Use of the CPIS for economic and financial analysis: Research at the Federal Reserve Board

Carol Bertaut
Board of Governors of the
Federal Reserve System

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Research using details of U.S. asset survey (U.S. contribution to CPIS)

- Studies using the detailed security-by-security information from the U.S. asset surveys to explore factors that determine U.S. portfolio behavior
  - Ahearne, Griever, Warnock (2004): foreign firms reduce information costs by publicly listing equity in the United States
  - Edison and Warnock (2004): U.S. holdings of emerging market equities are dominated by securities of large firms with fewer ownership restrictions and that are cross-listed o U.S. exchanges

Research using full CPIS (not only U.S. contribution)

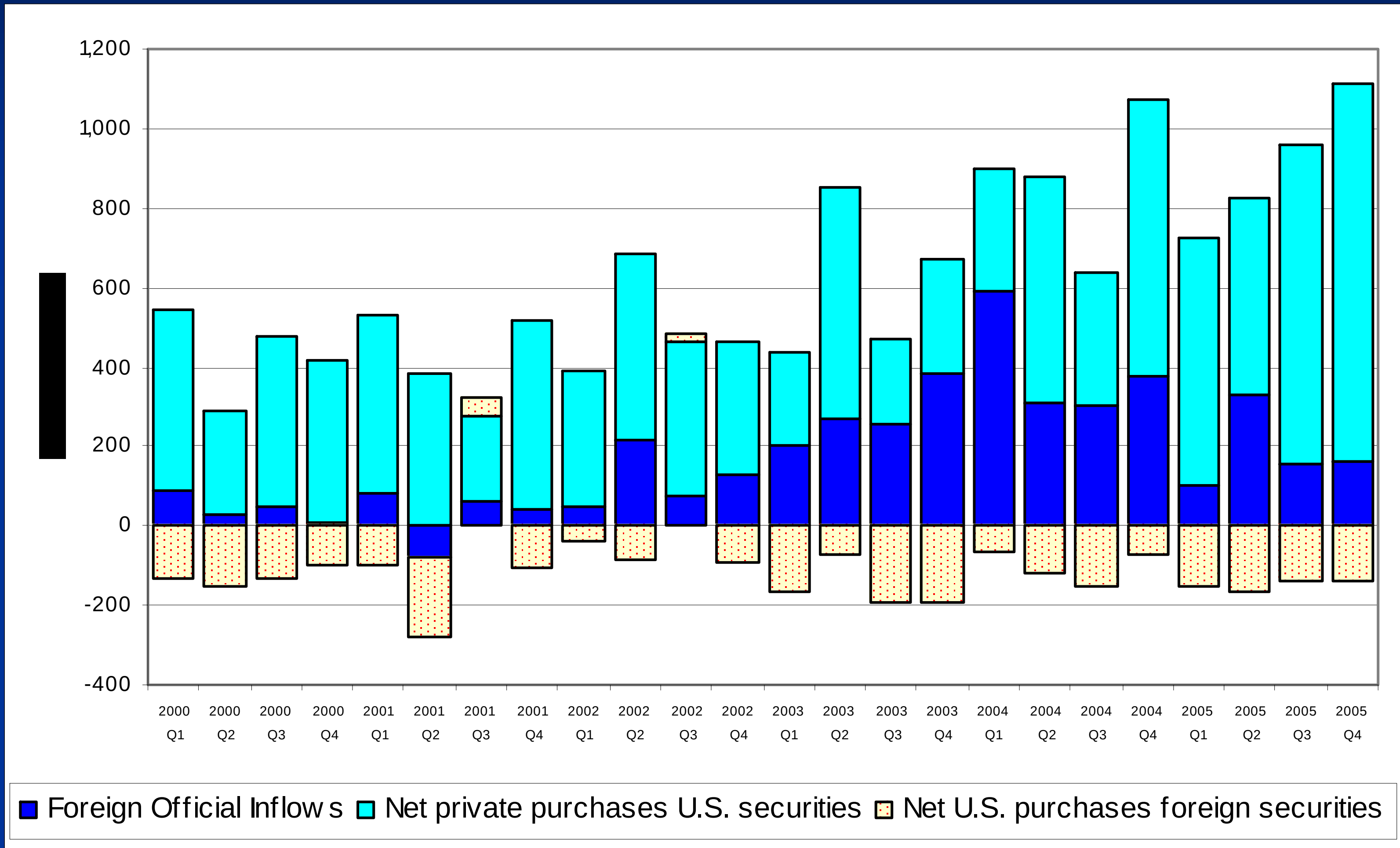
- Using the CPIS surveys: don't have access to detailed security-by-security information such as underlies the U.S. asset survey
  - data are available only by broad asset type (equity, debt) and by country
- But has advantage that CPIS covers a large number of investor countries
- Now have several years worth of comparable data
- Allows us to ask questions about global investors and global portfolios

Questions of interest to U.S. analysts and policy makers

- Financing record U.S. current account deficits requires record financial account inflows
- Raises question of the willingness of foreigner investors to continue to acquire U.S. assets

Selected U.S. Cross-Border Financial Flows

(annual rate)



