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Equity Portfolio Investment in Developing Countries

A Literature Survey

Stijn Claessens

Empirical research about equity portfolio investment in developing countries is needed to facilitate policy decisions about liberalizing capital accounts, reforming financial markets, and coping with the potential volatility of these financial flows.

This paper— a product of the International Trade Division, International Economics Department— is part of a larger effort in the department to study alternative forms of external financing to developing countries. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Rose Vo, room S8-042, extension 31047 February 1993, 25 pages).

Claessens surveys the literature on equity portfolio investment to develop a research agenda that could help developing countries interested in attracting equity portfolio flows.

He finds that a broad literature exists on equity portfolio flows, but that most empirical tests have focused on industrial countries. Although some of the analytical papers may be applicable to developing countries, Claessens identifies areas of empirical research of specific interest to developing countries:

• Identifying barriers that prevent a free flow of (equity portfolio) capital between industrial and developing countries.

• Quantifying the opportunity costs of these barriers in higher risk-adjusted cost of capital and lower flow of capital.

• Analyzing the optimal amount of portfolio investment and the degree to which investors in industrial countries are currently (under-) invested in developing countries.

• Analyzing the efficiency of the various stock markets in developing countries, as inefficient stock markets could be a barrier to foreign flows.

This research could help policymakers in developing countries make decisions about liberalizing capital accounts, reforming financial markets, and coping with the potential volatility of equity portfolio flows.

EQUITY PORTFOLIO INVESTMENT IN DEVELOPING COUNTRIES:

A LITERATURE SURVEY

by

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The World Bank

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EQUITY PORTFOLIO INVESTMENT IN DEVELOPING COUNTRIES: A LITERATURE SURVEY[*]

1.   Introduction

Equity portfolio flows (EPF) to developing countries have increased sharply in magnitude in recent years, especially to the so called emerging countries (World Bank (1992b). See also Howell and Cozzini (1992)). Total EPF to developing countries is estimated to have been $7.3 billion in 1991, and is projected to be $8.2 billion in 1992 (Table 1). EPF is quite concentrated among a small group of emerging countries (e.g., Latin America received over 60 percent of all flows to developing countries in 1992). At the same time, rates of returns on stock markets in developing countries have increased sharply: the IFC composite index for Latin America was up 134 percent in 1991 and over the period 1984-1991 the IFC overall composite index outperformed the S&P500.

Even though still relatively small for developing countries on aggregate (about 6 percent of aggregate net resource flows were equity flows in 1992), these flows are an important source of external finance for some developing countries. Equally important, they have the potential to be a large source of external finance for all developing countries as a small portfolio shift by investors in developed countries can lead to large gross flows. For example, a one-tenth of one percentage point increase in the share of assets held by institutional investors in the US in developing countries would imply about $6 billion in new resources.

EPF has desirable properties in terms of risk sharing between foreign and domestic investors, as repayments are indexed on the performance of the firms concerned. EPF can also lead to a capital structure of firms in developing countries that improves overall managerial incentives and therefore the value of the firms. In addition, EPF can have beneficial effects on the efficiency of domestic capital markets, for instance, by leading to further liberalization and development of domestic securities markets, and thereby further improving domestic resource mobilization and allocation.

EPF can take a number of forms: direct equity purchases by investors in the host stock markets; investments through country funds; issue of rights on equities held by depository institutions (American and Global Depository Receipts (ADRs and GDRs)); and direct foreign equity offerings. In the last three years EPF has largely taken place through ADRs. Next in importance are (closed-end) country funds, followed by direct purchases, and foreign equity

offerings (see Table 1). The volume of ADRs/GDRs issued for equity claims of developing countries is projected to be about $5.6 billion in 1992 and new country funds were created with an aggregated size of $0.6 billion. [1] Direct purchases of equities are projected to be about $1.9 billion in 1992. Direct offerings on foreign capital markets by corporations in developing countries outside the ADR/GDR structure (under Rule 144A in the US) have been minimal.[2]

Table 1: Equity Flows to Developing Countries
(Millions of U.S. Dollars, estimates)

Type of EPF	1989	1990	1991	1992^P	Total 1989-92
Closed-End Funds	$2,123	$2,832	$943	$594	$6,492
ADRs/GDRs	-	$138	$4,902	$5,643	$10,683
Direct Equity	$1,286	$768	$1,454	$1,947	$5,455
Total	$3,409	$3,738	$7,299	$8,184	$22,630

Notes   P = Projected
Source: World Bank (1992b)

The emergence of EPF as an important financial flow to a number of developing countries raises several policy and research questions: for example, what are the return and diversification benefits for an investor in an industrial country of investing in these markets? How well are these markets integrated with the markets of industrial countries, how has this changed over time, and to what extent is it a function of (identifiable) barriers to free capital movements? Have the risk-return characteristics of these markets changed over time, possibly as a result of exchange and trade reforms? What exactly are the barriers (in developing countries as well as industrial countries) which prevent a free flow of funds? What are the opportunity costs--in terms of higher costs of capital and lower flows of funds--associated with these barriers? What are (or can be) the sources (investors) of this type of finance? What is the volume of financing that can be expected through this form (if certain barriers are removed), to which countries, and from which iʳ ˏestors?

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[1] The growth in country funds has slowed down considerably in 1991 and 1992.

