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IMF Research Bulletin Has New Editor

M. Ayhan Kose, a Senior Economist with the Research Department, has been appointed as the new editor of the *IMF Research Bulletin*. He replaces Antonio Spilimbergo, who served as editor for the past two years.

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Research Summaries

Measures of Financial Integration

Martin Schindler



Understanding the costs and benefits of financial integration has been a topic of intensive research during the past two decades. Central to any empirical research investigating this topic is the measurement of financial integration. A large number of such measures have been suggested, including de jure measures, reflecting the extent of legal restrictions on cross-border financial flows, and de facto measures, reflecting a country's actual degree of financial integration. This article summarizes research on measures of financial integration, an area to which IMF research has contributed substantially.

Global financial integration, as measured by the magnitude of cross-border financial asset holdings, has grown exponentially in recent years. While it can benefit economies through improved access to capital and better risk diversification, it may also facilitate the transmission of adverse shocks across countries. Better understanding the relative costs and benefits of financial globalization is important for policy analysis: should policymakers impose restrictions on cross-

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Sovereign Wealth Funds and Financial Stability

Tao Sun and Heiko Hesse



Since the beginning of the financial crisis in the summer of 2007, financial stability has been at the forefront of policy discussions. At the same time, sovereign wealth funds have become dominant players during the past two years, as they have injected significant capital in major financial institutions. Research on the financial stability implications of these funds has been slowly emerging, hampered by lack of data on their asset allocations. This article summarizes the results of some recent studies about sovereign wealth funds and their implications for financial stability.

Sovereign wealth funds (SWFs) are defined as special-purpose investment funds or arrangements owned by the general government. They are often established out of balance of payments surpluses, official foreign currency operations, proceeds of privatizations, fiscal surpluses, or receipts resulting from commodity exports. Their total size has been estimated at \$2 trillion

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Measures of Financial Integration

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border capital flows or should they undertake policies to attract more flows? Central to empirical research investigating this and related questions is the measurement of financial integration.

Over the past several years, an increasing number of such measures have been made available, including de jure measures, aiming to reflect the extent to which countries impose legal restrictions on cross-border financial flows, and outcome-based de facto measures, aiming to capture a country's actual degree of financial integration. For the purpose of policy analysis, de jure measures, which are under policymakers' direct control, are more relevant, while in other applications, de facto measures may be more appropriate; in still other situations, both may be necessary, for example, if the research question centers on the effectiveness of capital controls in stemming de facto outcomes.

Most de jure measures rely on information contained in the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER). Until 1995, the AREAER summarized a country's openness to capital flows using a binary dummy variable. Since 1995, the AREAER has provided additional information on capital account restrictions in several subcategories. The structural break in the AREAER's format confronts researchers with a trade-off between sample coverage and detail.

The binary AREAER indicator provides the largest sample coverage, with a (unbalanced) panel starting in 1966 and covering 184 countries. Grilli and Milesi-Ferretti (1995) were among the first to use this indicator. However, the binary index only crudely approximates a country's degree of capital account openness and provides no information on the composition of capital controls.

The AREAER reported three additional binary variables: on current account openness; on export proceeds' surrender requirements; and on multiple exchange rate practices. Mody and Murshid (2005) extend all four variables until 1999 and interpret their sum as a financial integration index. (Grilli and Milesi-Ferretti, 1995, also use all four variables, but separately.) Chinn and Ito (2008) further extend these four variables for 182 countries up to 2006 and aggregate them taking a principal components approach. While these measures provide more finely gradated information, they arguably capture information that extends beyond a narrow definition of capital controls.

Other authors have chosen a more focused approach. Bekaert, Harvey, and Lundblad (2005) date equity liberalization episodes for 42 countries during 1960–2006; Edison

and Warnock (2003) focus on equity restrictions in 31 countries during 1989–2006 at a monthly frequency, by measuring the fraction of a country's market capitalization that is open to foreign investment.

