



In This Issue

- 1 Trade Finance and Its Role in the Great Trade Collapse
- 1 Sovereign Debt: How to Track Who Is Buying and Selling It?
- 7 Recommended Readings
- 8 Q&A: Seven Questions on the Implications of Global Supply Chains for Real Effective Exchange Rates
- 11 IMF Working Papers
- 14 Call for Papers
- 15 Staff Discussion Notes
- 15 *IMF Economic Review*

Online Subscriptions

The *IMF Research Bulletin* is available exclusively online. To receive a free email notification when quarterly issues are posted, please subscribe at www.imf.org/external/cntpst. Readers may also access the Bulletin at any time at www.imf.org/researchbulletin.

Research Summaries

Trade Finance and Its Role in the Great Trade Collapse

JaeBin Ahn



The Great Recession stimulated research on many issues that had been overlooked previously in the profession. Trade finance is one of the best examples of these issues. Although trade finance has served as the primary driver of international transactions for centuries, it received its due attention from academic researchers and policymakers only after the Great Recession that was accompanied by what has been called the Great Trade Collapse. This article summarizes recent research on trade finance, particularly the pattern of payment methods and the role of trade finance in the Great Trade Collapse.

At the onset of the Great Recession, triggered by the bankruptcy of Lehman Brothers, international trade fell much faster and more drastically than GDP worldwide, resulting in what has been labeled the Great Trade Collapse. Since then, researchers have found that the inherent nature of international trade—sectoral composition, vertical linkages, lumpiness, and trade finance—can lead

(continued on page 2)

Sovereign Debt: How to Track Who Is Buying and Selling It?

Serkan Arslanalp and Takahiro Tsuda



Recent events have shown that sovereigns, just like banks, can be subject to runs. Hence, it pays to know who holds their liabilities. This article explains the construction of a dataset on investor holdings of sovereign debt to track investor demand for advanced economy sovereign debt. It also discusses new risk indicators to capture both the vulnerability to and likelihood of potential investor shifts and their domestic financial stability implications.

There has been a lot of discussion about how the supply of sovereign debt changed after the global financial crisis. Compilation of the comprehensive *historical public debt database* by IMF economists reflects such renewed interest in public debt (Abbas and others, 2010). Yet, less attention has been paid to how the demand side has been changing, although shifts in the investor base for sovereign debt can have significant effects on government borrowing costs, as recently witnessed in a number of euro area countries.

(continued on page 4)

Trade Finance and Its Role in the Great Trade Collapse

(continued from page 1)

to larger drops in trade during downturns. This article will focus exclusively on trade finance.¹

There is no lack of evidence when it comes to the important role of financing in international trade. Berman and Martin (2012) show that African exports were particularly vulnerable to past financial crises in destination countries mainly due to disruptions in trade finance. Chor and Manova (2012) find that U.S. imports from countries with tighter credit markets fell more during the Great Trade Collapse period, and that the decline was more pronounced in external-finance-intensive industries. During the same period, a firm-level analysis also confirms that exporters hit harder by credit supply shocks reduced exports significantly more (Amiti and Weinstein, 2011; Paravisini and others, 2011). In fact, given the substantial role of financing in every modern economic activity, it is hardly surprising that the recent financial crisis had adverse effects on international trade. A more relevant question is why international trade was disproportionately hit relative to domestic activity, which in turn begs the question, what is trade finance?

Every business transaction involves trade finance. For example, when a seller receives a purchase order from a buyer that stipulates the payment from the buyer after delivery (i.e., a post-shipment payment or open-account transaction), the seller extends trade credit to the buyer and becomes responsible for working-capital financing to produce the goods and fulfill the order. Alternatively, the buyer can take up the responsibility of trade financing when a letter of credit is issued by the buyer's bank or the buyer makes advance payment. Such trade financing will be more acute for international transactions because the typical shipping time is longer (Ahn, Amiti, and Weinstein, 2011; Berman and others, 2012) and the risk of nonpayment or nondelivery is higher (Ahn, 2011; Antras and Foley, 2011; Schmidt-Eisenlohr, 2010).

In particular, Ahn (2011) develops a model that predicts the pattern of payment methods and explains the role of trade finance in the Great Trade Collapse in terms of the level of information accumulated between trading partners. Higher trade costs lead to fewer cross-border trans-

actions, resulting in less information on foreign trading partners, and hence riskier international transactions. Information becomes more important in uncertain times, which explains why international trade finance loans are more sensitive to a financial crisis. The underlying premise is that the level of information affects the cost of trade financing and plays a crucial role in determining the choice of payment methods and the value of transactions.

In order to test the empirical validity of such financing motives in the choice of payment methods, it is critical to consider the characteristics of both the buyer and the seller

“Information becomes more important in uncertain times, which explains why international trade finance loans are more sensitive to a financial crisis.”

involved in the transaction, including their bilateral relationship. This requires buyer-seller matched transaction data with payment method information. However, the lack of available data at such a detailed transaction level makes this a somewhat elusive quest.²

Ahn (2012a) tackles the hurdle by employing the universe of Colombian import data over the 2008–11 period, encompassing well over 2 million transactions a year. The unique features of this dataset—which identify the entities of each foreign supplier and Colombian importer in addition to the payment method used in each transaction—are almost ideal. Moreover, the fact that the majority of Colombian importers transact with multiple foreign suppliers enhances the quality of econometric analysis because it allows for exploiting within-importer variations, effectively controlling for importer-level characteristics such as nonpayment risks.

Controlling for goods and importer fixed effects, the baseline specification shows that the post-shipment payment term is more likely to be chosen if (1) a foreign supplier is larger (proxied by the volume of total exports to Colombia), and (2) a foreign supplier has transacted with

¹ Interested readers are referred to Bems, Johnson, and Yi (2012) for a comprehensive survey of the literature on the Great Trade Collapse, and to Asmundson and others (2011) for survey-based evidence on trade finance.

² Rare exceptions include Antras and Foley (2011) with data from a U.S. food exporter and Klapper, Laeven, and Rajan (2012) with data from a factoring company.

the Colombian importer previously, although the effect of such a transaction history is weakened for larger suppliers. To the extent that supplier size reflects the supplier's financing ability and past transaction history reflects the buyer's creditworthiness, this finding implies that financially healthier suppliers are better able to extend trade credits to buyers, whereas less liquid suppliers have to rely on advance payments or letters of credit. For a given importer, better-informed suppliers are more willing to extend trade credits. Furthermore, the interaction term suggests that illiquid suppliers are more concerned about buyers' creditworthiness. Most interestingly, when an intra-firm transaction dummy variable is added with interaction terms, each of these effects disappears for intra-firm transactions, which are relatively free from credit risks. In addition, country-level variations reveal that a supplier in a country with poorer information on Colombian importers (e.g., more distant, non-Spanish speaking, and less trade with Colombia), or in a financially less-developed country (e.g., lower level of bank credits to GDP), is less likely to offer post-shipment payment terms to a Colombian importer. Overall, the evidence strongly confirms that the choice of payment methods hinges on suppliers' ability and willingness to extend trade credit in the face of buyers' nonpayment risks.

