Why Did the Equity Home Bias Fall During the Financial Panic of 2008?

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Abstract

Theories of home bias and of portfolio choice under uncertainty both predict that the home bias should increase during a financial crisis. In contrast to these theories, using a sample of 45 countries, I document that the equity home bias fell during the financial panic of 2008. Employing a novel methodology to disentangle the active and passive component of portfolio holdings, I find that the trades of investors (the active component) increased the home bias, but the changes due to returns and exchange rates (the passive component) subsumed the active changes and reduced the home bias. Across countries, the change in home bias is consistent with portfolio rebalancing, increased information asymmetries, and familiarity bias during the crisis. The U.S. is the exception to the general global pattern because U.S. active changes outweighed U.S. passive changes, causing the U.S. home bias to increase. I show that U.S. investors reduced their holdings of foreign and domestic stocks, but reduced their holdings of foreign stocks at a higher rate.

Around the world, investors seemingly forgo the gains to international diversification and display a strong tendency to hold most of their equity wealth in domestic stocks (Lewis, 2011). This home bias remains an important puzzle in financial economics and has been the subject of much theoretical and empirical work.[1] Traditional portfolio choice theories frame the home bias to be a function of the benefits of holding foreign equity less the costs. Alternative approaches from the work in ambiguity aversion (Ellsberg, 1961) and familiarity bias (Heath and Tversky, 1991) examine whether portfolio choice under uncertainty can lead to a home bias. While economically distinct, both approaches share one prediction: during financial crises, the home bias should increase. However, using the International Monetary Fund's *Coordinated Portfolio Investment Survey (CPIS)* to create a global sample of the multilateral equity holdings of 45 countries, I find that in the recent financial crisis in 2008, the home bias decreased. Across countries the foreign portfolio share rose by an average of 3.62%, its largest increase over the 2000s. This result seemingly contrasts with the growing retrenchment literature that uses capital flows and transactions data to conclude that investors left foreign markets for home (Milesi-Ferretti and Tille, 2011; Forbes and Warnock, 2011; Fratzscher, 2011).

The difference between my result and that of the literature comes from the impact of valuation changes on holdings. Using a novel methodology, I decompose the change in allocation into its active component due to trades that investors made and passive component caused by differential returns and exchange rates. I find that in 2008, the active change in the foreign portfolio share was -1.02%, which is consistent with the retrenchment literature, but the passive change was much larger, 4.64%. During this period, some countries suffered worse returns than others, and most currencies significantly depreciated against the U.S. dollar (Fratzscher, 2009). My results show that, on average, the economic magnitude of the sales of foreign stocks by investors across the world was significantly less than the positive effect of these relative valuation changes in their foreign portfolio share.

To understand why investors would actively change their holdings, I examine whether the cross-country variation in stock portfolio changes was consistent with portfolio rebalancing, traditional theories

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[1] For detailed reviews of the home bias literature, see Lewis (2011) and Karolyi and Stulz (2003).

of the home bias, or portfolio choice under uncertainty. Assuming investors' target foreign holdings did not change, portfolio rebalancing predicts that investors who do not hold the world market portfolio would want to offset large passive changes in their holdings. This implies that active changes will be negatively associated with passive changes. Second, holding risk aversion constant, traditional home bias theories predict that if foreign investment is costly, reductions in wealth and increases in information asymmetry during the crisis would cause investors to raise their home bias. Third, there was a massive financial panic in 2008 (Gorton, 2008) that brought great uncertainty (Easley and O'Hara, 2010; Caballero and Krishnamurthy, 2008). All else equal, theories of portfolio choice under uncertainty predict that if investors are ambiguity averse, an increase in uncertainty (Uppal and Wang, 2003; Epstein, 2001) or heightening of familiarity bias (Cao et al., 2011) would cause investors to reduce their foreign portfolio share.

Empirically, I find that the change in equity holdings across countries support the predictions of portfolio rebalancing, increased information asymmetries, and familiarity bias during the crisis. Consistent with the portfolio rebalancing hypothesis, using the multilateral holdings from the CPIS, I find that active changes in the foreign portfolio share are negatively associated with passive changes in equity allocation in 2008. Investors rebalanced their equity holdings of more liquid countries at a higher rate, which is consistent with liquidity easing rebalancing. Additionally, I find that investors around the world significantly increased their home bias more towards target countries that were relatively distant and less towards countries within their same region or that shared a common culture; in the U.S., investors increased their home bias towards markets that experienced relatively lower returns in 2008. Both findings are consistent with information asymmetries causing a home bias (Brenan and Cao, 1997; Van Nieuwerburgh and Veldkamp, 2010; Andrade and Chhaochharia, 2010; Choe, Kho, and Stulz, 2005) and worsening during a period of crisis (Gelos and Wei, 2005). Finally, I find that the association between my proxy for familiarity, the growth of a target country in a home country's portfolio from 2001 to 2007, and changes in the home bias of U.S. investors is positive and economically significant. The relation is consistent with U.S. investors increasing their home bias more towards assets with which they were

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relatively less familiar during the crisis.

The results are less supportive of the predictions of wealth and ambiguity causing investors to change their portfolio allocation in 2008. To examine whether investors that suffer more severe wealth losses increase their home bias more, I proxy each home country's changes in financial wealth with buy and hold market returns. Additionally, I use GDP growth and consumption growth to proxy for changes in non-financial wealth and income. In my sample, only changes in financial wealth are associated with investors reducing the total share of equity wealth they allocate abroad, suggesting that changes in non-financial wealth were not significant drivers of the change in home bias during the recent crisis. Lastly, I do not find that the association between my proxy for increased uncertainty, the ratio of the highest standard deviation of daily market returns for any month in year t, divided by the monthly average of the standard deviation of daily market returns in year $t-1$, and changes in the home bias is significantly positive for the global sample or for U.S. investors. This finding does not support the prediction that investors increased their home bias towards markets where uncertainty grew higher.

Though several papers show how investors changed their portfolios in 2008, my paper decomposes the mechanisms through which investors' equity portfolios changed. As such, my contribution is three-fold. First, I directly map allocations from home to target countries to explain why investors left foreign markets as a function of conditions at home and abroad. Prior literature examines portfolio changes at either the home or target country level (Milesi-Ferretti and Tille, 2011; Forbes and Warnock, 2011; Fratzscher, 2011). I contribute to this research by using data that permit identification of changes in allocation from home to target countries. This allows me to test why investors in each country would enter and exit specific markets. Second, my findings demonstrate the importance of distinguishing between active and passive changes in investors' equity allocation. I show that passive changes were economically significant and on average, were greater than the trades of investors. The importance of passive changes has been absent from papers that either identify aggregate holdings between the U.S. and foreign investors during the crisis (Bertaut and Pounder, 2009; Bernanke et al., 2011) or that use the CPIS to examine changes in the home bias between home and target country pairs (see for example, Andrade

and Chhaochharia, 2010; Bekaert and Wang, 2009; Thapa and Pshakwale, 2010). Curcuru et al. (2010, 2011) investigate active versus passive changes in U.S. investors' international equity portfolio from 1994 to 2008 and find evidence supportive of portfolio rebalancing, but inconsistent with an information disadvantage. My results highlight the impact of the crisis on information asymmetry and demonstrate the importance of looking across the world to understand retrenchment in 2008. Third, I test whether the change in allocation during the crisis was consistent with distinct theories of portfolio choice and home bias.

The rest of this paper proceeds as follows. Section 2 describes the data and methodology I use to measure active allocation. Section 3 examines changes in the foreign portfolio share and home bias in 2008. In section 4, I investigate why investors would change their foreign portfolio share. I conclude in section 5.

Section 2. Data and Methodology

In the first part of the paper, I describe the data on portfolio holdings. I then turn to the construction of the home bias measure and of active and passive allocation changes.

2.1 Equity Holdings Data Sources

To investigate the reallocation of non-domestic equity, I use multilateral surveys conducted by the International Monetary Fund and bilateral surveys conducted by both the U.S. Treasury Department and the U.S. Federal Reserve Board.

For multilateral holdings, I use the *International Monetary Fund's Coordinated Portfolio Investment Survey (CPIS)* data to obtain country specific estimates of non-domestic equity holdings from 2001 to 2009. An advantage of the CPIS data is that it identifies country-level year-end holdings of non-domestic securities for IMF member countries. Limitations of the CPIS data are that some IMF member

countries do not report their foreign holdings and the data is at an annual frequency.[2] The reporting frequency makes it unclear when during the year investors traded foreign securities. This contrasts with the more frequent availability of bilateral U.S. holdings data, which I describe next.

For U.S. investors, I also use two main bilateral databases, the *Treasury International Capital Reporting System (TIC)* annual survey[3] from 2001 to 2009 and the Bertaut-Tryon (2007) monthly database[4] from 1994 to 2009. The TIC annual survey uses security-level identifiers (ISIN or SEDOL) to determine U.S. residents' country-level holdings of foreign securities and non-U.S. residents' country-level holdings of U.S. securities. The survey is strictly enforced and thus provides strong coverage of U.S. investors' international asset allocation and non-U.S. investors' holdings of U.S. securities. In addition to the detailed annual survey, the U.S. Treasury also collects monthly bilateral portfolio flows between the U.S. and foreign counter-parties that exceed US$ 50 million.[5] This can introduce a financial center bias in the monthly data (Griever, Lee, and Warnock, 2001); the Bertaut-Tryon database uses the detailed annual survey to adjust the TIC monthly portfolio flows data for financial center bias and valuation changes.[6] The Bertaut-Tryon database allows me to identify U.S. residents' monthly holdings of foreign securities by country and also to identify foreign investors' monthly holdings of U.S. securities by country of origin. All the data are reported in U.S. dollars.

The final sample includes the countries with the 45 largest equity markets according to the 2000 year-end market capitalization obtained from the S&P Global Fact Book; the IMF *World Economic Outlook 2000, Statistical Appendix, Data and Conventions* identified 24 of the countries in the sample as

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[2]For most countries the CPIS data is collected annually via the central bank, with a nine month delay between the year-end data being aggregated by the IMF and being made publicly available (http://cpis.imf.org/faq.aspx).
[3]http://www.treasury.gov/resource-center/data-chart-center/tic/Pages/fpis.aspx#usclaims
[4]http://www.federalreserve.gov/pubs/ifdp/2007/910/ifdp910appendix.pdf
[5]Federal Reserve Bank of New York, *TIC S Historic Reporting Changes* notes that after January 2001 *TIC* S changed the exemption level from US$ 2 million to US$50 million in either gross purchase or gross sales during a month (http://www.newyorkfed.org/banking/regrept/WebpageHistoricReportingChanges_TICS.pdf). U.S. Treasury *TIC* S Form instructions explain that once the exemption level is exceeded, reporting is required for the remainder of the calendar year regardless of the level of either purchase or sales in subsequent months (http://www.treasury.gov/resource-center/data-chart-center/tic/Documents/sinstr-june2011.pdf).
[6] Bertaut and Tryon (2007) provide a detailed explanation of how the sum of the observed, adjusted net transactions, corrected for valuation changes, is in error by a gap assumed to represent the financial center effect, as well as unknown errors and omissions in the monthly transactions.

"advanced economies" and the remainder developing.[7]

2.2. Measuring Equity Allocation

I use two measures of equity reallocation: changes in the foreign portfolio share of total equity wealth and changes in investors' home bias. Each provides a different measure of how investors shift equity assets across markets. The foreign portfolio share of total equity wealth measures how much wealth investors allocate abroad. The home bias measures how investors' allocation deviates from a global benchmark.

I use a methodology similar to Kho et al. (2009) to compute investors' domestic holdings, total equity wealth, and home bias. I obtain the year-end market capitalizations from the S&P Global Fact Book[8] and the year-end dollar value of multilateral equity holdings from CPIS Table 8.1.[9] To measure the holdings of investors from country i in the equity of their country at date t (Domestic Holdings$_{i,t}$), I take the country's dollar value market capitalization and subtract the total dollar value of non-residents' holdings of that country's equity. To measure the total equity wealth of investors in country i, I add the domestic equity holdings of investors from country i and the total dollar value of their equity holdings in each country j in the sample (Equity Holdings$_{i,j,t}$).[10] To measure portfolio weights (Portfolio Weight$_{i,j,t}$), I normalize the dollar value of equity holdings (Equity Holdings$_{i,j,t}$) by total equity wealth:

$$PortfolioWeight_{i,j,t} =$$

$$\frac{EquityHoldings_{i,j,t}}{DomesticHoldings_{i,t} + \sum_{j=1,44} EquityHoldings_{i,j,t}} \quad (1)$$

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[7] I exclude Ireland because the foreign portfolio holding of equities registered in Ireland exceeds Ireland's domestic market capitalization . Also, I exclude Taiwan because its macroeconomic data is not available through the World Bank.

[8] S&P Global Fact Book market capitalizations are all float-adjusted, i.e. represents the value of shares not held by insiders; for discussions of float-adjustment and foreign portfolio investment, see Dahlquist et al. (2003), Giannetti and Simonov (2006), Leuz, Lins, and Warnock (2008), and Kho et al. (2009).

[9] From CPIS Table 8.1 *Geographic Breakdown of Portfolio Investment Assets: Equity* (Total equity investment by foreign residents) for each home country and each target country.

[10] On average, total equity wealth for the sample covers 93.60% of total equity wealth calculated using total foreign investment to all countries.

where Portfolio Weight$_{i,j,t}$ is the relative amount of equity wealth investors in country i allocate to country j at time t. In the following, I define a country in which investors hold assets as a target country. All holdings are in U.S. dollars. In equation (1), the numerator is the dollar value of the amount of equity investors in country i hold in target country j at time t and the denominator, the total equity wealth that investors' in country i have at time t, equals the dollar value of domestic equity investors in country i hold at time t plus the dollar value of their equity holdings of all the target countries in the sample at time t.

The CPIS does not report non-domestic equity holdings of investors in China, Morocco, and Peru, but it does report foreign investors' holdings of those countries' securities. Therefore the CPIS sample consists of 42 home countries and 45 target countries. The initial sample contains 16,632 multilateral-holdings observations. Some observations are missing due to CPIS reporting rules. First, member countries do not report the dollar value of their foreign holdings when they believe it would violate an investor's anonymity.[11] This causes the sample to lose 713 observations. Next, the CPIS does not report the dollar value of holdings when a home country's portfolio holdings of a target country are at or below US$500,000; I code all cases where the dollar value is at or below US$500,000 as being at US$500,000. This affects 2,551 observations. Finally, the CPIS distinguishes between cases where holdings are not reported and where holdings data is simply missing. The cases where multilateral holdings are not reported due to missing information cause the sample to lose 3,226 observations. The final sample contains 372 country-year observations and 12,693 multilateral equity holding observations.

