.56	7.79	0.52	1.59	0.10	6.37
France	4.71	0.12	1.89	0.35	0.32	1.84	3.05	1.04	1.76	8.29	1.79	3.81	0.36	0.74	0.17	3.56
Germany	5.79	0.09	0.99	0.38	0.37	2.27	3.02	0.98	1.70	10.15	2.09	4.47	0.45	0.94	0.12	3.92
Greece	2.14	0.26	1.10	0.39	0.46	0.78	2.55	0.88	2.23	3.46	3.39	1.66	0.50	0.39	0.16	2.00
Hong Kong	5.95	0.07	0.70	0.17	0.15	1.36	7.24	4.28	4.24	12.88	4.58	1.40	0.13	0.38	0.10	0.79
Hungary	7.89	0.13	4.45	0.62	0.66	3.77	6.98	2.08	4.48	11.73	4.33	7.64	0.77	1.87	0.21	8.65
Iceland	2.07	2.12	12.95	2.93	2.08	0.57	24.05	1.39	10.44	12.89	4.91	15.04	2.21	1.02	2.99	5.42
India	1.54	0.42	1.23	0.26	0.25	0.68	5.04	0.83	2.93	3.65	.	1.23	0.29	0.23	0.47	.
Indonesia	7.79	2.18	1.65	5.01	4.35	1.55	14.31	3.47	.	9.58	5.21	16.66	5.96	0.66	2.07	12.65
Ireland	13.00	0.36	4.17	0.64	0.51	4.80	15.15	6.23	4.26	21.60	6.45	12.25	0.57	1.30	0.32	8.64
Israel	3.86	0.13	0.80	0.44	0.21	1.01	7.29	1.39	1.86	6.69	18.89	2.03	0.22	0.38	0.15	1.74
Italy	4.91	0.09	1.16	0.29	0.25	2.43	4.69	1.29	3.17	10.82	3.29	1.81	0.28	0.82	0.16	3.59

Table 3B: Competitiveness-Effect Statistics

Country *n*	Mexico 1994	Ecuad. 1995	Argent. 1995	Venez. 1995	Venez. 1997	Czech 1997	Thail. 1997	Philip. 1997	Indon. 1997	Korea 1997	India 1998	Russia 1998	Venez. 1998	Slovak 1998	Ecuad. 1998	Brazil 1999
Japan	2.87	0.02	0.26	0.11	0.10	0.72	1.81	0.90	0.62	6.95	0.53	1.47	0.13	0.31	0.02	1.28
Korea	7.54	0.10	1.13	0.36	0.38	1.84	6.66	4.08	4.19	.	3.07	2.73	0.49	1.04	0.18	5.57
Malaysia	32.64	1.94	3.36	6.40	5.72	3.71	40.40	17.17	71.43	59.60	5.16	15.30	7.07	1.48	1.67	10.61
Mauritius	6.41	0.70	3.39	1.13	0.46	1.99	45.86	10.77	11.45	14.93	18.29	1.34	0.39	1.08	0.91	70.29
Mexico	.	0.67	1.03	2.65	5.26	2.46	6.70	2.48	5.47	14.49	2.92	10.73	6.71	0.97	1.24	5.82
Morocco	4.45	0.47	1.81	0.19	0.19	0.71	6.04	1.74	3.70	5.81	3.33	7.89	0.26	0.32	0.63	.
Netherlands	10.54	0.64	3.84	0.98	1.00	3.41	8.94	3.42	5.30	17.60	5.38	17.24	1.20	1.52	1.03	8.70
