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U.S. International Equity Investment and Past and Prospective Returns

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Outline

- I. Overview
- II. Existing Studies
- III. Data Description
- IV. Empirical Results
- V. Conclusions



I. Overview

- This paper revisits some well-known stylized facts on the behavior of U.S. investors in international equity markets.
- Stylized Fact 1: U.S. investors exhibit return chasing behavior.
- Stylized Fact 2: U.S. investors do not rebalance their international portfolios.
- Stylized Fact 3: U.S. investors have information disadvantage when they invest abroad.
- These documented stylized facts are based on flows data, the best available data at that point. **But flows data are not appropriate to characterize portfolio reallocation behavior.**



I. Overview (cont.)

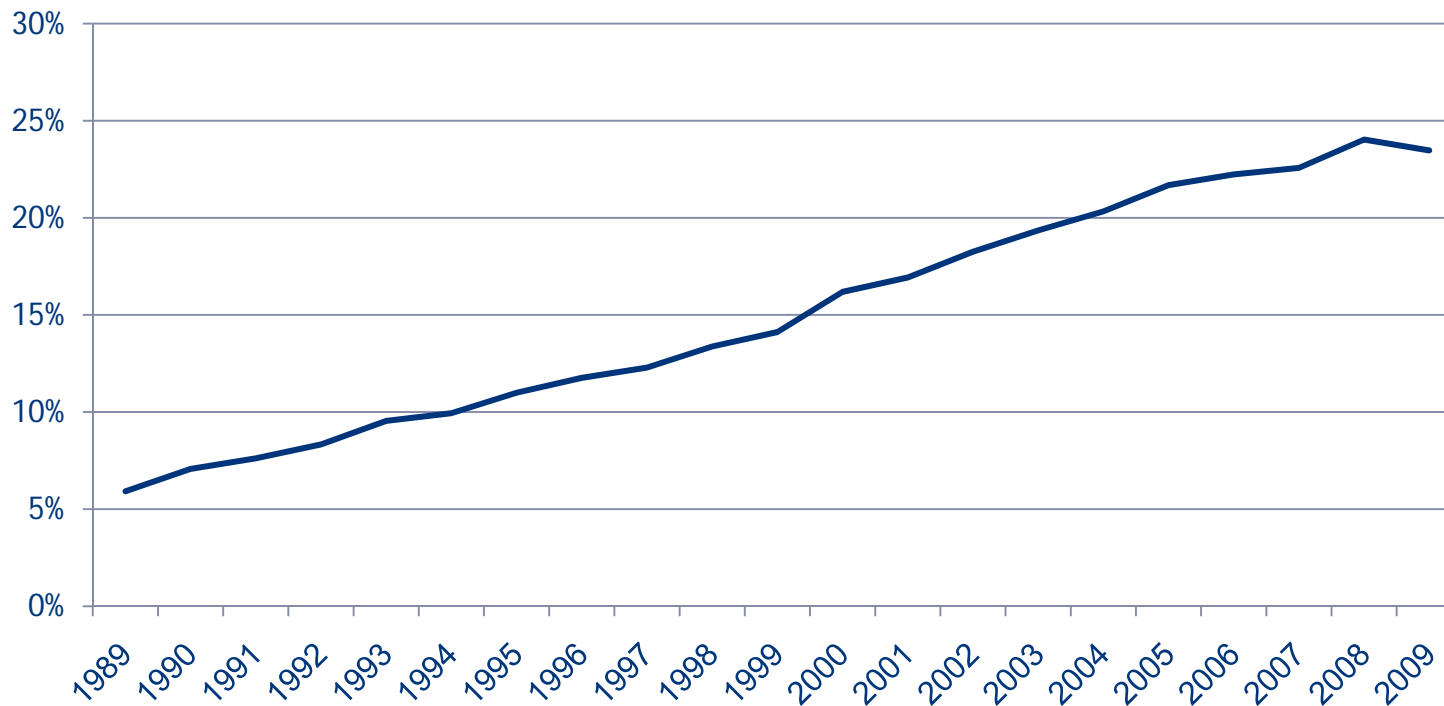
- We revisit these stylized facts using:
 - New dataset (portfolio holdings as opposed to flows)
 - New analysis technique (portfolio holdings-based as opposed to flows-based)
- We find almost exactly the opposite results.
 - Implications on policy recommendation
 - Implications on academic research



Motivation ... From the Practical to the Theoretical

- Cross-border equity investment has become more important.

