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Research Summaries

Globalization and Synchronization of Business Cycles

M. Ayhan Kose

The process of globalization, which refers to the rising trade and financial integration of the world economy, has recently attracted much interest. A growing research program has sought to examine how globalization has affected the synchronization of business cycles across different countries. Changes in synchronization have important implications for the conduct of macroeconomic policy at the domestic and international levels. This article briefly surveys recent research on the effects of increasing integration on the synchronization of business cycle fluctuations in main macroeconomic aggregates.

Understanding changes in the degree of synchronization of business cycles is of considerable interest from a policy perspective in a number of respects. With stronger business cycle transmission, policy measures taken by one country could have a larger impact on economic activity in other countries, implying that the degree of synchronization of business cycle fluctuations has important implications for international policy coordination (Obstfeld and Rogoff, 2002).

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Moral Hazard Versus Real Hazard

Tito Cordella

The recent wave of financial crises has fueled a heated debate on the effectiveness of rescue packages provided by the international financial institutions (IFIs). Do the IFIs fail to provide distressed countries with enough resources to mitigate the impact of adverse real shocks ("real hazard")? Or do the IFIs undermine market discipline through their excessive largesse (thus creating "moral hazard")? These somewhat conflicting possibilities reflect the relative weight of "real hazard" versus "moral hazard" considerations. A number of recent studies address this issue and provide insights into a trade-off that is relevant for designing and implementing rescue packages.

Does IMF lending make borrowers and lenders much more imprudent? In other words, are the moral hazard costs associated with IMF interventions so large that "the IMF might consider changing its name to IMH—the Institute for Moral Hazard" (Barro, 1998)? Or are they so small that "Argentina's difficulty in obtaining IMF lending has to do with an overstating of the problem of moral hazard" (Griffith-Jones, 2003)?

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Globalization and Synchronization of Business Cycles

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If global factors play a dominant role in explaining business cycles, domestic policies targeting external balances to stabilize macroeconomic fluctuations might have a limited impact. The extent of business cycle synchronization among a group of countries is also an important criterion in determining whether a currency union among those countries is desirable and feasible.

Economic theory does not provide a definitive conclusion regarding the impact of globalization on the synchronization of business cycles (Brooks and others, 2003). Increased trade in goods would normally be expected to heighten both demand- and supply-side spillovers across countries. However, Kose and Yi (2001) show that higher trade intensity leads to lower business cycle correlations in standard international business cycle models because favorable shocks to a country's productivity lead capital and other resources to move to that country. If industry-specific shocks are important in driving business cycles, increased intra-industry specialization across countries can increase cyclical comovement, but the degree of comovement might fall if inter-industry trade linkages are spurred.

Recent empirical research finds that stronger trade linkages have a positive impact on cross-country output correlations. For example, based on cross-country or cross-region panel regressions, Frankel and Rose (1998), Clark and van Wincoop (2001), Kose and Yi (2002), and Imbs (2004a, 2004b) show that, among advanced countries, pairs of countries that trade more with each other exhibit a higher degree of business cycle comovement.

The theoretical effect of increased financial flows on cross-country output correlations depends on the nature of shocks and specialization patterns. For instance, stronger financial linkages could generate higher cross-country synchronization of output by allowing easier spillovers of demand-side shocks. However, financial linkages could stimulate specialization of production through the reallocation of capital in a manner consistent with countries' comparative advantage. This type of specialization, which could result in more vulnerability to industry- or country-specific shocks, could lead to a decrease in the degree of output correlations while inducing stronger comovement of consumption across countries (Kalemli-Ozcan, Sorensen, and Yosha, 2003).

Recent empirical studies conclude that increased financial integration leads to higher business cycle comovement. Imbs (2004a, 2004b) shows that financial linkages are important in accounting for the synchronization of output fluctuations. Financial integration, by helping countries to diversify away country-specific risks associated with output fluctuations, should result in stronger comovement of consumption across countries. Imbs (2004a) documents that financial integration leads to higher cross-country consumption correlations among advanced economies. Kose, Prasad, and Terrones (2004) find that, for advanced countries, cross-country investment correlations have increased over time.