An alternative index by Quinn (1997) has recently been used in IMF research on structural reforms (IMF, 2008). An updated version covers 94 countries during 1950–2005; it captures the intensity of controls by ranking different control instruments by their (assumed) economic importance, which involves a certain degree of judgment, and it also distinguishes between residents and nonresidents.

Some authors have utilized the greater richness of the post-1995 AREAER structure to capture more dimensions of capital account restrictiveness, including by asset categories, residency status, and the direction of flows. Tamirisa (1999) codes the various subcategories in the new AREAER structure for 40 countries in 1996; Johnston and Tamirisa (1998) analyze the dataset and its various subcomponents in more detail. Miniane (2004) follows a similar approach, but extends some of the post-1995 structure backward, covering 1983–2000 for 34 countries, at the cost of a more limited country coverage and less detail, including the inability to distinguish between inflow and outflow restrictions.

“Should policymakers impose restrictions on cross-border capital flows or should they undertake policies to attract more flows?”

More recently, and broadly following Tamirisa's (1999) approach, Schindler (forthcoming) constructs a dataset containing information for a subset of the categories contained in the new AREAER structure, covering 91 countries during 1995–2005. In this dataset, indices are coded at the level of individual types of transactions, allowing for different data aggregations, including by asset category, residency status, and inflows versus outflows. (Dis)aggregations of this nature are likely to be important. As Henry (2007, p. 889) notes, existing evidence suggests that opening equity markets to foreign investors may avoid some of the problems associated with the liberalization of debt flows, and so, “[a]t a minimum, the distinction between debt and equity is critical.” The resulting, more finely gradated indices also allow for more meaningful comparisons across countries and over time.

The de jure measures discussed so far share some drawbacks: they do not reflect the extent to which legal controls

are enforced in practice; even the more disaggregated indices may not capture subtle, but possibly important differences between countries' capital control regimes; and they do not necessarily reflect a country's actual degree of financial integration, which is presumably the key issue of interest. For example, Dell'Ariccia and others (2008) document that even countries with relatively closed capital accounts became substantially more financially integrated over the past decades.

De facto indicators avoid these issues by focusing directly on outcomes. Lane and Milesi-Ferretti (2007) construct a database of external stocks of assets and liabilities by using official estimates from countries' international investment position and then generating estimates for stock positions in earlier years based on capital flows data and capital gain/loss calculations. Their database is the most comprehensive and widely used de facto measure of financial integration, covering 145 countries during 1970–2004.

Overall, a wide array of measures exists from which researchers can choose those that best fit their research question. For example, the inflow/outflow distinction in Schindler (forthcoming) allows Prati, Schindler, and Valenzuela (forthcoming) to identify the differential effects of capital account liberalizations on different subsets of firms; Binici, Hutchison, and Schindler (forthcoming) use both de jure (Schindler, forthcoming) and de facto (Lane and Milesi-Ferretti, 2007) measures and find significant differences in the effectiveness of capital controls between equity and debt flows and inflows and outflows; and Kose and others (2006) argue for the use of de facto measures. For further discussion of financial integration measures and related issues, researchers are referred to Edison and others (2004), Kose and others (2006), Miniane (2004), and Schindler (forthcoming).

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Sovereign Wealth Funds and Financial Stability

(continued from page 1)

to \$3 trillion, but many of them have probably seen unrealized losses from the ongoing financial crisis combined with a sharp reduction in oil prices.

There have been many arguments put forth regarding the potential positive and negative effects of SWFs on global financial markets. For example, some argue that SWFs can play a stabilizing role in global financial markets. First, many commentators point out that as long-term investors with no imminent call on their assets, and with mainly unleveraged positions, SWFs are able to sit out longer during market downturns or even go against market trends. In particular, the capital injections by SWFs into systematically important financial institutions in late 2007 and 2008 have augmented the recipients' capital buffers and have been helpful in reducing various bank-specific risk premia, at least in the short term. This provides initial evidence that SWFs could have a potentially volatility-reducing impact on markets. Second, large SWFs may have an interest in pursuing portfolio reallocations gradually so as to limit adverse price effects of their transactions. Third, SWFs could, as long-term investors and by adding diversity to the global investor base, contribute to greater market efficiency, lower volatility, and increased depth of markets.

