The Impact of Double Taxation Treaties on Cross Border Equity Flows, Valuations and Cost of Capital

Bhavik R. Parikh
Ph.D. Student, Department of Finance, Insurance and Real Estate
Fogelman College of Business and Economics
University of Memphis, Memphis, TN38152-3120
Office phone: (901) 678-4189, Fax: (901) 678-0839
brparikh@memphis.edu

Pankaj Jain
Associate Professor, Department of Finance, Insurance and Real Estate
Fogelman College of Business and Economics
University of Memphis, Memphis, TN38152-3120
Office phone: (901) 678-3810, Fax: (901) 678-0839
pjain@memphis.edu

Ronald W. Spahr
Professor and Chair, Department of Finance, Insurance and Real Estate
Fogelman College of Business and Economics
University of Memphis, Memphis, TN38152-3120
Office phone: (901) 678-1747 or 5930, Fax: (901) 678-0839
rspahr@memphis.edu

March 8, 2011

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Abstract

Bilateral double taxation treaties (DTTs) have become very popular in recent years with over 2,289 treaties in place at the end of 2008. Using a coordinated portfolio investment survey (CPIS) dataset from the IMF, we find that after the creation of DTTs bilateral portfolio investment flows between the treaty countries tends to increase by 48.53%. DTTs are also associated with an increase in equity valuation, and appear to be a factor in lowering the cost of equity capital in the treaty countries by approximately 0.24% per annum. These results are robust in multivariate regression models when controlling for country fixed effects, differences in corporate tax rates and other control variables.

1) Introduction

Globalization of investment portfolios has become increasingly important for both domestic investors seeking to maximize risk adjusted returns and for domestic corporations with an objective of minimizing their cost of capital. Policy makers have begun to recognize effects of globalization and innovation where new financial market technologies and products have lowered logistical constraints and barriers of cross-border transactions. The emergence of new economic players in the global landscape has also stimulated new opportunities for massive cross-border investment flows.

Cross-border transactions can have significant tax consequences for investors. An investor's home country and the investment's host country may both impose different levels of taxation. An important government policy initiative to facilitate inter-country equity investment is the signing of various pacts and treaties such as bilateral Double Taxation Treaties (DTT) with selected countries. In this paper, we investigate whether specific country policies such as the creation of DTTs also known Double Taxation Avoidance Agreements (DTA) facilitate the equity component of foreign portfolio investment.

A number of studies have investigated the effect of DTTs on foreign direct investment, (FDI); however, little work has been done regarding foreign portfolio investment (FPI) flows between countries. FDI involves active managerial participation and purchase of productive assets such as factories, mines and land in a foreign country. FDI explicitly excludes foreign portfolio investments through passive purchase of shares. Thus, FDI and FPI are mutually exclusive. One would anticipate that lower tax rates and treaties design to reduce double taxation of income would stimulate investments both in forms of FDI and FPI because of higher after tax

income; however, Goldstein &Razin (2006) show that there are information based trade-offs between foreign direct investment (FDI) and foreign portfolio investment (FPI).The informational value of FDI poses a possible asymmetric information problem between buyers and sellers of investment projects. As highlighted by Goldstein and Razin (2006), the direct investors information advantage - on where, when and why to invest in particular sectors of the host country - reduces the resale price that a direct investor may get when deciding to exit from the host country. This higher exit cost, due to the difficulty of reselling a firm, implies that only investors that have a low probability of having to resell early will end up undertaking FDI. Foreign portfolios investors, then by default, may be considered as shorter-term investors, for whom higher turnover might make taxes even more important. Another difference between FDI and FPI is the applicability of corporate taxes on the former and capital gains taxes on the latter. Thus DTTs may have a different impact on FDI than equity FPI. To understand the effects of DTTs, we utilize a relatively new data set from the IMF containing each country's reported equity portfolio investment assets held by nonresidents.

We make several contributions to the literature. First, our study focuses on cross border equity foreign portfolio investment as opposed to most previous studies covering only cross border FDI. Our second contribution is the international scope of the paper. Unlike previous single country studies most of which are focused on United States, we use a dataset covering 37 host countries from all continents and 50 source countries. Third, we formulate an event study methodology for new treaties signed between 2001 and 2007 to investigate their effects cross border equity investments. Also, we study differences between host and source country corporate income tax structures, and GDP growth rates to determine their effects on foreign equity portfolio investment. We also focus our attention on the effect of DTTs on valuation of

equity capital using an approach similar to Baker, Foley and Wurgler (2010). However, instead of FDI we test whether an increasing number of double taxation treaties increases stock market valuations. Finally, using a methodology similar to Jain (2005), we study the possible impact of double taxation treaties on the cost of equity capital.

We observe a surge in signing of bilateral double taxation treaties during the last two decades. Using a coordinated portfolio investment survey (CPIS) dataset from the IMF, we find that signing and ratifying of DTTs tends to increase bilateral foreign portfolio investment flows between the treaty countries. During the year that the DTT is signed we observe a 48.53% increase in foreign equity portfolio investment between the two countries and during the second year after the signing of the DTT, we observe an annual increase of 21.34%. Further, equity flows also increase with relative difference in corporate income tax rates between the host country and investing country, where in general, countries with relatively lower tax rates tending to attract increased equity investment from those countries with higher tax rates.

Next, we find that the average price to earnings (P/E) ratio for a country's stock market increases after the country signs DTTs. Improvements in a country's stock valuations subsequent to signing of the DTT may result from a country becoming a more favorable investment destination. Since the P/E ratios are affected by the cost of capital and expected future growth rates, we also examine the impact of DTT on cost of capital, controlling for the differences in growth rates.[1] Cost of capital is reduced by an annualized 0.24% after the signing of DTT.

