

A New Look at Exchange Rate Volatility and Trade Flows

Peter B. Clark, Natalia Tamirisa, and Shang-Jin Wei,
with Azim Sadikov and Li Zeng



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Foreword

This study examines the effect of exchange rate volatility on trade, and was prepared in response to a request to the IMF from the Director General of the World Trade Organization (WTO). The IMF produced a study in 1984 for the General Agreement on Tariffs and Trade (GATT) on this subject. Since then, there have been major developments in the world economy, some perhaps having exacerbated fluctuations in exchange rates whereas others likely having reduced the impact of volatility on trade. It is therefore appropriate to revisit the issue some 20 years later.

Overall, there is no robust evidence of a large negative effect of exchange rate volatility on trade. This suggests that, from the perspective of enhancing trade, exchange rate volatility is not likely to be a major policy concern. This does not rule out the possibility that a large exchange rate volatility could affect an economy through other channels.

This study was prepared by a team led by Peter B. Clark and Shang-Jin Wei and consisted of Natalia Tamirisa, Azim Sadikov (summer intern), and Li Zeng (research assistant). It has benefited from comments from Mary Amiti, Giovanni Dell’Ariccia, Raghuram Rajan, Stephen Tokarick, Management, and various departments of the IMF, as well as from Marc Auboin, Richard Eglin, and other staff of the WTO. Miklos Koren, Andrew Rose, Adam Szeidl, and Silvana Tenreyro generously shared their data. Marlene George, Celia Burns, and Laura Leon provided able assistance. Gail Berre of the External Relations Department edited the paper and coordinated the production of the publication. The views expressed are those of the authors and do not necessarily reflect the views of national authorities or IMF Executive Directors.

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I Overview

In 1984 the IMF produced a study for the General Agreement on Tariffs and Trade (GATT) on the impact of exchange rate volatility on world trade. That study was motivated by an increase in protectionist pressures, large exchange rate movements among the major currencies, and a significant slowdown in world trade. Some of these developments have reappeared. For example, the growth in world exports of goods and services declined sharply in 2001–03 from the double-digit pace in 2000, and the exchange value of the U.S. dollar fluctuated fairly sharply during 2002–03. The 1984 study also reflected a desire to take stock of the implications for currency volatility and trade resulting from the shift from largely fixed to floating rates among the major currencies after the breakdown of the Bretton Woods system in 1971–73. Because there have been other major developments in the international monetary system since then, it is appropriate to revisit the issues addressed in that study some 20 years later.

Some of these developments would appear to have exacerbated fluctuations in exchange rates. The liberalization of capital flows in the last 30 years and the enormous increase in the scale and variety of cross-border financial transactions have clearly increased the magnitude of exchange rate movements in those countries with underdeveloped capital markets and those where there is not yet a track record of consistently stable economic policies.¹ Currency crises in emerging markets, which have become more frequent in the last two decades, are especially notable cases of large exchange rate volatility.² This has been of particular concern to developing countries and emerging market economies. In addition, the transition to a market-based system in Central and Eastern Europe often involves major adjustments in the international value of these economies' currencies.

Other changes in the world economy may have reduced the impact of exchange rate volatility. The pro-

liferation of financial hedging instruments over the last 20 years could reduce firms' vulnerability to the risks arising from volatile currency movements. In addition, for multinational firms fluctuations in different exchange rates may have offsetting effects on their profitability. As a growing fraction of international transactions is undertaken by these multinational firms, exchange rate volatility may have a declining impact on world trade.

On balance, it is not clear whether the major changes in the world economy over the past two decades have operated to reduce or increase the extent to which international trade is adversely affected by fluctuations in exchange rates. One aspect of this issue is the extent to which such volatility itself has changed, and another is the degree to which firms are sensitive to exchange rate risk and can take steps to mitigate it at low cost. It is therefore necessary to examine new empirical evidence on this issue.

There are a number of differences between the current study and the earlier one. To begin with, the country coverage is considerably broader. In IMF (1984) the analysis was focused almost exclusively on the G-7 countries. This reflected the view that fluctuations in the major currencies were the most important factor for the environment within which other countries have to plan their policies.³ While these currencies are the most important to the functioning of the international monetary system, fluctuations in many other exchange rates are also relevant for systemic reasons as well as for their implications for the other countries themselves. Therefore, this study takes a more comprehensive view of the subject and covers the exchange rates of all IMF members for which data are available.