New Zealand	3.52	0.30	5.17	1.54	1.32	2.30	3.60	0.63	3.10	5.73	2.23	9.44	1.58	0.83	0.35	4.78
Norway	16.18	2.79	3.87	18.16	21.86	1.14	2.92	0.72	13.08	6.92	1.75	69.73	28.16	0.83	3.51	4.09
Oman	50.53	8.59	8.69	57.49	59.71	0.87	1.69	0.76	28.24	4.69	1.53	97.31	78.46	0.39	9.16	.
Peru	3.16	0.67	0.82	0.35	0.78	0.24	1.96	1.57	3.59	5.69	2.27	4.36	0.96	0.09	0.82	4.89
Philippines	6.15	2.37	0.95	0.35	0.17	1.25	12.69	.	9.53	25.59	4.07	2.13	0.20	0.45	2.23	3.81
Poland	5.82	0.14	1.05	0.67	0.49	3.17	3.80	1.34	4.26	9.64	2.59	5.15	0.53	0.97	0.23	3.79
Portugal	7.64	0.20	0.97	0.25	0.28	2.62	5.27	2.55	5.35	10.76	4.55	1.98	0.34	1.02	0.35	6.42
Romania	5.12	0.09	2.38	1.66	1.02	4.10	5.93	2.35	8.98	12.96	5.37	10.09	1.10	2.18	0.11	5.30
Russia	.	.	.	.	6.82	1.48	1.25	0.48	5.42	4.11	1.19	.	8.39	0.96	0.91	6.79
S. Africa	2.29	0.07	1.39	0.61	0.94	1.64	3.34	0.92	3.62	4.74	7.29	8.25	0.47	0.56	0.12	6.77
Singapore	46.04	1.39	3.68	1.18	1.02	6.24	60.04	27.60	23.22	100.00	9.21	15.44	1.06	1.94	0.55	10.93
Slovak Rep.	12.08	0.21	3.11	1.96	1.83	6.01	6.72	1.69	6.50	18.81	5.00	21.46	2.56	.	0.24	12.43
Slovenia	14.80	0.21	1.99	1.47	1.09	6.61	9.16	2.49	9.16	21.10	5.48	7.83	1.28	2.69	0.22	8.24
Spain	5.70	0.18	1.20	0.34	0.35	1.76	3.12	0.89	2.01	8.76	2.35	2.92	0.43	0.76	0.32	3.94
Sweden	8.64	0.08	1.16	0.80	0.45	3.35	4.21	1.63	3.29	11.52	2.27	10.20	0.55	1.43	0.16	7.98
Switzerland	4.62	0.07	0.94	0.28	0.26	2.53	4.51	1.20	2.21	8.92	5.35	2.01	0.32	0.79	0.08	3.13
Thailand	10.74	2.14	2.44	0.56	0.48	2.22	.	5.80	17.93	19.09	12.81	4.45	0.93	0.88	2.82	.
Tunisia	14.02	0.86	1.75	3.97	4.21	2.60	9.28	5.20	10.15	9.78	8.59	9.61	4.92	1.19	0.96	2.78
Turkey	4.21	0.11	1.32	0.40	0.35	1.83	3.82	1.59	3.67	7.39	6.47	3.19	0.40	0.61	0.14	2.93
UK	6.22	0.29	1.02	1.71	1.90	1.79	3.94	1.52	2.69	9.33	2.81	4.66	2.06	0.59	0.29	2.56
US	1.89	0.04	0.72	0.14	0.13	0.63	1.39	0.64	0.73	3.40	0.66	1.46	0.15	0.23	0.04	1.64
Venezuela	19.27	3.56	3.69	.	.	0.97	1.24	0.20	14.06	2.79	1.37	41.34	.	0.56	3.80	3.73