To measure the total foreign portfolio share, I normalize the sum of investors' holdings of foreign equity by total portfolio wealth:

$$TotalForeign\ Portfolio\ Share_{i,t} =$$

$$\frac{\sum_{j=1,44} EquityHoldings_{i,j,t}}{DomesticHoldings_{i,t} + \sum_{j=1,44} EquityHoldings_{i,j,t}} \quad (2)$$

where Total Foreign Portfolio Share$_{i,t}$ is the total dollar value of equity wealth that investors in country i

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[11] The CPIS reporting rules explain that in certain cases an investor would be easy to identify and reporting the holdings would place the investor at a competitive disadvantage. These cases are coded as '(c)' and I set those observations to missing.

allocate to all the target countries in the sample at time *t,* the denominator is previously defined.

Following Kho et al. (2009), I calculate the home bias of home country *i* towards target country *j* as 1 minus the ratio of the target country's weight in the home country's equity portfolio and the target's weight in the world market portfolio:

$$HomeBias_{i,j,t} = 1 - \left(\frac{PortfolioWeight_{i,j,t}}{WeightinWorldMarketPortfolio_{j,t}} \right) \tag{3}$$

where Home Bias$_{i,j,t}$ is the home bias of investors from home country *i* towards target country *j* at time *t,* Portfolio Weight$_{i,j,t}$ was previously defined and weight in the World Market Portfolio$_{j,t}$ is the dollar value of target country *j*'s market capitalization at time *t* divided by the dollar value of the world market capitalization at time *t.* A value for the home bias closer to one means that country *i* underweights country *j* relative to what the weight would be if investors in country *i* were to hold the world market portfolio. A value of zero means that investors in country *i* allocate wealth to country *j* proportionately to the share of country *j* in the world market portfolio.

I calculate equal-weighted and value-weighted averages of the home bias within and across countries. To reduce the impact of outliers, I winsorize the level of the home bias towards target countries (Home Bias$_{i,j,t}$) at the 1% and 99% level when I compute equally-weighted averages. For the countries in my sample, the 2008 average home bias was 0.733, ranging from -0.274 for investors in New Zealand[12] to 1.000 for those in Turkey. To value weight within countries, I use the S&P Global Fact Book market capitalization reported for each target country at time *t*-1 as weight. For each home market, I value weight the home bias across target countries in the sampled portfolio. This measure gives the value-weighted home bias of investors in a country; for instance, the U.S. value-weighted home bias in 2008 was 0.703. That means in 2008, the value-weighted U.S. allocation to the target countries was 29.7% of what it would have been had U.S. investors held the world market portfolio. I annually rebalance the value weights to sum to one within each home country's sampled portfolio at time *t.*

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[12] For New Zealand, the negative equally-weighted home bias is driven by domestic investors drastically overweighting Australian equities relative to a global benchmark; Bekaert and Wang (2009) attribute negative home bias to a foreign investment bias, in which investors overweight certain countries in their portfolio.

2.3. Measuring Passive Equity Allocation Benchmark

For each home country I estimate a passive benchmark of the total equity wealth and the home bias based on price and exchange rate changes of the target countries. This benchmark measures how the home bias would have changed for investors in a country if they had not made any trades. I use the same methodology described earlier, but with the dollar value of holdings implied by valuation changes. Since the CPIS does not provide security-level information on holdings, I use a measure of market returns. For emerging markets, not all domestic securities may be investable for foreign investors; for developed markets, this is less of a concern. The S&P Broad Market Index (SP BMI) and the S&P Investable Country Index (SP IFCI) measure country-level returns for developed and emerging markets, respectively.[13] I collect MSCI/DataStream foreign exchange rates.[14] To match the year-end dollar value of the annual holdings data, I use the year-end (i.e. the last day of December) observation to calculate annual changes in price and exchange rates. For all countries, all returns are in U.S. dollars and measured with the Total Return Index.

To measure the passive asset allocation benchmark, I estimate the implied value of home country i's holdings of target country j's equity at time t (Implied Holding$_{i,j,t}$) as a function of target country j's price appreciation ($R_{j,t}$) and exchange rate changes ($S_{j,t}$):

$$ImpliedHolding_{i,j,t} = [EquityHoldings_{i,j,t-1}][(1 + R_{j,t})]\left[\left(\frac{1}{S_{j,t}}\right)(S_{j,t-1})\right] \qquad (4)$$

where Implied Holding$_{i,j,t}$ is the passive benchmark's dollar value of home country i's holdings of target country j's equity at time t, $R_{j,t}$ is the annual return of target country j from t-1 to t in U.S. dollars, and $S_{j,t}$ is the spot exchange rate between the U.S. dollar and target country j's local currency at time t. First, the expression estimates the buy and hold implied level of equity holdings; next, it converts the dollar value

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[13] In most cases the series are available for the full length of my sample. The SP IFCI index for Argentina and Greece transitioned to SP BMI; I merge the Argentina SP IFCI with the SP BMI in October 2009 and the Greece SP IFCI to the Greece SP BMI in October 2002, the last month each IFCI was available, respectively. For Colombia and Pakistan I use each country's SP BMI.

[14] I use MSCI for Argentina, Australia, Austria, Belgium, Chile, Denmark, Egypt, Finland, France, Germany, Greece, Hong Kong, India, Ireland, Italy, Malaysia, Mexico, Morocco, Netherlands, New Zealand, Pakistan, Poland, Spain, the U.K.; I use DataStream for Brazil, Canada, China, Colombia, Czech Republic, Hungary, India, Israel, Japan, Korea, Norway, Peru, the Philippines, Poland, Russia, Singapore, South Africa, Sweden, Switzerland, Thailand, and Turkey.

of implied holdings into local currency at time *t;* finally, it converts the value of implied holdings from local currency at time *t* into the value of dollars at time *t-1*. This produces implied holdings at time *t* based solely on investors in home country *i* passively holding the equity of target country *j*. I use these implied holdings to obtain a passive benchmark of portfolio weights, total foreign portfolio share and home bias. I describe this in detail next.

To measure passive portfolio weights, I normalize the dollar value of investors' implied holdings of foreign equity by implied total portfolio wealth:

$$Passive\ PortfolioWeight(P,Fx)_{i,j,t} =$$

$$\frac{ImpliedHolding_{i,j,t}}{DomesticHoldings_{i,t} + \sum_{j=1,44} ImpliedHoldings_{i,j,t}} \tag{5}$$

where Passive Portfolio Weight (P,Fx)$_{i,j,t}$ is the relative amount of equity wealth investors in country *i* would have allocated to country *j* at time *t* had they passively held their foreign equity from time *t-1* to time *t*, Implied Holding$_{i,j,t}$ is previously defined and the denominator is the passive benchmark's total equity wealth that investors in country *i* have at time *t*. The difference between the denominator of Equation (1) and Equation (5) is the total foreign holdings term. Here the denominator's second term, the dollar value of country *i*'s implied equity holdings of all target countries in the sample, adjust total portfolio wealth for investors passively holding their non-domestic equity portfolio from time *t-1* to time *t*.[15]

To measure the passive benchmark of the total foreign portfolio share, I normalize the sum of investors' implied holdings of foreign equity by implied total portfolio wealth:

$$Passive\ Total\ Foreign\ Portfolio\ Share(P,Fx)_{i,t} =$$

$$\frac{\sum_{j=1,44} ImpliedHoldings_{i,j,t}}{DomesticHoldings_{i,t} + \sum_{j=1,44} ImpliedHoldings_{i,j,t}} \tag{6}$$

where Passive Total Foreign Portfolio Share (P,Fx)$_{i,t}$ is the total dollar value of equity wealth investors in

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[15] My methodology to calculate passive changes in the foreign portfolio share differs from the approach used in Curcuru et al. (2010), which applies buy and hold returns to the domestic holdings term to measure what they define as U.S. investors' global portfolio.

country i would have allocated to all target countries in the sample at time t had they passively held their foreign equity from time $t-1$ to time t, and the denominator, the passive benchmark's total equity wealth of investors in country i at time t, was defined previously.

Finally, I calculate the benchmark value of the home bias of home country i towards target country j as 1 minus the ratio of the passive portfolio weight of target country j in home country i's equity portfolio and target country j's weight in the world market portfolio:

$$Passive\ HomeBias(P,Fx)_{i,j,t} = 1 - \left(\frac{Passive\ PortfolioWeight(P,Fx)_{i,j,t}}{WeightinWorldMarketPortfolio_{j,t}} \right) \qquad (7)$$

where Passive Home Bias $(P,Fx)_{i,j,t}$ is the passive benchmark of home country i's home bias towards country j at time t, Passive Portfolio Weight $(P,Fx)_{i,j,t}$ and weight in the World Market Portfolio$_{j,t}$ are defined previously. As before, I winsorize the passive level of the home bias at the 1% and 99% level when I compute the equally-weighted average.

2.4. Measuring Active Equity Allocation

To determine if investors actively retrenched, I compare changes in the foreign portfolio share to changes implied by the passive benchmark:

$$ActiveForeignPortfolio\ Share_{i,t} =$$

$$\Delta TotalForeignPortfolio\ Share_{i,t} - \Delta TotalForeignPortfolio\ Share(P,Fx)_{i,t} \qquad (8)$$

To assess whether investors actively changed their value-weighted home bias, I contrast the first difference in investors' value-weighted home bias with the first difference implied by the passive benchmark:

$$ActiveValueWeightedHomeBias_{i,t} =$$

$$\Delta ValueWeightedHomeBias_{i,t} - \Delta ValueWeightedHomeBias(P,Fx)_{i,t} \qquad (9)$$

To examine if investors actively changed their home bias towards target countries in the sample, I estimate the change in the home bias that is not the result of changes in prices and exchange rates:

$$ActiveHomeBias_{i,j,t} = \Delta HomeBias_{i,j,t} - \Delta HomeBias(P,Fx)_{ij,t} \qquad (10)$$

Section 3. Did investors change their foreign portfolio share in 2008?

In this section, I use the three measures of foreign equity allocation defined in Section 2 to document investors' portfolio reallocations in 2008. To account for potential small sample bias, all standard errors are bootstrapped.

3.1. Changes in Total Foreign Portfolio Share in 2008

Table 1 Panel A presents statistics on changes in the total foreign portfolio share for the home countries in the CPIS sample in 2008. I find that the relative share of equity wealth allocated abroad rose by an average of 3.62% in 2008 (Column 2). For investors in developed and emerging countries, the increase in the foreign portfolio share occurred in distinctly different ways. Column (6) shows investors in developed countries experienced a relatively larger passive increase in their foreign portfolio share (7.54%) than investors in emerging countries (0.77%), a result consistent with investors in developed countries tending to allocate more wealth abroad (Lane and Milesi-Ferretti, 2008) and experiencing greater losses on foreign assets during the crisis (Gourinchas et. al, 2011). Column (9) reveals that the active change in the foreign portfolio share was significantly negative for investors in developed countries (-2.22%) and positive, but not significant, for investors in emerging countries (0.55%). This indicates that on average investors in developed countries sold foreign equities and investors in emerging markets did not.[16] Yet, the net effect of the active and passive changes was that the total increase in the foreign portfolio share was significantly higher for investors in developed countries (5.32%) than it was for those in emerging countries (1.35%).

The total foreign portfolio share did not rise in all countries; net decreases occurred in nearly one-fifth of the countries in the sample in 2008. Half were developed (Germany, Japan, Switzerland, and the

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[16]Because investors in the U.S. accounted for US$12,577.10 billion or 47.54% of the developed countries total equity wealth in 2008, it is important to determine if the active decrease was solely a U.S. phenomenon. When I remove the U.S. from the sample of developed countries, though total portfolio wealth is lower, the foreign portfolio share of total portfolio wealth actively falls by nearly the same amount, -2.19%.Additionally, the changes in the total foreign portfolio share remain economically and statistically significant when I exclude the U.S. These findings suggest that the active reduction in the foreign portfolio share in 2008 was not exclusive to the U.S. and seems driven by investors in developed markets.

U.S.) and half emerging (Argentina, Colombia, the Philippines, and Poland). Of the developed countries, the U.S. was the only one to experience a passive increase in the foreign portfolio share. This passive increase in the U.S. foreign portfolio share is puzzling because, from 2007 to 2008, average non-U.S. buy and hold dollar market returns were more negative than U.S. market returns as the flight-to-safety for safe assets (Bernanke et. al, 2011; Caballero and Krishnamurthy, 2009) led to an appreciation for the U.S. dollar against most currencies (Fratzscher, 2009). Had U.S. investors' holdings of domestic equity remained fixed, the return and exchange rate effects would have caused the U.S. foreign portfolio share to passively decrease; this indicates that U.S. investors reduced their holdings of domestic equity during the crisis. Since the total foreign portfolio share of the U.S. fell, U.S. investors' active reduction in foreign portfolio share was larger than its passive increase. This indicates that the U.S. investors sold their holdings of both foreign and domestic stocks, but sold their foreign stocks at a higher rate. Using the U.S. market capitalization provided by the S&P Global Fact Book and the total value of non-U.S. residents' holdings of U.S. equity, I find that the percentage of U.S. equity held by non-U.S. investors rose from 11.96% in 2007 to 12.82% in 2008. These results are consistent with U.S. investors reducing their holdings of foreign and domestic equity in 2008.

The U.S. findings raise the question of whether the global changes in the foreign portfolio share during the crisis were driven solely by non-U.S. investors' holdings of U.S. equity. Outside of the U.S., return differences in 2008 across markets and the appreciation of the U.S. dollar against local currencies would cause a passive increase in investors' holdings of U.S. equity. While this is consistent with the global findings, the purchase of U.S. equity by non-U.S. investors is not. Foreign investors buying U.S. equity would actively increase the foreign portfolio share; this contrasts with the significant active decrease in the foreign portfolio share, which occurred on average in 2008. In untabulated results, I examine whether the changes in the foreign portfolio share remain significant when I exclude the U.S. as either a home or target country. Neither specification significantly affects the main findings economic inferences and statistical significance. These findings suggest that the global changes in the foreign portfolio share were not solely driven by foreign holdings of U.S. equity.

