Household Finance
PhD Course

Portfolio Tilts

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Outline: Portfolio Tilts

- Portfolio tilts
  - Private information
  - Hedging
  - Non-standard preferences
- The value tilt
  - Rational theories
  - Behavioral Theories
- Evidence
- The value ladder
- Hedging

Household Portfolio Tilts: Information

Why do households take idiosyncratic risk?

- Information, Preferences, Hedging
- Information
  - Brennan (75), Merton (87): investors are not aware of all investment opportunities => market portfolio not efficient
  - Uppal and Wang (03): small differences in ambiguity aversion imply heavily tilted portfolios
  - Van Nieuwerburgh and Veldkamp (2009): endogenous information acquisition implies portfolios with two components: one fully diversified, the other with assets on which the investor has competitive advantage in learning
  - Peer effects? Arrondel et al. (2022)

Household Portfolio Tilts: Preferences

- Preferences
  - Huberman (01): investors have a taste for familiar assets, for example because they are professionally or geographically close, whether or not they represent a profitable investment. Boyle, Uppal, and Wang (2010) formalize the idea with ambiguity aversion preferences
  - Barberis and Huang (2008) and Polkovnichenko (2005): prospect theory and rank dependent utility implies preference for assets with positively skewed returns
  - Mitton and Vorkink (2007): introduce preference for skewness
  - Fama and French (2007) study the cross sectional asset pricing implications of a group of investors that have a preference for a subset of assets
  - Roussanov (2010): concern for social status generates preference for idiosyncratic risk in order to "get ahead of the Joneses"
  - Brunnermeier, Gollier, and Parker (2007): Anticipatory utility – optimism is tempered by the ex-post cost of incorrect beliefs

HOUSEHOLD PORTFOLIO TILTS: HEDGING

- Hedging
  - Duffie et al. (1997), Cochrane (2008): investors should tilt their to reduce their exposure to those assets that are correlated with their own endowment risk, most notably their human capital
  - DeMarzo, Kaniel, and Kremer (2004): limited resources might induce agents to rationally invest in assets positively correlated with their own endowment risk in order to hedge their relative wealth in the local community. Local goods and services in limited supply have prices that are increasing in aggregate wealth, hence financial assets whose payoffs are correlated with total wealth are highly valuable to local investors.

Household Portfolio Tilts: Evidence

- Familiarity
  - Large literature: Barber and Odean (2008), Grinblatt and Keloharju (2001), Ivkovic, Sialm, and Weisbenner (2008); Ivkovic and Weisbenner (2005); Massa and Simonov (2006), Døskeland and Hvide (2011), Seasholes and Zhu (2010), Keloharju, Knupfer, and Linnainmaa (2012)
- Hedging
  - Korniotis, Bonaparte, and Kumar (2014), Addoum, Delikouras, Korniotis and Kumar (forthcoming JF), Korniotis, Bonaparte, and Kumar (2018).
- Peer Effects
  - Knupfer, Rantapuska, and Sarvimäki (2017)
  - Bekaert, Hoyem, Hu, and Ravina (2017)

VALUE PREMIUM

Pervasive evidence that value stocks outperform growth stocks around the world (Basu 1977, Fama and French 1992)

- **Risk-based view:** Value premium is a compensation for the higher systematic risk exposure of value stocks
  - Jagannathan Wang 96, Cochrane 99, Campbell and Vuolteenaho 04, Lettau Ludvigson 01, Bansal Dittmar Lundblad 05, Petkova Zhang 05

- **Sentiment view:** Investors are irrationally exuberant about the prospects of glamour stocks
  - Lakonishok Shleifer Vishny 94, Daniel Hirshleifer Subrahmanyam 98

Who are the Value and Growth Investors?

- Disentangling theories of the value premium is challenging empirically
  - previous research focuses primarily on stock returns, and their links to macro and corporate data
- **Idea is to use the rich information in investor portfolio data**
  - administrative panel containing the portfolio holdings and socioeconomic characteristics of all Swedish residents 1999-2007
  - map the landscape of investor value and growth portfolio tilt
  - Relate findings to the portfolio implications of asset pricing theories

OUTLINE

1. Theoretical motivation
2. Data and definition of variables
3. Value and growth investors
4. Active management of the value tilt
5. Robustness checks

2. THEORETICAL MOTIVATION

Risk-Based View

The value premium is a compensation for systematic risk

- **cash-flow risk ("bad beta")**

  Campbell Vuolteenaho 04, Campbell Polk Vuolteenaho 10, Lettau Wachter 07

- **recession risk**

  Cochrane 99, Campbell Giglio Polk 13, Zhang 05, Petkova Zhang 05

- **long-run consumption risk**

  Lettau Ludvigson 01, Bansal Dittmar Lundblad 05, Hansen Heaton Li 08

- **displacement risk**

  Garleanu Kogan Panageas 11

Implications for portfolio choice?

Inter-temporal Hedging Demand

Intertemporal hedging demand (Merton, 1973)

- When returns are not i.i.d., investment opportunities (i.e. Sharpe ratios) are time-varying and investors have an additional hedging demand
  - **Larger for more risk averse investors**
  - **Larger for long term investors**

- $V(W_t,P_t,t)$ value function, P price vector, W is wealth

$$w_t = \underbrace{-\frac{V_W}{W_t V_{WW}}}_{1/RRA}\Omega_t^{-1}E_t(r^e) \underbrace{-\frac{V_W}{W_t V_{WW}}}_{1/RRA}\underbrace{\frac{V_{WP}}{V_W}}_{\text{Effect on MU of wealth of changes in investment opportunities}} I_{P_t}$$

- Assets whose prices have a larger effect on MU, have a larger demand

VALUE TILT: HEDGING INCOME RISK

Investors should **hedge** their non-tradable endowment

- Households with **income risk more exposed to HML**, should tilt their portfolios towards growth
- "Investors with income particularly vulnerable during **recessions** will avoid stocks that fall more than average during recessions"
  - Cochrane 11, Campbell Giglio Polk 13
- **Value** stocks are exposed to the **irreversibility** of physical capital, particularly risky during deep recessions, **physical and human capital are correlated** at the macro level
  - Baxter Jermann 97
- **Displacement risk** of human capital larger for value stocks
  - Garleanu Kogan Panageas 11

Portfolio Implications

Inter-temporal hedging

Value stocks are bad hedges to changes in investment opportunities

Value investors are
- Older
- Wealthier
- less levered
- lower income risk
- higher human capital

Hedging income risk

Value stocks more sensitive to displacement and recession risk

Value investors have
- lower beta of income risk to aggregate income or HML itself
- lower human capital

SENTIMENT VIEW

- Investors are **irrationally exuberant** about the prospects of growth stocks
  - glamour stocks following series of good news
  - evidence from surveys
    - LaPorta 96, LaPorta Lakonishok Shleifer Vishney 97, Greenwood Shleifer 13
- **Growth investors**
  - less sophisticated (less educated, poorer), less experienced in financial markets
  - more prone to overconfidence (males, entrepreneurs)