The next step is to verify the model's prediction on the trade collapse. Trade finance becomes costlier and less available during financial crises. According to Ahn (2011), such adverse shocks will be more severe for transactions between lesser-known trading partners, particularly when a transaction takes place under the post-shipment payment term. Again, the richness of the data allows for controlling for importers' goods-level demand shocks and for exploiting transaction-level variations for each payment type. The simplest and most direct evidence comes from the fact that inter-firm transactions dropped, on average, by 10 percentage points more than intra-firm transactions. A deeper look at the data confirms that imports from a supplier who has better information on the buyer (e.g., having imported from the buyer in the past) or who resides in a country with better information on Colombian importers, declined less.

Another piece of evidence is found by Ahn (2013b), who explores variations in letter of credit transactions for each importer-exporter pair across issuing banks using the same dataset. Controlling for importer-exporter specific demand shocks, the estimation results show that a bank with bigger adverse liquidity shocks reduced letter of credit supply substantially more, which was then directly passed

on to a reduction in imports. Calculations from the estimation results suggest that the trade finance channel can explain at least 38 percent to 47 percent of the collapse in imports by letters of credit in Colombia.

Trade finance undoubtedly played a role in the Great Trade Collapse. Adverse shocks from the global financial crisis on the supply and costs of trade finance seem to have been disproportionately bigger for international transactions due to informational disadvantage. The exclusive use of a letter of credit in international transactions amplified larger drops in trade. Point estimates suggest that such trade financing effects were economically significant even after controlling for adverse demand shocks.

It is reassuring, on the other hand, that international organizations including the World Trade Organization, International Monetary Fund, and World Bank were quick to recognize the drying up of trade finance as the main driver of the Great Trade Collapse. Their decisive action to put the issue on the agenda of the G-20 meeting in March 2009 helped boost trade finance by enhancing the supply of insurance and guarantees from export credit agencies, thus preventing further collapses in trade. In terms of trade finance, we have learned a priceless lesson from the Great Trade Collapse.

References

- Ahn, JaeBin, 2013a, "Understanding Trade Finance: Theory and Evidence from Transaction-Level Data," (unpublished; Washington: International Monetary Fund).
- Ahn, JaeBin, 2013b, "Estimating the Direct Impact of Bank Liquidity Shocks on the Real Economy: Evidence from Imports by Letters of Credit in Colombia," (unpublished; Washington: International Monetary Fund).
- Ahn, JaeBin, 2011, "A Theory of Domestic and International Trade Finance," IMF Working Paper 11/262 (Washington: International Monetary Fund).
- Ahn, JaeBin, Mary Amiti, and David Weinstein, 2011, "Trade Finance and the Great Trade Collapse," *American Economic Review: Papers and Proceedings*, Vol. 101, No. 3, pp. 298–302.
- Antràs, Pol and Fritz Foley, 2011, "Poultry in Motion: A Study of International Trade Finance Practices," NBER Working Paper No. 17091 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Asmundson, Irena, Thomas Dorsey, Armine Khachatryan, Iona Niculcea, and Mika Saito, 2011, "Trade and Trade Finance in the 2008–09 Financial Crisis," IMF Working Paper 11/16 (Washington: International Monetary Fund).

(continued on page 4)

Trade Finance and Its Role in the Great Trade Collapse

(continued from page 3)

- Bems, Rudolfs, Robert Johnson, and Kei-Mu Yi, 2012, “The Great Trade Collapse,” NBER Working Paper No. 18632 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Berman, Nicolas, Jose de Sousa, Philippe Martin, and Thierry Mayer, 2012, “Time to Ship During Financial Crises,” NBER Working Paper No. 18274 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Berman, Nicolas and Philippe Martin, 2012, “The Vulnerability of Sub-Saharan Africa to the Financial Crises: The Case of Trade?” *IMF Economic Review*, Vol. 60, No. 3, pp. 329–364.
- Chor, Davin, and Kalina Manova, 2012, “Off the Cliff and Back: Credit Conditions and International Trade During the Global

Financial Crisis,” *Journal of International Economics*, Vol. 87, No. 1, pp. 117–133.

Klapper, Leora, Luc Laeven, and Raghuram Rajan, 2012, “Trade Credit Contracts,” *Review of Financial Studies*, Vol. 25, No. 3, pp. 838–867.

Paravisini, Daniel, Veronica Rappoport, Philipp Schnabl, and Daniel Wolfenzon, 2011, “Dissecting the Effect of Credit Supply on Trade: Evidence from Matched Credit-Export Data,” NBER Working Paper No. 16975 (Cambridge, Massachusetts: National Bureau of Economic Research).

Schmidt-Eisenlohr, Tim, 2010, “Towards a Theory of Trade Finance,” Center for Business Taxation Working Paper No. 10/23 (Oxford, England: University of Oxford)

Sovereign Debt: How to Track Who Is Buying and Selling It? (continued from page 1)

The analysis of demand-side dynamics for sovereign debt is particularly challenging due to the lack of internationally comparable investor base estimates. For instance, (i) investor base data from national debt management offices usually cover only a subset of government debt (e.g., central government); (ii) national flow of funds data are not always internationally comparable; and (iii) data from private sector vendors (e.g., survey or custodial data) usually cover only a small share of the investor base.

Recent IMF staff research (Arslanalp and Tsuda, 2012) takes a step toward filling this data gap by compiling a comprehensive investor base dataset for 24 major advanced economies, covering 98 percent of the advanced economy sovereign debt universe.

The composition of sovereign investor base is important because shifts in the sovereign investor base can affect (i) governments’ borrowing costs; (ii) governments’ refinancing risks; and (iii) domestic financial stability.

The previous literature tended to focus on implications for governments’ borrowing costs (Friedman and Roley, 1980). Several studies show that an increase in the share of foreign investors or domestic institutional investors in the investor base is associated with lower sovereign bond yields (Andritzky, 2012; Warnock and Warnock, 2009).

The implications of the post-crisis changes in sovereign investor base for governments’ refinancing risks and domestic financial stability is the focus of this article. On the one

hand, a rising share of foreign private investors in the investor base can heighten governments’ refinancing risk because they could be a less stable source of demand. On the other hand, a high share of domestic banks in the investor base may jeopardize domestic financial stability through a strong two-way interdependence between the sovereign and domestic bank balance sheets (BIS, 2011; Merler and Pisani-Ferry, 2012).