[2] Rule 144A, which was adopted in April 1990, allows the placement and immediate resale of privately placed 'non-fungible securities' to so called qualified institutional buyers. Under Rule 144A, non-US issuers do not need to fulfill US registration and disclosure requirements.

Another set of questions is: To what extent is the flow of equity financing a function of factors in the developing countries and to what extent in the industrial countries, e.g., has the recent decline in (US) interest rates been an important "push" or have the improved economic prospects in many emerging countries been "pulling" EPF in? Do these flows represent "hot money"--and call for some form of public action--or do they represent long-term investments? Are there (institutional) factors in industrial countries which cause a "herd" behavior among investors, resulting in an excessive flow of funds to a small set of countries (which may call for public intervention)? Do asset prices overshoot (and/or provide positive feedback) in developing countries as foreign investors (over-)invest in a selected few countries? Does foreign equity ownership give rise to negative externalities which require restrictions or other forms of (public) regulation? Do stock markets in developing countries price domestic securities efficiently? What is the broader role of stock markets in resource allocation and managerial control, and what is the role of foreign investors in this respect? Is there a causal relationship between the extent to which the domestic capital market is integrated with the world capital market and domestic economic performance?

Recent research in these areas with a specific focus on developing countries is scarce.[3] Most research on equity portfolio flows has been concerned with industrial countries. The purpose of this paper is to survey the existing literature and try to develop a research agenda useful for developing countries. The focus of the survey will primarily be on the first set of questions, i.e., the diversification benefits of investing in developing countries, the empirical evidence of capital market integration, and the costs to developing countries of specific barriers. Only tangentially will the paper survey the literature covering the second set of questions, i.e., the sustainability of equity flows, the possibility of "herd" behavior of investors, possible overshooting, and micro (institutional) explanations for investors' behavior.[4]

The remainder of the paper is organized as follows. The section *Analytical Framework* reviews the literature on the motivations for EPF and the relationship between the concepts of diversification and capital market integration. This section provides an overview of the different analytical approaches that have been used to test for diversification benefits and lack of integration. The following two sections *Empirical Tests and Additional Tests* provide the overviews of the existing empirical literature organized along the different approaches identified in the section *Analytical Framework*. The last section concludes.

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[3]Some recent empirical research exist on country funds and ADRs (see Diwan et al. (1992) and Claessens et al. (forthcoming) and references in these papers). Little recent empirical research exist, however, on the direct forms of EPF to developing countries.

[4]This is largely because the analytical framework for addressing some of these questions (e.g., the importance of micro/institutional factors for price determination or the existence of noise traders) is still in a state of development and a generally accepted methodology does not appear to be available yet. For a general survey of the (macro-economic) issues involved with opening up the capital account see Hanson (1992).

2.   Analytical Framework

Diversification

EPF are dependent on a number of factors: the rates of return (and the associated risks) of investing in a developing country's stock market from a foreign investor's perspective (the benefits of diversification); the efficiency of the domestic stock (and other financial) markets; the regulatory, accounting, enforcement, etc. standards in the host country; the different forms of sovereign (or transfer) risk (e.g., capital controls affecting the ability to invest in and repatriate capital out of the host country); taxes and other transaction costs; restrictions imposed on investors in the home country (e.g., restrictions on the share of foreign assets held by pension funds); and other regulatory and accounting standards in the home country. All except the first factor can be called barriers to EPF, leading to imperfectly integrated markets. In the absence of any barriers, capital markets of different countries can be expected to be fully integrated.[5] Following Jorion and Schwartz (1986), barriers can be classified into indirect barriers, arising from differences in available information, transaction costs, accounting standards, etc.; and legal barriers, arising from the different judicial status of foreign and domestic investors, e.g., ownership restrictions and taxes.

The benefits of diversification are stronger across international financial markets than within domestic markets due to the low correlations that characterize equity returns from different countries (see, for example, Jorion (1989) for some OECD countries). For this reason, and independent of whether financial assets are correctly priced at an international level, investors can benefit from going international. This is especially so for investing in developing countries since their stock returns tend to have low correlations with those of industrial countries (e.g., correlations with the S&P500 are seldom above 0.4). Participation in developing countries is thus likely to lower overall unconditional portfolio risk.

Integration

The degree of capital market integration depends on the severity of barriers to capital flows. If markets are integrated, then financial assets traded in different markets, but with identical risk characteri_.ics will have identical expected returns. Alternatively, with barriers, assets in different markets may have different expected rates of returns even when their risk characteristics are the same. The benefits of diversification are related to the degree of capital market integration. For example, in a single factor Capital Asset Pricing Model (CAPM) world,

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[5]Note that integration may be defined with respect to the type of assets, e.g., money markets may be defined to be integrated if expected nominal interest rates are equalized, equity markets if the risk premiums on global risks are the same across all countries etc. Integration in one market does not necessarily imply integration of all other markets. For example, there may exist imperfect intermediation in the domestic markets itself (e.g., between short and long-term markets). For a survey of tests of (real) interest equalization, see Frankel (1992). We do not concern ourselves here with integration as defined in the Feldstein-Horioka sense of (large) net saving imbalances, but investigate instead the equalization of asset prices.

the two concepts diversification and integration are identical (see further Lessard (1973, 1974), Adler and Dumas (1975), Solnik (1974b), Stulz (1981b), and Adler and Dumas (1983) for International Asset Pricing Models (IAPM). Stulz (1984), Stulz (1992) and Solnik (1991) provide a good introduction). In a wr 'd with one source of risk (as measured by an observable benchmark portfolio, i.e., the world index)[6], tests of market integration and benefits of diversification are identical tests as portfolios of stocks in individual countries are priced relative to a single world index in the same way that individual stocks are priced relative to a domestic index (if the domestic capital market were closed). Price deviations which arise from lack of integration amount to unexploited diversification benefits.

