What Explains Equity Home Bias? Theory and Evidence at the Sector Level

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Motivation

Equity Home Bias Puzzle

Predominant share of domestic equity in portfolios

Potential Explanations

Institutional/informational frictions, risk-hedging motives

Contribution of This Paper

Adds the sectoral dimension

Evaluates determinants of home bias by exploiting cross-sector variations

Preview of Results

Empirical Findings

- Compute sectoral home bias (HB) for 27 sectors from 43 countries
- Identify country-,sector-,time-specific factors for sectoral HB
- Find sectoral HB increases with revealed comparative advantage (RCA)

Theoretical Model

Build a two-country two-sector open economy model

- Incorporate asset transaction costs, information frictions, and heterogeneous sectoral productivity
- Extend the solution method for portfolio choice under different frictions

Quantitative Assessment

Develop a DSGE model with Eaton-Kortum's framework

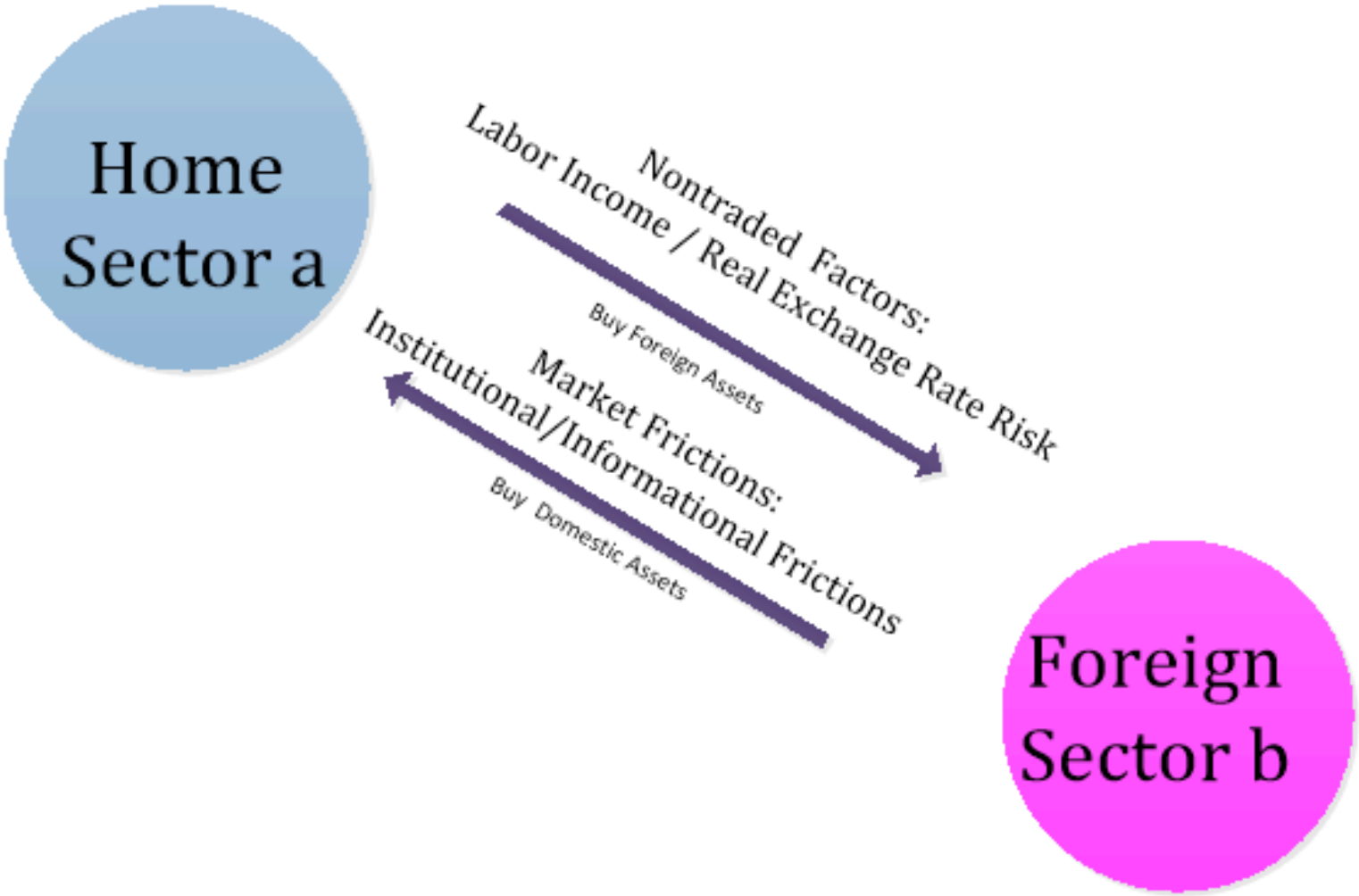
- Estimate and solve the model covering 60 countries and 15 sectors
- Quantify frictions and disentangle their contributions to HB

▸ List

Related Literature

- Home Bias surveyed by Coeurdacier and Rey (2013):
  - Risk-hedging motives
    - Labor income risk
      Baxter and Jermann (1997) and Heathcote and Perri (2013)
    - Real exchange rate risk
      Cole and Obstfeld (1991) and Coeurdacier (2009)
  - Market frictions
    - Informational frictions
      Brennan and Cao (1997), Okawa and van Wincoop (2012)
    - Institutional frictions
      French and Poterba (1991), Lewis (1999)
  - Solution method
    - Solving portfolio choice in a DSGE model
      Devereux and Sutherland (2008), Tille and van Wincoop (2008)

Mechanism — Existing Papers



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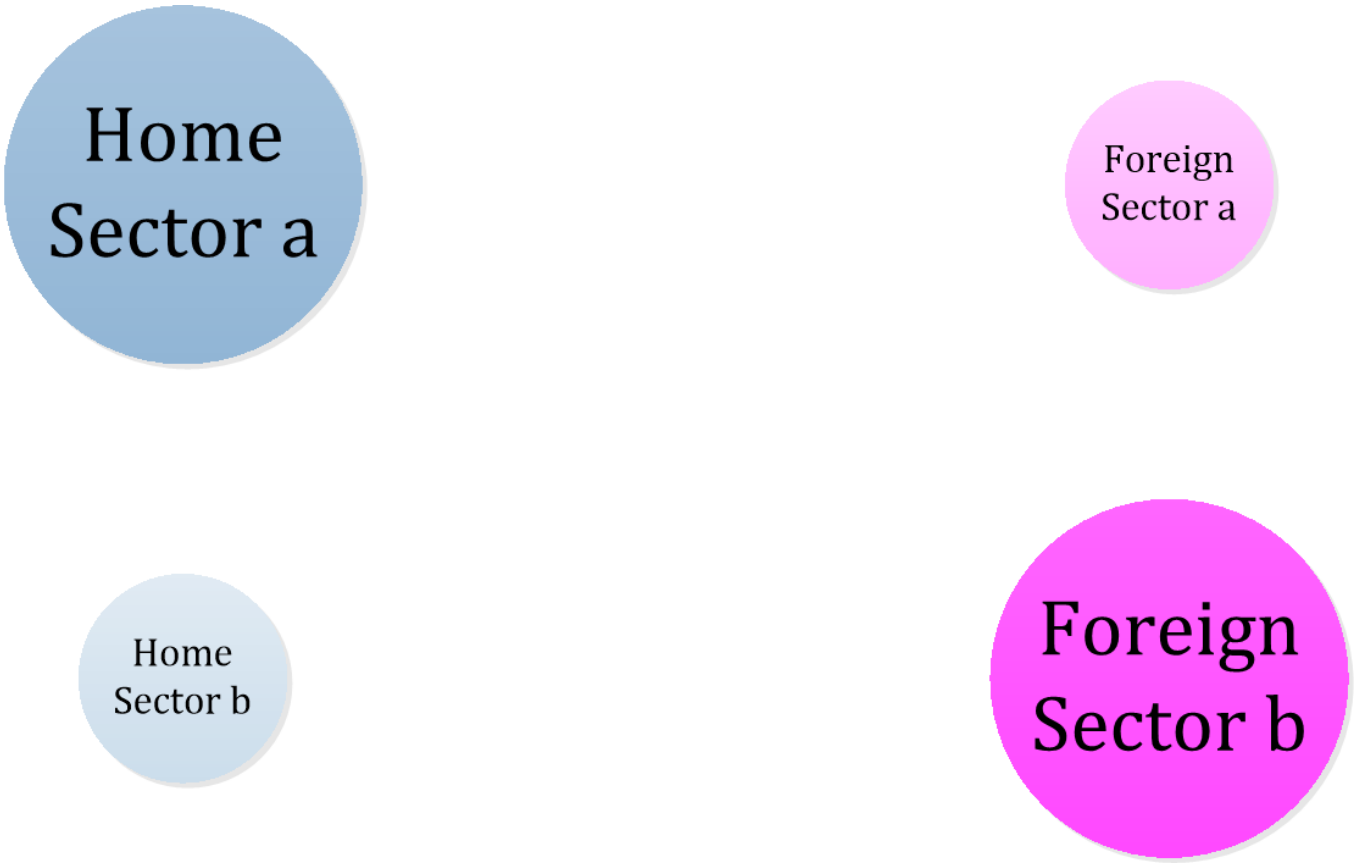