Source: U.S. Department of Commerce and TIC data

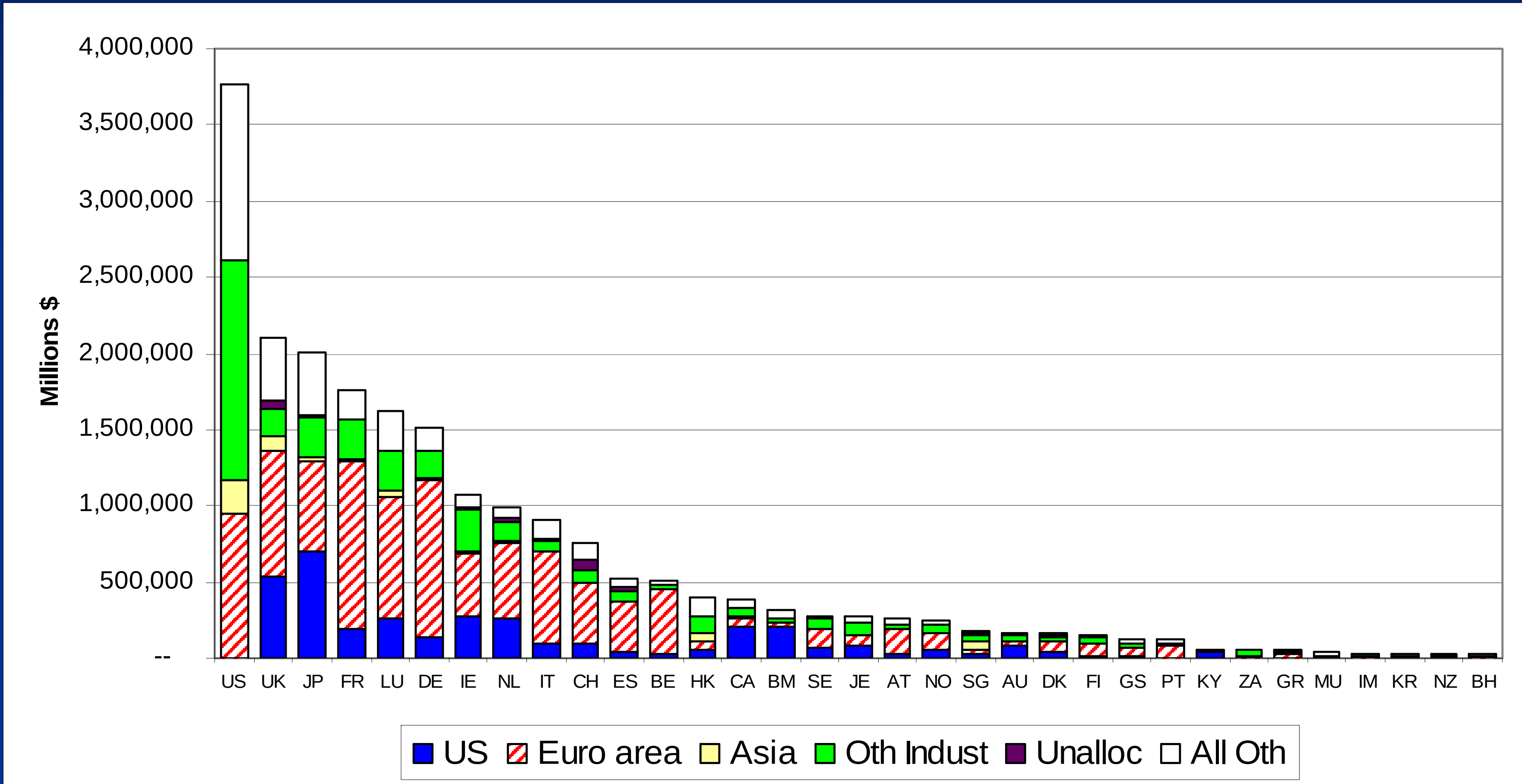
Assessing willingness of foreigners to continue to acquire U.S. assets

- Key factor is development of foreign financial markets
  - Increasing wealth abroad increases pool of funds available for investment in U.S. assets
  - Increased financial integration makes it easier for foreigners to acquire them
  - But on other hand: increased securitization abroad means growing pool of attractive alternatives to U.S. assets

How can we put foreign acquisitions of U.S. securities into perspective?

- Need information on full securities portfolio of foreign investors
  - Need information on other foreign assets held by international investors: CPIS asset surveys
  - How large are holdings of U.S. securities relative to other foreign securities in foreign portfolios?

Cross-border securities holdings: 2004 CPIS
(preliminary results)



But we also need information on holdings of domestic securities

- How large are holdings of U.S. (and other foreign) securities relative to *total* foreign portfolio?
  - Large holdings (in dollar terms) of foreign securities may not be large relative to holdings of domestic securities
    - Construct estimates of holdings of domestic securities from national financial balance sheet/flow of funds accounts, where available
    - Construct proxies using estimates of market capitalization and individual country IIP data on foreign holdings of domestic securities where balance sheet data are not available

Defining portfolio shares

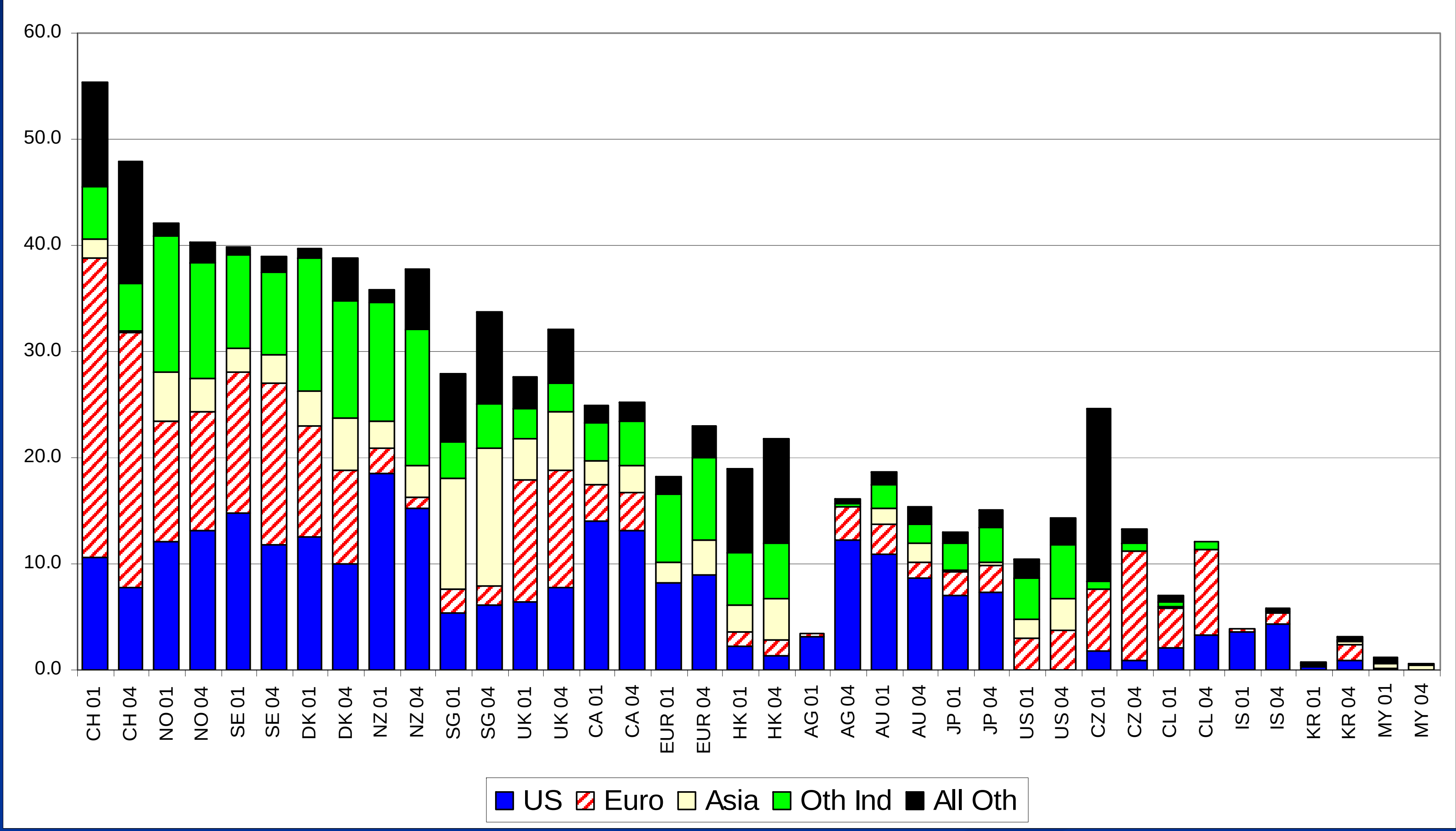
- Define share of country X's portfolio held in country Y securities (equities) as:

