Global Financial Integration and Real Estate Security Returns

Ashok Bardhan
Haas School of Business, University of California at Berkeley

Robert Edelstein
Haas School of Business, University of California at Berkeley

Desmond Tsang
Desautels Faculty of Management, McGill University

Abstract: Has increasing global economic and financial integration affected the rates of return of publicly traded real estate companies around the world? Using a set of multi-factor models for annual data for 946 firms from 16 countries over the sample period, 1995-2002, we estimate the impact of a country's economic openness on returns of publicly traded real estate firms, controlling for the effects of global capital markets, domestic macro-economic conditions, and firm-specific variables. We find that a country's real estate security excess (risk-adjusted) returns are negatively related to its openness. The results are robust across different multi-factor model specifications, and are a testament to increasing global financial integration and its interplay with the real estate sector.
.

Key Words: (Journal of Economic Literature Classification Codes F36, F21, G15) globalization, economic openness, international financial markets, real estate returns, international financial integration.
Corresponding Author: Robert Edelstein
Institutional Affiliation: Haas School of Business, University of California at Berkeley
Address, Phone, Fax & Email: F 602, Haas School of Business, UC Berkeley CA 94720; Tel. 510-643-6105; Fax: 510-643-7357; email: edelstei@haas.berkeley.edu

Global Financial Integration and Real Estate Security Returns

Abstract: Have globalization and increasing economic and financial integration affected the rates of return of publicly traded real estate companies around the world? Using a set of multi-factor models for annual data for 946 firms from 16 countries over the sample period, 1995-2002, we estimate the impact of a country's economic openness on returns of publicly traded real estate firms, controlling for the effects of global capital markets, domestic macro-economic conditions, and firm-specific variables. We find that a country's real estate security excess (risk-adjusted) returns are negatively related to its openness. The results are robust across different multi-factor model specifications, and are a testament to increasing global financial integration and its interplay with the real estate sector.

1. Introduction

Increasing global integration of financial and economic activities might be expected to impact real estate investors and markets. Free trade treaties and the expansion of the World Trade Organization have promoted international trade and investment flows, and have caused structural shifts across national boundaries for the demand for inputs, including real estate. In the financial markets, burgeoning real estate securitization and the changing real estate financial system have generated intense international investor interest. Global integration has had impacts via real and financial markets upon the pricing of and investment in local assets. Since real estate companies invest in real properties and are themselves real estate investment vehicles for other investors in international financial markets, it is natural to examine the overall effect of globalization on real estate companies, despite the "localness" of real estate.

The key issue explored in this paper is: Has increasing integration and globalization of economic-financial markets affected real returns for publicly traded real estate companies? The implied interplay between globalization and real estate markets remains, surprisingly, relatively uncharted territory, with notable exceptions mentioned later. Our objective is to develop an empirical model to estimate the impact of trade openness on international real estate company stock returns, while controlling for the effects of global capital markets, national economic conditions and firm-specific characteristics.

Our analysis contributes to and extends the existing understanding of international real estate in several different ways. First, our statistical results examine the responsiveness of

real estate returns to global and local economic conditions. While the relationship between economic activity and common stock returns has been explored, in an era of enhanced globalization one might expect global, as well as national and local economic shocks to have significant impacts on stock returns. The Asian Financial Crisis in 1997, and the concomitant collapse of real estate markets in Hong Kong, Singapore, Thailand, Malaysia and South Korea, illustrates that global economic shocks can have interactive contagion effects across clusters of economies and various asset markets. As a different example, U.S. Real Estate Investment Trusts appear to behave as small capitalization stocks, and are highly correlated with U.S. national, regional and local economic activities.

Second, our empirical results suggest a connection between global shocks and prices of local "non-tradable goods".[1] Since the real estate industry sector concentrates on developing, owning and/or operating "non-tradable" long term real estate assets, these firms assess the impact of global factors on real estate as being indirectly mediated through local domestic economic conditions, and typically are unable to respond rapidly to international shocks. To our knowledge, this is the first research effort to focus on the *explicit* relationship between economic measures of globalization and real estate returns. The inclusion of economic openness (and other related variables) in our statistical analyses generates an important set of tests about the impact of globalization on a country's real estate sector, typically the largest non-tradable sector in an economy.

[1] Non-tradable goods and assets are those that are not exportable or importable, and are essentially domestically produced and consumed.

Third, we analyze the interaction of local real estate and global impact through the prism of international capital flows and the perspective of an international portfolio investor. Our results provide evidence about the efficiency and appropriateness of the Capital Asset Pricing Model (CAPM). The lukewarm empirical performance of the Capital Asset Pricing Model has led some researchers to favor the Fama and French Factors approach for explaining risk premia; however, for our sample of real estate firms, the Fama and French approach does not outperform the CAPM.

The plan of the paper is as follows. The next section provides a description of the transmission mechanisms through which increasingly integrated financial and economic activities may affect the real estate sector. The third section is a selective review of the international real estate literature. The two subsequent sections present our empirical methodology, followed by a short description of our database. The sixth section presents and interprets our statistical results. The last section offers concluding remarks.

2. The Transmission Mechanisms from Globalization to the Real Estate Sector

Globalization may affect real estate quasi-rents through two related transmission mechanisms. First, when increased economic openness leads to higher local productivity and output, there will be an increased derived demand for real estate, which combined with an inherently low elasticity of supply for "local" real estate generates a disproportionate increase in real estate rents and prices, vis-à-vis tradable goods. The second, and a related transmission mechanism, predicated upon the Balassa-Samuelson

hypothesis,[2] implies that increasing international trade leads to an asymmetric increase in the country's productivity of tradable vis-à-vis non-tradable goods, leading to an increase in the relative price of the latter. Higher productivity growth in the tradable goods sector (usually the manufacturing sector, but now increasingly services as well), engendered by knowledge spill-over and country specialization, will bid up wages in that sector, and assuming labor mobility across the tradable goods and non-tradable goods sectors, wages in the entire economy will rise eventually. Since real estate is considered to be a classic non-tradable in any economy, the relative price of real estate will rise as a consequence of globalization and increasing international trade and economic integration.

While enhanced openness may raise a country's real estate sector rents and asset prices, the attendant increasing international financial integration will tend to reduce the excess returns of real estate companies vis-à-vis the risk free rate; especially for developing countries that are relatively more dependent upon economic trade and affected by the global financial system, and also provide investing access to foreign investors. (Developing countries typically have relative capital scarcity and abundant labor, leading to a higher return to capital.) Increasing financial integration should whittle away arbitraging opportunities and would tend to equalize returns after adjusting for country and currency risks. While for tradable goods sectors the equalization process, the law of one price, arbitraging and so forth have been in operation for awhile, the relatively recent increased access for international investors to acquire real estate securities around the world implies a similar downward pressure on risk adjusted excess returns. As a result of

[2] For a more detailed discussion of the Balassa-Samuelson hypothesis, see, for example, Kakkar (2002) and Gente (2006).

financial integration, publicly traded real estate companies, such as publicly traded developers, property management companies, Real Estate Investment Trusts, and real estate mutual funds are vehicles for real estate investing for foreign investors in the newly opening economies. The underlying intuition of this argument lies in a more integrated global financial system, with freer information and capital flows. International investors have enhanced access to "foreign" real estate company information, enabling them to make more efficient resource allocation decisions. The dynamics of portfolio allocations by international investors in an increasingly globalized (and efficient) real estate security market will reduce risk adjusted excess returns of real estate securities in those countries which had formerly enjoyed higher excess returns.