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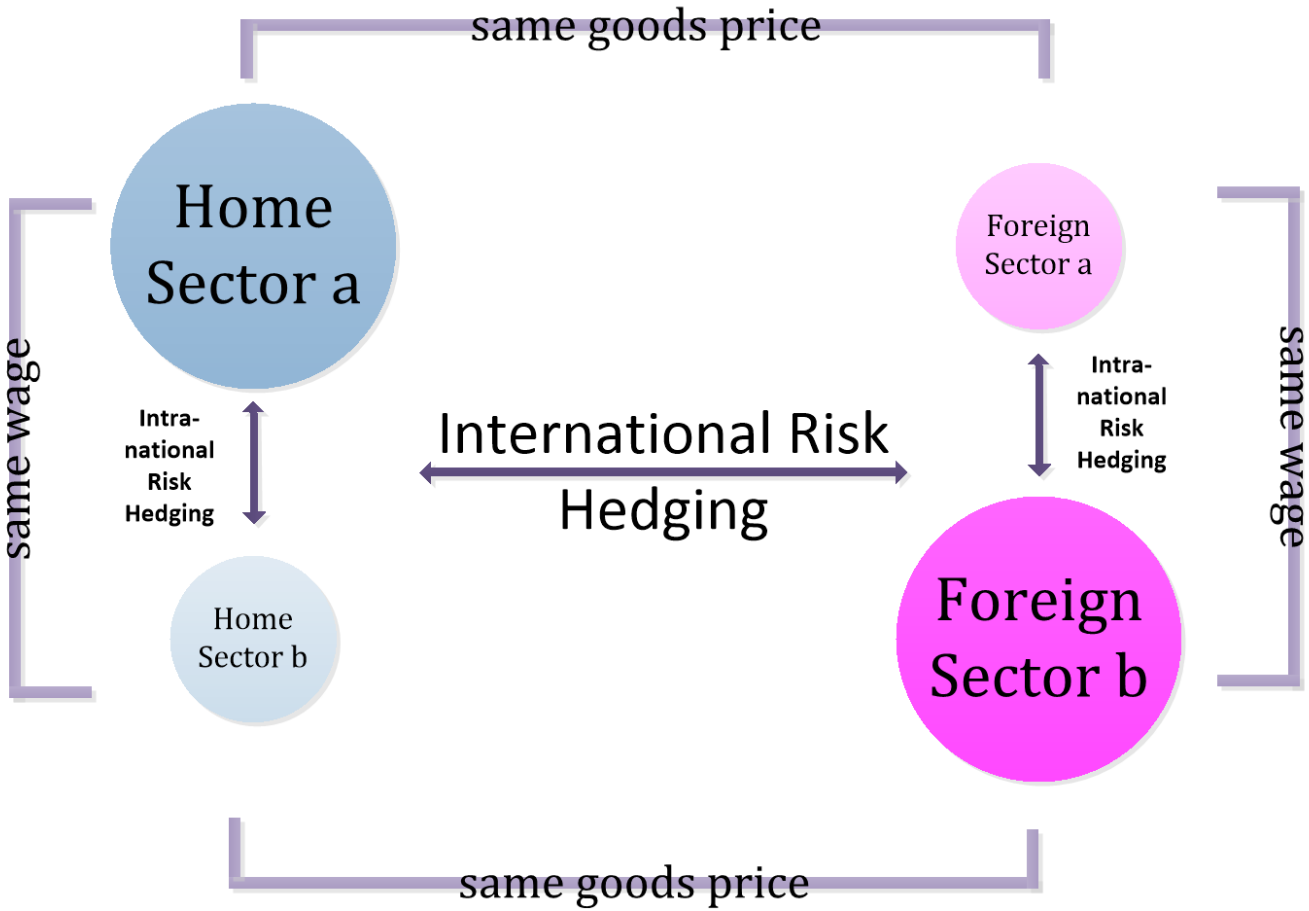


Outline

Sectoral Home Bias

Measure of Home Bias

$$HB_{i,s} = 1 - \frac{\text{Share of Sector s Foreign Equities in Country i Equity Holding}}{\text{Share of Sector s Foreign Equities in World Market Portfolio}}$$

Example: Aircraft Industry — French Market Values 60% US 40%
US investors split holdings 50-50