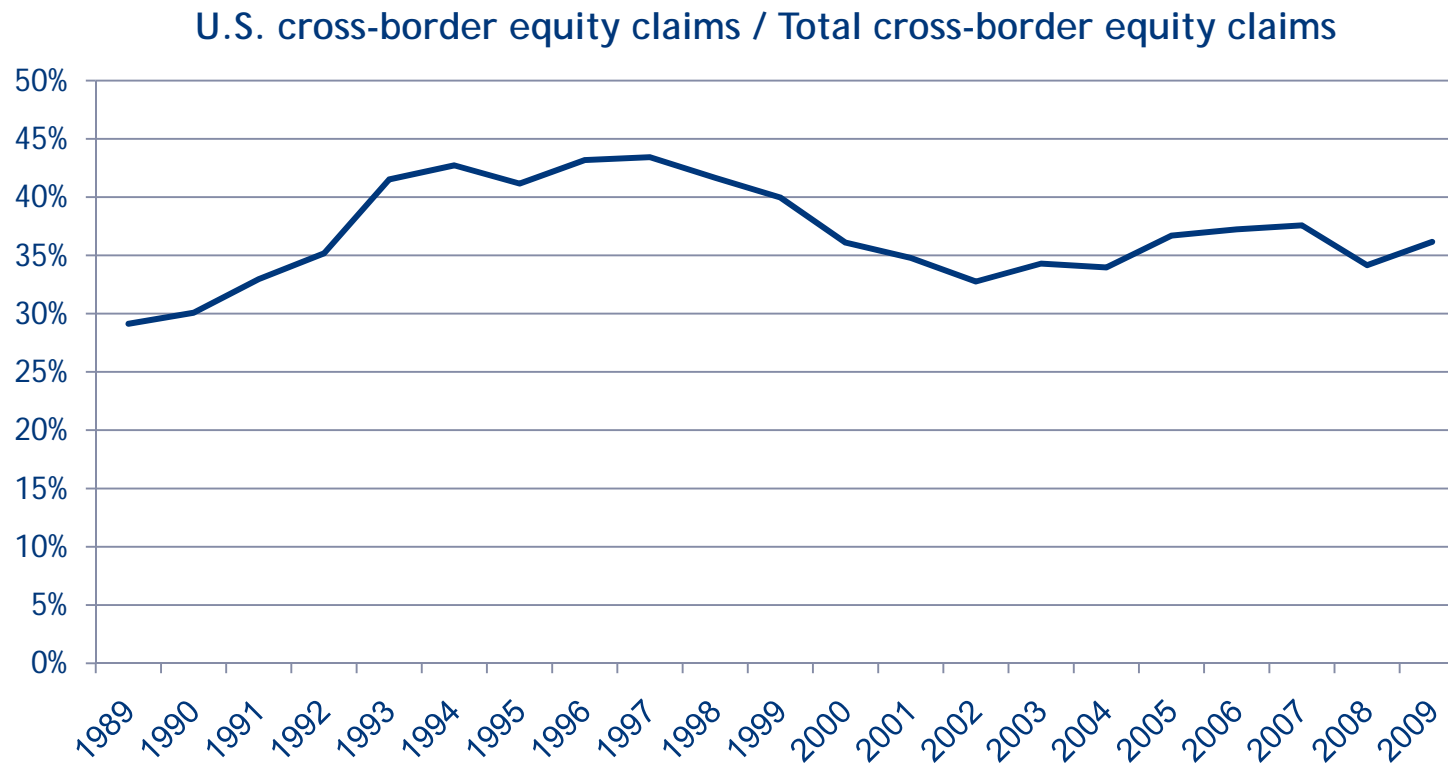
Cross-border equity claims / World market capitalization





Motivation (cont.)

- U.S. investors are a major participant.





Motivation (cont.)