The remainder of our study is structured as follows: section 2 contains a brief literature review. Section 3 discusses trends and types of double taxation agreements. Section 4 discusses

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[1] P/E = (Dividend/Earnings)/(Cost of Capital – Growth Rate)

data sources and control variables used in our study. Section 5 present research design and regression models. Section 6 provides results and section 7 concludes.

2) Literature Review

A number of studies have investigated the effect of DTTs on FDI; however, little work has been done regarding the effects of DTTs on FPI flows between countries. Since the factors affecting FDI and FPI may have some common features, it may be useful to review the FDI literature; however, there are reasons to believe that DTT's effects on FDI and FPI may also be different.

The previous literature is inconsistent regarding the impact of double taxation treaties on FDI. On one hand, (Dagan 1999) observes that DTTs may provide a positive signal to foreign investors and encourage developing countries to partner and to acquire 'international economic recognition. On the other hand, there is no dearth of studies questioning the effectiveness of DTTs.

The notion that DTTs increase FDI is supported by Barthel, Busse and Neumayer (2009) and Siegmann (2007) who find that countries with higher numbers of double taxation treaties also have higher levels Foreign Direct Investment. Further support is provided by Di Giovanni (2005) who examines cross-border M&A activities. His result suggests that an increase in double taxation treaty activity increases cross border business acquisition by corporations.

Alternatively, Figueroa (1992) argues that taxes do not enter foreign investors' investment decisions, which would imply that DTTs have little or no impact on FDI. Supporting Figueroa's argument, Reuven (2000) states that DTTs are generally unnecessary to prevent double taxation since most countries prevent double taxation unilaterally by exempting foreign income or granting a foreign income tax credit. Dagan (2000) concludes that DTT's function of

preventing double taxation is highly overrated. Davies (2003) examines the effect of treaties and finds that treaty renegotiations have no effect on FDI. Blonigen and Davies (2004) also find that DTTS have no positive effect on inward and outward FDI. Davies, Blonigen (2005) find that old treaties have a positive effect on FDI; whereas, new treaties have no significant effect on FDI. Egger, Larch, Winner and Pfaffermayr (2006) find a negative impact of newly implemented DTTs on FDI. Coupe', Orvola and Skiba (2008) study the effects of both bilateral investment treaties and double taxation treaties on FDI and find no consistent results. Neumayer (2007), estimating the effect of DTTs on FDI for developing countries, finds that middle income developing countries receive higher FDI from the United States as compared to low income developing countries. Generally, we conclude from these studies that the literature is unclear regarding double taxation agreement effects on foreign investments; although, none of the above studies have claimed that DTTs have any harmful effects.

In a recent study, Baker, Foley and Wurlger (2010) show that increase in stock market valuation are accompanied by increases in FDI. They find that FDI flows are positively related to average market-equity-to-book-equity-value (M/B) ratios of publicly traded firms in source countries; whereas, FDIs are unrelated to average M/B ratios of host countries. They also observe that increases in country-wide demand for particular stocks results in an incremental increase in valuation of those same stocks.

On balance, existing literature observed inconsistencies of DTT effects on FDI and firm valuation create an empirical issue which we examine in this paper. Instead of evaluating impacts of DTTs on FDI, we investigate potential economic impacts of DTTs on equity portfolio flows between each of the two countries, the effect of signing DTT's on valuation of each

country's firms, and finally we test for whether signing additional treaties aids in reducing the cost of capital.

3) Tax Treaties, Trends in tax Treaties and Trend in Bilateral Equity Flows

Two primary models, the OECD model and the UN model are referenced with respect to defining and formulating treaties. The OECD model is widely used and followed. The purpose of DTTs is not only to avoid double taxation but also pave a way for the exchange of financial and tax information between treaty countries. Furthermore, treaties also help the countries gain international economic recognition. Generally, the stated objective of bilateral tax treaties is to prevent the burden of double taxation on residents of one country as well as prevent tax evasion by residents of one country when they earn income in another country.

From an economic perspective, there are several advantages and disadvantages pertaining to tax treaties. On the positive side, DTTs serve to standardize taxable income definitions, and identify the jurisdiction of the taxation authorities among the treaty countries. In particular, they are useful in clarifying actual income taxability and reducing related ambiguities. On the negative side, there may be a cost associated in negotiating and ratifying the treaties. Some treaty provisions might conflict with domestic tax laws, curtailing national fiscal sovereignty. On the controversial side, DTTs help in exchange of tax information between tax authorities. Such transparency may compromise privacy and trade-secret protection apart from the desirable consequence of preventing tax avoidance and preventing tax rate shopping. Double taxation treaties have existed for a long time. Initially, only economically advanced countries were involved in signing and ratifying tax treaties.

As seen from Figure 1 there has been a recent significant increase the number of treaties. In 1960 only 71 treaties existed; by 2008, there were over 2,289.

Insert Figure 1about here

Figure (1) also includes the actual number of new treaties signed from 1951 to 2008. On average during 1970's 25 treaties were signed per year which jumped to about 100 treaties per year during the 1990's. In the 2000's signing activity has slowed somewhat, but still a significant number of new treaties were signed each year.

According to Barthel, Busse, and Neumayer (2009), developed countries were involved as a signatory in 74 percent of all DTTs, with either developing countries (38 percent), another developed country (24 percent), or a transition economy (12 percent) representing the contracting partners.