$$HB_{\text{US,Aircraft}} = 1 - \frac{50\%}{60\%} = \frac{1}{6}$$

$HB = 1$ full home bias; $HB = 0$ full diversification

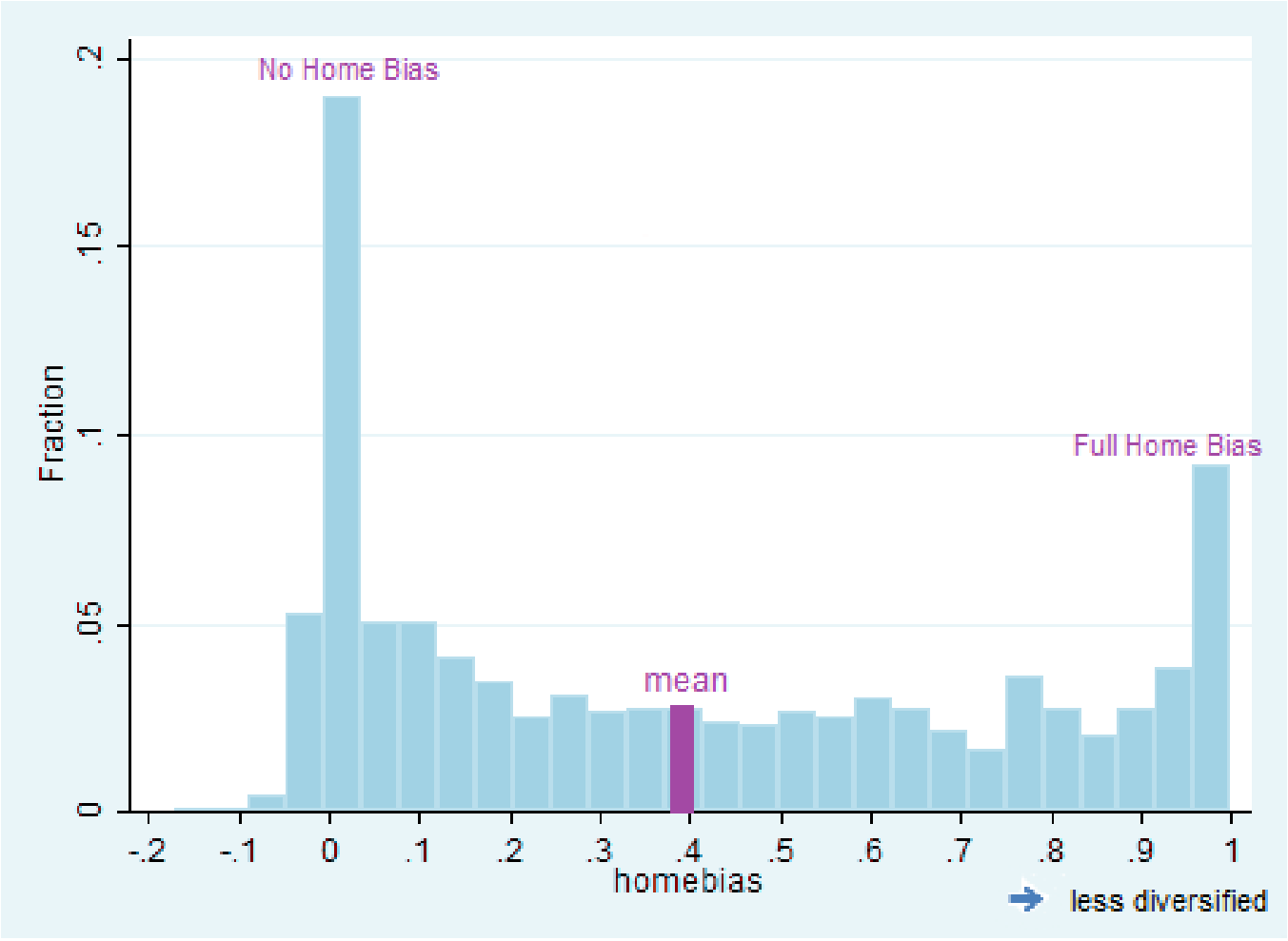
Data

- Numerator: Factset/Lionshare
- Denominator: Datastream

Factset/Lionshare Data

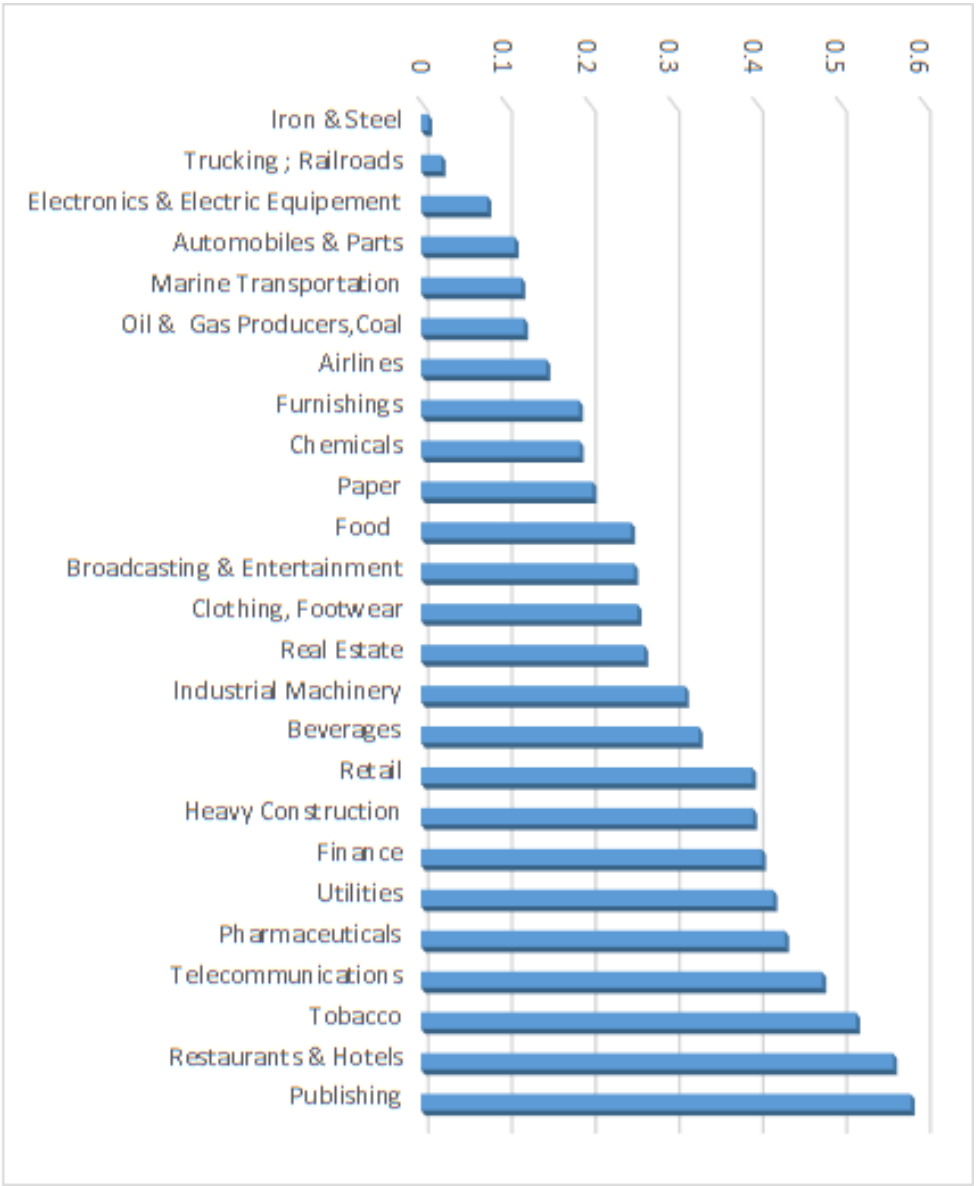
- When: 1998 - 2014
- Where: a large group of countries or regions
- Who: institutional investors: banks, insurance companies, retirement or pension funds, hedge funds, sovereign wealth funds and mutual funds (▸ Share , ▸ Comparison , ▸ Examples)
- How: public filings (e.g. 13-Filings with SEC in the U.S.)

Distribution of Sectoral Home Bias



834 observations (43 countries $\times$ 27 sectors)

Ranking of UK Sectoral Home Bias



Determinants of Sectoral Home Bias

Country effects: asset transaction costs

- Literature: Lewis (1999), Lane and Milesi-Ferretti (2003)
- Measure: Chinn-Ito Index based on IMF's AREAER

Sector effects: tradability

- Literature: Stockman and Dellas (1989), Obstfeld and Rogoff (2000)
- Measure: Mano and Castillo (2015)'s categorization; continuous measure based on trade data from WIOD

Time effects: declining trend

- Literature: Coeurdacier and Rey (2013)
- Measure: time trend

Determinants of Sectoral Home Bias

Dep. Var: Sectoral HB	(1)	(2)	(3)	(4)	(5)	(6)
Chinn-Ito	-0.688 ***	-0.238 ***				-0.260 ***
	(0.013)	(0.036)				(0.072)
	[-0.444]	[-0.153]				[-0.175]
Tradable dummy			-0.050 ***	-0.065 ***		-0.062 ***
			(0.007)	(0.005)		(0.006)
			[-0.127]	[-0.166]		[-0.16]
Year					-0.006 ***	-0.006 ***
					(0.001)	(0.001)
					[-0.016]	[-0.016]
Country FE	N	Y	N	Y	Y	Y
Sector FE	N	Y	N	N	Y	N
Year FE	N	Y	N	Y	N	N
Observations	11,795	11,795	11,795	11,795	11,795	11,795
R^2	0.197	0.531	0.004	0.509	0.542	0.515

Robust standard errors in parentheses, standardized coefficients in brackets.***significant at 1%

▸ Tradability ▸ Time

Sectoral Home Bias and Comparative Advantage

Hypothesis

Sectors with greater comparative advantage expose investors to greater risks.

- Sectoral returns increase more closely with country-level labor income.
- Sectoral returns decrease more closely with real exchange rates.

Therefore, sectoral HB should be weaker for risk-hedging.

Comparative Advantage and Sectoral Home Bias

Dep. Var: Sectoral HB	(1)	(2)	(3)	(4)
RCA	0.015 ***	0.017 ***	0.021 ***	0.021 ***
	(0.003)	(0.003)	(0.003)	(0.003)
	[0.061]	[0.071]	[0.085]	[0.083]
Chinn-Ito		-0.760 ***		-0.194 ***
		(0.018)		(0.056)
		[-0.484]		[-0.123]
Country FE	N	N	Y	Y
Sector FE	N	N	Y	Y
Year FE	N	N	Y	Y
Observations	6,064	6,064	6,064	6,064
R^2	0.004	0.237	0.564	0.566

Robust standard errors in parentheses, standardized coefficients in brackets.***significant at 1%

Discussion of results

Puzzle

Investors should show weaker home bias in comparative advantage sectors, but data show otherwise.

One explanation

Information asymmetry is exacerbated in comparative advantage sectors.

Next step

Build a theoretical model to quantify and disentangle frictions affecting portfolio choice.

Outline

Producers

Setup: Two symmetric countries ($i = \{H, F\}$) both produce two consumption goods ($s = \{a, b\}$).

- Cobb-Douglas production function

$$Y_{i,s,t} = T_{i,s,t} K_{i,s,t}^{\alpha} L_{i,s,t}^{1-\alpha}$$

Notations: Y output; T productivity; K capital endowment; L labor

- AR(1) productivity process with covariance matrix for shocks Σ:

$$T_{i,s,t} = \rho_{i,s} T_{i,s,t-1} + (1 - \rho_{i,s}) \bar{T}_{i,s} + \epsilon_{i,s,t}$$

- Sectoral productivity differences

$$\frac{\bar{T}_{H,a}}{\bar{T}_{H,b}} = \frac{\bar{T}_{F,b}}{\bar{T}_{F,a}} \equiv T > 1$$

- Dividends are claims to capital endowment

$$d_{i,s,t} = p_{i,s,t} Y_{i,s,t} - w_{i,s,t} L_{i,s,t} = \alpha p_{i,s,t} Y_{i,s,t}$$

Households

- CRRA utility $E_0 \sum_{t=0}^{\infty} \beta^t \frac{C_{i,t}^{1-\sigma}}{1-\sigma}$
- CES preference both across and within sectors:

$$C_{i,t} = (\psi_i^{\frac{1}{\phi}} C_{i,a,t}^{\frac{\phi-1}{\phi}} + (1-\psi_i)^{\frac{1}{\phi}} C_{i,b,t}^{\frac{\phi-1}{\phi}})^{\frac{\phi}{\phi-1}}$$

$$C_{i,s,t} = (\mu_i^{\frac{1}{\eta}} C_{ii,s,t}^{\frac{\eta-1}{\eta}} + (1-\mu_i)^{\frac{1}{\eta}} C_{ij,s,t}^{\frac{\eta-1}{\eta}})^{\frac{\eta}{\eta-1}}$$

- Households supply one unit of labor inelastically for wage w_i.
- Budget constraint

$$\begin{aligned} P_{i,t} C_{i,t} \quad & + \sum_{s=\{a,b\}} [q_{H,s,t}(\nu^i_{H,s,t+1} - \nu^i_{H,s,t}) + q_{F,s,t}(\nu^i_{F,s,t+1} - \nu^i_{F,s,t})] \\ & = w_{i,t} L_{i,t} + \sum_{s=\{a,b\}} (d_{H,s,t} \nu^i_{H,s,t} + d_{F,s,t} \nu^i_{F,s,t}) \end{aligned}$$

- Asset return

$$R_{i,s,t} = \frac{q_{i,s,t} + d_{i,s,t}}{q_{i,s,t-1}}$$

Notations: q asset prices; d dividends; ν^i asset holdings of investors from country i

Equilibrium Conditions

(a) Firms maximize their profits;

(b) Households maximize expected lifetime utility;

(c) Goods markets clear:

$$C_{H,s,t} + C_{F,s,t} = Y_{H,s,t} + Y_{F,s,t},\ s \in \{a, b\};$$

(d) Factor markets clear:

$$K_{i,a,t} + K_{i,b,t} = \bar{K}_i,\ L_{i,a,t} + L_{i,b,t} = \bar{L}_i,\ i \in \{H, F\};$$