$$Share_X^Y = \frac{X's\, holdings\, of\, Y\, equities}{X's\, total\, equity\, portfolio}$$

Where total equity portfolio consists of holdings of foreign + domestic equity

Construct these shares for 2001, 2001, 2003, 2004

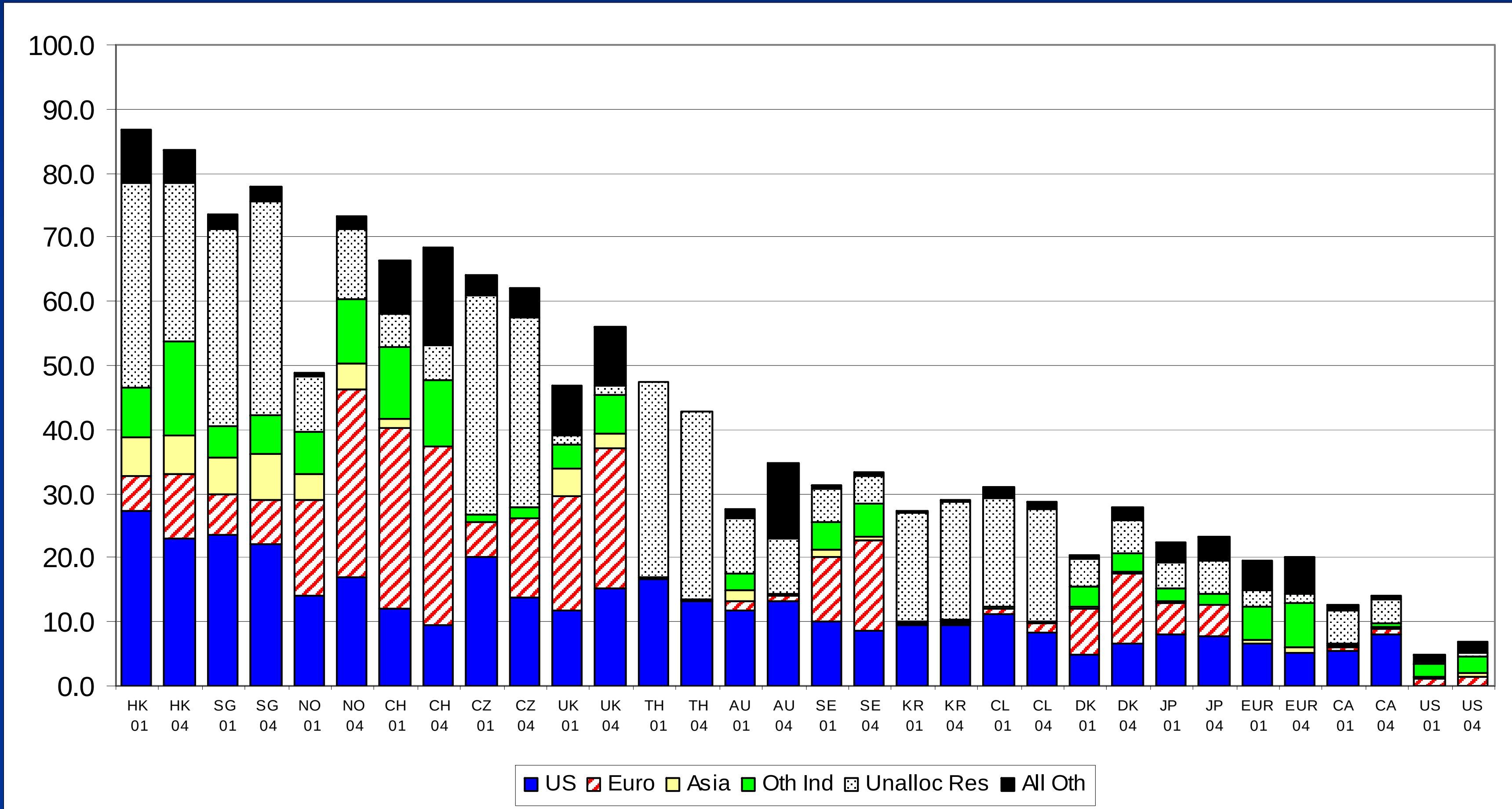
Portfolio shares in foreign equity: 2001 and 2004