In Figure (2) we have plotted percent increase of equity inflows before and after signing of DTT between treaty countries. We have plotted both actual flow and average flows. On an average flows are increasing by 21.34% on yearly basis. During the year in which the treaty is signed we see there is a surge in equity inflows between treaty countries. In treaty announcement year there is a 48.53% growth in equity inflows as compared to year just before signing where the growth rate is only 12.32%.

Insert Figure 2about here

4) Data Sources and Variable Definition

We obtain the signing dates of DTTs among all countries in the world from the United Nation Conference on Trade and Development (UNCTAD). We use this information to construct the main explanatory variable in our study. First, following Neumayer (2007), we create a binary indicator variable based on the year of signature of the Double Taxation Treaty (DTT); this variable is assigned a value of zero prior to the signing date of the treaty and a value of one after the signing date. Next, we aggregate this information by counting the number of active treaties present in a given month. For Example, the United Kingdom had 99 treaties in January 1999 and 100 in March 1999. Thus, for each country, the DTT count increases by one when it signs a new treaty.

Our three main dependent variables focus on the changes in equity investment inflows, equity valuations, and cost of equity capital for the countries signing the DTTs. Our first dependent variable is based on the equity investment in host countries made by non-resident foreigners from various source countries. Data on this information comes from the Co-ordinated Portfolio Investment Survey (CPIS) conducted by IMF for the years 1997, and 2001-2008. The first CPIS was conducted at the end of 1997, when 29 economies participated. Since 2001, the survey has been conducted annually. For each host country in which the investment is made, the survey reports holdings by investors from approximately 240 source countries or territories. Participants in the CPIS follow definitions and classifications that are consistent with the IMF Balance of Payment Manual (1993).[2] Currently data is available up to 2008. There are approximately 70 countries which provide data on holding of equity securities and debt securities of a given country held by non-residents. We use the logarithm value of equity investments. In

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[2] Despite the standardized guidelines, it is quite possible that different countries may use slightly different approach in determining their portfolio holdings. But out event study approach with country fixed effects ensures the validity of our findings as long as a given country reports the holding using a consistent approach over time.

general, we see a trend that foreign equity held by non residents increased every year from 2001 to 2007; however, in 2008 it declined for most countries. Appendix 1 contains the list of 37 host countries and 50 source countries that can be used in the CPIS related tests because data is available for three years before a DTT is signed as well as three years after a DTT is signed.

Our second dependent variable is equity valuation. Our proxy for valuation is price to earnings (P/E) ratio, which we obtain from DataStream International at monthly frequency from January 1965 to December 2008 for 54 countries. The average price to earnings ratio for all countries is 16.3

Our third dependent variable is cost of equity capital. The proxy for cost of equity capital is return index for each country, downloaded from DataStream at monthly frequency from January 1965 to December 2008 for 72 countries. DataStream has a total market capitalization index for 54 countries and for the remaining countries; we use each country's globally followed index. As examples, for Bahrain we used Bahrain's All Share Index, and for Lebanon we use the Lebanese Stock Market Index. Average market return for each country is approximately 0.8%.

Table 1 includes summary statistics of all dependent and explanatory variables used in the study.

Insert table 1 about here

We include several control variables in our study. For the economic size of each host country, we use the log of its total GDP in nominal USD (LNGDP) taken from World Economic Outlook provided by IMF. We expect country size to have a positive influence on foreign equity portfolio investment.

Corporate tax Rates are obtained from the American Enterprise Institute (AEI) International tax database, which provides tax data for more than 100 countries. To verify our data, we have also compared similar tax rate data from different publications. To control for and estimate the effect of corporate taxes on portfolio equity cross-country flows, we use the tax rate differences between the host and the source country, where investment dollars flow from source country to host country.

We also classify the countries according to their legal origin as defined by La Porta et al (1998). According to their study countries are divided into two sets representing common law countries and civil law countries. Civil law countries are further sub-classified into German law countries and Scandinavian law countries. For our study we classify the countries as those following Common Law, Civil Law or Scandinavian Law. Indicator binary variables for legal origin are in the regression models, where we skip the one category to avoid multicollinearity with the intercept term.

In order to capture the effect of trade imbalances we have considered Balance of payment of each country where data are obtained from the IMF's World Economic Outlook. We standardize the trade imbalance variable by dividing balance of payment of each country by its GDP.

We also control for past and future GDP Growth rate for each country:

$$Past\ GrowthRate_i = \frac{GDP_t - GDP_{t-1}}{GDP_{t-1}} \quad and \quad Future\ GrowthRate_i = \frac{GDP_t - GDP_{t-1}}{GDP_{t-1}}$$

Our growth rate control variable is the difference between the growth rate of the host and source countries for the cross border equity portfolio investment regression. For the P/E ration regression, we focus on the growth rate of the host country alone.

Also included is another binary variable called *Developed,* which takes on a value of 1 if a country is developed and 0 otherwise. The list of advanced economy countries (developed countries) is obtained from the IMF. Next, a dummy control variable labeled *Region* takes the value 1 if the treaty countries are located on the same continent and 0 otherwise. We have segmented countries into five continents only namely North America, South America, Europe, Africa and Asia- Pacific. For the cost of equity capital regressions, we add the World market return from Datastream as a control variable following Jain (2005).

5) Research Methodology

We apply an event study methodology to estimate effects of double taxation treaties on cross border equity portfolio investments, valuation and cost of capital The LN (Equity Investment), cross border portfolio equity investment from each source country to host country, is the dependent variable. The event of interest is the signing date of a treaty between two countries. We defined a binary indicator variable, DTT, that is assigned a value of one after signing date of the treaty between the source country and the host country. It is assigned a value of zero if there is no treaty or the investment takes place before the signing date of the treaty. We control for the size of each host country by using its logarithmic value of GDP.