(e) Equity markets clear:

$$\nu_{i,s,t} + \nu^*_{i,s,t} = 1, i \in \{H, F\}, s \in \{a, b\}.$$

Frictions Skewing Portfolios

Non-traded factors

- Labor income: $\rho(w_i L_i, R_{i,s})$
- Real exchange rate: $\rho(e, R_{i,s})$ where $e \equiv \frac{P_H}{P_F}$

Financial market frictions

- Transaction costs:
  - Modeled as an iceberg cost τ_i on foreign returns
  - Literature: Heathcote and Perri (2004), Tille and van Wincoop (2010)
- Information frictions:
  - Modeled as a perceived variance $f_{i,s} \times \sigma^2_{i,s}$ for foreign assets
  - Literature: Brennan and Cao (1997), Okawa and van Wincoop (2012)
- $\tau_i < 1$, $f_{i,s} > 1$ are both second-order (i.e. proportional to variance)

Solution Method

Solve for portfolio choice in a DSGE model

- Literature: Devereux and Sutherland (2008)
- Main idea:
  2nd-order approximation of Euler equations + 1st-order approximation of other equations $\Rightarrow$ a zero-order (i.e. steady-state) portfolio
- Contribution of this paper:
  Extends the method to embed financial frictions ▸ Skip technical derivations

Derivation w/o Financial Frictions

- Euler equations:

$$E_t[\frac{U'(C_{H,t+1})}{P_{H,t+1}}R_{H,s,t+1}] = E_t[\frac{U'(C_{H,t+1})}{P_{H,t+1}}R_{F,s,t+1}] \quad (1)$$

$$E_t[\frac{U'(C_{F,t+1})}{P_{F,t+1}}R_{F,s,t+1}] = E_t[\frac{U'(C_{F,t+1})}{P_{F,t+1}}R_{H,s,t+1}], s \in \{a,b\} \quad (2)$$

- Second-order Taylor expansion:

$$E_t[\hat{R}_{x,t+1} + \frac{1}{2}\hat{R}^2_{x,t+1} - (\sigma\hat{C}_{H,t+1} + \hat{P}_{H,t+1})\hat{R}_{x,t+1}] = \mathcal{O}(\epsilon^3) \quad (3)$$

$$E_t[\hat{R}_{x,t+1} + \frac{1}{2}\hat{R}^2_{x,t+1} - (\sigma\hat{C}_{F,t+1} + \hat{P}_{F,t+1})\hat{R}_{x,t+1}] = \mathcal{O}(\epsilon^3) \quad (4)$$

Notation: $\hat{R}_x$ excess return $\hat{R}'_x = [\hat{R}_{H,a} - \hat{R}_{F,b}, \hat{R}_{H,b} - \hat{R}_{F,b}, \hat{R}_{F,a} - \hat{R}_{F,b}]$.

- Take the difference:

$$E_t[(\hat{C}_{H,t+1} - \hat{C}_{F,t+1} + \frac{\hat{e}_{t+1}}{\sigma})\hat{R}_{x,t+1}] = \mathcal{O}(\epsilon^3) \quad (5)$$

Derivation with Financial Frictions

- Euler equations:

$$\begin{aligned} E_t[\frac{U'(C_{H,t+1})}{P_{H,t+1}} R_{H,s,t+1}] &= E_t[\frac{U'(C_{H,t+1})}{P_{H,t+1}}(1-\tau) R_{F,s,t+1}], \\ E_t[\frac{U'(C_{F,t+1})}{P_{F,t+1}} R_{F,s,t+1}] &= E_t[\frac{U'(C_{F,t+1})}{P_{F,t+1}}(1-\tau) R_{H,s,t+1}], s \in \{a,b\} \end{aligned}$$

- Second-order Taylor expansion:

$$\begin{aligned} E_t[\hat{R}_{x,t+1} + \tfrac{1}{2}\hat{R}^2_{x,t+1} + \tfrac{1}{2}\mathcal{T} - (\sigma \hat{C}_{H,t+1} + \hat{P}_{H,t+1})\hat{R}_{x,t+1}] &= \mathcal{O}(\epsilon^3) \\ E_t[\hat{R}_{x,t+1} + \tfrac{1}{2}\hat{R}^2_{x,t+1} - \tfrac{1}{2}\mathcal{T} - (\sigma \hat{C}_{F,t+1} + \hat{P}_{F,t+1})\hat{R}_{x,t+1}] &= \mathcal{O}(\epsilon^3) \end{aligned}$$

Notations: $\mathcal{T}$ vector of transaction costs.

- Take the difference:

$$E_t[(\hat{C}_{H,t+1} - \hat{C}_{F,t+1} + \frac{\hat{e}_{t+1}}{\sigma})\hat{R}_{x,t+1}] = \frac{\mathcal{T}}{\sigma} + \mathcal{O}(\epsilon^3).$$

Derivation with Financial Frictions

$$\begin{cases} \hat{C}_{H,t+1} + \frac{\hat{P}_{H,t+1}}{\sigma} & = D_{H1}\xi_{t+1} + D_{H2}\epsilon_{t+1} + D_{H3}z_{t+1} + \mathcal{O}(\epsilon^2). \\ \hat{C}_{F,t+1} + \frac{\hat{P}_{F,t+1}}{\sigma} & = D_{F1}\xi_{t+1} + D_{F2}\epsilon_{t+1} + D_{F3}z_{t+1} + \mathcal{O}(\epsilon^2). \end{cases}$$

$$\Rightarrow \begin{cases} \hat{C}_{H,t+1} + \frac{\hat{P}_{H,t+1}}{\sigma} & = \tilde{D}_H\epsilon_{t+1} + D_{H3}z_{t+1}, \quad \textit{where} \quad \tilde{D}_H = D_{H1}\tilde{H} + D_{H2}. \\ \hat{C}_{F,t+1} + \frac{\hat{P}_{F,t+1}}{\sigma} & = \tilde{D}_F\epsilon_{t+1} + D_{F3}z_{t+1}, \quad \textit{where} \quad \tilde{D}_F = D_{F1}\tilde{H} + D_{F2}. \end{cases}$$

Perceived covariance matrix:

Note: Ordering of assets — *Ha*, *Hb*, *Fa*, *Fb*.

$$\Sigma_H = \Sigma + \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & f_a & 0 \\ 0 & 0 & 0 & f_b \end{bmatrix}, \Sigma_F = \Sigma + \begin{bmatrix} f_a & 0 & 0 & 0 \\ 0 & f_b & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