Table 3C: Competitiveness-Effect Statistics
(Summary Statistics)

	CRISIS EVENT														
	Mexico 1994	**Ecuad. 1995**	**Argent. 1995**	**Venez. 1995**	**Venez. 1997**	**Czech 1997**	**Thail. 1997**	**Philip. 1997**	**Indon. 1997**	**Korea 1997**	**India 1998**	**Russia 1998**	**Venez. 1998**	**Slovak 1998**	**Ecuad. 1998**	**Brazil 1999**
Mean	8.79	0.84	2.28	2.69	2.85	2.26	8.15	2.90	7.90	12.59	4.85	10.97	3.60	0.94	0.99	6.86
Std. Dev.	9.52	1.47	2.08	8.10	8.43	1.72	10.82	4.39	10.45	14.83	4.21	16.12	11.03	0.70	1.57	9.58
Minimum	1.36	0.02	0.26	0.08	0.10	0.24	1.24	0.20	0.62	0.91	0.53	0.46	0.13	0.09	0.02	0.62
Maximum	50.53	8.59	12.95	57.49	59.71	7.67	60.04	27.60	71.43	100.00	19.46	97.31	78.46	3.10	9.16	70.29

Sample Statistics	
Mean	4.97
Std. Dev.	9.33
Minimum	0.02
Maximum	100.00

Table 4A: Income-Effect Statistics

							CRISIS EVENT									
Country *n*	Mexico 1994	Ecuad. 1995	Argent. 1995	Venez. 1995	Venez. 1997	Czech 1997	Thail. 1997	Philip. 1997	Indon. 1997	Korea 1997	India 1998	Russia 1998	Venez. 1998	Slovak 1998	Ecuad. 1998	Brazil 1999
Argentina	0.11	0.03	.	0.08	0.13	0.00	0.05	0.02	0.08	0.07	0.07	0.08	0.11	0.00	0.03	2.57
Australia	0.04	0.00	0.01	0.00	0.00	0.01	0.29	0.20	0.45	1.30	0.23	0.02	0.00	0.00	0.00	0.07
Austria	0.05	0.00	0.04	0.01	0.02	0.74	0.08	0.02	0.12	0.13	0.05	0.39	0.02	0.38	0.00	0.12
Bangladesh	0.01	0.00	0.01	0.00	0.00	0.00	0.04	0.03	0.01	0.03	0.06	0.04	0.00	.	0.00	0.03
Belgium	0.16	0.02	0.08	0.03	0.03	0.24	0.31	0.06	0.11	0.19	1.17	0.64	0.04	0.06	0.01	0.34
Brazil	0.19	0.05	0.76	0.05	0.06	0.00	0.05	0.04	0.04	0.11	0.02	0.09	0.09	0.01	0.02	.
Canada	0.14	0.01	0.03	0.08	0.07	0.01	0.07	0.03	0.11	0.34	0.05	0.04	0.11	0.00	0.01	0.16
Chile	0.41	0.17	1.28	0.15	0.21	0.00	0.17	0.15	0.22	1.30	0.10	0.06	0.21	.	0.21	1.05
China	0.04	0.01	0.05	0.01	0.01	0.02	0.15	0.12	0.17	0.92	0.10	0.23	0.01	0.00	0.01	0.11
Colombia	0.13	0.40	0.08	0.67	0.78	0.00	0.01	0.00	0.00	0.03	0.00	0.06	0.91	0.00	0.50	0.10
Croatia	0.00	0.07	0.00	0.00	0.03	0.20	0.01	0.00	0.00	0.00	0.01	0.81	0.00	0.11	0.02	0.00
Cyprus	.	0.00	.	.	.	0.02	0.02	0.00	0.00	0.01	0.01	0.14	.	0.03	0.00	.
Czech Rep.	0.04	0.02	0.04	0.01	0.01	.	0.08	0.01	0.03	0.08	0.12	1.46	0.01	5.54	0.02	0.07
Denmark	0.09	0.00	0.05	0.03	0.02	0.10	0.10	0.03	0.08	0.25	0.06	0.50	0.02	0.02	0.01	0.09
Ecuador	0.46	.	0.43	0.05	0.38	0.00	0.00	0.01	0.00	1.65	0.01	0.71	0.25	0.00	.	0.18
Egypt	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.03	0.00	0.00	.	0.02
Estonia	0.00	.	0.00	0.00	0.00	0.06	0.00	0.07	0.01	0.24	0.06	11.53	0.01	0.02	.	0.00
Finland	0.06	0.01	0.08	0.03	0.03	0.20	0.30	0.12	0.24	0.47	0.20	2.46	0.03	0.05	0.00	0.24
France	0.10	0.00	0.08	0.02	0.02	0.08	0.06	0.03	0.08	0.13	0.06	0.18	0.02	0.03	0.01	0.14
Germany	0.14	0.01	0.06	0.02	0.02	0.39	0.15	0.06	0.11	0.28	0.12	0.45	0.03	0.13	0.01	0.26
Greece	0.02	0.00	0.01	0.00	0.00	0.04	0.04	0.01	0.06	0.04	0.02	0.35	0.00	0.01	0.00	0.06
Hong Kong	0.11	0.00	0.03	0.00	0.00	0.00	0.22	0.21	0.13	0.22	0.03	0.01	0.00	.	0.00	0.04
Hungary	0.01	0.00	0.02	0.01	0.00	0.64	0.03	0.01	0.02	0.03	0.05	2.07	0.00	0.53	0.00	0.18
Iceland	0.00	.	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.10	0.01	0.45	0.00	0.00	.	0.11
India	0.02	0.00	0.01	0.00	0.00	0.01	0.11	0.05	0.15	0.13	.	0.23	0.01	0.00	0.00	0.00
Indonesia	0.08	0.00	0.03	0.01	0.01	0.01	0.36	0.30	.	1.44	0.32	0.04	0.01	0.00	0.01	0.18
Ireland	0.17	0.01	0.06	0.02	0.03	0.18	0.15	0.32	0.04	0.46	0.07	0.44	0.02	0.03	0.01	0.20
Israel	0.10	0.02	0.10	0.03	0.01	0.05	0.35	0.21	0.01	0.38	0.37	0.26	0.02	0.02	0.03	0.30
Italy	0.09	0.01	0.14	0.04	0.04	0.14	0.11	0.03	0.09	0.23	0.09	0.34	0.05	0.06	0.01	0.28

