# IMF Working Paper

# The Composition of Capital Flows:
# Is South Africa Different?

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INTERNATIONAL MONETARY FUND

**IMF Working Paper**

African Department

**The Composition of Capital Flows: Is South Africa Different?**

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Authorized for distribution by Michael Nowak

March 2005

**Abstract**

Over the past decade, South Africa has attracted relatively little foreign direct investment (FDI), but considerable amounts of portfolio inflows. In this context, the objective of the paper is twofold: to identify the determinants of the level and composition of capital flows to emerging markets and to draw policy conclusions for South Africa. We estimate a dynamic panel for up to 81 emerging markets using GMM (Generalized Method of Moments) techniques. The results suggest that further trade and capital control liberalization would increase the share of FDI. Additionally, a reduction in exchange rate volatility would affect the composition of capital flows in favor of FDI.

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## I. INTRODUCTION

Over the past decade, South Africa has attracted relatively little foreign direct investment (FDI), but considerable amounts of portfolio inflows. Between 1994 and 2002, FDI inflows amounted to 1.5 percent of GDP a year, on average, whereas portfolio inflows totaled about 3.5 percent of GDP. These outcomes contrast sharply with those in countries with similar risk attributes, where FDI is the dominant source of capital flows.[2] Unlike in other emerging markets, the composition of capital inflows in South Africa appears to be biased toward portfolio investment.

Capital inflows can bring substantial benefits to the recipient country and promote economic development, but different types of flows may have different effects (see, for example, Borensztein and Lee, 1998). FDI can be expected to facilitate the transfer of new technology, help improve workers' skills, and improve market access; it is generally considered to be the most resilient form of private capital flows during periods of financial distress.[3] In contrast, sudden shifts in market sentiment can lead to large reversals of portfolio flows, which, in turn, can cause detrimental economic effects. These differences between capital flows raise a number of policy questions for South Africa. What determines the level and composition of capital flows? Why is the composition of capital flows biased toward portfolio flows? What are the policies that can alter the composition of capital flows if a change is desirable?

There is a large and growing body of literature on the determinants of capital flows to emerging markets. Most analyses focus either on FDI (for recent overviews, see, for example, Kamaly, 2002; and Rogoff and Reinhart, 2003) or portfolio flows (for example, Portes and Rey, 2000). Yet much less, research has been done on the link between the two types of flows and what determines their composition. The purpose of this paper is to identify the determinants of the level and composition of capital flows to emerging markets and to draw policy conclusions for South Africa. In particular, we aim to identify common determinants of FDI and portfolio flows, specific determinants for each type of flow, and factors that may have opposite effects on the two types of capital flows. Most important, we will show that exchange rate volatility tends to deter FDI but has little impact on portfolio flows.

The remainder of this paper is organized as follows. Section II presents some stylized facts on capital flows to emerging markets and South Africa. Section III provides a brief overview of the relevant theoretical and empirical considerations. Section IV discusses the determinants of capital flows and the econometric methodology and presents the empirical findings. Section V draws some policy conclusions.

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[2] This analysis focuses on FDI, bond flows, and equity flows. Other investments, mainly bank finance, are not considered.

[3] For a nuanced view on the benefits of FDI, see Hausmann and Fernandez-Arias (2000).

## II.  Some Stylized Facts

To put our questions in perspective, we compare the level and composition of capital flows to South Africa with those in up to 81 countries and, in addition, with 16 emerging markets whose risk characteristics are broadly similar to those of South Africa (Appendix 1 and Table 1).[4] The smaller sample of emerging markets allows for a direct comparison of South Africa with its close competitors in the international contest for capital.

Capital flow data, which are drawn from the IMF's International Financial Statistics database and the World Bank's World Development Indicators, refer to net inflows—that is, gross inflows minus repatriation. Capital inflows are characterized as FDI if the investor acquires a lasting management interest (10 percent or more of the voting stock) in the foreign enterprise. Portfolio investment flows include portfolio debt flows (for example, domestic bonds purchased by foreign investors) and non-debt-creating portfolio equity flows (such as country funds, depository receipts, and direct purchases of shares by foreign investors).

During 1994-2002, FDI in South Africa was fairly low compared with that in the larger set of countries and with the 17 comparator countries (Table 2). However, South Africa attracted three times more portfolio investments, as a percentage of GDP, than the other emerging markets. Some 70 percent of which went into equity.[5] Despite the slowdown in equity inflows in the early 2000s, which was prompted by weak stock market performance in mature economies, equity flows to South Africa remained well above levels in other developing and emerging market countries.

As a result of the above developments, the composition of capital flows to South Africa appears to be quite the opposite of what it is on average for emerging markets. During 1994-2002, the share of FDI in capital flows amounted to only 30 percent in South Africa compared with over 70 percent in the comparator countries. In addition, FDI inflows to South Africa were driven by a few large transactions.[6] FDI inflows to South Africa are thus more

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[4] The selection of the countries has been dictated by data availability. Portfolio data were available for only 53 countries. After truncating the top 5 and bottom 5 percentile and eliminating countries with very few observations, econometric estimations for portfolio investment are based on regressions for up to 40 countries.

[5] The inflows were particularly large during 1997-2000, averaging about 6 percent of GDP. Their size, however, partly reflects the effects of the aftermath of the Asian crisis. Portfolio inflows to South Africa coincided with portfolio outflows from East Asian and Latin American countries. Negative correlation coefficients of capital flows (both equity and bond) between South Africa and these regions validate this hypothesis.

[6] Average FDI in South Africa amounted to only 0.7 percent of GDP if the two large-scale foreign investment transactions—the partial sale of Telecom in 1997 and the Anglo-American takeover of De Beers in 2001—are excluded.

volatile than inflows in comparator countries.[7] The coefficient of variation for portfolio inflows to South Africa is only half that in the comparator countries, implying that South Africa has attracted portfolio flows more consistently than other countries.

### III. A BRIEF REVIEW OF THE LITERATURE

### A. Theoretical Considerations

The literature can be divided into at least four broad approaches to explaining the level and composition of capital flows (see Lane and Milesi-Ferretti, 2000): the sovereign risk literature, the optimal portfolio choice theory, the corporate finance approach, and the "pull and push" literature.

Against the backdrop of the debt crisis in developing countries in the early 1980s, the sovereign risk literature focused on the role of country risk in explaining the level and volatility of flows. Capital flows then were dominated by syndicated bank lending, and early studies offered few insights into the composition of flows.