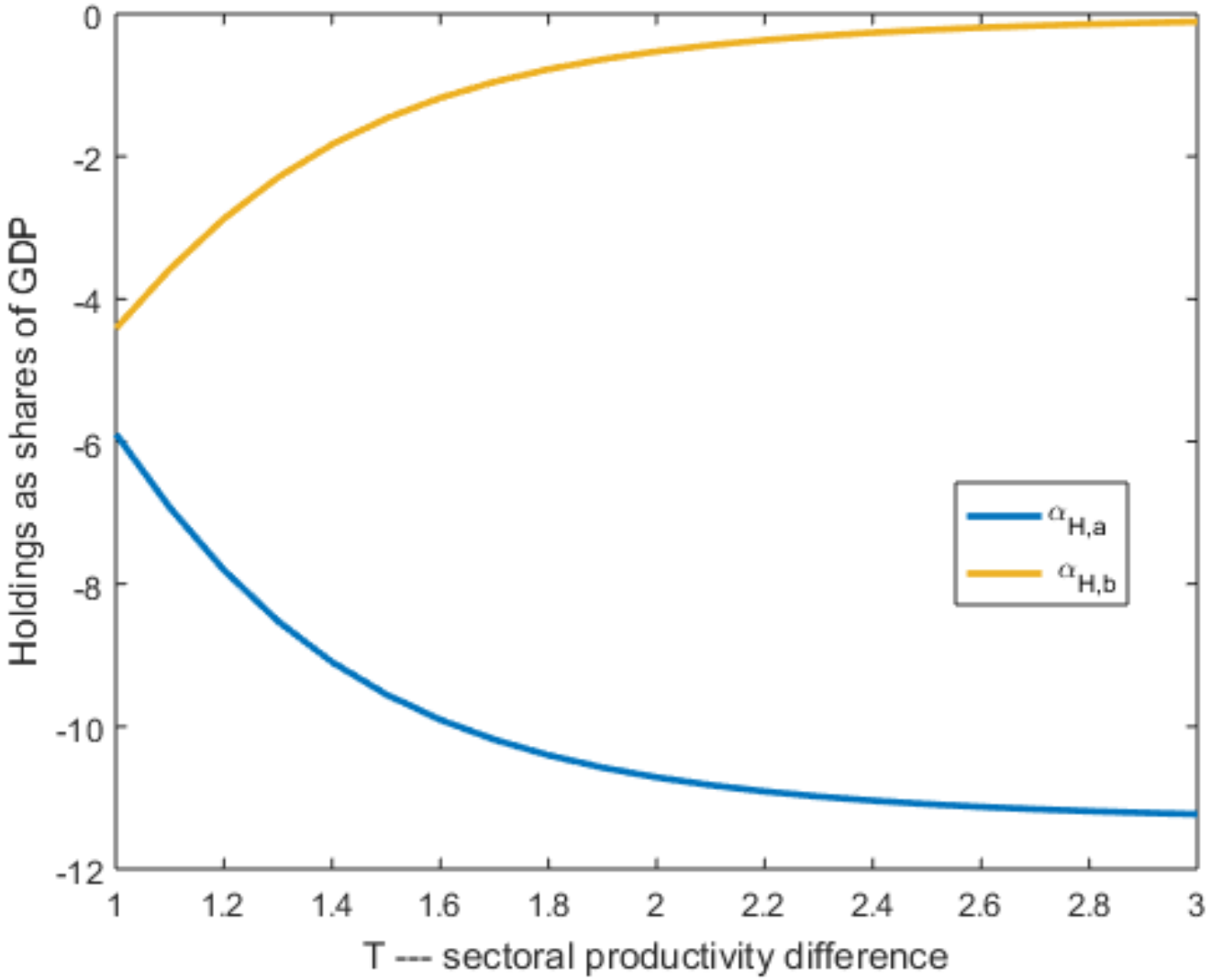
Portfolio determined by

$$E_t[(\hat{C}_{H,t+1} - \hat{C}_{F,t+1} + \frac{\hat{e}_{t+1}}{\sigma})\hat{R}_{x,t+1}] = \tilde{R}\Sigma_H\tilde{D}_H' - \tilde{R}\Sigma_F\tilde{D}_F' = \frac{\mathcal{T}}{\sigma} + \mathcal{O}(\epsilon^3)$$

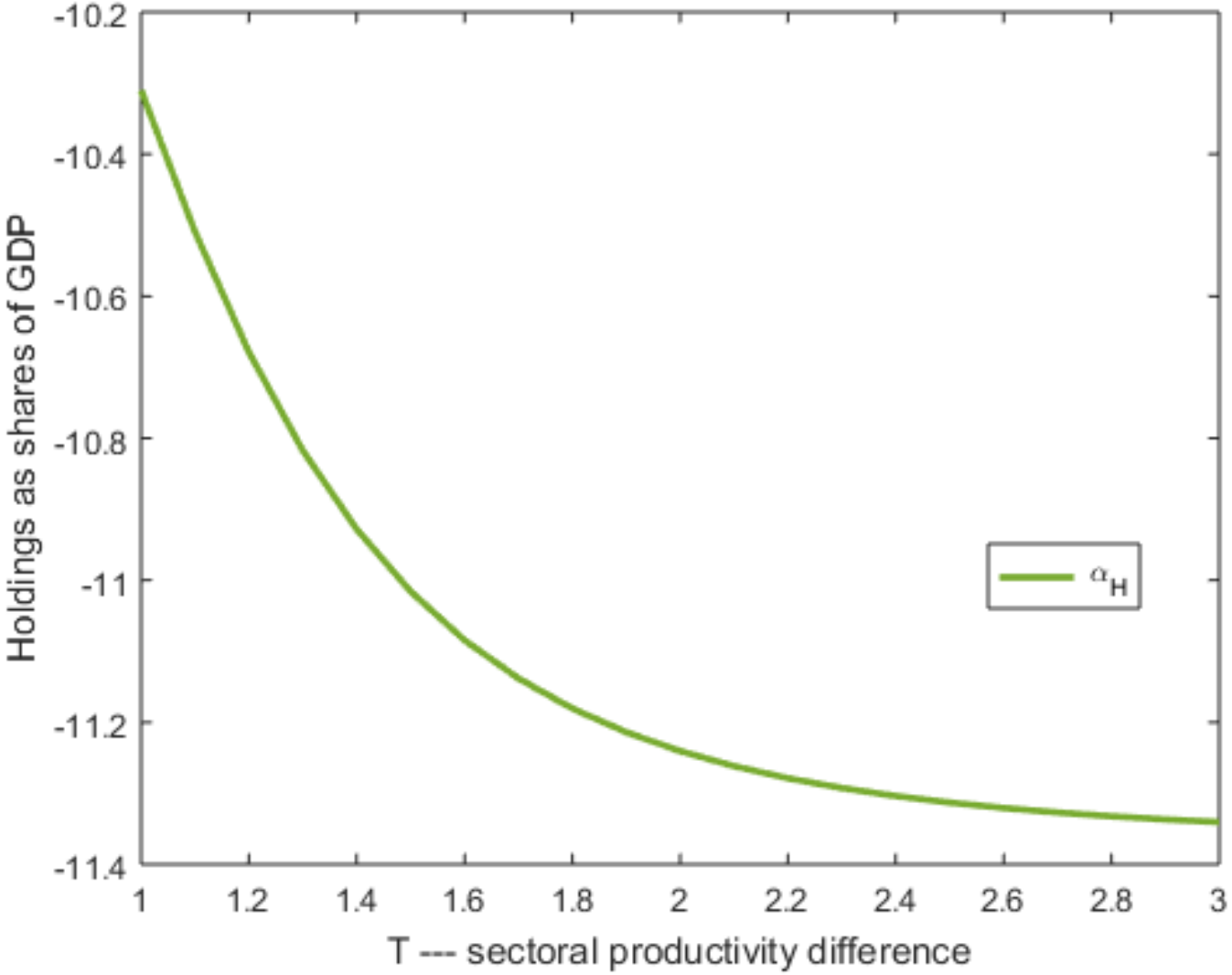
Baseline Parametrization

Parameter	Description	Value
β	Discount factor	0.95
σ	Coefficient of relative risk aversion	2
ϕ	Elasticity of substitution between sectors	2
η	Elasticity of substitution within sectors	5
μ	Weight of domestic goods in within a sector	0.6
ψ_H	Expenditure shares on comparative advantage sectors	0.6
α	Capital share in production	0.35
$\bar{L}$	Labor endowment	1
$\bar{K}$	Capital endowment	1
ρ	Autoregressive coefficient of productivity	0.9
σ_ϵ	Std. dev. of productivity shocks	0.25

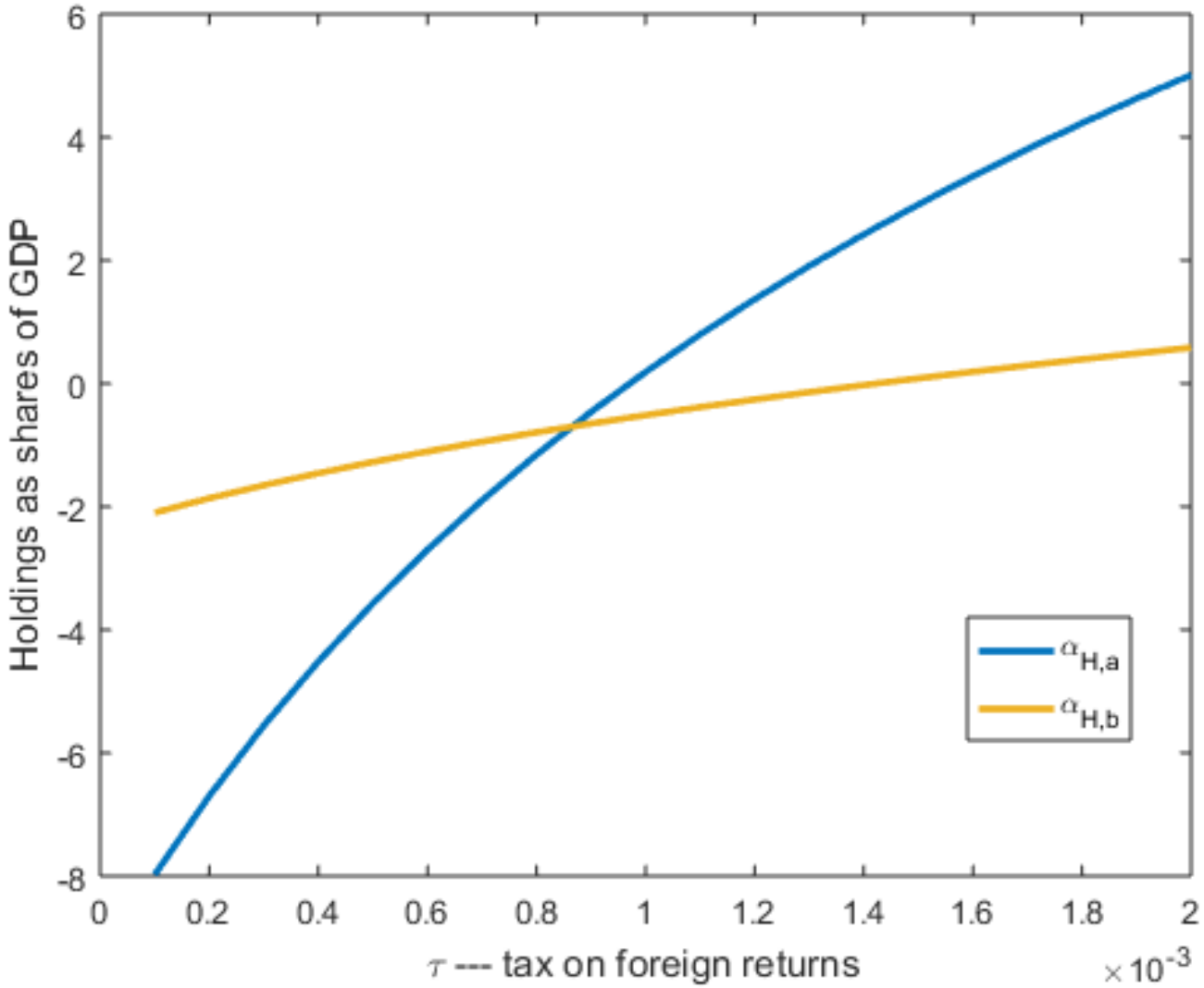
Sectoral Home Bias and Comparative Advantage