Table 4B: Income-Effect Statistics

Country *n*	Mexico 1994	Ecuad. 1995	Argent. 1995	Venez. 1995	Venez. 1997	Czech 1997	Thail. 1997	Philip. 1997	Indon. 1997	Korea 1997	India 1998	Russia 1998	Venez. 1998	Slovak 1998	Ecuad. 1998	Brazil 1999
						CRISIS EVENT										
Japan	0.09	0.01	0.01	0.01	0.01	0.00	0.40	0.18	0.20	0.64	0.05	0.02	0.02	0.00	0.01	0.07
Korea	0.32	0.03	0.12	0.02	0.02	0.04	0.51	0.37	0.61	.	0.24	0.37	0.05	0.01	0.02	0.56
Malaysia	0.54	0.01	0.08	0.02	0.02	0.02	3.18	0.93	1.21	2.39	1.18	0.09	0.05	0.00	0.00	0.37
Mauritius	0.00	.	0.01	.	.	0.00	0.05	0.01	0.00	0.01	0.33	0.00	.	.	.	0.03
Mexico	.	0.03	0.07	0.05	0.15	0.00	0.03	0.02	0.02	0.10	0.02	0.01	0.23	.	0.05	0.19
Morocco	0.11	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.05	0.03	1.16	0.12	0.02	0.00	0.00	0.00
Netherlands	0.07	0.01	0.05	0.03	0.02	0.16	0.13	0.07	0.10	0.23	0.13	0.53	0.03	0.07	0.02	0.13
New Zealand	0.22	0.00	0.04	0.10	0.09	0.00	0.28	0.26	0.35	1.03	0.14	0.32	0.11	0.00	0.00	0.14
Norway	0.02	0.00	0.01	0.01	0.01	0.04	0.10	0.06	0.03	0.15	0.05	0.22	0.03	0.01	0.00	0.16
Oman	.	.	0.00	0.00	0.00	.	0.05	0.02	0.00	0.11	0.52	0.15	0.00	.	.	.
Peru	0.33	0.12	0.05	0.17	0.21	0.00	0.06	0.05	0.05	0.24	0.03	0.01	0.22	0.00	0.17	0.29
Philippines	0.06	0.00	0.01	0.00	0.00	0.00	0.94	.	0.17	0.45	0.04	0.01	0.00	0.00	0.00	0.04
Poland	0.03	0.00	0.02	0.01	0.01	0.58	0.10	0.03	0.03	0.08	0.04	1.49	0.02	0.21	0.00	0.07
Portugal	0.02	0.00	0.07	0.01	0.01	0.02	0.02	0.01	0.00	0.03	0.02	0.07	0.01	0.01	0.00	0.21
Romania	0.02	0.02	0.14	0.01	0.06	0.06	0.13	0.05	0.03	0.14	0.18	0.72	0.07	0.07	0.01	0.02
Russia	0.00	0.00	0.00	0.00	0.00	0.42	0.05	0.03	0.01	0.24	0.21	.	0.00	0.40	0.01	0.06
S. Africa	0.03	0.01	0.06	0.02	0.03	0.00	0.10	0.04	0.12	0.47	0.13	0.03	0.05	0.00	0.01	0.13
Singapore	0.29	0.01	0.27	0.04	0.01	0.02	7.76	2.51	.	4.15	2.33	0.78	0.02	0.00	0.00	0.35
Slovak Rep.	0.21	0.03	0.08	0.00	0.00	14.58	0.11	0.01	0.12	0.04	0.19	1.69	0.01	.	0.01	0.02
Slovenia	0.01	0.02	0.04	0.01	0.01	0.78	0.04	0.01	0.02	0.05	0.06	1.79	0.02	0.31	0.01	0.08
Spain	0.28	0.01	0.19	0.03	0.04	0.06	0.05	0.02	0.06	0.11	0.04	0.16	0.06	0.02	0.03	0.24
Sweden	0.11	0.01	0.10	0.03	0.03	0.14	0.26	0.10	0.21	0.26	0.13	0.40	0.05	0.04	0.01	0.40
Switzerland	0.15	0.02	0.09	0.03	0.03	0.15	0.25	0.07	0.12	0.32	0.16	0.16	0.04	0.06	0.02	0.32
Thailand	0.08	0.00	0.03	0.00	0.00	0.02	.	0.35	0.53	0.56	0.20	0.08	0.01	0.00	0.00	0.00
Tunisia	0.00	0.00	0.02	0.03	0.00	0.00	.	.	0.08	0.01	0.81	0.02	0.00	0.00	0.00	0.12
Turkey	0.01	0.01	0.02	0.01	0.01	0.05	0.04	0.03	0.03	0.06	0.03	1.08	0.00	0.01	0.00	0.02
UK	0.06	0.01	0.03	0.03	0.02	0.10	0.13	0.05	0.11	0.18	0.20	0.16	0.03	0.02	0.01	0.11
US	0.73	0.02	0.06	0.06	0.06	0.01	0.09	0.08	0.05	0.34	0.04	0.04	0.08	0.00	0.02	0.17
Venezuela	0.43	0.25	0.06	.	.	.	0.00	0.00	0.00	0.02	0.01	0.03	.	.	0.34	0.70

Table 4C: Income-Effect Statistics
(Summary Statistics)

	CRISIS EVENT														
	Mexico 1994	**Ecuad. 1995**	**Argent. 1995**	**Venez. 1995**	**Venez. 1997**	**Czech 1997**	**Thail. 1997**	**Philip. 1997**	**Indon. 1997**	**Korea 1997**	**India 1998**	**Russia 1998**	**Venez. 1998**	**Slovak 1998**	**Ecuad. 1998**	**Brazil 1999**
Mean	0.13	0.03	0.09	0.04	0.05	0.37	0.33	0.13	0.12	0.40	0.21	0.61	0.06	0.17	0.03	0.22
Std. Dev.	0.15	0.07	0.20	0.09	0.12	1.96	1.10	0.36	0.20	0.69	0.40	1.57	0.13	0.78	0.09	0.37
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	0.73	0.40	1.28	0.67	0.78	14.58	7.76	2.51	1.21	4.15	2.33	11.53	0.91	5.54	0.50	2.57