Other studies analyze the impact of globalization on the synchronization and volatility of business cycle fluctuations among developing countries. Kose, Prasad, and Terrones (2003b) document that, on average, cross-country consumption correlations did not increase in the 1990s, precisely when financial integration would have been expected to result in better risk-sharing opportunities, especially for emerging market countries. Kose, Prasad, and Terrones (2003a) find that emerging market economies did not enjoy any sizable decrease in the volatility of consumption during the 1990s and lack of international risk sharing remains an important problem for these countries.

Several recent empirical studies examine how the dynamics of comovement of business cycles across advanced countries have evolved over time. The results of these studies indicate that differences in country coverage, sample periods, aggregation methods used to create country groups, and econometric methods employed could lead to diverse conclusions about the temporal evolution of business cycle synchronization. For example, some of these studies find evidence of declining output correlations among advanced economies over the last three decades. Helbling and Bayoumi (2003) find that correlation coefficients between the United States and other G-7 countries for the period 1973–2001 are substantially lower than those for 1973–89. In a related paper, Heathcote and Perri (2003) examine the correlations of output, consumption, and investment between the United States and the rest of the world, which is defined as an aggregate of Europe, Canada, and Japan. They find that the cross-country correlations are lower in 1981–2002 than those in 1960–81.

However, other studies document that business cycle linkages have become stronger over time. Kose, Prasad, and Terrones (2003b, 2004) study the correlations between the fluctuations in individual country aggregates (output, consumption, and investment) and those in corresponding world (G-7) aggregates using annual data over the period 1960–99. They find that, for advanced countries, the correlations on average increase sharply in the 1970s (the oil shock period) and rise further in the 1990s. Using a much longer sample of annual data (1880–2001), Bordo and Helbling (2003) document that the degree of synchronization across advanced countries has increased over time.

Studies employing recently developed econometric methods, such as dynamic factor models, seem to provide a more consistent description of the evolution of business cycle comovement. These methods allow estimation of the extent to which common or country-specific factors explain the changes in the comovement, and also help take into account potentially important "leads" and "lags" in the cross-correlation of different macroeconomic variables. Using these methods, recent studies find strong evidence of a common (world) factor that plays an important role in driving business cycles in advanced countries (Stock and Watson, 2003; Helbling and Bayoumi, 2003; Nadal-De Simone, 2002; and Lumsdaine and Prasad, 2003). This implies that there exists a world business cycle that describes fluctuations common across all advanced countries. Kose, Otrok, and Whiteman (2003) extend this research by analyzing how the world factor affects business cycles in developing countries. They find that the world factor plays a much smaller role in explaining business cycles in developing countries than it does in advanced economies.

Is the world factor becoming more important in explaining business cycles over time, suggesting a higher degree of business cycle synchronization? Stock and Watson (2003) find that, in some of the G-7 countries (Canada, Italy, and the United States), the importance of international factors in explaining business cycles is higher during 1984–2002 than that in 1960–83. Kose, Otrok, and Whiteman (2004) document that the world factor, on average, explains a larger share of business cycle variation in the G-7 countries during the globalization period (1986–2002) than it does during the Bretton Woods period (1960–72). Indeed, this is the case in all countries except Germany and Japan, where the relative importance of domestic developments (unification in Germany and prolonged slowdown in Japan) has likely swamped the effect of increasing globalization.

