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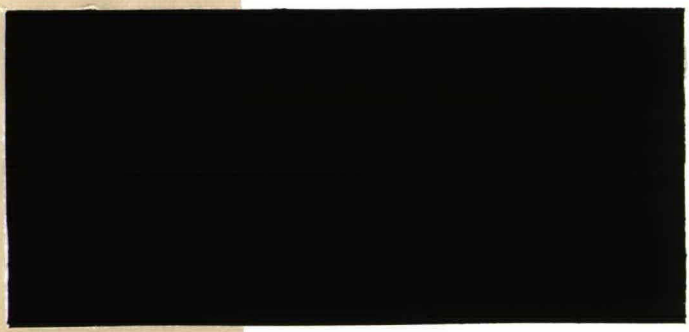

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BARRIERS TO PORTFOLIO INVESTMENTS IN EMERGING STOCK MARKETS

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Abstract

This paper investigates the significance of non-resident taxation and other investment costs in determining equity returns in emerging stock markets. Capital gains taxes on non-residents are shown to significantly increase required pre-tax equity returns, which is consistent with a generally limited creditability of foreign capital gains taxes in the capital exporting countries. Most countries tax inflationary as well as real capital gains, which means that inflation can have an independent positive impact on the required equity return. Required returns are shown to decline with the level of stock market development, as measured by stock market capitalization relative to gross domestic output.

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1. Introduction

The tendency of investors worldwide to hold primarily domestic securities points at the existence of important barriers to international capital mobility[1]. In early efforts to model capital controls, Black (1974) and Stulz (1981) represent barriers to international portfolio investment as proportional taxes on foreign asset holdings. Black (1974) assumes the tax rate is positive for long positions and negative for short positions, while Stulz (1981) instead assumes a positive tax applies equally to all positions. Booth (1987) further examines how the differential taxation of dividends accruing to domestic and foreign residents affects the international ownership of equity capital. As an alternative characterization of capital controls, Eun and Janakiramanan (1986), Errunza and Losq (1989) and Hietala (1989) model investment barriers as prohibitions on particular cross-ownerships of assets.

Empirical work on international capital barriers has generally not identified exactly what capital controls are in place and how they should be expected to affect asset returns. Instead, a general approach has been to construct an international asset pricing model for the case of perfect capital markets, and then to test the restrictions of the model implied by international capital market integration. A rejection of these restrictions is taken as evidence of international market imperfections. Examples of this literature are Stehle (1977), Jorion and Schwartz (1986), Cho, Eun and Senbet (1986), and Wheatley (1988).

Even when specific investment barriers are identified, empirical testing of the impact of these barriers on international asset pricing has proven difficult, as it is difficult to incorporate the cost equivalents of the range of international capital barriers into asset pricing models. The investment restrictions considered by Cho, Eun and Senbet (1986), Bosner-Neal, Brauer, Neal and Wheatley (1990), and Gultekin, Gultekin and Penati (1989), for instance, do not allow for a straightforward computation of tax or transaction cost equivalents. These authors, instead, examine how changes in investment restrictions differentially affect the international pricing of assets and of risk.

The extent to which non-resident withholding taxes affect pre-tax equity returns depends, in part, on whether foreign investors can obtain tax relief in the form of a tax credit or deduction from their national tax authorities. The developed countries, including the United States, generally provide tax relief in the form of a tax credit or deduction primarily for

foreign dividend taxes. Withholding taxes on foreign capital gains taxes, therefore, tend to be final taxes that are borne fully by the foreign investor, for a given pre-tax return. As compensation, the investor requires a higher pre-tax rate of return.

This paper investigates empirically the roles of (i) non-resident taxation and of (ii) proxies of other non-tax investment costs in explaining equity returns in emerging stock markets. As in the work of Black (1974) and Stulz (1981), tax barriers are explicitly incorporated in an asset pricing model, and it is straightforward to relate required pre-tax equity returns to withholding taxes applied to non-resident holdings. Empirically, pre-tax equity returns significantly reflect the variation in non-resident capital gains taxes. Most countries do not index their capital gains taxes to adjust for inflation. Thus inflation by itself increases the capital gains tax base, and the necessary pre-tax rate of return on equity. This paper shows that the taxation of purely inflationary capital gains can indeed have an independent positive impact on the required rate of return on equity in emerging stock markets. Proxies of non-tax investment costs are easily incorporated in the main analysis. Stock market development, as measured by a higher ratio of stock market capitalization to gross domestic product, is shown to reduce required pre-tax rates of return. The data of this study is for 18 emerging stock markets, from the Emerging Markets Data Base of the International Finance Corporation.

The remainder of this paper is organized as follows. Section 2 sets out a mean-variance international asset pricing model that includes non-resident dividend and capital gains taxes. Section 3 describes the data, and section 4 presents the empirical results. Section 5 discusses the paper's implications for (physical) investment and tax policy in developing countries.

2. The model

The model takes the perspective of a U.S. investor. The investor can invest in all developed and developing country equity markets. In addition, the investor can borrow and lend at a risk-free, pre-tax dollar interest rate, R_{rf}.[2] There are no barriers to international portfolio investment other than the possibly double taxation of international equity returns. This section incorporates the main features of the international taxation of a U.S investor's foreign portfolio returns in the mean-variance asset pricing model of Sharpe (1964) and Lintner (1965). The asset pricing model implies that the world portfolio is post-tax mean-

variance efficient from the perspective of a U.S. investor.[3] The accounting for international taxation gives rise to several additional tax burden variables in the standard capital asset pricing equation. Tests of the significance of these variables in the empirical work are at the same time tests of the significance of taxation barriers to international portfolio investments.