Sample Statistics	
Mean	0.19
Std. Dev.	0.77
Minimum	0.00
Maximum	14.58

Table 5A: Bargain-Effect Statistics

Country _n_	Mexico 1994	Ecuad. 1995	Argent. 1995	Venez. 1995	Venez. 1997	Czech 1997	Thail. 1997	Philip. 1997	Indon. 1997	Korea 1997	India 1998	Russia 1998	Venez. 1998	Slovak 1998	Ecuad. 1998	Brazil 1999
Argentina	0.11	0.04	.	0.02	0.05	0.01	0.03	0.01	0.03	0.18	0.05	0.05	0.02	0.01	0.04	2.59
Australia	0.03	0.00	0.02	0.00	0.00	0.01	0.25	0.07	0.40	0.53	0.14	0.00	0.00	0.00	0.00	0.06
Austria	0.04	0.02	0.01	0.00	0.00	0.74	0.07	0.03	0.08	0.13	0.10	0.23	0.00	0.39	0.02	0.10
Bangladesh	0.00	0.00	0.00	.	.	0.00	0.18	0.00	0.17	1.14	3.20	0.24	.	.	0.00	0.13
Belgium	0.14	0.02	0.15	0.06	0.05	0.17	0.33	0.05	0.25	0.17	0.65	0.75	0.07	0.07	0.08	0.76
Brazil	0.08	0.00	0.86	0.13	0.16	0.01	0.03	0.00	0.04	0.19	0.04	0.05	0.16	0.01	0.00	.
Canada	0.78	0.02	0.02	0.09	0.12	0.02	0.17	0.09	0.10	0.45	0.11	0.09	0.15	0.01	0.02	0.19
Chile	0.60	0.42	2.17	0.32	0.50	0.00	0.08	0.03	0.15	0.88	0.10	0.02	0.40	.	0.38	1.52
China	0.02	0.00	0.06	0.01	0.00	0.01	0.27	0.05	0.32	1.77	0.12	0.54	0.00	0.00	0.01	0.14
Colombia	0.45	0.35	0.27	1.53	1.47	0.02	0.02	0.01	0.04	0.21	0.06	0.09	1.66	0.01	0.40	0.57
Croatia	0.02	0.14	0.08	0.00	0.00	1.26	0.03	0.00	0.04	0.20	0.13	2.49	0.02	0.44	0.13	0.39
Cyprus	0.02	0.00	0.41	0.00	0.00	0.10	0.35	0.04	0.27	0.68	0.34	2.13	0.05	0.04	0.00	0.15
Czech Rep.	0.02	0.06	0.06	0.00	0.00	.	0.09	0.02	0.09	0.36	0.14	4.03	0.01	4.98	0.03	0.22
Denmark	0.01	0.01	0.20	0.01	0.04	0.10	0.16	0.03	0.14	0.18	0.16	0.22	0.04	0.02	0.00	0.20
Ecuador	1.04	.	0.34	1.10	1.12	0.02	0.01	0.00	0.07	0.39	0.02	0.21	1.75	0.01	.	1.13
Egypt	0.01	0.00	0.19	0.00	0.00	0.07	0.06	0.02	0.16	0.30	0.31	0.53	0.01	0.01	0.00	0.42
Estonia	.	.	.	.	.	0.51	0.08	0.00	0.14	1.38	0.24	15.01	.	0.28	0.07	.
Finland	0.03	0.03	0.03	0.02	0.01	0.13	0.14	0.06	0.13	0.20	0.09	2.69	0.02	0.05	0.01	0.21
France	0.05	0.01	0.03	0.01	0.02	0.05	0.13	0.03	0.09	0.14	0.10	0.33	0.02	0.02	0.01	0.18
Germany	0.03	0.02	0.06	0.03	0.02	0.41	0.12	0.07	0.12	0.23	0.15	0.60	0.02	0.15	0.02	0.23
Greece	0.01	0.01	0.08	0.01	0.00	0.09	0.07	0.01	0.10	0.55	0.10	0.56	0.00	0.03	0.01	0.09
Hong Kong	0.08	0.00	0.16	0.00	0.01	0.06	2.15	0.67	1.14	7.60	1.29	0.47	0.01	.	0.00	0.37
Hungary	0.01	0.02	0.02	0.00	0.00	1.19	0.06	0.01	0.09	0.36	0.11	4.46	0.00	0.97	0.01	0.44
Iceland	0.01	0.00	0.00	0.00	0.00	0.13	0.09	0.01	0.05	0.40	0.09	0.86	0.00	0.02	0.00	0.04
India	0.01	0.00	0.02	0.00	0.00	0.02	0.05	0.00	0.16	0.24	.	0.17	0.00	0.01	0.00	0.00
Indonesia	0.03	0.00	0.07	0.00	0.01	0.02	0.52	0.04	.	1.14	0.35	0.14	0.00	0.00	0.00	0.26
Ireland	0.03	0.02	0.03	0.00	0.01	0.08	0.50	0.12	0.12	0.77	0.16	0.02	0.01	0.02	0.00	0.09
Israel	0.01	0.01	0.07	0.01	0.00	0.03	0.21	0.01	0.00	0.43	0.35	0.19	0.00	0.00	0.01	0.08
Italy	0.01	0.02	0.09	0.02	0.03	0.08	0.07	0.02	0.10	0.11	0.15	0.47	0.03	0.07	0.02	0.24