Finally, recent research examines how the emergence of regional trading blocks affects the synchronization of business cycles in different parts of the world. Caldéron (2003) shows that free trade agreements have a positive impact on the degree of business cycle synchronization across the member countries. Kose (2004) and Kose, Meredith, and Towe (2004) find that the North American Free Trade Agreement has led to a substantial increase in the degree of business cycle synchronization across Canada, Mexico, and the United States. Employing a time-varying weighting procedure for constructing common components, Lumsdaine and Prasad (2003) show that business cycle fluctuations are closely linked across European countries, implying that there is a European business cycle. Using dynamic factor models, Canova, Ciccarelli, and Ortega (2003) and Kose, Otrok, and Whiteman (2003) find that, while business cycles in European countries display comovement, the source is not distinctly European, but rather worldwide.

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IMF Study on Hong Kong SAR

Hong Kong SAR: Meeting the Challenges of Integration with the Mainland

Edited by Eswar Prasad, with contributions from Jorge Chan-Lau, Dora Iakova, William Lee, Hong Liang, Ida Liu, Papa N'Diaye, and Tao Wang

This Occasional Paper provides an overview of the main challenges facing Hong Kong SAR as it continues to become more closely integrated with the Mainland of China. Section I summarizes the recent macroeconomic developments and the main policy issues in Hong Kong SAR. Section II presents the various dimensions of the ongoing economic and financial integration with the mainland, the outlook for further integration of these economies, and the associated implications for the structure of the economy and for macroeconomic and structural policies. Section III examines the medium-term fiscal outlook under different policy scenarios and discusses alternative policy options to restore fiscal balance. Section IV discusses recent developments in the real estate sector and their macroeconomic impact. Section V presents a comprehensive econometric analysis of deflation in Hong Kong SAR. Section VI analyzes the factors behind and the implications of rising wage inequality in Hong Kong SAR. Section VII analyzes recent developments in the financial sector and assesses Hong Kong SAR's future prospects as an international financial center.

This study was issued as IMF Occasional Paper No. 226.

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Visiting Scholars

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Alessio Anzuini; Bank of Italy, Italy
Omoregba Aregbeyen; Ahmadu Bello University, Zaria, Nigeria
Jushan Bai; New York University
Roel Beetsma; University of Amsterdam, The Netherlands
Michael Bordo; Rutgers University
Fabio Canova; Universitat Pompeu Fabra, Spain
Allan Drazen; University of Maryland
Abiodun Folawewo; University of Ibadan, Nigeria
Simon Johnson; Massachusetts Institute of Technology
Rafael La Porta; Tuck School of Business
Olayinka Lawanson; University of Ibadan, Nigeria
David Leblang; University of Colorado
Shawn Leu; University of Sydney, Australia
Enrique Mendoza; University of Maryland
Marcelo Muinhos; Banco Central do Brasil, Brazil
Ousmanou Njikam; University of Yaoundé II, Cameroon
Tatsuyoshi Okimoto; University of California at San Diego
Sawa Omori; University of Pittsburgh
David Parsley; Owen Graduate School, Vanderbilt University
Sergio Rebelo; Northwestern University
Carmen Reinhart; University of Maryland
Andrey Romanov; University of Wisconsin
Christopher Sims; Princeton University
Federico Sturzenegger; Universidad Torcuato Di Tella, Argentina
Lars Svensson; Princeton University
Mark Taylor; Warwick University, United Kingdom
Helmut Wagner; University of Hagen, Germany
Beatrice Weder; University of Mainz, Germany

Moral Hazard Versus Real Hazard

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Ultimately these are empirical questions. Although no study has provided a complete cost-benefit analysis of rescue packages along these lines, a number of IMF researchers have gathered substantial empirical evidence on these questions. Several studies have looked at the real cost associated with financial crises, others have provided estimates of the likely moral hazard implications of rescue packages.

The cost of real hazard, that is, of sharp declines in member countries' economic performance, has been documented by several authors. With respect to the social costs, Baldacci, De Mello, and Inchauste (2002) show that financial crises are associated with an increase in poverty and, in some cases, income inequality. Their view is that such negative effects call for the provision of targeted safety nets. Corbacho, Garcia-Escribano, and Inchauste (2003) look at the effects of the Argentine macroeconomic crisis using urban household surveys. This allows them to identify the most vulnerable households, to investigate whether employment in the public sector and government spending served to decrease vulnerability, and to shed light on the mechanisms used by households to smooth the effects of the crisis.