3.2 Changes in the Home Bias

Table 1 also reports results of the change in the home bias. Panel A presents statistics on the value-weighted home bias and Panel B focuses on the equally-weighed home bias. The results are generally consistent with the previous finding that, in developed markets, the total increase in the foreign portfolio share was larger than in emerging markets. Panel A Column (4) shows that, on average, the value-weighted home bias decreased by -4.18% in 2008. It fell by more in developed countries (-5.89%) than it did in emerging countries (-1.91%). As before, in developed countries the active change was significantly positive (2.70%) and lower than the passive component (-8.59%). For emerging countries, both the active change and passive change are negative, but the active change is not statistically significant. Panel B shows that the equally-weighted home bias fell by -3.19% (Column 2). Again, the total decrease was greater in developed countries (-3.79%) than it was in emerging (-2.38%). Interestingly, I find that investors in both developed and emerging countries actively increased their equally-weighted home bias by an average of 4.87% and 0.49%, respectively; though, the active change was only significant for investors in developed countries.[17]

3.3 Quarterly Changes in the U.S. Foreign Portfolio Share in 2008

Table 2 reports quarterly active changes in the foreign portfolio share of U.S. investors during 2008 and the quarterly change in non-resident holdings of U.S. equity as a percentage of the U.S. market capitalization. For the quarterly sample, the bilateral holdings are obtained from the Bertaut-Tryon database and the U.S. market capitalization is obtained from the S&P BMI. For U.S. investors, the quarterly data indicate that U.S. sales of foreign equity were mostly concentrated in developed markets. For non-U.S. investors holding U.S. equity, there is no quarter when the change in holdings relative to the U.S. market capitalization is negative. In other words, the results indicate that every quarter in 2008

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[17] Because investors in some countries hold the equity of relatively few countries in the sample (for example, New Zealand's sampled portfolio is composed of 4 target countries), in untabulated results I check if the findings are sensitive to home countries that hold relatively few target countries. When I remove home countries that have less than 5 or 10 target countries in their portfolio, all the value-weighted and equal-weighted home bias results hold.

foreign investors increased their share of the U.S. stock market capitalization.

Section 4. Why did investors decrease their foreign portfolio share?

In this section, I examine whether the cross-sectional variation in allocation was consistent with portfolio rebalancing, traditional theories of the home bias, or portfolio choice under uncertainty.

4.1 Did investors actively rebalance their equity portfolios?

Portfolio rebalancing can cause investors to sell foreign equity, even when their home bias remains unchanged. Because investors exhibit a strong home bias, divergent returns across countries can drastically alter their portfolios composition. All things equal, investors in home countries that experience lower returns relative to foreign countries will experience passive decreases in their home bias. If investors' target foreign shares remain unchanged, we would expect investors to sell foreign equity to rebalance towards their home bias. This may best be illustrated through an example. Suppose an investor has a portfolio of $100 dollars and her decision rule is to invest 80% at home and 20% abroad, i.e. she currently holds $80 at home and $20 abroad. If her home market declines by 50%, her total portfolio will be worth $60 --- one third of which she's holding abroad. To not violate her decision rule, she rebalances her portfolio and sells off nearly half of her foreign equity holdings. Holding the target foreign portfolio shares constant, the rebalancing hypothesis predicts that investors sell foreign stocks to restore their home bias to its previous level. This implies that if there is a passive decrease in the home bias, an investor will trade to reduce that passive decrease.

The portfolio rebalancing hypothesis predicts that investors offset through active changes the impact of passive changes on their portfolio. This hypothesis can be tested by regressing the active portfolio share of foreign stocks on the passive change in that portfolio share. The prediction of the rebalancing hypothesis in that regression is that the coefficient on the passive change should be minus one. If investors do not rebalance completely, the coefficient will be significantly greater than minus one but negative. Finally, if they do not rebalance at all, the coefficient will not be significantly different from

zero. In the extreme case where investors chase returns, the coefficient on passive changes would be significantly positive. I estimate this relationship in Regression (1) of Panel A of Table 3. Because of potential small sample bias, all standard errors are bootstrapped. The model includes the lagged passive change in total foreign portfolio share to account for the fact that the rebalancing may take time. The estimated coefficient on passive changes in foreign stock portfolio share is negative and statistically significant, indicating that valuation changes in equity allocation are strongly associated with investors actively reducing their allocation to foreign markets. The coefficient implies that when the foreign portfolio share passively rises by 1 percentage point, investors offset 18% of that increase in the same year.

For the home bias measures, Regressions (2) and (3) report active changes in the value-weighted and the equally-weighted home bias and Regressions (4) through (6) document active changes in the home bias at the target country level. I account for potential small sample bias in Regressions (2) and (3), by bootstrapping standard errors. To account for potential correlation at the country-portfolio level, in Regressions (4) through (6) I cluster standard errors by home country and bootstrap standard errors within each cluster. In Regression (2), the estimated coefficient on the passive change in the value-weighted home bias is negative and significant; a result that is consistent with investors actively rebalancing their portfolios. Regression (3) shows that the significantly negative relation between passive changes and active reductions in the foreign portfolio share grows stronger when I equal weight target countries. Relative to the value-weighted results, the estimated coefficient on passive changes nearly doubles. A stronger test of the rebalancing hypothesis is to investigate whether investors rebalance at the target country level. Regression (4) shows that the negative association between passive changes and active changes in foreign equity allocations remains economically and statistically significant, so that investors rebalance at the target country level as well as in the aggregate. The coefficient on passive changes in the regression that examines rebalancing at the target country level is larger than in the other regressions. The coefficient implies that if investors in a country see their allocation to a target country passively increase by 1 percentage point, they offset 65% of that increase in the same year.

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Given a passive increase in the foreign portfolio share, the extent to which an investor rebalances may depend on the transaction costs and the liquidity of the target countries. In Regression (5), I include the home bias in 2007 towards a country, as a proxy for obstacles in investing in that country, to test the hypothesis that investors rebalanced less actively with respect to countries where these obstacles are high because active changes are more expensive. The specification also includes the interaction between the home bias in 2007 and the passive change in the home bias. The prior year's home bias is demeaned at the country-level. The prediction is that the interaction should be positive, so that there is less rebalancing towards the home bias in countries where obstacles are higher. I find that the interactions are not statistically significant.

In Regression (6), I add a proxy for liquidity in 2008. Given the large numbers of countries in the sample, I restrict my analysis to using turnover for 2008 as a proxy for liquidity and use the turnover measure available from the World Bank. Regression (6) includes passive changes in foreign investment, the level of the home bias towards a target country in 2007, a target country's turnover, and the previously mentioned interactions. Both the level of the prior year's home bias towards a target country and annual turnover are demeaned at the country-year level. The estimated coefficient on passive changes remains economically large and significantly negative. The interaction between passive changes in equity allocation and a target country's turnover produces a significantly positive estimated coefficient. The result is consistent with a target country's liquidity easing investors' ability to actively rebalance their portfolios, conditional on investors encountering passive changes in equity allocations. Interacting passive changes with the proxy for investment obstacles, the prior year's level of the home bias, does not produce an association statistically different from zero. The proxies suggest that for active reallocation, obstacles abroad played less of a role than liquidity.

The results from the cross-sectional estimations presented in Panel A show a significantly negative association between passive changes and active changes in the foreign portfolio share. Panel B of Table 3 explores the relationship between passive and active changes for U.S. investors. A concern with the U.S. results is that the sample size becomes quite small as data is available for investment by

U.S. investors in 44 countries. The benefit is that it is available more frequently than the CPIS data. If portfolio rebalancing takes time, lagged passive changes would matter. With the higher frequency data, I can better examine whether current active changes are significantly associated with passive changes that occurred earlier in the year. Further, higher frequency data is valuable in terms of focusing on the fourth quarter of 2008, the period in which passive changes were most extreme. Regressions (1) through (3) use the same approach I used in Panel A of Table 3 to examine active changes in the U.S. home bias towards target countries in 2008. In Regressions (4) through (7) I take advantage of the higher frequency of the U.S. data and focus directly on the last quarter of 2008, which is when the dramatic changes in stock values took place. All holdings are measured relative to U.S. investors' total holdings of foreign and domestic equity.[18]

Consistent with the findings presented in Panel A, in Regressions (1) through (3) the estimated coefficient on passive changes in the home bias of U.S. investors towards target markets is significantly negative. In fact, in Regression (1) the coefficient is not distinguishable from minus one --- which suggests that U.S. investors fully offset passive changes in allocation. Regressions (2) and (3) include U.S. home bias towards target countries in 2007 and a target country's turnover. In contrast to the results of Panel A, I do not find that the interaction of a target countries turnover and annual passive changes in the U.S. home bias is statistically significant.

Turning to the fourth quarter of 2008, I estimate a cross-sectional model that includes only contemporaneous passive changes in the U.S. foreign portfolio share and passive changes from the previous quarter (Regression 4). The estimated coefficients on both terms are not statistically significant, indicating that passive changes alone were not significantly associated with U.S. investors' active portfolio adjustments during this period. Next, I use the home bias in 2007 towards a country as a proxy for the obstacles in investing in that country. Regression (5) shows the coefficient on the demeaned 2007 year-end home bias, interacted with current and lagged passive changes, is not distinguishable from zero. The estimated coefficients on current and lagged passive changes remain insignificant. This finding

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[18] U.S. month-end market capitalizations are from the S&P US BMI index.

suggests that for U.S. investors, obstacles abroad were not significantly associated with active changes in the foreign portfolio share in the fourth quarter of 2008.

To examine whether liquidity affected U.S. investors' active changes in the fourth quarter of 2008, in Regression (6) I add my proxy for liquidity, a target country's 2008 annual turnover into the model. Turnover is demeaned across target countries and interacted with current and lagged passive changes in the foreign portfolio share. I find that current and lagged passive changes are significantly associated with active changes in the foreign portfolio share. Consistent with the findings in Panel A, the coefficient on current passive changes is significantly negative and the interaction with turnover is significantly positive. But, in this specification, the sum of the coefficients is not statistically distinguishable from zero. The net effect implies that passive changes and a target market's liquidity cancel out one another. Because developed markets experienced relatively larger passive changes and tend to be relatively more liquid (Lee, 2010), the result is consistent with the finding from Table 2 that U.S. investors reduced their foreign portfolio share more in developed markets. The estimated coefficient on lagged passive changes is significantly positive and the interaction with turnover is significantly negative. The sum of the coefficients is negative and statistically significant. This result is consistent with U.S. investors rebalancing their portfolios in response to lagged passive changes in their equity holdings of relatively liquid markets. Lastly, to examine whether investors rebalanced in the last quarter of 2008 in response to passive changes throughout the year, Regression (7) includes passive flows from the first and second quarters of 2008. Similar to the previous results, the coefficient on current passive changes and its interaction with turnover suggests that the net effect of passive changes and liquidity on active changes is not distinguishable from zero. Surprisingly, I find the same for lagged passive changes interacted with turnover as well. The coefficients on the first and third additional lags are not distinguishable from zero. These findings suggest that U.S. investors were not rebalancing during the fourth quarter of 2008 in response to passive changes that occurred throughout the year.

The specification used in this section assumes that active changes do not affect passive changes in the foreign portfolio share. If an active change in holdings violates that assumption, then we may have

reverse causality. For many countries, it seems reasonable to assume that active changes do not cause passive changes since investors from any foreign country would seem to be a small component of the demand for U.S. stocks. Nevertheless, I investigate whether passive changes could have been affected by passive changes due to the price impact of these active changes. I perform unreported robustness checks focused mainly on Panel A Regression (6) to assess this alternative. To examine whether the relatively larger global investors drove the findings, I removed the top five home countries with the largest total equity wealth in 2007, the U.S., the U.K., Japan, Canada, and France. The findings remain relatively unchanged from Regression (6) and indicate that the results are not driven solely by the world's largest investors.

Foreign investors do not have to be globally large to impact a country's stock market, so long as they hold a significant portion of the target country's equity. To identify the largest foreign equity investors in each market, every year I normalize investors' multilateral holdings of each target country's equity by the target's market capitalization. Using the relative size of investors in home country i in target market j to proxy for the potential price impact, I divide the sample by the median relative size in 2007. Estimating Regression (6) of Panel A across both groups, the main inferences hold. Repeating the analysis using multilateral holdings normalized by the total dollar value of the total foreign equity investment each target market receives in a given year does not affect the main inferences either. These across-country results are not supportive of the price impact alternative.

Lastly, for U.S. investors I test the price impact of active equity trades on passive changes by estimating a vector auto regressive (VAR) model using monthly active and passive equity flows towards the target countries in the sample from 1995 to 2009. The equity flows are obtained from the Bertaut and Tryon (2007) database. For each country, I test the null that U.S. active flows do not Granger cause U.S. passive flows. In 35 out of 44 countries, I fail to reject the null. I interpret these findings as evidence that does not support the price impact alternative.

Overall, the results from Table 3 support two key predictions of the portfolio rebalancing hypothesis. First, active decreases in the foreign portfolio share are negatively associated with passive

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changes in equity allocation. Second, conditional on passive changes in foreign portfolio shares, a target country's liquidity is positively associated with investors actively reducing their foreign portfolio share. Lastly, I find supportive evidence that U.S. investors rebalanced their equity portfolios in 2008; however, their reallocation of foreign equity holdings during the fourth quarter of 2008 does not seem driven by passive changes that occurred throughout the year.

4.2 Did domestic wealth losses cause investors to decrease their foreign portfolio share?

In this section, I investigate the relation between wealth changes during the crisis and foreign equity holdings. Holding the level of risk aversion and the costs associated with maintaining a foreign investment position constant, the benefit of investing abroad will increase in wealth (Lane and Milesi-Ferretti, 2008). Furthermore, losses in non-financial wealth can lead investors to sell stocks to cover various shortfalls in income, i.e. labor income, proprietary income, and real estate (Heaton and Lucas, 2000). All else equal, I expect to observe investors in home countries that suffer more severe wealth losses to decrease their foreign portfolio share more.

To test this wealth shock hypothesis, I estimate a cross-sectional OLS regression using the total decrease in the foreign portfolio share from the CPIS sample in 2008. It is important to note that unlike the dependent variable in Table 3, which only included active changes in the foreign portfolio share, here I examine the impact of the wealth shock on the total change in the foreign portfolio share. The wealth theory has predictions for the total share of wealth invested abroad and changes in that share; therefore, I examine the foreign portfolio share's total change. The passive change in the foreign portfolio share would be directly affected if a decrease in wealth causes a decrease in the net benefit from international diversification. The active change directly affects investors' cash holdings in that an increase in the foreign portfolio share brought about by an active change requires the purchase of foreign equities. Hence, investors who need to sell stocks to make up for a decrease in income or non-financial wealth will do so through an active change. To measure the total decrease in the foreign portfolio share, I use a framework similar to the one used in the previous section; for each home-country, I multiply the total

change in the foreign portfolio share by (-1) to examine the degree to which investors *decrease* their allocation to foreign equities relative to their total equity wealth and use changes in the value-weighted and equally-weighted home bias.