Table 5B: Bargain-Effect Statistics

	CRISIS EVENT															
Country *n*	Mexico 1994	Ecuad. 1995	Argent. 1995	Venez. 1995	Venez. 1997	Czech 1997	Thail. 1997	Philip. 1997	Indon. 1997	Korea 1997	India 1998	Russia 1998	Venez. 1998	Slovak 1998	Ecuad. 1998	Brazil 1999
Japan	0.03	0.00	0.01	0.01	0.01	0.00	0.25	0.11	0.37	0.39	0.07	0.11	0.01	0.00	0.01	0.08
Korea	0.06	0.09	0.02	0.02	0.01	0.01	0.25	0.12	0.82	.	0.22	0.35	0.01	0.00	0.05	0.28
Malaysia	0.02	0.00	0.12	0.00	0.00	0.01	2.93	0.90	1.61	4.60	0.87	0.42	0.00	0.00	0.00	0.30
Mauritius	0.00	.	0.53	.	.	0.01	0.39	0.08	0.65	0.72	5.70	0.06	.	.	.	0.15
Mexico	.	0.02	0.08	0.08	0.08	0.01	0.08	0.04	0.08	0.34	0.07	0.06	0.14	.	0.02	0.28
Morocco	0.02	0.00	0.27	0.01	0.01	0.04	0.04	0.01	0.08	0.18	0.13	0.62	0.01	0.01	0.00	0.00
Netherlands	0.05	0.01	0.30	0.10	0.10	0.12	0.40	0.12	0.38	0.29	0.26	0.63	0.06	0.05	0.02	0.57
New Zealand	0.03	0.03	0.04	0.00	0.00	0.01	0.21	0.06	0.26	0.49	0.16	0.01	0.01	0.00	0.05	0.06
Norway	0.03	0.01	0.03	0.02	0.02	0.08	0.09	0.02	0.06	0.18	0.11	0.63	0.05	0.01	0.01	0.20
Oman	0.01	.	0.12	0.00	.	.	.	.	.	.	.	.	.	.	.	.
Peru	0.34	0.33	0.62	0.32	1.01	0.01	0.06	0.00	0.03	0.41	0.04	0.04	0.93	0.00	0.39	0.63
Philippines	0.04	0.00	0.02	0.02	0.00	0.01	0.82	.	0.88	2.23	0.33	0.59	0.00	0.00	0.00	0.22
Poland	0.01	0.09	0.04	0.00	0.00	0.93	0.08	0.02	0.13	0.54	0.10	2.11	0.00	0.38	0.07	0.19
Portugal	0.09	0.05	0.09	0.02	0.05	0.03	0.12	0.02	0.05	0.34	0.16	0.31	0.07	0.01	0.02	0.57
Romania	0.00	0.03	0.13	0.04	0.20	0.27	0.06	0.00	0.06	1.39	0.08	4.02	0.22	0.21	0.06	0.40
Russia	0.00	0.00	0.00	0.00	0.01	0.15	0.02	0.00	0.03	0.22	0.22	.	0.01	0.08	0.03	0.29
S. Africa	0.01	0.00	0.15	0.00	0.00	0.02	0.15	0.02	0.10	0.48	0.29	0.03	0.00	0.00	0.01	0.19
Singapore	0.11	0.00	0.12	0.06	0.08	0.07	10.20	1.98	.	6.42	1.41	0.20	0.04	0.00	0.00	0.32
Slovak Rep.	0.03	0.09	0.06	0.00	0.00	16.03	0.08	0.01	0.10	1.14	0.12	8.91	0.00	.	0.06	0.11
Slovenia	0.01	0.09	0.07	0.00	0.00	1.55	0.12	0.01	0.20	0.60	0.12	1.70	0.00	0.70	0.09	0.30
Spain	0.24	0.04	0.17	0.03	0.05	0.04	0.13	0.03	0.21	0.20	0.13	0.29	0.06	0.02	0.04	0.29
Sweden	0.03	0.01	0.03	0.08	0.08	0.11	0.09	0.02	0.10	0.16	0.13	0.27	0.06	0.03	0.00	0.14
Switzerland	0.03	0.01	0.03	0.00	0.00	0.09	0.19	0.02	0.04	0.13	0.15	0.35	0.01	0.04	0.01	0.13
Thailand	0.06	0.00	0.03	0.01	0.01	0.04	.	0.33	0.54	1.55	0.44	0.44	0.02	0.00	0.01	0.00
Tunisia	0.00	0.06	0.33	0.00	0.00	0.11	0.06	0.01	0.07	0.21	0.21	0.69	0.00	0.01	0.04	0.27
Turkey	0.02	0.02	0.04	0.00	0.00	0.06	0.05	0.01	0.09	0.42	0.17	1.22	0.01	0.01	0.02	0.23
UK	0.05	0.00	0.03	0.03	0.03	0.06	0.20	0.15	0.17	0.35	0.26	0.24	0.03	0.01	0.01	0.15
US	0.88	0.03	0.03	0.16	0.22	0.01	0.19	0.13	0.14	0.37	0.11	0.07	0.21	0.00	0.03	0.16
Venezuela	0.37	0.02	0.39	.	.	0.00	0.01	0.00	0.01	0.11	0.03	0.00	.	0.00	0.06	0.71

Table 5C: Bargain-Effect Statistics
(Summary Statistics)

	CRISIS EVENT															
	Mexico 1994	**Ecuad. 1995**	**Argent. 1995**	**Venez. 1995**	**Venez. 1997**	**Czech 1997**	**Thail. 1997**	**Philip. 1997**	**Indon. 1997**	**Korea 1997**	**India 1998**	**Russia 1998**	**Venez. 1998**	**Slovak 1998**	**Ecuad. 1998**	**Brazil 1999**
Mean	0.11	0.04	0.17	0.08	0.11	0.45	0.42	0.10	0.22	0.82	0.37	1.11	0.12	0.18	0.04	0.33
Std. Dev.	0.22	0.09	0.32	0.26	0.29	2.15	1.41	0.30	0.30	1.40	0.87	2.42	0.35	0.71	0.09	0.41
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.11	0.02	0.00	0.00	0.00	0.00	0.00
Maximum	1.04	0.42	2.17	1.53	1.47	16.03	10.20	1.98	1.61	7.60	5.70	15.01	1.75	4.98	0.40	2.59