Other studies focus on the output costs of financial crises. Gupta, Mishra, and Sahay (2003) use a broad sample of 195 currency crises in 91 countries from 1970 to 1998 to examine the output response to the crises. They show that, while the majority of crises have been contractionary, more than 40 percent of them turned out to be expansionary. Moreover, output contraction was greater in large and advanced economies than it was in small and developing countries. This finding contrasts with Disyatat's (2001) view that developing countries are more exposed to output collapses because of the vulnerability of their banking sector. Finally, Cerra and Saxena (2003) study output recovery in the aftermath of the Asian crisis and decompose the permanent and transitory components of recessions. Their main finding is that while growth recovered fairly quickly after the crisis, there is evidence of permanent losses in the levels of output in all the six countries considered in the study.

To better understand the positive and negative consequences of financial crises on the industrial structure of a country, Borensztein and Lee (2002) evaluate the differential impact of the Korean financial crisis on various industrial sectors. Their main finding is that, after the crisis, credit appears to have been reallocated from the chaebol-affiliated firms to more efficient and less connected ones. Along similar lines, Haksar and Kongsamut (2003) examine the performance of the Thai corporate sector, and show substantial heterogeneity across firms in their pattern of recovery from the crisis.

Estimating the moral hazard costs of IFIs' interventions is an even more difficult exercise. Indeed, while real costs are observable, moral hazard is not. To test for the existence of moral hazard associated with international lending, Lane and Philips (2000) look at how emerging market bond spreads reacted to a number of IMF-related news items between 1995 and 1999. They only find two out of 22 episodes in which interest rate spread behavior was consistent with the moral hazard hypothesis. One of these two episodes was the increase in emerging market spreads in the aftermath of the Russian 1998 default. This event is analyzed by Dell'Ariccia, Schnabel, and Zettelmeyer (2002), who look

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Thirty Years of Current Account Imbalances, Current Account Reversals, and Sudden Stops
Sebastian Edwards

A Gravity Model of Sovereign Lending: Trade, Default, and Credit
Andrew K. Rose and *Mark M. Spiegel*

Comment on: "A Gravity Model of Sovereign Lending: Trade, Default, and Credit," by Andrew K. Rose and Mark M. Spiegel
Mark L.J. Wright

Monetary Sovereignty, Exchange Rates, and Capital Controls: The Trilemma in the Interwar Period
Maurice Obstfeld, Jay C. Shambaugh, and *Alan M. Taylor*

Accounting for Consumption Volatility Differences
Holger Wolf

Exchange Rate Policy and the Management of Official and Private Capital Flows in Africa
Edward Buffie, Christopher Adam, Stephen O'Connell, and *Catherine Pattillo*

IMF Staff Papers, the IMF's scholarly journal, edited by Robert Flood, publishes selected high-quality research produced by IMF staff and invited guests on a variety of topics of interest to a broad audience, including academics and policymakers in IMF member countries. The papers selected for publication in the journal are subject to a rigorous review process using both internal and external referees. The journal and its contents (including an archive of articles from past issues) are available online at the **Research at the IMF** website at *http://www.imf.org/research.*

at the level and cross-country dispersion of spreads across relatively tranquil periods before and after the August 1998 Russian crisis. They find that, consistent with the moral hazard hypothesis, the failure to provide Russia with a generous rescue package increased emerging market spread levels, sensitivity to fundamentals, and cross-country dispersion.