The independent variables are proxies for domestic changes in financial and non-financial wealth. I measure domestic changes in financial wealth with a home country's 2007 to 2008 buy and hold stock return. As discussed previously, changes in holdings may affect prices; I address this concern by using returns that end in August, a full quarter before year-end 2008. Annual returns are in U.S. dollars and from the indices discussed in Section 2. To proxy for changes in non-financial income and wealth, I use annual GDP growth and the annual growth in consumption per capita in 2008. GDP growth and consumption growth are both obtained from the World Bank and are in year 2000 constant U.S. dollars. In 2008, investors suffered a large negative wealth shock and a massive economic contraction occurred; but, it is also possible that investors cut foreign investment in anticipation of future income losses. To test whether future changes in non-financial income and wealth are associated with current decreases in foreign portfolio share, I also use domestic GDP growth in 2009. Because the wealth hypothesis predicts that both active and passive change in foreign equity holdings will be affected by changes in wealth, I include the foreign portfolio share's passive changes in the cross-sectional model. Using this specification, the wealth hypothesis predicts that the estimated coefficients on the wealth proxies will be negative and that the estimated coefficient on passive changes will be positive. To account for potential small sample bias, all standard errors are bootstrapped.

Table 4 reports the results of the cross-sectional regressions. In Regressions (1) through (4) I examine the decrease in the total foreign portfolio share. Regression (1) includes both returns and passive changes in the foreign portfolio share in the estimation. The estimated coefficient on returns is significantly negative, indicating that an increase in domestic equity wealth is associated with an increase in the foreign portfolio share. The coefficient implies that if passive changes are held constant, when investors see their home market fall by 1 percentage point, they reduce their total foreign portfolio share by -0.03 percentage points that same year. Repeating specification (1) with current GDP growth and

passive changes, Regression (2) shows the estimated coefficient on the non-financial wealth proxy is not statistically distinguishable from zero. I find the same result using lead changes in GDP growth (Regression 3); these results suggests that holding passive changes constant, investors that experienced more severe economic contractions in either 2008 or 2009 were not significantly decreasing their foreign portfolio share more in 2008. Using consumption growth as an alternative proxy for changes in non-financial wealth and income produces similar results (Regression 4). The total foreign portfolio share results suggest that losses in domestic wealth, specifically financial wealth, were significantly associated with reductions in the allocation to foreign markets.

Turning to changes in the home bias, Regressions (5) through (10) show a significantly negative relation between returns and changes in the value-weighted home bias and indicate no such relationship with either proxy for non-financial wealth. Regression (5) applies specification (1) to the value-weighted home bias; relative to the foreign portfolio share findings in Regression (1), the coefficient on returns increases in economic and statistical significance. Holding passive changes constant, the coefficient implies that when returns fall by 1 percentage point, investors increase their value-weighted home bias by an average of 0.04 percentage points. This result is consistent with changes in wealth affecting how investors change their allocation to foreign equity, but the economic magnitude of the effect is small. For the equally-weighted home bias, the coefficient on returns in Regression (9) is similar to the value-weighted result, but standard errors are nearly two times larger and the association between returns and changes in the equally-weighted home bias is not statistically significant. Using the value-weighted and equally-weighted home bias, I do not find that the non-financial wealth proxies are significant in any specification. This finding is consistent with the total foreign portfolio share results previously documented and suggests that changes in non-financial wealth were not significant drivers of the increase in the equity home bias during the recent crisis.

The results from Table 4 support a fundamental prediction of the wealth shock hypothesis. First, returns, my proxy for changes in domestic wealth, are negatively associated with changes in the foreign portfolio share. Second, I do not find a statistically significant association between GDP growth and

consumption growth, the non-financial wealth and income proxies, and changes in the foreign portfolio share. This result does not support the non-financial wealth implications of the wealth shock hypothesis.

4.3 Did information asymmetries cause investors to reduce their foreign portfolio share?

If information asymmetries are an important cause of the home bias (see, for example, Brenan and Cao, 1997; Van Nieuwerburgh and Veldkamp, 2010; Andrade and Chhaochharia, 2010; Choe, Kho, and Stulz, 2005) [19] and information asymmetries worsen during a crisis (Gelos and Wei, 2005), the information asymmetry hypothesis predicts a worsening of the home bias during the crisis. In this section, I examine whether investors reduce their foreign portfolio share more in countries where these asymmetries are expected to be more prevalent.

I test this hypothesis at the target country level by regressing changes in the home bias towards target countries on proxies for information asymmetry. The cross-section contains year-end changes in the home bias from the CPIS sample in 2008. If information asymmetry increases more where it is already high, the home bias should increase more towards countries where non-resident investors already face high information asymmetries. If the obstacles for investing in a country are related to those asymmetries, this predicts that during a crisis, home bias changes will be positively correlated with their previous levels – in other words, the home bias will increase towards countries where it was already high. This increase in the home bias can occur through passive and active changes in investors' equity holdings. The passive changes in the home bias would occur when increases in information asymmetry decrease the net present value of holding a target country's equity.[20] The active changes would require investors to sell their holdings of countries for which they have a relatively high home bias. Following this logic, I use the level

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[19]Some authors provide evidence that leads to the opposite conclusion (see, for example, Curcuru et al., 2010 and 2011; Dahlquist and Robertsson, 2001). A closely related literature focuses on capital flows positively relating to contemporaneous and past returns as evidence of foreign investors being better informed or trend chasing; the findings there have been mixed (see for example, Jinjarak, Wongsman, and Zheng, 2011; Froot and Ramadorai, 2008; Griffin, Nadari, and Stulz, 2004; Froot, O'Connell, and Seasholes, 2001).

[20]Johnson, Boone, Breach, and Friedman (2000) show that during the Asian financial crisis, measures of corporate governance, specifically minority share holder protection, explain the degree of exchange rate depreciations and stock market declines among emerging markets better than traditional macroeconomic measures.

of the 2007 home bias towards a target country, the passive change in the home bias, and their interaction to proxy for information asymmetries. In this specification, the information asymmetry hypothesis predicts that the coefficient on each term will be positive. As before, the prior year's home bias is demeaned at the country-level; standard errors are clustered by home country and bootstrapped within each cluster.

Table 5 Panel A presents the results. Regression (1) includes the level of the previous year's home bias, the current year's passive change, and the interaction term. For passive changes, we can expect from the equally-weighted results of Table 4 that the coefficient will be significantly less than 1, but still positive. Indeed, that is the case. The estimated coefficient on passive changes is significantly positive and implies that when the home bias passively increases by 1 percentage point, the total home bias rises by 50% of that increase. While this result is consistent with the information hypothesis, the results for the previous year's level of the home bias and the interaction term are not. Both the estimated coefficients on the lagged home bias and the interaction term are insignificant, indicating that the change in home bias is not positively associated with its level from the previous year. To the extent that the home bias is a function of information asymmetry, these findings suggest that the information asymmetries that matter more during a crisis may differ from those that matter more during good times.

The next tests assess whether proxies for various forms of information asymmetry are associated with changes in the home bias during the crisis. Measures contributing to the information disadvantage investors in home country i face when allocating their wealth towards target country j include distance, language, and culture. I measure distance in two ways. The first method uses the log of the great circle distance (geographical distance) in kilometers between a home and target country's capital city; longitude and latitudes are obtained from Google Earth. Because the distance between two capital cities may not be the most relevant distance for the marginal investors in either country,[21] I also use a common region dummy variable for countries sharing the same geographic region (Ke et al., 2010). For language and

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[21] For example, the distance between the capital cities of Canada and the U.S., Ottawa and Washington, D.C., is farther than the distance between their major financial center, Toronto and New York.

religion, I follow the methodology outlined in Stulz and Williamson (2003) and define a language and religion dummy variable when the primary language spoken (religion practiced) by the largest fraction of two countries' population is the same. Language and religion are obtained from the CIA World Factbook. The information asymmetry hypothesis predicts that the coefficient on the geographical distance is expected to be positive and the coefficient on the common region, language, and religion dummy variables are expected to be negative. Regression (2) adds the geographical distance and the language and religion dummies into specification (1). The coefficients have the predicted signs and are statistically significant, except for the language dummy. For geographical distance, the estimated coefficient indicates that a 1 percentage point increase in the distance between an investor's capital city and that of a target country is associated with a 2.18 percentage point increase in the home bias. The coefficient on the religion dummy implies that in 2008 investors increased their home bias by -3.74 percentage points less towards target countries with which they shared a common religion. Regression (3) replaces the geographical distance with the common region dummy. The coefficient on the common region dummy is significantly negative, indicating that investors increased their home bias by -4.86 percentage points less towards target countries within their region. The estimated coefficients on the language and religion dummies remain similar to specification (2). The findings show that these information asymmetry proxies are strongly associated with investors reducing their foreign portfolio share.

The previous findings illustrate the role of physical and cultural barriers to information during the crisis. I now turn to institutional aspects of information asymmetry. If information asymmetries increase, relatively strong governance institutions can help to lessen their severity. Specifically, I examine whether investors reallocate their equity holdings towards markets with relatively strong institutional qualities during a period of crisis. To capture a target county's institutional quality, I calculate each target country's Kauffman et al. (2010) governance score. The governance score varies through time and is defined as the average of the following six indices: a country's political stability, government effectiveness, regulatory quality, adherence to the rule of law, control of corruption, and the degree to which a country's citizens participate in selecting a government. Regression (4) adds a target country's

governance score in 2008 to specification (1). The coefficient on the governance variable is not statistically significant. In untabulated results, I include each component of the governance score to specification (1) separately and do not find a statistically significant association between changes in the home bias and each one individually. This finding indicates that these proxies for institutional quality are not significantly associated with changes in foreign allocation and does not support the information asymmetry hypothesis.

The next experiment tests the return implications of information asymmetry. Brenan and Cao (1997) show that when domestic investors possess a cumulative information advantage over foreign investors about their domestic market, investors tend to sell foreign stocks when their return is low. Additionally, the markets where information asymmetries grow more severe may experience lower returns (Johnson, Boone, Breach, and Friedman, 2000). If non-residents reduce more of their holdings in those countries, then holding passive changes constant, their home bias towards countries with lower returns will rise. In Regression (5), I include a target country's return in 2008 into the model used in specification (1). The coefficient on the returns terms is not distinguishable from zero, a finding that does not generally support the information asymmetry hypothesis.

Lastly, I test the joint effect of the various information asymmetry proxies on changes in the home bias. The model adds the region, language and religion dummies, the governance score, and a target country's annual returns to specification (1). Regression (6) shows that the coefficient on passive changes remains significantly positive and the coefficients on the region and religion dummies remain significantly negative. All three remain largely unchanged from the previous specifications. The level of the home bias is significantly negative and I do not find any other variable to be significantly different from zero.

The results presented in Panel A show a significantly negative association between several proxies for information asymmetry and changes in the home bias. Panel B of Table 5 investigates whether this relationship holds for U.S. investors towards target countries in 2008. In Regressions (1) through (5), I follow the same approach used in Panel A of Table 5 to explore the total change in the U.S. home bias in

2008. Regressions (6) through (10) examine the changes in the U.S. foreign portfolio share in the fourth quarter of 2008, using methodology defined previously. To account for potential small sample bias, all standard errors are bootstrapped.

Consistent with the results of Panel A, in Regressions (1) through (5) the estimated coefficient on the passive change in the U.S. home bias towards target countries is significantly positive. Regression (1) includes passive changes in the U.S. home bias, the demeaned level of U.S. investors' 2007 home bias towards target countries and their interaction term. In this specification, I do not find a statistically significant association between the level of U.S. investors' demeaned home bias from the previous year and the total change in the U.S. home bias in 2008. The same holds for the interaction term with passive changes, indicating that U.S. investors did not significantly increase their home bias towards markets where previously it was high. When I include geographic distance, and the common language and religion dummies into specification (1), the coefficients are not significant. This result suggests that during a crisis, distance, language, and culture may play less of role for U.S. investors than they do globally. Regression (3) replaces the distance, language, and culture proxies with a target country's governance score and shows the coefficient on the governance score is not distinguishable from zero. This suggests that U.S. investors did not significantly increase their home bias towards countries with relatively weak governance and does not generally support the information asymmetry hypothesis.[22]

To test the return implications of information asymmetry, Regression (4) adds a target country's return in 2008 into the model used in specification (1). Consistent with the information asymmetry hypothesis, the estimated coefficient on returns is significantly negative. The coefficient implies that holdings passive changes constant, when at target country's returns fall by 1 percentage point U.S. investors raise their home bias by 0.15 percentage points in that same year. The coefficient on returns remains statistically significant and grows larger when I add geographic distance, the language and religion dummies, and the governance score to the regression (Regression 5). This result indicates that the

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[22]In untabulated results, when I replace the governance score with each of its six individual components and estimate Regression (3), I do not find that any are significantly associated with changes in the U.S. home bias.

relation between target returns and changes in the U.S. home bias is not subsumed by the additional information asymmetry proxies and generally supports the returns implications of the information asymmetry hypothesis.

Turning to changes in the U.S. foreign portfolio share in the fourth quarter of 2008, the results from Regressions (6) through (10) are generally similar with the annual U.S. findings. One notable difference is the size of the estimated coefficient on a target country's returns in specifications (9) and (10). The model estimated in specification (9) includes the quarterly passive change in the foreign portfolio share, the demeaned annual home bias in 2007, their interaction, and target countries' fourth quarter return. The coefficient on returns is significantly negative and implies that holding passive changes constant, when returns fall by 1 percentage point U.S. investors reduce their foreign portfolio share by -0.0023 percentage points during the fourth quarter. The size of the coefficient seems largely due to the units of measure. The mean of the dependent variable, changes in the U.S. foreign portfolio share during the fourth quarter, is -0.047% and the average return during this period was -27.42%. When I examine the joint effect of returns and the information asymmetry proxies (Regression 10), the coefficient on returns remains significantly negative and largely unchanged from the previous specification.