The investor base dataset¹ has the following characteristics: First, a common definition of sovereign debt is used (general government gross debt on a consolidated basis). Second, a common estimation methodology is used to ensure cross-country comparability based on harmonized international data sources, such as the Bank for International Settlements (BIS), IMF, and World Bank. Third, all data are compiled either in face value or adjusted for valuation changes, where appropriate. Fourth, this dataset tracks transactions and holdings of six different investor classes—domestic central banks, domestic banks, domestic nonbanks, foreign official sector, foreign banks, and foreign nonbanks, in contrast to national data sources that usually classify foreign investors under one category (“rest of the world”). While this article covers advanced economies, the methodology is general enough to cover emerging market economies too.

The dataset can be used to analyze demand-side dynamics through a number of different prisms:

- For example, Figure 1 shows the estimated investment flows of foreign investors since 2008. This is a tool that policymakers can use to track foreign investor flow across

¹ <http://www.imf.org/external/pubs/ft/wp/2012/Data/wp12284.zip>

all major advanced economies with a quarter lag. All investor flows are de-trended and scaled by the inverse of country-specific standard deviations to make them cross-comparable (i.e., based on z-scores). The mean and the standard deviation for the z-scores are calculated using an expanding window starting from 2004Q1, in line with the sudden stop identification methodology of Calvo and others (2004). The figure shows that, during the global financial crisis (2008–09), foreign investors increased their holdings of most advanced economy sovereign debt, reflecting its perceived risk-free status during that time. In the later period, however, they started to differentiate among different sovereigns, amid the ongoing euro area sovereign debt turmoil. Most recently, the European Central Bank’s announcement on outright monetary transactions (OMT) in August 2012 stabilized foreign investor outflows from euro area periphery government debt markets.

- Another use of this dataset includes analysis of portfolio shifts by different types of foreign investors. In particular, foreign central banks behaved quite differently from foreign private investors: post-crisis, they have significantly

diversified their portfolios toward “alternative safe haven” currencies. For instance, foreign central bank holdings of Australian sovereign debt have quadrupled over the last two years, according to the dataset.

- Sovereign exposures of domestic banks were also on the rise after the global financial crisis across most advanced economies, both in nominal terms and as a percent of banking sector assets (Figure 2). This may reflect cyclical factors, such as weak growth conditions, as well as structural factors, such as banks’ need to deleverage, preparations for implementing the new financial regulations including Basel III, and possibly home bias.

Taken together, advanced countries could face more uncertain funding conditions in the future given their higher reliance on foreign investors and growing exposure of their banks to own government debt. In light of these potential risks, the paper proposes a framework—sovereign funding shock scenarios (FSS)—to assess sovereigns’ vulnerability to sudden investor outflows. It envisages a funding shock that is triggered by foreign private investor outflow and then examines whether domestic banks can step in to fill the gap. A higher level of sovereign debt that would be held by domestic banks

(continued on page 6)

Figure 1. Advanced Economies: Foreign Net Purchases and Sales of Government Debt, 2008Q1-2012Q3

	2008Q1	2008Q2	2008Q3	2008Q4	2009Q1	2009Q2	2009Q3	2009Q4	2010Q1	2010Q2	2010Q3	2010Q4	2011Q1	2011Q2	2011Q3	2011Q4	2012Q1	2012Q2	2012Q3
Australia	0.4	0.1	0.0	-0.2	0.3	1.2	2.0	1.7	2.5	2.0	1.8	1.9	1.3	1.1	1.2	1.2	1.5	0.9	0.4
Austria	-0.2	-0.4	-0.6	0.2	0.1	0.0	-0.1	-0.3	-0.3	-0.1	0.0	0.1	0.1	0.0	0.1	0.0	-0.1	0.0	-0.2
Belgium	-0.1	-0.3	-0.4	0.4	0.4	0.5	0.6	-0.3	0.0	-0.1	-0.2	-0.1	-0.3	-0.4	-0.3	-0.5	-0.4	-0.2	-0.1
Canada	-0.3	0.5	0.6	1.5	1.5	1.4	1.0	1.0	0.6	1.2	1.4	1.1	1.1	0.6	0.9	1.0	0.7	1.1	0.6
Czech Republic	-0.5	0.3	0.1	-0.7	-0.7	-0.8	-0.6	0.5	0.7	0.3	1.0	0.4	0.3	0.5	-0.5	-0.7	-0.1	-0.3	0.1
Denmark	0.2	0.2	-0.1	1.5	0.8	1.1	1.3	0.4	0.4	0.2	0.2	0.0	0.5	0.4	1.0	0.6	-0.3	0.0	-0.3
Finland	-0.1	0.1	0.0	0.0	0.5	-0.2	0.6	0.6	0.3	1.0	0.6	0.5	0.2	0.0	0.2	0.1	0.2	0.5	0.1
France	-0.4	-0.9	-0.2	0.5	0.8	1.0	0.8	0.9	0.8	0.9	0.2	-0.3	-0.4	-0.4	-0.1	0.0	0.1	-0.2	-0.3
Germany	0.3	0.2	0.9	0.4	0.8	1.2	0.4	-0.1	-0.2	-0.7	-0.2	1.5	0.9	1.3	1.4	0.7	0.7	0.3	-0.3
Greece	0.0	-0.3	0.1	-0.3	-0.1	0.8	0.8	0.9	0.7	-2.8	-1.4	-1.6	-1.7	-0.7	-0.7	-0.6	-2.2	-1.4	-1.3
Ireland	0.4	1.0	0.7	1.5	1.4	1.4	0.8	0.6	0.8	-0.9	-0.5	-1.0	-1.5	-0.7	-0.8	-0.8	-0.7	-0.7	-0.5
Italy	-0.1	0.0	-0.3	-0.2	0.1	-0.1	0.2	0.2	0.2	0.1	-0.1	0.2	-0.1	-0.2	-1.1	-1.5	-1.7	-1.6	-0.9
Japan	0.3	0.9	0.5	-1.4	-0.5	-0.9	-1.3	-0.5	-0.8	-0.5	0.0	0.0	0.5	0.5	0.6	0.7	0.3	0.1	0.1
Korea	1.3	1.4	0.1	-0.8	-0.8	-1.0	-0.2	0.3	0.6	0.9	0.9	0.8	0.6	0.6	0.5	0.3	0.3	-0.5	-0.5
Netherlands	0.0	0.1	0.6	3.9	1.2	0.8	0.8	-0.4	-0.6	-0.3	-0.5	-0.4	-0.4	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2
New Zealand	0.4	0.5	-0.2	-0.1	0.0	0.3	0.7	0.4	0.6	0.4	0.8	1.5	1.6	1.9	1.6	0.7	0.5	0.3	-0.1
Portugal	-0.2	-0.3	-0.1	0.2	0.3	0.7	0.0	0.2	0.1	-1.8	-0.6	-1.2	-1.3	-1.0	-1.3	-1.2	-1.5	-1.4	-1.1
Norway	0.6	0.2	-0.1	0.2	-0.2	-0.4	0.3	0.4	1.1	1.9	1.3	1.0	0.6	-1.0	-0.6	-0.9	-0.5	-0.2	-0.1
Slovenia	0.3	0.2	0.3	0.2	-0.1	0.7	1.3	1.0	1.8	0.9	0.3	0.3	0.9	0.4	0.4	0.2	-0.9	-0.8	-0.8
Spain	-1.2	-0.9	0.1	0.8	1.2	1.4	1.4	1.9	1.6	0.7	0.4	-0.4	-0.8	-0.5	-1.1	-1.8	-1.9	-1.8	-1.1
Sweden	-0.6	-0.3	-0.1	0.3	0.4	1.0	1.1	0.3	1.0	0.1	-0.2	0.3	-0.6	-0.1	0.1	0.3	0.5	0.6	0.3
Switzerland	-0.5	-0.7	-0.6	-1.1	-0.9	-0.9	-1.1	-0.3	0.1	0.0	0.1	0.0	0.2	0.3	0.7	0.3	0.2	0.3	-0.2
United Kingdom	0.2	0.0	1.4	0.7	1.6	0.8	-0.2	0.1	0.8	1.0	0.9	1.6	0.4	0.2	0.5	0.0	0.1	-0.2	-0.3
United States	0.2	0.2	0.8	1.2	1.2	1.3	1.1	0.6	0.5	0.5	0.9	0.8	0.9	0.6	0.4	0.3	0.0	-0.2	0.2