In a more complex, multi-factor model the mapping between diversification benefits and market integration is not one-to-one. Even in a fully integrated market where many different risks are priced correctly, additional investment opportunities may still provide better hedges against particular risks and thus diversification benefits.[7] Two markets may ᵤᵤ fully integrated, but investing in both may still provide diversification benefits in terms of lowering (conditional) risk as they have different exposures to world risks. (For example, if US and French firms are exposed to different sources of risks, and if these risks move independently, the expected returns will move independently, even if the two markets are integrated.)

The general difficulty with testing the hypothesis of integration is, however, the need to use a specific model of asset pricing (e.g., using a latent variable ⸺pproach, multiple factors, dynamic, static, etc.). Hence, one doesn't know whether to attribute rejections to the model used or to the lack of integration. The question researchers have attempted to answer instead is whether the returns in different countries are predictable using the same set of (risk) world factors. A finding of common movement of <u>expected</u> returns can then be interpreted as suggestive of integration. Whether the predictability of returns itself is evidence of market inefficiency or time-varying risk premiums[8] is left unresolved as no asset pricing model is specified. A review of these and other type of empirical tests is provided in the section *Empirical Tests*.

Additional Tests

In addition to tests on the pricing of all financial assets, there are other means of testing diversification benefits and integration issues. One test is to explicitly model barriers,

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[6]Note that this world index is uniquely identified if purchasing power parity holds. Otherwise, dependent on the exact assumptions about exchange and inflation risk, investors will hold a mix of a universal portfolio (which itself will include all assets and may include foreign borrowings or lending) with domestic lending. Furthermore, this is only correct for a static CAPM (see further Dumas and Solmik (1992). Note that the singe factor model can be tested using conditional approaches, allowing first and second moments to change through time (Harvey 1991).

[7]While there may still be benefits of diversification--because these markets may provide hedges against specific risks--one would expect the diversification benefits to be less.

[8]Or, peso-problems, regime switches and learning about policy changes.

derive the resulting equilibrium asset prices, and to verify the model using actual asset prices. Another test is to look for actual cross-border holdings and trading of foreign equities. The degree of cross-border-holdings relative to the optimal amount (as indicated by a portfolio allocation model) can then be related to the degree of integration. A very direct way to measure lack of integration is to look for barriers and to find evidence that investors consider these barriers indeed as effective barriers when making portfolio allocation decisions.

The most direct and model-free way to test lack of integration is, however, to study the actual pricing of the _same_ asset in two markets, i.e., to test the law of one price. Differential pricing of identical securities would then imply barriers and lack of integration (risk characteristics are automatically corrected for). Finally, tests on market integration can be performed when there have been announcements of changes in barriers, which can lead to changes in asset prices if barriers were effective previously. These and other tests are described in the section *Additional Tests*.

3.   Empirical Tests

Empirical Tests for Industrial Countries

Empirical tests of capital market integration have thus mostly been joint tests of the hypotheses that markets are internationally integrated and that a particular asset pricing model holds. Most models assume the existence of only a class of homogenous investors, i.e., the tests have calculated rates of return in one numeraire currency (usually the dollar), and have not concerned themselves with the possibility of heterogeneous investors, i.e. different consumption baskets. The particularities of the asset pricing model used have included the use of conditional (using individual country instruments or using common instruments and based on time series techniques) or unconditional returns and/or covariances (Harvey (1991) and Chan et al. (1992))[9]; conditional constant or time-varying betas; currency-hedged (using the forward markets) (Eun and Resnick (1988) and Glen and Jorion (1992)) or unhedged stock market returns (Giovannni and Jorion (1989)); and CAPM-type (single factor, Solnik (1974)) and APT-type models (Cho, Eun and Senbet (1986) and Gultekin, Gultekin and Penati (1989)), and consumption-based asset pricing models (Wheatley (1988)). Non-parametric tests of international capital market integration, i.e., tests whether the law of one price holds for all securities (verifying that one vector of discount factors consistently prices all assets), have also been performed (De Santis (1991)).

The actual empirical evidence on market integration is mixed. Some claim that at least the industrial countries' capital markets are well integrated. Harvey (1991), for instance, finds that a single source of risk adequately describes the cross-sectional variation in risk across different countries (with the possible exception of Japan). He cannot reject the hypothesis of conditional mean-variance efficiency of a benchmark world portfolio using a model that allows for a time-varying price of covariance risk. Wheatley (1988) finds that a consumption based asset pricing model cannot be rejected empirically. Ferson and Harvey (1992) find that a multiple beta model can explain a substantial fraction of the predictable variation in returns in many countries. Campbell and Hamao (1992) find that there is some evidence of common movements in expected returns across Japan and the United States. Roll (1992) finds that much of the different comparative behavior of 24 national equity markets can be explained by the idiosyncracies of the countries' industrial structures, and the behavior of exchange rates. The implication is that the large differences of returns across national equity markets do not necessarily imply lack of market integration.[10]

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[9]These test involve thus conditional and unconditional versions of the Capital Asset Pricing Model (CAPM) to evaluate integration.