Although SWFs appear to have been a stabilizing force thus far, given their size, there are circumstances in which they could cause volatility in markets. Having large and often unclear positions in financial markets, SWFs—like other large institutional investors—have the potential to cause a market disturbance. For instance, actual or rumored transactions may affect relative valuations in particular sectors and result in herding behavior, adding to volatility. Such effects could be especially pronounced in shallower markets. To the extent that SWFs invest through hedge funds that rely on leverage or are subject to margin requirements, such investments may inadvertently magnify market changes. For markets to absorb flows from any major investor class without large price fluctuations, it helps if they can anticipate the broad allocation and risk-preference trends of such investor classes. Opacity about such trends can lead to inaccurate pricing and volatility. As regards the financial stability implications of SWFs, both theoretical and empirical research has been implemented.

Given the lack of publicly available data on SWF asset allocations, a strand of IMF research has been on the theory side. Lam and Rossi (forthcoming) develop a theoretical model that aims to examine the impact of SWFs on global financial stability during periods of stress. Their findings

indicate that SWFs have a risk-sharing role in financial markets. As part of the IMF-coordinated process of the Santiago Principles that provide generally accepted principles and practices for SWFs, Hammer, Kunzel, and Petrova (2008) examine the asset allocation and risk management frameworks of SWFs based on a detailed survey. The results show that SWFs have specific investment objectives in place, adopt an asset approach (mean-variance style) in determining their asset allocation strategy, utilize common risk measures (e.g., credit ratings, value-at-risk models, tracking errors, duration, and currency weights) for their risk management, and have explicit limits in their investment classes and instruments.

Simulations of SWFs' asset allocations have been undertaken by Kozack, Laxton, and Srinivasan (forthcoming). Specifically, they create two stylized diversified portfolios, one mimicking Norway's SWF and the other representing some well-established SWFs, and they conduct a scenario analysis of the impact from a diversification of sovereign assets. While the calibrations are highly sensitive to the underlying model assumptions, the findings indicate that advanced economies will see lower capital inflows, while emerging market countries will be the primary beneficiaries. Their quantitative results are consistent with the back-of-the-envelope calculations of Beck and Fidora (2008), which imply a net capital outflow from the United States and the euro area and net inflows to emerging market countries. In the same vein, Hogue (2008) points out that there is scope for the global equity risk premium to fall and for real bond yields to rise if SWFs allocate their assets to equities. In addition, as SWFs increasingly diversify into global portfolios, their activities may place some pressure on the dollar.

Other empirical research, using equity market indicators and an event study approach, has examined the role of SWFs as major institutional investors. Sun and Hesse (forthcoming) assess whether and how stock markets react to the announcements of investments and divestments to firms by SWFs using an event study approach. Based on over 160 publicly traceable events collected on investments and divestments by major SWFs during 1990–2008, they evaluate the short- and long-term financial impact of SWFs on selected public equity markets in which they invest. The impact is further analyzed on different sectors (financial and nonfinancial), actions (buy and sell), market types (developed and emerging markets), countries, and transparency (more transparent and less transparent). In particular, following the estimation of a market model and the predic-

tion of a “normal” return during the event window, the abnormal return is calculated.

Results suggest that average abnormal returns are positively associated with SWFs’ buy actions and not significantly negatively with SWFs’ sell actions in the full sample. Moreover, preliminary results suggest that the share price responses to SWFs’ investment in developed economies are significant, while those in emerging economies are not. In addition, SWFs’ investments in the financial sector have a larger impact on share prices than in the nonfinancial sector. These differences in responses may be due to the relatively more liquid equity markets in developed economies as well as in the financial sector.