Source: Arslanalp and Tsuda (2012).

Note: The z-scores measure the relative size of net sales (purple) or purchases (green) of government debt by foreign investors, compared to historical norms.

They are color coded as follows: purple (less than -1); yellow (between -1 and -0.5); light yellow (between -0.5 and 0.5); light green (between 0.5 and 1); and green (greater than 1).

Sovereign Debt: How to Track Who Is Buying and Selling It?

(continued from page 5)

suggests growing interdependence between banks and the sovereign, which could jeopardize domestic financial stability. As the standard debt sustainability analyses (DSA) does not capture vulnerability to liquidity shocks or sudden stop, the FSS can complement the DSA in that regard.

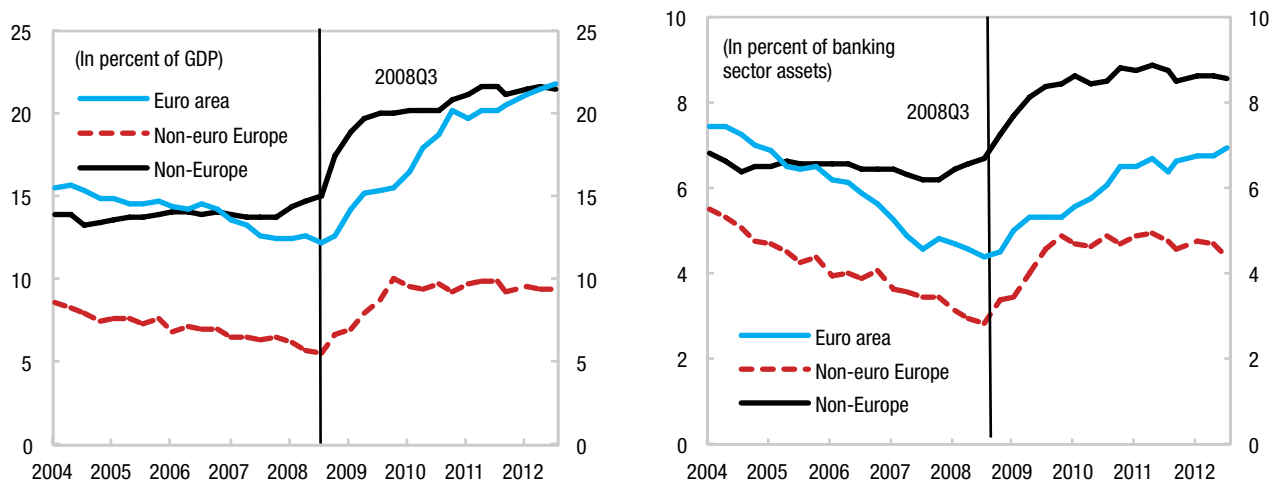
While FSS aim to capture the vulnerability stemming from investor outflow, the proposed Investor Risk Index (IRI) attempts to capture the likelihood of outflow by different types of investors. The index runs from zero to one hundred, based on the composition of the investor base and the risk scores assigned to different investors given the way they tend to change their holdings. By this metric, countries with a high share of domestic investors, as well as foreign central banks, in their investor base receive lower scores. In contrast, high scores are assigned to countries whose investor base has a high share of foreign private investors. Distinguishing between foreign central banks and foreign private investors is useful, particularly for countries where the foreign official sector accounts for a large share of foreign investors (e.g., Australia).

The resulting risk indicators need to be interpreted with caution. For instance, the FSS is a stress-test approach, thus silent on the probability of shocks. Setting parameters and scenarios requires economic intuition and judgment. Also, the IRI alone does not predict a future crisis as such. Rather,

the IRI could be combined with other risk indicators, such as current or projected debt-to-GDP ratios, to provide a more comprehensive measure of sovereign risk. For example, Finland has a high IRI, but with its low debt-to-GDP ratio the country is not necessarily prone to investor outflow. At the same time, although Japan's IRI is low owing to its domestically concentrated investor base, its high debt-to-GDP ratio remains worrisome. Our related blog post highlights this point (Arslanalp and Tsuda, 2013). Moreover, current account imbalances (more specifically, international investment position) also can be used along with the IRI to better gauge risks of investor flows from the economy. Finally, interpretation of the IRI can vary depending on the exchange rate regime, as a floating exchange rate probably provides a safety value against foreign outflows.

Despite these limitations, these risk indicators can help understand demand dynamics of sovereign debt, suggesting lessons for policymakers. First, public debt managers should continue to pay attention to investor relations and monitor government refinancing risk closely through rigorous scenario analysis. Second, financial sector supervisors should place more emphasis on macrofinancial risks emanating from bank holdings of sovereign debt. Continuous monitoring of sovereign-bank interlinkages is warranted. Third, standard DSA should be complemented with investor base risk indicators to capture sovereign risk in a more comprehensive fashion. Finally, further efforts to reduce data gaps on investor holdings of sovereign debt could be of significant benefit to policymakers, in line with the G-20 Data Gaps Initiative.

Figure 2. Bank Holdings of Own Government Debt in Advanced Economies, 2004Q1-2012Q3



Source: Arslanalp and Tsuda (2012).