3. Literature Review

While the academic real estate literature has explained the inter-relationships between and among real estate markets across national boundaries, there is little research addressing the *explicit* international determinants of real estate returns, using variables from the realm of international economics. A few pioneering efforts focus on international real estate diversification, examining mean-variance portfolio performance; the collective findings are varied. Eichholtz (1995) studies the covariance structure of international property share returns, using monthly property company returns from different countries from 1973-1993. He finds that the international property rates of return covariances are unstable, which may limit their usefulness in standard portfolio allocation models. Goetzmann and Wachter (1996) perform a mean-variance analysis for a sample of international office markets and identify three clusters of office markets that

tend to “move together”. Ziobrowski et al (1997) evaluate the use of risk reduction strategies for international real estate investment through investment and currency hedging. They find that currency swaps enhance the returns of U.S. real estate to foreign investors; they also find that hedged U.S. real estate assets provide little gain beyond those available from hedging U.S. common stock. Conover et al (2002) show that foreign real estate investments provide diversification benefits beyond that obtainable from foreign stocks. Newell and Webb (1995) conclude that (1) there is significant appraisal smoothing and inter-temporal correlations among the country real estate indices; and (2) currency risks increase real estate investment risks. Recognizing that portfolio analysis for international real estate often has been concerned with benefits from naïve diversification strategies, Geurts and Jaffe (1995) show that the country specific risk/ return relationship is affected by institutional characteristics (such as political risk and socio-cultural factors). Liu and Mei (1998) investigate the incremental diversification benefits of international real estate securities, using mean-variance analysis and a multi-factor latent variable model. The inclusion of international real estate securities in a portfolio, they claim, will improve the risk-reward frontier, after accounting for currency risks. Using both hedged and un-hedged returns, Hoesli et al (2004) claim that portfolio diversification benefits are created by including real estate assets in a mixed-asset portfolio. In contrast, Stevenson (2000) finds that the potential diversification benefits that could arise from investing in real estate securities are generally not statistically significant. Liu, Hartzell, & Hoesli (1997) conclude that there is no evidence that the inflation hedging attributes of foreign property trusts are superior to hedges against inflation through common stocks.

Comparative research explaining the underlying market forces that drive the difference in real estate returns across countries is somewhat sparse, with a few notable exceptions. Hamelink and Hoesli (2004) disentangle factors that determine real estate security returns in 21 countries; they find that the country, scale and value/growth factors are significant for explaining returns. By regressing log real estate index returns on constructed continental real estate indices for Europe, Asia and North America, Eichholtz et al (1998) find that real estate rates of return are influenced by "continental" differences. In a related study, Eichholtz et al (1999) demonstrate that cross-sectional variation of excess returns for global property firms are affected by interest rates and the firm size; and, country-specific variables are significant. Applying an International Capital Asset Pricing Model, Ling and Naranjo (2002) detect little evidence of abnormal returns for publicly traded real estate companies at the country level, but find that international real estate returns are driven by a strong worldwide "factor" and an orthogonal country-specific factor. By utilizing a series of more sophisticated CAPM and Fama and French Factors Models, Bond et al (2003) find that both country-specific risk and the Fama and French "factors" are significant determinants of international and country-specific property index returns.

Another strand of literature analyzes returns for securitized and non-securitized real estate assets. Quan and Titman (1999), examining stock returns and changes in property values and rents, discover that a contemporaneous relation between value changes and stock returns for individual countries is statistically insignificant; but a significant relationship exists for the international pooled data. The empirical study by Case et al

(1999) implies that real estate returns are dependent on fundamental cross-country correlated economic variables; but local output is a more important determinant for real estate returns than global variables. Bardhan, Edelstein and Leung (2004) provide tentative statistical evidence for the explicit impact of international economic openness on residential real estate rents, while controlling for urban wages, city size and location. They find that urban rents are positively affected by openness.

None of the existing papers comparing real estate returns across countries takes into account international economics variables, such as measures of openness, or makes allowances for cross-border investing and capital flows. In his seminal paper, Frankel (1992) delineates the difference between measures of capital mobility and the extent of global financial integration, including the covered interest parity condition, whereby capital flows equalize interest rates across countries when contracted in a common currency, and the real interest parity condition, when international capital flows equalize real interest rates across countries. He observes that capital controls and barriers to international investment flows have only recently started to recede even in developed countries. While covered interest rates have been equalized, large differentials remain in real interest rates. While the latter pertains to bonds, similar differentials would pertain to equities, even after accounting for other factors. Since the paper was written in 1992, global economic and financial integration has proceeded by leaps and bounds. While massive international portfolio flows, securities cross-listing, proliferation of equity investment funds in the more traditional tradable sectors would have presumably brought potential returns into relative alignment, after adjusting for risks, local factors and so

forth, the process may be still in its infancy, though gathering substantial steam. (Our paper, in part, can be construed as an examination of increasing global economic and financial integration of real estate.)

4. Methodology

We utilize a multi-factor model for determining the incremental effect of globalization on excess real estate returns, equation (1). Our task is to employ an empirical strategy to disentangle the effects of openness, domestic macro-economic fundamentals, and firm specific characteristics on real estate returns.

$$R_{it}-R_{ft} = D_t+\beta_1[R_{ct}-R_{ft}]+\beta_2[M/B_t]+\beta_3[Size_t]+ \beta_4[Turnover_t]+\beta_5[Local\ GDP\Delta_t]+\beta_6[Local\ credit\ spread_t]+ \beta_7[Openness_t]+v_{it} \quad (1)$$

- R_{it} is realized returns for publicly traded real estate equity for firm i at time t.[3]
- R_{ft} is the risk free rate for the respective country.
- $R_{it}-R_{ft}$ represents the excess annual returns for firm i over the country risk free rate.
- D_t is the set of annual dummies.[4]
- R_{ct} is the realized returns of the stock index for country c at time t.
- $R_{ct}-R_{ft}$ signifies the excess returns of a country's market portfolio over its risk free rate.

[3] Following Stevenson (2001), we analyze our data on the basis of local returns, thereby implying perfect hedging ability. While this assumption ignores the impact of currency movements on international firm returns, it also avoids the need to assume the domicile of the investors. In a subsequent section we will introduce exchange rate measures to control for exchange rate fluctuations.

[4] The inclusion of annual dummies will increase the number of explanatory variables, and thereby reduce the degrees of freedom. Also, the use of dummy variables may not control for cross correlations across time as economic time series are likely to be serially correlated. To overcome these problems we use the Fama-MacBeth annual regression techniques, and test for the significance of the average of the coefficients obtained from the annual regressions.

-M/B_t is the market to book ratio; the company market capitalization divided by reported book value.

-$Size_t$ is the firm's market capitalization in local currency, adjusted by the corresponding U.S. exchange rates. Hence, firm size in all countries is expressed in U.S. dollars.[5]

-$Turnover_t$ is the annual total value, measured in U.S. dollars, of a firm's trading volume, and serves as a market liquidity measure for the firm.[6]

The impact of local market fundamentals on excess real estate security returns can be separated into local demand and supply effects, namely the local country GDP change and the long interest rate minus the short interest rate spread.[7] Local GDP change is the key fundamental determinant of commercial and residential space demand. A change in demand for space, ceteris paribus, will exert an impact on rents and property values, and returns of real estate companies. While local GDP change may not be a perfect proxy for the change in demand, it has been widely used; we supplement it later with additional demand proxies. The interest rate spread, measured by the country's long (10-year) minus short (3-month) term interest rates, is a well-recognized standard measure of credit cost and availability. It affects real estate market supply since, ceteris paribus, profitability of developers depends critically on cost and availability of borrowed funds.

[5] M/B and Size are surrogate Fama and French factors. The Fama and French model uses the spread between the returns on small and large cap stocks; and the spread between the return on stocks with high and low book-to-market ratios. However, due to the small number of firms available for some countries in our sample, it is difficult to construct and use such spreads in our empirical study.

[6] We have also used an alternative measure of turnover, measured as the firm's annual trading volume scaled by its market capitalization. Using the scaled measure of turnover does not qualitatively change our main empirical results.

[7] We have included additional proxy factors for the impact of local market fundamentals in our robustness tests to address possible omitted variable bias.