- Several policy initiatives were derived from these stylized facts.
- Increased prevalence of theoretical international macro models that incorporate international portfolio choice
 - Example: Devereux and Sutherland (2008 NBER, 2010 JIE); Tille and van Wincoop (2008 NBER, 2010 JIE); Hnatkowska (2010 JIE)
- Some theoretical models designed to explicitly incorporate some stylized facts about the relationship between US foreign investments and returns.
 - Example: Guidolin (2005 RIE); Albuquerque, Bauer and Schneider (2007 RES); Dumas, Lewis, and Osambela (2010 WP)



II. Existing Studies

Bohn and Tesar (1996 AER; BT) and Brennan and Cao (1997 JF; BC) are two seminal papers that examine the relationship between U.S. investors' portfolio reallocations and returns.

Stylized Fact 1: U.S. investors exhibit return chasing behavior.

- Test: Correlation of portfolio flows and past returns
- Interpretation: Positive correlation is consistent with a return chasing behavior.
- Evidence: Positive correlation between portfolio flows and past returns



II. Existing Studies (cont.)

Stylized Fact 2: U.S. investors do not rebalance their foreign portfolios.

- Test: Correlation of portfolio flows and current returns (in excess of the rest of the portfolio's returns)
- Interpretation: Negative correlation is consistent with portfolio rebalancing.
- Evidence: Positive correlation between portfolio flows and current returns

Stylized Fact 3: U.S. investors have information disadvantage when they invest abroad.

- Test: Correlation of portfolio flows and current returns
- Interpretation: If foreigners have an information disadvantage relative to domestic investors, foreigners will tend to purchase domestic equities when the return is high.
- Evidence: Positive correlation between portfolio flows and current returns



Issues with Existing Studies

While the theories in BT and BC are explicitly about portfolio adjustments, **portfolio holdings data were not available** so they used flow data.

1. Real Issues

Flows data are not well-suited to character portfolio reallocations because

- Can not control for the wealth effect
- Can have quality issues (Financial Center Bias)
 - Capital flows data capture the countries through which U.S. residents purchase and sell foreign securities with, but not the residence of the issuer of foreign securities.

2. Perception Issue

- Stylized facts are robust to the sample period.



Example of Flows, Holdings, and Past Returns

- Period 1: Initial investment

Period 1		
Country	Holdings Value	Weight
A	\$300	75%
B	\$100	25%

- Period 2: Suppose we have a wealth increase of \$320 and allocate it equally across the two countries

Period 2					
Country	Return (1->2)	Holdings Value: Valuation Effect	New Flows	Total Holdings Value	Weight
A	20%	$\$300 \times (1+0.2) = \360	\$160	\$520	65%
B	20%	$\$100 \times (1+0.2) = \120	\$160	\$280	35%

- We find a positive correlation between flows and past returns.
- We find no correlation between changes in portfolio weights and past returns.



III. Data Description

1. Portfolio Holdings

- U.S. investors' country-level foreign equity holdings in 43 countries from January 1990 through December 2008 (monthly frequency).
- Portfolio holdings can not be directly infer from flows data because of the "Financial Center Bias" in the capital flows data.

To correct for the Financial Center Bias, we use:

- Infrequent comprehensive (security-level) surveys of cross-border holdings as fixed points.
- To interpolate positions between survey dates, we use monthly capital flows data (TIC) and country price returns.