The U.S. investor's foreign equity returns are first taxed by the developing country. In particular, country i taxes the U.S. investor's dividends at a (withholding tax) rate τ_i^d, while capital gains, measured in local currency, are taxed at a rate τ_i^c. In calculating the capital gains tax burden, we will assume that capital gains are realized each period.[4] In addition to developing country taxes, the investor is subject to a U.S. personal (or corporate) income tax rate, τ_{us}. The rate rate τ_{us} applies to ordinary dividend income as well as to capital gains. Interest income (expenses) are further assumed to be fully taxable (tax deductible) in the U.S.[5]

The U.S. investor generally can claim a U.S. tax credit for foreign taxes paid to alleviate the burden of double taxation. The U.S. (and other developed countries) tend to offer more generous foreign tax credits for foreign dividend than for foreign capital gains taxes, and even in the former case several limitations may apply.[6] Let γ_c and γ_d generally be the shares of foreign capital gains and dividend taxes paid that are eligible for a U.S. credit. $\theta_c = 1 - \gamma_c$ and $\theta_d = 1 - \gamma_d$ then represent the incidences of the foreign capital gains and dividend taxes on a U.S. investor - for a given pre-tax equity return. For a small country without capital market power, the pre-tax equity return has to rise by the incidence rates times the assessed capital gains and dividend tax burdens to compensate the foreign investor. For a small country, the incidence of any taxes on a non-resident U.S. investor ultimately is on the U.S. Treasury or on the country itself.

Apart from taxes, differences in transaction costs associated with national equity markets can give rise to a variation in (risk-adjusted) net-of-tax equity returns across countries. Let C_i generally denote the dollar transaction costs per dollar invested in equity market i per holding period. This transaction cost consists of a straight brokerage fee or, for instance, of legal expenses necessary to protect the investor's assets. National differences in transaction costs can reflect differences in the quality of the legal and accounting infrastructure.

The starting point of our analysis is the standard capital asset pricing relationship,

$$ER_i^a - R_{rf}^a = \beta_i(ER_m^a - R_{rf}^a) \quad (1)$$

where ER_i^a is the expected dollar return on equity market i after all taxes and transaction costs,[7]

β_i is the post-tax beta,

ER_m^a is the expected dollar return from the world equity market after all taxes and transaction costs,

R_{rf}^a is the after-tax cost of borrowing dollars, given by $(1 - \tau_{us})R_{rf}$.

The foreign country assesses non-resident withholding taxes separately on local currency capital gains and on dividends. Let CL_i and DY_i be the parts of the U.S. investor's dollar return that are subject to the foreign country's capital gains and dividend taxation, respectively. CL_i and D_i are given as follows,

$$CL_i = \left(\frac{I_i - I_{i,-1}}{I_{i,-1}}\right) \frac{e_i}{e_{i,-1}} \quad (2)$$

$$DY_i = \frac{D_i}{I_{i,-1}} \frac{e_i}{e_{i,-1}} \quad (3)$$

where I_i is the local currency price index for equity market i,

e_i is the exchange rate, measured as the dollar price of one unit of foreign currency,

D_i are local currency dividends, paid in market i during the period.

In (2) the subscripts -1 refer to the previous period.

Note that the local currency capital gains variable, CL_i, can be positive if the dollar appreciates, i.e. if $e_i < e_{i,-1}$, even if the dollar price index, $I_i e_i$, remains unchanged or even falls. The capital gains and dividend tax base variables, CL_i and DY_i, are random variables with means ECL_i and EDY_i and random terms ε_i^{cl} and ε_i^{dy}, respectively.

Accounting for the international tax system and transaction costs, we can now express the expected after-tax and after-transaction cost dollar equity return, ER_i^a, in market i as follows,

$$ER_i^a = (1 - \tau_{us})EG_i - \theta_c \tau_i^c ECL_i + (1 - \theta_d \tau_i^d - \tau_{us})\, EDY_i - (1 - \tau_{us})EC_i \quad (4)$$

where,

$$G_i = \frac{I_i e_i - I_{i,-1} e_{i,-1}}{I_{i,-1} e_{i,-1}}$$

The first term on the right hand side of (4) is the dollar capital gain net of U.S. taxes. The second term substracts the foreign capital gains tax, adjusted for the U.S. credit. Expression (4) thus reflects that the U.S. Treasury taxes dollar capital gains, while the foreign treasury taxes capital gains in local currency. The third term is the dividend yield, net of U.S. and foreign taxes, again adjusted for the tax credit. The final term accounts for the net-of-tax transaction costs, where the transaction costs, C_i, are taken to be deductible from U.S. income taxes.

Transaction costs, C_i, in country i generally are determined by a number of country specific factors. Specifically, let us assume that costs, C_i, are affected by a vector of country characteristics, X_i, in the following straighforward linear fashion,

$$C_i = \delta X_i \tag{5}$$

In the empirical work, the vector X_i will consist of country dummies, the rate of inflation, a qualitative index of dividend repatriation restrictions, and linear and squared terms in the $(MCAP/Y)_i$ variable, which is a country's equity market capitalization relative to GDP. The latter variable is demonstrated to be a good index of costs associated with investments in a particular equity market, as reflected in equity returns. The X_i vector is equal to a mean EX_i plus a random vector ε_i^x.