We subsequently add various control variables that were defined in the previous section as they have been extensively used in previous DTT literature. These variables include balance

of payment divided by GDP to control for trade imbalances, growth rate differences between

host and source countries, and corporate income tax rate differences between the host and source

countries, region dummy, developed dummy, and different legal systems. We use OLS

estimation and country fixed effects and year fixed effects estimation including control variables

as follows:

$$Ln(EquityInvestment)_{ij,t} = \beta_0 + \beta_1 DTT + \beta_2 Ln(GDP)_{i,t} + \beta_3 CorporateTaxRatesDifference_{ij,t}$$
$$+ \beta_4 CorporateTaxRatesDifferenceTaxDifference_{ij,t} * DTT + \beta_5 \frac{BOP_{i,t}}{GDP_{i,t}} + \beta_6 GrowthRateDifference_{ij,t}$$
$$+ \beta_7 Developed + \beta_8 \operatorname{Re} gion + + \beta_{9-11} LegalSystem. + \beta_{12} CountryFixedEffects + \beta_{13} YearFixedEffects$$

$$....(1)$$

To estimate the effect of double taxation treaties on equity valuation, we perform a series

of OLS estimations. As previously discussed, our proxy for valuation is the price to earnings

ratio of country i for time t. Our main explanatory variable is Number of Double taxation treaty

present in a given month (DTTN)

$$P/E_{i,t} = \beta_0 + \beta_1 DTTN_t + \beta_2 \operatorname{Re} turn_{i,t} + \beta_3 GrowthRate_{i,t+1} + \beta_4 Developed \quad............(2)$$

To estimate the effect of double taxation treaties on the cost of equity capital, we use

OLS estimation and country fixed effects. Our proxy for cost of equity is overall ex post stock

market return for a given country and the main explanatory variable is Number of Double

taxation treaty present in a given month (DTTN)

$$CostofCapital_{i,t} = \beta_0 + \beta_1 DTTN_t + \beta_2 Ln(MarketCapitalization)_{i,t} + \beta_3 \frac{BOP_{i,t}}{GDP_{i,t}} + \beta_4 Developed$$
$$+ \beta_5 Gdpgrowth_{i,t} + \beta_6 Countryfixedeffects$$

$$..(3)$$

6.1) Results-DTT Effects on FPI

One of the primary objectives of our study is to determine whether a country's execution of DTTs has an impact on the level on foreign portfolio investment. The results of our OLS model are presented in Table (2). The statistically significant positive coefficient on the DTT variable suggests that the double taxation treaties are associated with an increase in foreign equity investment. A second OLS model controlling for country size by including LN (GDP) displays similar results for DTT where again foreign portfolio investment flows increase after signing a DTT. In model III and model IV we do a robustness check. We control for country fixed effects and year fixed effects and results obtained are similar to results obtained in model I and model II.

Insert table 2 about here

Table 3 examines the joint effects of DTT and corporate tax rates. Corporate income tax rate difference between source and host country are included in model I where a statistically significant negative sign for the coefficient suggests that countries with lower corporate income tax rates attract equity investments from countries having higher corporate income tax rates. Thus investors appear to be sensitive corporate income tax rates to take advantage of potentially higher after-tax dividends and overall risk-adjusted returns. Model II introduces an interaction variable of Corporate tax difference *DTT that is found to be statistically insignificant. In Model III controls Balance of Payments' coefficient is positive and statistically significant. This indicates that countries with positive balances of payment tend to attract more investments than countries having negative payment balances. Differences in GDP growth rates are not statistically significant which would suggest that GDP growth rates may not be a major factor for

investors when investing in another country. In Model IV we control for a Developed Markets Dummy and a Region Dummy. Developed is positive and statistically significant and Region is negative and also significant. Model VI where we include all the control variables together and in Model VII we control for country and time fixed effects. The main explanatory variable of Double Taxation Treaty is still positive and statistically significant which indicates that signing of a treaty results in larger equity flows.

Insert table 3 about here

6.2) Results-DTT Effects on Valuation

Table (4), Model I reports initial, base model, results for the valuation study. Here the dependent variable, a proxy for valuation, is the price/earnings ratios computed for each country as the total market capitalization of all stocks in the country divided by total earnings of all those stocks. Again our main independent variable is the number of double taxation treaties present in each given month. From our base OLS model, DTT is positive and statistically significant indicating that countries having more treaties will have higher price-earnings ratios.

Our second OLS model reported in Table 4 includes additional control variables. The coefficient for our key explanatory variable, DTT, continues to be positive and statistically significant. Developed is positive and significant indicating that advanced economies have higher equity valuation as compared emerging economies. Return is also positive and significant; this is expected as increases in price earnings ratio and positive stock return go hand in hand when earnings are constant. The coefficient on GDP growth Rate is insignificant.

Insert table 4 about here

Results from Model I and II lead us to conclude that higher numbers of double taxation treaties for a country tends to result in higher equity valuation for the firms of that country.[3]

6.3) Results-DTT Effects on Cost of Equity Capital

Now we turn our attention to cost of capital. Table (5), Model I and II reports initial results. Here the dependent variable is monthly returns for each country, which is the proxy for cost of equity. Our independent variable is the number of double taxation treaties which existed in a given month. Model I presents results of a simple OLS estimation, where the sign for the double taxation treaty variable is negative and statistically significant. In Model II, we include country fixed effects and obtain similar results. When compared to Jain (2005), who performed OLS estimation only, we have applied OLS with fixed effects estimations. Similar to Jain's results, our initial results suggests that the cost of equity capital decreases as the number of double taxation treaty increases.