Estimating Portfolio Holdings Data

- Form naïve holdings estimates

$$nh_t = nh_{t-1}(1 + r_t) + gp_t - gs_t$$

- Doing so will result in a “gap” at time T of a benchmark

$$gap_T = bh_T - nh_T$$

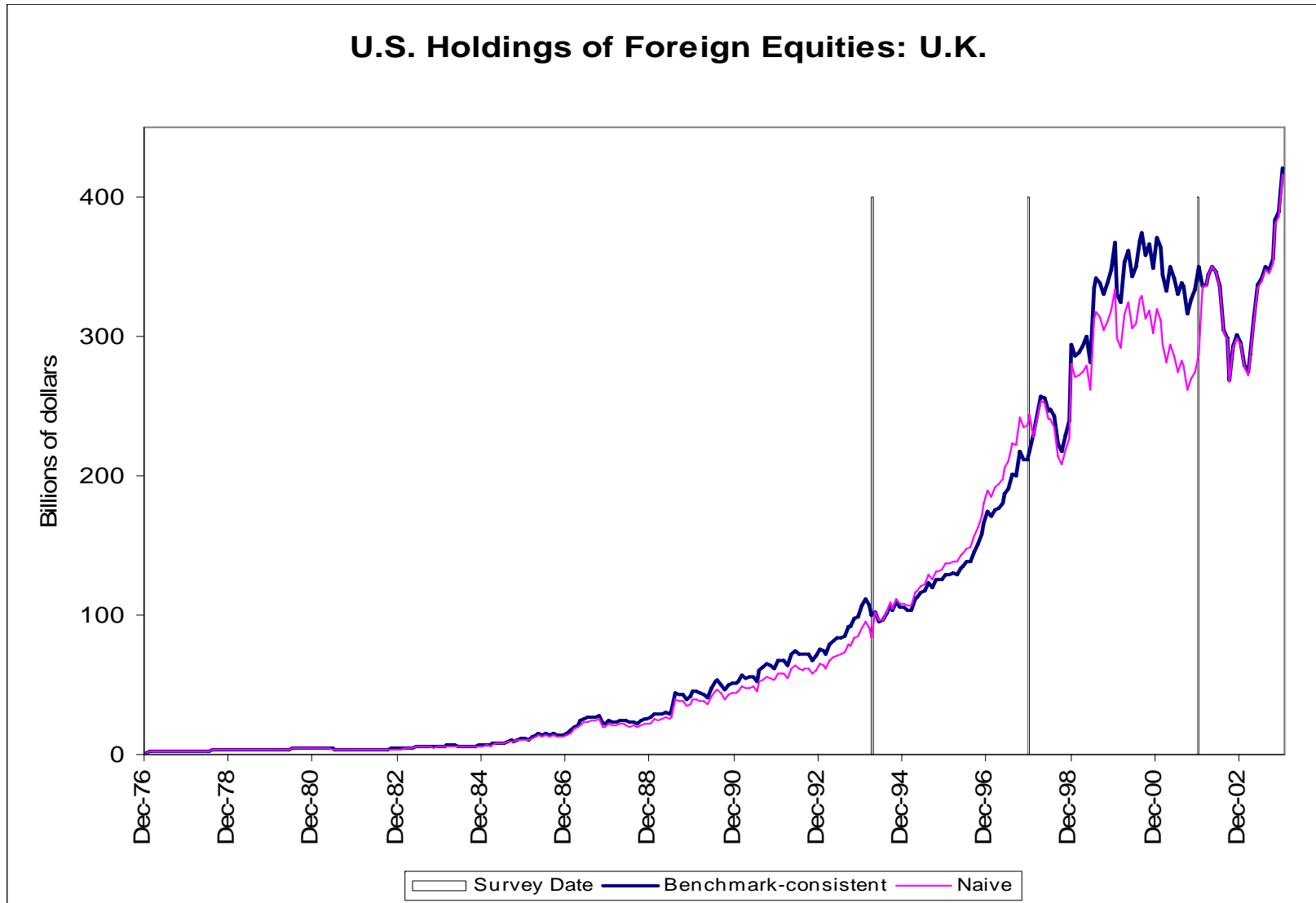
- Solve for an adjustment factor (*adj*) such that at T estimated holdings (*h*) = benchmark holdings (*bh*)

$$h_t = h_{t-1}(1 + r_t) + gp_t - gs_t + (gap_T \times adj_t)$$

- This methodology is originally implemented in Thomas, Warnock, and Wongswan (2004 IFDP) and improved upon and updated by Bertaut and Tryon (2007 IFDP).



U.S. Holdings of Foreign Equities: U.K.





III. Data Description (cont.)

2. Country Returns

We use MSCI country-level total return index for each country.

- Assume that U.S. investors' holdings composition within each country is similar to that of MSCI country index.
 - At the end of 1997, the cross-sectional correlation between firm-weights in the MSCI world (excluding the U.S.) and firm-weights in U.S. investors' international portfolios is 0.77.
- Adjust for the share outstanding availability for the public (float adjustment).
- Adjust for foreign ownership restrictions.



IV. Empirical Results

We apply well-established techniques from the finance literature to revisit the three stylized facts for U.S. investors' international equity portfolio.