Combining (1), (4) and (5), we can now restate the post-tax asset pricing relationship (1) in terms of pre-tax equity returns as follows,

$$R_i - R_{rf} = \beta_i(R_m - R_{rf}) + \theta_c TAXC_i + \theta_d TAXD_i + \delta X_i + \eta_i \tag{6}$$

where R_i is the before-tax and before-transaction costs dollar return in equity market i,

R_m is the before-tax, but after-transaction costs dollar return on the overall world equity portfolio (with a mean ER_m and a random part ϵ_m),

$$TAXC_i = \tau_i^c CL_i$$

$$TAXD_i = \tau_i^d DY_i$$

$$\bar{\theta}_c = \frac{\theta_c}{1-\tau_{us}}$$

$$\bar{\theta}_d = \frac{\theta_d}{1-\tau_{us}}$$

$$\eta_i = \varepsilon_i^r - \beta_i \varepsilon_m - \bar{\theta}_d \tau_i^d \varepsilon_i^{dy} - \bar{\theta}_c \tau_i^c \varepsilon_i^{cl} - \delta \varepsilon_i^x$$

In deriving (6), use is made of the identity $R_i = G_i + DY_i$. Further, foreign taxes and corresponding U.S. tax credits for the world portfolio are ignored.[8] This implies that $R_m^a - R_{rf}^a = (1 - \tau_{us})(R_m - R_{rf})$. The variables $TAXC_i$ and $TAXD_i$ are the per period foreign capital gains and dividend tax burdens per dollar invested in equity market i. The parameters $\bar{\theta}_c$ and $\bar{\theta}_d$ indicate the extent to which the U.S. investor has to be compensated for these tax liabilities by way of a higher pre-tax rate of return, R_i.

The local currency capital gains tax liability variable, CL_i, represents (approximately) real, dollar capital gains as well as additional inflationary gains. It is, therefore, possible to divide CL_i into separate real and nominal parts, denoted CR_i and CN_i, as follows,

$$CL_i \approx CR_i + CN_i \tag{7}$$

with,

$$CR_i = \frac{I_i/P_i - I_{i,-1}/P_{i,-1}}{I_{i,-1}/P_{i,-1}} \frac{e_i}{e_{i,-1}} \tag{8}$$

$$CN_i = \frac{P_i - P_{i,-1}}{P_{i,-1}} \frac{e_i}{e_{i,-1}} \tag{9}$$

In (8) and (9), P_i stands for country i's goods price index.[9] The variables CR_i and CN_i are assumed to be random variables with stochastic components ϵ_i^{cr} and ϵ_i^{cn}. The division of CL_i into CR_i and CN_i allows us to estimate possibly different incidence rates of the foreign capital gains tax, as applied to dollar and additional inflationary capital gains. In particular,

let $\bar{\theta}_{cr}$ and $\bar{\theta}_{cn}$ stand for the incidence shares of the real and inflationary parts of the foreign capital gains tax on the U.S. investor (for a given pre-tax equity return, and divided by 1 - τ_{us}). After substituting for CL_i from (7) into (6) and allowing for different incidence parameters, $\bar{\theta}_{cr}$ and $\bar{\theta}_{cn}$, we can now rewrite (6) as follows,

$$R_i - R_{rf} = \beta_i(R_m - R_{rf}) + \bar{\theta}_{cr} TAXCR_i + \bar{\theta}_{cn} TAXCN_i + \bar{\theta}_d TAXD_i + \delta X_i + \bar{\eta}_i \quad (10)$$

with,

$$TAXCR_i = \tau_i CR_i$$

$$TAXCN_i = \tau_i^c CN_i$$

$$\bar{\eta}_i = \varepsilon_i^r - \beta_i \varepsilon_m - \bar{\theta}_d \tau_i^d \varepsilon_i^{dy} - \bar{\theta}_{cr} \tau_i^c \varepsilon_i^{cr} - \bar{\theta}_{cn} \tau_i^c \varepsilon_i^{cn} - \delta \varepsilon_i^x$$

Equations (6) and (10) together form the basis for the estimations reported below.

3. The data

The data set consists of monthly observations for the period from January 1987 to April 1992 for 18 developing countries with emerging equity markets. The stock market data is from the Emerging Markets Data Base, compiled by the International Finance Corporation. These IFC indices comprise representative groups of firms and they are value-weighted.[10] The advantage of the IFC indices over other local market indices is their consistency and comparability across countries. The Appendix accounts for all data sources and provides variable definitions.

Summary information on mean stock market returns and related variables is given in Table 1 for each of the 18 countries. The variable R, again, is the dividend-inclusive monthly dollar return. The table shows that dollar rates of return for most countries have been very favorable during the period. Argentina and Brazil, in particular, have experienced monthly dollar rates of return of around 9 and 5 per cent, respectively, for the more than five year period. As discussed before, foreign countries tax capital gains as denominated in their own currencies rather than in dollars. The domestic currency capital gains measure, CL, and its

inflationary part, CN, have also been high, especially for the Latin American countries. The capital gains related variables throughout are computed on the assumption that the gains are realized at the end of each month.

