The Informational Advantage of Foreign Investors: An Empirical Study of the Swedish Bond Market[*]

Patrik Säfvenblad

Stockholm School of Economics

Department of Finance[†]

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Abstract

This paper uses a unique dataset on daily capital flows to the Swedish bond market to analyse the relative information endowment of domestic and foreign investors.

Using the standard framework of a noisy rational expectations equilibrium, it is concluded that foreign investors are on average better informed than domestic investors about the future value of SEK denominated bonds. The better information of foreign investors is shown to be related to both pure Swedish factors as well as international factors.

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1 Introduction

A growing literature studies the relationship between international portfolio investment and asset returns. Most of this literature studies the effect of investments in equity markets, in particular emerging markets. The fact that very little work has been made using bond market data can be attributed to the lack of high quality data. As most bond markets operate as decentralised dealer markets, it has been hard to establish comprehensive datasets on trading.

In the Swedish bond market, however, primary dealers are subject to strict reporting requirement. This provides an unprecedented opportunity to extend earlier equity market results to a well developed bond market. The Swedish central bank, Sveriges Riksbank, has collected daily transaction data from all market participants creating a dataset that is unique both in comprehensiveness and detail. Furthermore, the dataset is from a country without capital restrictions and a floating exchange rate, eliminating many of the empirical problems encountered when studying, for example, emerging markets.

The capital flow information has never been observed by market participants. This means that, for once, the econometrician has an informational advantage over market participants. The daily data permits inference on both concurrent and the lagged price adjustment. If capital flows are publicly available, market participants would presumably trade more aggressively on their information, reducing lagged price effects.

Contrary to conventional wisdom, the paper concludes that foreign investors are better informed about future Swedish bond prices than Swedish investors. It thus provides a contrasting backdrop to the ongoing discussion of home bias, the effects of internationalisation of financial markets, and the influence of foreign investors on capital markets.

2   Theoretical background

This paper uses the correlation between capital flows and bond returns to determine the relative information endowment of international and domestic investors. The methodology is based on standard results derived in the literature on noisy rational expectations equilibria (REE, see Hellwig, 1980, Kyle, 1985, 1989), and is widely used to study the relationship between capital flows and equity returns (e.g. Brennan and Cao, 1997, Froot et al., 1998, Grinblatt and Keloharju, 1998).

In this literature, price changes corresponds to changes in the commonly perceived value of a security.[1] This implies that returns will be serially uncorrelated and that trading strategies based on public information such as past prices cannot be profitable. Regardless of the chosen REE framework, there are three identifiable trader types, the noise trader, the informed trader and the market maker (e.g. Kyle, 1989).

A noise trader is an investor who trades for reasons unrelated to the future value of a security, for example due to a liquidity shock or for hedging purposes. Since noise traders cannot credibly signal the non-informational nature of their trades, a net purchase made by a noise trader will tend to push up the price temporarily. After a while, prices return to their prior level.

The informed investor, on the other hand, implements a profit maximising trading strategy that is based on information not yet reflected in securities prices. The resulting profits correspond to losses for the noise traders. A net purchase made by an informed investor pushes up a price permanently. The price increase will be followed by continued price increases and net purchases until the information of the informed investor is fully reflected in prices.

If the number of informed investors is limited there may also be room for a third type of trader, the market maker. A market maker has no information

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[1]This information based literature should not be confused with the reasoning in the flow-of-funds literature, where capital flows are assumed to correspond to changes in the net demand of cash or bonds (e.g. Correia-Nunes and Stemitsiotis, 1995, Evans, 1987, Cebula and Koch, 1989, 1994). The two literatures can be reconciled by seeing short term capital flows as a speculatively motivated signal of the future supply and demand of funds.

that is not already reflected in securities prices, but can make trading profits by accommodating the demand of noise traders. Relative to a market without market makers, price efficiency will improve while losses of noise traders and profits of the informed investors are reduced. A market maker will act as a "contrarian investor," buying when prices drop and selling when prices increase.

Of course, any individual investor may change trader type depending on circumstances, possibly from one trade to the next. The statement that foreign investors tend to act as informed investors does thus not preclude these investors from occasionally trading as market makers or noise traders. It only implies that the average trading pattern of foreign investors corresponds to that of an informed investor.