Table 5 generally supports the information asymmetry hypothesis. First, the results show that investors significantly increased their home bias more towards target countries that were relatively more distant and less towards countries within their same region or that shared their common culture. Second, consistent with the economic downturn implications of information asymmetry, the findings indicate that in 2008 U.S. investors increased their home bias more towards markets that experienced relatively lower returns in 2008. I interpret these findings as supportive of the information asymmetry hypothesis. Lastly, using the level of the home bias from the previous year and the Kauffman et al. (2010) governance score, I do not find that changes in the home bias were significantly associated with either their previous levels or with a target country's intuitional qualities. While the previous level of the home bias and the governance results do not generally support the information asymmetry hypothesis, overall the findings are consistent with a worsening of information asymmetries during the crisis.

4.4 Did ambiguity aversion cause investors to reduce their foreign portfolio share?

In this section, I examine whether the cross-sectional change in allocation during the crisis was consistent with ambiguity averse investors responding to uncertainty. The general idea is that investors prefer lotteries in which the probability of each outcome is certain over lotteries in which the probability of each outcome is uncertain (Ellsberg, 1961). For ambiguity averse investors, uncertainty about a foreign country's return process can lead to a home bias (Uppal and Wang, 2003; Epstein, 2001). If ambiguity aversion causes the home bias and if uncertainty increases during financial panics, the ambiguity aversion hypothesis predicts that the home bias increases during crises. Holding the level of ambiguity aversion constant, the ambiguity aversion hypothesis predicts that investors reduce their allocation more in countries where the increase in uncertainty was greater.

I test this hypothesis at the target country level by regressing changes in the home bias towards target countries from the CPIS sample in 2008 and changes in the foreign portfolio share of U.S. investors in the fourth quarter of 2008 on a proxy for uncertainty. This requires distinguishing between uncertainty and risk. The literature often uses changes in the Chicago Board Options and Exchange (CBOE) VIX index to capture when market uncertainty increases (Giannetti and Laeven, 2012; Forbes and Warnock, 2011); VIX is not available for my sample of countries. As a proxy for the increase in uncertainty of a target country's return distribution, I take the ratio of the highest standard deviation of daily market returns for any month in year *t*, divided by the monthly average of the standard deviation of daily market returns in year *t-1*. In untabulated results, I find the sample average of the maximum volatility ratio nearly doubles from 2007 to 2008, and dramatically falls in 2009. For the U.S., the maximum volatility ratio has a correlation of 0.71 with changes in the VIX index over the 2000s. As before, I control for the passive change in the foreign portfolio share. Because ambiguity averse investors may already avoid the markets they perceive as uncertain, I also control for the demeaned 2007 home bias. In this specification, the ambiguity aversion hypothesis predicts that the coefficient on the maximum volatility ratio is to be positive. As before, standard errors are clustered by home country and bootstrapped within each cluster.

Table 6 presents the results. Regression (1) includes the maximum volatility ratio, the passive change and the level of the home bias. Contrary to the prediction of the ambiguity aversion hypothesis, the coefficient on the maximum volatility ratio is significantly negative. The coefficient implies that when a target country's maximum volatility ratio grows by 1 percentage point, investors decrease their home bias by 0.99 percentage points that same year. In other words, the result implies that during crisis investors increase their home bias less towards markets with relatively higher uncertainty. This result does not support the ambiguity aversion hypothesis.

An alternative explanation for the significantly negative association of the maximum volatility ratio and changes in the home bias is that this proxy for uncertainty actually captures diversification. For example, emerging markets tend to offer greater diversification opportunities even during large market downturns (Christoffersen et al., 2012) and generally tend to be more volatile. To examine whether the significantly negative relation between the maximum volatility ratio and changes in the home bias is driven by this effect, using average monthly market returns over a rolling 3 year (36 month) span, I calculate the correlation between each home and target country. When I include the annual change in correlation between home and target countries into specification (1), Regression (2) shows that the coefficient on the maximum volatility ratio remains significantly negative and similar to the previous specification. This indicates that the maximum volatility ratio does not proxy for changes in correlation. Additionally, I examine whether the negative relation between the maximum volatility ratio and changes in the home bias is subsumed by changes in a target market's volatility. I calculate the standard deviation of a target country's monthly returns over a 3 year (36 month) span and add its year to year change to the model (Regression 3). The coefficient on the maximum volatility ratio remains statistically and economically significant. This supports the idea that the maximum volatility ratio measures uncertainty and not variance, but does not support the ambiguity aversion hypothesis. Lastly, I add a target market's global weight to the estimation (Regression 4). The results hold. These findings indicate that the negative relation between the maximum volatility ratio and changes in the home bias is not driven by the ratio measuring diversification. The proxy for uncertainty suggests that investors increased their home bias

significantly less towards markets where uncertainty was higher and does not support the ambiguity aversion hypothesis.

Regression (5) through (8) report changes in the home bias of U.S. investors' in 2008. When I repeat the experiment with U.S. investors, I do not find that the maximum volatility ratio is significantly associated with changes in the home bias. The same holds using the change in the U.S. foreign portfolio share in the fourth quarter of 2008 (Regression 9 through 12). These results contrast the previous findings and suggest that U.S. investors responded differently to uncertainty than investors did globally.

To assess the sensitivity of the finding that changes in the home bias have a significantly negative relation to a target country's maximum volatility ratio, I perform unreported robustness checks focused mainly on Regression (4). First, I examine whether the significantly negative relation is driven by outliers in the maximum volatility ratio and winsorize the ratio at the 1% and 99% level. The findings remain relatively unchanged from Regression (4) and indicate that the negative relation is not driven by outliers. Next, I test whether the negative relation exist through time and estimate a panel regression using changes in the home bias from the CPIS sample from 2003 to 2009. I add target country fixed effects and year fixed effects into the model, cluster by home country, and bootstrap standard errors within each cluster. The relation between changes in the home bias and the maximum volatility ratio remains significantly negative and suggests that the association exists through time. Epstein (2001) shows how the ambiguity aversion can lead to home bias even when investors are uncertain about their home return process as well. Adding a home country's maximum volatility ratio to the previously explained specification does not impact the result. These results do not support the ambiguity aversion hypothesis.

Lastly, I examine whether the relation differs across investors in developed and emerging home markets and use panel regressions to estimate a model that includes the maximum volatility ratio of each home and target country, my proxy for return distribution uncertainty, the control variables of specification (4), target fixed effects and year fixed effects. Again, I cluster standard errors by home country and bootstrap within each cluster. For developed countries, the estimated coefficient on a target country's maximum volatility ratio is significantly negative and is consistent with the negative association

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existing through time. When I further divide the developed portfolio into developed and emerging target countries, the main inference holds across both subgroups. This finding does not support the ambiguity aversion hypothesis for investors in developed countries. I repeat the analysis for investors in emerging home countries. I only find a significant association between the maximum volatility ratio and changes in the home bias when I restrict the portfolio to developed targets. But the relation is significantly negative and thus does not support the ambiguity aversion hypothesis.

The results in Table 6 do not support the ambiguity aversion hypothesis. I do not find that the association between the maximum volatility ratios, my proxy for distribution uncertainty, and changes in the home bias is significantly positive for the global sample or for U.S. investors. First, the results show that across countries investors did not increase their home bias more towards target countries that had higher maximum volatility ratios. Second, the significantly negative association between the uncertainty proxy and changes in the home bias is not subsumed by correlation, variance, or a target market's global weight. I interpret this as supportive evidence that the uncertainty proxy does not proxy for benefits from diversification. Lastly, I do not find that the negative relation holds for U.S. investors, suggesting that U.S. investors responded to uncertainty differently. Collectively, these findings do not support the ambiguity aversion hypothesis.

4.4 Did familiarity cause investors to reduce their foreign portfolio share?

Ambiguity averse investors who have a familiarity bias view familiar gambles as less risky than unfamiliar ones, even if they assign identical probability distributions to the two gambles (Tversky and Heath, 1991). This implies that familiarity can lead to a home bias even if investors have equal degrees of uncertainty about foreign and domestic assets. French and Poterba (1991) document that the home bias of investors in the U.S., the U.K., and Japan is consistent with investors expecting returns in their domestic equity market to be several hundred basis points higher than other markets. Li (2004) shows that the home bias of investors in G7 countries is consistent with investors viewing foreign equities, in terms of both expected returns and risk, less favorably than domestic equities. During periods of high uncertainty

ambiguity averse investors who have a familiarity bias may grow more pessimistic about unfamiliar assets than familiar ones (Cao et al., 2011). If investors are ambiguity averse and if familiarity causes the home bias, the familiarity hypothesis predicts that at high levels of uncertainty, the home bias rises. In this section, I examine one implication of the familiarity hypothesis; namely, I assess whether investors reduce their foreign portfolio share more in target countries with which they are less familiar.

I test this hypothesis at the target country level by regressing changes in the home bias towards target countries from the CPIS sample in 2008 and changes in the foreign portfolio share of U.S. investors in the fourth quarter of 2008 on a proxy for familiarity. I use the growth of a target country in a home country's portfolio from 2001 to 2007 to measure familiarity. The motivation is that after an investor purchases an asset, the asset becomes more familiar (Cao et. al, 2011). Over time, an investor may feel more knowledgeable about the risks associated with that security. This implies an investor would feel relatively more expert in the securities they have held for a longer time. Conversely, an investor may feel somewhat inexperienced with the securities they have recently acquired. To measure portfolio weight growth, I take the log difference of target country $j's$ weight in home country $i's$ equity portfolio in 2001 and in 2007. The control variables include the passive change in the home bias, and the demeaned level of the 2007 home bias. In this specification, the familiarity hypothesis predicts that the coefficient on portfolio weight growth will be positive. As before, I cluster errors by home country and bootstrap within each cluster.

Table 7 reports the cross-sectional regression results. For the CPIS sample, Regressions (1) through (4) show that the estimated coefficient on portfolio weight growth is not distinguishable from zero. This indicates that the proxy for familiarity, portfolio weight growth, was not significantly associated with changes in the home bias of investors around the world. These results do not support the familiarity hypothesis.

For U.S. investors, Regressions (5) through (8) show a significantly positive relation between portfolio weight growth and changes in the home bias. The results strongly contrast with the global findings for the same period. When I estimate a model containing portfolio weight growth, the passive

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change in the home bias, and its level from the previous year, the coefficient on portfolio weight growth is significantly positive (Regression 5). The coefficient implies that when passive changes and the previous level of the home bias are held constant, a 1 percentage point increase in portfolio weight growth is associated with a 2 percentage point increase in the home bias. This finding is consistent with U.S. investors increasing their home bias towards markets with which they were less familiar.

If information is costly to acquire, portfolio weight growth may proxy for these costs and not familiarity. I examine whether the previously defined information asymmetry proxies subsume portfolio weight growth. When I add the geographic distance, language, and culture dummies to the model, Regression (6) shows that the coefficient on portfolio weight growth increases in economic and statistical significance. An additional alternative explanation for the strong association between portfolio weight growth and active changes in the home bias of U.S. investors is that the familiarity proxy captures size or liquidity. Regressions (7) and (8) suggest that this is not the case. The relation between portfolio weight growth and changes in the home bias remains significant when I include a target market's global weight (Regression 7) and the demeaned turnover interacted with passive changes (Regression 8). The U.S. results are consistent with investors increasing their home bias more towards target countries with which they are less familiar during the crisis and generally support the familiarity hypothesis.

Lastly, I examine changes in the U.S. foreign portfolio share in the fourth quarter of 2008 in Regressions (9) through (12). I do not generally find a significant association between portfolio growth and quarterly changes in the U.S. foreign portfolio share. Regression (12) shows only after controlling for all the variables included in specification (4) is the estimated coefficient on portfolio weight growth statistically distinguishable from zero. This suggests that during the intensification of the crisis, U.S. investors did not significantly reduce their foreign portfolio share more in countries where portfolio growth was higher. These results do not generally support the familiarity hypothesis.

Table 7 shows that across countries, the growth of a target country in a home country's portfolio does not significantly relate to total changes in the home bias in 2008, but for U.S. investors, I find the association to be positive and economically significant. The relation is consistent with investors

increasing their home bias more towards countries with which they were relatively less familiar. Lastly, I do not generally find a significant relation between portfolio weight growth and U.S. changes in the home bias during the fourth quarter of 2008. This finding suggests that U.S. investors did not significantly reduce their allocation more towards countries with which they were less familiar at the peak of the crisis.

Section 5. Conclusion

An emerging literature in portfolio choice suggest that in 2008, investors left foreign markets for home (Giannetti and Laeven, 2011; Milesi-Ferretti and Tille, 2011; Forbes and Warnock, 2011; Fratzscher, 2011). In this paper, I document that during 2008, on average the share of equity wealth allocated abroad increased, which is contrary to the retrenchment phenomenon emphasized in the literature. The difference between my results and those of the retrenchment literature is that I develop a methodology to account for both the passive change in allocation due to stock returns and exchange rate changes and the active changes resulting from transactions undertaken by investors, while the literature focuses on investors' trades. On average, across the world, investors came home through trading their foreign equities; but, passive changes in their portfolio shares overwhelmed the retrenchment effect, so that, on average, the home bias fell. However, for the U.S., both changes in domestic and foreign equity holdings go in the same direction, which contrasts with the typical country.

I then investigate the determinants of changes in the share of equity wealth allocated to foreign countries. The crisis dramatically changed market capitalizations, so that portfolios that were optimal for investors before the crisis stopped being so. I therefore investigate whether investors rebalanced their portfolios towards what they were before the crisis. In other words, I ask whether investors rebalance to restore the home bias in their portfolios. I find strong evidence that active portfolio changes were undertaken to offset passive changes as predicted by portfolio rebalancing.

After showing the role of portfolio rebalancing, I examine the extent to which traditional theories of the home bias and theories of the impact of crises on portfolio allocation can help understand the changes in foreign portfolio shares during the crisis. For the traditional portfolio choice theories, I test the

impact of changes in wealth and information asymmetry. In my sample, changes in financial wealth are associated with investors reducing the total share of equity wealth they allocate abroad. I find supportive evidence that investors increased their home bias less towards markets that were relatively close in distance and in culture. The recent literature on uncertainty and familiarity suggests that during a crisis investors will retrench from countries with a greater increase in uncertainty and from countries they are less familiar with. I do not find a relation between my proxy of distribution uncertainty and active changes in the home bias. For familiarity bias, I do find supportive evidence that is consistent with U.S. investors increasing their home bias more towards market with which they were less familiar.

References

Acemoglu, D., S. Johnson, J. Robinson, and Y. Thaicharoen, 2003. Institutional Causes, Macroeconomic Symptoms: Volatility, Crises and Growth, *Journal of Monetary Economics* 50, 49-123.

Andrade, S., and V. Chhaochharia, 2010. Information Immobility and Foreign Portfolio Investment, *Review of Financial Services* 23, 2429-2463.