Similar to the previous section (6.2) where we studied the effects of double taxation treaties on foreign equity portfolio investment, we now include more control variables to determine their impact on cost of equity capital. Model III is a simple OLS estimation suggesting that the cost of equity capital decreases with increases in double taxation treaties. World return is positive and significant, consistent with the market model for asset pricing. GDP Growth rates and market capitalization have statistically insignificant. Balance of payment is statistically significant and has a positive impact on cost of equity. Developed is negative and is statistically

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[3]Note that each country's corporate income tax rate is not included in Table (7). This variable was generally insignificant when included in unreported models. We posit that the reason corporate tax rates are unimportant is that P/E ratio implicitly includes corporate taxes in the earnings variable. This suggests that in an economically competitive world, global investors are interested mainly in after-corporate-tax returns. This does not suggest, however, that corporate income taxes are not important for each country.

significant suggesting that cost of capital is lower in advanced economies compared to emerging markets.

Model IV includes country fixed effects and our results are similar with Model I except that the variable "Developed" has now become insignificant. However, the main result that the cost of capital decreases with the signing of more treaties still holds. Other variables retain the same signs as obtained in Model III and same level of statistical significance.

Insert table 5 about here

8) Conclusion

Unlike most of the previous literature focusing on Foreign Direct Investment (FDI), we address the effects of Double Taxation Treaties (DTTs) on foreign portfolio inflows (FPI), equity valuation, and cost of equity capital. We utilize a relatively new data set from the IMF containing reported equity portfolio investment assets in each country's stock that is held by nonresidents.

We have found that DTTs tend to increase FPI by 48.43% in the signing year as compared to average growth rate of 21.34%

We also analyze the joint effects of DTTs and tax rates. We also observe that differential corporate tax rates between investing and host countries also play an important role in cross border flows of foreign portfolio equity investment. Countries with lower tax rates tend to attract investment from countries having higher tax rates. Countries having positive balances of trade will attract higher equity investment than countries having negative balance of trade. All legal systems or frameworks generally encourage foreign investment.

We also analyze the impact of Double Taxation Treaties on equity valuation in each country, where we observe that DTTs result in higher valuation. Developed countries tend to receive higher equity valuation as they attract more equity investment as compared to developing economies.

Our result from the analysis of equity premiums suggests that cost of equity capital declines with the signing of additional DTTs. As more treaties are signed, countries receive more recognition, tax certainty and transparency, which results in increased incremental foreign equity flows which systematically reduced cost of equity.

We dispute studies by Egger et al (2006) and Daggan (2000) who suggest that treaties are not an effective tool for attracting investment but are merely a part of international co-operative tax policy. We find that DTTs create a positive environment for foreign investors to purchase equity securities of stable countries with lower tax rates. As such they have a profound impact on the countries financial market by boosting foreign portfolio investment of equity, which in turn leads to higher price to earnings ratios and a lower cost of equity capital.

In terms of future research we have laid the foundation to study the impact of DTTS on foreign portfolio investment, equity valuation and cost of equity capital. A further study would be to investigate whether DTTs and other control variables have similar effects on foreign debt investments, although that analysis would also need to consider term structure of interest rates and currency exchange rates. Likewise, DTTs could affect the markets for alternative investments such as commodities, real estate, and derivative products.

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United Nation Conference on Trade and Development(UNCTAD) Double Taxation Agreements signing dates,http://www.unctad.org/Templates/Page.asp?intItemID=4505&lang=1

Table 1: Summary statistics

In this table we provide summary statistics from 2001 to 2007 for up to three years before and three years after the signing of a double taxation treaty. LN (Equity Investment) is the logarithmic value of equity investment in millions of dollars in the host country's stock held by the source country investors. DTT is a double taxation treaty is dummy value taking the value 1 after signing of the treaty and 0 otherwise. LN(GDP) is the logarithmic GDP value in billions of dollars for a the host country. Personal Income tax Difference is the between the host and the source country. Corporate Tax difference is the difference between the host and source country. BOP/GDP is the ratio of balance of payment over GDP of the host country. Growth rate difference is the difference each year of GDP growth rate between host and source country. Common Law, Civil Law, Scandinavian Law and German Law are dummy variables which take the value 1 if a country's legal system is classified as any of them or 0 otherwise. Region is also a dummy variable if host and source country lie in the same continent. Developed is a dummy variable which takes the value 1 when a country is classified as advanced economy and 0 otherwise. P/E is the price earnings ratio. DTTN is the total number of double taxation treaty currently present in a given month. Return is a country's total market capitalization index return. Growth rate is one year forward GDP growth rate. Std. dev gives the standard deviation of the variable. Market Cap is the logarithmic value of market capitalization. World Return is the S & P Global Index return

Variable	Observation	Mean	Std.Dev	Min	Max
LN(Equity Investment)	547	18.57	2.84	13.15	27.02
DTT	547	0.39	0.49	0.00	1.00
LN(GDP)	547	26.24	1.59	21.82	30.30
Corporate Tax Difference	547	0.01	0.11	-0.33	0.35
BOP/GDP	547	0.02	0.08	-0.25	0.50
Developed	547	0.80	0.40	0.00	1.00
Growth Rate Difference	547	-0.01	0.12	-0.29	0.76
Common law	547	0.30	0.46	0.00	1.00
Civil Law	547	0.40	0.49	0.00	1.00
German law	547	0.17	0.38	0.00	1.00
Scandinavian Law	547	0.13	0.33	0.00	1.00
Region	547	0.44	0.50	0.00	1.00
P/E	14895	16.3070	11.6411	0.6	747
DTTN	14895	39.2414	24.0441	0	111
Return	14895	0.0067	0.0775	-0.6275	0.77008
Growth Rate	14895	0.0832	0.1191	-0.62	0.51
Market Cap	13220	24.66484	2.19963	19.41	30.62
World Return	13220	0.00247	0.04559	-0.2259	0.1358