National Home Bias and Comparative Advantage



Sectoral Home Bias and Transaction Costs



Sectoral Home Bias and Information frictions

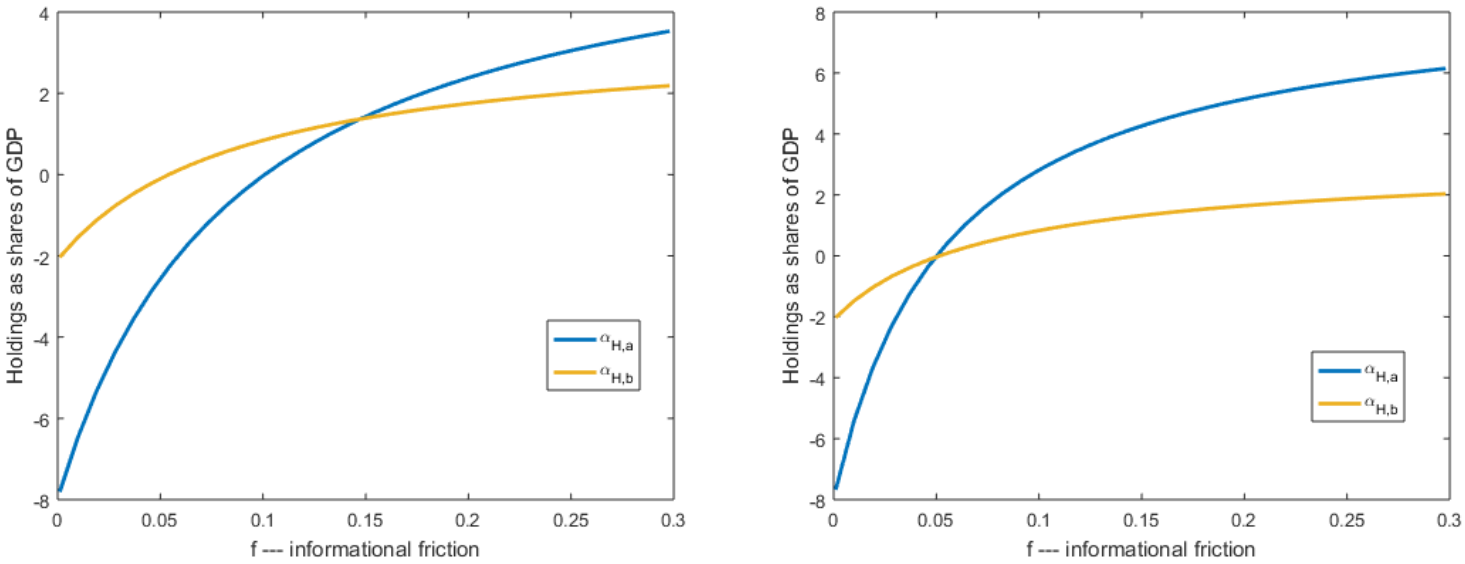


Figure: Homogeneous ($f_a = f_b$) vs Heterogenous ($f_a > f_b$) Information Frictions

Extension I: Nontradable Sectors

- Lit: Obstfeld and Rogoff (2001), Collard et al.(2007)
- Specification:

$$C_{i,t} = C_{i,a,t}^{\psi_i} C_{i,b,t}^{1-\psi_i} \tag{1}$$

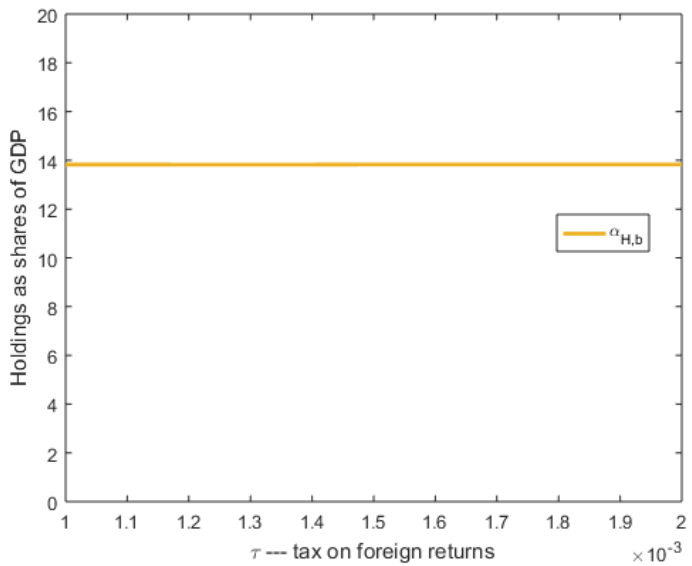


Figure: Under transaction costs τ

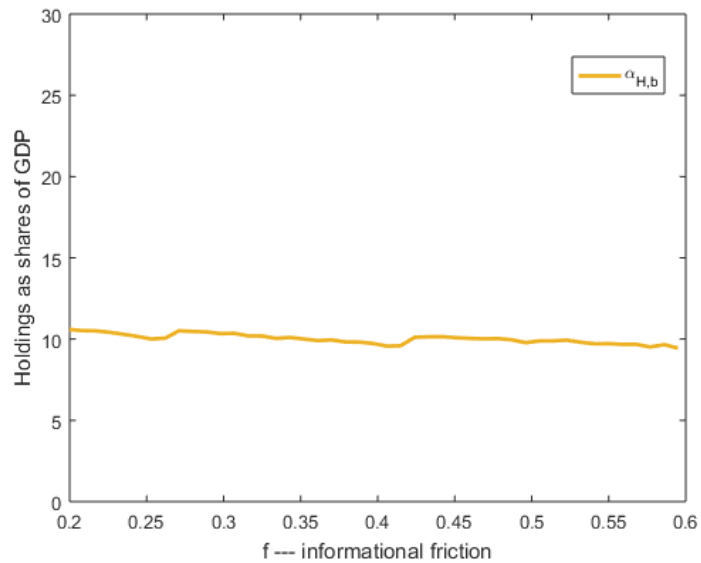


Figure: Under information frictions f

Extension II: Capital Investment and Bonds

- Lit: Heathcote and Perri(2013), Coeurdacier and Gourinchas(2016)
- Specification:

$$K_{i,s,t} = (1-\delta)K_{i,s,t-1} + IV_{i,s,t}, s \in \{a, b\} \quad (2)$$

$$d_{i,s,t} = \alpha p_{i,s,t} y_{i,s,t} - P_{i,t} IV_{i,s,t} \quad (3)$$

Assets	$\rho(R, IV_H)$	$\rho(R, e)$	$\rho(R, W)$	α
Ha	-0.1398	-0.7099	0.2278	0.0069
Hb	-0.1667	-0.7030	0.2081	0.0108
H^B	0.2579	0.6723	-0.1166	-0.0106

Notations: correlation ρ, assets' returns (R) and holdings (α), home investment (IV_H), real exchange rate ($e = \frac{P_H}{P_F}$), and labor income ($W = \frac{w_H N_H}{w_F N_F}$). Equities *Hs*, Bonds H^B

Outline

Extended Model

- Covers about 60 countries and 15 tradable sectors
- Introduces the Eaton-Kortum (2002) framework
  - a continuum of varieties in each sector $Y_{i,s} = [\int_0^1 y_{i,s}(z)^{\frac{\epsilon-1}{\epsilon}} dz]^{\frac{\epsilon}{\epsilon-1}}$
  - trade costs $p_{i,s}(z) = \frac{t_i r_i^{\alpha s} w_i^{1-\alpha s}}{A_{i,s}(z)}$
  - sectoral technology distribution $F_{i,s}(A) = exp(-T_{i,s}A^{-\theta})$
  - AR(1) productivity process with shocks drawn from Σ
    $T_{i,s,t} = \rho_{i,s} T_{i,s,t-1} + (1-\rho_{i,s})\bar{T}_{i,s} + \epsilon_{i,s,t}$
- Includes nontradable sectors

$$C_i = C_{i,T}^{\mu_i} C_{i,N}^{1-\mu_i} = \left(\sum_{s=1}^{S} \psi_s^{\frac{1}{\phi}} C_{i,s}^{\frac{\phi-1}{\phi}}\right)^{\frac{\phi}{\phi-1}\mu_i} C_{i,N}^{1-\mu_i}.$$

▸ Skip parametrization

Parametrization

Common parameters from previous literature

Parameter	Description	Value
β	Discount factor	0.95
σ	Coefficient of relative risk aversion	2
ϕ	Elasticity of substitution between sectors	2
θ	Dispersion of productivity draws	8.28

Country-specific factors

- Examples: labor and capital endowments, expenditure on nontradables
- Sources: Penn World Table, STAN