Bekaert, G., X. Wang, 2009. Home Bias Revisited, Columbia Business School.

Bernanke, B., C. Bertaut, L. Pounder DeMarco, and S. Kamin, 2011. International Capital Flows and the Returns to Safe Assets in the United States, 2003-2007, *Federal Reserve Board International Finance Discussion* Paper No 1014.

Bertaut, C., and R. Tryon, 2007. Monthly Estimates of U.S. Cross-Border Securities Positions, *International Finance Discussion Papers 910*. Board of Governors of the Federal Reserve System (U.S.).

Bertaut, C. and L. Pounder, 2009. The Financial Crisis and U.S. Cross-Border Financial Flows, *Federal Reserve Bulletin,* 93(A): 147-67.

Brennan, M., and H. Cao, 1997. International portfolio investment flows, *Journal of Finance,* 52, 1851-80.

Caballero, R. J. and A. Krishnamurthy, 2008, Collective Risk Management in a Flight to Quality Episode, *Journal of Finance* 63, 2195-2230.

Caballero, R. and A. Krishnamurthy, 2009. Global Imbalances and Financial Fragility, *American Economic Review,* 99(2): 584-588.

Cao, H., B. Han, D. Hirshleifer, and H. Zhang, 2011. Fear of the Unknown: Familiarity and Economic Decisions, *Review of Finance,* 15(1), 173-206.

Choe, H, B-C. Kho, and R. Stulz, 2005. Do Domestic Investors Have an Edge? The Trading Experience of Foreign Investors in Korea, Review of Financial Studies, 18(3), 795-829.

Christoffersen, P. and V. Errunza, K. Jacobs, H. Langlois, 2012. Is the Potential for International Diversification Disappearing? A Dynamic Copula Approach, *Review of Financial Studies,* Forthcoming.

Curcuru, S., C. Dvorak, J. Wongsman, and F. Warnock, 2011. U.S. International Equity Investment and Past and Prospective Returns, *American Economic Review,* 101(7): 3340-3455.

Curcuru, S., C. Dvorak, J. Wongsman, and F. Warnock, 2010. What influences U.S. International Equity Investment: Equity or Currency Returns?, Working Paper.

Dahlquist, M. and G. Robertsson, 2001. Direct foreign ownership, institutional investors, and firm characteristics. *Journal of Financial Economics,* 59, 413-440.

Dahlquist, M., L. Pinkowitz, R. Stulz, and R. Williamson, 2003. Corporate governance, investor protection, and the home bias. *Journal of Financial Quantitative Analysis*, 87-110.

Easley, D. and O'Hara, M., 2010. Liquidity and Valuation in an Uncertain World, *Journal of Financial*

Economics, 97(1), 1-11.

Ellsberg, D., 1961. Risk, ambiguity, and the Savage axioms, *Quarterly Journal of Economics*, 75, 643–669.

Epstein, L., 2001. Sharing Ambiguity, *American Economic Review,* 91(2), 45-50.

Fratzscher, M., 2009. What explains global exchange rate movements during the financial crisis?, *Journal of International Money and Finance*, 28(8), 1390-1407.

Fratzscher, M. 2011. Capital Flows, Push versus Pull Factors and the Global Financial Crisis, *NBER Working Paper*, Paper No 17357.

French, K. and J. Poterba, 1991. Investor Diversification and International Equity Markets, *American Economic Review*, 81 (2), 222–226.

Forbes, K. and R. Rigobon, 2002. No Contagion, Only Interdependence: Measuring Stock Market Comovements, *Journal of Finance,* 57, 2223-2261.

Forbes, K. and F. Warnock, 2011, Capital Flow Waves: Surges, Stops, Flight, and Retrenchment, *NBER Working Paper,* Paper No 17351.

Froot, K., P. O'Connell, and M. Seasholes, 2001, The portfolio flows of international investors, *Journal of Financial Economics,* 59, 151-193.

Froot, K., and T. Ramadorai, 2008. Institutional Portfolio Flows and International Investments, *Review of Financial Studies,* 21, 937-971.

Giannetti, M. and A. Simonov, 2006. Which Investors Fear Expropriation? Evidence from Investors' Portfolio Choices, *Journal of Finance,* 61(3), 1507-1547.

Giannetti, M. and L. Laeven, 2012. The Flight Home Effect: Evidence from the Syndicated Loan Market During Financial Crises, *Journal of Financial Economics 104,* 23-43.

Griever, W., G. Lee, and F. Warnock, 2001. The U.S. System for Measuring Cross-Border Investment in Securities: A Primer with Discussion of Recent Developments, *Federal Reserve Bulletin,* 87(10).

Gelos, G. and S-J Wei, 2005. Transparency and International Portfolio Holdings, *Journal of Finance* 60, 2987-3020.

Gorton, G., 2008, The Panic of 2007. *Prepared for the Federal Reserve Bank of Kansas City, Jackson Hole Conference, August 4, 2008.*

Gourinchas, P-O, H. Rey, and K. Truempler, 2011. The Financial Crisis and The Geography of Wealth Transfers, *NBER Working Paper*, Paper No 17353.

Griffin, John M., Federico Nardari, and Rene´ M. Stulz, 2004, Are daily cross-border equity flows pushed or pulled?, *Review of Economics and Statistics,* 86, 641–657.

Heaton, J. and D. Lucas, 2000. Portfolio Choice in the Presence of Background Risk, *Economic Journal,* 110(460), 1-26.

Jinjarak, Y., J. Wongswan, and H. Zheng, 2011. International fund investment and local market returns, *Journal of Banking and Finance,* 35, 572-587.

Johnson, S., P. Boone, A. Breach, and E. Friedman, 2000. Corporate governance in the Asian financial crisis, *Journal of Financial Economics,* 58(2), 141-186.

Johnson, S., R. La Porta, F. Lopez-de-Silanes, and A. Shleifer, 2000. Tunneling, *American Economic Review,* 90(2), 22-27.

Ke, D., L. Ng, and Q. Wang, 2010. Home Bias in Foreign Investment Decisions, *Journal of International Business Studies,* 41, 960–979.

Kaufmann, D., A. Kraay, and M. Mastruzzi, 2009. Governance matters VIII: Aggregate and individual governance indicators 1996-2008, *Policy Research Working Paper Series 4978*, The World Bank.

Karolyi, G. A., and R. Stulz, 2003. Are assets priced globally or locally?, *Handbook of the Economics of Finance, Edited by G.M. Constantinides, M. Harris and R. Stulz, Elsevier Science B.V., Chapter 16,* 973-1018.

Kho, B.C., R. Stulz, and F. Warnock, 2009. Financial globalization, governance, and the evolution of the home bias, *Journal of Accounting Research,* 47, 597-635.

Lane, P. and L. Milesi-Ferretti, 2008. The Drivers of Financial Globalization, *American Economic Review,* 98(2), 327-32.

Lee, K-H, 2010. The World Price of Liquidity, *Journal of Financial Economics,* 99, 136-161.

Lewis, K., 2011. Global Asset Pricing, *Annual Review of Financial Economics,* 3, 435-466.

Leuz, C., K. Lins, and F. Warnock, 2009. Do foreigners invest less in poorly governed firms?, *Review of Financial Studies* 22(8), 3245-3285.

Li, K., 2004. Confidence in the Familiar: An International Perspective. *Journal of Financial and Quantitative Analysis,* 39(01), 47-68.

Milesi-Ferretti, G-M and C. Tille, 2011. The Great Retrenchment: International Capital Flows During the Global Crisis, *Economic Policy,* 26, 295-342.

Rose, A. and M. Spiegel, 2010. Cross-country causes and consequences of the crisis: an update, *CPER Discussion Paper,* Paper No 7901.

Stulz, R. and R. Williamson, 2003. Culture, openness, and finance, *Journal of Financial Economics,* 70(3), 313-349.

Thapa, C. and S. Poshakwwle, 2010. International equity portfolio allocations and transaction costs, *Journal of Banking & Finance,* 2627-38.

Van Nieuwerburgh, S. and L. Veldkamp, 2010. Information Acquisition and Under-Diversification, *Review of Economic Studies,* 77(2), 779-805.

Table 1. Descriptive Statistics of Changes in Foreign Portfolio Share of Equity Wealth and Equity Home Bias.

The table shows descriptive statistics on the total foreign portfolio share of investors in the sample in 2008. The sample contains country-level year-end equity-holding observations from 2001 – 2009 from the CPIS. Using the S&P Global Fact Book, I select the 45 largest equity markets by year-end market capitalization. I exclude countries where the year-end dollar value of foreign holdings exceeds the domestic market capitalization and where macroeconomic data is not available through the World Bank. The final sample contains the multilateral holdings of investors in 42 home countries to 45 target countries. I delete observation when year-end non-domestic holdings are not reported and code all cases where multilateral holdings are at or below US$500,000 as being at US$500,000. *Investors' Allocation to Non-Domestic Assets* labels each home country's year-end allocation to target countries in the sample, as computed from CPIS multilateral holdings. *Passive Benchmark of Non-Domestics Assets* measures the change in allocation to non-domestic assets from year *t-1* to year *t*, given investors' allocation at the end of year *t- 1*and assuming investors do not trade foreign stocks. *Active Allocation* measures the change in allocation not due to price and exchange rate changes from year *t-1* to year *t*. Panel A describes each home country's foreign portfolio share of total equity wealth and the value-weighted home bias in 2008. Panel B provides each countries equally-weighted home bias in 2008. To test if the average active change is statistically different from zero, I bootstrap the mean. *, **, *** indicate the statistical significance of average active reallocation from year *t-1* to *t* at the 10%, 5%, and 1% level, respectively.

Panel A: Active change in Foreign Portfolio Share and the Value-Weighted Home Bias in 2008, by Country

	Investors' Allocation to Non-Domestic Assets				Passive Benchmark of Non-Domestic Assets				Active Allocation (%)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Foreign Portfolio Share		Home Bias (Value Weighted)		Foreign Portfolio Share		Home Bias (Value Weighted)		Difference	Difference
	Level	Change (%)	Level	Change (%)	Level	Change (%)	Level	Change (%)	(2) - (6)	(4) - (8)
Developed Markets										
AUSTRALIA	21.861	2.062	0.751	2.697	22.534	6.849	0.740	-3.806	-4.787	6.502
AUSTRIA	42.859	14.135	0.532	-16.095	46.327	17.857	0.482	-21.526	-3.722	5.431
BELGIUM	42.935	4.428	0.526	-3.976	46.367	7.574	0.483	-8.091	-3.145	4.115
CANADA	30.500	5.673	0.681	-1.921	31.431	9.034	0.666	-6.227	-3.361	4.306
DENMARK	45.430	4.730	0.512	-2.892	48.938	10.202	0.466	-9.808	-5.472	6.916
FINLAND	38.617	3.544	0.415	-16.785	47.342	15.838	0.307	-31.551	-12.294	14.766
FRANCE	24.423	1.057	0.719	-0.944	26.130	2.570	0.700	-2.214	-1.513	1.270
GERMANY	27.380	-2.465	0.689	3.560	32.582	-0.320	0.630	1.104	-2.145	2.455
GREECE	10.974	5.624	0.877	-5.735	9.279	5.325	0.895	-5.791	0.300	0.056
HONGKONG	11.686	-11.571	0.848	4.083	10.418	-11.648	0.865	4.592	0.077	-0.509
ISRAEL	10.648	2.685	0.876	-1.411	9.518	3.352	0.889	-2.554	-0.667	1.143
ITALY	20.722	2.959	0.771	-2.826	21.110	1.511	0.767	-1.212	1.449	-1.613
JAPAN	11.018	-1.672	0.876	3.260	10.383	-2.167	0.882	3.827	0.495	-0.567
KOREA	9.759	0.530	0.894	-2.332	10.766	8.211	0.884	-9.108	-7.681	6.776
NETHERLANDS	64.430	14.758	0.323	-9.326	63.678	15.605	0.325	-11.147	-0.848	1.821
NEWZEALAND	44.035	7.933	0.100	-16.440	41.492	6.261	0.136	-12.707	1.672	-3.734
NORWAY	67.948	19.456	0.263	-17.410	60.578	18.738	0.345	-17.021	0.718	-0.389
PORTUGAL	69.551	34.778	0.235	-40.569	70.153	38.214	0.224	-44.261	-3.436	3.692
SINGAPORE	46.616	7.268	0.503	-9.747	40.704	9.791	0.560	-13.785	-2.523	4.037
SPAIN	3.943	0.720	0.933	-3.229	3.532	-0.421	0.949	-0.977	1.141	-2.252
SWEDEN	44.661	9.712	0.506	-9.773	45.036	11.008	0.504	-10.775	-1.297	1.002
SWITZERLAND	23.063	-3.168	0.749	4.993	24.251	-0.973	0.732	2.112	-2.195	2.881
UK	41.578	5.866	0.540	-3.286	43.081	6.958	0.519	-4.154	-1.093	0.869
US	18.637	-1.440	0.703	4.756	20.488	1.612	0.665	-1.030	-3.051	5.786
Total	32.220	5.317	0.618	-5.890	32.755	7.541	0.609	-8.588	-2.224***	2.698***

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Table 1. Panel A. - *Continued*