The tax burden variables, TAXC, TAXCR, and TAXCN, measure the monthly dollar tax burdens per dollar invested, associated with the capital gains tax base measures CL, CR and CN, respectively. The tax burden associated with merely inflationary capital gains, TAXCN, is, of course, closely linked to the rate of inflation, INF. The dividend tax burden variable, TAXD, on the other hand, measures the monthly dollar tax burden per dollar invested stemming from the withholding tax on dividends. This tax burden is small for most countries, compared to the capital gains tax liabilities.

The variable MCAP/Y stands for stock market capitalization as a share of GDP. According to this index, equity markets are most important in Malaysia, with a MCAP/Y ratio of 0.91. This figure is similar to the ratio of 0.96 for the United States in 1987.[11] Chile, Jordan, and Korea, also have relatively important stock markets, with market capitalization to GDP ratios close to 0.5.

The variable τ^c is the capital gains withholding tax rate imposed on U.S. investors at the beginning of 1991.[12] The tax rates reflect the bilateral treaties, if any, between the U.S. and the countries with emerging stock markets. Most countries do not index their capital gains tax for inflation, and correspondingly the tax rates underlying the table apply to all nominal gains.[13] The tax rate τ^d is the dividend withholding tax rate for a U.S. investor at the beginning of 1991. Only Mexico, Malaysia, Jordan and Turkey are shown to refrain from taxing U.S. portfolio investment altogether. The developing country withholding tax rates, if positive, tend to be somewhat higher than the (treaty) dividend tax rates imposed on U.S. investors by most developed countries.

Summary data for all countries combined are given in Table 2 by year for the years 1987-1991. The dollar return figures, R and G, confirm that for the sample period, on average, emerging stock markets have performed very well. Interestingly, average market capitalization as a percentage of GDP rose from 15.5 per cent in 1988 to 29.1 per cent in 1991. This development reflects the increasing significance of equity markets in developing countries and the generally large rates of capital appreciation during the period. The average

capital gains withholding tax rate is shown to be rather stable between 12 and 15 per cent during the 1987-1991 period. The average dividend witholding tax rate, instead, has progressively declined from around 20 per cent in 1988 to around 16 per cent in 1991.

4. Empirical results

This section presents tests of whether non-resident dividend and capital gains taxes affect the rates of return in emerging stock markets. From equations (6) and (10), we see that the error terms, η_i and $\bar{\eta}_i$, are contemporaneously correlated across countries, as they have a common market error term, ε_m, multiplied by a country's post-tax beta. In addition, the right-hand-side TAX variables are generally not exogenous to the error terms. The estimation, in this instance, is in three steps. In the first stage, the TAX variables are regressed separately on lagged values and a constant for each country. In the second stage, country betas are estimated. This is done by regressing market returns on world returns, predicted TAX variables, lagged values of the MCAP/Y, $(MCAP/Y)^2$, and DIVREST variables and the INF variable.[14] In the third stage, country specific dummies and month dummies, multiplied by the country-specific betas from the second stage, are added to the regressions. The included predicted TAX variables are as reported for the individual regressions in the tables.[15] In the tables, we reports (third stage) standard OLS errors as well as corrected standard errors, according to White (1980), to adjust for any heteroskedasticity remaining at the third stage.

To start, we estimate the returns equations based on (6) and (10) with the rate of dollar appreciation rather than the dividend-inclusive return, R, as the dependent variable. The reason for this is that the dividend-yield in the data base is not very useful for high inflation countries. In the data base, the dividend yield is computed on a 12 month rolling basis, based on the domestic currency price index at the beginning of the 12-month period. As a result, computed dividend yields are unrealistically high for high inflation countries.

Table (3) presents the regression results. All regressions allow for (unreported) country-specific β parameters and, as indicated, country and time specific fixed effects. The world portfolio return is measured as the average of the dividend-inclusive S&P 500 index and the Morgan Stanley world index. The risk-free, pre-tax dollar return, R_{rf}, is approximated by the

3-months U.S. T-bill rate. The inflation variable, INF, is included in the regression to test for an inflationary impact on equity returns, independent of its implications for an investor's capital gains tax liability. The regressions in columns (1)-(4) are in terms of actual returns, while column (5) is in terms of excess returns. The OLS standard errors and White's (1980) corrected standard errors are in parentheses.

The regression in column (1) represents the base case of equation (6) minus the TAXD variable. The results first indicate that the stock market return is related negatively to MCAP/Y, which suggests that the costs of investing in a country's equity market decline with its market size/GDP ratio. This empirical relationship possibly reflects that a more sizable stock market - relative to GDP - results in higher liquidity and lower brokerage costs. The relationship can also be a reflection of cross-country variation in disclosure rules or other stock market regulations. The regression reported in column (1) also includes a squared MCAP/Y term, with a positive coefficient. This suggests that, at higher levels of stock market development, there are lower marginal benefits of further development in terms of lower required pre-tax equity returns.

The TAXC variable enters positively, with $\bar{\theta}_c$ estimated to be around 3.1. If the U.S tax rate, τ_{us}, is taken to be 1/3, then the corresponding estimate of θ_c is 2.0. The evidence suggests that capital gains taxes levied by developing countries on non-residents are fully reflected in higher pre-tax rates of equity returns.