The portfolio diversification literature has brought the composition of capital flows to the forefront of the debate on capital movements. It highlights the risk and return aspects of foreign investment decisions and argues that the composition of capital flows is based on optimal portfolio decisions of foreign investors (Kraay and others, 2000). Asymmetric information about the projects, however, adds an additional constraint on portfolio decisions.

The corporate finance literature highlights the role of asymmetric information, agency problems, and corporate control considerations. This strand of the literature attempts to explain why investors may prefer FDI over portfolio investment (Gordon and Bovenberg, 1996; Razin and others, 1998; Albuquerque, 2003). According to this theory, the feature that most distinguishes FDI from other capital inflows is the element of control that foreign investors enjoy over a group of assets in the host country. Because increased control may alleviate the adverse consequences of asymmetric information and poor investors' rights, investors may prefer FDI over portfolio investment.

Though less theoretical, the pull and push approach, which tries to bring together the various investment considerations, forms the basis for many empirical analyses. It distinguishes between domestic factors (pull factors) and external factors (push factors) (see, for example, Calvo and others, 1993) and identifies broad categories of macroeconomic, institutional, and policy variables that influence the level and composition of capital flows. While push factors may help explain the timing and magnitude of new capital inflows, pull factors may be necessary to explain the regional distribution of flows (Montiel and Reinhart, 1999).

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[7] Volatility is measured by the coefficient of variation, defined as the standard deviation of annual flows divided by average inflows.

## B. Empirical Findings

The theoretical considerations described above suggest that capital flows are determined by a variety of macroeconomic and institutional factors and the relative risks associated with these investments (Bhattacharya, Montiel, and Sharma, 1997).

**Foreign direct investment**

Most empirical analyses focus on FDI. Recent surveys of the empirical literature by Chakrabati (2001) and Kamaly (2002) suggest that a few selected variables play a key role in a country's ability to attract FDI. The most important variables are the host country's growth prospects, the openness of the host market, and the institutional environment. In addition, a number of nontraditional variables, such as the quality of infrastructure, political stability, and the level of economic distortions, have also been found to affect FDI. Overall, the results of empirical analyses suggest that several broad categories of factors influence a country's attractiveness for FDI. These are its macroeconomic performance, the investment environment, infrastructure and resources, the quality of institutions, and global factors. In addition, recent research has shown that FDI tends to cluster in particular locations (the "agglomeration" effect) (Kamaly, 2002). More specifically, FDI flows depend on a country's past stock of FDI; that is, countries that have been successful in attracting FDI in the past are more likely to do so in the future.

Only a few empirical analyses focus on FDI to Africa and, more specifically, on South Africa. Asiedu (2002) shows that a number of factors explain Africa's limited success in attracting FDI. African countries tend to be less open than other emerging markets; are perceived as very risky; and, despite absolute improvements in the policy environment, have lost ground relative to other regions. Rogoff and Reinhart (2003) argue that a high incidence of regional conflicts, high and volatile rates of inflation, and frequent currency crashes play an important role in explaining why Africa lags behind other regions in attracting FDI. Based on some African success stories, Basu and Srinivasan (2002) posit that political and macroeconomic stability, well-designed structural reforms, and natural resources contributed to an increase in FDI in these countries. Comparing South Africa with a group of similarly rated countries, Arvanitis (2003) finds that South Africa has lower rates of growth, is less open to trade, and lacks labor skills.

**Portfolio inflows**

Unlike the voluminous literature on the determinants of FDI inflows, research on the determinants of portfolio inflows to emerging markets is more limited. Most of the empirical analyses focus on industrial countries, owing, in part, to data availability and the fact that portfolio flows, especially equity inflows, to emerging markets and developing countries began very recently, mostly in the late 1980s.

Early investigations of portfolio flows analyzed whether they were driven by push or pull factors. Based on quarterly portfolio data (both equity and debt) during 1989-93 for a panel of 13 middle-income countries, Fernandez-Arias (1996) find that the increase in capital inflows to most countries was driven largely by low returns in developed countries—that is,

by push factors. In a more comprehensive study, Chuhan and others (1998) analyzed monthly U.S. equity and bond flows to nine Latin American and nine Asian countries during 1988-92. They find that although global factors—U.S. interest rates and industrial production—are important, country-specific developments are equally important, particularly for Asia. They also reported that equity inflows are more sensitive than bond flows to global factors.

More recent empirical findings suggest that the development and efficiency of financial markets are key determinants for a country's success in attracting portfolio flows. Using a micro-founded gravity model of asset trade and a panel data set of bilateral gross cross-border equity flows between 14 countries from Europe and Asia during 1989-96, Portes and Rey (2000) find that market size, efficiency of the transaction technology, and informational frictions are among the most important determinants of portfolio flows. Empirical studies also support the view that domestic returns and portfolio flows are positively correlated. Richards (2002) stresses the role of local returns. He shows that, based on daily data, portfolio inflows are positively related to the lagged return in the domestic market. Griffin and others (2002) find similar evidence in daily data from several Asian countries. Al-Khalil (2003) examines the determinants of country allocations in the portfolio (equity) of Finnish investors and finds that the distance between Finland and the destination countries and the market capitalization of the host countries are statistically significant. Gordon and Gupta (2003), based on monthly portfolio equity flow data into India, find that external and domestic factors are equally important. They find that lagged stock returns and changes in credit ratings are the primary domestic determinants.

The volatility of monetary variables also plays a role in explaining the composition of portfolio flows. Using monthly data on bilateral equity and bond transactions between U.S. residents and counterparties located in 14 selected countries, Siourounis (2002) shows that the volatility of money market rates and inflation and exchange rates explains a large part of these flows. Regression results support the claim that increased volatility of foreign inflation leads to a decline in gross cross-border transactions of U.S. equities, while exchange rate volatility has the opposite effect in most cases.