	Investors' Allocation to Non-Domestic Assets				Passive Benchmark of Non-Domestic Assets				Active Allocation (%)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Foreign Portfolio Share		Home Bias (Value Weighted)		Foreign Portfolio Share		Home Bias (Value Weighted)		Difference	Difference
	Level	Change (%)	Level	Change (%)	Level	Change (%)	Level	Change (%)	(2) - (6)	(4) - (8)
Emerging Markets										
ARGENTINA	12.602	-1.566	0.876	2.963	14.116	2.244	0.853	-1.709	-3.810	4.672
BRAZIL	0.530	0.310	0.994	-0.299	0.299	0.126	0.997	-0.118	0.184	-0.181
CHILE	17.685	13.695	0.805	-15.527	4.043	1.296	0.955	-1.750	12.399	-13.776
COLOMBIA	1.309	-0.244	0.966	1.502	1.144	0.165	0.971	0.213	-0.409	1.289
CZECH	14.984	0.412	0.784	-4.172	10.609	-0.034	0.855	-2.039	0.445	-2.133
EGYPT	0.448	0.266	0.980	-1.064	0.179	0.064	0.990	-0.247	0.202	-0.817
HUNGARY	17.915	6.146	0.760	-10.144	14.412	5.148	0.801	-9.582	0.998	-0.561
INDIA	0.071	0.052	0.999	-0.068	0.033	0.023	1.000	-0.018	0.030	-0.050
INDONESIA	0.637	0.138	0.974	-2.231	0.525	0.199	0.987	-0.798	-0.061	-1.432
MALAYSIA	4.854	2.281	0.954	-1.793	2.304	0.925	0.976	-0.884	1.355	-0.910
MEXICO	0.923	0.103	0.978	0.242	0.845	-0.782	0.977	1.997	0.886	-1.755
PAKISTAN	0.021	0.013	0.997	-0.158	0.017	-0.002	0.997	-0.170	0.015	0.012
PHILIPPINES	0.086	-0.054	0.999	0.253	0.161	0.011	0.996	-0.069	-0.065	0.322
POLAND	3.194	-0.504	0.952	-0.573	4.163	2.496	0.928	-5.129	-3.000	4.556
RUSSIA	0.599	0.328	0.993	-0.437	0.590	0.556	0.993	-0.705	-0.229	0.268
SOUTHAFRICA	8.943	2.818	0.890	-2.788	7.022	0.631	0.913	-0.041	2.187	-2.747
THAILAND	1.620	0.124	0.983	-0.053	1.676	0.746	0.983	-0.730	-0.621	0.676
TURKEY	0.048	0.023	0.999	-0.029	0.038	0.009	0.999	-0.011	0.014	-0.018
Total	4.804	1.352	0.938	-1.910	3.454	0.768	0.954	-1.211	0.584	-0.699
Total (Across All Countries)										
Equally Weighted Average	20.470	3.618	0.755	-4.184	20.198	4.638	0.757	-5.426	-1.021*	1.242*

Panel B: Change in the Equally-Weighted Home Bias in 2008, by Country

	Investors' Allocation to Non-Domestic Assets		Passive Benchmark of Non-Domestic Assets		Active Allocation (%)
	(1)	(2)	(3)	(4)	(5)
	Home Bias (Equal Weighted)		Home Bias (Equal Weighted)		Difference
	Level	Change (%)	Level	Change (%)	(2) - (4)
Developed Markets					
AUSTRALIA	0.752	10.356	0.743	5.352	5.005
AUSTRIA	0.513	-8.747	0.376	-22.969	14.222
BELGIUM	0.573	-4.938	0.523	-8.693	3.755
CANADA	0.807	-2.291	0.785	-7.035	4.744
DENMARK	0.489	-3.125	0.418	-13.235	10.110
FINLAND	0.299	-15.394	0.177	-29.235	13.841
FRANCE	0.663	-1.411	0.645	-7.105	5.694
GERMANY	0.615	0.869	0.554	-7.192	8.061
GREECE	0.927	-2.615	0.942	0.386	-3.001
HONGKONG	0.929	7.690	0.931	6.092	1.598
ISRAEL	0.961	0.352	0.957	-0.977	1.329
ITALY	0.767	-3.999	0.763	-3.220	-0.779
JAPAN	0.922	1.914	0.921	0.708	1.206
KOREA	0.927	2.332	0.906	-7.125	9.458
NETHERLANDS	0.469	-8.914	0.444	-14.642	5.727
NEWZEALAND	-0.274	2.215	-0.382	-6.918	9.133
NORWAY	0.121	-35.722	0.330	-18.928	-16.794
PORTUGAL	0.556	-16.638	0.503	-23.577	6.939
SINGAPORE	0.384	-0.066	0.364	-12.672	12.606
SPAIN	0.799	-8.876	0.717	-19.072	10.197
SWEDEN	0.527	-3.297	0.487	-7.990	4.694
SWITZERLAND	0.794	2.317	0.781	1.164	1.154
UK	0.509	-4.797	0.480	-7.570	2.773
US	0.735	1.722	0.703	-3.591	5.313
Total	0.615	-3.794	0.586	-8.669	4.874***
Emerging Markets					
ARGENTINA	0.975	3.728	0.931	-1.079	4.807
BRAZIL	0.988	-0.488	0.992	-0.393	-0.095
CHILE	0.619	-31.902	0.940	-2.703	-29.199
COLOMBIA	0.986	3.484	0.988	1.940	1.545
CZECH	0.669	8.769	0.626	4.987	3.782
EGYPT	0.973	-1.553	0.989	-0.312	-1.241
HUNGARY	0.525	1.471	0.539	-0.406	1.877
INDIA	0.998	-0.084	0.998	-0.118	0.034
INDONESIA	0.940	-2.364	0.970	0.761	-3.124
MALAYSIA	0.898	-1.654	0.922	-2.359	0.705
MEXICO	0.990	0.382	0.991	1.463	-1.082
PAKISTAN	0.996	-0.249	0.998	-0.125	-0.124
PHILIPPINES	0.987	-0.547	0.991	-0.537	-0.010
POLAND	0.561	-19.754	0.417	-48.889	29.135
RUSSIA	0.989	0.030	0.973	-2.626	2.656
SOUTHAFRICA	0.951	-1.495	0.960	-0.826	-0.669
THAILAND	0.975	-0.651	0.981	-0.404	-0.247
TURKEY	1.000	-0.023	1.000	-0.010	-0.013
Total	0.890	-2.383	0.900	-2.869	0.485
Total (Across All Countries)					
Equal Weighted Average	0.733	-3.190	0.721	-6.183	2.993**

Table 2 Statistics on Active Change U.S. Foreign Portfolio Share and Change in Non-US Ownership of U.S. Equity (% US Market Cap)
Quarterly Mean and Sum, 2008

The table presents an overview of the active change in U.S. foreign portfolio share and non-U.S. holdings of U.S. equity as a percentage of U.S. market captilaztion in 2008. U.S. holdigns of foreign equity and non-resident holdings of U.S. equity are obtained from Bertaut-Tryon database. Active change calculates the change in allocation not due change in prices and exchnage rates from quarter *t-1* to quarter *t*. U.S. foreign portfolio share calculated relative to total U.S. equity wealth. Monthly market cap obtained from U.S. S&P BMI Index.

		Quarter 2008							
		(1)		(2)		(3)		(4)	
		Mean	Sum	Mean	Sum	Mean	Sum	Mean	Sum
US Active Change Foreign Equity (% Total Portfolio Wealth)									
Developed Markets	23	0.042	0.973	-0.039	-0.893	-0.044	-1.011	0.022	0.505
Emerging Markets	21	0.001	0.016	0.003	0.053	-0.012	-0.255	-0.001	-0.030
Total	44	0.022	0.989	-0.019	-0.840	-0.029	-1.266	0.011	0.475
Change Foreign Holdings US Equity (%US Market Cap)									
Developed Markets	23	0.018	0.412	0.006	0.146	0.001	0.034	0.027	0.617
Emerging Markets	21	0.008	0.173	0.007	0.140	0.001	0.031	0.002	0.042
Total	44	0.013	0.584	0.007	0.286	0.001	0.065	0.015	0.658
Home Bias (Equal-Weighted)									
Developed Markets	919	0.611	-6.727	0.591	-11.036	0.611	-6.727	0.591	-11.036
Emerging Markets	402	0.726	-10.429	0.803	-8.298	0.726	-10.429	0.803	-8.298
Total	1321	0.647	-7.853	0.655	-10.203	0.647	-7.853	0.655	-10.203

Table 3. Portfolio Rebalancing and Active Allocation

This table presents results from OLS estimates of the effect of portfolio rebalancing on active allocation. Panel A presents cross-sectional regressions of the active decrease in the total foreign portfolio share, active changes in the value-weighted and equally-weighted home bias in Column (1) through (3) and active changes in the home bias of home country i towards target country j in Columns (4) though (6). The cross-sections contain country-level year-end multilateral holdings from the CPIS sample for 2008. Active changes from year $t-1$ to year t are changes in allocation not due to passive changes in asset prices and exchange rates. Passive changes in allocation are calculated using holdings from year $t-1$ and the change in prices and exchanges rates from year $t-1$ to year t. *Home Bias i,j t-1* is the level of the home bias of investors in home country i towards target country j for year-end 2007. *Turnover* is a target country's 2008 annual turnover, provided by the World Bank. *Home Bias i,j t-1* and *Turnover* are demeaned at the country-year level. F-test examine if the estimated coefficient on current or lagged passive changes in the foreign portfolio share are equal to (-1). Panel B presents cross-sectional regression results of U.S. investors' active changes in the home bias in 2008 and quarterly active changes in the foreign portfolio share in the fourth quarter of 2008. All standard errors are bootstrapped and presented in paranthesis. For home bias at the country-portfolio level, standard errors are clustered by home country and bootstrapped within each cluster. ***,**,* report cases where the estimated coefficient is different from zero at 10%, 5%, 1% significant level, respectively.

Panel A Passive and Active Changes in Foreign Portfolio Share in 2008

	(1) Active Decrease Foriegn Port. Share	(2) Active Change VW Home Bias	(3) Active Change EW Home Bias	(4)	(5)	(6)
				Active Change Home Bias i,j		
Passive Δ FPS	-0.18*					
	(0.102)					
Passive Δ FPS *t-1*	-0.34					
	(0.221)					
Passive Δ VW Home Bias		-0.20**				
		(0.094)				
Passive Δ VW Home Bias *t-1*		-0.01				
		(0.169)				
Passive Δ EW Home Bias			-0.45***			
			(0.129)			
Passive Δ EW Home Bias *t-1*			0.16			
			(0.329)			
Passive Δ Home Bias i,j				-0.65***	-0.60***	-0.73***
				(0.087)	(0.105)	(0.107)
Passive Δ Home Bias i,j *t-1*				0.09	0.18	0.14
				(0.142)	(0.174)	(0.179)
Home Bias i,j *t-1*					-1.03	-1.05
					(3.264)	(3.442)
Target Turnover						1.71
						(1.553)
Passive Δ HB i,j *HB i,j t-1					0.09	-0.03
					(0.170)	(0.087)
Passive Δ HB i,j *Target Turnover						0.41***
						(0.087)
Passive Δ HB i,j t-1 *HB i,j t-1					0.03	0.12
					(0.101)	(0.150)
Passive Δ HB i,j t-1 *Target Turnover						-0.42
						(0.377)
Constant	0.07	0.19	0.35	-1.65	-1.36	-1.64
	(0.550)	(0.674)	(1.029)	(1.319)	(1.305)	(1.321)
Observations	42	42	42	1,234	1,234	1,234
No of Countries	42	42	42	42	42	42
Cluster	.	.	.	Home	Home	Home
Passive t = (-1)	0.000	0.000	0.000	0.000	0.000	0.011
Passive t_1 = (-1)	0.003	0.000	0.000	0.000	0.000	0.000
Adjusted R-squared	0.187	0.160	0.281	0.328	0.330	0.367

Panel B US Passive and Active Changes in Foreign Portfolio Share in 2008

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Active Change US Home Bias in 2008			Active Change US Foreign Portfolio Share in Q4 2008			
Passive Δ US Home Bias	-0.80***	-0.67***	-0.58**				
	(0.141)	(0.187)	(0.230)				
Passive Δ US Home Bias t-1	-0.30*	-0.32	-0.25				
	(0.162)	(0.287)	(0.325)				
Passive Δ US FPS				0.07	-0.34	-0.99**	-0.78**
				(0.392)	(0.323)	(0.451)	(0.376)
Passive Δ US FPS t-1				-0.30	-0.30	0.83*	0.84*
				(0.461)	(0.382)	(0.483)	(0.454)
US Home Bias t-1		-1.61	-8.05		-0.09	-0.08	-0.06
		(11.122)	(15.037)		(0.074)	(0.055)	(0.049)
Target Turnover			-2.10			-0.01	0.00
			(2.865)			(0.017)	(0.018)
Passive Δ US HB * US HB t-1		0.75	0.66				
		(1.048)	(1.639)				
Passive Δ US HB * Target Turnover			-0.26				
			(0.516)				
Passive Δ US HB t-1 * US HB t-1		-0.94	-1.57				
		(1.219)	(1.913)				
Passive Δ US HB t-1 * Target Turnover			0.06				
			(0.581)				
Passive Δ US FPS*US HB t-1					-2.31	1.17	-0.00
					(3.071)	(3.048)	(3.389)
Passive Δ US FPS*Target Turnover						1.74*	1.24
						(1.012)	(0.984)
Passive Δ US FPS t-1 *US HB t-1					-1.11	-4.41	-1.46
					(3.215)	(3.088)	(3.525)
Passive Δ US FPS t-1 *Target Turnover						-2.67**	-1.62
						(1.180)	(1.212)
Passive Δ US FPS t-2							0.47
							(0.451)
Passive Δ US FPS t-3							-0.30
							(0.440)
Constant	1.45*	2.02	2.81	0.00	-0.00	-0.00	0.01
	(0.758)	(1.953)	(2.255)	(0.007)	(0.010)	(0.009)	(0.009)
Observations	44	44	44	44	44	44	44
No of Countries	44	44	44	44	44	44	44
F-test (Passive t= -1)	0.146	0.082	0.067	0.006	0.042	0.989	0.556
F-test (Passive t_1 = -1)	0.000	0.018	0.021	0.131	0.065	0.000	0.000
Adjusted R-squared	0.545	0.531	0.504	0.074	0.247	0.593	0.664

This table presents results from OLS estimates of the effect of changes in domestic wealth on investors' total foreign portfolio share in 2008. The changes in the foreign portfolio share are measured with the decrease in the total foreign portfolio share relative to total portfolio wealth, changes in the value-weighted and equally-weighted home bias in 2008. The cross-section contains country-level year-end multilateral holdings from the CPIS sample for 2008. Changes in financial and non-financial are measured with annual buy and hold market returns, annual GDP Growth, and consumption per capita growth; buy and hold market returns are in U.S. dollars. GDP Growth and consumption growth are in year 2000 constant U.S. dollars and obtained from the World Bank. All standard errors are bootstrapped and presented in paranthesis. ***,**,* report cases where the estimated coefficient is different from zero at 10%, 5%, 1% significant level, respectively.

