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Home bias and high turnover reconsidered

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Abstract

The Tesar and Werner (J. Int. Money Finance 14 (1995) 467) finding of very high turnover rates on foreign equity portfolios is based on an underestimation of cross-border equity positions. Foreign turnover rates calculated using information from comprehensive benchmark surveys on cross-border holdings are much lower than previously reported and comparable to domestic turnover rates. However, the basic intuition from the Tesar–Werner study, that transaction costs do not help explain the observed home bias, is confirmed using data on transaction costs in 41 markets.
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1. Introduction

Foreign equities comprise only a small portion of investors' portfolios. For example, as shown in Fig. 1(a), foreign equities are now about 12 percent of US investors' equity portfolios, a substantial increase from the one percent share two decades ago, but far smaller than the relative size of non-US equities in world market capitalization. Figure 1(b) condenses this information into a measure of equity home bias, defined as one minus the ratio of the share of non-US equities in the US and

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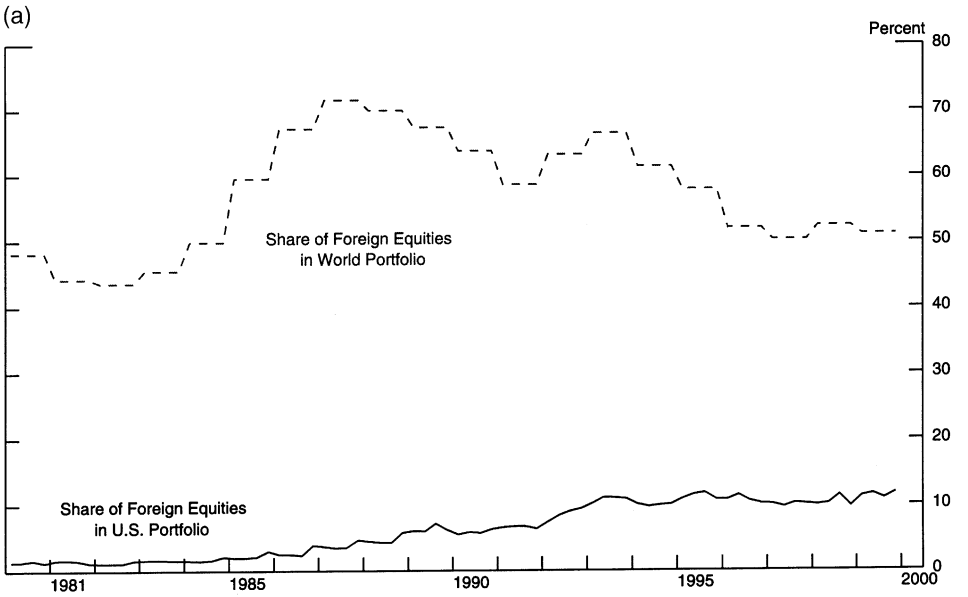

