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# Dancing in Unison?

## Economists lack evidence of increasing synchronization of the world's economies

*Robin Brooks, Kristin Forbes, Jean Imbs, and Ashoka Mody*

**G**LOBALIZATION is increasing the links between the world's economies, particularly through capital markets and trade flows. Does the growing importance of these links mean that international policy coordination is now a necessity for effective policy-making? How sensible is it, in an increasingly global economy, to make policy decisions largely at the national level? These questions came to the fore when, after a decade of economic expansion, growth slowed simultaneously in early 2000 in the advanced economies known as the Group of Seven (G-7)—Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.

Researchers were interested in two key issues. To what extent did the slowdown in growth result from an adverse global shock that affected these economies simultaneously? And to what extent did it result from faster transmission of shocks across borders? Because global shocks are rare and their effects temporary, they are of less concern. In contrast, national economies are constantly buffeted by economic shocks. Faster cross-border transmission of these shocks can cause national economies to move in step, or comove, on a permanent basis. This increased *comovement* could reduce their ability to steer their own economy out of trouble. What, then, are the sources of comovement? Are they transitory, the result of a global shock, or permanent—a sign that the rise in global link-

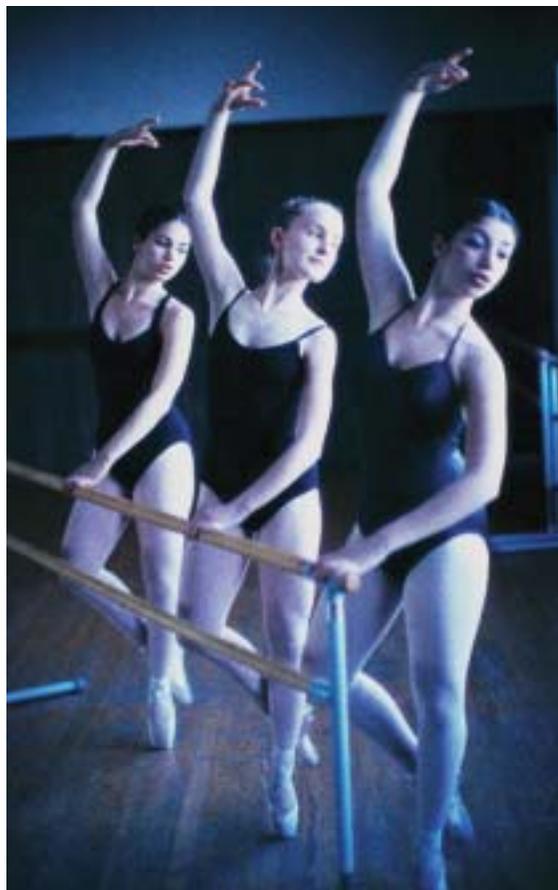
ages is bringing economies, and thus national policies, closer together?

Researchers looking into this complex issue make a distinction between financial market synchronization and synchronization of what they term the “real” economy, such as the output of goods and services as measured by GDP. What they have found is that, although the increase in financial market comovement is relatively clear and consistent, evidence of increased comovement of the real economy is blurred and controversial. While stock prices in the advanced economies

may move in parallel much of the time, the degree of synchronization of the real economy is substantially lower.

### Differing views

Measuring comovement is not simple, and there are various ways to look at the numbers. Charts 1 and 2 show that stock market correlations between the United States and other advanced and emerging markets, respectively, are generally higher than GDP correlations for the same markets. While financial comovement increased in the 1990s, especially for stock markets in the G-7, correlations between real variables (such as GDP growth) have not clearly increased over time. For the G-7 economies, real correlations may have increased in the late 1990s along with financial correlations, but they were still lower than in the early 1990s. In emerging markets, although financial market correlations are lower than for the G-7, they have also increased steadily.



The rise in financial market correlations in the 1990s is associated with greater financial openness. Chart 3 shows a small increase in trade openness in the 1990s, but a much larger increase in financial openness (measured as the amount of international assets and liabilities a country holds relative to its GDP). Chart 4 shows that cross-border holdings of equities also increased over the 1990s, implying a reduction in the so-called home bias in equity portfolios. This was driven largely by a steady opening of countries' international capital accounts.

Greater policy openness fostered a strong increase in capital flows and generated higher correlations between financial markets around the world. But economists disagree on how to interpret the figures for the real economy, while, even for financial markets, the degree of correlation may have been distorted by the bubble in Internet stocks in the 1990s. Reconstructing Charts 1 and 2 in different ways, various authors have concluded that real comovement rose, was steady, or actually declined. These trends and different interpretations are not surprising given that economic theory suggests that the relationship between real and financial market comovement is far from straightforward. Chart 5 illustrates this complex relationship, including a variety of both direct and indirect effects between financial integration, real integration, and specialization. The chart documents the possibility that financial integration, for instance, may have offsetting effects on real comovement, thus accounting for the absence of a marked response of real variables to financial integration.