In order to identify the "type" of a particular class of traders we can use the outlined correlation between price impact and net trades. Trades of active investors will be positively correlated with concurrent returns. Trades will be accommodated by "passive" investors who effectively act as market makers.

The price reaction *after* the trade allows us to make a distinction between informed and uninformed trades. Trades of the more informed investors will be positively correlated with future returns, while trades of trades of uninformed investors will be followed by price reversals.

3 Empirical evidence on asset returns and capital flows

The empirical literature on the relationship between capital flows and asset prices is dominated by studies of equity markets. An notable exception is Cebula and Koch (1989, 1994) who find that monthly capital flows to the US correlate positively with USD bond returns.

Most studies use monthly data on flows and returns , but some recent studies use daily data, for example, Froot et al. (1998) and Grinblatt and Keloharju (1998). Froot et al. (1998) study US capital flows to foreign equity markets

using a daily data set from a major US custodian bank. They find evidence of investment flows predicting future returns in emerging markets, a result consistent with US-based investors having better marginal information than local investors. However, capital flows to developed markets are negatively correlated with future returns indicating that US-based investors are at an informational disadvantage in these markets.

Grinblatt and Keloharju (1998) use daily transaction data from the Helsinki Stock Exchange to measure the relative informativeness of trades of various investor groups. They find that trades of more advanced investors (including banks and international investors) are positively correlated with future returns while trades of less advanced investors (e.g. households) are negatively correlated with future returns.

Brennan and Cao (1997) study monthly capital flows to 16 emerging market economies, showing that flows correlate positively with returns. Similarly, Sellin (1996) shows that Swedish stock market returns are positively correlated with investment flows. However in the Swedish case, returns are subsequently reversed, leading to a net price effect of zero after three months and the conclusion that foreign investors act as noise traders.

4 The Swedish bond market

This section gives an overview of the structure of the Swedish bond market during the 1993-1996 sample period used for the empirical study.

The value of outstanding bonds amounts to approximately 1600 billion SEK (200 billion USD), 50% of which was mortgage bonds, 40% government bonds and 10% remaining include corporate bonds and bonds issued by banks and finance companies. Swedish investors hold 92% of all outstanding bonds (1995) with foreign investors accounting for the remainder. The Swedish national pension fund and major Swedish banks and insurance companies hold 61% of the total volume. 28% is held by other Swedish investors, including companies,

municipalities and mutual funds.[2] Foreign investors primarily have small SEK denominated bond holdings as part of internationally diversified bond portfolios.[3]

The Swedish bond market is a highly liquid dealer market, similar in structure to the foreign exchange market. 10-15 "primary dealers" display quotes in an electronic information system.[4] Quotes are usually honoured, but must be confirmed over telephone before a transaction is made. For a spot transaction, physical delivery is made after 5 bank days in a manual settlement procedure. There are no capital controls facing either Swedish or foreign investors. The standard trade size is 20 million SEK (2.5 million USD) face value.

Primary dealers are bound by contract with the Swedish National Debt Office. In return for the exclusive right to bid for new issues in the primary market they must provide two-way quotes in benchmarks bonds, and maintain at least a 2% market share in both primary and secondary market.

The primary dealers act as intermediaries for all domestic and foreign investors. Average bond trading volume amounts to 42 billion SEK (5.2 billion USD) per day (see table 1). Approximately 60% of transactions are traded spot with the remainder traded forward. Interdealer trading accounts for roughly a third of total trading. Customer trades are approximately equally divided between domestic and foreign investors. Since foreign holdings are much smaller than domestic holdings the turnover rate of foreign investors' holdings is much higher than that of domestic investors. This is similar to relatively high turnover rates of foreign investors' equity holdings reported by Tesar and Werner (1995).

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[2]The data in this paragraph can be found in official central bank statistics. The reported holdings refer to 1995 and vary slightly over time between approximately 5% and 15% (Sveriges Riksbank, 1996)

[3]A survey of bond holdings are available from Capital Access Inc. on a commercial basis. Swedish holdings as reported by Capital Access Inc are discussed in in Affärsvärlden (1997).