Sample Statistics	
Mean	0.30
Std. Dev.	1.05
Minimum	0.00
Maximum	16.03

Table 6
Regression Results[a]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Competitiveness Effect	-0.041**	-0.051**	-0.064**	-0.060**	-0.063**	-0.056**	-0.078**
	(0.016)	(0.017)	(0.019)	(0.018)	(0.019)	(0.019)	(0.019)
Income Effect	-0.518	-1.038**	-1.155**	-1.011**	-1.253**	-1.108**	-1.071**
	(0.332)	(0.364)	(0.559)	(0.436)	(0.548)	(0.543)	(0.500)
Bargain Effect	0.091	0.591**	0.461	0.563*	0.658*	0.492	0.603
	(0.236)	(0.263)	(0.390)	(0.336)	(0.382)	(0.389)	(0.392)
Private Credit Growth		-1.696**			1.950**		-0.889
		(0.543)			(0.548)		(1.891)
Government Consumption / GDP		3.891		5.087**			6.108**
		(2.722)		(2.501)			(3.023)
Current Account Surplus / GDP		2.065			-1.161	4.883	0.159
		(3.380)			(4.934)	(3.437)	(4.425)
Bank Reserves / Assets		-1.341		-0.670			-0.277
		(1.558)		(1.709)			(1.924)
Private Capital Inflows / GDP		-0.093		0.548	1.019		0.311
		(0.676)		(0.539)	(1.266)		(1.252)
Domestic Credit Growth			-1.495**			0.333	
			(0.692)			(1.251)	
Government Surplus / GDP			-6.033		-4.020	-0.020	
			(4.768)		(4.760)	(4.229)	
Money Supply (M2) / Reserves			2.134		1.013	1.562	1.302
			(1.609)		(1.546)	(1.580)	(1.777)
Openness (Total Trade / GDP)			12.052**		8.778*		6.652
			(4.195)		(4.979)		(4.215)
Exchange Rate Overvaluation				0.654			0.899
				(1.675)			(2.088)
Growth in GNP Per Capita				-8.325	-7.856		-10.134
				(6.064)	(7.233)		(7.129)
Inflation (in CPI)				-0.228**		0.295**	-0.107
				(0.108)		(0.142)	(-0.186)
R^2	808	739	476	660	474	475	492
Observations	0.24	0.26	0.20	0.30	0.22	0.20	0.27

NOTE: (a) Standard errors are white-adjusted for heteroscedasticity. All specifications also include period dummy variables (with the Brazilian crisis as the excluded variable.) Variables defined in Appendix A. ** and * indicate significance at the 5 and 10 percent level respectively.

Table 7
Country Examples: Predicted Trade and Macro Effects[a]

	Predicted Weekly Trade Effects:			Total Predicted Weekly Return from:			Avg. Wk. Stock Return
	Competitiveness (1)	Income (2)	Bargain (3)	Trade (4)	Macro Controls (5)	Trade + Macro (6)	(7)
Thai Crisis							
Korea	-0.34	-0.53	0.15	-0.72	-0.06	-0.78	4.63
Malaysia	-2.06	-3.30	1.73	-3.63	-0.20	-3.83	-1.54
Russian Crisis							
Finland	-0.40	-2.55	1.59	-1.36	0.90	-0.46	-4.42
Poland	-0.26	-1.55	1.25	-0.56	-0.13	-0.69	-5.87
Brazilian Crisis							
Argentina	-0.39	-2.67	1.53	-1.53	0.14	-1.39	-5.38
Chile	-0.24	-1.09	0.90	-0.43	0.06	-0.37	-3.07

NOTE: (a) Predicted impact on weekly stock market indices based on coefficient estimates in column 2 of Table 6.

Table 8
Sensitivity Tests[a]

	Base Results (1)	**Exclude Oil Exporters**[b] (2)	**Redefine Income Effect**[c] (3)	**Redefine Bargain Effect**[d] (4)	**Normal Returns**[e] (5)	**Add OECD dummy** (6)	**Add Regional Dummies**[f] (7)
Competitiveness Effect	-0.051**	-0.056**	-0.060**	-0.043**	-0.061**	-0.049**	-0.049**
	(0.017)	(0.020)	(0.017)	(0.017)	(0.019)	(0.017)	(0.017)
Income Effect	-1.038**	-1.033**	-0.248**	-0.381*	-0.819**	-1.044**	-1.076**
	(0.364)	(0.376)	(0.097)	(0.232)	(0.412)	(0.363)	(0.360)
Bargain Effect	0.591**	0.597**	0.201	0.015	0.333	0.610**	0.635**
	(0.263)	(0.272)	(0.159)	(0.107)	(0.301)	(0.265)	(0.263)
Private Credit Growth	-1.696**	-1.650**	-1.388**	-1.760**	-1.956**	-1.580**	-1.908**
	(0.543)	(0.564)	(0.520)	(0.551)	(0.547)	(0.565)	(0.561)
Government Consumption / GDP	3.891	3.889	3.239	3.060	6.077**	3.496	1.380
	(2.722)	(2.804)	(2.695)	(2.746)	(2.805)	(2.741)	(3.856)
Current Account Surplus / GDP	2.065	2.018	1.278	2.071	5.689	1.759	3.977
	(3.380)	(3.844)	(3.314)	(3.431)	(3.467)	(3.426)	(3.792)
Bank Reserves / Assets	-1.341	-0.689	-1.197	-1.562	-0.606	-1.002	-2.437
	(1.558)	(1.535)	(1.553)	(1.572)	(1.589)	(1.562)	(1.600)
Private Capital Inflows / GDP	-0.093	0.066	-0.184	-0.224	-0.192	-0.244	0.080
	(0.676)	(0.707)	(0.675)	(0.679)	(0.669)	(0.682)	(0.717)
OECD dummy						0.335	
						(0.298)	
R^2	739	700	748	744	762	739	739
Observations	0.26	0.26	0.26	0.26	0.29	0.26	0.27