2. DATA AND DEFINITION OF VARIABLES

Local Asset Pricing Factors

- **Data on Nordic stock returns**
  - monthly data from 1985 to 2009
  - universe: 1000 stocks (743 from SSE, HEX, CSE, OSE in 2003)
  - market portfolio: SIX return index
- **Unconditional 4-factor pricing model**
  - standard methodology as in Fama French 93, Carhart 97
  - unconditional version shuts down HML migration over time within firms
  - for each asset *i* we estimate

$$r_{i,t} = a_i + b_i MKT_t + v_i HML_t + s_i SMB_t + m_i MOM_t + u_{i,t}$$

Value Loadings of a Portfolio

$$v_{h,t} = \sum_i w_{h,i,t} \; v_i$$

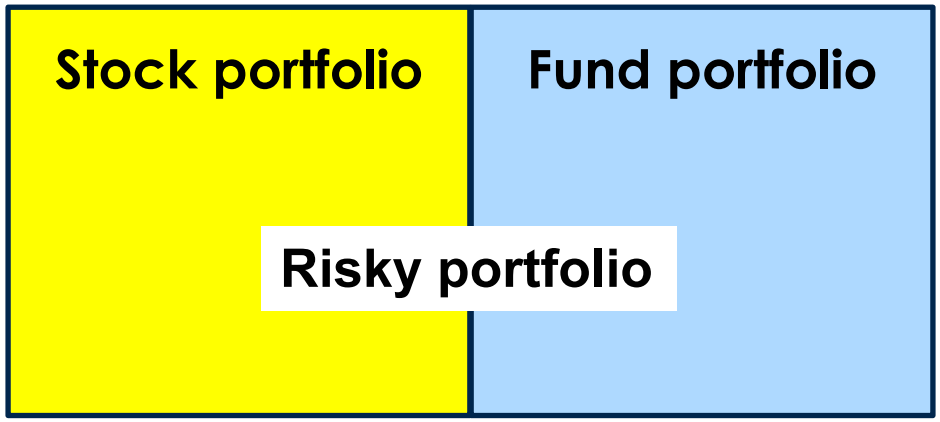
Where:

- $w_{h,i,t}$ is household *h*'s portfolio share of asset *i* at date *t*
- v_i is the value loading of asset *i*

The method allows us to take advantage of the long time series of asset returns.

Changes in loadings are driven only by changes in portfolio weights

PORTFOLIOS



3. VALUE AND GROWTH INVESTORS

SUMMARY STATISTICS

FINANCIAL & DEMOGRAPHIC CHARACTERISTICS

Panel A: Financial and Demographic Characteristics

	All Participants		Fundholders		Stockholders		Stockholders Sorted By Number of Stocks Owned		
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	1-2 Mean	3-4 Mean	5+ Mean
Financial Characteristics									
Financial wealth ($)	48,849	121,578	50,614	121,099	66,478	152,690	37,123	60,091	126,493
Residential real estate wealth ($)	137,108	184,525	138,327	179,024	165,020	215,680	129,854	169,241	229,107
Commercial real estate wealth ($)	19,581	112,626	19,520	111,890	27,255	135,585	21,598	30,115	36,131
Leverage ratio	0.66	1.13	0.65	1.09	0.53	0.91	0.65	0.46	0.34
Human Capital and Income Risk									
Human capital ($)	955,680	515,879	972,402	513,389	993,114	545,932	929,517	1,030,770	1,089,285
Income ($)	46,184	31,316	46,785	30,687	50,066	37,029	44,902	51,133	59,183
Self-employment dummy	0.04	0.20	0.04	0.19	0.05	0.22	0.05	0.05	0.05
Unemployment dummy	0.08	0.27	0.07	0.26	0.07	0.25	0.08	0.06	0.05
Conditional income volatility	0.16	0.12	0.16	0.11	0.17	0.12	0.17	0.17	0.18
Demographic Characteristics									
Age	46.27	10.73	46.06	10.69	47.60	10.58	46.82	47.55	49.12
Male household head dummy	0.64	0.48	0.63	0.48	0.69	0.46	0.66	0.70	0.73
High school dummy	0.85	0.36	0.85	0.35	0.86	0.35	0.84	0.86	0.90
Post-high school dummy	0.37	0.48	0.37	0.48	0.42	0.49	0.35	0.42	0.53
Economics education dummy	0.12	0.32	0.12	0.32	0.13	0.34	0.12	0.14	0.16
Immigration dummy	0.08	0.27	0.08	0.26	0.08	0.27	0.08	0.09	0.07
Family size	2.53	1.40	2.61	1.40	2.52	1.37	2.42	2.56	2.69
Number of observations	71,639	71,639	62,972	62,972	42,153	42,153	22,522	7,786	11,845

Financial & Demographic Characteristics

The **average risky asset market participant** is 46 and has

- $ 50,000 in liquid financial wealth
- $155,000 in real estate wealth
- $955,000 in human capital

Direct stockholders

- $65,000 in liquid financial wealth
- $190,000 in real estate wealth

Households with **1 or 2 stocks** have

- $ 35,000 in liquid financial wealth

Households with **5 stocks or more** have

- $125,000 in liquid financial wealth

PORTFOLIO CHARACTERISTICS

Panel B: Portfolio Characteristics

	All Participants		Fundholders		Stockholders		Stockholders Sorted By Number of Stocks Owned		
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	1-2 Mean	3-4 Mean	5+ Mean
Portfolio Characteristics									
Risky share	0.40	0.27	0.42	0.26	0.46	0.27	0.37	0.49	0.61
Share of direct stockholdings in risky portfolio	0.29	0.37	0.19	0.28	0.49	0.37	0.44	0.48	0.58
Share of popular stocks	0.71	0.37	0.71	0.36	0.71	0.37	0.79	0.71	0.57
Share of professionally close stocks	0.16	0.32	0.16	0.31	0.16	0.32	0.15	0.17	0.18
Number of stocks	2.59	5.15	2.53	5.30	4.40	6.10	1.35	3.42	10.85
Number of funds	4.11	4.51	4.68	4.53	4.55	5.19	3.49	4.90	6.34
Share of Aggregate Wealth									
Risky portfolio	1.00		0.94		0.86		0.18	0.13	0.54
Stock portfolio	1.00		0.85		1.00		0.09	0.11	0.80
Fund portfolio	1.00		1.00		0.75		0.25	0.14	0.36
Number of observations	71,639	71,639	62,972	62,972	42,153	42,153	22,522	7,786	11,845

The average risky asset market participant

- has a risky share of 40%
- owns 4 funds and 2-3 stocks
- has a strong bias toward popular stocks (71%)
- invests 16% of stock portfolio in professionally-close stocks

PORTFOLIO CHARACTERISTICS

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Households with 1 or 2 stocks

- have lower risky shares
- are more tilted toward popular stocks
- represent the majority of stockholders
- own directly only 9% of the equity market held by households

PORTFOLIO CHARACTERISTICS

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Stockholders with 5+ stocks

- represent 16% of risky asset market participants
- own the bulk of aggregate equity held by household