The DIVREST variable in the regression is a dummy variable that equals one if the country imposes any restrictions on the repatriation of dividends, while it is zero otherwise. The variable enters the regression negatively, which suggests that dividend repatriation restrictions lower the pre-tax return on equity. This may reflect that repatriation restrictions force investors to maintain their investments in the country to a larger extent and longer than is desirable. Trapped dividends are then invested in low return projects, which gives rise to a negative relationship between equity returns and the repatriation restrictions variable. The inflation variable, INF, finally, is insignificant, which suggests that inflation implies no costs to the non-resident investor other than through a possibly higher capital gains tax liability.[16]

Regressions (2) and (3) correspond more closely to equation (10) in the text, with separate capital gains tax liability variables for dollar and other, inflationary capital gains.

The two regressions differ in that regression (2) only includes a linear MCAP/Y term. The $\bar{\theta}_{cr}$ and $\bar{\theta}_{cn}$ parameters are estimated at around 2.8 and 1.8-1.9 respectively, and both are significant. The significance of the $\bar{\theta}_{cn}$ parameter indicates that inflation independently contributes to the capital gains tax liability, as reflected in equity returns.

The asset pricing model of section 2 is special in that it is only a one-period model. As realistic investors operate in a multi-period world, there are two difficulties in interpreting the estimates of θ_c, θ_{cr} and θ_{cn} as incidence shares that do not exist in a single period world. First, the investor's asset holding period does not necessarily correspond to a month. In this instance, the estimated coefficients on the TAXC, TAXCR and TAXCN variables, instead, correspond more closely to the increases during the month, in present value terms, of the capital gains tax liabilities, to be paid at some time in the future. Clearly, the deferment of a tax payment reduces its present value. The postponement of capital gains taxes, therefore, lowers the estimated coefficients, even if it does not influence tax incidence shares. A additional difficulty is that the estimated coefficients can also reflect additional information, obtained during the month, on tax liabilities to be incurred in the future. Higher inflation today, for instance, may generally imply higher inflation tomorrow. If so, the estimated coefficient on the TAXCN variable reflects the tax burden associated with a higher capital gains liability incurred today as well tomorrow. Persistence in inflation thus gives rise to a larger estimated coefficients during an initial inflationary period. These difficulties caution against overinterpretation of the actual sizes of the estimated coefficients.

Uncertainty regarding the timing of liquidation of the investor's assets not only affects the timing of taxes, but also the form these taxes will take. In particular, the longer the investor maintains his position, the larger the share of total returns repatriated as dividends rather than as capital gains. At one extreme, the investor never sells his international assets, and capital gains are never realized. In that instance, all present and future returns will be repatriated as dividends. For this case, the tax liability of an investor incurred during a period can be approximated, as if that period's capital gain are paid out as dividends in that period. For this procedure to be correct, the dividend withholding tax rate has to be constant over time. Let now TAXR be the tax burden incurred during the period on the assumption

that all returns are repatriated as dividends against the present dividend withholding tax rate. In column (4) of Table 3, TAXR enters the regression with the expected positive sign.

Finally, column (5) is as column (2), with the distinction that the dependent variable is the excess return on a developing country stock market, measured as the rate of appreciation of the IFC dollar index minus the 3-months U.S. T-bill interest rate. The results are very similar to those reported in column (2).

To conclude, we present some regression results where the dependent variable is the dividend-inclusive dollar return rather than the dollar rate of appreciation. The sample is now restricted to exclude the high-inflation Latin American countries, as for these countries the dividend yield is calculated with distortion. The regressions, reported in Table 4, inlcude the TAXD variable as an explanatory variable. In other respects, the regressions are exactly as those in Table 3. All the capital gains TAX variables in the table are estimated with positive coefficients and they are significant. The estimated coefficients are large, especially for the TAXCN variable. This could be due to the fact that for the countries in the sample higher inflation serves as a signal of higher inflation in the future, leading to substantially higher nominal capital gains tax liabilities. The sample period under consideration, with extreme fluctuations in some emerging stock market, may also contribute to large estimated coefficients.

The TAXD variable enters the regressions of Table 4 with widely varying esimated coefficients that are not significant. Insignificant coefficients for the TAXD variable are consistent with the reality that non-resident investors generally are able to obtain off-setting tax credits for foreign withholding taxes from their domestic treasury. A further reason for the imprecise estimation is that for the sample period dividends were rather unimportant as a share of the total return due to the growth stock nature of equity investments in emerging stock markets.[17]

5. Conclusion

This paper has examined to what extent features of the international tax system and indicators of transaction costs affect the required rates of return in emerging stock markets. The capital gains withholding tax levied on foreign portfolio investors is shown to increase

pre-tax required rates of return. As countries generally do not index their capital gains taxes, it follows that inflation increases the capital gains tax base, and also the required rate of return on equity. Dividend withholding taxes, instead, appear not to significantly increase pre-tax equity returns. These results are consistent with the generally more generous foreign tax credits available in capital-exporting countries, such as the United States, for foreign dividend taxes than for foreign capital gains taxes.

The return on equity is part of the issuing firm's cost of capital. Capital gains withholding taxes imposed on non-residents will therefore increase the cost of capital for domestic firms, and they can discourage physical investment. Unfortunately, private sector investment levels have tended to be low in developing countries in the 1980s. Relative to earlier periods, the cost of equity finance has gained in importance in developing countries, as these countries' access to international lending capital has proven to be restricted over the last decade.