Domestic Change in Wealth and Total Changes in Foreign Portfolio Share in 2008

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Decrease in Foreign Portfolio Share				Δ Value Weighted Home Bias				Δ Equal Weighted Home Bias			
Home Return t	-0.03*				-0.04**				-0.04			
	(0.018)				(0.019)				(0.048)			
Home GDP Growth t		-0.02				0.03				-0.09		
		(0.172)				(0.236)				(0.411)		
Home GDP Growth $t+1$			-0.05				-0.05				-0.04	
			(0.121)				(0.129)				(0.170)	
Home Consumption Growth t				-0.06				-0.02				-0.23
				(0.148)				(0.183)				(0.359)
Passive Δ FPS	0.85***	0.83***	0.84***	0.84***								
	(0.090)	(0.091)	(0.086)	(0.092)								
Passive Δ VW Home Bias					0.82***	0.80***	0.81***	0.80***				
					(0.095)	(0.096)	(0.091)	(0.097)				
Passive Δ EW Home Bias									0.56***	0.56***	0.56***	0.55***
									(0.137)	(0.145)	(0.143)	(0.147)
Constant	-0.11	0.29	0.17	0.36	-0.24	0.09	0.09	0.19	-0.15	0.45	0.18	0.51
	(0.548)	(0.570)	(0.562)	(0.547)	(0.655)	(0.810)	(0.700)	(0.705)	(1.283)	(1.296)	(1.175)	(1.140)
Observations	42	42	42	41	42	42	42	41	42	42	42	41
No of Countries	42	42	42	41	42	42	42	41	42	42	42	41
Adjusted R-squared	0.811	0.803	0.804	0.801	0.799	0.791	0.792	0.787	0.388	0.383	0.383	0.383

Table 5. Information Asymmetry and Changes in the Foreign Portfolio Share in 2008

This table presents cross sectional OLS regressions of reductions in the foreign portfolio share on proxies for information asymmetry in 2008. Panel A reports the changes in the foreign portfolio share are measured with changes in the home bias of home country i towards target country j. The cross section contains country-level year-end multilateral holdings from the CPIS sample for 2008. Passive change is the change in the home bias due to the change in prices and exchange rates from year $t-1$ to year t. Home bias i,j $t-1$ is the level of the home bias investors in home country i have towards target country j year-end 2007. Geographic distance is the log of the great circle distance between a home and target country's capital cities. Share region, language, and religion are dummy variables for home and target countries that share a common geographic region, predominantly spoken language, or predominantly practiced religion, respectively. Language and religion are obtained from the CIA World Factbook. Governance is the annual Kauffman et al. (2010) country-level governance score for each target in 2008. Annual buy and hold market returns are in U.S. dollars. Panel B present cross-sectional regression results of U.S. investors total change in the home bias in 2008 and quarterly total change in the U.S. foreign portfolio share in the fourth quarter of 2008. Target Return (Q4) is a country's buy and hold market return for the fourth quarter of 2008 and is measured in U.S. dollars. All standard errors are clustered by home country, bootstrapped within each cluster and presented in parentheses. *, **, *** indicate the statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A Information Asymmetry and Total Change in the Home Bias in 2008

	(1)	(2)	(3)	(4)	(5)	(6)
	Total Change in Home Bias i,j					
Passive Δ Home Bias i,j	0.50***	0.47***	0.47***	0.50***	0.50***	0.47***
	(0.139)	(0.150)	(0.150)	(0.144)	(0.144)	(0.149)
Home Bias i,j $t-1$	-1.29	-5.37**	-5.03*	-1.57	-1.25	-5.06*
	(3.231)	(2.512)	(2.607)	(3.365)	(3.263)	(2.623)
Passive Δ HB i,j *HB i,j t-1	0.07	0.05	0.05	0.07	0.07	0.05
	(0.117)	(0.122)	(0.122)	(0.121)	(0.123)	(0.122)
Geographic Distance		2.18*				
		(1.188)				
Share Language		-14.12	-13.69			-13.61
		(9.498)	(9.793)			(10.155)
Share Religion		-3.74*	-3.72*			-3.66*
		(1.975)	(1.921)			(2.068)
Share Region			-4.86**			-4.88**
			(2.385)			(2.435)
Target Governance t				-0.72		-0.17
				(1.346)		(1.347)
Target Return t					-0.02	-0.02
					(0.036)	(0.031)
Constant	-1.04	-18.08*	1.93**	-0.51	-2.20	1.24
	(1.481)	(10.830)	(0.751)	(2.175)	(2.160)	(1.956)
Observations	1,267	1,267	1,267	1,267	1,267	1,267
No of Countries	42	42	42	42	42	42
Cluster	Home	Home	Home	Home	Home	Home
Adjusted R-squared	0.192	0.217	0.218	0.192	0.192	0.217

Panel B Information Asymmetry and Total Change in the US Home Biasin 2008 and US Foreign Portfolio Share in Q4 2008

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Total Change US Home Bias in 2008					Total Change US Foreign Portfolio Share in Q4 2008				
Passive Δ US Home Bias	0.39**	0.43**	0.39**	0.46***	0.58***					
	(0.182)	(0.204)	(0.193)	(0.172)	(0.226)					
Passive Δ US HB*US HB t-1	0.77	0.75	0.83	1.01	0.96					
	(0.891)	(1.106)	(0.969)	(0.819)	(0.967)					
Passive Δ US FPS						0.42	0.44*	0.42	0.42*	0.43**
						(0.276)	(0.230)	(0.274)	(0.217)	(0.194)
Passive Δ US FPS*US HB t-1						-3.15	-1.81	-3.15	-3.57*	-2.40
						(2.042)	(1.954)	(2.042)	(1.938)	(1.915)
US Home Bias t-1	-3.45	-2.73	-5.44	-3.57	-6.36	0.08	0.05	0.08	0.11	0.06
	(5.967)	(6.292)	(6.713)	(5.490)	(6.006)	(0.065)	(0.063)	(0.071)	(0.072)	(0.065)
Geographic Distance		0.92			-0.75		-0.03			-0.02
		(2.539)			(2.765)		(0.020)			(0.019)
Share Language		0.56			1.52		0.07			0.06
		(4.518)			(4.143)		(0.063)			(0.060)
Share Religion		2.54			4.46		0.00			0.01
		(4.098)			(3.610)		(0.020)			(0.023)
Target Governance t			-0.78		-1.89			-0.00		-0.01
			(1.147)		(1.222)			(0.008)		(0.008)
Target Return (2008) t				-0.15**	-0.16**					
				(0.070)	(0.080)					
Target Return (Q4) t									-0.00***	-0.00**
									(0.001)	(0.001)
Constant	2.83***	-5.90	3.32***	-4.67	2.13	0.00	0.25	0.00	-0.06**	0.14
	(0.973)	(22.788)	(1.157)	(3.514)	(23.063)	(0.009)	(0.178)	(0.010)	(0.029)	(0.172)
Observations	44	44	44	44	44	44	44	44	44	44
No of Countries	44	44	44	44	44	44	44	44	44	44
Adjusted R-squared	0.103	0.090	0.092	0.200	0.223	0.683	0.735	0.675	0.748	0.788

Table 6. Distribution Uncertainty and Changes in the Foreign Portfolio Share in 2008

This table presents cross sectional OLS regressions of reductions in the foreign portfolio share on proxies for information asymmetry in 2008. Changes in the foreign portfolio share are measured with changes in the home bias of home country i towards target country j, U.S. investors total change in the home bias in 2008 and quarterly total change in the U.S. foreign portfolio share in the fourth quarter of 2008. The cross section contains country-level year-end multilateral holdings from the CPIS sample for 2008 and the Bertaut and Tryon (2007) sample for U.S. investors in the fourth quarter of 2008. *Target Max Volatility* is the ratio of the highest standard deviation of daily returns for any month in year t, divided by the average standard deviation in year $t-1$. Passive change is the change in the home bias due to the change in prices and exchange rates from year $t-1$ to year t. Home bias i,j $t-1$ is the level of the home bias investors in home country i have towards target country j year-end 2007. Correlation and standard deviation are estimated using 3-year (36 month) rolling windows of monthly returns of home and target countries. Returns are in U.S. dollars. Global weight is the weight of a country in the world market portfolio. All standard errors are bootstrapped and presented in paranthesis. For home bias at the country-portfolio level, standard errors are clustered by home country and bootstrapped within each cluster. *, **, *** indicate the statistical significance at the 10%, 5%, and 1% level, respectively.

Uncertainty and Changes in the Home Bias and Foreign Portfolio Share in 2008

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Total Change in Home Bias i,j				Total Change in US Home Bias				Total Change in US FPS Q4			
Target Max Volatility t	-0.99**	-1.01*	-0.94*	-0.95*	-0.18	-0.37	-0.54	-0.57	0.00	-0.00	-0.00	-0.00
	(0.499)	(0.521)	(0.518)	(0.526)	(0.783)	(0.916)	(0.928)	(0.895)	(0.004)	(0.004)	(0.004)	(0.004)
Δ Corretlation t (36 Month)		1.32	0.83	0.85		4.29	5.16	5.24		0.05	0.03	-0.00
		(2.917)	(2.921)	(2.982)		(5.822)	(5.821)	(6.017)		(0.055)	(0.069)	(0.094)
Δ Target Volatility t (36 Month)			-0.04	-0.03			0.06	0.06			0.00	0.00
			(0.033)	(0.033)			(0.071)	(0.078)			(0.001)	(0.001)
Target Market Global Weight t				0.01				0.07				-0.01
				(0.063)				(0.447)				(0.013)
Home Bias $t-1$	-2.27	-2.30	-2.38	-2.39	-6.35	-6.53	-6.82	-6.72	-0.02	-0.02	-0.01	0.01
	(3.363)	(3.322)	(3.343)	(3.311)	(6.407)	(6.479)	(6.924)	(6.699)	(0.054)	(0.054)	(0.055)	(0.053)
Passive Δ Home Bias i,j	0.43***	0.43***	0.43***	0.43***	0.29**	0.28*	0.28*	0.28*				
	(0.067)	(0.068)	(0.068)	(0.067)	(0.143)	(0.164)	(0.165)	(0.159)				
Passive Δ US FPS									0.84***	0.85***	0.87***	1.03***
									(0.282)	(0.291)	(0.288)	(0.309)
Constant	3.15	2.96	3.74	3.72	3.59	3.31	2.34	2.24	-0.00	-0.01	-0.01	0.00
	(3.067)	(3.003)	(2.929)	(3.056)	(3.821)	(3.717)	(4.464)	(4.476)	(0.016)	(0.017)	(0.020)	(0.019)
Observations	1,267	1,267	1,267	1,267	44	44	44	44	44	44	44	44
No of Countries	42	42	42	42	44	44	44	44	44	44	44	44
Cluster	Home	Home	Home	Home	.	.	.	.	.	.	.	.
Adjusted R-squared	0.190	0.190	0.189	0.189	0.081	0.072	0.063	0.039	0.573	0.564	0.557	0.571

Table 7. Familiarity and Changes in the Foreign Portfolio Share in 2008

This table presents cross sectional OLS regressions of reductions in the foreign portfolio share on proxies for information asymmetry in 2008. Changes in the foreign portfolio share are measured with changes in the home bias of home country i towards target country j, U.S. investors total change in the home bias in 2008 and quarterly total change in the U.S. foreign portfolio share in the fourth quarter of 2008.The cross section contains country-level year-end multilateral holdings from the CPIS sample for 2008 and the Bertaut and Tryon (2007) sample for U.S. investors in the fourth quarter of 2008. *Portfolio Weight Growth* is the log difference of the weight of a target country in a home country's equity portfolio in 2001 and 2007. All other variables are previously defined. All standard errors are bootstrapped and presented in paranthesis. For home bias at the country-portfolio level, standard errors are clustered by home country and bootstrapped within each cluster. *, **, *** indicate the statistical significance at the 10%, 5%, and 1% level, respectively.

Portfolio Weight Growth and Changes in the Home Bias and Foreign Portfolio Share in 2008

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Total Change in Home Bias i,j				Total Change in US Home Bias				Total Change in US FPS Q4			
Portfolio Weight Growth (2001-07)	0.56	0.44	0.44	0.22	2.00*	2.62**	2.73**	2.67**	0.00	0.01	0.01	0.02*
	(0.621)	(0.589)	(0.567)	(0.518)	(1.029)	(1.295)	(1.256)	(1.294)	(0.008)	(0.008)	(0.009)	(0.011)
Passive Δ Home Bias i,j	0.44***	0.43***	0.43***	0.40***	0.31**	0.42**	0.43**	0.45*				
	(0.073)	(0.069)	(0.069)	(0.082)	(0.146)	(0.194)	(0.207)	(0.230)				
Passive Δ US FPS									0.84***	0.63***	0.75***	0.49
									(0.264)	(0.213)	(0.210)	(0.310)
Home Bias i,j t-1	-2.18	-5.88**	-5.88**	-5.37*	-10.46*	-9.81	-10.53	-11.90*	-0.02	-0.03	-0.02	-0.03
	(3.390)	(2.901)	(2.837)	(2.842)	(6.070)	(6.393)	(6.868)	(7.197)	(0.059)	(0.054)	(0.053)	(0.054)
Geographic Distance						-0.08	-0.12	0.12		-0.04**	-0.04*	-0.04**
						(2.446)	(2.458)	(2.975)		(0.021)	(0.021)	(0.020)
Share Region		-5.34**	-5.33**	-4.63**								
		(2.359)	(2.380)	(2.350)								
Share Language		-14.14	-14.15	-13.94		1.33	1.68	1.06		0.09	0.09	0.10
		(10.099)	(10.154)	(10.254)		(3.976)	(4.100)	(5.542)		(0.063)	(0.063)	(0.068)
Share Religion		-3.94*	-3.94**	-3.59*		3.95	3.94	4.40		0.00	0.00	-0.02
		(2.014)	(1.987)	(1.876)		(3.815)	(3.808)	(4.454)		(0.020)	(0.019)	(0.029)
Target Market Global Weight t			0.00	-0.03			-0.23	-0.02			-0.01	-0.01
			(0.078)	(0.058)			(0.459)	(0.674)			(0.009)	(0.008)
Target Turnover				2.03				-1.97				0.01
				(1.745)				(2.921)				(0.018)
Passive Δ HB i,j *Target Turnover				0.28***				-0.13				
				(0.057)				(0.472)				
Passive Δ US FPS*Target Turnover												0.44
												(0.547)
Constant	-1.76	1.73**	1.72**	1.74**	0.40	-0.24	0.31	-2.14	-0.00	0.36*	0.31*	0.35**
	(1.383)	(0.787)	(0.848)	(0.883)	(1.512)	(21.172)	(21.238)	(26.380)	(0.011)	(0.182)	(0.182)	(0.174)
Observations	1,166	1,166	1,166	1,166	44	44	44	44	44	44	44	44
No of Countries	39	39	39	39	44	44	44	44	44	44	44	44
Cluster	Home	Home	Home	Home	.	.	.	.	.	.	.	.
Adjusted R-squared	0.192	0.220	0.219	0.239	0.141	0.169	0.154	0.118	0.574	0.712	0.715	0.758