1. Charactering U.S. investors' portfolio reallocation behavior

- The Lag Momentum (LM) measure of Grinblatt, Titman, and Wermers (1995 AER) to measure portfolio reallocations and past returns

2. Charactering U.S. investors' portfolio performance

- The Conditional Weight Measure (CWM) of Eckbo and Smith (1998 JF) and Ferson and Khang (2002 JFE) to measure conditional portfolio performance
- The unconditional Sharpe Ratio to measure average performance



1. Portfolio Reallocations and Past Returns

- Goal: Measure the relationship between portfolio reallocations and past returns.
- Momentum behavior: Actively reallocate more (less) investment into the country that has relatively higher (lower) past return.
- Contrarian behavior: Actively reallocate more (less) investment into the country that has relatively lower (higher) past return.
- We use Lag Momentum (LM) measure of Grinblatt, Titman, and Wermers (1995 AER) to measure this relationship.



1. Portfolio Reallocations and Past Returns (cont.)

Portfolio reallocation

- Definition: Active changes in portfolio holdings net of valuation effect ($X_{i,t}$)
- Calculation:

$$X_{i,t} = w_{i,t} - w_{i,t-1} \left(\frac{1 + r_{i,t}}{1 + r_{p,t}} \right)$$

Actual New Weight

Implied New Weight due to Valuation Effect

- $X_{i,t}$ equals to zero for a buy-and-hold portfolio.



Example of Active Weight Change ($X_{i,t}$) for a Buy-and-Hold Portfolio

Period 1		
Country	Holdings Value	Weight
A	\$200	50%
B	\$200	50%

Period 2			
Country	Return (1->2)	Holdings Value	Weight
A	20%	$\$200 \times (1+0.2) = \240	$240 / (240+260) = 48\%$
B	30%	$\$200 \times (1+0.3) = \260	$260 / (240+260) = 52\%$

Portfolio return = $(0.5 * 0.2) + (0.5 * 0.3) = 25\%$

A buy-and-hold portfolio weights in period 2 are $W_{A,2} = 48\%$ and $W_{B,2} = 52\%$,

$$X_{A,2} = 0.48 - 0.50 * [(1+0.2)/(1+0.25)] = 0.48 - 0.48 = 0$$

$$X_{B,2} = 0.52 - 0.50 * [(1+0.3)/(1+0.25)] = 0.52 - 0.52 = 0$$



1. Portfolio Reallocations and Past Returns (cont.)

- LM is based on the covariance between X_{it} and relative returns in country i at lag k :

$$LM_k = \frac{1}{T} \sum_{t=1}^T \sum_{i=1}^{N_T} X_{i,t} (r_{i,t-k} - r_{p,t-k})$$

← Relative Past Return

- $LM > 0 \rightarrow$ Momentum trading behavior
- $LM < 0 \rightarrow$ Contrarian trading behavior
- LM can also be computed for buy or sell only, limiting observations to only times in which X_{it} is positive (BM) or negative (SM).



U.S. investors can be characterized as selling past winners

Table 1: The Relationship between Flows and Past Returns

	All Countries			Developed Countries			Emerging Markets		
	Lag 1	Lag 2	Lag 3	Lag 1	Lag 2	Lag 3	Lag 1	Lag 2	Lag 3
LM (Buy and Sell)	0.005 (0.144)	-0.169 (0.152)	-0.179 (0.146)	-0.072 (0.140)	-0.226 (0.145)	-0.237 (0.152)	0.589 (0.381)	-0.198 (0.428)	0.104 (0.373)
BM (Buy Only)	0.159 (0.123)	0.064 (0.114)	0.036 (0.103)	0.044 (0.123)	-0.056 (0.103)	-0.099 (0.109)	0.685* (0.258)	0.258 (0.317)	0.528 (0.263)
SM (Sell Only)	-0.154* (0.056)	-0.232* (0.065)	-0.215* (0.065)	-0.116* (0.058)	-0.170* (0.064)	-0.138* (0.067)	-0.096 (0.183)	-0.456* (0.189)	-0.425* (0.174)

Newey and West (1987) standard errors are in parentheses.

* Statistically significant at the 5 percent level.