[10]There is also a literature on whether stock markets were affected in the same manner during the October 1987 crashes and whether stock markets exhibit high degrees of intermarket correlations (see for instance Kupiec (1990) and his paper for some further references). This literature does not, however, make use of an explicit asset pricing model.

Chan, Karolyi and Stulz (1992) use a bivariate GARCH process to test a conditional, international CAPM using a U.S. portfolio and a portfolio that combines foreign equity returns; when all returns are denominated in U.S. dollars they fail to reject the model. Bekaert and Hodrick (1992) investigate the behavior of excess returns in equity and foreign exchange markets. They find evidence of predictability of excess returns in major equity and foreign exchange markets using common risk factors. While they do not relate this to any explicit, dynamic asset pricing theory, and can thus not distinguish between highly variable risk premiums, peso problems, regime switches, learning about policy changes or other inefficiencies, this does suggest that markets in industrial countries, at least from 1980 onwards, are relatively well integrated.

Others find that it is unlikely that a similar process would generate the required returns in international markets (Cutler, Poterba, and Summers (1990)). De Santis (1991), using results by Hansen and Jagannathan (1991) and Gallant, Hansen and Tauchen (1990), finds that adding securities of a capital market helps in explaining asset returns in another capital market, something that would be contradict full market integration.[11] Bekaert and Hodrick (1992) find that variance bounds tests when considering US and foreign investments are considerable higher than those considering US investments only. While they do not draw any conclusions regarding possible market inefficiencies, this could suggest lack of integration. Stehle (1977) rejects the integration hypothesis using different specifications of mean-variance models.

Grauer and Hakansson (1987) find large gains from diversification and strong evidence of market segmentation in that optimal levels of investment in US securities were mostly zero in the presence of non-US asset categories, contradicting actual behavior.[12] Giovannini and Jorion (1989) reject the mean-variance model using different parameterizations of the conditional second moments for a portfolio that includes U.S. dollars, a basket of foreign currencies and U.S. stocks. Engel and Rodriguez (1989) reject the restrictions of a conditional CAPM when applying a multivariate GARCH process to six aggregate assets (outstanding debt of six countries in the hands of the public).

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[11]De Santis uses their result that observed asset data can be used to derive boundary regions (respectively unconditional and conditional on the set of available information) for the moments of a generally defined stochastic discount factor (pricing operator). He then uses these regions to evaluate the implications for dynamic models of asset pricing. Note that many of these tests make important assumptions: many for instance use nominal instead of real returns or assume that the global investor is a US dollar investor. Furthermore, as noted by Adler and Dumas (1983) and Solnik (1991), in contrast to a domestic market, the global market portfolio is undefined and depends on the risk aversion and wealth parameters of all investors. Only under certain restrictive conditions (such as purchasing power parity or no inflation) can a world portfolio hedged against exchange risk be identified (see also Black (1991), and the responses to his article by Adler and Solnik (1991), Briys and Solnik (1991) and Adler and Prasad (1992)).

[12]The result of the last two tests would probably be interpreted differently today.

In addition to tests on asset prices, researchers (French and Poterba (1991) and Tesar and Werner (1992)) have drawn attention to the fact that actual portfolios of investors in developed countries exhibit significant "home bias", i.e., the shares of domestic securities in the portfolios is much higher than one would expect on the basis of risk/returns tradeoffs and a reasonable level of risk aversion.[13] At the same time, as Tesar and Werner document, turnover ratios of foreign equities appear to be higher than those of domestic stocks, which would contradict any explanation of home bias based on transaction costs. While not necessarily a rejection of integrated capital markets, the home bias does cast some doubt on it.

The home bias is likely even larger for the investments of industrial countries in developing countries: the cumulative inflows of foreign equity investments over 1989-1992 ($23 billion, see Table 1), still represents only 3 percent of a group of 20 emerging countries' stock markets capitalization and only 0.2 percent of all industrial countries' stock markets capitalization. Even if we double this to account for the stock of earlier flows, a significant home bias remains to be explained since most optimal asset allocation models indicate a share of up to 20 percent for developing countries given the low correlations of developing countries stockmarkets' returns with industrial countries.

Empirical Tests for Developing Countries

Availability of data to researchers has so far been limited the research on developing countries largely to the Asian countries (as represented in published data sources such as the Morgan Stanley Capital International (MSCI), Financial Times or Goldman Sachs world indexes): Hong Kong, Singapore and Malaysia have been studied most; some work has been done on the Philippines, South Korea, Taiwan and Thailand (Bailey and Stulz (1990). However, the IFC's Emerging Market Data Base (EMDB) covers a much broader set of data on developing countries' stock markets (e.g., compared to the MSCI for about ten additional countries monthly data on stock indexes and total returns are available from the mid-1980s on), which have not been utilized extensively so far.