Even if one accepts that international bailouts may create investor moral hazard, the question remains of who pays for such excessive risk taking. Is such moral hazard financed by global taxpayers? Jeanne and Zettelmeyer (2001) address this critical issue. Looking at the IMF's repayment record, they argue that official crisis lending de facto involves virtually no cost to the rest of the world. Along similar lines, Joshi and Zettelmeyer (2004) estimate the IMF's realized transfers to emerging and developing countries for the period 1973–2003. On the basis of their estimates, they suggest that it is implausible that such transfers could have been a source of significant moral hazard in lending to emerging market countries.

If countries (almost) always repay the IMF, then IMF rescue packages should not be considered as state-contingent transfers but as state-contingent loans, that is, as fairly priced country insurance policies. The effect of such contracts has recently been studied by Cordella and Levy Yeyati (2004). They identify the conditions under which the positive insurance effect of a rescue package more than offsets its moral hazard consequences. In particular, they show that insurance, especially when made contingent on the occurrence of adverse external macroeconomic shocks, is more likely to foster reforms in crisis-prone volatile economies. This effect is similar to the value effect created by a bank bailout (Cordella and Levy Yeyati, 2003).

The implication of this body of research is that one should carefully weigh moral and real hazard considerations in the design of IMF rescue packages. Although the real hazard costs are quite well documented, the evidence on moral hazard is more shaky, in part, because it is more difficult to gather. On the basis of the existing evidence, Rogoff (2002) rules out the possibility that the moral hazard element associated with IMF lending is as large as some of the IMF critics have suggested. His view is somehow similar to that of his predecessor, Michael Mussa. Indeed, Mussa (1999) argued that the problem of moral hazard arising from international financial support has been greatly exaggerated, and that the main cause of financial crises may not be moral hazard but rather the real hazard that results from lack of proper hedging on the part of the country authorities and the international financial system.

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Fourth Annual IMF Research Conference

The Fourth Annual IMF Research Conference was held in Washington, D.C., on November 6–7, 2003. The conference had an overarching theme of capital flows and macroeconomic cycles. The discussion focused on the management of macroeconomic policy in the presence of large capital flows, and on issues related to the effects of free capital mobility and increased financial integration. The Mundell-Fleming lecture was delivered by Sebastian Edwards of UCLA. The conference included a panel discussion on "Capital Flows Cycles: Old and New Challenges" with Agustín Carstens, Deputy Managing Director of the IMF; Jeffry Frieden, Professor of Government at Harvard University; Peter Garber, Global Strategist at Deutsche Bank; Morris Goldstein, Director of the Institute for International Economics; and Zanny Minton-Beddoes of The Economist. The conference agenda and a short description of the papers follow. All the conference papers and a transcript of the panel discussion are available at the IMF's website at http://www.imf.org/External/NP/EXR/ECForums/2003/110703.htm.

Mundell-Fleming Lecture

Current Account Imbalances: History, Trends, and Adjustment Mechanisms

Sebastian Edwards (UCLA)

This paper analyzes the historical behavior of current account imbalances and the patterns of adjustment followed by countries with large balance of payments disequilibria. The focus is on the connection between adjustment and exchange rate changes and on the costs of current account deficit reversals, and their connection with "sudden stops" of capital inflows. In that context, the paper analyzes whether openness, the extent of dollarization, and the exchange rate regime affect the costs of reversals.

Papers

The Real Effects of Financial Integration

Jean Imbs (London Business School and CEPR)

This paper studies why, contrary to theory, fluctuations in GDP are more synchronized internationally than fluctuations in consumption. When financial integration increases, risk sharing synchronizes both consumption and GDP growth rates, with no effect on the discrepancy. Hence, the puzzle does not arise from failure to internationally diversify risk, but rather from the fact that financial flows also affect output correlations. Furthermore, while the bulk of risk sharing works via equities, long-term debt flows affect GDP correlations.

Are Immigrant Remittance Flows a Source of Capital for Development?