### Competing explanations

There are two leading explanations for increased real comovement: trade integration and trends in specialization. Economies of countries tend to comove with important trading partners, as recessions and expansions are exported across borders. Countries and regions engaged in similar economic activities are also exposed to similar economic developments, including global economic shocks, such as swings in oil prices. Financial integration, however, makes it possible for countries to diversify consumption patterns without having to diversify production and thus allows them to become more economically specialized, which reduces real comovement. But, if investors herd, capital will flow in similar patterns across countries, increasing real comovement. The effect of financial integration on real comovement is thus ambiguous.

The story does not stop there, however, because trade integration, financial integration, and specialization patterns are themselves intricately linked (as in Chart 5). Like financial integration, trade openness allows economies to specialize in industries in which they have a comparative advantage. Thus, both financial and trade integration can indirectly lower real comovement by influencing the extent of specialization, even if the direct effects of financial and trade integration are positive. Which of these effects dominates is an empirical question, but the presence of these offsetting phenomena can account for the apparent lack of a clear trend in real comovement, even as financial integration has undeniably increased. They also

Chart 1

### In step . . .

The degree of comovement across national stock markets in the G-7 rose dramatically in the late 1990s, while the extent to which business cycles are synchronized across these countries has been broadly stable.



Sources: DataStream (total stock market returns); and IMF, World Economic Outlook database (real GDP).  
Note: Correlations computed between each G-7 member and the United States using a five-year rolling window with quarterly data from 1974:Q1 to 2002:Q4. Displayed correlation is average of all pairwise correlations for that particular quarter.

Chart 2

### . . . and in harmony?

A similar phenomenon is apparent in emerging markets, where stock market correlations have also been rising, while real comovement has been stable over time.



Sources: DataStream (total stock market returns); and IMF, World Economic Outlook database (real GDP).  
Note: Correlations computed using five-year rolling window with quarterly data from 1991:Q1 to 2002:Q4. Data from the following emerging markets were used: Argentina, Brazil, Chile, Indonesia, Malaysia, Mexico, Singapore, Taiwan Province of China, and Thailand. Displayed correlation is average for all pairwise correlations for that particular quarter.

imply that both trade and financial policies have potentially ambiguous effects on the globalization of business cycles.

A final relationship depicted in Chart 5 is that the real economy and financial markets can move in tandem when there are global economic shocks or significant events that affect all countries in the world, such as a new technology. Global shocks could include stock market bubbles, which arise when investors' expectations are out of line with fundamental economic realities. However, because most global shocks tend to be temporary, they have only a short-term impact on real and financial comovement.

### Explaining recent trends

Is the recent rise in financial comovement merely a financial market phenomenon, or does it have some underpinnings in

the real economy? This is a difficult question to answer empirically because financial markets are much more volatile than underlying economic activity. Recent research, however, has made progress in discovering the answer.

Robin Brooks and Marco del Negro have explored the link between international stock market comovement and the degree to which businesses operate internationally. Using firm-level data on stock returns and balance sheet variables, they find a surprisingly large effect. A company raising the international component of its sales by 10 percent increases the exposure of its stock return to global shocks by 2 percent and reduces its exposure to country-specific shocks by 1.5 percent. Brooks and del Negro also find that this link has grown stronger since the mid-1980s. Their work suggests that the recent rise in comovement across national stock markets is reflected in the real economy and complements earlier evidence that, at a regional level, increasing stock market comovement is being driven by institutional reforms, such as European Monetary Union.

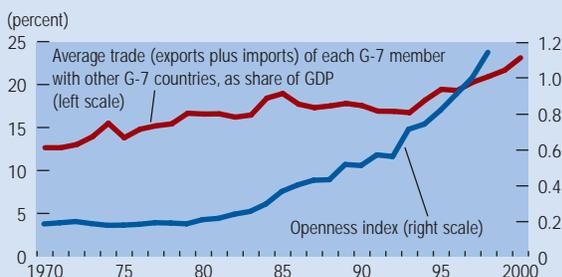
Kristin Forbes and Menzie Chinn also find a relationship between real variables and financial market returns. They control for global and sectoral shocks to isolate the extent to which asset prices in pairs of countries move together and then relate these comovements to bilateral linkages through trade and finance. They find that cross-country linkages become important determinants of bilateral asset price movements only in the second half of the 1990s. In particular, they find that, during this period, trade linkages are a significant determinant of comovements in stock and bond markets, more so than linkages through foreign direct investment and other financial flows.

Thus, there is some evidence that real and financial comovements are related and that the strength of this relationship

Chart 3

### More open

The rise in financial comovement is associated with a dramatic increase in financial openness. Trade integration, in contrast, has increased at a much slower pace.

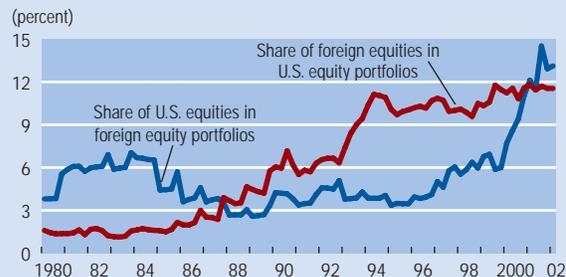


Sources: U.S. Federal Reserve Board; and authors' calculations.  
Note: Openness index is total foreign assets plus total foreign liabilities, as share of GDP, as defined in Lane and Milesi-Ferretti (2001). Average trade computed using annual data from 1970 to 2000; openness index based on annual data from 1970 to 1998.