Past empirical tests specifically concerned with a large group of developing countries--some of which who have used the EMDB-data base--are Lessard (1973, 1974), Errunza (1983), Divecha, Drach and Stefek (1992), Speidell and Sappenfield (1992), and Diwan et al. (1992b). All papers finds that there are significant diversification benefits from investing in developing countries. Divecha, Drach and Stefek, for example, find that by investing up to 20 percent of an international portfolio in developing countries the risk-return tradeoff of investors can be

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[13]Admittedly, the asset allocation model used to derive the optimal shares could be misspecified. Possibly, differences in consumption baskets, uninsurable (nontradeable) income risk and borrowing constraints, possibly resulting from sovereign risk, can explain this home bias. See the two articles for some further explanations. Cooper and Kaplanis (1991) provide some evidence, however, that the magnitude of the home bias cannot be explained by a model with differences in consumption baskets or deviations from purchasing power parity alone. A model with PPP-deviations and deadweight costs of a few percent per annum can however generate the observed home bias.

Pareto-improved, i.e., the mean-variance frontier shifts significantly upwards. They also document strong industry effects. [14]

4. Additional Tests

Barriers to Portfolio Investment

With barriers to investment, asset prices can not be expected to be equalized across markets. Theoretically, one can identify the effects of certain barriers on equilibrium asset pricing. Black (1974 and 1978), Stulz (1981a), Errunza and Losq (1985), and also Eun and Janakiramanan (1986), and Errunza and Losq (1989)) show how ownership restrictions or taxes may, within the context of a specific asset-pricing model, lead to a certain level or direction of "mispricing".[15] Recently developed asset pricing models (including those separating risk-aversion from inter-temporal substitution) have not yet been adapted to deal with barriers to capital market integration.

The analytical predictions on asset pricing with barriers crucially depend on the type of market segmentation. For example, one type of market segmentation can be when the industrial countries' security markets are well integrated and developing country investors can invest in all these (foreign) security markets but foreign investors can not invest in developing countries. Another type of segmentation can be when the industrial countries' security markets are not integrated and developing country investors can invest in all foreign security markets but not vice-versa. Crucial in both cases is of course whether there is a loss in diversification opportunities from investment barriers or whether the markets that are already integrated offer a complete set of diversification opportunities.[16]

So far, only a few papers have tested empirically for specific barriers to capital market integration. Errunza and Losq (1985) find tentative empirical support for a hypothesis of mild[17] market segmentation. (See also Errunza, Losq and Padmanabhan (1991)).

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[14]This is not surprising since stock markets in developing countries exhibit a much higher degree of concentration, and consequently industry structure is likely much more important in explaining aggregate market returns than for many industrial countries.

[15]More recently Errunza (1991) and Diwan et al. (1992) have investigated the impact of market segmentation in the context of the pricing of country (index) funds (see further below).

[16]A priori, one would expect developing countries to exhibit relatively large degrees of idiosyncratic risks and thus large diversification opportunities. In the presence of barriers, the prices of the different risks would be high in developing countries. Removing the barriers--the "opening up" of a developing country's stock market--can then be expected to lead to an increase in asset prices (a reduction in the risk-adjusted cost of capital).

[17]Defined as a situation where the industrial countries' security markets are well integrated and developing country investors can invest in all these (foreign) security markets but foreign investors can not invest in developing countries.

Indirect tests of market integration have been performed by investigating the effects of international operations on the market value of a firm. Investors who face limited access to foreign assets may benefit from acquiring equity shares of multinationals on their domestic markets. Agmon and Lessard (1977) find that US investors already recognize the international composition of the activities of US based corporations in their risk/return tradeoff and no gains remain. Jacquillat and Solnik (1978) find, however, that investing in the stocks of US multinationals is no direct substitute for international diversification.[18]

Asset-Specific Tests

In addition to tests on stock market indexes, tests of market integration can be performed by comparing the pricing of particular assets with identical risk characteristics in different capital markets. Here one can think of: (closed-end) country funds; individual stocks; American and Global Depository Receipts (ADRs/GDRs);[19] bond, equity, or convertible bond offerings in different capital markets; and joint (inter-) listed securities. Any difference in pricing (not attributable to taxes or transaction costs)[20] would then indicate some form of market segmentation.

As with the models assuming the presence of investment barriers, the theoretical direction and magnitude of the difference in pricing is not always clear. This is also what is observed. Closed-end country funds, for instance, trade at discounts or at a premium compared to their intrinsic asset value (Cumby and Glen (1990) and Diwan et al. (1992b)).[21] Diwan et al. (1992a) show analytically that these discounts or premiums can not be explained by capital inflow restrictions imposed on foreign investors as long as local investors have access to the

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[18]Errunza and Senbet (1981) go one step further and investigate the existence of monopoly rents associated with international operations due to imperfections in all markets (product, factor, financial and differential international taxation). They show that there exists a systematic positive relationship between the current degree of international involvement and excess market value.

[19]ADRs and GDRs are receipts issued by financial intermediaries in industrial countries against shares held in custody by these intermediaries in the developing countries. In essence, ADRs and GDRs are almost identical from a legal, operational, and technical standpoint. The difference lies largely in the way of marketing the DRs; GDRs are issued simultaneously in different markets (U.S. component sold to U.S. investors as ADRs, and European tranche being sold to investors there and listed at the Luxembourg Exchange). GDRs are thus comparable to the World Bank's Global Bonds. At present, ADRs do exist in Europe, but not in Japan (although the Osaka Stock Exchange explored the idea some years ago).