We utilize the standard National Bureau of Economic Research (NBER) definition of openness, the ratio of exports plus imports to the Gross Domestic Product (GDP).[8] In addition, we also perform our analyses using two other measures of globalization, the net inflows of Foreign Direct Investment (FDI) as a percentage of GDP, and the "Globalization Ranking Index," created by the Foreign Policy Magazine as a measure of countries' openness.[9]

5. Data

Our data is collected for the period 1995-2002 for a set of 16 countries, having sufficient sample size of publicly traded real estate companies. The source of our firm data is Datastream. As defined by Datastream, the real estate sector includes real estate services (brokers and real estate agents), development companies, investment companies and REITs, but excludes pure construction companies. Our sample size is substantially larger than those used in previous studies (e.g. Eichholtz et al 1998) utilizing the Global Property Research database, consisting of the 250 largest real estate firms. Our sample contains data from seven countries in Europe (U.K., France, Germany, Italy, Sweden,

[8] This measure of openness is also the standard measure reported in the Penn World Table by the Center of International Comparisons at the University of Pennsylvania. A caveat for this measure of openness is that the definition emphasizes the importance of trade vis-à-vis say foreign investment, tariff or non-tariff barrier structure, etc. In our opinion, it is difficult to create a single measure that captures all aspects of globalization. Nonetheless, our empirical findings are robust using different definitions.

[9] The Globalization Index created by Foreign Policy Magazine uses several indicators, spanning information technology (IT), finance, trade, personal communication, politics, and travel, to determine country rankings. The index has four components: Political engagement, Technology, Personal Contact and Economic Integration. A detailed illustration of the construction of the Index can be found at www.foreignpolicy.com.

Netherlands, and Denmark), four countries/jurisdictions in Asia (People's Republic of China, Hong Kong, Singapore, and Japan), two countries in the Americas (U.S.A. and Canada), two countries in the South Pacific (Australia and New Zealand) and one country in Africa (South Africa). There are other countries, such as India, Brazil and Spain, that we have omitted from our sample because of the paucity of publicly traded real estate firms. There are 1052 publicly traded securities,[10] of which 106 were deleted because they deal in publicly traded preferred or B shares, leaving in our final sample 946 common stock issues from individual firms. Figures 1 and 2 show the distribution of our sample firms across four different industry sub-sectors and 16 countries, respectively. Seventy-six percent of our firms are classified as either real estate developers, real estate investors or REITS. U.S. firms represent the largest portion of our sample (387 firms), followed by Hong Kong (94 firms), U.K. (78 firms), Canada (72 firms) and Australia (67 firms).

Table 1 reports firm descriptive statistics. The computed rate of return is calculated as the change in annual adjusted prices[11] plus current year dividend, divided by adjusted price of the prior year. The annual average firm rate of return is 13.10%, with a standard deviation of 187.43% for the sample period, 1995-2002. Excluding the sample of 387 U.S. firms, the average annual rate of return declines to 9.94%. The European countries generally achieve the highest average rate of returns over the sample period, with the

[10] Since Datastream reports only information for firms that exist at the end of the sample period, there may be a survivorship bias in our data. That is, the 1052 publicly traded real estate securities represent real estate firms that exist at the end of 2002 and it is obviously only a sub-sample of all real estate firms that have existed during 1995-2002.

[11] Adjusted price is defined by Datastream as the latest security price available in the local market currency, adjusted for subsequent capital actions.

Netherlands (30.61%), France (30.42%), Italy (28.91%), Sweden (22.20%) having the second to fifth highest average returns among the 16 countries. The Asian countries, which suffered from the Asian Financial Crisis during the sample period, tend to have the lowest average returns. An exception is People's Republic of China that generates the highest average return. Consistent with the findings of Eichholtz et al (1999) which deals with a different sample period, we find that property companies in Hong Kong and Japan have the largest average market capitalization; moreover these two countries also report the largest dispersion around average market capitalization.[12]

Table 1 also shows descriptive statistics of sub-samples partitioned by country, continent and year. The American company sub-sample, the largest sub-group, exhibits the highest level of return dispersion. Similar to country-level returns, the Europe sub-sample has the highest average return and the Asia sub-sample has the highest average market capitalization and dispersions for market capitalization. Finally, there are large variations for average annual returns by year; with a low 4.01% in 1995 and a high 33.20% in 2000.

International economic data are obtained from two sources, including the Global Financial Database (GFD) and the World Development Indicators Database (WDI). The risk free rate is proxied by the three-month Treasury Bills[13] interest rate of each country. Interest rate spread is the difference between each country's three-month Treasury Bills interest rate and the ten year Government Bond interest rate. Local country GDP change is defined as the annual percentage growth of GDP. Country market return is computed

[12] The country-level returns must be interpreted with caution because of the small number of companies for some countries.
[13] For China, since T-Bill rates are not available, the China Central Bank Discount Rate is used.

using the country broad stock market index.[14] For the globalization measures, as mentioned before, openness is the sum of the imports and exports (from the WDI Database), as a percentage of GDP. Net inflow of FDI as a percentage of GDP is one of our alternative measures of globalization. We follow the definition of the WDI database and define FDI as investments to acquire a lasting management interest in an enterprise operating in an economy other than that of the investor. Finally, we scale the Globalization Ranking Index obtained from Foreign Policy Magazine by reverse country ordinal ranking.[15] Table 2 contains descriptive statistics for country economic data. The openness measure (i.e., see Table 2 and Figure 3) tends to have low variation across countries, except for the Hong Kong and Singapore "outliers".

6. Statistical Findings

6.1 Pooled Regressions

Table 3A presents sets of regressions corresponding to equation (1) for the pooled sample, for all firms and years. First, we examine the impact of globalization on real estate security returns using the traditional measure of economic openness, (imports + exports)/GDP. Since real estate company returns may be cross-correlated, and because of the possible presence of heteroskedasticity, we use Generalized Least Square (GLS) with annual fixed effects to estimate the model.

[14] The broad market indices used are ASX All-Ordinaries for Australia, TSE-300 for Canada, Shanghai A for China, SBF-250 for France, CDAX for Germany, Hang Seng Index for Hong Kong, Nikkei-225 for Japan, SES All-Share for Singapore, Overall Index for South Africa, Affarsvarlden General Index for Sweden, All Share Price Index for Denmark, BCI Return Index for Italy, CBS All-Share for Netherlands, New Zealand 40 for New Zealand, FT All-Shares for U.K. and the S&P 500 for U.S.

[15] The globalization index tracks changes in economic integration, political engagement, technology and personal contact across 62 countries and quantifies an overall globalization ranking. Our measure of globalization is scaled such that the country with the highest degree of globalization is assigned a value of 100 and the country with the lowest globalization ranking has a value of 39 (i.e., 101 minus 62).

In column 1 of Table 3A, a single factor model (i.e., a variant of the International Capital Asset Pricing Model) is estimated by regressing excess firm returns on the excess market returns.[16] As anticipated, the coefficient in the single factor model is positive, less than unity and statistically significant. The Beta estimators are less than unity for virtually all alternative model specifications, and reinforce the notion that real estate stocks are perceived to be less risky than the general equity market. In column 2, openness is introduced into the International CAPM model. The coefficient for openness is negative and statistically significant. This implies that real estate firm excess returns decline in the more open economies. This statistical finding is robust across different model specifications.

Columns 3 and 4 in Table 3A are variants of the Fama and French Factors Model. Column 3, using the two factors suggested by Fama and French, shows that the coefficient of the log of firm size is significant and positive. Fama and French (1992) claim a small firm effect (i.e., investors can earn a positive return for investing in smaller firms). Eichholtz et al (1998) have confirmed the Fama-French finding for their sample of real estate firms. However, our results indicate real estate firm returns relate positively to firm size, which indicates that investors may be able to realize abnormal profits by investing in larger real estate firms, after adjusting for the impact of openness.[17] It is possible that small firm effects may disappear when firms are very small, causing

[16] Excess firm return is defined as the annual return for a firm minus the country risk free rate. Excess market return is defined as the annual return of a country's broad stock market index minus its risk free rate.