[4]The number of primary dealers changes due to mergers and entry/exit of smaller dealers.

Table 1: Daily trading volume in the Swedish bond market

	Trading volume (billion SEK per day)	Share
Spot bond trading		
Dealer - Foreign investor	9.2	19.1%
Dealer - Domestic investor	8.6	21.6%
Dealer - Dealer	8.1	20.2%
Total spot	26.0	60.8%
Forward bond trading		
Dealer - Foreign investor	5.4	12.6%
Dealer - Domestic investor	4.7	11.1%
Dealer - Dealer	6.1	14.3%
Total forward	16.2	38.0%
Total	42.2	100.0%

Sample period: 1 January 1993 – 31 May 1996.

Table 2: Quintiles of daily transaction flows

Series	Quintile 1 (Outflow)	2	3	4	Quintile 5 (Inflow)	T
Spot Government	−2.30	−0.68	0.03	0.79	2.54	900
Spot Mortgage	−0.61	−0.12	−0.00	0.12	0.44	900
Forward Government	−1.42	−0.46	−0.01	0.42	1.40	900
Forward Mortgage	−0.46	−0.08	0.01	0.11	0.48	900
Total	−2.73	−0.80	0.07	0.91	2.73	900

Net transaction flows are divided into quintiles and an capital flow average is calculated over trading days days. Negative values imply foreign investors selling SEK-denominated bonds (capital outflow). Values in SEK bn per day. The average of all days is close to zero for all series. Sample period: 1 January 1993 – 31 May 1996.

5 Data

As part of their contract with the Swedish National Debt Office, primary dealers provide daily reports of their trading to Sveriges Riksbank, the Swedish central bank. Virtually all trading in Swedish bonds and related instruments is made via a primary dealer resulting in a very comprehensive record of trading.

Reports specify the market value of net transactions made with three separate investor classes: domestic, foreign and other dealers. Spot and forward trades are reported separately. Trades are further divided into government

bonds and mortgage bonds, resulting in four bond categories. As all dealers close the trading day with an empty book, inter-dealer trades sum to zero.[5] Reported trades with domestic and foreign investors are therefore equal with opposite sign. Net trades can thus be interpreted seen as an investment flow from foreign investors to the Swedish market.

The daily summary of primary dealer reports used in this paper is completely anonymous and there is no possibility of tracking transactions to individual dealers, market participants or bond issues. Individual reports and daily summaries have never been made public.

There are five separate series to measure of capital flow from foreign investors: *Spot Government* and *Forward Government* are spot and forward purchases of government bonds, while *Spot Mortgage* and *Forward Government* are spot and forward purchases of mortgage bonds. The series *Total* is the sum of the other four series. Table 2 gives an indication of the size of these flows. In 40% of the trading days the total capital flow is at least 2.7 billion SEK.

The sample period is 1 January 1993 to 31 May 1996, starting relatively soon after the devaluation of the Swedish crown (November 1992). The first part of the sample period can thus be seen as period when the bond market tries to find the new equilibrium price dynamics under the flexible exchange rate regime. In addition to the capital flow series, data on yields on 10 year government bonds and exchange rates at market close have been collected from the Swedish central bank interest rate database.

6   Empirical results

6.1   Summary statistics

Table 3 reports the contemporaneous correlation between the five capital flow series. There is strong negative correlation between spot and forward purchases of securities, indicating that traders use forward trading to hedge transactions

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[5]In the summary, any overnight position is added to the Swedish account.

Table 3: Correlation matrix of capital flows

	Spot Govern- ment	Spot Mort- gage	Forward Govern- ment	Forward Mort- gage	Total
Daily flows					
Spot Government	$\cdots$				
Spot Mortgage	0.07*	$\cdots$			
Forward Government	−0.14**	0.01	$\cdots$		
Forward Mortgage	0.01	−0.20**	−0.05	$\cdots$	
Total	0.82**	0.25**	0.40**	0.11**	$\cdots$
Flows aggregated over 5 trading days					
Spot Government	$\cdots$				
Spot Mortgage	0.25**	$\cdots$			
Forward Government	−0.19*	−0.05	$\cdots$		
Forward Mortgage	0.16**	−0.05	−0.00	$\cdots$	
Total	0.84**	0.40**	0.32**	0.28**	$\cdots$

Sample period: 1 January 1993 – 31 May 1996. **/* Significantly different from zero at the 0.01/0.05 level. (The significance levels are calculated using GMM.)

in the spot market.