[20]Regardless of lack of market integration, ADRs and GDRs will trade at a discount in industrial countries compared to their intrinsic values due to the capitalization of future transaction costs (custodian fees, foreign exchange conversions costs (bid/ask spreads), financing costs for advancing settlement, etc.).

[21]It should be realized that part of the discount may be due to the closed-end nature of the funds. Closed-end funds in the US typically trade at a discount, albeit at much a much lower discount than the one observed for some of the country funds.

foreign capital markets (and can then short the fund and arbitrage).[22] Eun, Janakiramanan and Senbet (1992) show that discounts as well as premiums on country funds are possible if local investors do not have access to foreign markets. Diwan et al. (1992b) explore these and other explanations empirically for cross-country differences in discounts and premiums.

Capital inflow restrictions combined with international arbitrage restrictions can also lead to discounts or premiums on individual stock prices.[23] Hietala (1989) investigates the pricing of individual Finnish stocks which can be owned by foreign as well as domestic investors (unrestricted) versus stocks which can only be owned by domestic investors (restricted). He finds that the premiums of unrestricted stocks over restricted stocks (of the same company) is solely related to the domestic beta of the restricted stock as the stocks have zero international betas. The premium is less, however, than would be predicted on the basis of the legal restrictions alone, indicating that other barriers were important. See Bailey and Jagtiani (1992) for evidence for Thailand.

Bailey and Lim (1992) and Diwan, Errunza and Senbet (1992b) point out that closed-end country funds may be poor vehicles for diversification compared to investing directly in foreign stock markets since the funds have a much higher correlation with the US market than with their underlying market. This suggests severe barriers as not only the law of one price does not hold, but also the two assets appear to be priced independently.

Price behavior of ADRs allow for straightforward tests of market segmentation--as the law of one price can be tested directly on the prices of ADRs relative to their underlying asset values, very similar to tests performed on country funds.[24] Furthermore, the introduction of an ADR of an individual stock (on a foreign exchange) may influence the price of the stocks

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[22]Arguably, the assumption of unlimited short-sales by the domestic investors of the country fund is akin to assuming perfect access by foreign investors to the underlying assets. Bailey and Lim question the possibility of any short-sales of country fund shares given the widely dispersed ownership. They seek part of the explanation of the different discounts and premiums in the behavior of fund managers who introduce noise. There are some more anomalies in country funds. Two Thai funds, Thai Capital fund (THAC) and Thai Fund (THAI) have very high net asset value correlation (.918 in levels and .912 in log first differences), but, using the prices and dividends of the funds in New York, much lower dollar rate of return correlation (.539). In addition, THAC trades on average at a discount (8%) and THAI at a premium (9%). There are no evident differences in the two funds which could explain this difference.

[23]In addition, Diwan et al. (1992a) identify a large number of other factors that may influence the relative pricing of the funds, including the possibility of increased "noise trading."

[24]Occasionally will ADRs trade at premiums when foreign ownership restrictions become binding. For example, for a period of time the total amount of ADRs issued on TELMEX stock reached a foreign ownership restriction in Mexico, preventing further issuance.

in the home market if it serves as way of removing a barrier.[25] It may also affect the pricing of other stocks in the country to the extent that total systematic risk in the country has declined (i.e., to the extent that the international tradeability of the ADR-stock has lowered its required return, the required rate of return on other, correlated, but non-tradeable securities may also go down. See further Claessens, Eun and Jun (1992)). Similarly, direct offerings of equity or debt in foreign markets may reveal differences in pricing (cost of capital) and thus market segmentation. The most apparent example of this can be the difference in yields on bonds issued by a US company in the domestic market and those issued by the same company in the Euro-market (see Kim and Stulz (1989)).

Dual listings of stocks (apart from listing of ADRs at foreign stock exchanges) can also indicate the presence of segmentation. A theoretical investigation of dual-listing is Alexander, Eun and Janakiramanan (1987) and an application of their model for industrial countries is Alexander, Eun and Janakiramanan (1988). They find some evidence consistent with (mild) segmentation from the behavior of rates of returns of stocks around the period of dual-listing. Jorion and Schwartz (1986) look at stocks that are joint-listed on the Canadian and US stock market and for which they expect no indirect barriers. They reject full market integration between Canada and the US on the basis of the relative pricing of the stocks in each market. They attribute this to legal barriers arising from the different judicial status of foreign and domestic investors. So far, only a few Mexican companies have their stocks joint-listed on the New York (e.g., Vitro) and/or London exchanges, and no similar tests have been done.

Announcements, Domestic Market Efficiency and Barriers

Announcements of changes in barriers allow for a good opportunity to evaluate market segmentation, either at an individual asset level or at an aggregate level. Event studies can, for instance, be done when restrictions on ownership or voting rights are changed. Eun (1990) analyzes the pricing of different classes of Nestlé stocks before and after voting rights are harmonized, and find some changes in the total market value of the firm. Eun and Janakiramanan (1990) find that the announcement of international stock listings affects expected returns. And Bosner-Neal et al. (1990) analyze the effect of changes in international investment restrictions on closed-end country fund prices. They find for some funds a reduction in the price of the fund over its net asset value around the date of an announcement of a liberalization.