Ralph Chami (IMF), Connel Fullenkamp (Duke University), and Samir Jahjah (IMF)

This paper explores the role of remittances in developing countries. It develops a framework where, because of asymmetric information and economic uncertainty, remittances involve a moral hazard problem. The implication is that remittances may have a negative effect on economic growth. The paper confirms this prediction with evidence from a panel of countries.

Testing the Portfolio Channel of Contagion: The Role of Risk Aversion

Fernando A. Broner (University of Maryland) and R. Gaston Gelos (IMF)

This paper examines whether changes in investors' risk aversion in response to gains and losses can explain international contagion. Using investment fund–level data, it shows that funds react to shocks, reducing their exposure to countries in which they are "overweight" and increasing their exposure to countries in which they are "underweight." It, then, constructs a matrix that can help in predicting the patterns of contagion using information about which countries share a set of overexposed funds.

Capital Account Liberalization, Investment, and the Invisible Hand

Anusha Chari (University of Michigan) and Peter Blair Henry (Stanford University and NBER)

This paper presents the first firm-level analysis of capital account liberalization and investment in developing countries. The paper uses a model of Tobin's q to decompose the firms' postliberalization changes in investment into (1) the country-specific change in the risk-free rate; (2) firm-specific changes in equity premiums; and (3) firm-specific changes in expected future earnings. The results stand in contrast to the view that investment and fundamentals are unrelated during liberalization episodes.

Procyclical Government Spending in Developing Countries: The Role of Capital Market Imperfections

Alvaro Riascos (Banco de la República, Colombia) and Carlos A. Végh (UCLA and NBER)

This paper shows that differences in the cyclicality of government consumption across countries are consistent with a standard neoclassical model of fiscal policy. It shows that,

with complete markets, the correlation of government consumption and output is zero (as in G-7 countries), while, with only risk-free debt, this correlation is typically positive. This suggests that the lack of sufficiently developed financial markets significantly affects how fiscal policy is carried out in developing countries.

The Trilemma in History: Trade-offs Among Exchange Rates, Monetary Policies, and Capital Mobility

Maurice Obstfeld (University of California at Berkeley, NBER, and CEPR), Jay C. Shambaugh (Dartmouth College), and Alan M. Taylor (University of California at Davis and NBER)

This paper examines whether the monetary policy trilemma, which imposes a stark trade-off among exchange stability, monetary independence, and capital market openness, is actually supported by historical data. Looking at the coherence of international interest rates over more than 130 years, it finds that the constraints implied by the trilemma are largely borne out by history.

Exchange Rate Policy and Management of Official and Private Capital Flows in Africa

Edward Buffie (Indiana University), Christopher Adam (Oxford University), Stephen O'Connell (Swarthmore College), and Catherine Pattillo (IMF)

This paper focuses on the monetary and exchange rate policy response to persistent shocks to aid flows that, although beneficial in the long run, can produce dramatic macroeconomic management problems in the short run. The paper finds that when the credibility of policymakers' commitment to low inflation is firm, some degree of dirty floating, with little or no sterilization of increases in the monetary base, is the most attractive approach in the short run.

A Gravity Model of Sovereign Lending: Trade, Default, and Credit

Andrew K. Rose (University of California at Berkeley) and Mark M. Spiegel (Federal Reserve Bank of San Francisco)

This paper develops a simple theoretical model that captures the idea that countries service their external debts because of the fear that default might lead to shrinkage of international trade. It then tests whether creditors systematically lend more to countries with whom they share closer trade links.

How Private Creditors Fared in Emerging Debt Markets, 1970–2000

Christoph Klingen (IMF), Beatrice Weder (University of Mainz), and Jeromin Zettelmeyer (IMF)

This paper estimates ex post returns to emerging market debt. It finds that, for the period 1970–2000, these returns were about the same as that of a 10-year U.S. treasury bond, reflecting the 1980s debt crisis and the high returns of the 1990s. Since 1986, returns have been less volatile than emerging market equity returns, but more volatile than those on U.S. corporate or high-yield bonds, and have not been significantly correlated with U.S. or world stock markets.