The results of this paper have some implications for the design of tax policy in developing countries. The existence of wider foreign tax credits for dividend taxes paid, in particular, suggests a country should tax capital gains lightly in comparison to repatriated dividends[18]. This is the policy pursued by Greece, Pakistan, Portugal and Venezuela. Each of these countries has positive dividend withholding taxes but no capital gains taxes imposed on non-residents. Colombia and India, however, do the exact opposite: they tax capital gains heavily compared to dividends. Contrary to what appears optimal, the trend in developing countries is towards lower dividend withholding taxes according to Table 2, with little change in the average level of capital gains taxation. It also appears desirable for developing countries to index their capital gains taxes to prevent them from being higher than anticipated.

While developing countries have not substantially reduced the taxation barriers to foreign portfolio investment, they have taken steps to improve overall foreign access to the domestic equity market in other important ways. Some countries, specifically, have encouraged foreign equity participation through debt equity swaps, and through the establishment of country equity funds. Foreign ownership restrictions and repatriation restrictions on dividend and capital returns have also generally been relaxed over the last decade.

The assertion that capital gains taxes increase the required pre-tax return on portfolio investment in emerging equity markets should hold equally for developed countries. A capital gains tax cut for U.S. equities can, therefore, be expected to lower the required rate of return on U.S. equities, with a concomitant reduction in the cost of capital of U.S. firms.[19] It may be impossible, however, to infer the impact of capital gains taxes on equity returns for a single country, as there is very little variation in the capital gains tax rate. For the developed countries as a group, however, tests similar to those in this paper should be possible.

In addition to taxes, there are other costs to investors associated with international portfolio investments for which they need to be compensated. A country's market capitalization to GDP ratio is shown to be a good indicator of these costs. In particular, international equity returns are negatively related to the equity market's market capitalization to GDP ratio. The data, however, do not enable us to state whether this relationship is due to variation in direct transactions costs, or whether a high market capitalization/GDP ratio reflects favorable equity market practices in the area of accounting practices and other rules and regulations.

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ENDNOTES

1. International differences in consumption patterns and the non-tradeability of human capital point at other possible reasons for investors to hold primarily domestic assets.

2. The U.S. investor is in fact assumed to be invested in the 18 developing country emerging stock markets investigated in this study. In practice, foreign residents frequently invest in country funds. In these cases, it is reasonable to assume that a foreign investor invests in the broader market rather than simply in a limited number of stocks. The values of country funds in 1990 range from around 0.2 per cent of market capitalization for countries such as Korea and Turkey, to 0.6 per cent for Chile and Indonesia, and to 1.0 and 2.0 per cent for Mexico and Thailand respectively. Systematic information on the volume of non-country fund investment by non-residents in emerging stock markets is not available.

3. The implications of the tax systems in the developing countries themselves on equity pricing can be ignored, as the wealth of developing country investors is negligible in comparison to U.S. investors' wealth. The tax systems of the developed countries, other than the U.S., can equally be ignored in so far as these countries' tax treatments of emerging market equity earnings is roughly comparable to the U.S treatment.

4. The limitations of this assumption for the empirical work are discussed in section 4.

5. As the paper is concerned with passive portfolio investments, foreign dividend income is taxed in the U.S. regardless of whether it is reinvested. It is assumed the U.S. investor indeed reports his foreign investment income in the U.S.. If tax is evaded then clearly a credit will not be obtained. Finally, interest is not taxed and cannot be expensed abroad. These assumptions sidestep existing national rules for allocating interest expense to different income sources.

6. U.S. foreign tax credits can only be used to offset U.S. taxes on foreign source income in the same income basket. Credit limitations may be binding more quickly for institutional investors that pay little U.S. tax.

7. The securities that comprise an equity market are taken to be a single asset. This paper, therefore, abstracts from selective investments in foreign equity markets.

8. This is because it is difficult to accurately compute the appropriate withholding tax rates. Transaction costs associated with holding the market portfolio similarly are ignored in the empirical work.

9. In the empirical work, P_i is taken to be the consumer price index.

10. For information on the method of construction of the IFC indices, see the Emerging Stock Markets Factbook 1991, pp. 78-79.

11. The value of U.S. corporate stock at the end of 1987 was 4,315 billion dollars, while U.S. GDP for 1987 was 4,497 billion, with a ratio of 0.96.

12. Capital gains tax rates for domestic residents display a close correlation with those imposed on foreign residents. Nigeria, for instance, has a flat capital gains tax of 20 per cent imposed on residents as well as non-residents. A number of countries, such as Brazil, Chile, Mexico, Venezuela, India and Korea tax capital gains as ordinary income, and hence the marginal tax rate depends on the person's

income level. Chile and Mexico allow for adjustments of capital gains for inflation. Colombia and Turkey distinguish between short term (less than 2 and 1 year(s) respectively) and long term capital gains. Short term capital gains are counted as ordinary income, while long term capital gains are taxed at a lower rate. Argentina has no capital gains tax on marketable securities for residents, even though it taxes capital gains accruing to foreign residents. Malaysia, Portugal and Greece do not tax domestic capital gains. Sources: latest country guides of the 'Doing Business in ..' series of Price Waterhouse.

13. This means that capital gains withholding tax rates for Argentina and Chile for the years 1990-1991 and 1987-1989, respectively, in which only inflation-adjusted capital gains were taxed, are excluded.

14. To be precise, the included TAX variables are TAXC for the regressions underlying Table 3, and TAXC and TAXD for the regressions underlying Table 4. For regression 5 in each of the two tables, betas are obtained by regressing excess market returns on excess world returns.