Similarly, in an event study, Chhaochharia and Laeven (2008) find that the announcement effect of SWF investments is positive. They report that share prices of firms respond favorably when SWFs announce investments, in part because these investments often take place, and also because the long-run performance of equity investments by SWFs tends to be poor (see Fotak, Bortolotti, and Megginson, 2008, for similar results). Kotter and Lel (2008) show that the cumulative abnormal return of SWF investments has an announcement effect similar to that of investments by hedge funds and institutional investors such as CalPERS on stock returns. In addition, investments by more transparent SWFs have a larger cumulative abnormal return by an order of 3.5 percent, suggesting that voluntary SWF disclosure might serve as a signal device to investors. Similar to Sun and Hesse (forthcoming), Kotter and Lel (2008) also obtain a significant negative but small announcement impact from SWFs’ divestitures. Beck and Fidora (2008) conduct a country case study of Norway’s SWF and ask whether its exclusion of companies that violate the ethical guidelines of the Ministry of Finance exhibit price pressures on those companies. Their findings suggest no significant negative abnormal returns following the divestiture of these companies.

Overall, these event studies do not find any significant destabilizing effect of SWFs on equity markets. It will be hard to draw conclusions for overall global and regional financial stability or stability in markets other than equity markets from these event studies. Other methods to examine the empirical impact of SWFs would require more detailed knowledge of SWFs’ investments and their

timing and amount—data that is presently not available. Hypothetical market responses to SWFs’ investments require a thorough understanding of how asset allocations are constructed and the size, depth, and breadth of the corresponding markets.

To summarize, existing research on SWFs suggests that they can be a stabilizing force in global financial markets. Event studies do not find a destabilizing impact from SWF investments and divestments in equity markets, while simulations of SWF asset allocations only imply a gradual shift with modest economic effects. With SWFs improving their transparency and disclosure over time, the availability of historical SWF transactions would provide researchers with the necessary data to further examine their implications for financial stability.

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Regional Study

Cross-Border Labor Flows in New European Union Member States

Rudolfs Bems



In recent years, new European Union member states have experienced sizable net labor outflows driven by a combination of persistent income differences and a significant decrease in costs and other barriers associated with cross-border labor movement. So far, the recorded outflows have had a limited effect on economic outcomes in the source countries and have facilitated the ongoing income convergence process in the region. Main outflow-related challenges for the source countries include erosion of competitiveness and underutilization of labor resources. This article summarizes recent and ongoing IMF research on cross-border labor flows in new member states.

Following European Union (EU) accession, the new member states—the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic, and Slovenia, and later Bulgaria and Romania—experienced sizable cross-border labor flows. During 2004–07, some 200,000 to 250,000 workers left the eight initial new member states annually, intensifying the trend that had occurred since the outset of the transition in the early 1990s. By comparison, cumulative net migration from new member states between 1989 and 2000 is estimated at 650,000. So far, cumulative net outflows since 2004 represent 1.5 percent of the source countries' total population, which is broadly in line with the predicted outflows (Bertola and others, 2002).

Cross-border flows show growing heterogeneity within new member states, with labor flowing in both inbound and outbound directions. While the majority of new member states witnessed sizable outflows to higher-income countries, Slovenia, the Czech Republic, and Hungary simultaneously benefited from large inflows from their lower-income neighbors and on balance have been net labor recipients. In terms of destinations, it is estimated that between 2004 and 2007, the number of persons from the 10 new member states living in the United Kingdom increased by 140,000 annually, making the United Kingdom by far the most significant recipient country (Pollard, Lattore, and Sriskandarajah, 2008; Iakova, 2007). Although reliable data on flow composition are scarce, the limited evidence suggests that young people are highly represented in both outflow and inflow statistics. Comprehensive data on skill composition of labor

flows are not available and partial evidence from selected countries offers conflicting findings.

Cross-border flows have been driven to a large extent by income differences between new member states and recipient countries. Brunner (forthcoming) shows that net migration rates are strongly correlated with income differentials. The author's estimated relationship between income and migration, based on historical data for European countries, can explain a significant share of the size and cross-country variation in net migration in new member states. The timing of the intensification of the cross-border flows can be attributed to the elimination of labor movement restrictions in recipient countries after the EU expansion, as well as to a major reduction in other migration related costs, such as the cost of air travel and telecommunications (Bems and Schellekens, 2008). Another contributing factor has been the growth of migrant communities in recipient countries, which further lowers the cost of migration.