Table 2: Initial results on DTTs impact on portfolio investments

In this table we provide initial results. LN (Equity investment) is the dependent variable. DTT is a double taxation treaty is dummy value taking the value 1 after signing of the treaty and 0 otherwise. LN(GDP) is the logarithmic GDP value of the host country. In parenthesis are the reported t-statistics. *** indicates statistical significance at 1% level

Variable	I	II	III	IV
Intercept	18.21***	1.32	23.51***	-3.57
	(113.95)	(0.55)	(20.68)	(-0.22)
DTT	0.89***	0.67***	0.6***	0.44*
	(3.66)	(2.90)	(2.80)	(1.84)
LN(GDP)		0.65***		0.9*
		(-8.07)		(1.70)
Country Fixed Effects	No	No	Yes	Yes
Time Fixed Effects	No	No	Yes	Yes
Number of observation	547	547	547	547
Adjusted R Square	0.02	0.15	0.5023	0.5038

Table 3: Joint effects of DTT and corporate tax rates on foreign equity portfolio investments

In this table we present estimates from OLS regression as shown in equation2. LN (Equity investment-$ millions) is the dependent variable. DTT is a double taxation treaty indicator variable taking the value 1 after signing of the treaty and 0 otherwise. LN(GDP-$ billions) is the logarithmic GDP value of the host country. Corporate Tax rate difference is the difference between the host and source country. BOP/GDP is the ratio of balance of payment over GDP of the host country. Growth rate difference is the difference of GDP growth rate each year between host and source country. Common Law, Civil Law, and German Law, are indicator variables which take the value 1 if a country's has the respective legal system. Scandinavian law category is omitted to avoid perfect multicollinearity with the intercept. Region is also a dummy variable which is equal to 1 if the host country and the source country are from the same continent, and it equal to zero if the two are from different continents. Developed is a dummy variable which takes the value 1 when a country is classified by IMF as an advanced economy and 0 otherwise. In parenthesis are the reported t-statistics. *** ** * indicates statistical significance at 1%, 5% and 10% levels, respectively.

Variable	I	II	III	IV	V	VI	VII
Intercept	-0.79	-0.88	-0.75	2.25	6.02**	5.96**	-10.79
	(-0.35)	(-0.39)	(-0.33)	(0.93)	(2.4)	(2.37)	(-0.9)
DTT	0.63***	0.64***	0.63***	0.67***	0.77***	0.78***	0.42*
	(2.76)	(2.78)	(2.77)	(3.00)	(3.58)	(3.57)	(1.79)
LN(GDP)	0.73***	0.73***	0.72***	0.58***	0.35***	0.35***	0.84
	(8.36)	(8.32)	(8.19)	(6.24)	(3.52)	(3.53)	(1.58)
Corporate Tax Difference	-3.4***	-3.1***	-2.95***	-2.88***	-2.00**	-1.77	1.52
	(-3.51)	(-2.76)	(-3.04)	(-2.95)	(-2.09)	(-1.63)	(1.21)
Corporate Tax Difference*DTT		-0.95				-0.62	0.78
		(-0.51)				(-0.34)	(0.46)
BOP/GDP			3.5**	3.53**	3.67***	3.68***	-0.28
			(2.21)	(2.4)	(2.69)	(2.7)	(-0.1)
Growth Rate Difference			-0.52			0.22	2.12***
			(-0.55)			(0.24)	(2.68)
Developed				1.13***	1.76***	1.77***	4.83*
				(4.18)	(6.07)	(6.02)	(1.94)
Region				-0.47**	-0.41*	-0.41*	0.68
				(-2.05)	(-1.81)	(-1.77)	(2.93)
Common					2.59***	2.6***	3.92*
					(8.21)	(8.23)	(1.79)
Civil					1.57***	1.57***	2.93
					(5.31)	(5.27)	(1.17)
German					2.09***	2.1***	2.27
					(5.50)	(5.59)	(1.19)
Country Fixed Effects	No	No	No	No	No	No	Yes
Time Fixed Effects	No	No	No	No	No	No	Yes
Number of observations	547	547	547	547	547	547	547
Adjusted R Square	0.17	0.16	0.17	0.19	0.25	0.25	0.51

Table 4: Results for on impact of Double Taxation Treaty on Price to Earnings ratio with addition of control variables

In this table we provide results for valuation study. Our dependent variable is Price to Earnings ratio of total market capitalization index which is a proxy for valuation of equity. DTT is the total number of double taxation treaty currently present in a given month is the main independent variable .Return is a country's total market capitalization index returns. Growth rate is one year forward GDP growth rate. Developed is dummy variable taking the value 1 if it is an advanced economy and 0 otherwise. In parenthesis are reported T Values. The standard errors are white heteroscedastic standard errors. *** indicates significance at 1% level

| Parameters	I	II
Intercept	15.5886***	15.1452***
	(62.05)	(51.53)
DTTN	0.0183***	0.0176***
	(3.96)	(4.41)
Return		16.9944***
		(2.98)
Growth Rate		-0.4726
		(-0.75)
Developed		0.5839***
		(2.71)
No of Observation	14982	14895
Adjusted R Square	0.0014	0.0155