Chart 4

### More adventurous

The rise in financial comovement is also associated with a substantial increase in cross-border equity holdings over the 1990s, implying a reduction in the so-called home bias in equity portfolios.



Source: U.S. Federal Reserve Board.  
Note: Shares are computed using quarterly data from 1980:Q1 to 2002:Q1.

varies across time. Jean Imbs, who did the analysis for Chart 5, argues that financial integration results in increased real comovement, even though it also induces specialization. Imbs confirms that trade partners and economies with similar sectoral patterns of production are more correlated. Thus, the lack of clear evidence for an increase in real comovement could simply be due to the complex interactions of offsetting factors: financial integration, trade integration, and specialization.

### Sources of global shocks

Economic shocks can vary in impact and duration. They may be caused by abrupt changes in terms of trade or by the spillover effects of domestic problems in a major economy. Global shocks may also be the result of coordinated policies across countries. Ayhan Kose, Christopher Otrok, and Charles Whiteman have estimated the importance of global shocks during the past century and attempted to identify their sources. Their results suggest that, although oil price movements were important sources of shocks in the 1970s, a more recent trigger is the similarity of monetary and fiscal policies across countries.

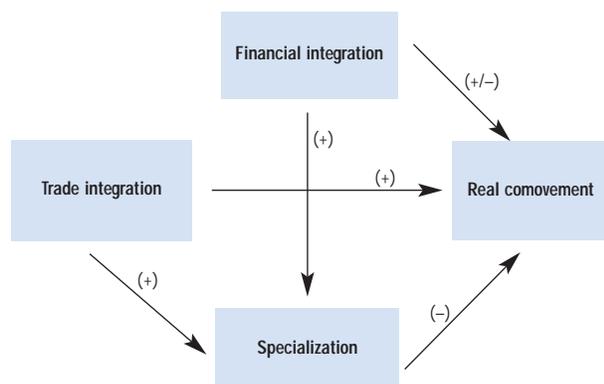
Comovement may also increase because of convergence in certain institutional features. Of particular relevance is the evolution of international norms in financial regulations, such as capital adequacy requirements and accounting standards. For example, Kan Li, Randal Morck, Fan Yang, and Bernard Yeung find that greater capital account openness increases pressure for improved transparency and reduces the influence of country factors on stock price movements.

Other factors promoting comovement may be increased productivity growth and the spread of innovations, such as information technology in the 1990s. Increased comovement resulting from the spread of productivity gains, however, is difficult to distinguish from increased comovement arising from a financial bubble (where market expectations and fundamentals become misaligned). The rise in financial market comovement in the 1990s, as well as the increased link between real variables and financial comovement, undoubtedly reflects a combination of genuine productivity gains and a financial bubble.

Chart 5

## Examining the links

The effects of growing financial integration on comovement of the real economy are complex. The nature of the link is ambiguous because integrated capital markets can allow countries to become more specialized economically, reducing real comovement. But if investors herd, capital flow patterns to countries with quite different characteristics may be similar, increasing real comovement.



Source: Jean Imbs, 2003.

## Explaining a bubble

The potential for bubbles in financial markets has been an important consideration for policymakers. Financial markets may take on a life of their own through bubbles that last a number of years; even short-lived bubbles can have significant consequences. Financial crises that spread across countries can generate substantial economic and social losses. This has prompted research asking why—and how far—crises spread. Graciela Kaminsky and Carmen Reinhart have addressed one aspect of this question by studying extreme positive and negative movements in financial markets. They find that such movements typically remain contained within a region. When these extreme movements in emerging markets trigger similar movements in important financial centers, however, financial contagion is more likely to be global.

John Griffin, Federico Nardari, and René Stulz have also examined the impact of stock market movements in emerging

and developed markets on the performance of domestic capital markets. They conclude that the observed pattern of financial flows is not consistent with theoretical models that assume perfect financial markets and investors who know the true distribution of stock returns. Capital flows into emerging markets tend to be large when global stock returns are unexpectedly high. Equity outflows from emerging markets can be large even when there are no changes in the economy's fundamentals.

## Conclusions

Comovement in financial markets clearly rose during the 1990s as capital flows increased. There is some evidence that financial and real comovements feed on each other. However, financial and real synchronization have not always moved in unison. We are in the early stages of understanding these relationships. Predicting trends is also difficult since the huge increase in financial comovement in the 1990s was partly the consequence of a bubble, and, hence, such comovement will inevitably decline. But, even if it declines, financial market integration is still high, and shocks to large financial markets will continue to be transmitted to other countries. Policymakers will continue to struggle with how to respond to real and financial movements in other countries. Globalization is a fuzzy—and often abused—analytical concept. A focus on the economic and institutional drivers of global and regional comovements could bring more discipline to our understanding of ongoing complex and exciting changes. ■

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