As would be expected if trades are based on informational differences, capital flows are positively autocorrelated (e.g. Kyle, 1985). *Spot Government* and *Spot Mortgage* have significant one-day autocorrelation as well as a day-of-the-week effect manifested in the five day autocorrelation (see table 4). Autocorrelation is low for the other series.

6.2 Estimation procedure

The estimation uses linear least squares. When series are aggregated over several trading days, regressions use overlapping observations. Standard error estimates are calculated using the GMM estimator of Hansen (1982, 1985). Reported significance levels are thus robust to both autocorrelation and conditional heteroskedasticity.

The immediate price effect of day t trades is measured as the interest rate change between the closing of day $t-1$ and the closing of day t: $i_t - i_{t-1}$. The lagged price effect of day t trades is measured as the price effect between the

Table 4: Partial autocorrelation at lag $1-5$

	$\hat{\beta}_1$	$\hat{\beta}_2$	$\hat{\beta}_3$	$\hat{\beta}_4$	$\hat{\beta}_5$	$\chi^2(5)$	T
Transaction series							
Spot Government	0.09^{**}	-0.01	0.02	0.01	0.05	10.7	884
Spot Mortgage	0.18^{**}	-0.02	0.01	0.04	0.11^{**}	36.8^{**}	884
Forward Government	0.07	-0.07	0.03	0.04	-0.03	7.3	884
Forward Mortgage	-0.06	0.05	0.04	0.08	-0.02	7.3	884
Total	0.15^{**}	-0.03	0.00	0.04	0.07^{*}	22.8^{**}	884
Bond yield changes							
$i_t - i_{t-1}$ (SEK 10y)	0.03	-0.03	0.02	0.08	-0.11	8.3	739
$i_t - i_{t-1}$ (DEM 10y)	-0.04	0.01	0.02	-0.06	0.05	6.4	746
$i_t - i_{t-1}$ (ITL 10y)	-0.04	0.03	0.05	0.03	-0.02	4.1	758
Exchange rate changes							
$ln(x_t) - ln(x_{t-1})$ (DEM/SEK)	0.04	-0.07	-0.04	0.02	0.00	7.6	781
$ln(x_t) - ln(x_{t-1})$ (DEM/ITL)	-0.03	-0.05^{*}	-0.07	0.12	-0.03	6.9	781

The table reports the estimates from fitting an AR(5) process + constant to each of the series. The constant is omitted from the table. The $\chi^2(5)$ statistic tests the restriction $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$. Sample period: 1 January 1993 – 31 May 1996. $^{**}/^{*}$ Significantly different from zero at the 0.01/0.05 level.

closing of day t and the closing of day $t+5$: $i_{t+5} - i_t$.

Swedish interest rates depend heavily on other European, mainly DEM interest rates, therefore all regressions control for changes in DEM interest rates. Similar results obtain using the spread between SEK and DEM bond yields as dependent variable. Results are also robust to the choice for choices of aggregation frequency between 2 and 20 days. More elaborate modelling using, e.g., VAR models show no significant feedback effect from interest and exchange rates to capital flows.

6.3 Correlation between bond returns and capital flow

By estimating the correlation between capital flows and returns we can determine whether foreign investors trade actively or passively. The results presented in table 5 are unambiguous. Capital flows are positively correlated with Swedish bond returns. The $\hat{\beta}_1$ estimate for *Spot Government* of -7.478 implies that a net purchase of 10 billion SEK (12 billion USD) worth of government bonds correspond to a reduction of bond yields of 7.5 basis points.