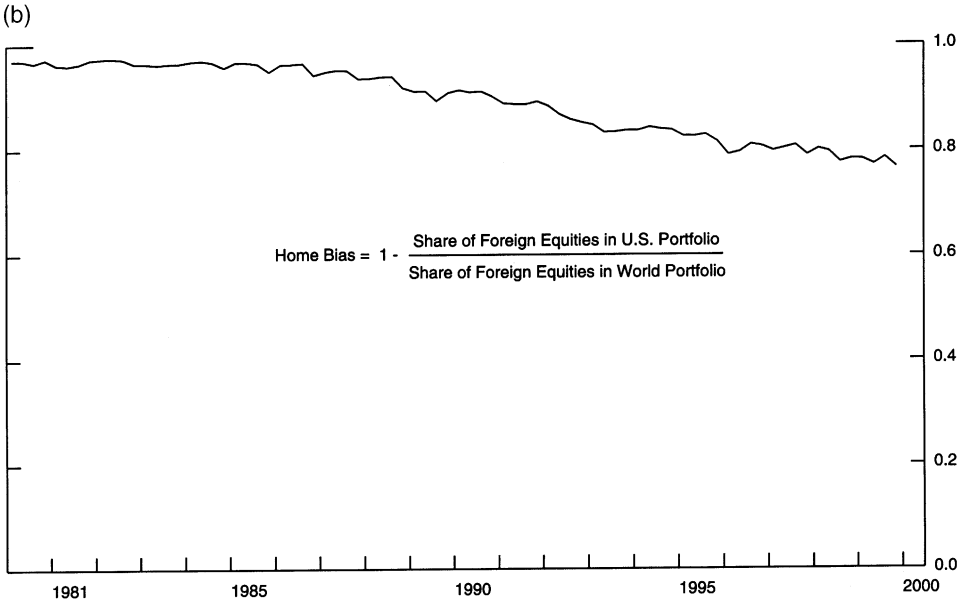

Fig. 1. (a) Share of foreign equities in world and US portfolios. Sources: International Finance Corporation, International Federation of Stock Exchanges, and Federal Reserve Board. (b) Home bias.

world portfolios. As the graph shows, the home bias in US equity portfolios has decreased substantially over the past two decades, but remains quite high.[1]

This paper focuses on another stylized fact of international finance, high turnover rates on foreign equity portfolios, which is attributable to the evidence presented in Tesar and Werner (1995). In particular, Tesar and Werner showed that in 1989 Canadians turned over their foreign equity portfolio ten times faster than their domestic equity portfolio, and that US residents turned over their foreign portfolio at twice the rate of their domestic portfolio. High foreign turnover presented a new puzzle for the theory of international portfolio choice. High turnover also ruled out high transaction costs associated with trading foreign securities as a plausible explanation of home bias.

The Tesar–Werner findings on foreign turnover rates have generated two new bodies of literature. First, models are now designed to produce high turnover on cross-border positions (Rowland, 1999; Coval, 1999; and Guidolin, 2001). Second, the evidence against the plausibility of transaction costs as a factor in home bias is cited as reason to dismiss transaction costs as a source of barriers to international investment. This dismissal has led to models that rely on information asymmetries to explain portfolio flows (Kang and Stulz, 1997 and Brennan and Cao, 1997).

The Tesar–Werner findings were based on data published before reliable cross-border holdings data were available. Estimates of cross-border positions—the denominator in the turnover rate on foreign holdings—were constructed from cumulated capital flows and estimated valuation adjustments. Recent work has shown that capital flows data are poorly designed for estimating positions in foreign securities (Griever et al., 2001 and Warnock and Cleaver, 2002). This deficiency stems from the following sources. A large component of the position in foreign securities is due to past valuation adjustments. Returns can vary substantially across markets, which means the geography of the flows is a vital component of holdings estimates. But this is precisely the shortcoming of the capital flows data. Because capital flows data were designed according to the conventions of balance of payments accounting, they capture only the country of the foreign intermediary, which is not necessarily the country of the issuer.[2]

Comprehensive benchmark surveys of residents' holdings of foreign equities, available for a handful of countries, show the inaccuracies of past holdings estimates. The United States conducted a benchmark survey in 1994. Based on the results of that survey, the Bureau of Economic Analysis (BEA) increased their end-1993 estimate of US holdings of foreign equities by $241 billion, or 80 percent. Such underestimations led to the Tesar–Werner result. Since the foreign turnover rate is the value of transactions in foreign equities divided by the value of the foreign equity position, understatement of the denominator generates an artificially high turnover rate. Once

[1] See Karolyi and Stulz (2002) for a survey of the home bias literature.

[2] It should be noted that a security is designated as domestic or foreign based on the location of the issuer, not where the security is traded. For example, non-US securities trading on the New York Stock Exchange are considered foreign for US balance of payments purposes.

estimates based on benchmark survey data are used, foreign turnover rates decrease substantially and are roughly comparable to domestic turnover rates.[3]

Section 2 documents this result for the United States and Canada for 1989, the year of the Tesar–Werner data. Section 3 does the same for 1997, the year of the IMF-led Coordinated Portfolio Investment Survey, when both Canada and the United States conducted benchmark surveys. Section 4 asks the following question: Is home bias a consequence of high transaction costs? Data on actual transactions data for 41 countries suggests that the answer is no: Transaction costs are not directly related to home bias. Section 5 concludes.