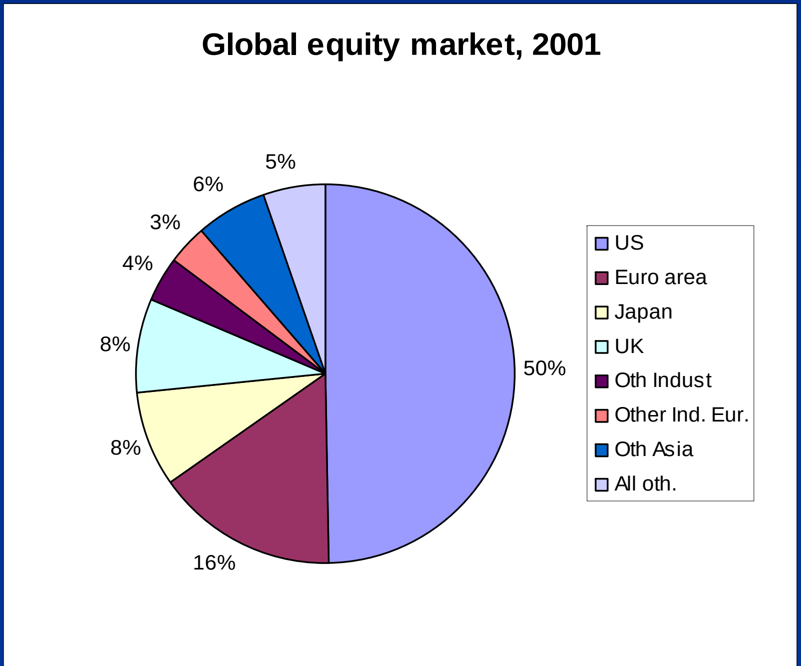
For securities portfolio in long-term debt: include estimates of reserve holdings

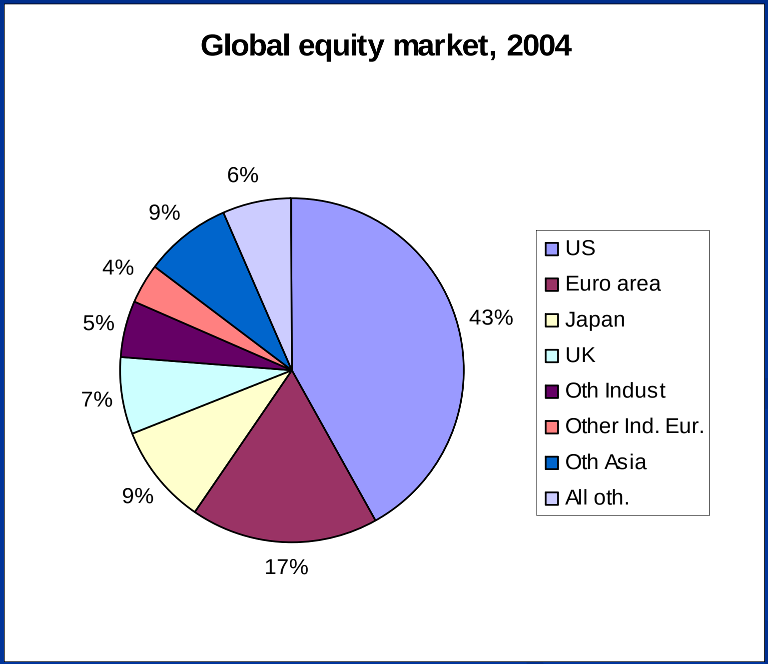
- CPIS is non-reserve holdings only
- But reserve holdings can be a large part of foreign holdings, especially for debt securities
- We use IMF data on total reserve holdings and estimates of share of reserves in dollars
  - We compare these dollar reserve estimates to internal data on foreign official holdings of U.S. long-term debt securities
- As we did for equity shares, we calculate the share of the total portfolio for each country X that is held in bonds issued by foreign country Y
- Compute shares for both foreign private bond portfolios and bond portfolios including reserve holdings

Portfolio shares in foreign bonds, including reserve holdings: 2001 and 2004



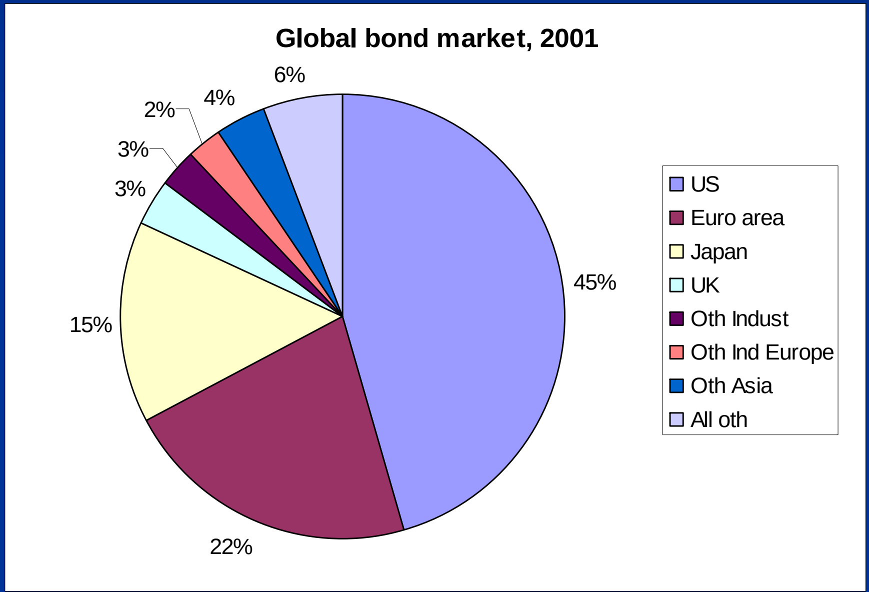
Compare portfolio allocations relative to market size: global equity markets

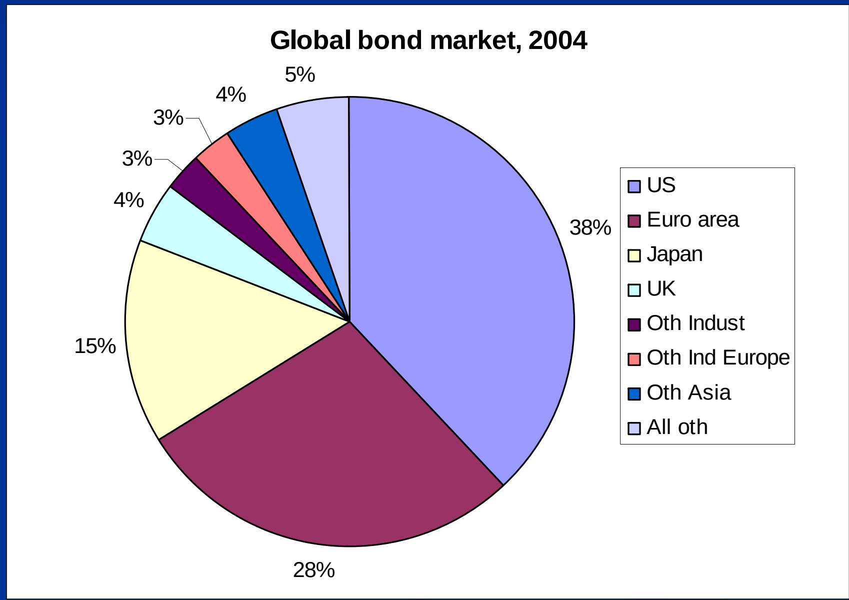




Source: S&P Global Stock Markets Factbook

Compare portfolio allocations relative to market size: global bond markets





Source: BIS international financial statistics

Compare actual portfolio shares to ICAPM benchmark portfolio

ICAPM benchmark portfolio: hold securities of country Y in proportion to Y's share in the global market.