References

- Abbas, S.M.A., N. Belhocine, A. El-Ganainy, and M. Horton, 2010, “A Historical Public Debt Database,” IMF Working Paper 10/245 (Washington: International Monetary Fund).
- Andritzky, J. R., 2012, “Government Bonds and Their Investors: What Are the Facts and Do They Matter?” IMF Working Paper 12/158 (Washington: International Monetary Fund).
- Arslanalp, S. and T. Tsuda, 2012, “Tracking Global Demand for Advanced Economy Sovereign Debt,” IMF Working Paper 12/284 (Washington: International Monetary Fund).
- Arslanalp, S. and T. Tsuda, 2013, “The Ties That Bond Us: What Demand For Government Debt Can Tell Us About the Risks Ahead” iMFdirect (blog) January 17, 2013, <http://blog-imfdirect.imf.org/2013/01/17/the-ties-that-bond-us-what-demand-for-government-debt-can-tell-us-about-the-risks-ahead/>.
- Bank for International Settlement, 2011, “The Impact of Sovereign Credit Risk on Bank Funding Conditions,” CGFS Paper No. 43.
- Calvo, G., A. Izquierdo, and L. Mejía, 2004, “On the Empirics of Sudden Stops: The Relevance of Balance-Sheet Effects,” NBER Working Paper Series, No. 10520 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Friedman, B., and V. Roley, 1980, “Models of Long-Term Interest Rate Determination,” *The Journal of Portfolio Management*, Vol. 6, No. 3, pp. 35-45.
- Merler S. and J. Pisani-Ferry, 2012, “Who is Afraid of Sovereign Bonds?” Bruegel Policy Contribution, No. 2012/02 (Brussels, Belgium: Bruegel).
- Warnock, F.E., and V. Warnock, 2009, “International Capital Flows and U.S. Interest Rates,” *Journal of International Money and Finance*, Vol. 28, No. 6, pp. 903-919.

RECOMMENDED READINGS FROM THE IMF BOOKSTORE



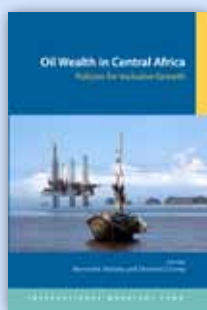
The Challenges of Public Pension Reform in Advanced and Emerging Market Economies

Pension reform is high on the policy agenda of many advanced and emerging market economies. This Occasional Paper examines the current pension landscape in 53 advanced and emerging market economies. It analyzes the outlook for pension spending over the coming decades and the options for reform.



The Economics of Public Health Care Reform in Advanced and Emerging Economies

Health care reform has key implications for macroeconomic stability and will present many fiscal policy challenges in both advanced and emerging economies in coming years. This book provides insights into these challenges and potential policy responses, with cross-country analysis and case studies.



Oil Wealth in Central Africa: Policies for Inclusive Growth

Despite its vast oil wealth, central Africa still struggles to sustain strong, inclusive economic growth. This book lays out the macroeconomic and growth challenges facing the region; and examines oil wealth management and its implications for poverty reduction.



Seven Questions on the Implications of Global Supply Chains for Real Effective Exchange Rates

Rudolfs Bems



The real effective exchange rate (REER)—the most commonly used measure of competitiveness—requires a conceptual update to reflect the rise of global supply chains. This article summarizes recent research that develops a value-added REER, measuring competitiveness for value-added exports.

measuring competitiveness for value-added exports.

Question 1: What do we know about global supply chains?

The term “global supply chains” broadly refers to the shift of production to a multi-stage arrangement that can stretch across countries. In recent decades we have seen a proliferation in global supply chains, especially after 1990. A common way to measure global supply chains is to estimate re-exported imports, which have gradually increased to account for around one-fourth of global gross exports. With these networks, one can split gross exports of a country into two parts: (i) re-exported imports and (ii) exports of value added. Proliferation of global supply chains leads to an increasing “round-tripping” of goods across borders, as countries import intermediate inputs, and export new products after additional value is added to the input. As a result, the share of value-added exports in gross exports falls, while the share of re-exported imports rises.

Question 2: What are real effective exchange rates (REER) measuring?

The question that motivates the construction of REER indices is “How is demand for a country’s output affected by changes in prices of output relative to competitors?” The framework that underlies REERs (see Armington, 1969; McGuirk, 1987) postulates that the answer depends on three factors. First, the degree of openness—if a country is closed then changes in prices relative to competitors do not affect demand for output. Second, an elasticity of substitution, which captures the sensitivity of demand to changes in relative prices. Finally, it depends on the REER, which summarizes relative price developments weighted by trade patterns.

For our purpose, the key simplifying assumption of the conventional REER index is that countries produce goods entirely at home and compete with each other in various

markets. Because there are no intermediate inputs, there is no distinction between a price of a country’s value-added and gross output. The two are identical. Similarly, there is no distinction between exports in value-added and gross terms. The two are, again, assumed to be identical.

Question 3: Does the rise of global supply chains warrant a rethinking of REERs?

Accounting for global supply chains can alter our interpretation of the state of the international economy. Estimates show that global supply chains can change bilateral trade flows. For example, in value-added terms, China’s trade surplus with respect to the United States is roughly 25 percent to 40 percent smaller, because headline gross-trade based surplus includes value added from other countries (Johnson and Noguera, 2012a). Also, in value-added terms the United States, not Germany, is France’s largest trade partner. A more subtle point is that sectoral composition of exports can change: in value-added terms one half of U.S. exports are services. In gross terms services account for one third of exports.

Turning more specifically to the framework that motivates REERs, all three previously mentioned ingredients can in principle be affected by the rise of global supply chains. Most importantly, in the presence of global supply chains (and intermediate inputs more generally) there is a multitude of output prices and trade weights because quantities and prices in value-added terms and gross terms are distinct. Consequently, a question arises as to what are the most appropriate prices, weights, and formula for the REER.

Question 4: How to modify the REER that account for global supply chains?

In a recent paper, Bems and Johnson (2012) account for global supply changes by generalizing the framework that motivates conventional REERs. In essence, they introduce demand for intermediate inputs into the framework, in addition to the final demand. They re-derive the REER index with the same underlying motive, although the more general framework allows for a more pointed question: “How is demand for a country’s *value added* affected by changes in

prices of *value added* relative to competitors?” The answer is a new value-added index: Value-Added REER or VAREER.

There are two key advantages to using this particular generalization of the conventional framework. First, it collapses to the Armington demand system that motivates conventional REERs, when intermediate inputs are assigned zero weights in production. Second, the new framework has the same make/use structure as input-output tables, so all the model parameters (except elasticities) can be easily mapped into data.

Question 5: What are the findings conceptually and empirically?

Conceptually, Bems and Johnson (2012) find that the gist of the REER remains valid—it summarizes relative price developments weighted by trade patterns. The key new insight concerns the types of data required to build the index. To measure relative prices and trade links, the VAREER uses different data from the conventional REER:

- GDP deflators to measure changes in relative prices. Intuitively, they are the most direct summary measure for factor (capital and labor) costs.
- Bilateral trade in value added to construct country trade weights. What matters for a country’s competitiveness is demand for its value added, rather than for its gross output. Intuitively, global supply chains redefine a country’s competitors. There is less competition between countries that share a supply chain because each can affect the price of the final product and hence the competitiveness of any other country in the supply chain. VAREER reflects these considerations by assigning smaller weights to countries that share a supply chain.