Announcements of removal of capital controls can also lead to market wide effects. Gultekin, Gultekin and Penati (1989) find that the removal of capital controls in Japan in 1980 led to an equalization of the price of risks in the US and Japanese stock markets. Diwan and Unal (1992) investigate the effects of announcements of the different phases of the Brady plan

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[25]Even though ADRs still contain country risk, some institutional investors in developed countries will allow them to be counted as domestic (e.g., dollar) investments (in surveys of institutional investors it is generally found that they prefer ADRs over direct purchases of foreign equities). Where this can overcome restrictions placed on foreign ownership (mostly self-imposed through charters and other fiduciary regulations), the ADR-mechanism removes an indirect barrier to integration.

on stock market pricing in Mexico. They find that this period is characterized by large changes in the pricing of the Mexican stocks relative to US market fundamentals leading to more financial integration. In case of Thailand, Taiwan and Korea, Cumby and Khanthavit (1992) find that, from the perspective of an international investor, the risk-return trade-off for stocks has changed over time as a result of increased integration in both financial and goods markets. Given the opening up of many of the developing countries' goods as well as financial markets similar effects on changes in the domestic risk-return tradeoff (or asset values) over time or at the time of specific announcements of liberalizations are likely.

EPF will likely be affected by the efficiency of the domestic stock market. Foreign investors may be discouraged from investing because of certain market inefficiencies. Efficiency can be tested in three ways: weak efficiency (using only past rate of return information, e.g., test of trading rules, autocorrelations, etc.; semi-weak (using all publicly available information); or strong (using all information). Given the evidence of predictability of returns in industrial countries, other tests may be required too. Other tests of stock market performance may also be informative for assessing the attractiveness of a market. For instance, an analysis of the pricing of IPOs in developing countries would be informative also since one may expect the factors explaining the mispricing which have been identified in industrial countries to be even more important for developing countries.

Empirical test of market segmentation require detailed, qualitative information on the barriers to capital flows. Cross-country and events studies can only provide insights on the effect of different and changing barriers (on the cost of capital and the flow of funds) to the extent that barriers can be identified. Overview papers on barriers are the OECD-reports for industrial countries, and World Bank (1992a) and the annual Emerging Markets Factbooks for developing countries. However, many direct barriers cannot be readily identified, something which is confirmed in surveys of investors which bring to light barriers that are not be easily discernable by any formal regulation. Many regulations imposed on institutional investors which are for custodian, fiduciary or financial soundness reasons, may end up being (unnecessary) barriers to EPF. For example, the Dutch pension fund APB is only allowed to invest at most 5 percent of its assets abroad. Another example is that institutional investors in the UK turn over their foreign equity investments before the end of a (restrictive) holding period. In addition, tax rules can present a barrier or distortion.

However, barriers may not always be effective. Investors may find ways around explicitly defined barriers and doing tests using data on explicit barriers may then be misleading. In addition, many barriers do not originate from formal government laws or regulations. For instance, in a survey investors listed the following issues when assessing emerging markets (in order of importance): political stability, management quality, domestic regulations, disclosure requirements and currency risk. On regulatory issues, repatriation requirements, disclosure requirements, settlement systems and accounting standards were mentioned. Another survey listed custody and settlement issues, overall regulatory environment, obtaining research and quality of accounting (see further Broadgate Consultants, Inc., (1991) and Kleiman International Consultants (1991)). Many of these issues have no relationship to formal regulations. In the

end, investors' perceptions and attitudes may thus matter as much as formal barriers, making it difficult to predict what the effects will be of any change in a barrier.

Lastly, it may also be that no securities of corporations in the developing countries have been available which are appropriate to investors in industrial countries, indirectly leading to market segmentation. The emergence of the ADR market has demonstrated that appropriate security design (even though in this case using an existing security design) is important in generating capital flows.[26]

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[26]Diwan et al. (1992a), for example, show that country funds can be attractive to developing countries as they can allow for ownership restrictions without affecting asset pricing efficiency. Regarding sovereign lending, Kletzer, Newbery and Wright (1992) draw attention to designing financial instruments which can deal with default risk for a commodity-exporting developing country.

5.   Conclusions

The above literature overview indicates that a proper analysis of the prospects of EPF, whether to a single developing country or to a group of developing countries, would have to include the following elements.

- An analysis of the <u>direct and indirect barriers</u> in industrial as well as developing countries. Such a qualitative study would document the existence, importance as well as announcements of changes of different direct and indirect barriers as they affect EPF. For the indirect barriers, measures of <u>effective</u> barriers are required and surveys of investors could provide such a subjective classification of barriers. Barriers in the form of fiduciary or regulatory restrictions on foreign investments and other indirect barriers in industrial countries will also be difficult to obtain and drawing on investors' surveys may be necessary here too.