Table 5: Results of Impact of Double Taxation Treaty on Cost of Equity with addition of control variables

In this table we provide initial results. Return on total market capitalization index which is the proxy for Cost of capital is the dependent variable. DTT is the number of double taxation treaty existing in a given month.GDP growth rate is defined as the ratio of difference between present Gross Domestic Product and previous year Gross Domestic Product over previous year GDP. Market Cap is the logarithmic value of market capitalization. BOP/GDP is the ratio of balance of payment over gross domestic product. World Return is the S & P Global Index return and developed is a dummy variable taking a value 1 for developed countries as classified by IMF and 0 otherwise. In parenthesis are the reported t-statistics. The standard errors are heteroscedastic white standard errors. ***, ** indicates statistical significance at 1% and 5% level respectively

| Parameters	I	II	III	IV
Intercept	0.01148***	0.00356	0.00471	-0.07257**
	(9.5)	(0.59)	(0.52)	(-2.50)
DTTN	-0.00011***	-0.00020***	-0.00008**	-0.00051***
	(4.37)	(-5.25)	(-2.52)	(-6.41)
World Return			0.73723***	0.72953***
			(41.08)	(40.5)
BOP/GDP			0.03247***	0.10883***
			(3.81)	(6.1)
GDP Growth			-0.00712	-0.01293
			(-0.52)	(-0.9)
Market Cap			0.00033	0.00418***
			(0.85)	(3.31)
Developed			-0.00625***	-0.00139
			(-3.9)	(-0.13)
Country Fixed Effects	No	Yes	No	Yes
No of Observations	18202	18202	13220	13220
Adjusted R Square	0.001	0.0042	0.1628	0.1679

Figure 1

In figure 1 we plot cumulative number of treaties which existed from 1951 to 2008. Cumulative Treaties is represented by a solid line graph. The Bar graph represents number of new treaties signed each year from 1951 – 2008.

Double Taxation Treaties Trend
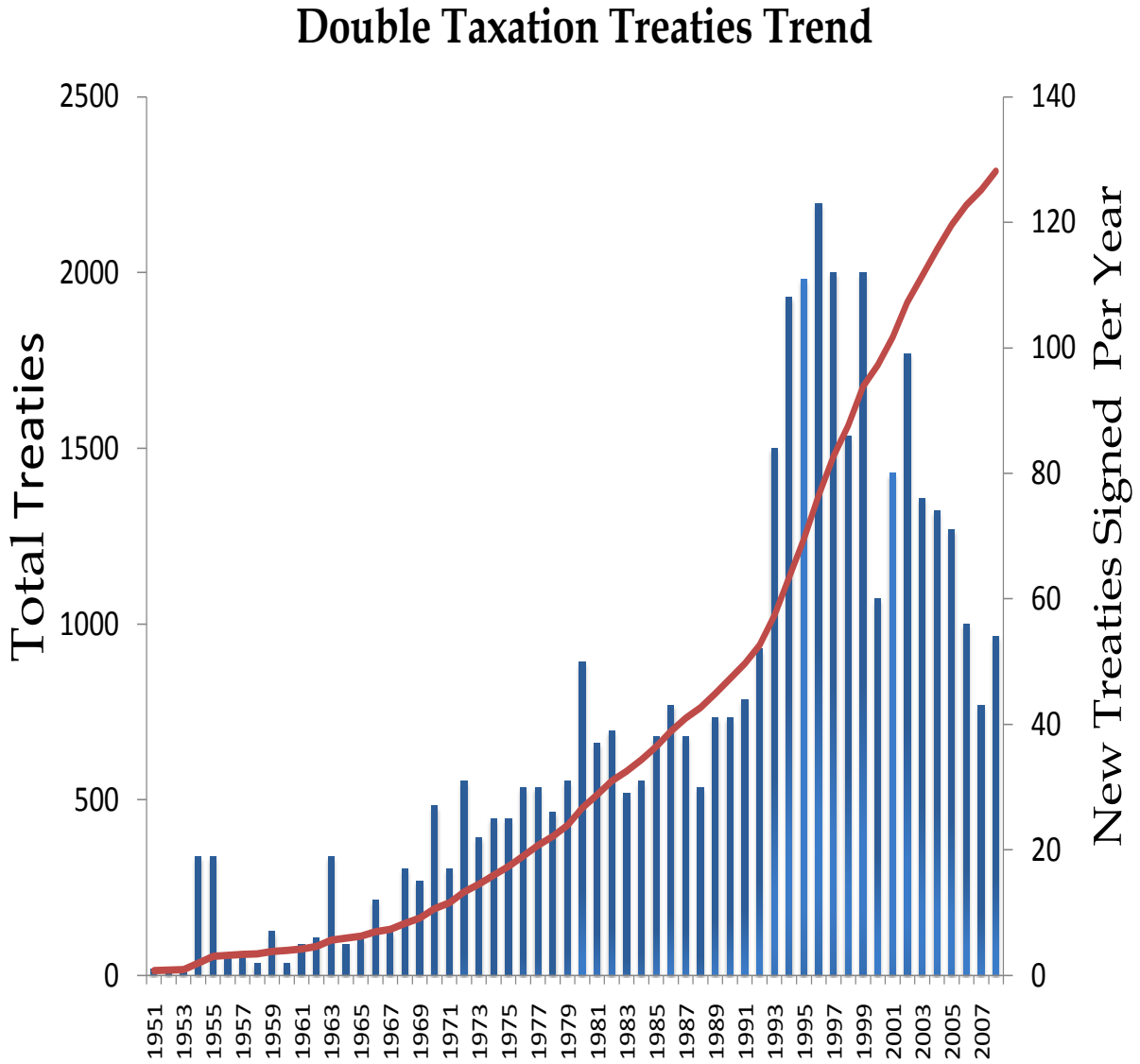
Figure 2

In figure 1 we plot growth rate of equity flows before and after signing of Treaties. Blue Bar represents the percent increase of equity inflows on a yearly basis whereas the red bar indicates average percent growth rate of equity flows