Table 5: Regression of changes in SEK bond yields on concurrent capital flow

	$\hat{\beta}_1$ (flow)	$\hat{\beta}_2$ (DEM)	R^2	T
Daily data				
Spot Government	-7.478^{**} (2.026)	0.893^{**} (0.077)	0.229	867
Spot Mortgage	-2.158 (8.085)	0.922^{**} (0.075)	0.215	867
Forward Government	0.277 (3.073)	0.924^{**} (0.075)	0.214	867
Forward Mortgage	4.807 (8.983)	0.924^{**} (0.076)	0.215	867
Total	-5.664^{**} (1.829)	0.895^{**} (0.077)	0.226	867
Aggregated over 5 days				
Spot Government	-8.840^{**} (3.344)	1.054^{**} (0.151)	0.296	864
Spot Mortgage	-13.123 (10.818)	1.093^{**} (0.149)	0.277	864
Forward Government	-0.232 (5.668)	1.108^{**} (0.152)	0.274	864
Forward Mortgage	-39.044^{**} (14.065)	1.101^{**} (0.148)	0.288	864
Total	-8.190^{**} (3.077)	1.039^{**} (0.146)	0.299	864

Regression models: $(i_t - i_{t-s})$ [SEK] $= \beta_0 + \beta_1$ (Net bond transaction in billion SEK between $t - s$ and t) $+\beta_2(i_t - i_{t-s})$ [DEM] $+ \varepsilon_t$. $s = 1$, 5. Sample period: 1 January 1993 – 31 May 1996. **/* Significantly different from zero at the 0.01/0.05 level.

The price impact of capital flows is a measure of the *difference* in trading characteristics between the two investor groups. The positive correlation between flows and returns indicate that, in aggregate, foreign investors trade more "actively" than domestic investors. The stock market analogy of this result is that foreign investors submit mostly market orders while domestic investors trade using limit orders.

Positive correlation between net purchases and price changes is expected for both noise traders and informed traders (Kyle, 1989, Brennan and Cao, 1997). Using the correlation between bond returns and lagged capital flows we can determine to which extent foreign trades are based on information.

6.4 Correlation between bond returns and lagged capital flow

Table 6 repeats the estimation of table 5 using lagged capital flows. With the exception of daily *Forward Government*, all parameter estimates are negative, with the 1 day coefficient of *Forward Mortgage* and the 5 day coefficients for *Spot Mortgage*, *Forward Mortgage* and *Total* being significantly negative.

Capital flows from foreign investors are thus positively correlated with both concurrent and future bond returns. In an REE environment this corresponds to foreign investors being, on average, better informed about future Swedish bond prices than domestic investors. By purchasing SEK denominated bonds they profit from their informational advantage.

The results of table 6 indicate that foreign investors are, on average, better informed about future Swedish bond prices. This informational advantage can be related to several different types of information, both Sweden-specific and international.

Swedish factors include domestic monetary policy, inflation, inflation expectations, growth, capacity utilisation etc. These factors should, intuitively, be better known or understood by Swedish investors.

International factors include similar information for other countries or the world economy. Since interest rate changes in, for example, Germany has a direct influence of Swedish interest rates levels knowledge of factors that determine German interest rates can be used for profitable trading in the Swedish bond market.

Such "international" factors should be expected to be better known by international investors. In any case, it is not to be expected that the experts on international interest rate determination are affiliated with Swedish bond market traders. If it is the case that foreign investors trade profitably in Swedish bonds using "international" information, this information should be valuable in other markets as well.

Table 6: Regression of changes in SEK bond yields on lagged capital flow

	$\hat{\beta}_1$ (lagged flow)	$\hat{\beta}_2$ (DEM)	R^2	T
Daily data				
Spot Government	−2.016 (2.006)	0.926** (0.075)	0.216	868
Spot Mortgage	−6.614 (6.803)	0.923** (0.075)	0.215	868
Forward Government	4.507 (3.252)	0.922** (0.075)	0.216	868
Forward Mortgage	−34.200** (9.505)	0.931** (0.075)	0.226	868
Total	−1.545 (1.675)	0.926** (0.075)	0.215	868
Aggregated over 5 days				
Spot Government	−6.796 (4.389)	1.106** (0.151)	0.276	868
Spot Mortgage	−53.943** (18.330)	1.100** (0.149)	0.282	868
Forward Government	−6.151 (8.764)	1.105** (0.152)	0.274	868
Forward Mortgage	−49.026* (21.321)	1.114** (0.154)	0.278	868
Total	−10.811* (5.019)	1.107** (0.150)	0.281	868