  54% of risky assets, 81% of direct stock-holdings, 35% of equity funds

Cross-Sectional Distribution of the Value Tilt

Determinants of the Value Tilt

Run panel regressions of value tilt on characteristics

	Dependent Variable: Value Loading						Dependent Variable:	
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)		Risky Share (4)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics								
Log financial wealth	0.017	12.44	0.050	16.15	0.012	14.57	0.095	135.95
Log residential real estate	0.001	1.75	0.003	4.55	0.000	-0.27	0.000	3.32
Log commercial real estate	0.001	3.97	0.007	12.36	0.000	0.43	-0.002	-11.89
Leverage ratio	0.000	0.30	-0.008	-1.73	-0.001	-0.98	-0.008	-14.46
Human Capital and Income Risk								
Log human capital	-0.052	-9.50	-0.103	-9.50	-0.021	-6.63	0.016	5.92
Log income	-0.046	-11.35	-0.044	-5.75	-0.029	-12.87	-0.062	-29.50
Self-employment dummy	-0.034	-4.41	-0.037	-2.66	-0.011	-2.62	-0.047	-13.49
Unemployment dummy	-0.017	-3.99	-0.021	-2.03	-0.005	-1.97	-0.012	-5.92
Conditional income volatility	-0.353	-21.84	-0.338	-10.98	-0.116	-13.28	-0.062	-9.24
Demographic Characteristics								
Age	0.003	16.02	0.009	23.50	0.001	5.53	-0.002	-26.14
Male household head dummy	-0.062	-18.48	-0.106	-13.57	-0.013	-5.85	0.014	8.62
High school dummy	-0.014	-3.38	-0.035	-3.43	-0.006	-2.16	0.023	11.20
Post-high school dummy	-0.016	-4.64	0.016	2.00	-0.015	-6.89	0.034	19.95
Economics education dummy	-0.027	-5.94	-0.011	-1.09	-0.014	-4.76	0.011	4.69
Immigration dummy	-0.066	-11.13	-0.135	-10.33	-0.003	-0.95	-0.007	-2.61
Family size	0.036	24.60	0.024	7.42	0.017	19.23	-0.007	-10.44
Adjusted R^2	2.37%		3.95%		0.94%		16.57%	
Number of observations	589,561		331,693		523,798		589,561	

Year, county, industry fixed effects

Determinants of the Value Tilt

Value investors have higher financial wealth

	Dependent Variable: Value Loading						Dependent Variable:	
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)		Risky Share (4)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
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Determinants of the Value Tilt

Value investors have lower human capital and lower income risk

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WHAT ABOUT HUMAN CAPITAL?

- **Positive effect on financial risk taking**
  - as theory predicts

    Calvet Sodini 14
- **HML tilt? Theoretically challenging**
  - **source of wealth** → value tilt
  - **correlation with physical capital** → growth tilt

    Baxter Jermann 97, Garleanu Kogan Panageas 12
- **Empirically: human capital leads to a growth tilt**
  - effect is robust and significant
  - guide for future research

DETERMINANTS OF THE VALUE TILT

Value investors are **older**

	Dependent Variable: Value Loading						Dependent Variable:	
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)		Risky Share (4)	
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Unemployment dummy	-0.017	-3.99	-0.021	-2.03	-0.005	-1.97	-0.012	-5.92
Conditional income volatility	-0.353	-21.84	-0.338	-10.98	-0.116	-13.28	-0.062	-9.24
Demographic Characteristics								
Age	0.003	16.02	0.009	23.50	0.001	5.53	-0.002	-26.14
Male household head dummy	-0.062	-18.48	-0.106	-13.57	-0.013	-5.85	0.014	8.62
High school dummy	-0.014	-3.38	-0.035	-3.43	-0.006	-2.16	0.023	11.20
Post-high school dummy	-0.016	-4.64	0.016	2.00	-0.015	-6.89	0.034	19.95
Economics education dummy	-0.027	-5.94	-0.011	-1.09	-0.014	-4.76	0.011	4.69
Immigration dummy	-0.066	-11.13	-0.135	-10.33	-0.003	-0.95	-0.007	-2.61
Family size	0.036	24.60	0.024	7.42	0.017	19.23	-0.007	-10.44
Adjusted R^2	2.37%		3.95%		0.94%		16.57%	
Number of observations	589,561		331,693		523,798		589,561	

Year, county, industry fixed effects

DETERMINANTS OF THE VALUE TILT

Q: **Real estate and leverage**, source of wealth or risk?

	Dependent Variable: Value Loading						Dependent Variable:	
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)		Risky Share (4)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics								
Log financial wealth	0.017	12.44	0.050	16.15	0.012	14.57	0.095	135.95
Log residential real estate	0.001	1.75	0.003	4.55	0.000	-0.27	0.000	3.32
Log commercial real estate	0.001	3.97	0.007	12.36	0.000	0.43	-0.002	-11.89
Leverage ratio	0.000	0.30	-0.008	-1.73	-0.001	-0.98	-0.008	-14.46
Human Capital and Income Risk								
Log human capital	-0.052	-9.50	-0.103	-9.50	-0.021	-6.63	0.016	5.92
Log income	-0.046	-11.35	-0.044	-5.75	-0.029	-12.87	-0.062	-29.50
Self-employment dummy	-0.034	-4.41	-0.037	-2.66	-0.011	-2.62	-0.047	-13.49
Unemployment dummy	-0.017	-3.99	-0.021	-2.03	-0.005	-1.97	-0.012	-5.92
Conditional income volatility	-0.353	-21.84	-0.338	-10.98	-0.116	-13.28	-0.062	-9.24
Demographic Characteristics								
Age	0.003	16.02	0.009	23.50	0.001	5.53	-0.002	-26.14
Male household head dummy	-0.062	-18.48	-0.106	-13.57	-0.013	-5.85	0.014	8.62
High school dummy	-0.014	-3.38	-0.035	-3.43	-0.006	-2.16	0.023	11.20
Post-high school dummy	-0.016	-4.64	0.016	2.00	-0.015	-6.89	0.034	19.95
Economics education dummy	-0.027	-5.94	-0.011	-1.09	-0.014	-4.76	0.011	4.69
Immigration dummy	-0.066	-11.13	-0.135	-10.33	-0.003	-0.95	-0.007	-2.61
Family size	0.036	24.60	0.024	7.42	0.017	19.23	-0.007	-10.44
Adjusted R^2	2.37%		3.95%		0.94%		16.57%	
Number of observations	589,561		331,693		523,798		589,561	

Year, county, industry fixed effects

Determinants of the Value Tilt

- Value investors have more real estate wealth & are less levered
- Investors with less equity in their real estate move away from value

Panel A: Real Estate Interacted with Leverage

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Log residential real estate	0.000	0.96	0.002	3.25	0.000	-0.55
Log commercial real estate	0.000	1.13	0.006	8.42	0.000	-1.11
Log residential real estate × Leverage ratio	-0.001	-3.81	-0.004	-4.75	0.000	-1.25
Log commercial real estate × Leverage ratio	-0.002	-5.23	-0.003	-3.10	-0.001	-3.76
Leverage ratio	-0.011	-3.91	-0.040	-5.25	-0.004	-2.11

Panel B: Family Size Variables

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Dummy for having children	0.087	17.21	0.028	2.17	0.03	8.20
Dummy for having twins	-0.020	-2.63	-0.039	-1.83	-0.01	-1.15

DETERMINANTS OF THE VALUE TILT

Q: **Family size**: source of risk or selection bias?