[17] Our findings may not contradict the findings by Fama and French (1992), since the firms they classify as small have similar or larger market capitalization when compared to many real estate firms in our sample.

increased inherent risks[18] of these small firms to outweigh the benefits of investing. Also, in contrast to the Fama-French findings, the coefficients for the market to book ratios remain insignificant across all model specifications. Finally, judging by the adjusted R-squared, the Fama-French Model performs marginally better than the International CAPM.

The model specifications presented in columns 5 and 6 include local demand (GDP growth) and supply (interest rate spread) factors. The results show that the coefficients for both our proxies for the demand and supply are positive and significant. To our knowledge, prior research, in general, does not employ macroeconomic variables to explain real estate firm returns.

The last regression specification presented in column 8 of Table 3A includes all our explanatory variables. The coefficient for openness is negative and significant. The coefficients for market excess returns and firm sizes remain highly statistically significant and positive. The coefficient estimate of the turnover variable, our measure of liquidity of the individual firms, is significant and negative. This is consistent with the notion that more liquid stocks are priced more efficiently with a lower liquidity risk premium, thereby entailing lower excess returns. For the macroeconomic variables, the coefficient for GDP remains positive and significant. Data for the market-to-book ratios and turnover is not available for a substantial number of observations; the coefficient for the interest

[18] The assumption of an efficient market may not be tractable because of the lack of liquidity, etc. Previous studies examining the size effect truncate the sample to exclude extremely small firms. However, since real estate firms tend to be small in less developed countries, truncating our sample would mean losing a substantial subset of our total observations.

rate spread is insignificant in column 8. Therefore, we re-estimate equation (1), omitting these three variables. The statistical results in column 7 show that the coefficients for both excess market returns and firm size remain positive and significant; and the coefficient for openness is negative and significant.

6.2 Robustness Analysis

Table 3B presents additional regression results for our model, exploring the robustness of our findings. The global economy, especially Asia, suffered a major financial crisis in 1997-98. The events suggest a potentially "natural break" in the underlying international economic regime. We partition our samples into two periods, 1995-97 and 1998-2002, and estimate our model for the two sub-samples separately. The statistical results, columns 1 and 2, are consistent with previous findings in Table 3A, as the coefficients of the openness variable continue to be negative and significant across sub-periods and under both model specifications.

Since the U.S. firms may be both a disproportionate and qualititatively different part of our sample, we re-estimate equation (1), excluding all U.S. firms. The results (column 3) demonstrate that the coefficient for openness is significant and negative for the sample of foreign (non-U.S.) real estate firms. Since our full sample includes real estate service firms that are likely to provide "services" rather than be long term real estate investment vehicles, we re-estimate our model, excluding all real estate service firms. The results in column 4 show that the openness measure continues to be negative and significant.

Our next two model re-specifications examine the impact of firm size and turnover on firm excess returns. First, we omit log firm size and substitute firm size and the square of firm size as explanatory variables (in equation (1)) as the relationship of firm size and excess returns may be nonlinear. We find that the coefficient for firm size is positive and significant and the coefficient for the square of firm size is significantly negative, the latter effect implying that the positive size effect diminishes as real estate firms become larger. We next omit log turnover and substitute turnover, scaled by firm market capitalization. Both the openness and turnover variables remain negative and significant.

Using only GDP growth and interest rate spread to proxy for all demand and supply fundamentals that affect the real estate market may seem overly-simplistic and may introduce an omitted variable bias in our empirical analysis. In Table 3B, column 7, we introduce three alternative, additional country specific macro-economic variables: the annual average household consumption growth rate (Consumption Δ), the annual population growth rate, and the prime lending rate.[19] While macro-economic variables tend to be inter-correlated and may proxy a number of factors, the key statistical findings, the negative statistical relation between openness and excess returns persist. The coefficient for consumption growth is positive and significant, and the prime lending rate is negative and significant, respectively.

Finally, a potential concern with our analysis is that the negative relationship between firm excess returns and trade openness may be driven by the "rule of law" environment.

[19] Consumption Δ is the annual average household consumption percentage growth and population growth measures the annual percentage in the country's total population.

A well-codified legal and judicial system may significantly lower country risks and thereby be the cause for reduced risk premiums required by investors, rather than globalization; to the extent that the two variables are correlated may lead to a false conclusion about globalization's impact on the risk premium.[20]. To examine this issue, we re-estimate our model by including a set of country dummy variables. Presumably, the legal and political system changes more gradually than imports and exports, and thus the trade openness of a country. The findings in Table 3B, column 8 suggest that our statistical results for the openness coefficients are robust when controlling for the "rule of law" factors.

6.3 Annual, Country and Continent Regressions

In this section we estimate sub-sample regressions by year, country and continent to evaluate the impact of globalization on real estate firm excess returns across time and geographic regions. The annual regressions, Table 4, examine the changes in the openness coefficient over time; the statistical results show that the openness coefficient is negative and significant in five of the eight sample years. Applying the Fama-MacBeth procedures to control for firm cross-correlations and to re-examine the significance of the explanatory variables, we find that the openness variable is again negative and significant, reinforcing our earlier results. A set of Wald equality tests assesses if the estimated openness parameters are (i) jointly equal over the entire sample period ($\beta_{95}=\beta_{96}=\ldots=\beta_{02}$) and/or (ii) constant on a year by year basis ($\beta_{95}=\beta_{96},\ldots, \beta_{01}=\beta_{02}$). The Wald statistic for the joint test is 54.13, rejecting the hypothesis of constant openness

[20] It is not entirely clear that a correlation/causation exists. For example, PRC is open, but does not enjoy a credible legal/juridical framework. On the other hand, there are countries, such as India, which until recently was not very open but had an effective legal superstructure.

coefficients over the entire sample period. On a year by year comparison, the hypothesis that the coefficients between consecutive years are equal is rejected for all years, but 1998-1999. The Wald tests imply that though openness is in general negatively related to firm excess returns, the impact of openness on the performance of real estate companies is likely to vary over time.

Bond et al (2003) and Ling and Naranjo (2002) claim that risk factors that explain real estate company returns are not constant across international markets. For this reason, even though sub-sample country stratification reduces several degrees of freedom, we examine if the impact of openness appears to be invariant across countries or continents. We first estimate the relationship between economic openness and real estate company returns by continents, assuming countries in the same continent react to risk and return attributes in a similar fashion. We estimate our model using OLS and SUR, with a system of 16 equations, one for each country, and constraining the coefficients to be equal across countries of the same continent. We do not report the empirical results here. In summary, the OLS regressions show that economic openness is negatively related to firm excess returns in four of the five continents with Asia being the only continent with a statistically significant negative openness coefficient. Examining parameter estimates for other variables reveals that most of the coefficients are not significant. Using SUR to control for the contemporaneous correlations across error terms, the openness coefficients become negative and significant for Asia and Australasia, but insignificant for the Americas. On the other hand, the openness coefficient is positive and significant for

Europe.[21] The Asian regression seems to perform well with the coefficients for market excess return, GDP and firm size all being positive and significant. Moreover, firm size is also significant at a 10% level for both the Europe and Africa regressions.[22]

6.4 The Inclusion of Exchange Rate Adjustment

Mobile capital is return sensitive across borders; in principle, cross-country real (risk adjusted) returns should tend to be equalized through capital flows and when returns are qualified by exchange rate movements (i.e., when evaluated in the home currency, such as the dollar for U.S. investors). The statistical significance of openness in our earlier analyses implies that globalization may exert a real impact on firm excess returns, but these findings need to be qualified for expected currency appreciation/depreciation. Since international real estate portfolio investors are likely to be sensitive to currency risk, we examine how real estate firm returns may be affected by changes in the exchange rate. We control for the impact of the exchange rate using the following proxies: (i) the one year ahead exchange rate change (covered interest parity), and (ii) the interest rate differential between foreign and U.S. risk free rates (uncovered interest parity; see

[21] It is possible that the creation of a common economic space in the relatively newly formed European Union affects our results.