Parametrization

Sector-specific factors

Sector Name	Expenditure Shares within Tradables (ψ_s)	Capital Intensity (α_s)
Food	0.165	0.329
Beverages	0.054	0.272
Tobacco	0.010	0.264
Clothing & Accessories, Footwear	0.134	0.491
Forestry	0.009	0.452
Paper	0.013	0.366
Oil & Gas Producers,Coal	0.096	0.244
Chemicals	0.008	0.308
Pharmeceutical	0.036	0.319
Iron & Steel	0.015	0.381
Nonferrous Metals	0.074	0.407
Electronics & Electric Equipement	0.060	0.405
Machinery	0.073	0.473
Automobiles & Parts	0.183	0.464
Furnishings	0.068	0.460

Sources: US consumption data and I-O table

Country-sector specific factors

- Productivity estimated to match trade data

Algorithm

- **Step 1**. Guess factor prices using national output and endowment data.
- **Step 2**. Estimate sectoral productivity and trade cost to fit a country's trade pattern including
  - (1) its share of all the countries' exports in a sector
  - (2) the country's overall export-to-output ratio
- **Step 3**. Plug the estimated productivity and trade cost in the model equations to determine factor allocations.
- **Step 4**. Update factor prices, repeat Step 2 and 3, until they satisfy the market-clearing conditions.
- **Step 5**. Solve all the domestic and foreign real variables.
- **Step 6**. Estimate the covariance matrix of productivity shocks.
- **Step 7**. Extract the coeffcient matrices from first order conditions.
- **Step 8**. Solve for financial frictions to match both country- and sector-level home bias.

Estimated Transaction Costs

Summary Statistics

	Mean	Std. Dev.	Min	Max
$\hat{\tau}_i$	8.2e-6	9.8e-5	-8.2e-5	6.1e-4

▸ Details

Covariances

$$\hat{\tau}_i = \alpha_1 + \beta_1 \mathit{Chinn}^{-} - \mathit{Ito}_i + \epsilon_i, \tag{4}$$

Standardized β_1 = -0.29, significant at 1%.

Estimated Information Frictions

Summary Statistics

	Mean	Std. Dev.	Min	Max
$\hat{f_{i,s}}$	1.3e-5	4.3e-4	-4.1e-3	6.3e-3

▸ Details

Covariances

$$\hat{f_{i,s}} = \alpha_2 + \beta_2 R\bar{CA}_{i,s} + \gamma_i + \epsilon_{i,s}. \quad (5)$$

Standardized β_2 = 0.10, significant at 10%.

Counterfactual Analysis

Comparative Statics

$$\Delta HB_{i,s,\tau} = \alpha_\tau + \beta_\tau \hat{\tau}_i + \gamma_{i,\tau} + \epsilon_{i,s,\tau}, \quad (6)$$

$$\Delta HB_{i,s,f} = \alpha_f + \beta_f \hat{f}_{i,s} + \gamma_{i,f} + \epsilon_{i,s,f}. \quad (7)$$

Standardized β_τ = -0.33, significant at 1%.

Standardized β_f = -0.02, significant at 10%.

Counterfactual Predictions

	Original home bias (1)	No transaction costs (2)	No information frictions (3)
$\bar{HB}_{i,s}$	0.291	0.096	0.260
$\bar{HB}_i$	0.438	0.418	0.419

▸ Robustness

Outline

Conclusion

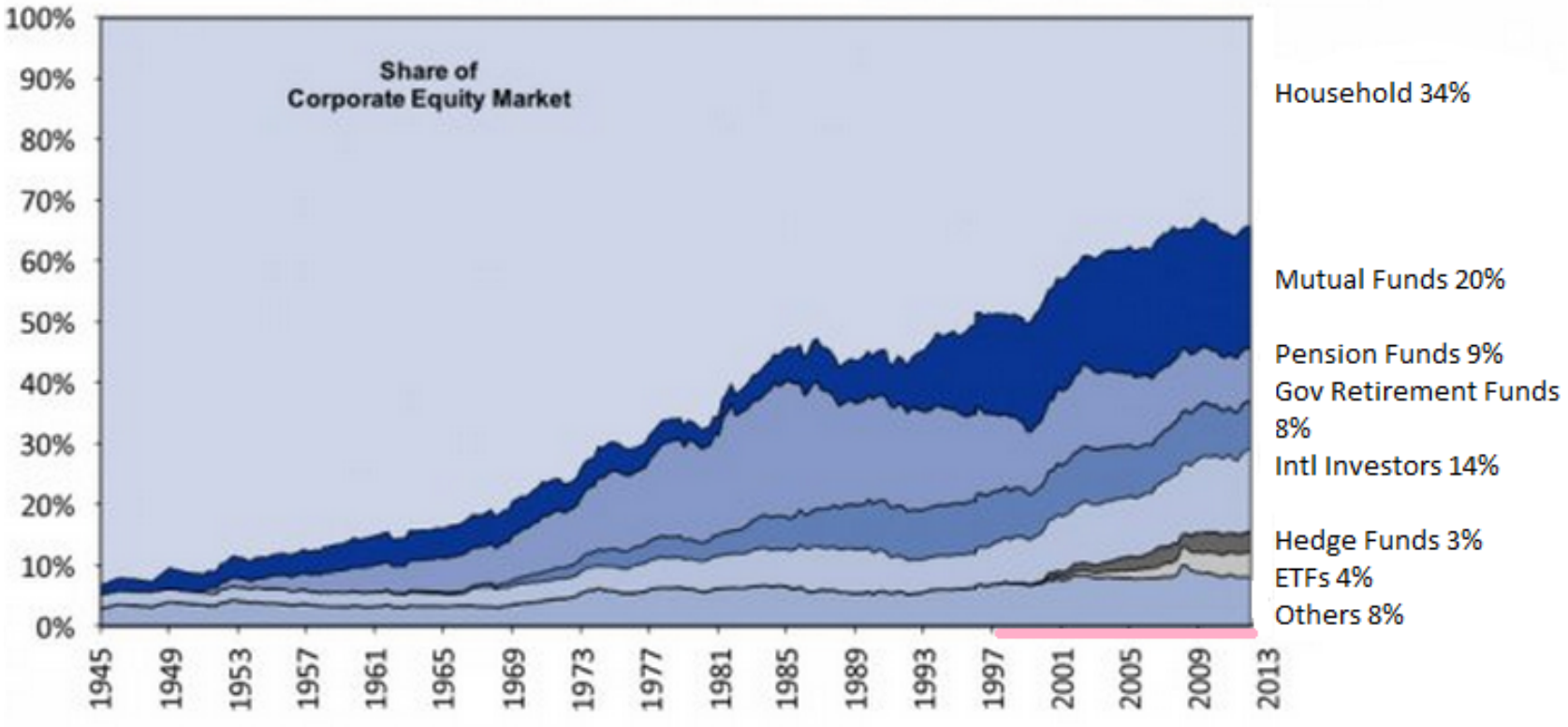
Summary

- Compute a sectoral home bias index using financial datasets
- Empirically identify the determinants of home bias
- Develop a multi-sector model to explain the effects of frictions on portfolio choice
- Quantify frictions in a calibrated DSGE model

Future Research

- Use micro-level data to exploit variations across holders and assets
- Introduce debt and examine investors' preferences between different types of assets

Ownership Share of Equity Market



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Top Twenty US Institutional Investors (2014Q3)

Name	Equity Assets ($)	Location
The Vanguard Group, Inc.	1,607,502,939,834	PA
BlackRock Fund Advisors	1,216,454,636,413	CA
SSgA Funds Management, Inc.	1,000,113,734,436	MA
Fidelity Management & Research Co.	818,423,292,122	MA
T. Rowe Price Associates, Inc.	505,493,540,323	MD
Capital Research & Management Co.	458,524,984,616	CA
Wellington Management Co. LLP	410,550,019,151	MA
Capital Research & Management Co.	405,170,640,206	CA
Northern Trust Investments, Inc.	343,990,576,944	IL
Massachusetts Financial Services Co.	267,025,899,324	MA
JPMorgan Investment Management, Inc.	247,083,106,467	NY
Dimensional Fund Advisors LP	234,054,032,158	TX
BlackRock Advisors LLC	193,125,056,156	NY
Mellon Capital Management Corp.	191,980,125,222	CA
TIAA-CREF Investment Management LLC	187,726,247,974	NY
Geode Capital Management LLC	173,264,747,809	MA
Invesco Advisers, Inc.	170,566,991,974	GA
Columbia Management Investment Advisers LLC	155,105,284,565	MA
Dodge & Cox	153,491,210,142	CA
OppenheimerFunds, Inc.	147,243,417,222	NY