**Composition of capital flows**

The early empirical literature on the composition of capital flows has stressed regional differences. During the 1970s and 1980s, Latin America was often associated with short-term portfolio flows, while Asian countries attracted more FDI. Montiel and Reinhart (1999) show that regional differences have diminished over time and that economic policies can influence the composition of capital flows. They find that capital controls alter the composition, but not the volume, of capital flows and that sterilized intervention can affect both volume and composition. Using data from 25 transition countries, Garibaldi and others (2002) find that the determinants for FDI and portfolio flows are different. While FDI is well explained by economic fundamentals, a well-developed financial market infrastructure and property-rights indicators are the only robustly significant variables affecting portfolio investment. Carlson and Hernandez (2002) explore whether policies can alter the composition of capital inflows and if composition aggravates crises. They find that, if the exchange rate is allowed to float, the share of short-term debt in total capital inflows increases. Capital account restrictions are

associated with a higher share of FDI. Carlson and Hernandez also find that portfolio equity flows respond to policies in a similar way as FDI.

## IV. EMPIRICAL ANALYSES

## A. Determinants of Capital Flows

Based on the above literature review, we identify and describe in the following indicators for the six broad categories of factors that influence capital flows. Their relevance and expected signs are as follows:

*Macroeconomic performance.* A rapidly growing economy is likely to offer higher future earnings and thus higher rates of return coupled with lower risk. We use lagged GDP per capita growth as a proxy for growth prospects. The expected sign of the coefficient is positive for FDI and portfolio flows.

*Quality of institutions:* Theoretical and empirical findings suggest that good institutions help promote capital inflows (Wei and Wu, 2001). We use an index of law and order from *International Country Risk Guide* (published by Political Risk Services) as an indicator for the quality of the institutional environment. A country that ranks high in terms of law and order is expected to attract more capital flows (Alfaro and others, 2003).

*Investment environment.* The openness of the economy, the degree of exchange rate and inflation volatility, and exchange controls are three key ingredients of the investment environment.

- In the case of FDI, investors are often interested not only in serving the local market, but also in pursuing export-oriented activities. They are, therefore, likely to favor countries with a large traded goods sector.[8] A positive relationship between FDI and openness is well established in the literature (see Asiedu, 2002; Morisset, 2000). In contrast, the relationship between portfolio flows and trade openness is less clear, and the degree of trade openness may be expected to play a small role. Following previous empirical studies, we use the ratio of imports and exports to GDP as a proxy for market openness.

- Exchange rate volatility increases the uncertainty of demand for products of export-oriented firms and may reduce the profitability of FDI. It is, therefore, expected to have an adverse impact on FDI (Goldberg and Kolstad, 1994; Kamaly, 2002). Its impact on portfolio flows is less clear. Since portfolio investors with a short investment horizon may be able to hedge currency risk easily, exchange rate volatility should have little impact on portfolio investment. However, it could attract portfolio investors with a higher risk tolerance and make speculators more interested in

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[8] In theory, more trade restrictions could also lead to more FDI if firms wanted to serve the local market and hence wanted to bypass existing trade restrictions through FDI.

participating in the stock market, leading to an increase in portfolio investments. Overall, exchange rate volatility may have an asymmetric impact on FDI and portfolio flows. We use the annual standard deviation of monthly changes in the real effective exchange rate as a proxy for exchange rate volatility.[9]

- Inflation volatility is another important source of uncertainty for foreign investors (see Rogoff and Reinhart, 2003) and is expected to have a negative effect on FDI. Because some portfolio flows are short term, the effect of inflation volatility on them may be smaller than on FDI or even negligible.

- The effect of capital controls depends on the kind of distortions they create (Asiedu and Lien, 2004). Requirements to surrender exports may reduce the return on FDI and may, in general, be expected to limit FDI flows.[10] Capital account restrictions, if effective, are expected to limit portfolio flows. The expected sign of the coefficient is negative. Multiple exchange rate practices may also reduce capital flows. The three proxies for capital account controls are taken from the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions*.[11]

*Infrastructure and resources.* Both the quality of the infrastructure and the availability of resources determine the attractiveness of a location.

- A well-developed infrastructure facilitates communication with parent companies abroad and the information-gathering process for business and reduces distribution costs, thus promoting local and regional trade. In line with the literature, we use the number of telephones per 1,000 people as a proxy for infrastructure development. The expected sign of the coefficient is positive for FDI and portfolio flows, but may be less important for the latter.

- Different indicators can be used as a proxy for the availability and quality of resources. We use fuel export receipts as a percentage of exports as indicator for the availability of oil resources. More natural resources are expected to be a positive factor for FDI; it may be less important for portfolio flows.

*Financial development*: The deeper a country's financial markets, the more capital flows the country attracts. In particular, well-developed financial markets appear to be a precondition for portfolio inflows (Garibaldi and others, 2002). For FDI, deeper financial markets may allow foreign firms to finance short- and long-term transactions more easily and meet capital

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[9] Results are qualitatively similar when nominal exchange rate variability is used.

[10] Current account restrictions may also encourage FDI flows, particularly in a large country where foreign investors want to serve the local market and circumvent existing trade restrictions.

[11] A country is classified as having exchange restrictions as long as full liberalization has not taken place. The indicators do not capture the effects of partial liberalization.

needs in the local market (Alfaro and others, 2003). However, existing empirical evidence is mixed. We use domestic credit to the private sector and the domestic stock market capitalization of listed companies as a percentage of GDP as proxies for financial development and expect a positive relationship between financial development and capital flows, particularly for portfolio flows.

*Global factors:* The principal global variables that influence capital inflows are international interest rates and business cycle developments in industrial countries (Calvo and others, 1993). Foreign investment decisions are determined in part by the opportunity costs of FDI. FDI or portfolio flows will be less attractive if international returns on investment rise. Real short-term and long-term U.S. interest rates are used as an indicator for global developments. We hypothesize that international long-term interest rates matter for FDI because it, too, is long term. For portfolio flows, a large part of which is short-term, the money markets rate may play a larger role. In both cases, the expected sign of the coefficient is negative.

In addition to these variables, recent research has shown that capital flows tend to cluster in particular locations (the "agglomeration" effect) (Kamaly, 2002). More specifically, capital flows depend on a country's past success in attracting flows, in particular in the case of FDI. We use lagged capital inflows as a percentage of GDP to capture this effect. The expected sign of the coefficient is positive.

## B.  Econometric Methodology

Our sample comprises annual data from 1975 to 2002 for up to 81 countries: 12 Asian countries, 42 African countries, 20 countries in the Western Hemisphere, and 7 other countries. We use panel data on an annual basis. The dependent variable is the ratio of net FDI inflows to GDP, portfolio inflows to GDP, bond inflows to GDP, and equity inflows to GDP.[12] Normalizing capital inflows in terms of GDP allows us to avoid a dependent variable non-stationarity problem. Empirically, the level of capital flows appears to have high persistence that is likely to generate a unit root in the series.