Regression models: $(i_t - i_{t-s})$ [SEK] $= \beta_0 + \beta_1$ (Net bond transaction in billion SEK between $t - s - 1$ and $t - s$) $+\beta_2(i_t - i_{t-s})$ [DEM] $+ \varepsilon_t$. $s = 1, 5$. Sample period: 1 January 1993 – 31 May 1996. **/* Significantly different from zero at the 0.01/0.05 level.

6.5 Correlation between ITL bond returns and lagged capital flow

Table 7 shows the results of tests on whether capital flows to Sweden has any predictive power for future ITL bond yields. It is hard to imagine a direct economic link between capital flows to Sweden and ITL interest rate determination. The link, if any should be informational: trades of foreign investors reflect information about fundamentals that are valuable also for pricing ITL denominated debt instruments.

Results reported in table 7 are very similar to those obtained for SEK bond

Table 7: Regression of changes in ITL bond yields on lagged capital flows to the Swedish bond market

	$\hat{\beta}_1$ (lagged flow)	$\hat{\beta}_2$ (DEM)	R^2	T
Daily data				
Spot Government	−2.462	0.855**	0.145	861
	(2.500)	(0.095)		
Spot Mortgage	−0.472	0.852**	0.143	861
	(6.136)	(0.093)		
Forward Government	2.808	0.851**	0.144	861
	(3.501)	(0.093)		
Forward Mortgage	−20.749*	0.856**	0.147	861
	(8.141)	(0.093)		
Total	−1.720	0.855**	0.144	861
	(1.960)	(0.094)		
Aggregated over 5 days				
Spot Government	−10.116*	1.173**	0.263	858
	(4.583)	(0.136)		
Spot Mortgage	−23.371	1.171**	0.260	858
	(21.114)	(0.135)		
Forward Government	−3.065	1.173**	0.259	858
	(7.930)	(0.137)		
Forward Mortgage	−51.615*	1.182**	0.263	858
	(22.263)	(0.137)		
Total	−11.295**	1.174**	0.265	858
	(4.078)	(0.135)		

Regression models: $(i_t − i_{t−s})$ [ITL] $= \beta_0 + \beta_1$ (Net bond transaction in billion SEK between $t − s − 1$ and $t − s$) $+\beta_2(i_t − i_{t−s})$ [DEM] $+ \varepsilon_t$. $s = 1, 5$. Sample period: 1 January 1993 – 31 May 1996. **/* Significantly different from zero at the 0.01/0.05 level.

yields in table 6; capital flows significantly predict future ITL bond yields. This implies that at least part of trades of foreign investors result from better information on a factor in interest rate formation that affects both Sweden and Italy.

There is no evidence of capital flows predicting future DEM bond yields or the SEK/DEM exchange rate (estimation results not reported). This result supports the conventional market wisdom that SEK bonds shares a "weak currency" factor with ITL bonds.

6.6 Correlation between bond returns and lagged capital flow controlling for international factors

In an integrated market it is not possible to find uniquely "Swedish" assets that are exclusive loaded on the "Swedish" factors. In addition it is possible that foreign assets are loaded on "Swedish" factors. However, by controlling for foreign asset prices we can determine whether the informational advantage of foreign investors extend to the pricing of Swedish debt in excess of factors such as the DEM interest rates.

Table 8 presents the results of such a regression. Here Swedish bond returns are controlled for concurrent yield changes for DEM and ITL, as well as the SEK/DEM exchange rate. Although the statistical significance is low, capital flows still seem to predict future Swedish bond yields after these controls. This lead to the conclusion that that foreign investors are informed about pure Swedish fundamentals, in additional to international fundamentals.

7   Conclusions

This paper investigates whether foreign investors are more or less informed about future SEK bond returns than Swedish investors. Contrary to earlier empirical studies, the evidence suggests that foreign investors are better informed of future Swedish bond prices. This conclusion is reached by showing that the net trades of foreign investors are informative for future SEK bond returns.