NOTES: (a) Standard errors are white-adjusted for heteroscedasticity. All specifications also include period dummy variables (with the Brazilian crisis as the excluded variable.) Variables defined in Appendix A. ** and * indicate significance at the 5 and 10 percent level respectively.

(b) Major oil exporters defined as countries for which the ratio of oil and gas exports to GDP is over 5 percent. Countries in the sample that qualify as major oil exporters are: Ecuador, Norway, Oman and Venezuela.

(c) Income effect redefined as exports from country *n* to the crisis country as a percent of total exports from country *n*.

(d) Bargain effect redefined as imports to country *n* from the crisis country as a percent of total imports to country *n*.

(e) Dependent variable is normal returns.

(f) Regional dummy variables are: Africa, Australasia, Central and South Asia, East Asia, Former Communist Europe (including Russia), Latin and South America, North America, and Western Europe. The excluded region is the Middle East.

Table 9
Crisis Subgroups[a]

Crises with a weekly:	
Currency Devaluation[b] ≥ 10 %	**Interest Rate Increase[c] ≥ 30 %**
Mexico	Mexico
Venezuela (1)	Ecuador (1)
Thailand	Argentina
Philippines	Venezuela (2)
Indonesia	Czech Republic
Korea	Philippines
Russia	Indonesia
Ecuador (2)	India
Brazil	Russia
	Venezuela (3)
	Slovak Republic
	Ecuador (2)

NOTES: (a) Based on the crisis events labeled in Table 1.
(b) Devaluation measured as the nominal exchange rate based on U.S. dollars. See Section IV for further information.
(c) Interest rates are short-term and based on the difference between the spread with the short-term U.S. interest rate versus the same spread averaged over the previous year. See Section IV for further information.

Table 10
Regression Results Based on Crisis Subgroups[a]

	Full Sample	CRISIS EVENTS WITH:			
		A Major Devaluation[b]	No Major Devaluation[b]	A Major Interest Rate Hike[c]	No Major Interest Rate Hike[c]
	(1)	(2)	(3)	(4)	(5)
Competitiveness Effect	-0.051**	-0.051**	-0.033	-0.043*	-0.059*
	(0.017)	(0.017)	(0.081)	(0.024)	(0.032)
Income Effect	-1.038**	-0.897*	-1.404**	-1.046**	-0.572
	(0.364)	(0.463)	(0.645)	(0.346)	(1.131)
Bargain Effect	0.591**	0.326	1.043*	0.633**	-0.026
	(0.263)	(0.297)	(0.582)	(0.251)	(0.882)
Private Credit Growth	-1.696**	-1.036	-2.458**	-2.143**	-0.095
	(0.543)	(0.759)	(0.910)	(0.615)	(1.117)
Government Consumption /	3.891	7.766**	-0.278	1.581	10.062*
	(2.722)	(2.957)	(5.024)	(3.046)	(5.847)
Current Account Surplus / GDP	2.065	5.110	-3.837	1.862	-0.076
	(3.380)	(3.626)	(6.541)	(3.865)	(6.854)
Bank Reserves / Assets	-1.341	1.845	-5.764*	-2.888	3.936
	(1.558)	(1.667)	(3.046)	(1.762)	(3.072)
Private Capital Inflows / GDP	-0.093	0.318	-0.146	-0.501	3.146*
	(0.676)	(0.658)	(1.254)	(0.735)	(1.744)
R^2	*739*	*412*	*327*	*567*	*172*
Observations	*0.26*	*0.26*	*0.27*	*0.26*	*0.24*

NOTES: (a) Standard errors are white-adjusted for heteroscedasticity. All specifications also include period dummy variables (with the Brazilian crisis as the excluded variable.) Variables defined in Appendix A. ** and * indicate significance at the 5 and 10 percent level respectively.
(b) Major devaluation defined as an increase in the nominal U.S. dollar exchange rate of at least 10 percent within at least one week of the crisis. See Table 9 for the crisis list.
(c) Major interest rate hike defined as an increase of at least 30 percent within at least one week of the crisis in the short-term interest rate spread (compared to the U.S. rate) less the average spread over the past year. See Table 9 for the crisis list.