We assume that all types of capital flows in percent of GDP follow the following data-generating process:

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[12] We use flow data because we are interested in the short-run dynamics. In contrast, Kraay and others (2000) and Lane and Milesi-Ferreti (1999) constructed estimates for foreign assets and liabilities and their subcomponents for different countries. This strand of literature uses stock data and aims at investigating a long-run relationship between the external capital structure and its determinants.

$$y_{it} = \alpha + \delta y_{it-1} + X_{it}^{'}\beta + u_{it} \qquad i = 1,..., N, t = 1,...T$$

$$u_{it} = \mu_i + v_{it}$$

$$v_{it} \sim \quad iid\,(0,\sigma_u^2),$$

where

$y_{it}$: dependent variable
$X_{it}$: vector of explanatory variable other that the lagged dependent variable
$N$: total number of countries
$T$: number of time periods
$\mu_i$ : country specific effect
α, δ , β: unknown parameters to be estimated
$v_{it}$: iid  residuals.

This specification with a lagged dependent variable allows us to capture capital flow agglomeration effects and to correct for residual autocorrelation present in static panel specifications. This model specification assumes that country-specific unobservable characteristics, such as norms and cultural differences, are invariant over time and it assumes slope homogeneity across countries.[13]

Most cross-country studies use static panel models. However, if a lagged dependent variable is included in the estimation, ordinary least squares (OLS) estimates are known to be biased and inconsistent (see Anderson and Hsiao, 1981). [14] We therefore estimate this dynamic panel model using both OLS and Arrellano and Bond's (1991) First Difference Generalized Method of Moments (GMM), also known as GMM-IV, which provides unbiased and consistent estimators. The Arrellano Bond estimator builds on Anderson and Hsiao (1981, 1982). To tackle the deficiencies of OLS estimates for dynamic panel models, Anderson and Hsiao proposed a first difference estimator and the use of $\Delta y_{t-2}$ or $y_{t-2}$ as instruments. To increase the efficiency of the first difference estimator, Holtz-Eakin (1988)[15] proposed an

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[13] We relax this assumption by introducing an interactive dummy for South Africa.

[14] There are two potential sources of bias. The first source of bias stems from the presence of a fixed effect. The within operator solves that source of bias by wiping out the fixed effects. However, bias also exists because new residuals $u_{it} - \overline{u}_{i.}$ are now correlated with $y_{it-1} - \overline{y}_{i.}$ even if the initial residuals are not serially correlated. Nickell (1981) showed that the magnitude of the bias of the within estimator is $0(1/T)$, and its consistency thus depends on $T$ being large.

[15] See also Holtz-Eakin (1988), Holtz-Eakin, Newey, and Rosen (1988, 1989), Arrellano and Bond (1991), Arrellano and Bover (1995), and Ahn and Schmidt (1995).

estimator called the differenced GMM estimator à la Hansen (1982). Arrellano and Bond developed two versions of the differenced GMM estimator that are more efficient and that correct for heteroskedasticity, one-step and two-step procedures.[16] In the one-step version, the variance covariance matrix used in generalized least squares estimation is based on the assumption that the differenced residuals follow a moving average process of order one MA(1). In the two-step estimator, the variance-covariance matrix is derived from the differenced residuals from the one-step estimation. Given our relatively large sample, we use the two-step version of the Arrellano and Bond estimator, which is theoretically more efficient asymptotically.

Following Arrellano (1989), we use as instruments for the lagged difference of the dependent variable the lagged levels of the dependent variable. In addition, explanatory variables that are strictly exogenous (not correlated with future shocks and past shocks) provide good instruments because they are not correlated with the residuals.[17] To take account of the potential endogeneity of some of our explanatory variables, in particular growth and exchange rate volatility, we use the lagged realization of those variables as instruments for those variables.

To assess the validity of the instruments and the model specification, we follow Arrellano and Bond and use the Sargan[18] test for overidentifying constraints and the test of second order autocorrelation[19] of the new residuals to assess the validity of the model specification.[20]

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[16] Arrellano and Bond argue that as time increases the number of potential instruments also increases because all past realizations of the lagged dependent variable are not correlated with the future realization of the new residuals.

$$t = 3 \qquad y_{it} - y_{it-1} = \partial(y_{it-1} - y_{it-2}) + (X'_{it} - X'_{it-1})\beta + (u_{it} - u_{it-1}), \ y_{i1} \text{ is an instrumental variable.}$$

$$t = 4 \qquad y_{it+1} - y_{it} = \partial(y_{it} - y_{it-1}) + (X'_{it+1} - X'_{it})\beta + (u_{it+1} - u_{it}), \ y_{i1} \text{ and } y_{i2} \text{ are now instrumental}$$
variables.

Therefore, the Arrellano and Bond GMM-IV estimator uses those additional instruments that theoretically increase estimator efficiency with respect to Holtz-Eakin (1988).

[17] U.S. interest rates are the only good candidate for a strictly exogenous variable. Other variables, such as the number of telephone lines, could be affected both by the past realization of the exogenous component of the dependent variable and by shocks.

[18] The Sargan test is used to assess the validity of the overidentifying restrictions. The null hypothesis is that the overidentifying restriction is a valid restriction. In this respect the test could also be used to assess the validity of instruments.

[19] Due to the Arellano-Bond difference GMM formulation, new residuals (which are first differences of the original model residuals) should be autocorrelated of order 1 but not autocorrelated of order 2 if the model is well specified.

## C.  Determinants of FDI

To analyze the determinants of FDI and to see why South Africa may be different from other emerging market countries, we regress FDI as a share of GDP on the explanatory variables identified above. Table 3 presents the regression results. The first four specifications (i-iv) are based on OLS estimation; the last three regression results (v-vii) use the GMM technique. As a starting point, regression (i) is a simple static OLS estimation that ignores the fact that a country's attractiveness for FDI depends on past developments. Regressions (ii) and (v) follow Kamaly (2002) and include lagged FDI to capture agglomeration effects and only those four variables that have been identified in the literature as being fairly robust: growth, trade openness, foreign interest rate developments, and institutional quality.