	Dependent Variable: Value Loading						Dependent Variable:	
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)		Risky Share (4)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics								
Log financial wealth	0.017	12.44	0.050	16.15	0.012	14.57	0.095	135.95
Log residential real estate	0.001	1.75	0.003	4.55	0.000	-0.27	0.000	3.32
Log commercial real estate	0.001	3.97	0.007	12.36	0.000	0.43	-0.002	-11.89
Leverage ratio	0.000	0.30	-0.008	-1.73	-0.001	-0.98	-0.008	-14.46
Human Capital and Income Risk								
Log human capital	-0.052	-9.50	-0.103	-9.50	-0.021	-6.63	0.016	5.92
Log income	-0.046	-11.35	-0.044	-5.75	-0.029	-12.87	-0.062	-29.50
Self-employment dummy	-0.034	-4.41	-0.037	-2.66	-0.011	-2.62	-0.047	-13.49
Unemployment dummy	-0.017	-3.99	-0.021	-2.03	-0.005	-1.97	-0.012	-5.92
Conditional income volatility	-0.353	-21.84	-0.338	-10.98	-0.116	-13.28	-0.062	-9.24
Demographic Characteristics								
Age	0.003	16.02	0.009	23.50	0.001	5.53	-0.002	-26.14
Male household head dummy	-0.062	-18.48	-0.106	-13.57	-0.013	-5.85	0.014	8.62
High school dummy	-0.014	-3.38	-0.035	-3.43	-0.006	-2.16	0.023	11.20
Post-high school dummy	-0.016	-4.64	0.016	2.00	-0.015	-6.89	0.034	19.95
Economics education dummy	-0.027	-5.94	-0.011	-1.09	-0.014	-4.76	0.011	4.69
Immigration dummy	-0.066	-11.13	-0.135	-10.33	-0.003	-0.95	-0.007	-2.61
Family size	0.036	24.60	0.024	7.42	0.017	19.23	-0.007	-10.44
Adjusted R^2	2.37%		3.95%		0.94%		16.57%	
Number of observations	589,561		331,693		523,798		589,561	

Year, county, industry fixed effects

Determinants of the Value Tilt

A: Households with twin twins move away from value

Panel A: Real Estate Interacted with Leverage						
	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Log residential real estate	0.000	0.96	0.002	3.25	0.000	-0.55
Log commercial real estate	0.000	1.13	0.006	8.42	0.000	-1.11
Log residential real estate × Leverage ratio	-0.001	-3.81	-0.004	-4.75	0.000	-1.25
Log commercial real estate × Leverage ratio	-0.002	-5.23	-0.003	-3.10	-0.001	-3.76
Leverage ratio	-0.011	-3.91	-0.040	-5.25	-0.004	-2.11
Panel B: Family Size Variables						
	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Dummy for having children	0.087	17.21	0.028	2.17	0.03	8.20
Dummy for having twins	-0.020	-2.63	-0.039	-1.83	-0.01	-1.15

Determinants of the Value Tilt

Households in sectors **more exposed to HML** tilt towards growth

	Dependent Variable: Value Loading						Dependent Variable:	
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)		Risky Share (4)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics								
Log financial wealth	0,017	12,24	0,050	15,85	0,012	14,30	0,095	134,31
Log residential real estate	0,001	2,08	0,003	4,64	0,000	0,48	0,000	2,71
Log commercial real estate	0,001	3,31	0,007	11,57	0,000	0,26	-0,002	-11,43
Leverage ratio	0,001	0,36	-0,007	-1,67	-0,001	-0,70	-0,008	-13,78
Human Capital and Income Risk								
Log human capital	-0,060	-9,91	-0,110	-9,24	-0,027	-7,55	0,024	8,02
Log income	-0,040	-8,79	-0,038	-4,28	-0,025	-9,45	-0,074	-30,49
Self-employment dummy	-0,030	-3,63	-0,033	-2,21	-0,006	-1,33	-0,062	-15,97
Unemployment dummy	-0,014	-3,29	-0,013	-1,22	-0,005	-1,65	-0,015	-7,26
Sector income beta to HML	-0,919	-5,70	-0,907	-2,18	-0,359	-3,33	0,042	0,48
Conditional idio. income volatility	-0,325	-20,27	-0,318	-10,23	-0,111	-12,67	-0,061	-9,04
Demographic Characteristics								
Age	0,002	11,51	0,008	19,59	0,000	2,44	-0,002	-19,77
Male household head dummy	-0,063	-18,25	-0,107	-13,35	-0,013	-5,78	0,015	8,49
High school dummy	-0,014	-3,24	-0,032	-3,11	-0,006	-2,03	0,023	11,10
Post-high school dummy	-0,014	-4,15	0,019	2,32	-0,014	-6,45	0,034	19,59
Economics education dummy	-0,027	-6,01	-0,011	-1,03	-0,014	-4,77	0,011	4,58
Immigration dummy	-0,064	-10,55	-0,132	-9,84	-0,004	-1,07	-0,007	-2,80
Family size	0,036	24,44	0,024	7,29	0,017	18,69	-0,006	-9,18
Adjusted R^2	2,13%		3,59%		0,88%		16,59%	
Number of observations	569 117		320 078		506 919		569 117	

Year, county, industry fixed effects

Determinants of the Value Tilt

HH in sectors **more exposed to aggregate income** tilt towards growth

	Dependent Variable: Value Loading						Dependent Variable:	
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)		Risky Share (4)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics								
Log financial wealth	0,017	12,26	0,050	15,86	0,012	14,31	0,095	134,30
Log residential real estate	0,001	2,12	0,003	4,65	0,000	0,49	0,000	2,70
Log commercial real estate	0,001	3,39	0,007	11,61	0,000	0,32	-0,002	-11,43
Leverage ratio	0,001	0,38	-0,007	-1,66	-0,001	-0,68	-0,008	-13,78
Human Capital and Income Risk								
Log human capital	-0,060	-9,91	-0,110	-9,24	-0,027	-7,54	0,024	8,03
Log income	-0,040	-8,78	-0,038	-4,28	-0,025	-9,48	-0,074	-30,51
Self-employment dummy	-0,030	-3,68	-0,033	-2,23	-0,006	-1,36	-0,061	-15,97
Unemployment dummy	-0,015	-3,30	-0,013	-1,22	-0,005	-1,65	-0,015	-7,26
Sector income beta to agg. Income	-0,057	-5,11	-0,062	-2,16	-0,015	-2,05	0,007	1,17
Conditional idio. income volatility	-0,325	-20,30	-0,319	-10,25	-0,111	-12,71	-0,061	-9,05
Demographic Characteristics								
Age	0,002	11,57	0,008	19,61	0,000	2,53	-0,002	-19,75
Male household head dummy	-0,063	-18,20	-0,107	-13,33	-0,012	-5,65	0,015	8,55
High school dummy	-0,013	-3,19	-0,032	-3,09	-0,005	-2,00	0,023	11,10
Post-high school dummy	-0,014	-4,14	0,019	2,33	-0,014	-6,44	0,034	19,59
Economics education dummy	-0,027	-6,00	-0,011	-1,02	-0,014	-4,78	0,011	4,57
Immigration dummy	-0,064	-10,60	-0,132	-9,86	-0,004	-1,10	-0,007	-2,80
Family size	0,036	24,46	0,024	7,26	0,017	18,76	-0,006	-9,12
Adjusted R^2	2,12%		3,59%		0,88%		16,59%	
Number of observations	569 117		320 078		506 919		569 117	