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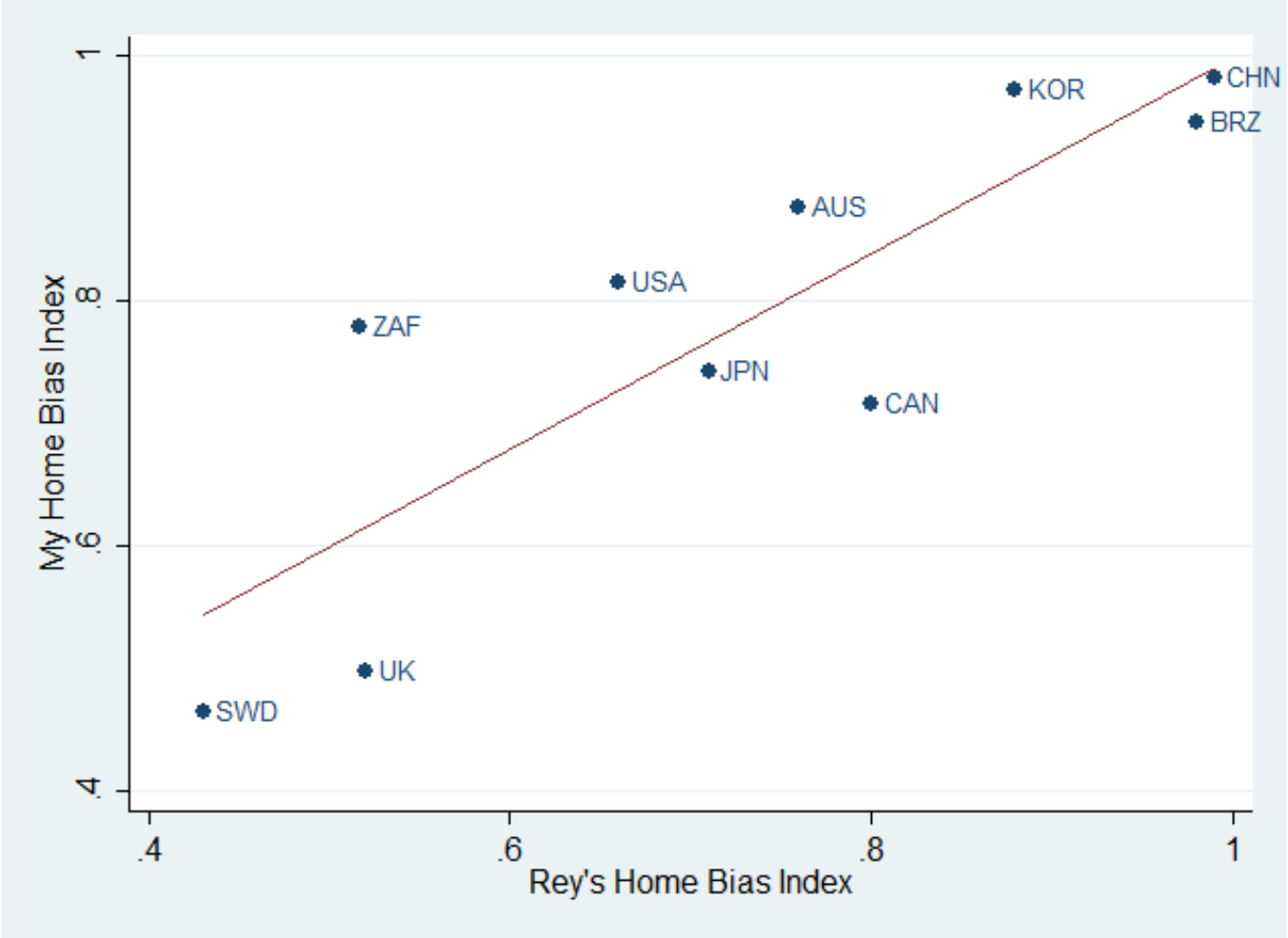
National HB based on Factset Data versus that based on IFS



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Robustness check for sectoral tradability and sectoral HB

Dep. Var: Sectoral HB	Export-based tradability		Import-based tradability	
	(1)	(2)	(3)	(4)
Tradability	-0.181 ***	-0.194 ***	-0.306 ***	-0.328 ***
	(0.029)	(0.021)	(0.033)	(0.023)
Country FE	N	Y	N	Y
Time FE	N	Y	N	Y
Observations	11,795	11,795	11,795	11,795
R^2	0.003	0.506	0.007	0.510

Robust standard errors in parentheses.***significant at 1%.

Measure of tradability based on WIOD data —
Export-based: sectoral exports/total sectoral use (EXP/USE bas)
Import-based: sectoral imports/total sectoral supply (IMP/SUP bas)

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Robustness check for time trend and sectoral HB

Dep. Var: Sectoral HB	(1)	(2)	(3)
Year	-0.006 ***	0.023 ***	-0.004 **
	(0.001)	(0.003)	(0.002)
Chinn-Ito		27.243 ***	
		(6.044)	
Year × Chinn-Ito		-0.014 ***	
		(0.003)	
Tradable dummy			7.583 *
			(4.360)
Year × tradable dummy			-0.004 *
			(0.002)
Country FE	Y	N	Y
Sector FE	Y	Y	N

Robust standard errors in parentheses.***significant at 1%, **significant at 5%, *significant at 10%.

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Estimated Transaction Costs

Country	$\hat{\tau}_i$	Country	$\hat{\tau}_i$
Australia	3.07E-05	Malaysia	1.05E-05
Austria	-8.66E-06	Mexico	-6.78E-07
Bahrain	3.24E-06	Netherlands	-3.93E-06
Belgium	-8.20E-05	New Zealand	8.11E-06
Brazil	2.25E-05	Norway	-9.89E-06
Canada	-8.06E-06	Philippines	4.49E-06
Chile	5.86E-08	Poland	1.03E-05
China	8.00E-06	Portugal	-2.01E-05
Hong Kong	-1.08E-05	Korea	3.64E-06
Czech	-1.16E-05	Romania	5.19E-05
Denmark	-8.16E-06	Russia	6.10E-04
Finland	-5.71E-06	Singapore	-2.35E-05
France	3.90E-06	Slovenia	7.78E-06
Germany	-5.30E-06	South Africa	9.73E-06
Greece	1.88E-07	Spain	-1.59E-05
Hungary	-2.23E-05	Sweden	-3.94E-05
Ireland	-3.21E-05	Switzerland	-1.80E-05
Israel	-9.99E-07	United States	9.52E-06
Japan	-3.67E-06	U.A.E.	1.69E-06
Kuwait	-7.30E-05	United Kingdom	-1.94E-05
Luxemboug	-2.74E-05		

Estimated Average Information Frictions

Sector Code	Sector Name	$\bar{f}_{i,s}$
1	Food	1.02E-04
2	Beverages	2.20E-05
3	Tobacco	-1.74E-05
4	Clothing & Accessories, Footwear	-1.89E-05
5	Forestry	1.00E-07
6	Paper	-4.26E-06
7	Oil & Gas Producers,Coal	-1.25E-04
8	Chemicals	-5.44E-05
9	Pharmaceuticals	1.73E-04
10	Iron & Steel	-1.36E-05
11	Nonferrous Metals	1.33E-04
12	Electronics & Electrical Equipment	-2.12E-05
13	Industrial Machinery	-1.22E-05
14	Automobiles & Parts	4.68E-06
15	Furnishings	-1.23E-06

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Computation Robustness

- Trade Imbalances

$$X_{i,t} = w_{i,t} L_{i,t} + r_{i,t} K_{i,t} - D_{i,t}. \tag{8}$$

- Input-output Linkages for Intermediate Inputs

$$c_{i,k} = (r_i^{\alpha_k} w_i^{1-\alpha_k})^{\nu_k} (\Pi_n (P_{i,n})^{\gamma_{kn}})^{1-\nu_k}, \tag{9}$$

	Observed home bias	Counterfactual home bias					
		Baseline		Imbalances		I-O linkages	
Friction excluded		τ	f	τ	f	τ	f
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$H\bar{B}_{i,s}$	0.29	0.10	0.26	0.05	0.26	0.07	0.23
$H\bar{B}_i$	0.46	0.42	0.42	0.34	0.45	0.33	0.41

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Country and Sector List

Country/Region	Code	Country/Region	Code	Sector	Code
Australia	AU	Norway	NW	Food Producers	1
Austria	OE	Philippines	PH	Beverages	2
Bahrain	BA	Poland	PO	Tobacco	3
Belgium	BG	Portugal	PT	Clothing & Accessories, Footwear	4
Brazil	BR	Qatar	QA	Forestry	5
Canada	CN	Romania	RM	Paper	6
Chile	CL	Russia	RS	Oil & Gas Producers,Coal	7
China	CA	Singapore	SG	Chemicals	8
Czech Republic	CZ	South Africa	SA	Pharmaceuticals	9
Denmark	DK	Slovenia	SL	Iron & Steel	10
Finland	FN	Spain	ES	Nonferrous Metals	11
France	FR	Sweden	SD	Electronics & Electric Equipement	12
Germany	BD	Switzerland	SW	Industrial Machinery	13
Greece	GR	Taiwan	TA	Automobiles & Parts	14
Hong Kong	HK	U.A.E.	AE	Furnishings	15
Hungary	HN	United Kingdom	UK	Utilities	16
Ireland	IR	United States	US	Heavy Construction	17
Israel	IS			Retail	18
Italy	IT			Real Estate	19
Japan	JP			Trucking ; Railroads	20
Korea	KO			Marine Transportation	21
Kuwait	KW			Airlines	22
Luxembourg	LX			Restaurants & Bars; Hotels	23
Malaysia	MY			Publishing	24
Mexico	MX			Broadcasting & Entertainment	25
Netherlands	NL			Telecommunications	26
New Zealand	NZ			Finance	27

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