2. Conditional Portfolio Performance

- Goal: Measure portfolio reallocations and future abnormal return.
- Good performance portfolio: Actively rebalance the portfolio into (out of) a country that subsequently earns positive (negative) abnormal return.
- Abnormal return: Return component that cannot be predicted from using public information.
- We use the **Conditional Weight Measure (CWM)** of Eckbo and Smith (1998 JF) and Ferson and Khang (2002 JFE) to measure conditional portfolio performance.



2. Conditional Portfolio Performance

- The measure is based on the conditional covariances between changes in portfolio weights and future abnormal returns.

$$CWM_k = \sum_{i=1}^{N_T} E \left[\left(w_{i,t} - w_{i,t}^b \right) \left(r_{i,t+1} - E \left(r_{i,t+1} \mid \Omega_t \right) \right) \mid \Omega_t \right]$$

Active Reallocation

Abnormal Return

where the buy-and-hold benchmark holding is:

$$w_{i,t}^b = w_{i,t-k} \prod_{\tau=t-k+1}^t \left(\frac{1 + r_{i,\tau}}{1 + r_{p,\tau}} \right)$$

- $CWM > 0 \rightarrow$ Good performance portfolio



U.S. investors switch into markets that subsequently outperform.

Table 2: The Relationship between Flows and Future Returns (CWM)

	k=1	k=2	k=3
All Foreign Countries	0.369* (0.147)	0.649* (0.211)	0.735* (0.274)
Developed Markets	0.268 (0.141)	0.519* (0.201)	0.591* (0.276)
Emerging Markets	0.457 (0.382)	1.122* (0.575)	1.148 (0.747)

Newey and West (1987) standard errors are in parentheses.

* Statistically significant at the 5 percent level.



3. Unconditional Sharpe Ratio

U.S. investors' foreign equity portfolios outperform value-weighted benchmark.

Table 3: The Unconditional Performance of U.S. Investors' Foreign Equity Portfolios

	All Foreign		Developed		Emerging	
	Value-Weighted	US	Value-Weighted	US	Value-Weighted	US
Mean	0.08	0.21	0.06	0.19	0.71	0.82
Stdev	4.9	4.7	4.9	4.6	7.2	7.5
Sharpe	1.6*	4.5*	1.3*	4.1*	9.9	10.9

Percentage points per month in excess of one-month Treasury bill rate.

* Chi-squared test for equal Sharpe ratios rejected with p-value = 0.06.



Summary of Empirical Results

- 1. U.S. investors are not momentum traders in their international portfolio.**
 - If anything, they are contrarian when selling or selling past winners.
- 2. Some evidence of portfolio rebalancing.**
 - See point 1: Allocate away from countries that recently had high returns.
- 3. No evidence of poor information:**
 - On average U.S. investors reallocate into countries' equity markets that subsequently outperform (and out of ones that subsequently underperform).
 - Overall, U.S. investors' foreign equity portfolio performs quite well, beating the value-weighted benchmark by 160 bps per year over the past two decades.