15. The country and month dummies (multiplied by the betas) estimate random effects as fixed effects. For a discussion of this procedure, see Judge, et al. (1985, p. 537).

16. Some alternative indicators of equity market development such as qualitative information regarding the quality of accounting standards, and the existence of a government agency concentrating on regulating market activity and the extent of investor protection generally proved not to be important in determining stock market returns. These unreported results only demonstrate that these additional indicators of market development do not affect returns on financial capital. The results, however, do not rule out that the indicators are related to the returns on physical investment if they in part reflect the cost structure of the firm.

17. Finally, as mentioned, there are some difficulties is constructing dividend yields in inflationary economies.

18. This is on the assumption that the developed countries will not significantly limit the credibility of foreign dividend taxes after these are raised. The paper has not been concerned with the use of taxes on foreign investors with the aim of exploiting a country's market power. In the presence of such power dividend taxes could equally well be used to the national advantage.

19. Of course, the relationship between the capital gains tax and equity returns is only one aspect of a larger debate that includes the overall distributive implications.

Appendix. Variable Definitions and Sources

Basic variables:

I_i: Foreign currency IFC equity market index

D_i: Foreign currency dividend return on IFC index

P_i: Foreign price index at end of period

e_i: Exchange rate expressed as dollars per unit of foreign currency

τ_i^c: Capital gains withholding tax rate for U.S. investors

τ_i^d: Dividend withholding tax rate for U.S. investors

$MCAP_i$: Equity market capitalization in foreign currency

Y_i: GDP in foreign currency

R_m: World portfolio return in dollars, computed as average of S&P 500 and the Morgan Stanley world index

R_{rf}: Risk-free rate of return in U.S. dollars measured as 3-month U.S. T-Bill rate

$DIVREST_i$: Dummy variable equal to one if the country in any way restricts the repatriation of dividends, and zero otherwise

Derived Variables:

$R_i = \frac{I_i + D_i}{I_{i,-1}} \frac{e_i}{e_{i,-1}} - 1$:

Dividend inclusive dollar return on equity market i

$G_i = \frac{I_i e_i}{I_{i,-1} e_{i,-1}} - 1$:

Rate of appreciation of dollar price index of market i

$INFi = \frac{P_i - P_{i,-1}}{P_{i,-1}}$:

Rate of inflation

$CL_i = \frac{I_i - I_{i,-1}}{I_{i,-1}} \frac{e_i}{e_{i,-1}}$:

Part of the dollar return on equity market i that is subject to capital gains tax in country i

$CR_i = \frac{I_i/P_i - I_{i,-1}/P_{i,-1}}{I_{i,-1}/P_{i,-1}} \frac{e_i}{e_{i,-1}}$ and $CN_i = INFi \frac{e_i}{e_{i,-1}}$:

Parts of CL_i that are due to real and purely inflationary capital gains in country i

$TAXC_i = \tau_i^c * CL_i$:

Capital gains tax in dollars assessed per dollar invested in country i

$TAXCR_i = \tau_i^c * CR_i$ and $TAXCN_i = \tau_i^c * CN_i$:

Parts of $TAXC_i$ due to real and purely inflationaly capital gains

$DY_i = \frac{D_i e_i}{I_{i,-1} e_{i,-1}}$:

Dollar dividend yield

$TAXD_i = \tau_i^d * DY_i$:

Dividend tax in dollars assessed on U.S. investor per dollar invested in country i

$TAXR_i = \tau_i^d * R_i$:

Dividend tax in dollars assessed on U.S. investor per dollar invested if all returns were repatriated as dividends

Data Sources:

$I_t, D_t, e_t, MCAP_t$:

Emerging Markets Data Base, International Finance Corporation

P_t, Y_t, R:

International Finance Statistics, International Monetary Fund

$\tau_t^c, \tau_t^d, DIVREST_t$:

Emerging Stock Market Facts Book, International Finance Corporation, various issues

R_m:

Morgan Stanley, and Standard and Poor

Country	R	G	CL	CR	CN	INF	TAXC	TAXCR	TAXCN	TAXD	MCAP/Y	τ^c	τ^d
Latin America													
Argentina	.094	.094	.206	.055	.178	.246	.086	.024	.044	.000	.019	36	17.5
Brazil	.053	.053	.229	.039	.186	.240	.018	.006	.009	.000	.080	25	25
Chile	.041	.036	.043	.027	.015	.015	.012	.007	.002	.0018	.449	10	10
Colombia	.031	.027	.047	.027	.021	.021	.012	.008	.005	.0006	.033	30	0
Mexico	.052	.050	.057	.034	.022	.022	.000	.000	.000	.0004	.127	0	0
Venezuela	.036	.035	.050	.024	.032	.032	-.000	.000	.000	.0001	.081	0	20
Asia													
India	.029	.028	.042	.022	.008	.008	.013	.009	.003	.0004	.110	40	25
Indonesia	-.018	-.012	-.008	-.023	.008	.006	-.002	-.005	.002	.000	.059	20	20
Korea	.005	.004	.003	-.001	.006	.006	-.001	.000	.000	.0002	.444	0	25
Malaysia	.016	.014	.014	.011	.003	.003	.000	.000	.000	.0003	.931	0	0
Pakistan	.024	.019	.026	.023	.008	.008	.000	.000	.000	.0007	.074	0	15
Thailand	.020	.017	.018	.011	.004	.004	.002	.000	.001	.0006	.259	25	20
Europe/Mideast/Africa													
Greece	.018	.015	.023	.009	.013	.014	.003	.001	.002	.0014	.128	0	42
Jordan	.002	-.002	.010	-.002	.011	.012	.000	.000	.000	.000	.507	0	0
Nigeria	.008	.003	.027	.007	.023	.024	.005	.001	.005	.0009	.035	20	15
Portugal	-.006	-.008	-.007	-.017	.009	.009	.000	.000	.000	.0004	.174	0	25
Turkey	-.009	-.012	.023	-.013	.042	.043	.004	.003	.001	.0003	.091	0	0
Zimbabwe	.002	-.003	.019	.014	.014	.014	.006	.004	.004	.0009	.205	30	20