2. The Tesar–Werner turnover results revisited

Tesar and Werner present three turnover measures. *Domestic turnover* is the ratio of annual transactions on a market to its capitalization. The *turnover rate in foreign equity held by domestic residents* is the ratio of annual transactions in foreign equities to the investment position in foreign equities. Similarly, the *turnover rate in domestic equity held by foreigners* is the ratio of foreigners' annual transactions in domestic equities to their holdings of domestic equities. This paper focuses on the first two measures.

Table 1 shows turnover rates for 1989. Panels A and B give the original Tesar–Werner turnover rates. Panel C shows that the foreign turnover rate for US investors falls in half to 1.18, and from 7.7 to 0.83 for Canadian investors, when more up-to-date estimates of cross-border holdings are employed.[4] In both cases, the sharp drop in the turnover rate was due to large upward revisions in estimates of foreign equity holdings. For the United States, these holdings estimates were more than doubled, from $92 billion, reported by Tesar and Werner, to $197 billion. For Canada, the revised estimates are approximately ten times that reported in Tesar and Werner.

The point of this paper is not to fault Tesar and Werner or the international investment position (IIP) data they used. The fact is, at least in the United States and likely elsewhere, capital flows data are ill-suited to estimate positions in foreign equities. The geography is confounded, with many transactions attributed to financial centers, making valuation adjustments—an important component of holdings estimates—guesswork. Short of redesigning the portfolio flow data to capture the foreign country in which the security was issued instead of the country of the foreign inter-

[3] It is not possible to determine the accuracy of the numerator, the sum of gross purchases and gross sales of foreign equities. For a discussion of the accuracy of the data on net purchases (gross purchases minus gross sales), see Warnock and Cleaver (2002).

[4] Our foreign turnover rates are comparable to those on Korean equities that are implied by summary statistics presented in Cho et al. (1999).

Table 1
Turnover rates in international equities, 1989 (US$ billions unless otherwise noted)

A. Domestic turnover rates (from Tesar and Werner (1995)

	Total transactions on domestic market(A)	Equity market capitalization(B)	Domestic turnover(A/B)
Canada	117.8	290.1	0.61
US	3223.9	3027.1	1.07

B. Turnover rates in foreign equity held by domestic residents (from Tesar and Werner (1995)

	Transactions in foreign equity(C)	Investment positions in foreign equity(D)	Turnover rate(C/D)
Canada	43.1	5.6	7.7
US	232.8	91.7	2.5

C. Turnover rates in foreign equity held by domestic residents (updated data)

	Transactions in foreign equity(C)	Investment positions in foreign equity(D)	Turnover rate(C/D)
Canada (C$ billion)	54.3	65.4[a]	0.83
US	232.8	197.4	1.18

[a] Estimates for Canadian holdings of foreign equities for 1989 are the author's, based on data from the 1995 edition of *Canada's International Investment Position*. See text for complete discussion.

mediary, accurate estimates of foreign equity positions can only be obtained through comprehensive, benchmark surveys.[5]

That said, the estimates of foreign holdings presented in the bottom panel of Table 1 are not directly from benchmark surveys. The US number is what the BEA now thinks—with the benefit of information from the 1994 US benchmark survey—US holdings of foreign equities amounted to in 1989. The survey gave a value as of March 1994; the end-1989 value, calculated by carrying backward position estimates, is an estimate.[6]

The Canadian number is also an estimate, but a large part of it—Canadian holdings of US equities—is based on benchmark survey data. According to the 1989 US benchmark survey of foreigners' holdings of US securities, the market value of Canadian holdings of US stocks at end-1989 was $44 billion, or about C$51 billion. In

[5] Total foreign holdings of domestic securities, but not the country-level detail, can be more accurately estimated using capital flows data because the valuation adjustment does not depend on correctly identifying the source country of the transaction.