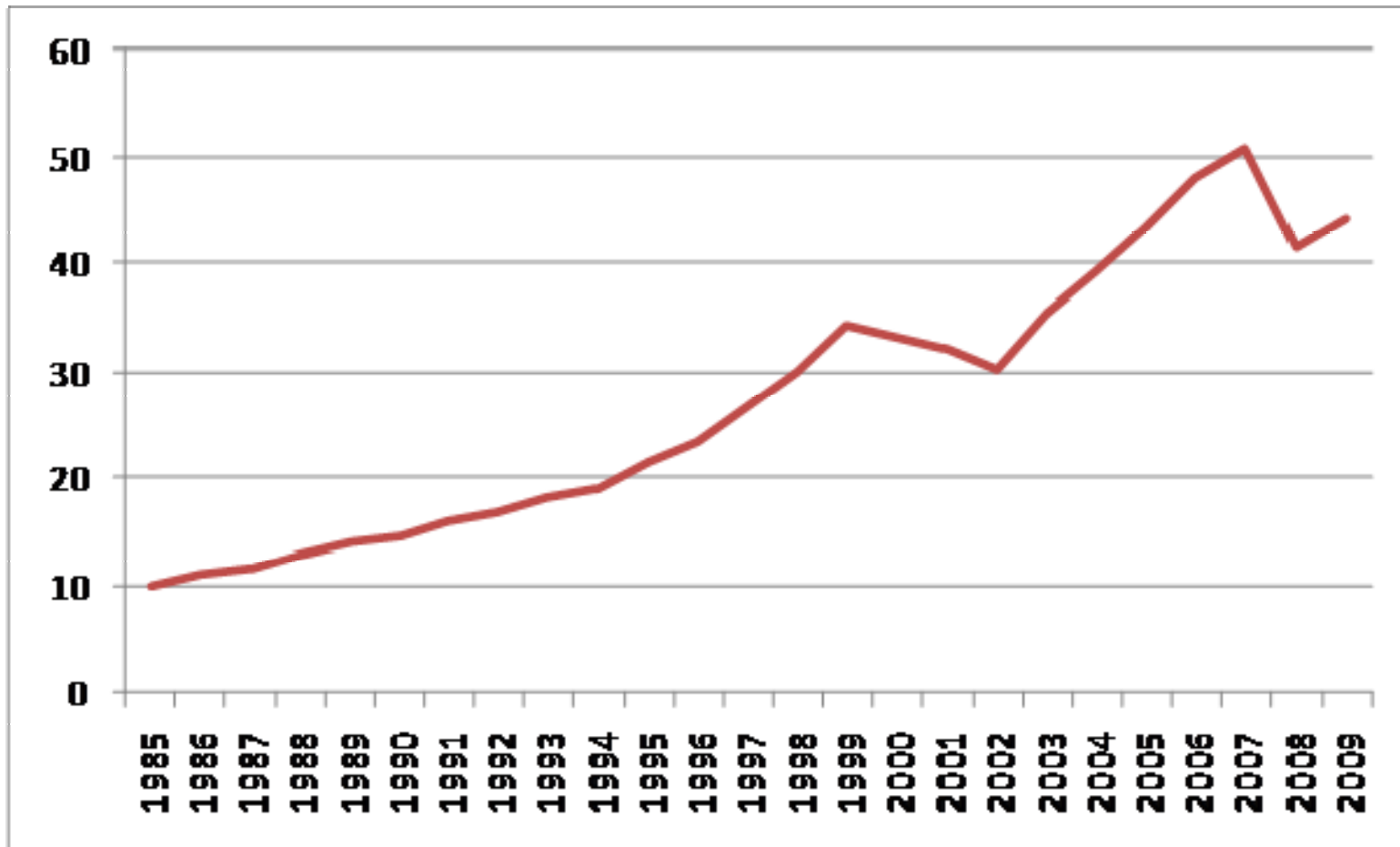


What Drives the Results? Data or Techniques

- Two differences between our data and as-reported flow data.
 - It is of portfolio allocations, not flows.
 - It is cleansed of the financial center bias.
- Which is driving the results?
 - Rerun the old analysis with “restated flows” (flows cleansed of financial center bias) → get old results
 - Rerun the old analysis with portfolio weights → old results disappear
- Results are driven by having portfolio weights, suggesting that the problem with flow data is that it is confounded by changes in financial wealth.



U.S. financial wealth is not constant.



Trillions of US dollars.



V. Conclusions

- Using portfolio holdings data, we find evidence that contradicts long-standing stylized facts. We find that
 - U.S. investors tend to sell-past winners.
 - U.S. investors tend to move into (out of) the country that subsequently outperform (underperform).
- Researchers and policymakers should be cautious when using flow data to examine portfolio behavior. It is best to use portfolio data.
- International macro models that attempt to replicate the existing stylized facts should be re-considered. In addition, policy implications drawn out of these models need to be treated with great caution.
- International macro models that incorporate international portfolio choice should take seriously the fact that fluctuations in financial wealth are important.



V. Conclusions (cont.)

- Our finding that U.S. investors reallocate into markets just prior to strong returns might appear puzzling.
 - Many empirical studies have found that foreigners perform poorly when investing in countries ranging from Indonesia (Dvorak, 2005) and Korea (Choe, Kho, and Stulz, 2005) to Germany (Hau, 2001). These are studies of stock selection within a country.
 - Our analysis concerns country picking, not within-country timing and execution.
 - Our results are not inconsistent with empirical work on the predictability of equity prices, especially for one market relative to another.
- International equity investments may be an attractive asset class for U.S. investors.