Year, county, industry fixed effects

DETERMINANTS OF THE VALUE TILT

Value investors are more likely to be **female**

	Dependent Variable: Value Loading						Dependent Variable:	
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)		Risky Share (4)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics								
Log financial wealth	0.017	12.44	0.050	16.15	0.012	14.57	0.095	135.95
Log residential real estate	0.001	1.75	0.003	4.55	0.000	-0.27	0.000	3.32
Log commercial real estate	0.001	3.97	0.007	12.36	0.000	0.43	-0.002	-11.89
Leverage ratio	0.000	0.30	-0.008	-1.73	-0.001	-0.98	-0.008	-14.46
Human Capital and Income Risk								
Log human capital	-0.052	-9.50	-0.103	-9.50	-0.021	-6.63	0.016	5.92
Log income	-0.046	-11.35	-0.044	-5.75	-0.029	-12.87	-0.062	-29.50
Self-employment dummy	-0.034	-4.41	-0.037	-2.66	-0.011	-2.62	-0.047	-13.49
Unemployment dummy	-0.017	-3.99	-0.021	-2.03	-0.005	-1.97	-0.012	-5.92
Conditional income volatility	-0.353	-21.84	-0.338	-10.98	-0.116	-13.28	-0.062	-9.24
Demographic Characteristics								
Age	0.003	16.02	0.009	23.50	0.001	5.53	-0.002	-26.14
Male household head dummy	-0.062	-18.48	-0.106	-13.57	-0.013	-5.85	0.014	8.62
High school dummy	-0.014	-3.38	-0.035	-3.43	-0.006	-2.16	0.023	11.20
Post-high school dummy	-0.016	-4.64	0.016	2.00	-0.015	-6.89	0.034	19.95
Economics education dummy	-0.027	-5.94	-0.011	-1.09	-0.014	-4.76	0.011	4.69
Immigration dummy	-0.066	-11.13	-0.135	-10.33	-0.003	-0.95	-0.007	-2.61
Family size	0.036	24.60	0.024	7.42	0.017	19.23	-0.007	-10.44
Adjusted R^2	2.37%		3.95%		0.94%		16.57%	
Number of observations	589,561		331,693		523,798		589,561	

Year, county, industry fixed effects

DETERMINANTS OF THE VALUE TILT

Value investors are **not better educated**

	Dependent Variable: Value Loading						Dependent Variable:	
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)		Risky Share (4)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics								
Log financial wealth	0.017	12.44	0.050	16.15	0.012	14.57	0.095	135.95
Log residential real estate	0.001	1.75	0.003	4.55	0.000	-0.27	0.000	3.32
Log commercial real estate	0.001	3.97	0.007	12.36	0.000	0.43	-0.002	-11.89
Leverage ratio	0.000	0.30	-0.008	-1.73	-0.001	-0.98	-0.008	-14.46
Human Capital and Income Risk								
Log human capital	-0.052	-9.50	-0.103	-9.50	-0.021	-6.63	0.016	5.92
Log income	-0.046	-11.35	-0.044	-5.75	-0.029	-12.87	-0.062	-29.50
Self-employment dummy	-0.034	-4.41	-0.037	-2.66	-0.011	-2.62	-0.047	-13.49
Unemployment dummy	-0.017	-3.99	-0.021	-2.03	-0.005	-1.97	-0.012	-5.92
Conditional income volatility	-0.353	-21.84	-0.338	-10.98	-0.116	-13.28	-0.062	-9.24
Demographic Characteristics								
Age	0.003	16.02	0.009	23.50	0.001	5.53	-0.002	-26.14
Male household head dummy	-0.062	-18.48	-0.106	-13.57	-0.013	-5.85	0.014	8.62
High school dummy	-0.014	-3.38	-0.035	-3.43	-0.006	-2.16	0.023	11.20
Post-high school dummy	-0.016	-4.64	0.016	2.00	-0.015	-6.89	0.034	19.95
Economics education dummy	-0.027	-5.94	-0.011	-1.09	-0.014	-4.76	0.011	4.69
Immigration dummy	-0.066	-11.13	-0.135	-10.33	-0.003	-0.95	-0.007	-2.61
Family size	0.036	24.60	0.024	7.42	0.017	19.23	-0.007	-10.44
Adjusted R^2	2.37%		3.95%		0.94%		16.57%	
Number of observations	589,561		331,693		523,798		589,561	

Year, county, industry fixed effects

DETERMINANTS OF THE VALUE TILT

Experience does not lead to a value tilt

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Initial value loading	0.351	35.77	0.470	34.01	0.126	29.09
Experience						
Number of participation years	-0.006	-4.07	-0.015	-2.46	-0.011	-11.42
Financial Characteristics						
Log financial wealth	0.018	7.24	0.075	12.57	0.002	1.29
Log residential real estate wealth	0.000	-0.24	0.003	2.07	-0.001	-4.79
Log commercial real estate wealth	0.001	1.73	0.007	7.11	0.000	0.10
Leverage ratio	0.004	1.23	0.010	0.93	0.000	0.23
Human Capital and Income Risk						
Log human capital	-0.079	-6.96	-0.140	-6.18	-0.021	-3.98
Log income	-0.004	-0.46	0.018	1.00	-0.014	-3.40
Self-employment dummy	-0.052	-3.93	-0.064	-2.45	-0.007	-1.18
Unemployment dummy	-0.026	-2.27	-0.032	-1.13	-0.001	-0.16
Conditional income volatility	-0.172	-6.09	-0.046	-0.83	-0.023	-1.75
Demographic Characteristics						
Age	0.001	1.49	0.005	5.90	0.001	4.13
Male household head dummy	-0.037	-7.36	-0.055	-4.45	-0.003	-0.91
High school dummy	-0.022	-3.50	-0.077	-4.63	-0.003	-0.78
Post-high school dummy	-0.010	-2.02	0.037	3.00	-0.015	-5.27
Economics education dummy	-0.036	-5.04	-0.009	-0.55	-0.019	-4.80
Immigration dummy	-0.073	-7.63	-0.133	-6.17	0.007	1.55
Family size	0.029	11.72	0.005	0.89	0.012	9.17
Adjusted R^2	15.15%		13.25%		6.12%	
Number of observations	50,818		27,701		45,257	

INTERPRETATION

- **Interterporal hedging - horizon effects**
  - value loading increases with age
  - consistent with Jurek Viceira 11
- **Interterporal hedging - risk aversion**
  - value loading goes up with financial & real estate wealth
  - value loading goes down with leverage, income risk & exposure to aggregate income
  - consistent with Munk (2008)