So far, net labor outflows from new member states have been smaller than in comparable historical episodes and have played a limited role in economic outcomes in source countries. Brunner (forthcoming) examines the mass migration of 1870–1910, and concludes that despite similar income gaps, larger migration flows were recorded in the mass migration episode. The same conclusion is reached from a comparison with the migration that followed German reunification. At the same time, recent cross-border labor flows in new member states are comparable to migration flows in selected European countries during 1960–2000.

Two other observations about the relative importance of cross-border labor flows in new member state economies are noteworthy. First, natural changes in population in new member states—i.e., changes from fertility and mortality—are in magnitude similar to migration-induced changes. Second, in line with the findings of Decressin and Fatás (1995) for European countries, labor force participation margin plays the dominant role in labor force dynamics in new member states. In fact, despite the net labor outflows and the natural decrease in population, the size of the labor force increased during 2004–07 in all new member states.

Labor outflows have facilitated the ongoing income convergence process. In theory, cross-border labor flows can

add a new dimension to the income convergence in the region. Using a two-sector growth model from Bems and Hartelius (2006) and Bems and Schellekens (2007) with an endogenous cross-border labor supply decision, Bems and Schellekens (2008) show that by boosting the capital-labor ratio, labor outflows speed up the convergence process in capital-poor new member states. In the model, labor outflows moderate the boom in the nontradable prices and the buildup of current account deficit that arises during the convergence process.

Subsequently, labor outflows also lessen the requirements for internal factor market flexibility to direct resources to the tradable sector, which facilitates the required reduction in the current account deficit and reorients the economy toward tradables. Income convergence can be further accelerated by remittance flows, although empirically the contribution of remittances has so far been small. Under certain conditions, the theoretical framework can also generate the more recently observed return migration. In a related empirical investigation, Brunner (forthcoming) decomposes changes in capital/labor ratios in new member states over 1995–2006 into their components and finds that convergence has taken place mostly through capital accumulation.

If left unattended, the accompanying real wage growth can cause problems for new member states. Bems and Schellekens (2008) show that in the income convergence process wage rate is the only price that increases as a result of labor outflows. Furthermore, they argue that recent real wage developments in new member states are in line with this model prediction—economies with the largest net labor outflows have experienced rapid growth in wages, while in net labor recipient countries real wages have stayed roughly flat.

The relevance of this transmission channel is confirmed in a recent study by Mishra and Spilimbergo (forthcoming). They estimate the direct effect of labor migration on wages for a large set of countries and find an elasticity of 0.4 for countries with highly flexible labor markets. Although wage increases are an integral part of the income convergence process, over the medium term, second-round effects of wage inflation possibly associated with outward labor flows need to be avoided so as to prevent an erosion of competitiveness.

Notwithstanding the recent improvements, there is further scope to mobilize and better utilize labor resources in most new member states. While the average employment rate has improved in most countries, it remains in all countries below the Lisbon target of 70 percent (Bems and Schellekens, 2008). The average employment rate in 2007 stood at 63 percent, with some countries experiencing rates below 60 percent. Also, unemployment rates remain high in several countries. The process of income convergence is accelerated if policymakers stimulate labor force participation and employment rates. Greater labor market participation and lower structural unemployment could be achieved through better targeted active labor market policies, less rigid regulations regarding hiring and dismissals, and an improved design of the tax benefits system.

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IMF Staff Papers

Volume 56 Number 1

Special Issue: Frontiers of Research on Financial Globalization

Recent events in global financial markets have once again shown the critical importance of understanding the effects of financial globalization, an issue that has long stirred passionate debate among development researchers and policymakers. However, the evidence on which that debate is based is often ambiguous. This special issue brings together world-renowned experts to provide a systematic and critical analysis of the costs and benefits of financial globalization.

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M. Ayhan Kose

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