In the GMM estimation, all variables have the expected sign and are significant at conventional levels. Results are comparable to those of Kamaly (2002). Regressions (iii) and (vi) include other explanatory variables to capture infrastructure availability, current account restrictions, investment uncertainty (inflation and exchange rate volatility), and resource availability. Most variables have the expected sign and are significant at conventional levels. In line with previous findings, the results confirm that pull factors, such as higher growth, trade openness, a better infrastructure, and a better institutional quality, attract FDI inflows. Higher international interest rates increase the opportunity costs of investing in emerging markets and tend to deter FDI inflows. The results also suggest that current account restrictions in the form of export surrender receipts, high inflation, and exchange volatility deter FDI.

To analyze whether South Africa may benefit more or less than the average emerging market from changes in the economic environment, we included an interactive dummy in regressions (iv) and (vii). We tried the interactive dummy with all explanatory variables individually and jointly. The most robust result was achieved for exchange rate volatility. The negative and significant interactive dummy suggests that South Africa would benefit more than the average emerging market from a reduction of exchange rate volatility, perhaps because the rand has been one of the more volatile currencies in the emerging market asset class.

## D.  Determinants of Portfolio Flows

To compare the determinants of portfolio flows and FDI and to benchmark results, the first two columns in Table 4 (i, ii) use the same explanatory variables for portfolio flows as for FDI flows. As expected, only a subset of explanatory variables appears to play a significant role for portfolio investors. To substantiate the results further, we omitted those variables— such as trade openness, current account restrictions, and the quality of the infrastructure— from the regression when theory would not suggest an important impact. We added two explanatory variables that may play a more important role for portfolio flows than for FDI.

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[20] In the following regressions, we eliminate outliers to avoid the regression slope bias. We eliminate all observations above the 5 percent top decile as well as the observations below the 5 percent bottom decile.

The results are presented for total portfolio flows (iii, iv), and for bond (v, vi) and equity flows (vii, viiii) separately.

The findings suggest that some of the variables that matter for FDI also play an important role in attracting portfolio flows. Higher growth rates, better institutions, and lower international interest rates make the environment favorable to portfolio inflows. In the case of portfolio investments, short-term interest rate developments abroad appear to be the relevant measure for opportunity costs; long-term bond yield developments appear to be more important for FDI decisions.

In line with previous findings, well-developed financial markets help increase a country's attractiveness for portfolio flows (Portes and Rey, 2000). Capital account restrictions in the form of multiple exchange rate practices tend to deter portfolio inflows. However, the impact of other capital account restrictions is inconclusive, which may reflect limitations associated with this measure, such as a failure to take partial liberalization into account (Miniane, 2004). What is most interesting is that the results also suggest that exchange rate volatility does not have a statistically significant effect on portfolio flows; in some cases, the coefficient is even positive, though not statistically significant.[21] This finding supports the often heard view that some portfolio investors are comfortable with currency volatility because of an implied pickup in yield caused by higher currency risk premia. In addition, portfolio investors may find it easier and less costly to hedge against currency risk than FDI investors because of the shorter investment horizon.[22]

### E. Composition of Capital Flows

The above results already provide some indication as to what determines the composition of capital flows. So far, they suggest that some determinants of capital flows are specific to certain types of flows, whereas other determinants have a similar impact on FDI, bond, and equity flows. For example, more trade openness, more natural resources, and fewer restrictions on export receipts affect FDI inflows positively, but have little impact on portfolio flows. Therefore, we would expect that these variables also affect the share of FDI positively. Common determinants may be growth prospects and the quality of institutions, proxied by the rule of law. Higher exchange rate volatility may have opposite effects on FDI and portfolio flows.

To test directly for the determinants of the composition of capital flows, Table 5 presents results for the share of FDI in total inflows. Regressions (i ) and (ii) present results for all explanatory variables, and (iii) and (iv) for a subset of variables. The regression results support our hypotheses. The composition of portfolio flows is affected by some of those determinants that are specific to a certain type of capital flow. On average, the share of FDI

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[21] Results are qualitatively similar when nominal exchange rate volatility is used.

[22] As before, we included an interactive dummy for exchange rate volatility in South Africa. In the case of portfolio investments, the interactive dummy was not significant at conventional levels.

tends to be higher in economies with abundant resources. Multiple exchange rate practices also favor a larger share of FDI, as does a reduction in current account restrictions. However, higher exchange rate volatility tends to reduce the share of FDI.

## V.   CONCLUSIONS AND POLICY IMPLICATIONS FOR SOUTH AFRICA

We find broad evidence that a number of explanatory variables matter for both FDI and portfolio flows and can thus be considered as common determinants. A better institutional environment and foreign interest rate developments fall into this category.

Our results also suggest that (short-run) macroeconomic policies may affect both the level and composition of capital flows. Trade openness is conducive to FDI flows, but has little impact on portfolio flows. Therefore, further trade liberalization may be expected to lead to an increase in both the level of FDI inflows and the share of FDI in total capital flows. In contrast to Montiel and Reinhart (1999), we find that changes in capital controls are expected to have an impact on both the volume and structure of flows. The results also suggest that exchange rate volatility tends to have opposite effects on FDI and portfolio flows. While exchange rate volatility deters FDI, there is no evidence that it has a statistically significant effect on portfolio flows.

For South Africa, the results suggest that a number of policy variables contribute to the lower share of FDI and higher share of portfolio flows. Although South Africa has liberalized trade extensively since the early 1990s, it still appears less open than its major competitors. The ongoing review of South Africa's Department of Trade and Industry provides an excellent opportunity for a further simplification of the tariff regime. Additional trade liberalization should help increase South Africa's attractiveness as a destination for FDI. South Africa also scores lower than its major competitors in terms of growth, infrastructure, and law and order (Table 6). Improvements in these areas would also be beneficial for attracting FDI.

The results also suggest that lower currency volatility would contribute to an increase in the share of FDI. The rand has been one of the more volatile currencies of the emerging market countries. The South African Reserve Bank (SARB) has recently closed its open position in the forward market—long a source of external vulnerability—and increased its net international reserves significantly. Compared with other emerging market economies, South Africa's foreign reserves, however, remain somewhat low. Hviding and others (2004) have demonstrated that an increase in reserves can reduce exchange rate volatility, possibly through a signaling effect. Therefore, a further increase in reserves would likely help reduce currency volatility and help promote FDI.