[6] See Bach (1997) for a description of the revisions to the US IIP due to the 1994 benchmark survey.

addition, Canadian investors held other (non-US) foreign stocks that had an estimated book value of C$5 billion, or, based on a 2.87 price-to-book ratio for non-US securities, about C$14 billion in market value.[7] My estimate of C$65 billion is the market value of Canadian holdings of US equities (given by the US benchmark survey and published by Statistics Canada) plus the market value of Canadian holdings of non-US foreign equities (computed using the book value and price-to-book ratio).[8]

To restate, using information from two US benchmark surveys of cross-border holdings—the 1989 survey of foreign holdings of US securities and the 1994 survey of US holdings of foreign securities—the 1989 turnover rates on Canadian and US investors' foreign equity portfolios fall sharply from 7.7 and 2.5 to 0.8 and 1.2, respectively. In the next section, turnover rates for 1997, when both the United States and Canada conducted benchmark surveys, are examined.

3. Turnover rates based on the 1997 CPIS

At the end of 1997, twenty-nine countries participated in the IMF-led Coordinated Portfolio Investment Survey (CPIS), conducting simultaneous surveys to determine their residents' holdings of foreign securities.[9] The CPIS should provide accurate measures of foreign holdings of investors from twenty-nine countries and greatly enhance our knowledge of foreign turnover rates.

However, the data quality from the 1997 CPIS is not likely uniform. For many of these countries, the CPIS marked a first attempt: Only one-third had previously reported an IIP statement. Data collection approaches varied by country. The main choices countries had to make were whether to (i) conduct the survey at the aggregate or security-by-security level, (ii) survey end-investors or custodians, and (iii) make participation in the survey compulsory or mandatory. Surveying custodians (if domestic custodians exist), rather than just large end-investors, provides greater coverage of households' holdings (and retail holdings, in general), while a security-by- security survey is likely to provide more reliable estimates than an aggregate survey. Countries that took the aggregate approach asked the respondents to write down holdings by country. In contrast, in the security-by-security approach, respondents provide security-by-security data on holdings. National authorities then could cross-check the data to determine the accuracy of the value and country-attribution of reported positions.

Most countries took an aggregate approach. Of those that conducted security-by-security surveys, very few included data from custodians and obtained commercial databases to aid in their cross-checks. Of those that did, to my knowledge only two,

[7] Treasury Department (1998), a write-up of the 1994 Survey of Foreign Holdings of US Securities, also contains data from the 1989 US survey. See *Canada's International Investment Position* (1995) for the 1989 Canadian data. The price-to-book ratio corresponds to the MSCI (World ex US) Index.

[8] Until 1997, Canadian IIP data for Canadian holdings of foreign stocks were reported only at book value.

[9] See IMF (2000) for a discussion of the coordinated surveys.

Canada and the United States, also report data on gross transactions (i.e., gross purchases and gross sales) in foreign equities, which are necessary to compute turnover rates. Restricting the analysis to those countries that followed best practices and report gross transactions data rules out all countries but Canada and the United States.

Table 2 shows turnover rates on domestic and foreign equity portfolios for the United States and Canada in 1997. Panel A shows that domestic turnover rates are low on the Toronto and New York Stock Exchanges, but quite high on the Nasdaq. Panel B shows that while Canadians turned over their foreign equity portfolio twice in 1997, this was due to a high turnover rate (2.76) on their portfolio of US equities; their turnover rate on non-US foreign equities is about one.[10] US investors turned

Table 2
Turnover rates in international equities, 1997 (US$ billions unless otherwise noted)

A. Domestic turnover rates[a]

	Total transactions on domestic market(A)	Equity market capitalization(B)	Domestic turnover(A/B)
Canada (Toronto)	305	568	0.54
US (NYSE)	5778	8880	0.65
US (Nasdaq)	4482	1726	2.60

B. Turnover rates in foreign equity held by domestic residents[b]

	Transactions in foreign equity(C)	Investment positions in foreign equity(D)	Turnover rate(C/D)
Canada (C$ billion)			
All foreign equities	319	159	2.01
In US equities	227	82	2.76
In non-US equities	93	77	1.21
US	1553	1208	1.29

[a] Data in Panel A are from the International Federation of Stock Exchanges (www.fibv.com) and are not directly comparable because Nasdaq computes turnover rates differently from NYSE or TSE. The latter exchanges count as turnover only those transactions which pass through their trading systems or which take place on the exchange's trading floor. Nasdaq includes in its turnover figures all transactions subject to supervision by the market authority (transactions by member firms, and sometimes non-members, with no distinction between on- and off-market and transactions made into foreign markets reported on the national market). Transactions include trading in foreign firms listed on these exchanges and thus overstate the turnover rates on domestic equities. Data for 1999 suggest that the degree of overstatement is quite small.