Percent Increase in Equity Portfolio Inflows(FPI)
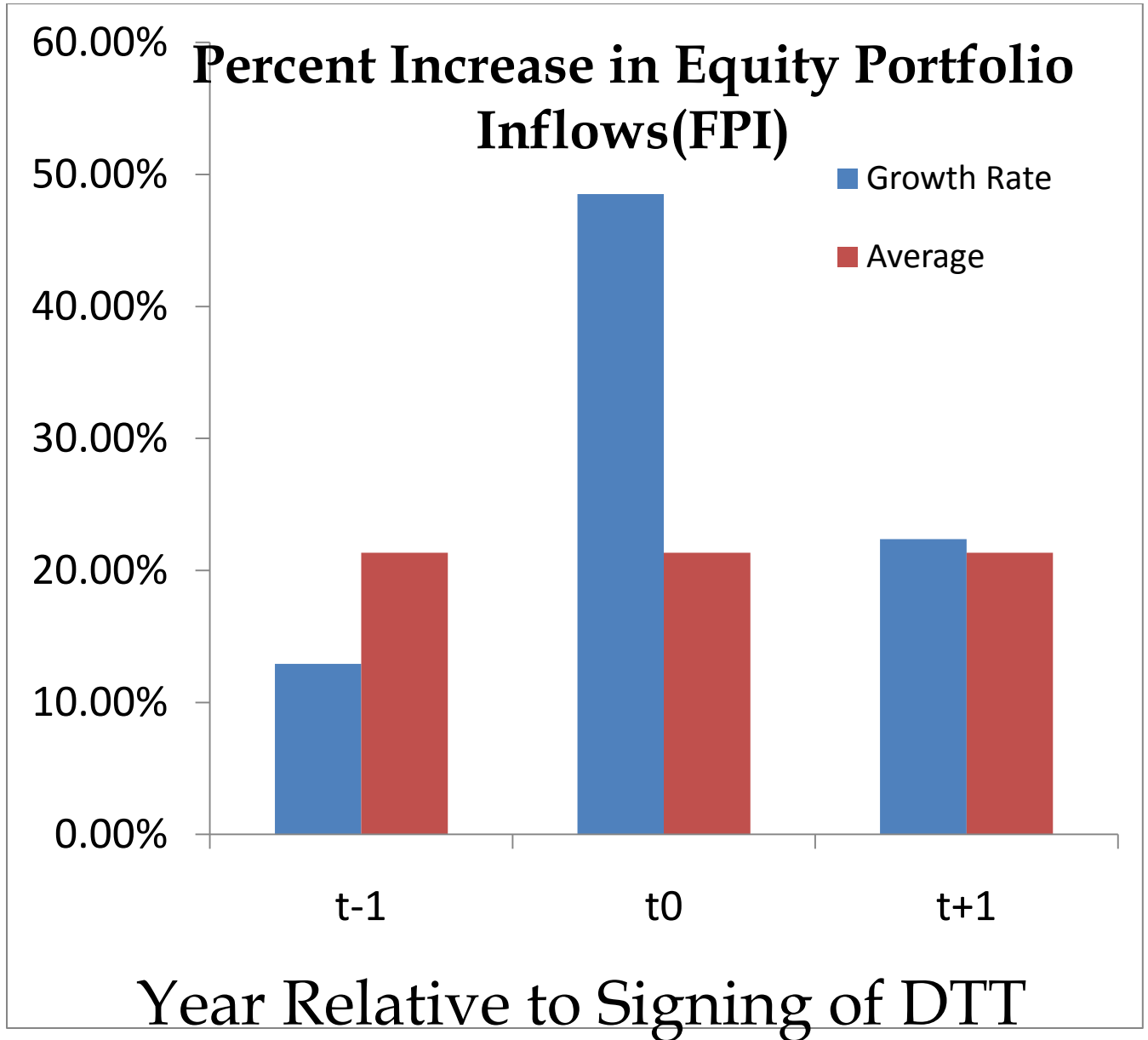
Appendix 1:

List of Host Countries

Australia, Austria, Bahrain, Barbados, Belgium, Canada, Chile, Czech Republic, Denmark, Finland , France, Germany, Greece, Hong Kong, Iceland, Ireland, Israel, Japan, Kazakhstan, Kuwait , Lebanon, Luxembourg, Malaysia, Mauritius, Netherland, Norway, Poland, Portugal, Singapore, South Africa, South Korea, Spain, Switzerland, Sweden, Thailand, Turkey, United Kingdom, United States of America

List of Source Countries

Argentina, Austria, Bahrain, Belgium, Brazil, Bulgaria, Canada, Chile, China, Colombia, Croatia Czech Republic, Estonia, Finland, France, Germany, Greece, Hong Kong, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Kazakhstan, Latvia, Luxembourg, Malta, Mexico, Netherland, New Zealand, Peru, Poland, Portugal , Romania, Russia, Saudi Arabia, Seychelles, Singapore, Slovak Republic, Slovenia, Spain, South Africa, South Korea, Switzerland, Sweden, Thailand, Turkey, United Kingdom, United States of America