[22] We also examine the impact of economic openness on excess firm returns across countries. In unreported results, we find that the openness measure is significant in only 3 of the 16 country regressions (i.e., Hong Kong, Japan and Singapore). Moreover, most other explanatory variables are not significant. Since we have only eight years of annual data and a very limited number of firm observations for some countries, the country regressions are suspect, and unlikely to generate reliable results.

Frankel (1992); there is no parity in actuality but a tendency toward one because of arbitrage). The intuition is that international investors,[23] seeking returns in their own currency, would evaluate the nominal returns of foreign equities after adjusting for expected exchange rate changes. Table 5 adds exchange rate variables to our statistical model for explaining returns.[24] In general, even with the addition of exchange risk variables, the coefficient for openness remains negative and significant across alternative model specifications, reinforcing our primary finding that openness enhances international portfolio market efficiency, even in the case of securities for non-tradable goods and assets. The coefficient for the contemporaneous exchange rate change, defined as the percentage change of the exchange rate (local currency to U.S. dollars) from the previous year, is insignificant.[25] The coefficients for both the forward exchange rate change (one year ahead; a proxy for interest rate parity in the presence of limited futures markets and for perfect foresight) and the interest rate differential (between foreign and U.S. risk free rates) are both positive and significant. This is consistent with a priori expectation since, from the perspective of an international investor, nominal foreign firm returns should increase to compensate the investor if the foreign currency is expected to depreciate in the future; and a positive interest rate differential between the foreign country and U.S., ceteris paribus, should require a large excess stock return.[26]

[23] The exercise has been conducted from the point of view of U.S. investors, primarily by virtue of the weight of dollar denominated capital flows.
[24] Definitions and calculations of the exchange rate variables are explained in Table 5.
[25] This finding supports the weak form of market efficiency (i.e., past information has no effect on stock returns).
[26] We also include the observed current inflation rate in our regression model. The coefficient for the observed current inflation rate is negative and significant. This finding is expected to occur because the higher the level of current inflation, the larger the noise and/or unexpected inflation, which would exert a negative impact on firm prices and hence returns. When we include proxies for expected inflation and expected inflation differential across countries, expected inflation (as proxied by the actual inflation one

6.5 Other Globalization Measures

In this section, we discuss the relationship between real estate firm excess returns and globalization, using alternative globalization measures. Due to data limitation for the "Globalization Index"[27] before year 2000, we examine the impact of this variable on firm excess returns using annual regressions for 2001 and 2002. Table 6A presents regression results with the "Globalization Index". The coefficients for the "Globalization Index" are negative in both years, but insignificant in 2002. The only other variable that is consistently significant in both years is market capitalization of firms, which has a positive coefficient in both years. Table 6B presents regression results with net inflows of FDI as a percentage of GDP as the globalization variable. Consistent with our previous findings, the globalization coefficients remain negative and significant.

7. Concluding Remarks

This study examines the impact of global economic and financial integration on excess rates of returns for publicly traded real estate companies in 16 countries, controlling for general risk and return factors, as well as a set of other potentially relevant variables. Our key finding is that openness is consistently statistically significant and negatively related to firm excess returns. We also find that other international factors such as a country's index returns over risk free rates and its demand and supply fundamentals are significant determinants of individual firm's returns. Our results are robust across different model specifications and sample partitions.

---

year ahead) as well as expected inflation differential (as proxied by the actual inflation differential between foreign countries and the U.S.) are not statistically significant.

[27] Foreign Policy Magazine has published its globalization index since 2001.

We also show that the impact of openness on firm returns is incremental to the impact of currency appreciation/ depreciation; in other words, both real and nominal factors affect international real estate firm returns. The findings suggest and are consistent with the premise that greater openness leads to more efficient markets, both financial and real, and excess returns are whittled away by international financial integration, even in the case of returns of firms involved in non-tradable goods and assets.

References

Bardhan, A.D., R.H. Edelstein and C. Leung, 2004, "Globalization and Urban Residential Rents," *Journal of Urban Economics,* 56, 3, 505-513.

Bond, S.A., G.A. Karolyi and A.B. Sanders, 2003, "International Real Estate Returns: A Multifactor, Multicountry Approach," *Real Estate Economics,* 31, 3, 481-500.

Case, B., W. Goetzmann and K.G. Rouwenhorst, 1999, "Global Real Estate Markets – Cycles and Fundamentals," *Yale International Center for Finance,* unpublished working paper.

Cauchie, S., M. Hoesli and D. Isakov, 2004, "The Determinants of Stock Returns in a Small Economy," *International Review of Economics and Finance*, 13, 167-185.

Chiang, K.C.H., M.L. Lee and C.H. Wisen, 2005, "On the Time-Series Properties of REIT Betas," *Real Estate Economics,* 33, 2, 381-396.

Conover, C.M., H.S. Friday and G.S. Sirmans, 2002, "Diversification Benefits from Foreign Real Estate Investments," *Journal of Real Estate Portfolio Management*, 8, 1, 17-25.

Dokko, Y., R. Edelstein, A.J. Lacayo, and D.C. Lee, 1999, "Real Estate Value Cycles: A Theory of Market Dynamics," *Journal of Real Estate Research,* 18, 1, 69-95.

Eichholtz, P.M.A., 1995, "The Stability of the Covariances of International Property Share Returns," *The Journal of Real Estate Research,* 11, 2, 149-158.

Eichholtz, P.M.A., R. Huisman, K. Koedijk, and L. Schuin, 1998, "Continental Factors in International Real Estate Returns," *Real Estate Economics,* 26, 493-509.

Eichholtz, P.M.A. and R. Huisman, 1999, "The Cross Section of Global Property Share Returns," *A Global Perspective on Real Estate Cycles,* Kluwer Academic Publishers, Boston.

Fama, E.F. and K.R. French, 1992, "The Cross-Section of Expected Stock Returns," *The Journal of Finance*, 47, 2, 427-465.

Fama, E.F. and K.R. French, 1998, "Value versus Growth: The International Evidence," *The Journal of Finance*, 53, 6, 1975-1999.

Fama, E.F. and J.D. MacBeth, 1973, "Risk, Return and Equilibrium: Empirical Tests," *The Journal of Political Economy*, 81, 3, 607-636.

Frankel, J.A., 1992, "Measuring International Capital Mobility: A Review," *The American Economic Review*, 82, 2, Papers and Proceedings of the Hundred and Fourth Annual Meeting of the American Economic Association, 197-202.

"Measuring Globalization: Who's up, Who's Down?" *www.foreignpolicy.com.*

Gente, K., 2006, "The Balassa-Samuelson Effect in a Developing Country," *Review of Development Economics*, 10, 4, 683-699.

Geurts, T.G. and A.J. Jaffe, 1996, "Risk and Real Estate Investment: An International Perspective," *The Journal of Real Estate Research,* 11, 2, 117-130.

Goetzmann, W.N. and S.M. Wachter, 1996, "The Global Real Estate Crash: Evidence From an International Database," *Yale School of Management and The Wharton School,* unpublished working paper.

Grant, W.G. and T. Wuilloud, 1995, "Currency Risk in International Portfolios: How Satisfying is Optimal Hedging?" *The Journal of Portfolio Management*, Spring, 59-67.

Griffin, J.M., 2002, "Are the Fama and French Factors Global or Country-Specific?" *Review of Financial Studies*, 15, 3, 783-803.

Hamelink, F. and M. Hoesli, 2004, "What Factors Determine International Real Estate Security Returns?" *Real Estate Economics*, 32, 3, 437-462.

Hoesli, M., J. Lekander and W. Witkiewiez, 2004, "International Evidence on Real Estate as a Portfolio Diversifier," *The Journal of Real Estate Research*, 26, 2, 161-206.

Kakkar, V., 2002, "Capital-Labor Ratios and Total Factor Productivity in the Balassa-Samuelson Model," *Review of International Economics*, 10, 166-176.

Ling, D.C. and A. Naranjo, 2002, "Commercial Real Estate Return Performance: A Cross-Country Analysis," *Journal of Real Estate Finance and Economics*, 24, 1, 119-142.