Empirically, Bems and Johnson (2012) construct the VAREER index for 42 countries over the 1970–2009 period and compare it to the conventional CPI-based real effective exchange rate. As one would expect, the two indices move in the same direction. Year-to-year differences are small, but over time sizable deviations can accumulate in some cases. For example, while the conventional REER for China exhibits no trend over the 1990–2009 period, VAREER shows a 20 percent appreciation over the last decade. There are also significant differences between VAREER and CPI-based REER for Eurozone countries, in the post-1995 period. Among these countries, the VAREER moves more strongly in directions that are consistent with the widening of current account imbalances prior to the onset of the crisis.

The authors decompose the differences between VAREER and conventional REER and show that the bulk of deviations between the two indices stems from the shift in prices from CPI to GDP deflators. Although there can be sizable changes in trade weights, these do not correlate systematically with changes in relative prices and, hence, at least historically, have not had a significant impact on differences between the two price indices.

Question 6: Is the new index feasible to build for a large set of countries?

Yes, it is relatively easy to implement the new VAREER index. Because the gist of the REER formula does not change, one simply needs to substitute weights and prices. The price data—GDP deflators—are available at quarterly frequencies for a large set of countries. The weights—based on bilateral trade in value-added—have a more limited coverage, but their availability has increased rapidly in recent years. Several datasets are now available, including from Timmer (2012) and Johnson and Noguera (2012). Furthermore, because weights contribute little to the deviations between the two indices, weights based in bilateral gross trade flows provide a good proxy for the VAREER index. Using this shortcut, the VAREER can be computed for all countries that report GDP deflators and bilateral trade flows.

Question 7: How synchronized are national recessions around episodes of global recessions? And how do national cycles interact with the global cycle during these periods?

Work on the effect of global supply chains on price competitiveness needs to revisit the other two factors that have been, justifiably or not, neglected by the conventional framework: the degree of openness and elasticity of substitution (see Question 2 above). First, global supply chains reinterpret the traditional measures of openness. Empirically, countries are more open in value-added terms (i.e., value-added trade as a share of GDP) than in gross terms (i.e., gross trade as a share of gross output). Furthermore, for the majority of economies openness has been increasing over time. Changes in openness, in turn, lead to reinterpretation of the macroeconomic impact of a given change in a price index. The impact is larger when the economy is more open. Results in Bems and Johnson (2012) suggest that macroeconomic implications of this channel can be significant.

Seven Questions on the Implications of Global Supply Chains for Real Effective Exchange Rates

(continued from page 9)

Second, accounting for global supply chains and intermediate inputs more generally requires a reinterpretation of price elasticities of demand. Available empirical estimates of relevant macro and micro elasticities are all based on expenditure data and, therefore, estimate the effect of changes in the relative price of final goods on demand for goods. What is missing are comparable elasticity estimates for value added. It is conceivable that some of the deviations between the VAREER and the conventional REER index stem from differences in underlying elasticities rather than

price indices. This is an empirical question that requires an answer (see Bems, 2012, for further discussion).

Finally, in the context of the new VAREER¹ index, it would be beneficial to gain a better understanding of deviations between prices of a country's value added and gross output. In particular, to what extent are such deviations driven by domestic intermediate inputs as opposed to imported intermediate inputs. If the source of deviations is domestic, then it is domestic intermediate inputs, such as

¹ The full dataset with VAREERs is available from the authors' homepages: <http://sites.google.com/site/rudolfsbems> or <http://sites.google.com/site/robjohnson41>.

References

- Armington, Paul S. 1969. "A Theory of Demand for Products Distinguished by Place of Production," *IMF Staff Papers*, Vol. 16, No. 1, pp. 159-178.
- Bayoumi, Tamim, Sarma Jayanthi, and Jaewoo Lee. 2006. "New Rates from New Weights," *IMF Staff Papers*, Vol. 53, No. 2, pp. 272-305.
- Bems, Rudolfs. 2012. "Intermediate Inputs, External Rebalancing, and Relative Price Adjustment," (unpublished; Washington: International Monetary Fund).
- Bems, Rudolfs and Robert Johnson, 2012, "Value-Added Exchange Rates," NBER Working Paper No. 18498 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Johnson, Robert C., and Guillermo Noguera. 2012a. "Accounting for Intermediates: Production Sharing and Trade in Value Added," *Journal of International Economics*, Vol. 82, No. 2, pp. 224-236.
- Johnson, Robert C., and Guillermo Noguera. 2012b. "Fragmentation and Trade in Value Added Over Four Decades." NBER Working Paper No. 18186 (Cambridge, Massachusetts: National Bureau of Economic Research).
- McGuirk, Anne. 1987. "Measuring Price Competitiveness for Industrial Country Trade in Manufactures." IMF Working Paper 87/34 (Washington: International Monetary Fund).
- Timmer, M.P. (2012, ed), "The World Input-Output Database (WIOD): Contents, Sources and Methods," WIOD Working Paper 10.

IMF Working Papers

Working Paper 12/272

The East African Community: Prospects for Sustained Growth

McAuliffe, Catherine; Saxena, Sweta; Yabara, Masafumi

Working Paper 12/273

Fiscal Rules at a Glance: Country Details from a New Dataset

Budina, Nina; Kinda, Tidiane; Schaechter, Andrea; Weber, Anke

Working Paper 12/274

Public Investment in Resource-Abundant Developing Countries

Berg, Andrew; Portillo, Rafael; Yang, Shu-Chun; Zanna, Luis-Felipe

Working Paper 12/275

Effects of Capital Flow Liberalization—What is the Evidence from Recent Experiences of Emerging Market Economies?

Saadi Sedik, Tahsin; Sun, Tao

Working Paper 12/276

The Challenges of Fiscal Consolidation and Debt Reduction in the Caribbean

Yartey, Charles Amo; Narita, Machiko; Peron Nicholls, Garth; Chiedu Okwuokei, Joel

Working Paper 12/277

Is China Over-Investing and Does It Matter?

Lee, Il Houn; Syed, Murtaza; Xueyan, Liu

Working Paper 12/278

Modeling the Impact of Taxes on Petroleum Exploration and Development

Smith, James

Working Paper 12/279

Nonfinancial Firms in Latin America: A Source of Vulnerability?