For example, country X's shares in U.S. equity relative to ICAPM benchmark equity portfolio:

$$X\text{'s relative weight in U.S. equities} = \frac{S_x^{U.S.}}{\dfrac{U.S.\ Market\ Cap}{Global\ Market\ Cap}}$$

A relative portfolio weight = 1 implies a portfolio share that is equal to the benchmark portfolio share

A weight < 1 implies an underweight relative to the benchmark portfolio

A weight > 1 implies an overweight relative to the benchmark portfolio

Comparing country X's total foreign portfolio shares to the ICAPM benchmark portfolio

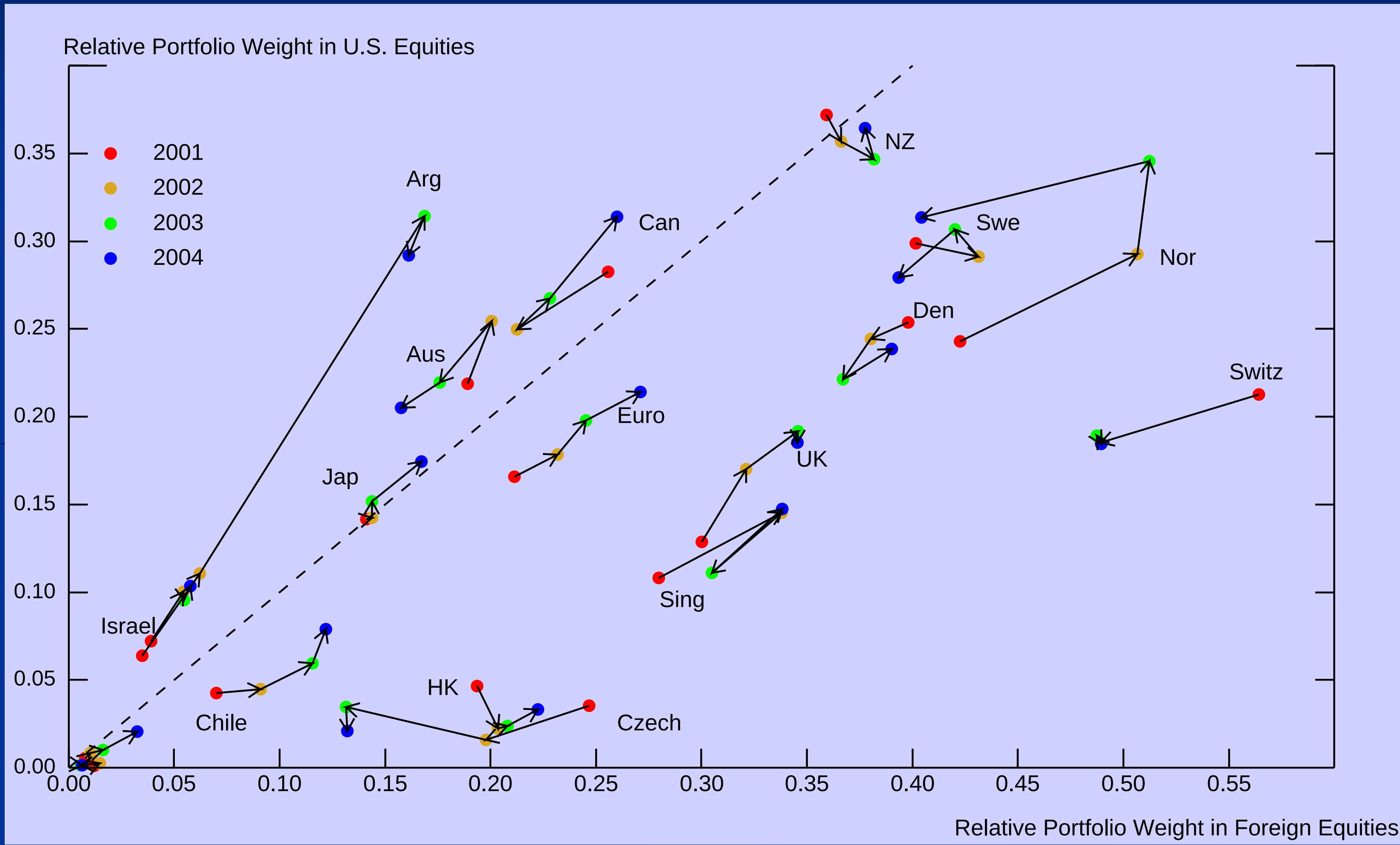
Country X's shares in all foreign equity relative to ICAPM benchmark:

$$X's\ relative\ weight\ in\ all\ foreign\ equities = \frac{S_x^{total\ foreign}}{\dfrac{Foreign\ Market\ Cap}{Global\ Market\ Cap}}$$