This result is contrary to conventional wisdom, supposing that domestic investors should be better informed about local assets. Their presumably lower information costs would make it worthwhile to invest more in information gathering and as a result they will end up more informed.

However there are a number of factors that could explain the relative low informativeness of "Swedish" trades. Swedish investors are dominated by very large and sophisticated pension funds and insurance companies. These institutions hold a large fraction of their assets in SEK denominated bonds. Therefore

Table 8: Regression of changes in SEK bond yield on lagged capital flow controlling for DEM and ITL bond yields and SEK/DEM exchange rate

	$\hat{\beta}_1$ (lagged flow)	$\hat{\beta}_2$ (DEM)	$\hat{\beta}_3$ (ITL)	$\hat{\beta}_4$ (DEM/SEK)	R^2	T
Daily data						
Spot Government	−1.276 (1.729)	0.654** (0.072)	0.196** (0.036)	−6.371** (0.561)	0.432	857
Spot Mortgage	−9.197 (5.829)	0.651** (0.072)	0.197** (0.036)	−6.388** (0.561)	0.433	857
Forward Government	2.164 (3.026)	0.651** (0.072)	0.197** (0.036)	−6.353** (0.563)	0.432	857
Forward Mortgage	−20.748** (7.890)	0.660** (0.072)	0.195** (0.036)	−6.293** (0.561)	0.436	857
Total	−1.372 (1.425)	0.654** (0.072)	0.196** (0.036)	−6.380** (0.562)	0.432	857
Aggregated over 5 days						
Spot Government	−3.113 (2.952)	0.740** (0.113)	0.209** (0.047)	−9.435** (0.932)	0.633	854
Spot Mortgage	−33.634* (13.155)	0.737** (0.113)	0.209** (0.047)	−9.391** (0.935)	0.636	854
Forward Government	−6.301 (5.236)	0.738** (0.113)	0.211** (0.047)	−9.439** (0.933)	0.633	854
Forward Mortgage	−13.904 (15.132)	0.741** (0.114)	0.210** (0.047)	−9.416** (0.933)	0.633	854
Total	−6.139* (3.053)	0.744** (0.112)	0.206** (0.046)	−9.427** (0.931)	0.635	854

Regression models: $(i_t - i_{t-s})$ [SEK] $= \beta_0 + \beta_1$ (Net bond transaction in billion SEK between $t-s-1$ and $t-s$) $+\beta_2(i_t-i_{t-s})$ [DEM] $+\beta_3(i_t-i_{t-s})$ [ITL] $+\beta_4(x_t-x_{t-s})$ [LN DEM/SEK] $+\varepsilon_t$. $s = 1$, 5. Sample period: 1 January 1993 – 31 May 1996. **/* Significantly different from zero at the 0.01/0.05 level.

any liquidity will be directly meet by trading by buying or selling bonds. This will reduce the informational content of the average trade.

Swedish bonds make up only a small fraction of the portfolio of a typical foreign investor. Therefore liquidity shocks are less likely to be passed on into buy and sell decisions. It is also conceivable that international investors allocate capital and analytic resources to markets where they, at least temporarily, hold an informational advantage over domestic investors.[6] The relatively small size

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[6]This notion is supported by the finding of Tesar and Werner (1995), that investors have a higher rate of turnover of foreign stock holdings.

of their holdings make entry/exit feasible.

The informational advantage of foreign investors is partly due to pan-European fundamentals, reflected in the fact that the transaction series have explanatory power for future ITL bond returns changes and partly due to knowledge of future order flow. However, when controlling for foreign factors, predictability remains, indicating that foreign investors are also better informed about pure "Swedish fundamentals."

The results are particularly interesting as they contradict the conventional wisdom of local investors being better informed about local economic prospects than foreign portfolio investors. This result makes the home bias puzzle even more puzzling — if foreign investors excel in foreign markets why do they not invest more of their assets abroad? On the other hand it makes the high turnover documented here and by Tesar and Werner (1995) less surprising. If foreigners profit from trading Swedish bonds, we should expect them to trade a lot.

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