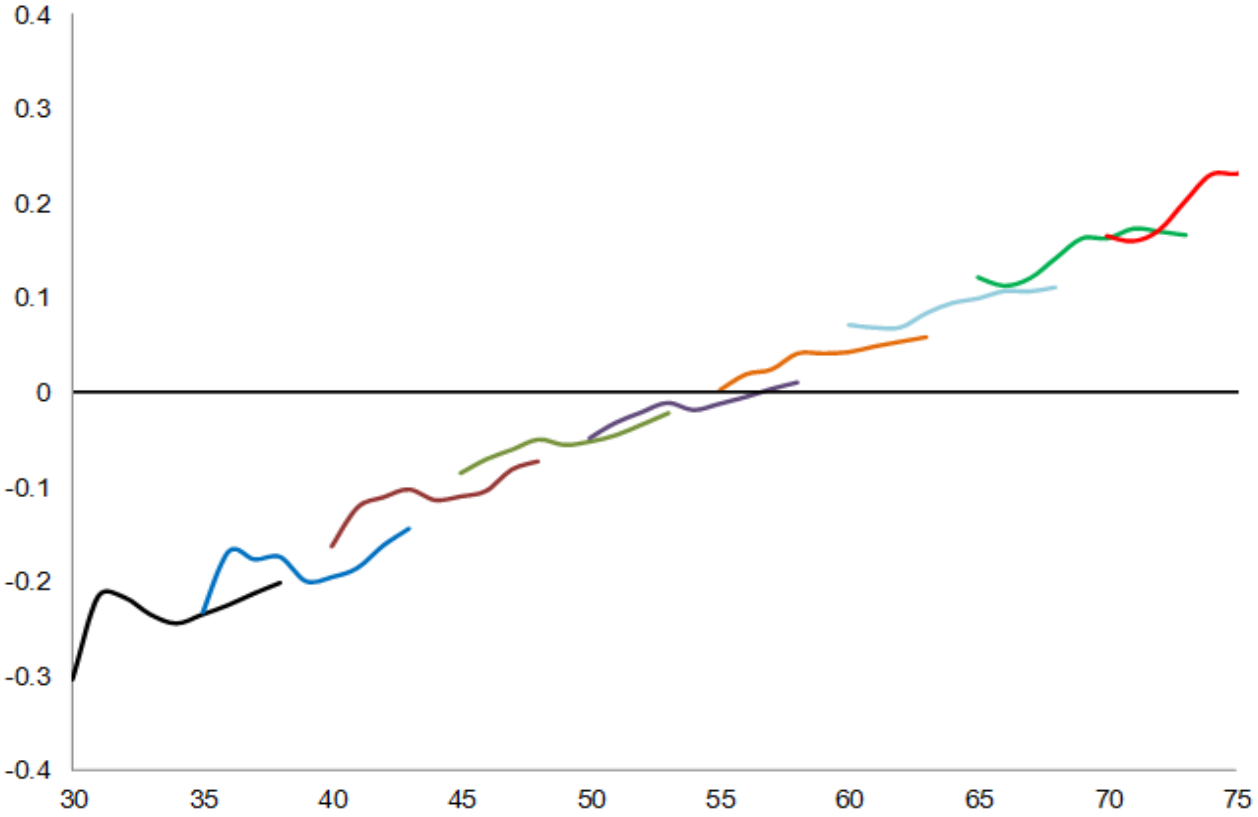
    risk aversion = f(wealth, background risk….)
- **Hedging income risk**
  - value loading increases with sector exposure to HML & to aggregate income, decreases with human capital

INTERPRETATION

- **Overconfidence**
  - males and entrepreneurs go growth
  - tilt toward popular stocks also consistent with biases
- **Education and financial experience**
  - more educated households do not have a value tilt
  - households with longer market participation have a more pronounced growth tilt
- Wealth is not a proxy for sophistication
- Age is not a proxy for experience

4. THE VALUE LADDER

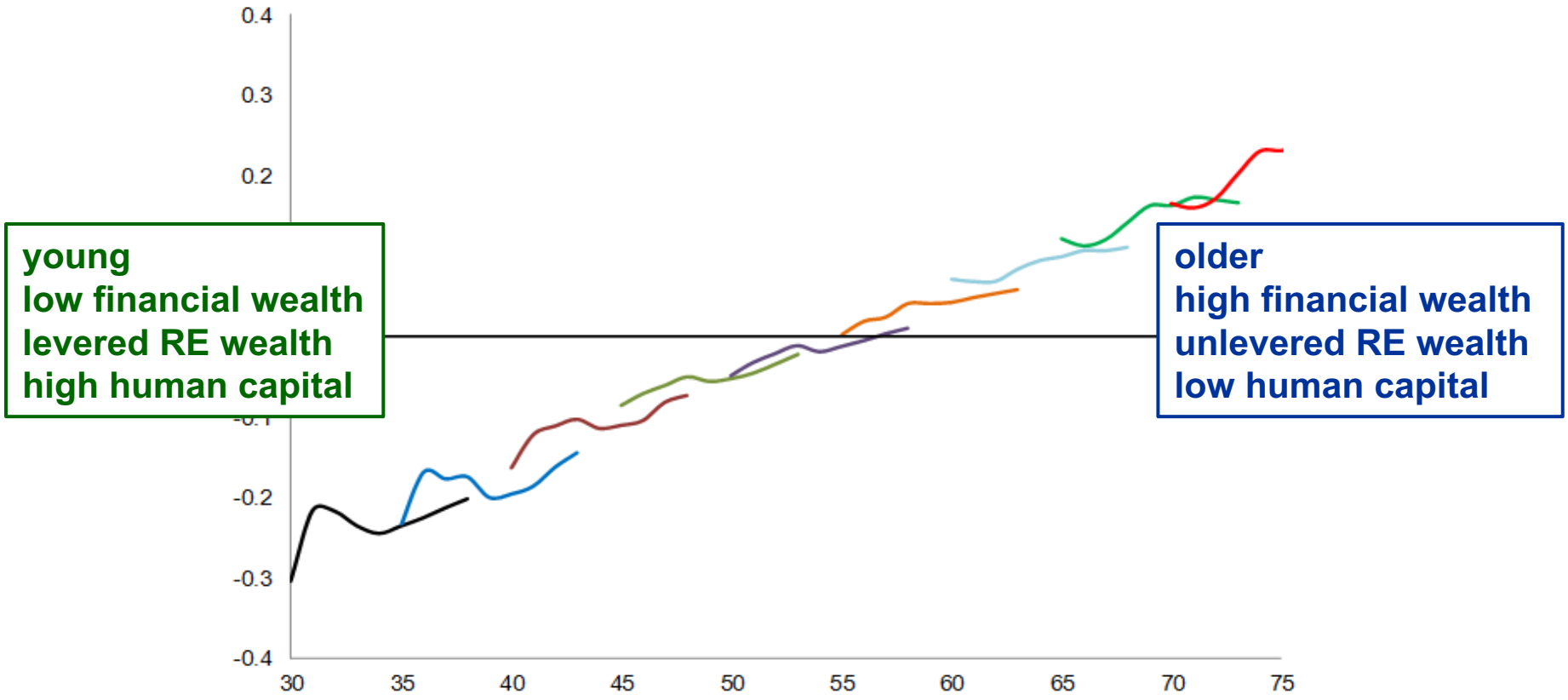
The Value Ladder



Age (beginning in 1999 for each cohort)