Over the past 10 years, South Africa has gradually relaxed capital controls but retains some, including the requirement that exporters repatriate their foreign exchange earnings within six months. According to our results, these types of requirements deter FDI. The present strength of the rand may present an opportune time to ease capital controls further.

Overall, our findings indicate that the relatively low share of FDI can be addressed, in part, by government policies, including further trade and capital account liberalization. A reduction in exchange rate volatility and an increase in reserves—accumulated at a pace

dictated by prevailing market conditions—would most likely also lead to changes in the composition of capital flows and increase the share of FDI. Other policies not explicitly considered in this study, such as an acceleration of privatization, should also be instrumental in increasing the share of FDI.[23]

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[23] Limited data availability has hindered a more vigorous analysis of the relationship between privatization and FDI. Some preliminary estimates for a smaller sample have, however, suggested that privatization tends to have a positive impact on FDI inflows.

Table 1: Comparator Countries and Sovereign Credit Ratings

BBB+   Korea, Poland

BBB    China, Malaysia, Tunisia

BBB-    Egypt, Mexico, **South Africa**, Thailand

BB+     Uruguay

BB      Colombia, Costa Rica, Guatemala, India, Morocco, Panama, Philippines

Note: Ratings are Standard and Poor's sovereign ratings for long-term currency risk as of mid-2002. The list excludes newly independent European countries, because data were unavailable prior to 1992, and small oil-producing countries.
Source:  Arvanitis (2002).

Table 2. Patterns of Capital Inflows
(In percent of GDP)

|  | Average 1994-2002 | Standard Deviation | Coefficient of Variation |
|---|---|---|---|
| All countries |  |  |  |
| FDI | 2.7 | 3.5 | 1.3 |
| Portfolio inflows | 0.4 | 2.4 | 5.5 |
| Equity inflows | 0.3 | 0.9 | 3.5 |
| Bond inflows | 0.2 | 2.2 | 11.9 |
|  |  |  |  |
| Selected countries |  |  |  |
| FDI | 2.6 | 2.3 | 0.9 |
| Portfolio inflows | 1.0 | 2.0 | 2.0 |
| Equity inflows | 0.5 | 1.1 | 2.3 |
| Bond inflows | 0.5 | 1.4 | 2.8 |
|  |  |  |  |
| South Africa |  |  |  |
| FDI | 1.5 | 1.9 | 1.3 |
| Portfolio inflows | 3.5 | 4.1 | 1.2 |
| Equity inflows | 2.5 | 2.8 | 1.1 |
| Bond inflows | 1.0 | 2.0 | 2.0 |

Memorandum items:
FDI Share (In percent of total inflows)

| All countries | 85.9 |
|---|---|
| Selected Countries | 72.7 |
| South Africa | 29.9 |

Sources: World Development Indicators, International Financial Statistics.

Table 3. Foreign Direct Investment in Emerging Markets 1/

| | OLS (i) | OLS (ii) | OLS (iii) | OLS (iv) | GMM-IV (2 step) (v) | GMM-IV (2 step) (vi) | GMM-IV (2 step) (vii) |
|---|---|---|---|---|---|---|---|
| Lagged Dependent | | 0.4873 *** (11.81) | 0.4371 *** (7.91) | 0.4590 *** (9.22) | 0.4241 *** (40.36) | 0.1967 *** (4.27) | 0.2426 *** (5.58) |
| Lagged GDP growth | 0.0152 (1.46) | 0.0049 (0.73) | 0.0056 (0.61) | 0.0052 (0.57) | 0.0058 *** (3.40) | 0.0041 (0.92) | 0.0060 (1.61) |
| Trade openness | 0.0109 *** (2.81) | 0.0092 *** (4.49) | 0.0080 ** (2.22) | 0.0078 ** (2.17) | 0.0174 *** (16.87) | 0.0101 *** (4.35) | 0.0103 *** (2.98) |
| Real US Government bond yield (10 year) | -0.1078 *** (-4.37) | -0.0797 *** (-6.33) | -0.0694 *** (-3.12) | -0.0724 *** (-3.24) | -0.0906 *** (-21.15) | -0.0303 *** (-3.29) | -0.0440 *** (-8.10) |
| Law and Order | -0.0058 (-0.11) | 0.1386 *** (3.98) | 0.0327 (0.67) | 0.0212 (0.43) | 0.2478 *** (32.79) | 0.1092 *** (3.62) | 0.0902 * (1.91) |
| Telephone lines per 1,000 | 0.5402 *** (4.95) | | 0.2048 ** (2.26) | 0.1893 ** (2.20) | | 0.7831 *** (6.46) | 0.6937 *** (5.29) |
| Lagged Inflation Volatility | -0.0125 *** (-2.93) | | -0.0068 ** (-2.23) | -0.0067 ** (-2.22) | | -0.0049 *** (-2.67) | -0.0048 *** (-6.87) |
| Lagged Exchange Rate Volatility (ERV) | -0.0057 *** (-3.16) | | -0.0034 *** (-2.63) | -0.0033 *** (-2.58) | | -0.0032 *** (-3.02) | -0.0025 * (-1.79) |
| Domestic Credit over GDP | -0.0020 (-0.46) | | -0.0011 (-0.30) | -0.0007 (-0.18) | | 0.0016 (1.09) | 0.0071 *** (4.90) |
| Fuel Exports Proceeds | -0.0067 * (-1.76) | | -0.0030 (-0.95) | -0.0022 (-0.73) | | 0.0075 *** (4.28) | 0.0075 *** (2.79) |
| Surrender of exports receipts | -0.3280 ** (-2.31) | | -0.1930 (-1.50) | -0.1890 (-1.47) | | -0.3005 *** (-2.67) | -0.3145 ** (-2.22) |
| Capital Account Restriction | -0.2168 (-1.25) | | 0.0510 (0.33) | 0.0625 (0.41) | | -0.1853 (-0.96) | 0.0312 (0.13) |
| Fixed effect, South Africa | -0.0369 (-0.05) | 0.7609 (0.88) | 0.2402 (0.27) | 3.09 (1.54) | | | |
| ERV, South Africa Interactive Dummy | | | | -1.0556 * (-1.88) | | | -0.7825 *** (-9.21) |
| Adj R² | 0.80 | 0.80 | 0.83 | 0.83 | | | |
| Sargan test | | | | | 0.98 | 1.00 | 1.00 |
| Serial correllation test (first order) | | | | | 0.00 | 0.00 | 0.00 |
| Serial correllation test (second order) | | | | | 0.32 | 0.54 | 0.91 |
| Number of cross-sections used: | 59 | 68 | 55 | 55 | 68 | 55 | 55 |
| Number of observations | 723 | 1057 | 688 | 688 | 948 | 588 | 588 |