Gonzalez, Maria

Working Paper 12/280

Striking an Appropriate Balance Among Public Investment, Growth, and Debt Sustainability in Cape Verde

Mu, Yibin

Working Paper 12/281

Taxation and Leverage in International Banking

Gu, Grace Weishi; Mooij, Ruud A.; Poghosyan, Tigran

Working Paper 12/282

Systemic Risk from Global Financial Derivatives: A Network Analysis of Contagion and Its Mitigation with Super-Spreader Tax

Markose, Sheri

Working Paper 12/283

A Tradeoff Between the Output and Current Account Effects of Pension Reform

Catalan, Mario; Magud, Nicolas

Working Paper 12/284

Tracking Global Demand for Advanced Economy Sovereign Debt

Arslanalp, Serkan; Tsuda, Takahiro

Working Paper 12/285

Pension Reforms in Japan

Kashiwase, Kenichiro; Nozaki, Masahiro; Tokuoka, Kiichi

Working Paper 12/286

Fiscal Multipliers and the State of the Economy

Baum, Anja; Poplawski-Ribeiro, Marcos; Weber, Anke

Working Paper 12/287

Issues in Extractive Resource Taxation: A Review of Research Methods and Models

Smith, James

Working Paper 12/288

The Need for “Un-consolidating” Consolidated Banks’ Stress Tests

Cerutti, Eugenio; Schmieder, Christian

Working Paper 12/289

Coordinating Climate and Trade Policies: Pareto Efficiency and the Role of Border Tax Adjustments

Keen, Michael; Kotsogiannis, Christos

Working Paper 12/290

Inequalities and Growth in the Southern African Customs Union (SACU) Region

Basdevant, Olivier; Benicio, Dalmacio; Yakhshilikhov, Yorbol

Working Paper 12/291

What Role Can Financial Policies Play in Revitalizing SMEs in Japan?

Lam, Raphael; Shin, Jongsoo

Working Paper 12/292

Spring Forward or Fall Back? The Post-Crisis Recovery of Firms

Medina, Leandro

Working Paper 12/293

Global Financial Crisis, Financial Contagion, and Emerging Markets

Ozkan, F. Gulcin; Unsal, D. Filiz

Working Paper 12/294

Optimal Oil Production and the World Supply of Oil

Aleksandrov, Nikolay; Gyurko, Iajos; Espinoza, Raphael

Working Paper 12/295

Income and Democracy: Lipset’s Law Revisited

Hoeffler, Anke; Bates, Robert H.; Fayad, Ghada

[Working Paper 12/296](#)

Information Rigidity and the Expectations Formation Process: A Simple Framework and New Facts
Coibion, Olivier; Gorodnichenko, Yuriy

[Working Paper 12/297](#)

Trade Flows, Multilateral Resistance, and Firm Heterogeneity
Behar, Alberto; Nelson, Benjamin D.

[Working Paper 12/298](#)

Global Bonding: Do U.S. Bond and Equity Spillovers Dominate Global Financial Markets?
Bayoumi, Tamim; Bui, Trung

[Working Paper 12/299](#)

Bank Debt in Europe “Are Funding Models Broken”
Le Lesle, Vanessa

[Working Paper 12/300](#)

The Rising Resilience of Emerging Market and Developing Economies
Abiad, Abdul; Bluedorn, John; Guajardo, Jaime; Topalova, Petia

[Working Paper 12/301](#)

The Determinants of Banks’ Liquidity Buffers in Central America
Delechat, Corinne; Henao Arbelaez, Camila; Muthoora, Priscilla; Vtyurina, Svetlana

[Working Paper 12/302](#)

Accounting for Reserves
Bayoumi, Tamim; Saborowski, Christian

[Working Paper 12/303](#)

Macroprudential Policies and Housing Prices—A New Database and Empirical Evidence for Central, Eastern, and Southeastern Europe
Vandenbussche, Jerome; Vogel, Ursula; Detragiache, Enrica

[Working Paper 13/1](#)

Growth Forecast Errors and Fiscal Multipliers
Blanchard, Olivier; Leigh, Daniel

[Working Paper 13/2](#)

Breaking the Curse of Sisyphus: An Empirical Analysis of Post-Conflict Economic Transitions
Cevik, Serhan; Rahmati, Mohammad

[Working Paper 13/3](#)

Capital Requirements for Over-the-Counter Derivatives Central Counterparties
Lin, Li; Surti, Jay

[Working Paper 13/4](#)

Macroeconomic Model Spillovers and Their Discontents
Bayoumi, Tamim; Vitek, Francis

[Working Paper 13/5](#)

A Modern History of Fiscal Prudence and Profligacy
Mauro, Paolo; Romeu, Rafael; Binder, Ariel; Zaman, Asad

[Working Paper 13/6](#)

Why Are the G-20 Data Gaps Initiative and the SDDS Plus Relevant for Financial Stability Analysis?
Heath, Robert

[Working Paper 13/7](#)

New Zealand Banks’ Vulnerabilities and Capital Adequacy
Jang, B.; Kataoka, Masahiko

[Working Paper 13/8](#)

The Behavior of Currencies During Risk-Off Episodes
De Bock, Reinout; Carvalho Filho, Irineu

[Working Paper 13/9](#)

Banks’ Foreign Credit Exposures and Borrowers’ Rollover Risks Measurement, Evolution and Determinants
Cerutti, Eugenio

[Working Paper 13/10](#)

Okun’s Law: Fit at 50?
Ball, Laurence; Leigh, Daniel; Loungani, Prakash

[Working Paper 13/11](#)

Modeling Sterilized Interventions and Balance Sheet Effects of Monetary Policy in a New-Keynesian Framework
Benes, Jaromir; Berg, Andrew; Portillo, Rafael; Vavra, David

[Working Paper 13/12](#)

Bond Markets in Africa
Mu, Yibin; Phelps, Peter; Stotsky, Janet

[Working Paper 13/13](#)

Explaining ASEAN-3’s Investment Puzzle: A Tale of Two Sectors
Zhou, Yong Sarah

[Working Paper 13/14](#)

Connected to Whom? International Interbank Borrowing During the Global Crisis
Tintchev, Kalin

[Working Paper 13/15](#)

Recent Improvements to the Government Finance Statistics Yearbook Database in Response to Analytical Needs
Seiferling, Mike

[Working Paper 13/16](#)

Liquidity and Transparency in Bank Risk Management
Ratnovski, Lev

[Working Paper 13/17](#)

A Fiscal Stimulus and Jobless Recovery
Cantore, Cristiano; Levine, Paul; Melina, Giovanni

Working Paper 13/18**Macprudential Policies for a Resource Rich Economy: The Case of Mongolia**

Maino, Rodolfo; Imam, Patrick; Ojima, Yasuhisa

Working Paper 13/19**Regionalization vs. Globalization**

Hirata, Hideaki; Kose, M. Ayhan; Otrók, Christopher

Working Paper 13/20**You Never Give Me Your Money? Sovereign Debt Crises, Collective Action Problems, and IMF Lending**

Committeri, Marco; Spadafora, Francesco

Working Paper 13/21**Inflation Targeting and Country Risk: An Empirical Investigation**

Fouejieu, Armand; Roger, Scott

Working Paper 13/22**Assessing the Macroeconomic Impact of Structural Reforms: The Case of Italy**

Lusinyan, Lusine; Muir, Dirk

Working Paper 13/23**Assessing the Determinants of Interest Rate Transmission Through Conditional Impulse Response Functions**