The Value Ladder

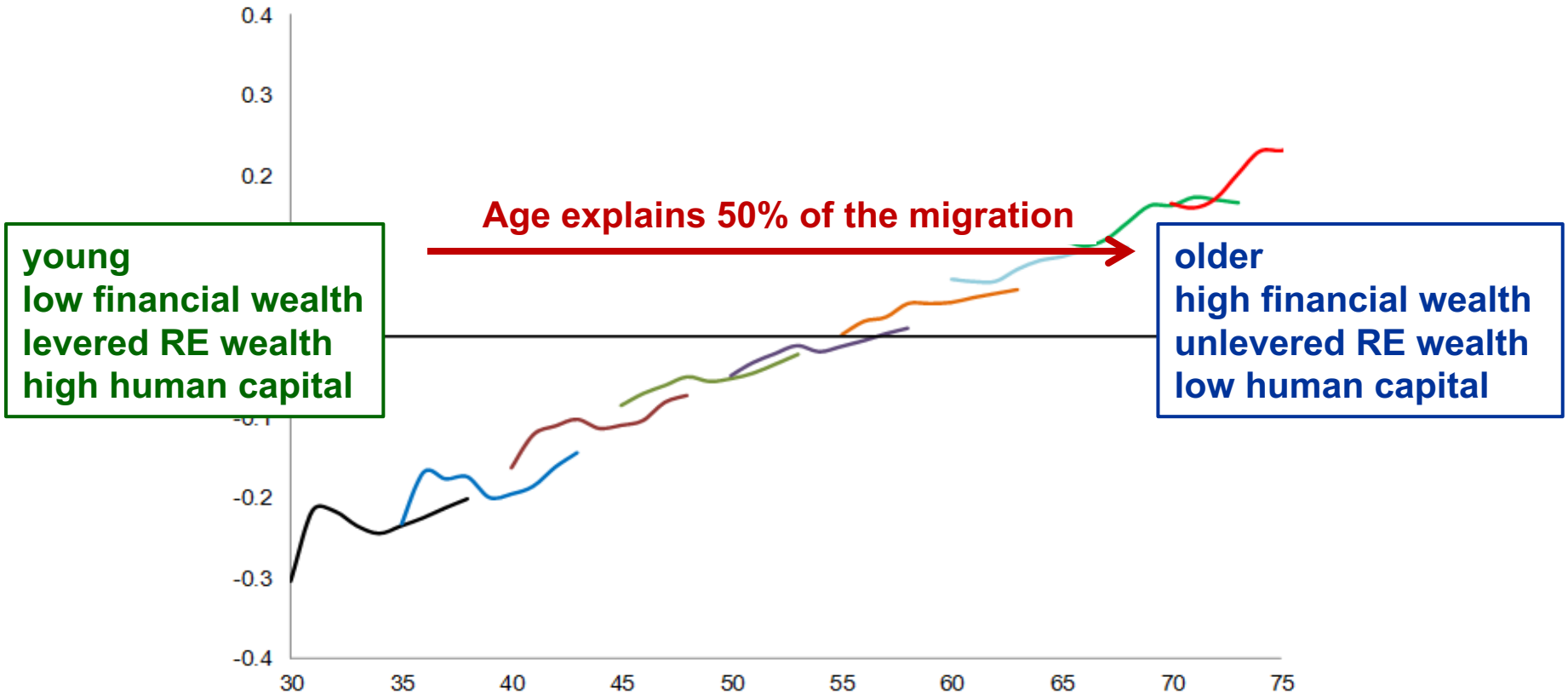
What drives the value ladder?



Age (beginning in 1999 for each cohort)

The Value Ladder

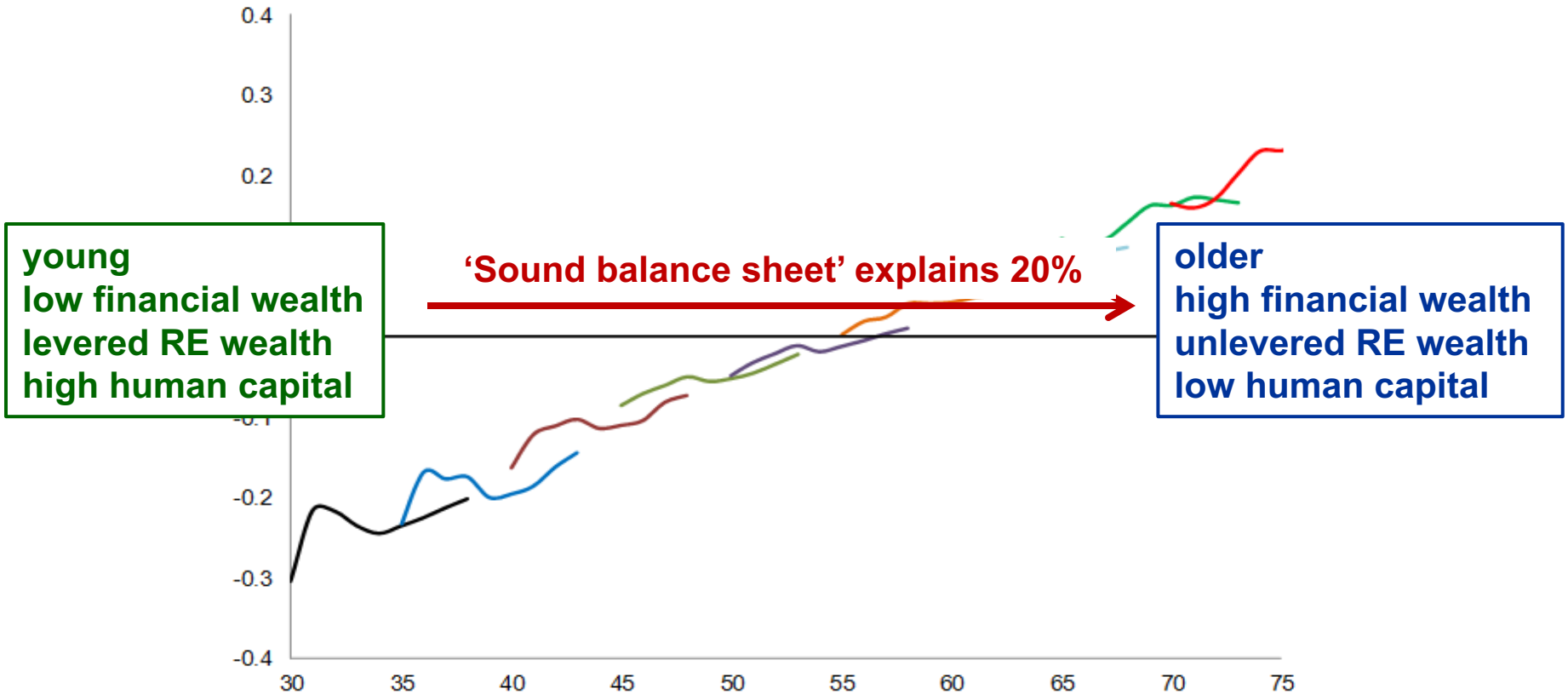
What drives the value ladder?



Age (beginning in 1999 for each cohort)

The Value Ladder

What drives the value ladder?