1/ The dependent variable is FDI net inflows as a percent of GDP.
   White heteroskedasticity-consistent t-statistics in parentheses.
  * significant at the 10 percent significance level
 ** significant at the 5 percent significance level
*** significant at the 1 percent significance level

Table 4. Portfolio Flows to Emerging Markets 1/

| | PORTFOLIO | | PORTFOLIO | | DEBT | | EQUITY | |
|---|---|---|---|---|---|---|---|---|
| | OLS | GMM-IV ( 2 step) | OLS | GMM-IV ( 2 step) | OLS | GMM-IV ( 2 step) | OLS | GMM-IV ( 2 step) |
| | (i) | (ii) | (iii) | (iv) | (v) | (vi) | (vii) | (viii) |
| First order Lag Dependent | 0.2579 *** | -0.0819 ** | 0.1475 * | 0.0625 | 0.1106 | 0.1142 *** | 0.2963 *** | 0.1286 ** |
| | (3.40) | (-1.99) | (1.71) | (0.83) | (0.93) | (3.11) | (2.45) | (2.04) |
| Second order Lag Dependent | | | 0.1565 * | 0.0541 | 0.1248 | 0.1516 *** | 0.0940 | -0.0080 |
| | | | (1.81) | (0.97) | (1.14) | (4.14) | (0.86) | (-0.09) |
| Lagged GDP growth | 0.0352 *** | 0.0230 *** | 0.0212 * | 0.0481 *** | 0.0079 | 0.0073 | 0.0037 | 0.0070 * |
| | (2.90) | (2.83) | (1.70) | (3.88) | (0.79) | (0.61) | (0.78) | (1.83) |
| US Treasury Bill Rate 2/ | -0.0973 *** | -0.0900 *** | -0.0388 | -0.0576 * | -0.0508 ** | -0.0578 *** | -0.0092 | -0.0171 *** |
| | (-2.87) | (-5.50) | (-1.24) | (-1.89) | (-2.05) | (-8.72) | (-0.90) | (-3.79) |
| Law and Order | 0.0953 * | 0.4170 *** | 0.1707 *** | 0.3532 *** | 0.0578 | 0.0801 * | 0.0624 *** | 0.0718 *** |
| | (1.60) | (14.47) | (2.45) | (3.61) | (1.11) | (1.70) | (2.57) | (4.88) |
| Lagged Inflation volatility | 0.0097 | -0.0086 *** | 0.0027 | -0.0157 | 0.0174 | -0.0055 | -0.0005 | 0.0021 |
| | (1.11) | (-3.59) | (0.20) | (-0.64) | (1.41) | (-0.52) | (-0.24) | (0.67) |
| Lagged Exchange rate volatility (ERV) | 0.0041 | 0.0082 | -0.0063 | -0.0343 | -0.0299 | -0.0025 | 0.0037 | 0.0022 |
| | (0.27) | (1.50) | (-0.27) | (-1.48) | (-1.40) | (-0.24) | (0.48) | (0.91) |
| Domestic Credit over GDP | 0.0057 | 0.0036 | -0.0039 | 0.0144 * | 0.0003 | -0.0009 | -0.0006 | 0.0027 * |
| | (1.21) | (1.11) | (-0.63) | (-1.87) | (0.09) | (-0.29) | (-0.47) | (1.74) |
| Capital Account Restriction | -0.0317 | -0.2015 | 0.1676 | 0.1162 | 0.0965 | 0.1361 | 0.0395 | -0.0166 |
| | (-0.20) | (-1.10) | (0.87) | (0.24) | (0.56) | (0.23) | (0.62) | (-0.52) |
| Multiple Exchange Rate Practice | | | -0.0403 | 0.2396 | -0.0233 | -0.4020 ** | -0.0158 | 0.0002 |
| | | | (-0.23) | (-1.55) | (-0.13) | (-2.00) | (-0.18) | (0.00) |
| Stock Market Capitalization over GDP | | | 0.0115 *** | 0.0074 *** | 0.0092 *** | 0.0109 *** | -0.0000 | 0.0001 |
| | | | (2.88) | (3.35) | (2.93) | (7.70) | (-0.05) | (0.61) |
| Trade openness | -0.0113 ** | -0.0023 | | | | | | |
| | (-2.33) | (-0.69) | | | | | | |
| Telephone lines per 1,000 | -0.0554 | -0.2022 | | | | | | |
| | (-0.44) | (-1.41) | | | | | | |
| Fuel Exports Proceeds | 0.0014 | 0.0215 *** | | | | | | |
| | (0.20) | (8.78) | | | | | | |
| Surrender of exports receipts | -0.0579 | 0.0884 | | | | | | |
| | (-0.32) | (0.55) | | | | | | |
| Adj R² | 0.60 | | 0.68 | | 0.65 | | 0.60 | |
| Sargan test | | 1.00 | | 1.00 | | 1.00 | | 1.00 |
| Serial correllation test (first order) | | 0.00 | | 0.00 | | 0.03 | | 0.03 |
| Serial correllation test (second order) | | 0.26 | | 0.44 | | 0.29 | | 0.69 |
| Number of cross-sections used: | 40 | 40 | 32 | 32 | 32 | 32 | 32 | 32 |
| Number of observations | 353 | 278 | 232 | 188 | 238 | 196 | 235 | 186 |

1/ The dependent variable is portfolio, bond or equity net inflows as a percent of GDP.
   White heteroskedasticity-consistent t-statistics in parentheses
2/ For regression (i) and (ii), real yield on 10-year US bond was used.
 * significant at the 10 percent significance level
 ** significant at the 5 percent significance level