Liu, C.H. and J. Mei, 1998, "The Predictability of International Real Estate Markets, Exchange Rate Risks and Diversification Consequences," *Real Estate Economics,* 26, 1, 3-39.

Liu, C.H., D.J. Hartzell and M.E. Hoesli, 1997, "International Evidence On Real Estate Securities as an Inflation Hedge," *Real Estate Economics,* 25, 2, 193-221.

Newell, G. and J. Webb, 1996, "Assessing Risk for International Real Estate Investments," *The Journal of Real Estate Research,* 11, 2, 103-115.

Quan, D.C. and S. Titman, 1999, "Do Real Estate Prices and Stock Prices Move Together? An International Analysis," *Real Estate Economics,* 27, 2, 183-207.

Stevenson, S., 2000, "International Real Estate Diversification: Empirical Tests using Hedged Indices," *The Journal of Real Estate Research*, 19, 1, 105-131.

Stevenson, S., 2001, "Bayes-Stein Estimators and International Real Estate Asset Allocation," *The Journal of Real Estate Research*, 21, 1, 89-102.

Stiglitz, J.E., 2003, "Globalization and Growth in Emerging Markets and the New Economy," *Journal of Policy Modeling,* 25, 505-524.

Wu, H., 2002, "Exchange Risk versus the Value Factor In International Asset Pricing," West Virginia University, unpublished working paper.

Ziobrowski, A.J., B.J. Ziobrowski, and S. Rosenberg, 1997, "Currency Swaps and International Real Estate Investment," *Real Estate Economics,* 25, 2, 223-251.

Table 1: Descriptive Statistics for Real Estate Firm Data, 1995-2002

	Firm Returns	Market to Book Ratios	Sizes in USD (millions)	Turnover by Volume in USD (millions)	Number of Firms
Total Sample	13.10 187.43	2.06 25.97	415.39 1437.96	31849.70 100450.7	946
Total except US	9.94 135.29	1.77 6.20	435.01 1706.80	40965.12 112275.1	559
Sub-sample by country					
Australia	16.70 120.88	1.21 1.27	341.03 851.56	52214.71 100309.6	67
Canada	17.08 176.28	1.55 2.08	131.50 501.30	3314.45 8658.37	72
China	32.93 81.86	6.84 5.19	562.30 568.79	69818.37 90007.58	17
Denmark	18.86 119.87	0.63 6.23	32.80 32.72	316.83 600.43	10
France	30.42 352.49	1.37 1.78	33.68 64.28	183.72 420.63	49
Germany	16.32 57.45	4.61 5.48	196.83 370.32	966.88 2381.49	29
Hong Kong	-10.11 54.67	1.27 11.01	890.29 3253.77	71277.33 138773.9	94
Italy	28.91 114.81	1.08 0.78	110.22 184.50	102.60 289.89	12
Japan	-3.62 43.65	1.98 3.19	809.99 2324.13	436.70 1100.02	55
Netherlands	30.61 91.11	1.11 1.01	299.10 417.78	3387.93 3240.29	11
New Zealand	5.19 28.19	0.89 0.44	65.96 50.44	24078.40 39170.98	10
Singapore	-1.32 41.46	1.54 3.24	711.09 3.00	142677.1 227427.1	23
South Africa	12.89 40.41	3.07 12.65	33.47 41.85	2242.82 5035.90	25
Sweden	22.20 26.02	1.65 1.75	324.92 274.95	1565.15 1828.64	7
UK	10.72 32.20	0.85 0.87	462.31 1130.04	85695.88 165264.9	78
USA	18.28 252.41	2.63 43.47	382.51 805.86	15891.83 72737.56	387
Sub-sample by continents*					
Americas	18.27 242.31	2.54 41.53	342.97 771.33	13690.26 66334.01	459
Australasia	15.28 113.64	1.17 1.20	307.61 803.28	48712.03 95297.19	77
Africa	12.89 40.41	3.07 12.65	33.47 41.85	2242.82 5035.90	25
Europe	19.46 184.84	1.60 3.08	249.80 761.64	33206.12 110142.5	196
Asia	-3.35 55.10	1.98 8.29	815.86 2662.94	60586.31 136744.3	189

Sub-sample by year					
1995	4.01 166.47	1.73 3.96	380.08 1254.54	21747.01 56367.28	384
1996	16.54 35.70	2.06 7.51	421.67 1525.81	23464.39 57254.33	486
1997	13.85 71.54	4.49 67.69	498.30 1839.55	30950.26 75636.91	552
1998	13.70 117.84	1.02 12.19	419.56 1220.57	30746.87 88621.47	618
1999	2.29 53.41	1.75 5.65	426.45 1448.86	33640.08 111806.7	762
2000	33.20 439.55	2.15 17.40	364.38 1290.38	37072.51 104404.9	815
2001	9.03 57.71	2.49 23.77	394.63 1493.10	28762.37 83803.78	877
2002	10.03 79.41	1.24 15.85	430.71 1402.46	40269.28 149701.6	768

Each data cell contains the mean and its standard deviation.

*Sub-samples by continents partition the 16 countries in the following way: U.S.A. and Canada are in Americas; Australia and New Zealand are in Australasia; South Africa is in Africa; Denmark, France, Germany, Italy, Netherlands, Sweden and U.K. are in Europe; China, Hong Kong, Japan and Singapore are in Asia.

Table 2: Descriptive Statistics for Country Data, 1995-2002

	Risk Free Rate	Country Market Return	Interest Rate Spread	Annual Growth in GDP	Inflation Rate	Exchange Rate	Household Consumption Growth	Lending Interest Rate	Population Growth	Openness (Import + Export) / GDP
Australia	5.41	5.83	0.87	3.77	2.71	1.60	3.80	9.04	1.12	0.319
	0.98	8.13	0.67	1.08	1.99	0.23	0.78	1.05	9.43	0.014
Canada	3.99	6.93	1.74	3.43	2.01	1.48	3.24	6.25	0.93	0.798
	1.38	16.52	1.32	1.42	1.18	0.09	0.89	1.36	0.10	0.0537
China	5.58	13.99	0.91	7.44	2.04	8.30	8.08	7.50	0.90	0.449
	3.20	33.26	2.55	1.03	4.18	0.03	2.16	2.48	0.17	0.059
Denmark	3.93	9.23	1.56	2.47	2.28	6.93	1.15	8.14	0.40	0.753
	0.72	22.10	1.02	0.51	0.47	0.97	1.30	1.03	0.11	0.077
France	3.63	9.71	1.56	2.30	1.45	6.10	2.44	6.80	0.41	0.497
	0.96	28.12	0.79	1.03	0.66	0.85	1.17	0.57	0.13	0.043
Germany	3.51	4.16	1.45	1.44	1.42	1.82	1.56	9.66	0.15	0.587
	0.61	26.77	0.81	0.89	0.54	0.26	1.05	0.69	0.11	0.080
Hong Kong	4.55	5.63	2.40	3.08	0.67	7.77	1.61	7.98	1.47	2.753
	2.07	33.03	1.29	4.31	4.58	0.03	4.23	1.84	1.26	0.174
Italy	4.93	10.52	1.05	1.85	2.80	1815.81	1.99	8.29	0.12	0.511
	2.67	29.47	0.86	0.90	1.22	230.03	1.11	2.80	0.11	0.035
Japan	0.24	-8.10	1.62	1.21	-0.23	116.25	0.87	2.37	0.24	0.194
	0.17	20.74	0.58	1.53	1.38	10.83	0.92	0.53	0.07	0.013
Netherlands	3.49	9.90	1.58	2.88	2.51	2.04	3.21	5.37	0.61	1.188
	0.60	27.34	0.82	1.42	0.80	0.30	1.37	1.29	0.13	0.065
New Zealand	6.61	0.64	0.01	3.12	1.96	1.89	3.27	10.67	1.06	0.627
	1.61	9.95	1.37	1.53	1.30	0.33	0.96	1.29	0.46	0.057
Singapore	1.16	-1.69	2.82	4.94	0.75	1.64	4.94	6.13	2.48	1.734
	0.70	32.32	1.06	4.62	1.31	0.16	5.36	0.64	1.21	0.192
South Africa	13.05	9.68	0.56	2.77	7.40	6.47	3.49	17.65	2.12	0.521
	2.78	26.35	1.75	1.05	3.61	2.87	1.39	2.80	0.43	0.064
Sweden	4.39	11.41	1.37	2.92	1.19	8.29	2.36	6.75	0.20	0.791
	1.74	32.97	0.95	1.40	1.32	1.28	1.53	1.89	0.18	0.057
UK	5.51	4.22	0.13	2.66	2.55	0.63	3.50	5.85	0.24	0.561
	1.07	17.81	1.07	0.54	0.93	0.03	0.93	1.03	0.64	0.020
USA	4.21	10.63	1.15	3.21	2.40	1	3.79	7.84	1.15	0.242
	1.75	22.52	1.30	1.40	0.73	0	1.03	1.44	0.05	0.009

Each data cell contains the mean and its standard deviation.