Call for Papers

IMF Jacques Polak Annual Research Conference

The International Monetary Fund will hold its Fifth Annual Research Conference at its headquarters in Washington, D.C., on November 4–5, 2004. The conference provides a forum for discussing innovative research in international economics, undertaken both by IMF staff and by outside economists, and to facilitate the exchange of views among researchers and policymakers.

This year's conference will be devoted to **Policies, Institutions, and Instability**. Possible topics include (1) the effect of political institutions on economic instability; (2) the corporate sector origins of macroeconomic vulnerability; (3) financial sector collapses, including both causes and effects; (4) debt and default; and (5) general equilibrium models of crises. Papers that do not fit into these categories, but that are related to the main theme of the conference, are also welcome.

Interested contributors should submit a two-page proposal to the Program Committee, including the title of the paper, the author(s)' affiliation and contact information, the main questions to be examined, the most relevant literature, the intended contribution of the paper, and the possible data sets and methodology to be employed. A detailed outline or preliminary draft of a paper is encouraged. Authors are also encouraged to provide a list of up to three of their publications or working papers or a copy of their vitae.

Please submit your proposals (in a Word or PDF file) by April 15, 2004 (e-mail to *ARC2004@imf.org*). Please use the contact author's name as the name of the file. The Program Committee will evaluate all proposals in terms of originality, analytical rigor, and policy relevance and will communicate its decision by late April. A 12-page work-in-progress draft will be required by June 30, 2004, to ensure adequate progress toward completion.

Country Study

Chile

Marco A. Espinosa-Vega

Chile has maintained macroeconomic and financial stability for almost two decades, largely as a result of sound policies. IMF researchers have sought to shed light on the sources of these positive outcomes to contribute to the policy discourse and to identify potential challenges for the years ahead.

Chile seems to have skillfully fended off international contagion from crises in other emerging markets in recent years. Rebucci (2002) studies the daily movements in the peso exchange rate to test the hypothesis of "shift-contagion" from Argentina in 2001. He finds evidence of contagion during some months, at least through end-2001. One interpretation of his finding is that Chile has faced episodes of contagion but has successfully resisted them.

While Chile's sound economic policies have been well documented over the last decade, less attention has been paid to the institutional arrangements underlying the adoption and sustained implementation of such policies. Espinosa-Vega and Phillips (2003) conclude that time-consistent financial regulation and the constitutional features that have promoted fiscal discipline and central bank independence have been especially important in this regard.

Phillips and Espinosa-Vega (2003) review Chile's macroeconomic policy framework, which has helped the country endure recent shocks. The country's fiscal policy aims at a structural balance target that has allowed automatic fiscal stabilizers to operate while providing adequate assurance of sustainability. Chile's central bank policies, in the context of a floating exchange rate, focus on inflation targeting. The inflation-targeting framework consists of (1) a prespecified *continuous* inflation target band; (2) a preannounced policy horizon; and (3) timely communication of the authorities' inflation forecast, the rationale for their policy decisions, and the reasons for any temporary deviations from the inflation target.

Forecasting inflation is an essential element of any inflation-targeting regime. Nadal-De Simone (2000) compares the forecasting performance of three econometric models with a benchmark Box-Jenkins model. He finds that the Box-Jenkins model performs well only in the short run and that including the preannounced official inflation target as an explanatory variable improves the forecast performance of the alternative models. Importantly, Nadal-De Simone (2001) also shows that the decline in inflation variance associated with inflation-targeting regimes has not been accompanied by an increase in output variance in Chile.

The effectiveness of monetary policy depends, among other things, on the degree to which changes in the monetary authority's target rate are followed by changes in retail banking rates (whether there is fast and complete "pass-through"). Espinosa-Vega and Rebucci (2004) perform a cross-country analysis of the degree of "interest rate pass-through." Their sample includes some of Chile's "peer" economies, and some industrial economies. They find that Chile exhibits fast and close to complete interest rate pass-through.