Table 5. Composition of Capital Flows: FDI Inflows to Emerging Markets as a Share of Total Inflows 1/

|  | OLS (i) | GMM-IV ( 2 step) (ii) | OLS (iii) | GMM-IV ( 2 step) (iv) |
|---|---|---|---|---|
| First order lag dependent | 0.0988 (0.54) | -0.0103 (-0.05) | -0.0574 -0.52 | -0.0942 *** (-2.76) |
| Lagged GDP growth | -0.0218 (-1.27) | 0.0060 (0.19) | -0.0453 (-1.44) | -0.0695 *** (-5.49) |
| Trade openness | 0.0541 (1.32) | 0.0001 (0.00) | 0.0077 (0.49) | 0.0112 * (1.73) |
| U.S. treasury bill rate | 0.1848 (1.24) | 0.0138 (0.23) | -0.0774 (1.04) | -0.0190 (-0.62) |
| Telephone lines | -0.4815 (-1.13) | -0.9189 (-1.27) | 0.0571 (0.30) | -0.0933 (-0.42) |
| Lagged inflation volatility | -0.0207 (-1.13) | -0.0053 (-0.37) | 0.0292 (1.14) | 0.0316 *** (3.17) |
| Lagged exchange rate volatility | -0.0610 (-1.12) | 0.0090 (0.25) | -0.0720 ** (-1.98) | -0.0699 *** (-4.85) |
| Domestic credit over GDP | -0.0231 (-1.13) | 0.0059 (0.24) | -0.0147 (-1.26) | -0.0060 (-0.85) |
| Fuel exports proceeds | 0.0104 (0.95) | 0.0352 (0.99) | 0.0133 (1.11) | 0.0202 *** (5.48) |
| Surrender of exports proceeds | -0.4713 (-0.78) | -0.8869 * (-1.69) | -1.1045 (-1.05) | -1.9749 *** (-7.26) |
| Multiple exchange rate practice | 1.6128 (1.08) | 1.1852 (1.30) | 0.6799 (0.79) | 0.8488 * (1.90) |
| Law and order | -0.0113 (-0.15) | -0.0815 (-0.67) |  |  |
| Capital account restrictions | 0.0372 (0.08) | -0.6852 (-1.00) |  |  |
| Stock market capitalization over GDP | 0.0008 (0.31) | 0.0011 (0.39) |  |  |
| Adj R² | 0.30 |  | 0.19 |  |
| Sargan test |  | 1.00 |  | 1.00 |
| Serial correlation test (first order) |  | 0.11 |  | 0.10 |
| Serial correlation test (second order) |  | 0.72 |  | 0.13 |
| Number of cross-sections used: | 28 | 28 | 39 | 39 |
| Number of observations | 216 | 168 | 395 | 313 |

1/ The dependent variable is FDI, portfolio, bond, or equity net inflows as a percent of GDP.
   White heteroskedasticity-consistent t-statistics in parentheses.
 *  significant at the  10 percent significance level
 **  significant at the  5 percent significance level
*** significant at the 1 percent significance level

Table 6.  Determinants of Capital Flows: Performance Comparison Across Countries

| Factors | Proxies used | Average 1994-2002 | | | Change 1994-2002 1/ | | |
|---|---|---|---|---|---|---|---|
| | | All countries | Comparator Countries | South Africa | All countries | Comparator Countries | South Africa |
| 1. Macro performance | | | | | | | |
| | GDP per capita growth (in percent) | 1.6 | 2.0 | 0.7 | -0.9 | -1.9 | -0.1 |
| 2. Investment environment | | | | | | | |
| | Trade openness (in percent of GDP) | 65.7 | 71.2 | 51.0 | 3.7 | 11.6 | 13.9 |
| | Real exchange rate volatility (std dev) | 3.1 | 2.0 | 2.9 | -1.3 | 0.3 | 2.0 |
| | Inflation volatility (std dev) | 3.7 | 1.1 | 1.7 | -2.0 | -0.4 | 0.5 |
| | Surrender of export receipts index | 0.7 | 0.7 | 1.0 | -0.2 | -0.1 | 0.0 |
| | Capital account restriction index | 0.6 | 0.5 | 1.0 | -0.2 | -0.1 | 0.0 |
| | Multiple exchange rate practice | 0.1 | 0.1 | 0.0 | -0.1 | -0.1 | 0.0 |
| 3. Infrastructure and human capital | | | | | | | |
| | Telephone density (per 1000 people) | 73.0 | 132.8 | 110.7 | 29.4 | 51.9 | 8.7 |
| 4. Quality of institutions | | | | | | | |
| | Law and order index | 3.5 | 3.9 | 2.8 | -0.5 | -0.6 | -1.9 |
| 5. Financial development | (In percent of GDP) | | | | | | |
| | Stock market capitalization | 34.2 | 36.3 | 157.7 | 23.4 | -9.0 | -35.2 |
| | Domestic credit | 32.4 | 62.9 | 127.0 | 3.4 | 9.0 | 21.5 |

1/ Difference between 1994-96 and 2000-2002 averages.

Appendix 1. List of Countries Included in This Study

| North Africa and CFA | Sub-Saharan Africa non-CFA | Asia | Other | Western Hemisphere | |
|---|---|---|---|---|---|
| Algeria | Angola | China | Egypt | Argentina | |
| Morocco | Botswana | India | Iran, I.R. of | Bolivia | |
| Tunisia | Burundi | Indonesia | Israel | Brazil | |
| Benin | Congo, Dem. Rep. of | Korea | Jordan | Chile | |
| Burkina Faso | Ethiopia | Lao People's Dem. Rep | Kuwait | Colombia | |
| Cameroon | Gambia, The | Malaysia | Lebanon | Costa Rica | |
| Central African Rep. | Ghana | Nepal | Turkey | Dominican Republic | |
| Chad | Guinea | Pakistan | | Ecuador | |
| Congo, Republic of | Kenya | Philippines | | El Salvador | |
| Côte d'Ivoire | Lesotho | Sri Lanka | | Guatemala | |
| Equatorial Guinea | Madagascar | Thailand | | Guyana | |
| Gabon | Malawi | Vietnam | | Haiti | |
| Guinea-Bissau | Mauritania | | | Honduras | |
| Mali | Mauritius | | | Jamaica | |
| Niger | Mozambique | | | Mexico | |
| Senegal | Nigeria | | | Nicaragua | |
| Togo | Rwanda | | | Paraguay | |
| | Somalia | | | Peru | |
| | South Africa | | | Uruguay | |
| | Sudan | | | Venezuela, Rep. Bol. | |
| | Swaziland | | | | |
| | Tanzania | | | | |
| | Uganda | | | | |
| | Zambia | | | | |
| | Zimbabwe | | | | |

*Number of countries:*

| 17 | 25 | 12 | 7 | 20 | 81 |

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