For variables R, G, CL, TAXC, and TAXD the reported values are means for the period 1988-1992. For τ^c and τ^d 1991 values are reported. The means for the rest of the variables do not include 1992 observations. Variable definitions and sources are given in the Appendix.

Table 2. Emerging Stock Markets -- Descriptive Statistics by Year.

	1988	1989	1990	1991
R	.013	.043	.018	.030
G	.016	.039	.009	.028
CL	.037	.074	.035	.049
CR	.002	.030	.002	.025
CN	.032	.043	.038	.023
INF	.034	.056	.045	.025
TAXC	.006	.016	.006	.011
TAXCR	.001	.007	.000	.006
TAXCN	.004	.008	.002	.003
TAXD	.001	.001	.001	.000
MCAP/Y	.155	.199	.229	.291
τ^c	12.237	13.289	14.778	13.111
τ^d	20.033	19.612	21.700	15.528

Reported are the yearly mean values for the countries in the sample (see Table 1). Variable definitions and sources are given in the Appendix.

Table 3. Rate of Return Regressions for Emerging Markets -- Excluding Dividends.

	(1)	(2)	(3)	(4)	(5)
MCAP/Y	-.316** (.113) (.097)	-.090* (.051) (.038)	-.331** (.112) (.096)	-.288** (.112) (.096)	-.261** (.114) (.096)
$(MCAP/Y)^2$	.181** (.084) (.069)		.201** (.083) (.069)	.159* (.083) (.068)	.167** (.084) (.068)
TAXC	3.064* (.702) (.973)				
TAXCR		2.817** (.689) (.534)	2.817** (.686) (.550)		2.735** (.701) (.614)
TAXCN		1.781** (.445) (.699)	1.897** (.446) (.712)		1.756* (.446) (.734)
TAXR				4.802** (.928) (.901)	
INF	-.188 (.058) (.149)	-.201 (.063) (.153)	-.204 (.063) (.154)	-.066 (.054) (.149)	-.212 (.064) (.163)
DIVREST	-.047** (.016) (.014)	-.049** (.015) (.014)	-.055** (.016) (.015)	-.044** (.016) (.014)	-.055** (.016) (.015)
N.OBS	810	810	810	810	810
R^2	.30	.31	.31	.31	.35

The dependent variable is G, the dollar capital gains rate of return, in specifications 1-4, and the G - R_{rf}, the excess return in the last specification. Not reported above are country and (adjusted) month dummy variables. Regressions also include the world rate of return (excess return in specification 5), with a coefficient that is allowed to vary across countries. The second reported error in parentheses is White's standard error. ** and * indicate that the coefficient is significantly different from zero at 1 and 5 percent levels, respectively, based on White's standard errors. Variable definitions and sources are given in the Appendix.

Table 4. Rate of Return Regressions for Emerging Markets -- Including Dividends.

	(1)	(2)	(3)	(4)	(5)
MCAP/Y	-.453** (.107) (.101)	-.080# (.054) (.049)	-.402** (.106) (.103)	-.447** (.099) (.101)	-.365** (.107) (.102)
$(MCAP/Y)^2$	.272** (.071) (.057)		.248** (.070) (.057)	.267** (.070) (.058)	.218** (.070) (.055)
TAXC	5.016** (1.303) (1.185)				
TAXCR		4.811** (1.239) (1.111)	4.671** (1.223) (1.084)		4.307** (1.242) (1.088)
TAXCN		19.342** (3.935) (5.671)	18.370** (3.895) (5.645)		17.878** (3.928) (5.671)
TAXD	-4.328 (22.508) (22.035)	27.662 (21.960) (22.885)	9.103 (22.309) (22.723)		1.340 (22.546) (22.932)
TAXR				3.953** (1.189) (.981)	
INF	.040 (.246) (.284)	-.152 (.250) (.291)	-.110 (.247) (.294)	-.043 (.245) (.278)	-.121 (.249) (.310)
DIVREST	-.077** (.017) (.021)	-.072** (.016) (.021)	-.078** (.016) (.021)	-.074** (.016) (.019)	-.076** (.017) (.021)
N. OBS	514	514	514	514	514
R^2	.24	.25	.27	.24	.44

The dependent variable is R, the rate of return, in specifications 1-4, and R - R_{rf} , the excess rate of return in the last specification. Not reported above are country and (adjusted) month dummy variables. Regressions also include the world rate of return (excess return in specification 5), with a coefficient that is allowed to vary across countries. The second reported error in parentheses is White's standard error. **, * and # indicate that the coefficient is significantly different from zero at 1, 5, and 10 percent levels respectively, based on White's standard errors. Variable definitions and sources are given in the Appendix.

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