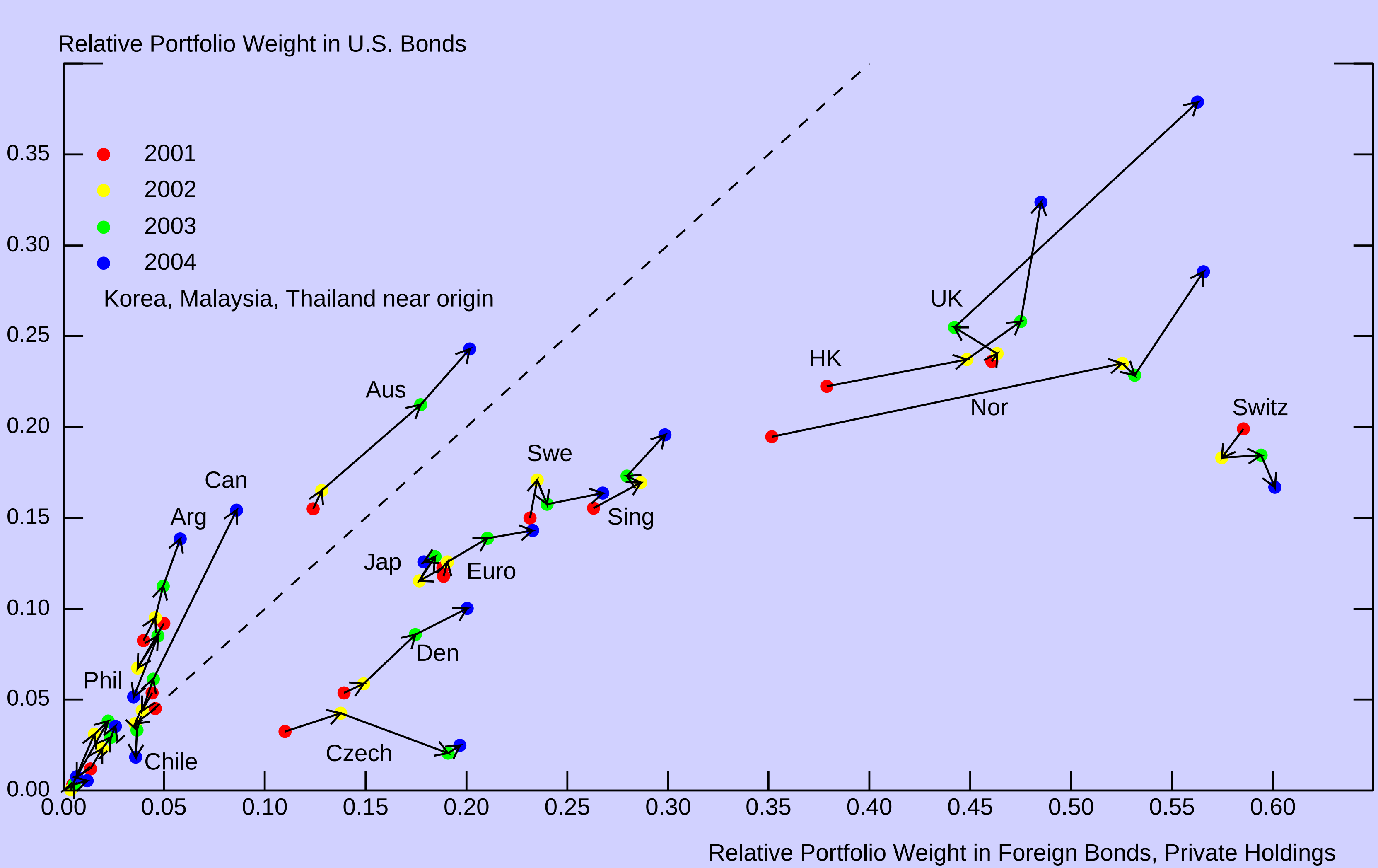
A relative portfolio weight = 1 implies portfolio share in foreign equity that is equal to the benchmark portfolio share

A weight < 1 implies an underweight relative to the benchmark portfolio ("Home Bias")

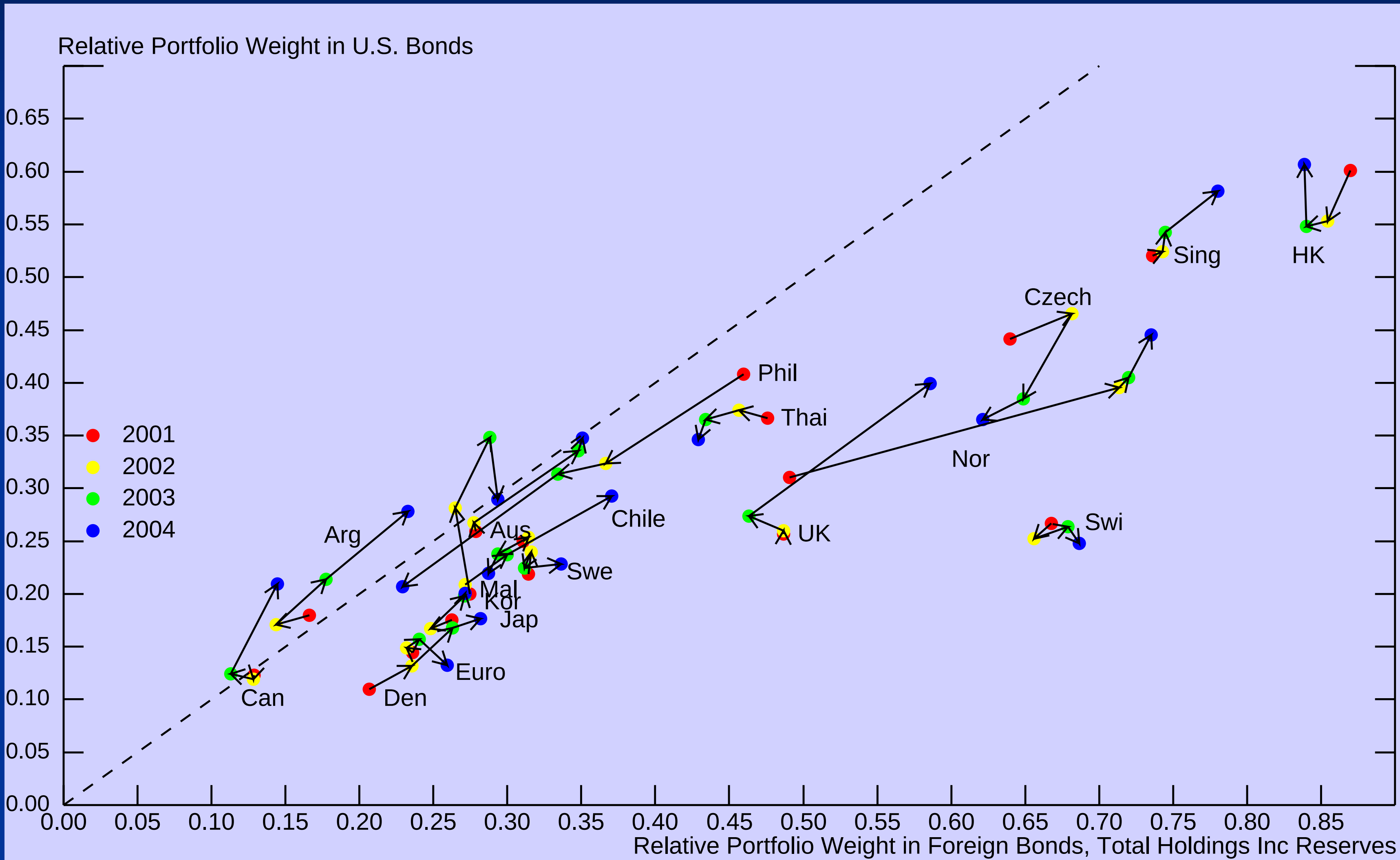
Changes in relative equity portfolio weights