- Empirical studies regarding the <u>risk-return tradeoff</u> in the developing countries market(s) would be necessary to ascertain the attractiveness of investing there. Even when using an asset-pricing model which assumes full integration--where tests thus involve joint hypotheses--a wide range of tests are possible: unconditional tests of diversification benefits (simply measuring h.storical risk/returns and correlations with industrial countries' stock markets); conditional tests (by correcting for the exposure of local stock markets of developing countries to world risk factors); tests which take into account the time variation in asset returns studied (to test whether asset returns in developing countries are predictable in a statistical sense); tests which include the sources of predictability (risk factors) to test whether a multi-factor world asset pricing model holds; and tests of the portfolio performance of a dynamic strategy over a buy-and-hold strategy (to test the economic implications of the predictable variation). All tests can, by studying different time periods, document the degree of integration over time and relate the pricing errors from these tests to any barriers identified.

- Non-parametric tests (variance bounds) tests, are also possible. This would involve testing whether adding securities of individual countries (or their indexes) would alter the information on the stochastic discount factors for assets returns already included in the portfolio.[27] In addition to tests assuming full integration, tests can be performed assuming the existence of (specific) barriers. Given that there are strong

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[27]If two countries are well integrated than adding the securities of the second country to a portfolio of the first country should not alter the stochastic discount factor. Starting from a well-diversified portfolio consisting of industrial countries' securities (or indexes), securities of developing countries could be added consecutively to test if, and by how much, these securities alter the benefits of international diversification. Using measures such as Sharpe ratios, one can identify the countries most likely to be the least integrated, and relate this then back to barriers identified. The advantage of using a variance bound test can be that it requires little parameterization of the model underlying the test.

a priori reasons to believe that developing countries' stock markets are segmented from industrial countries' capital markets, this may help quantify the opportunity costs of lack of market integration (in terms of costs of capital and, possibly, volume of financial flows). This may be done within the context of a very well-specified or more general asset pricing model.

- Home bias tests. Using balance of payments accounts in industrialized and developing countries and other data one can get a rough measure of the extent of foreign portfolio investment in developing countries. The extent of foreign investment in developing countries relative to a benchmark of an optimal or capitalization weighted portfolio will then implicitly give an indication of the barriers that may affect EPF. Also data on international securities transactions combined with rates of return on portfolio investment in developing countries can be used to examine whether adjustments in portfolio are motivated by changes in relative (conditional) rates of return. Simulation techniques may be used to estimate the volume of capital flows implied by changes in the structure of returns over time.[28]

- Asset specific tests of market integration and security design. This could involve testing whether assets are priced differently across markets (or differently across time) as a result of (changes in) barriers. Such tests would likely focus on dual stock listings and straight equity offerings, where little research applicable to developing countries is available.[29] The performance of stocks at the moment of dual-listing and the initial pricing of direct offerings can also be linked to information on type (and/or changes) of identifiable barriers (in or out, ownership restrictions, remittance restrictions, other FX restrictions, restrictions on capital structure, etc.). Security design could investigate what type of instruments are useful for corporations of developing countries.

- Domestic stock market efficiency could be tested. Questions like to what extent is all information available in the domestic market absorbed in individual stock prices, are there any market anomalies, what are the transaction costs, are there any

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[28]French and Poterba (1991) as well as Tesar and Werner (1992) explore this. French and Poterba find that in order to explain the home-bias of investors (high local share compared to, say, a value-weighted portfolio), investors must expect excess returns from their domestic market on the order of 90 basis points for US investors, 250 basis points for UK investors and 400 basis points for Japanese investors. The results by Tesar and Werner are similar in magnitude and direction to the ones reached by French and Poterba.

[29]Some Eastern European firms have dual-listed their stocks on selected Western markets, most notably Hungarian firms on the Vienna Stock exchange. A (small) number of ADRs right on stocks of developing countries are now joint listed in the US, mostly on the NYSE (six) and one on (the over-the-counter market) NASDAQ. Little is known about the relative pricing of these assets on their respective two exchanges and the effect on the cost of capital. Relatively recently, some new equity has been directly issued in industrial countries by corporations from developing countries, largely through the use of Rule 144A (which is essentially a private placement of ADRs), but also through direct (Euro-)equity offerings.

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institutional restrictions on ownership for investors within the country, etc., could be addressed (along the lines of Hawawini et al. (1987) on international stock markets' returns and Van Agtmael (1984) on developing countries).

- Issues of _volatility_ and _effects of government policies_ could be investigated. While opening up a country's securities markets can lead to foreign capital inflows, it can also expose the economy to new sources of risk. Policy makers may in this respect be concerned with the following three aspects (in order of likely importance): effects of foreign flows on stock price behavior (e.g., excessive price movements); macro-economic effects of (possibly volatile) foreign flows (e.g., on real exchange rates); and issues regarding (majority) foreign ownership control. This may lead governments to choose for a less liberal capital account regime. The research here could investigate empirical evidence on (excessive) price and volume volatility for countries which have recently opened up their stock markets or have experienced large EPF (e.g., South Korea, Mexico and Chile). In the absence of a tight analytical framework on the determinants and measurement of "excessive" volatility, this line of research is more likely to provide a number of descriptive statistics on price and investors' behavior surrounding the period of the opening of the securities markets (e.g., turnover ratios, number of traders in the markets, price/earnings ratios), than conclusive rejection or acceptance of a particular model. In addition, this research could explore which policy instruments are the most efficient to overcome some of the identified negative aspects of an open securities market.[30]

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[30]For instance, are there certain forms of policies or regulations that succeed better than others--better in the sense of a lower cost of capital--in mitigating domestic concerns about volatile flows and large foreign ownership?

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