[b] Aggregate data for Canada are from *Canada's International Transactions in Securities* and *Canada's International Investment Position*; both are Statistics Canada publications. The US/non-US split for Canadian holdings of and transactions in foreign equities is from unpublished data provided by Statistics Canada. US data are from www.treas.gov/tic/ and www.treas.gov/fpis/.

[10] According to Statistics Canada, the reported market value of Canadian holdings of foreign equities should be considered a lower bound, because the household sector is under-represented in the survey.

over their foreign equity portfolio 1.3 times in 1997, comparable to their 1989 turnover rate. Thus, the table shows that investors may well turn over their foreign portfolios slightly faster than their domestic portfolios. It also highlights the fact that turnover rates vary greatly across stock exchanges.

4. But do transaction costs matter?

Turnover rates on foreign equity portfolios are much lower than previously reported, but the question remains: Can transaction costs explain the observed home bias in equity holdings? Recently, researchers have investigated this question using a direct measure of transaction costs faced by institutional investors across many countries. The measure, compiled for markets in 42 countries by Elkins–McSherry Co. and analyzed in Domowitz et al. (2001) and Willoughby (1997), is comprised of three components: commissions, fees, and market impact costs. Market impact costs, or liquidity costs, are intended to measure the deviation of the transaction price from the price that would have prevailed had the trade not occurred. In practice, impact costs are measured as the deviation of the transaction price from the day's average price; see Willoughby (1998) for a discussion.

Results in Domowitz et al. (2001) suggest that transaction costs cannot explain the home bias in US equity portfolios. Using cost-adjusted returns instead of unadjusted returns tilts the composition of a US investor's global efficient portfolio from North America (which includes the relatively high cost Nasdaq) toward Europe and Latin America, indicating that incorporating costs makes the observed home bias even more of a puzzle.

Rather than working with cost-adjusted returns, Ahearne et al. (2000) use data from the 1997 benchmark survey of US holdings of foreign equities—the same data used in calculating the turnover estimates in Table 2—to investigate the relationship between transaction costs and home bias. For 41 foreign countries, Fig. 2 plots the Elkins–McSherry measure of transaction costs for 1997 (normalized so that costs in the highest cost country, Korea, equals one) against the country's underweighting in US investors' portfolios, where underweighting (or bias) is defined relative to the foreign country's share of worldwide market capitalization. As the figure shows, it is difficult to discern a simple bilateral relationship between trading costs and the measure of bias; there is wide dispersion around a flat trendline.

While no direct evidence between transaction costs and home bias exists, there may well be an indirect relationship. Since the NYSE is one of the lower cost exchanges in the world, one way firms from high cost countries can alleviate trading costs in their stocks is by listing on the NYSE, as in the model of Martin and Rey (2000).[11] The general result from Ahearne et al. (2000) is that countries whose firms tend to list on US exchanges are less underweighted in US portfolios. This listing

[11] See Alaganar and Bhar (2001) for evidence showing that Australian fund managers can lower costs by using ADRs rather than the underlying Australian stock.