Changes in relative bond portfolio weights (private holdings)



Changes in relative bond portfolio weights
(including reserve holdings)



Summary:

- All countries have home bias (foreign portfolio weights in equities and bonds are less than 1)
- Most countries are more underweight in U.S. securities than they are in foreign securities in general (most points lie below the 45 degree line)
- Generally movement over 2001-2004 period to increase both total foreign and U.S. exposure
  - Relative increases appear to be about the same
- Adding in reserve holdings increases weights in both U.S. and total foreign bonds
- Overall: suggests that there is room in foreign portfolios to continue to acquire U.S. assets

Research into explaining underweights and overweights for equity holdings

- Bertaut and Kole (2004, revised 2006):

  What makes investors over or underweight? Explaining international appetites for foreign equities
- Framework of analysis: construct relative equity portfolio weights for:
  - 29 investor countries from the 2003 CPIS
  - for investment in roughly 50 destination countries
- Panel tobit analysis to explore factors contributing to relative portfolio weights for county X in destination Y
- Explanatory variables include trade, proximity, common language, measures of market depth, market return, country credit risk, accounting standards, and proxies for information costs

Bertaut-Kole Main Results

- Trade, proximity, common language, proxies for information and credit standards are all statistically and economically significant in explaining equity portfolio weights across countries
- All countries we observe demonstrate home bias, but investors in some countries are actually overweight in equities of other destinations
  - Euro area countries overweight equity of other euro area countries
  - Nordic countries overweight equity of other Nordic countries
- Confirm that most countries we observe are more underweight in U.S. equities than in foreign equities in general
  - Result is somewhat surprising, given common perception of US as desirable investment destination because of well-developed legal and regulatory framework

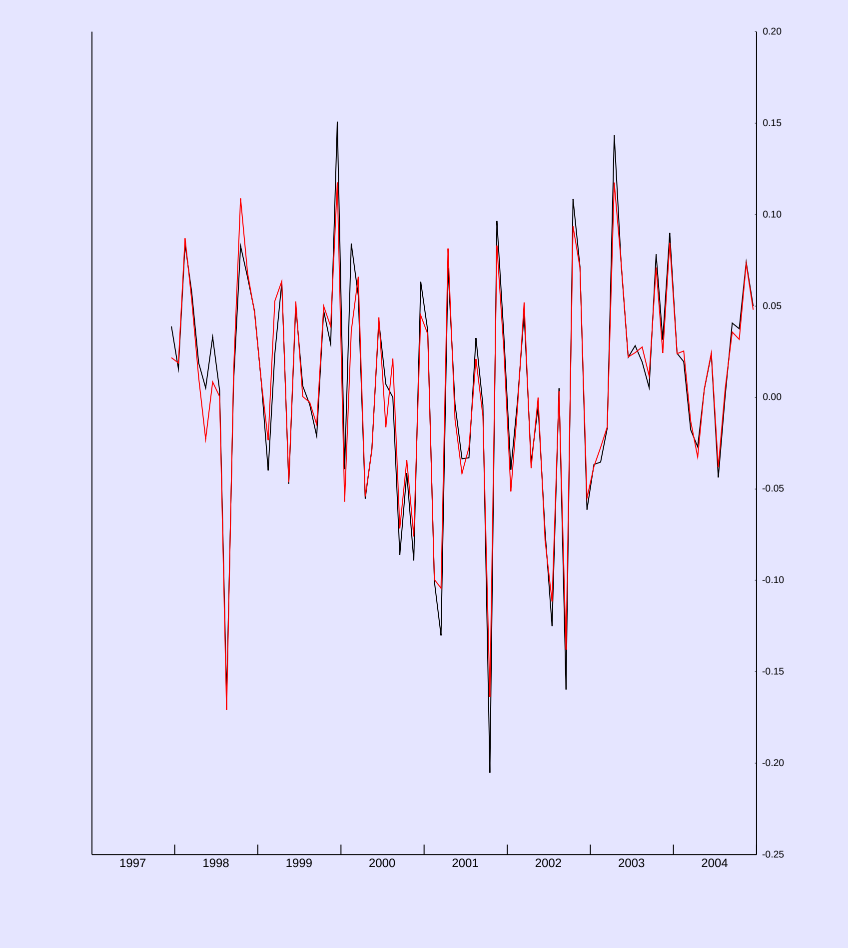
Bertaut-Kole Main Results cont'd

- Why do foreign investors underweight U.S. equities more than foreign equity in general?
- And why do some countries overweight investment in other regions?
  - Positive features of U.S. equity market (liquidity, credit risk, legal framework) matter for explaining U.S. investor portfolios, but do not seem to give U.S. equity an edge in foreign portfolios
  - Instead, we find strong preferences for equity of nearby countries and major trading partners, and among countries that share a common language
  - Advantages of U.S. market does not appear to be enough to overcome perceived or actual informational advantages about "nearby" markets

Ongoing research using CPIS

- Thomas, Warnock, Wonsong (2004): The Performance of International Equity Portfolios
  - Using estimates derived from U.S. asset survey and monthly transactions data, found that U.S. investors' foreign portfolios outperformed a global benchmark portfolio
- What can we learn about foreign investors' portfolio returns?
- Calculate country-specific equity portfolio returns using shares derived from various "waves" of the CPIS
- Compare performance of these foreign portfolios against MSCI global benchmark portfolio