Table 3A: Rate of Returns Pooled Fixed Effect Regression Results (Dependent Variable: Firm Excess Returns*)

Specifications	1	2	3	4	5	6	7	8***
Excess Mkt. Return**	0.498 **(24.246)**	0.554 **(26.744)**					0.586 **(28.628)**	0.520 **(19.751)**
Log Size			0.021 **(12.617)**	0.023 **(13.668)**			0.031 **(25.016)**	0.031 **(12.654)**
Market to Book Ratios			$8.61*10^{-4}$ (1.056)	$6.18*10^{-4}$ (0.786)				$4.13*10^{-4}$ (0.542)
Log Turnover								-0.011 **(6.941)**
GDP Growth					0.016 **(7.180)**	0.023 **(10.165)**	0.005 **(2.408)**	0.015 **(6.816)**
Spread					0.026 **(9.197)**	0.049 **(14.764)**		-0.002 (0.551)
Openness		-0.051 **(14.067)**		-0.072 **(21.144)**		-0.063 **(14.928)**	-0.068 **(19.563)**	-0.059 **(11.860)**
Total Panel Observations	5572	5433	4274	4175	5449	5310	5385	3795
Adjusted R-squared	0.019	0.022	0.034	0.047	0.008	0.012	0.038	0.059

All equations are estimated by GLS with correction for heteroskedasticity. The top entry in each cell is the coefficient estimate; the entry in brackets is the absolute value of the t-statistics calculated from the White heteroskedasticity-consistent standard errors. Bolded t-statistics indicate the corresponding coefficients are significant at the 10% level.

* Excess firm return is defined as the annual returns for firms less the country risk free rate.

** Excess market return is defined as the annual returns of a country's broad stock market index less its risk free rate.

***Alternative definitions of return, including log return and return not adjusted by risk free rates, are used in this specification, but not reported; the regression results do not vary significantly for different return definitions.

Table 3B: Rate of Returns Pooled Fixed Effect Regression Results – Additional Specifications (Dependent Variable: Firm Excess Returns)

	1. 1995-1997	2. 1998-2002	3. Exclude U.S.	4. Exclude Real Estate Service Firms	5. Size & Size^2	6. Scaled Turnover	7. Additional Demand/ Supply Controls	8. Country Controls
Excess Mkt. Return	0.416 **(5.051)**	0.635 **(16.781)**	0.524 **(15.718)**	0.490 **(18.940)**	0.500 **(18.748)**	0.520 **(19.751)**	0.536 **(20.067)**	0.559 **(18.374)**
Log Size	0.029 **(4.009)**	0.025 **(8.226)**	0.0217 **(8.280)**	0.035 **(14.796)**		0.020 **(10.298)**	0.030 **(11.886)**	0.049 **(17.160)**
Market to Book Ratios	0.002 (1.141)	$1.06*10^{-4}$ (0.127)	$8.57*10^{-4}$ (0.881)	$6.64*10^{-4}$ (1.514)	$7.07*10^{-4}$ (0.912)	$4.13*10^{-4}$ (0.542)	$4.69*10^{-4}$ (0.612)	$4.30*10^{-5}$ (0.564)
Log Turnover	-0.008 (1.473)	-0.010 **(5.127)**	-0.005 **(3.677)**	-0.010 **(5.284)**	$-4.45*10^{-4}$ (0.326)		-0.011 **(6.823)**	-0.017 **(6.570)**
GDP Growth	0.049 **(3.196)**	0.007 **(2.866)**	0.015 **(7.159)**	0.012 **(5.766)**	0.015 **(6.644)**	0.015 **(6.816)**	-0.001 (0.217)	0.020 **(6.507)**
Spread	0.032 (1.314)	-0.006 (1.360)	-0.027 **(6.375)**	0.004 (0.913)	0.005 (1.146)	-0.002 (0.551)	-0.005 (1.213)	0.001 (0.249)
Openness	-0.098 **(4.613)**	-0.059 **(9.232)**	-0.055 **(9.434)**	-0.055 **(10.870)**	-0.066 **(13.282)**	-0.059 **(11.860)**	-0.047 **(8.979)**	-0.564 **(6.935)**
Size					$3.50*10^{-5}$ **(10.992)**			
Size^2					$-1.58*10^{-9}$ **(10.216)**			
Turnover/ Size						-0.021 **(6.941)**		
Consumption Δ							0.016 **(4.934)**	
Population Growth							$3.21*10^{-4}$ (0.276)	
Lending Rate							-0.003 **(2.491)**	
Total Panel Observations	938	2857	2363	2775	3795	3795	3795	3795
Adjusted R-squared	0.116	0.041	0.054	0.067	0.052	0.059	0.059	0.069

All equations are estimated by GLS with correction for heteroskedasticity. The top entry in each cell is the coefficient estimate; the entry in brackets is the absolute value of the t-statistics calculated from the White heteroskedasticity-consistent standard errors. Bolded t-statistics indicate the corresponding coefficients are significant at the 10% level.

Table 4: Annual OLS Regression Results (Dependent Variable: Firm Excess Returns)

Specifications	1995	1996	1997	1998	1999	2000	2001	2002	Fama-MacBeth Regression*
Excess Mkt. Return	0.764	-0.072	0.504	1.360	0.572	0.957	-0.043	0.228	0.534
	(1.468)	(0.592)	**(3.105)**	**(3.601)**	**(4.053)**	(0.746)	(0.250)	(0.959)	**(3.265)**
Log Size	-4.390	4.557	2.098	-0.381	-0.005	-5.970	3.923	3.477	0.414
	(1.366)	**(7.047)**	**(1.917)**	(0.237)	(0.007)	(1.035)	**(6.396)**	**(3.801)**	(0.321)
GDP Growth	8.103	-2.013	3.712	1.162	-4.435	23.818	-0.107	6.169	4.551
	(1.868)	**(2.161)**	**(2.174)**	(0.613)	**(5.258)**	**(2.355)**	(0.093)	**(2.282)**	(1.561)
Openness	-0.203	0.014	-0.229	0.008	-0.012	-0.700	-0.074	-0.194	-0.174
	(2.349)	(0.711)	**(4.631)**	(0.118)	(0.282)	**(1.920)**	**(2.788)**	**(6.514)**	**(2.238)**
Total Observations	473	503	569	618	762	815	877	768	
Adjusted R-squared	0.011	0.078	0.133	0.037	0.053	0.001	0.051	0.061	

The first entry in each cell is the coefficient estimate from OLS regressions; the entry in brackets is the absolute value of the t-statistics calculated from the White heteroskedasticity consistent standard errors. Bolded t-statistics indicate the corresponding coefficients are significant at the 10% level.

*Coefficient estimates in the Fama-MacBeth regressions are calculated by averaging the coefficient estimates obtained from the annual regressions. Bolded t-statistics indicate the coefficients are significant at a 10% level.