Substantial reforms have also been undertaken in Chile's financial markets. IMF researchers underscore the fundamental role of Chile's well-developed and large institutional investor base as a stable source of domestic finance. Luzio (2003) also analyzes remaining policy challenges, such as low liquidity in equity and corporate bond markets, and a high degree of ownership and investor concentration. Recent changes in financial regulation and legislation have sought to address concerns on the relative depth of capital markets while improving capital markets regulation.

Most of the policies and reforms pioneered by Chile in the last two decades have been market oriented. However, Chile has also attracted much attention on the part of both policymakers and academics for having thrown some "sand in the wheels" of capital inflows. In the early 1990s, unremunerated reserve requirements (URRs) were imposed on short-term capital inflows to improve the composition and moderate the total volume of capital inflows, with a view to avoiding sharp reversals.

Although no consensus exists on the effectiveness of such a form of capital control, Laurens and Cardoso (1998) suggest that URRs lengthened the average maturity of capital inflows but had no long-term effect on total capital inflows or the exchange rate, and therefore increased the autonomy of Chile's monetary policy only to a limited extent. In their evaluation of the impact of URRs, Nadal-De Simone and Sorsa (1999) note that the URRs were enforced effectively—as one might have expected in light of Chile's generally good record of effective governance. They caution that lessons drawn from the Chilean experience with URRs should not be applied to other countries without taking into account the particular country's institutional history and record in enforcing regulations.

Sound macroeconomic and financial policies have been usefully complemented by Chile's open trade policy, which

has recently included the unilateral reduction of tariffs and a number of trade agreements. Even so, the large share of natural resources in Chile's exports might have been expected to be a source of volatility. But Villafuerte (2003) notes that Chile has been able to avoid the "Dutch disease"—episodes where strong exports of natural resources are associated with diminishing rates of growth. He argues that, in the case of Chile, such exports have been associated with positive spillovers and have led to product innovation. He further maintains that, to take full advantage of these spillovers, Chile needs to continue to diversify exports and promote human capital accumulation.

Copper plays an especially important role in the Chilean economy—as a key contributor to exports, GDP, and fiscal revenues. Spilimbergo (1999) finds evidence of a close relationship between copper prices and the Chilean business cycle, though establishing the precise transmission channel between these two variables is a more difficult task. Spilimbergo points out that, unlike other countries endowed with nonrenewable resources, there is limited evidence in Chile of consumption booms being related to copper price booms. He suggests, therefore, that investment could be a more plausible transmission channel between the copper price and business cycles. He also cautions against simplistically attributing Chile's economic success to high copper prices.

Given the size of copper revenues for the Chilean economy and the fact that the price of copper is considerably volatile, forecasting the price of copper is of paramount importance. The Chilean government adheres to a "structural balance target" that includes adjustments for copper price fluctuations. The rationale for such adjustments relies in large part on the ability to forecast the copper price in the medium term with some degree of accuracy. Phillips (2002) compares the out-of-sample forecasting performance of several models and finds that it is possible to forecast medium- and long-term copper price movements. However, he cautions that there is still significant uncertainty about the copper price steady state and its cyclical properties.

What are the fiscal policy implications for a country that derives important tax revenue from an exhaustible commodity sector? The answer is far from straightforward because it depends on a number of assumptions, including how the tax revenues will be used, whether the economy is in a dynamically efficient equilibrium, and what weight the current government assigns to the well-being of future generations. Alier and Kaufman (1999) remind us that Chilean copper will not be around forever and that it is important to study the welfare implications of alternative fiscal balance paths. They examine a stylized model that assumes a dynamically efficient economy with government provision of public consumption goods and conclude that, in their model, during the years that fiscal revenues are derived from copper, the government should run fiscal surpluses that allow the replacement of nonfinancial wealth with financial assets.

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