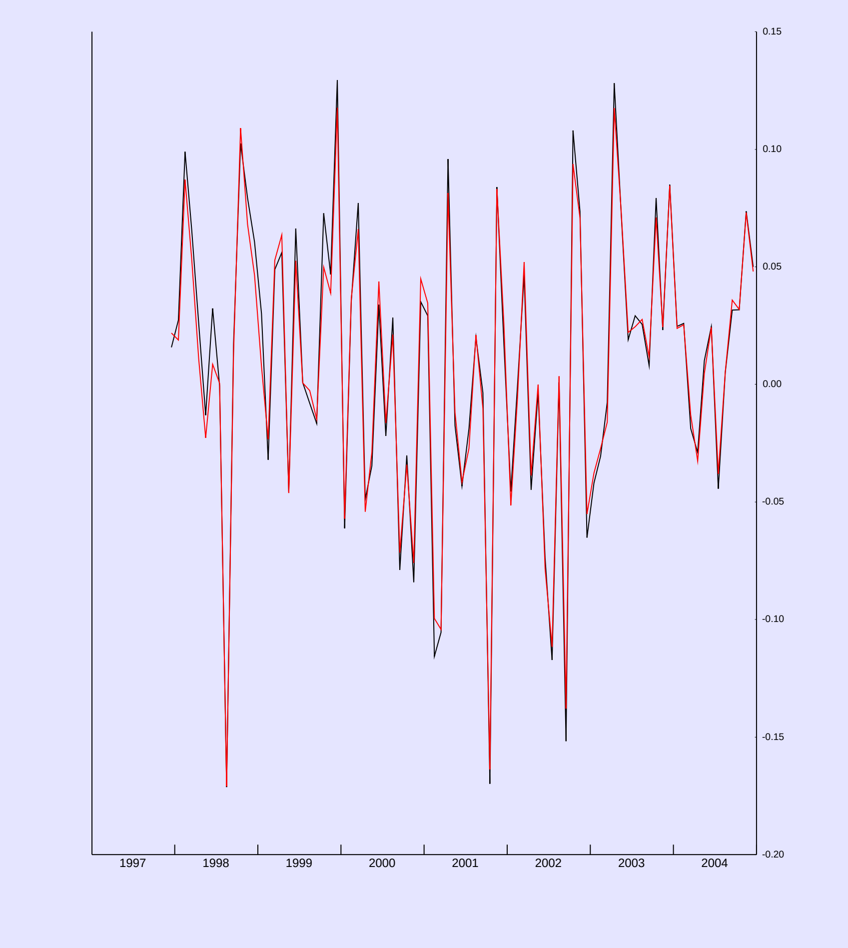
(Very preliminary) Comparing foreign portfolio performance: Austria equity portfolio (black) vs MSCI (red) global index, 1997 - 2004



Austria	
Mean return	.0065
Std Dev	.0644
Sharpe ratio	.1016
MSCI	
Mean return	.0060
Std Dev	.0593
Sharpe ratio	.1011

Austria: greater shares allocated to other Euro area, emerging market Europe

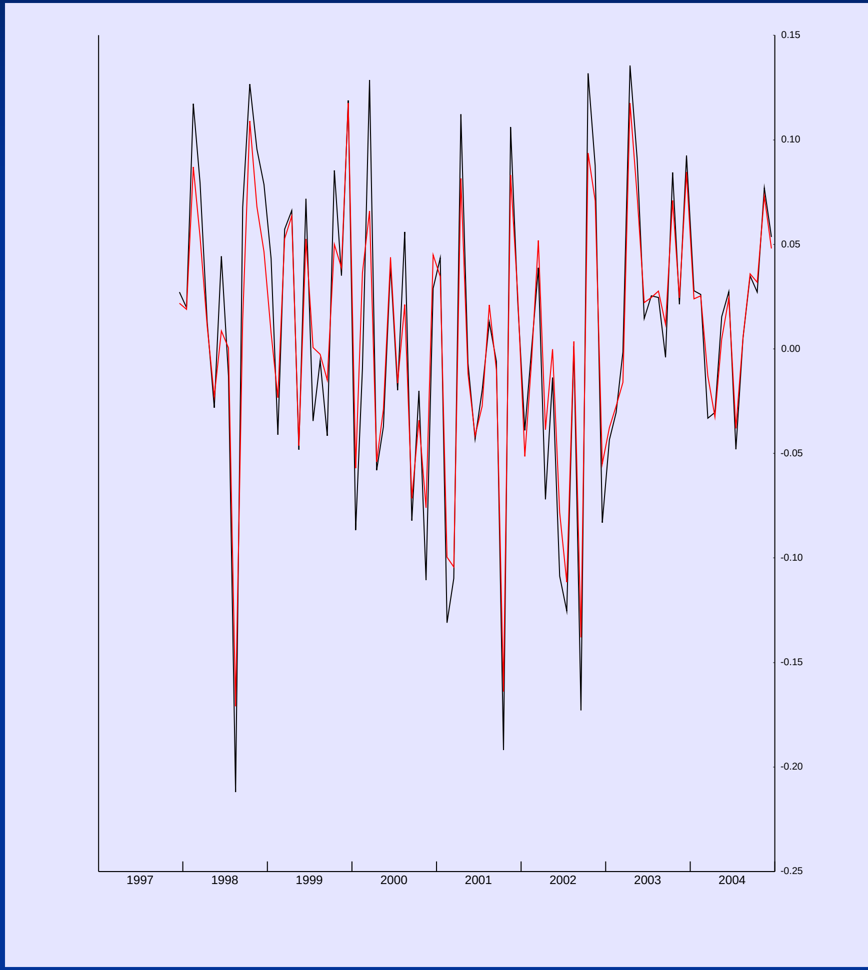
(Very preliminary) Comparing foreign portfolio performance: Norway equity portfolio (black) vs MSCI (red) global index, 1997 - 2004



Norway	
Mean return	.0072
Std Dev	.0629
Sharpe ratio	.1150
MSCI	
Mean return	.0060
Std Dev	.0593
Sharpe ratio	.1011

Norway: greater shares allocated to Euro area, other Nordic

(Very preliminary) Comparing foreign portfolio performance: Japan equity portfolio (black) vs MSCI (red) global index, 1997 - 2004



Japan	
Mean return	.0068
Std Dev	.0737
Sharpe ratio	.0923
MSCI	
Mean return	.0060
Std Dev	.0593
Sharpe ratio	.1011

Japan: smaller shares in European emerging markets; larger shares in Asian emerging markets

Concluding remarks

- CPIS is a remarkable resource for exploring questions of global portfolio allocations
- Provides the cross-country detail necessary to compare allocations in U.S. and foreign securities
- Annual data allows us to ask questions about how portfolio allocations are changing over time
- Research community has only begun to realize the wealth of information CPIS provides
- Conferences such as this that bring together compilers and analysts should be useful in promoting what the CPIS has to offer