The study also explores a range of different exchange rate volatility measures. Moreover, aside from examining aggregate trade, the study divides all products into two groups—differentiated and homogeneous products—and tests whether volatility has a differential effect on them.

Given the large number of countries in the data set, it is possible to estimate the degree to which volatility has

¹Some aspects of these developments have recently been analyzed in Prasad and others (2003).

²Issues related to balance of payments adjustments in response to capital account crises were discussed in a recent note to the WTO prepared by IMF staff. (See World Trade Organization, 2003.)

³For a recent analysis of the impact of G-3 exchange rate volatility on developing countries, see "How Concerned Should Developing Countries Be About G-3 Exchange Rates" in IMF (2003a).

a differential effect depending on whether the country is advanced or developing. The estimation techniques are also quite different, as recent theoretical advances in gravity-equation specification are employed to assess more accurately the impact of exchange rate volatility on trade.

Finally, following the work of Rose (2000), the study looks at the effect of common currency arrangements on trade. This is a related yet distinct issue from the impact of exchange rate volatility because a currency union is more than just an elimination of exchange rate volatility among members. It reduces other transaction costs relevant to trade and provides a commitment device for macroeconomic policies.

Anticipating some of the findings below, this study shows that while exchange rate fluctuations have increased in times of currency and balance of payments crises during the 1980s and 1990s, there does not appear to have been any increase, on average, in such volatility between the 1970s and the 1990s. It is also noteworthy that an exchange rate regime that is classified as pegged does not necessarily have lower overall exchange rate volatility than an arrangement that permits some degree of rate flexibility. Pegging to an anchor currency still leaves a country exposed to fluctuations in the anchor against other currencies, and a peg that becomes misaligned can subsequently generate exchange market pressures and large, discrete changes in currency values, and hence volatility.

A review of the theoretical literature since the 1984 study has, if anything, reinforced the conclusion that there is no unambiguous relationship between exchange rate volatility and trade flows. The general presumption that trade is adversely affected by an increase in exchange rate fluctuations depends on a number of specific assumptions and does not necessarily hold in all cases, especially in general equilibrium models, where other variables change along with exchange rates. These models show that exchange rate volatility is the result of the volatility in underlying shocks to the economy and the policy regime, which deter-

mines how the shocks are reflected in exchange rates and other variables.

For the world as a whole, there is no obvious association between periods of low exchange rate volatility and periods of fast growth in trade. In other words, at an aggregate level there is no evidence of a negative effect of exchange rates on world trade. Once one examines the data on trade and exchange rate volatility at a bilateral level, a negative relationship between the two is borne out by some of the empirical evidence in this study. This negative relationship, however, is not robust to a more general specification of the equation linking bilateral trade to its determinants that embodies the recent theoretical advances in a gravity model. Thus, if there is a negative impact of exchange rate volatility on trade, it is not likely to be quantitatively large and the effect is not robust.

These findings suggest that, from the perspective of promoting world trade, exchange rate volatility is probably not a major policy concern. Note that this does not imply necessarily that exchange rate fluctuations should be viewed with equanimity. For example, currency crises—special cases of exchange rate volatility—have required painful adjustments in output and consumption. In this case, however, what is important is not that measures need to be taken to moderate currency fluctuations directly, but that appropriate policies need to be pursued in order to avoid the underlying causes of large, unpredictable, and damaging movements in exchange rates.

There are a number of aspects related to exchange rate volatility that are not covered in this study. It does not deal with determining the level of exchange rates nor with choosing the optimal exchange rate arrangement, e.g., fixed versus floating.⁴

Section II reviews the relevant theoretical and empirical literature over the last two decades. Section III describes the recent history of exchange rate volatility in different parts of the world. Section IV presents some new evidence on the effect of exchange rate volatility on trade, and Section V offers concluding remarks.

⁴For an extensive analysis of the performance of alternative exchange rate regimes, see Rogoff and others (2004).