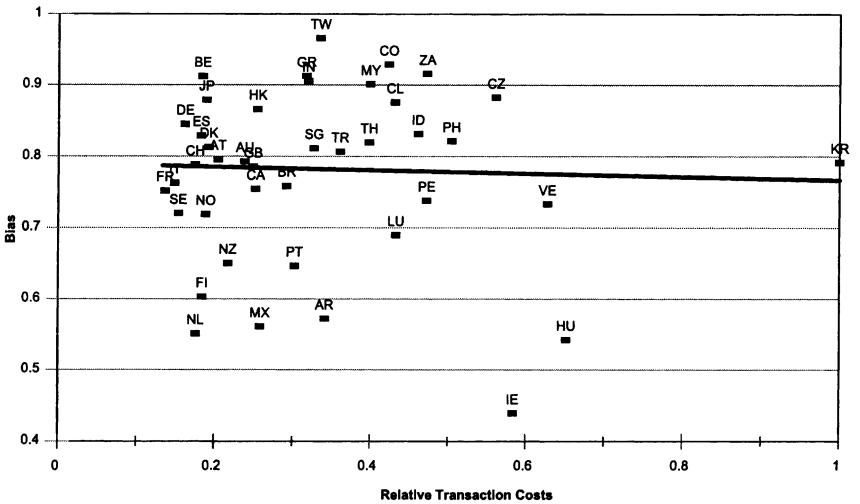

Fig. 2. Transaction costs and home bias.

[a]Bias, or underweighting in the US portfolio, is one minus the relative weight of a country's equities in the US portfolio to its weight in world market capitalization, as computed in Ahearne et al. (2000). The trendline from a regression of bias on transaction costs is shown; the R^2 of the regression is 0.00.

Country codes

AR	Argentina	DK	Denmark	IN	India	PH	Philippines
AT	Austria	Eg	Egypt	IT	Italy	PK	Pakistan
AU	Australia	ES	Spain	JP	Japan	PL	Poland
BE	Belgium	FI	Finland	KR	Korea	PT	Portugal
BR	Braxil	FR	France	LU	Luxumbourg	RU	Russia
CA	Canada	GB	Great Britain	MA	Morocco	SE	Sweden
CH	Switzerland	GR	Greece	MX	Mexico	SG	Singapore
CL	Chile	HK	Hong Kong	MY	Malaysia	TH	Thailand
CN	China	HU	Hungary	NL	Netherlands	TR	Turkey
CO	Colombia	ID	Indonesia	NO	Norway	TW	Taiwan
CZ	Czech	IE	Ireland	NZ	New Zealand	VE	Venezuela
DE	Germany	IL	Israel	PE	Peru	ZA	South Africa

effect is greater for high transaction cost countries, suggesting that transaction costs may well matter, albeit indirectly.

5. Conclusion

The Tesar–Werner home bias and high turnover puzzle is not evident when more up-to-date and higher quality estimates of cross-border holdings are used. Turnover rates on foreign equity portfolios are much lower than previously reported, and are roughly comparable to domestic turnover rates. New data on transaction costs confirm the main Tesar–Werner conclusion that transaction costs cannot explain the observed home bias.

Perhaps more important than the findings is the message that estimates of cross-border holdings can be inaccurate for the simple reason that capital flows data, designed based on the conventions of balance of payments accounting, identify the country through which the transaction was made. With *inbound* transactions data—that is, foreigners' net purchases of *domestic* securities—this is not a major obstacle for estimating aggregate positions. To estimate aggregate foreign holdings of US equities, for example, knowledge of the country of the foreign investor is not necessary. We should be less confident, though, when estimating bilateral holdings, such as German holdings of US stocks. With *outbound* transactions data—that is, domestic residents' net purchases of *foreign* securities—the country of the issuer of the security is a vital piece of information when estimating aggregate holdings of foreign securities. Since capital flows data do not identify the country of the issuer, a price index to revalue holdings cannot be chosen with confidence.[12]

Data quality should improve in the near future, because more countries are committing to relatively frequent benchmark surveys of cross-border holdings using harmonized definitions. Twenty-nine countries conducted outbound surveys at the end of 1997. Over 75 countries are on board for an end-2001 survey.[13] Thereafter, it is quite possible that annual surveys will be conducted. Moreover, more countries will likely to be able to conduct a comprehensive, security-by-security survey, which, according to IMF (2000), should provide more accurate results.

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[12] Canada is able to identify its residents' transactions in US securities. For all other countries, though, Canada presents transactions data based on the country of the transactor.

[13] See article in the IMF Survey (www.imf.org/external/pubs/ft/survey/2001/040201.pdf).

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