Table 5: Rate of Returns Pooled Fixed Effect Regression Results with Exchange Rate Variables (Dependent Variable: Firm Returns)

Specifications	1	2	3
Excess Return	0.553 **(18.084)**	0.583 **(20.176)**	0.580 **(18.706)**
Log Size	2.589 **(14.092)**	2.414 **(11.610)**	2.464 **(12.296)**
GDP Growth	1.293 **(7.228)**	1.462 **(8.387)**	1.276 **(7.112)**
Openness	-0.081 **(18.287)**	-0.054 **(10.831)**	-0.086 **(18.705)**
Exchange Rate Change*	3.301 (0.791)		
Exchange Rate Forward		19.551 **(4.340)**	
Interest Rate Differential			0.455 **(3.751)**
Total Panel Observations	3041	2955	3368
Adjusted R-squared	0.054	0.047	0.052

Regression specifications are calculated with GLS and corrected for heteroskedasticity. The first entry in each cell is the coefficient estimate; the bottom entry in brackets is the absolute value of the t-statistics calculated from the White heteroskedasticity-consistent standard errors. Bolded t-statistics indicate the corresponding coefficients are significant at a 10% level.

*The Exchange Rate Change is defined as $(e_t-e_{t-1})/e_t$, where e_t is the exchange rate of foreign currencies in terms of U.S. dollars. The Exchange Rate Forward is proxied by the one year ahead actual percentage change of the exchange rate. The Interest Rate Differential is the interest rate spread of foreign vs. U.S. risk free rates.

Table 6A: Annual OLS Regression Results with Alternative Measures of Globalization – Globalization Index (Dependent Variable: Firm Excess Returns)

Specifications	2001	2002
Excess Return	-0.351 **(1.698)**	-0.148 (0.569)
Log Size	4.622 **(6.066)**	2.867 **(3.801)**
GDP Growth	1.596 (1.202)	-0.749 (0.473)
Globalization Index	-0.191 **(3.096)**	-0.057 (0.633)
Total Panel Observations	877	907
Adjusted R-squared	0.055	0.010

Regression specifications are calculated with OLS and corrected for heteroskedasticity. The first entry in each cell is the coefficient estimate; the bottom entry in brackets is the absolute value of the t-statistics calculated from the White heteroskedasticity-consistent standard errors. Bolded t-statistics indicate the corresponding coefficients are significant at a 10% level.

Table 6B: Rate of Returns Pooled Fixed Regression Results with Alternative Measures of Globalization – FDI % (Dependent Variable: Firm Excess Returns)

Specifications	1
Excess Return	0.415 **(18.707)**
Log Size	0.031 **(26.047)**
GDP Growth	0.005 **(2.896)**
FDI as % of GDP	-0.004 **(4.079)**
Total Panel Observations	3795
Adjusted R-squared	0.059

Regression specifications are calculated with GLS and corrected for heteroskedasticity. The first entry in each cell is the coefficient estimate; the bottom entry in brackets is the absolute value of the t-statistics calculated from the White heteroskedasticity-consistent standard errors. Bolded t-statistics indicate the corresponding coefficients are significant at a 10% level.

Figure 1: Sample Number of Firms by Industry Sub-Sectors

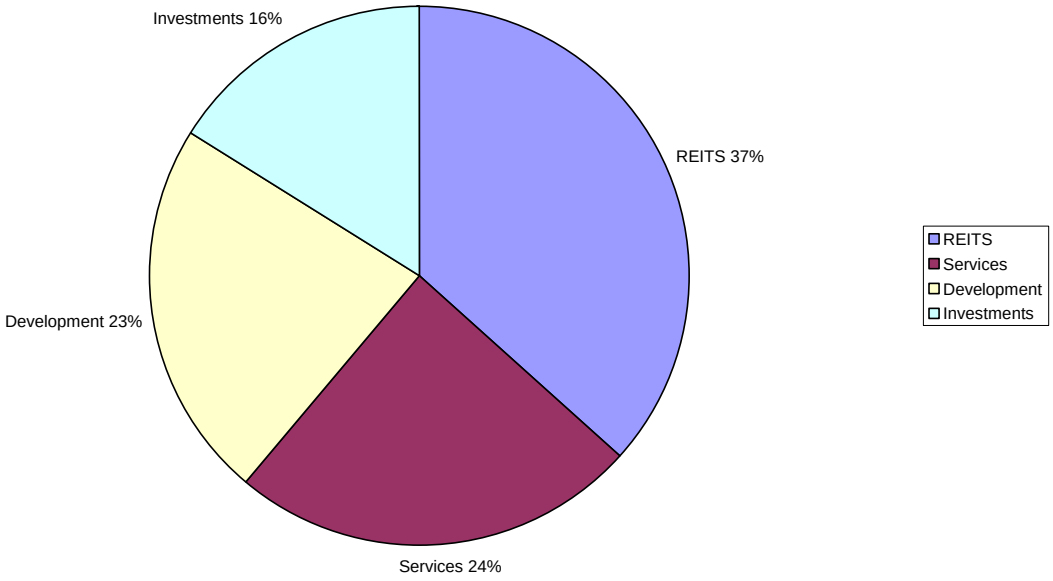

Figure 2: Sample Number of Firms by Country

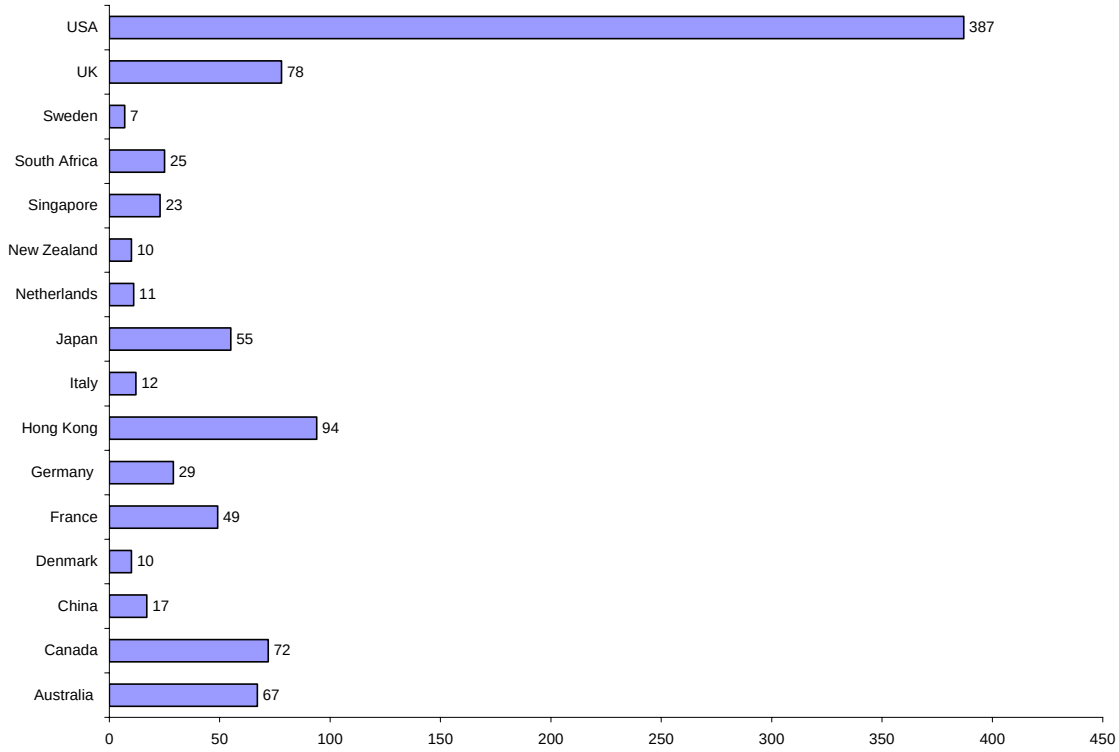

Figure 3: Average Openness by Country, 1995-2002