Saborowski, Christian; Weber, Sebastian

Working Paper 13/24**Income Mobility and Welfare**

Krebs, Tom; Krishna, Pravin; Maloney, William

Working Paper 13/25**The Changing Collateral Space**

Singh, Manmohan

Working Paper 13/26**Chronicle of a Decline Foretold: Has China Reached the Lewis Turning Point?**

Das, Mitali; N'Diaye, Papa

Working Paper 13/27**External Conditions and Debt Sustainability in Latin America**

Adler, Gustavo; Sosa, Sebastian

Working Paper 13/28**Financial Crises Explanations, Types, and Implications**

Claessens, Stijn; Kose, M. Ayhan

Working Paper 13/29**Revisiting the Link Between Finance and Macroeconomic Volatility**

Dabla-Norris, Era; Srivisal, Narapong

Working Paper 13/30**Wholesale Bank Funding, Capital Requirements, and Credit Rationing**

Agur, Itai

Working Paper 13/31**Inward and Outward Spillovers in the SACU Area**

Canales Kriljenko, Jorge; Gwenhamo, Farayi; Thomas, Saji

Working Paper 13/32**Exchange Rate Liberalization in Selected Sub-Saharan African Countries: Successes, Failures, and Lessons**

Mæhle, Nils; Teferra, Haimanot; Khachatryan, Armine

Working Paper 13/33**International Reserves and Rollover Risk**

Bianchi, Javier; Hatchondo, Juan Carlos; Martinez, Leonardo

Working Paper 13/34**Determinants of Bank Interest Margins in Sub-Saharan Africa**

Ahokossi, Calixte

Working Paper 13/35**Boosting Competitiveness to Grow Out of Debt—Can Ireland Find a Way Back to Its Future?**

Nkusu, Mwanza

Working Paper 13/36**Fiscal Consolidation and the Cost of Credit: Evidence from Syndicated Loans**

Agca, Senay; Igan, Deniz

Working Paper 13/37**Competition Among Exchanges and Enforcement Policy**

Caglio, Cecilia; Pescatori, Andrea

Working Paper 13/38**Global House Price Fluctuations: Synchronization and Determinants**

Hirata, Hideaki; Kose, M. Ayhan; Otrók, Christopher; Terrones, Marco

Working Paper 13/39**Monetary Transmission Mechanism in the East African Community: An Empirical Investigation**

Davoodi, Hamid; Dixit, Shiv; Pinter, Gabor

Working Paper 13/40**Growth and Employment in the Dominican Republic: Options for a Job-Rich Growth**

Abdullaev, Umidjon; Estevao, Marcello

IMF Working Papers and other IMF publications can be downloaded in full-text format from the **Research at the IMF** website: www.imf.org/research.

Call for Papers

Asia: Challenges of Stability and Growth

September 26–27, 2013

The Bank of Korea (BOK), the International Monetary Fund (IMF), and the *IMF Economic Review* are organizing a conference on “Asia: Challenges of Stability and Growth.” The conference will be hosted by the BOK and will take place in Seoul on September 26–27, 2013.

The conference will provide a forum to discuss innovative research on challenges of stability and growth that Asia is facing and to facilitate the exchange of views among researchers and policymakers. The Program Committee welcomes papers addressing the following issues in the context of Asia:

- Managing capital flows
- Global imbalances
- Exchange rate determination
- Monetary and fiscal policy challenges
- Macroeconomic fluctuations
- Is there an Asian growth model?
- Rebalancing growth: internal vs. external considerations
- National savings
- Investment dynamics
- Financial sector development
- Productivity growth
- Demographic challenges

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 draft paper or a 10-page proposal to the Program Committee. The proposal should include the title of the paper, the author(s)'s affiliation and contact information, the main questions to be examined, the most relevant literature, the intended contribution of the paper to the literature, and the possible data sets and methodology to be employed. All presenters will be reimbursed for travel expenses and accommodation.

Please submit your proposals by Friday, April 12, 2013 (e-mail to resasia@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 contact the authors whose papers have been selected by late April, 2013. A 20-page work-in-progress draft will be required by Friday, June 7, 2013. Further information on the conference program will be posted on the IMF website (www.imf.org).

Staff Discussion Notes

Staff Discussion Notes showcase new policy-related analysis and research by IMF departments. These papers are generally brief and written in nontechnical language, and are aimed at a broad audience interested in economic policy issues. For more information on this series and to download the papers in this series, please visit: www.imf.org/external/pubs/cat/createx/Publications.aspx?page=sdn

No. 12/12

Shadow Banking: Economics and Policy

Stijn Claessens, Zoltan Pozsar, Lev Ratnovski, and Manmohan Singh

No. 12/13

Economic Diversification in LICs: Stylized Facts and Macroeconomic Implications

Chris Papageorgiou and Nikola Spatafora

No. 13/01

A Banking Union for the Euro Area

Rishi Goyal, Petya Koeva Brooks, Mahmood Pradhan, Thierry Tresselt, Giovanni Dell'Ariccia, Ross Leckow, Ceyla Pazarbasioglu, and an IMF Staff Team



IMF Economic Review

Free Access to IMF Economic Review in April!

Palgrave Macmillan is offering free online access to all its journals, including *IMF Economic Review*, for the month of April. If you have not had a chance to explore the journal we hope you will take advantage of this opportunity. We also encourage you to spread the word to your colleagues.

IMF Economic Review presents policy-relevant and innovative academic research on global macroeconomics, with articles by prominent authors in the field such as **Viral V. Acharya**, **Olivier Blanchard**, **Patrick Bolton**, **Anil K. Kashyap**, and **Hyun Song Shin**. The journal received its first Impact Factor, **2.100**, with the release of the latest Thomson Reuters Journal Citation Reports (JCR), and was ranked **37/320** in the Economics category and **9/86** in the Business and Finance category.

For ongoing access, recommend *IMF Economic Review* to your librarian or information manager, or learn more about subscribing by visiting: www.palgrave-journals.com/imfer/



IMF Research Bulletin

M. Ayhan Kose
Editor

Prakash Loungani
Co-Editor

Patricia Loo
Assistant Editor

Tracey Lookadoo
Editorial Assistant

Feras Abu Amra
Systems Consultant

Multimedia Services
Composition

The **IMF Research Bulletin** (ISSN: 1020-8313) is a quarterly publication in English and is available free of charge. The views expressed in the Bulletin are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Material from the *Bulletin* may be reprinted with proper attribution. Editorial correspondence may be addressed to The Editor, *IMF Research Bulletin*, IMF, Room HQ1-9-612, Washington, DC 20431 USA; or e-mailed to resbulletin@imf.org.

For Electronic Notification

Sign up at www.imf.org/external/cntpst to receive notification of new issues of the *IMF Research Bulletin* and a variety of other IMF publications. Individual issues of the *Bulletin* are available at www.imf.org/researchbulletin.