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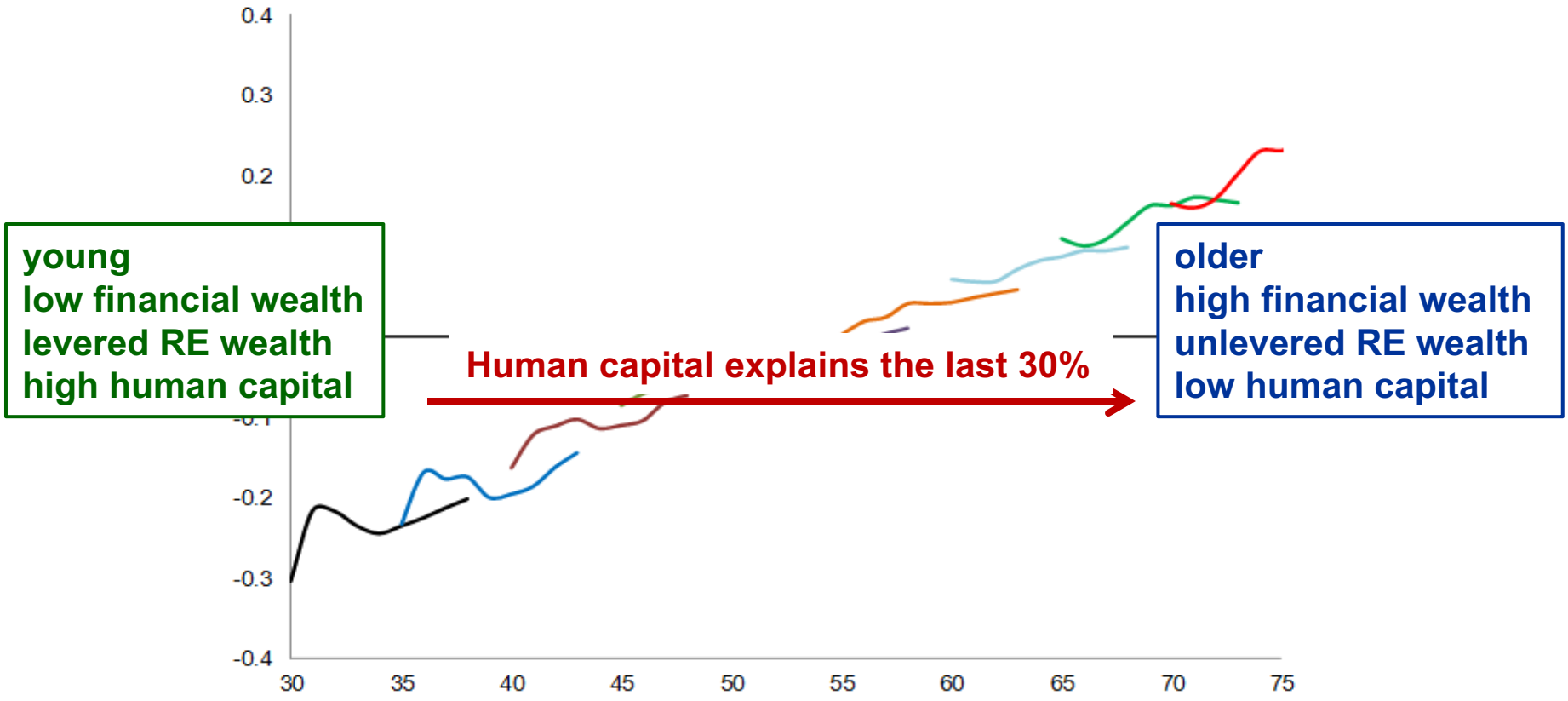
What drives the value ladder?

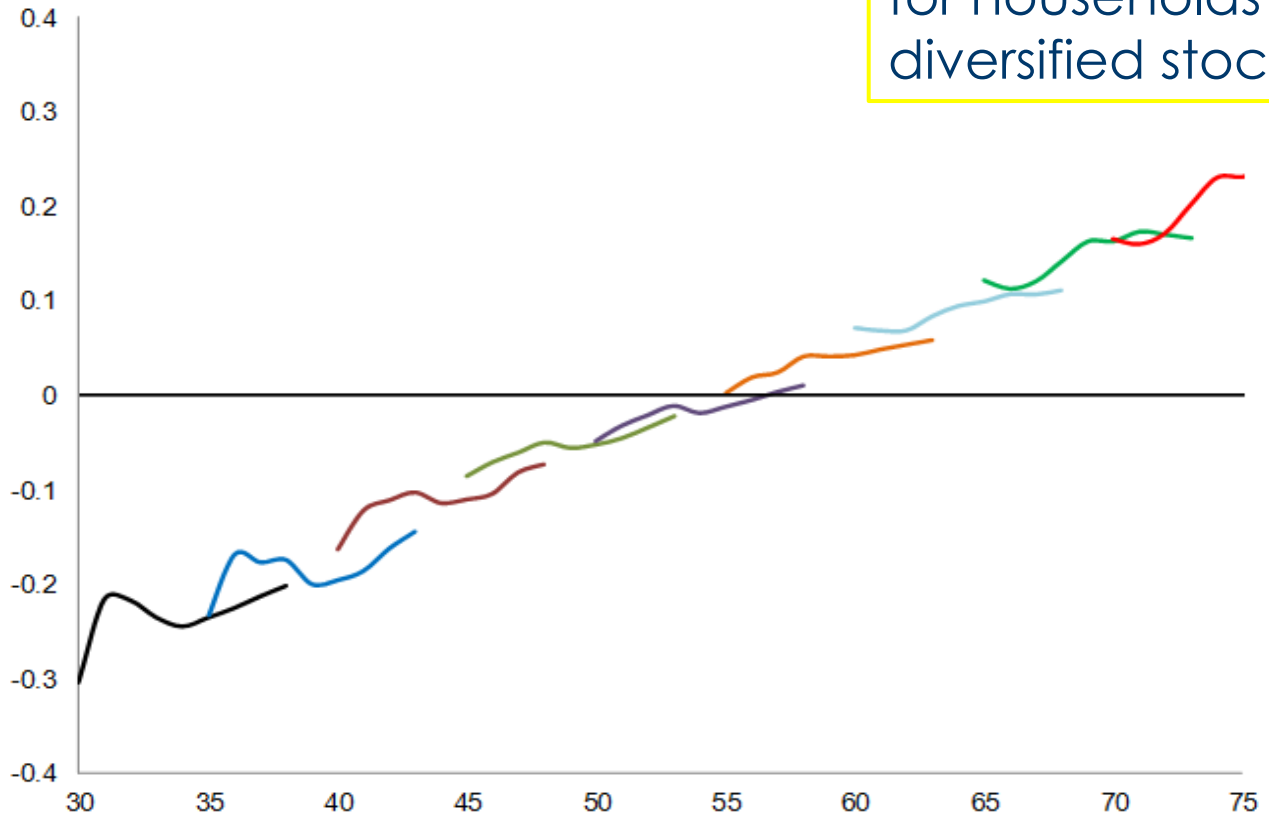


Age (beginning in 1999 for each cohort)

The Value Ladder

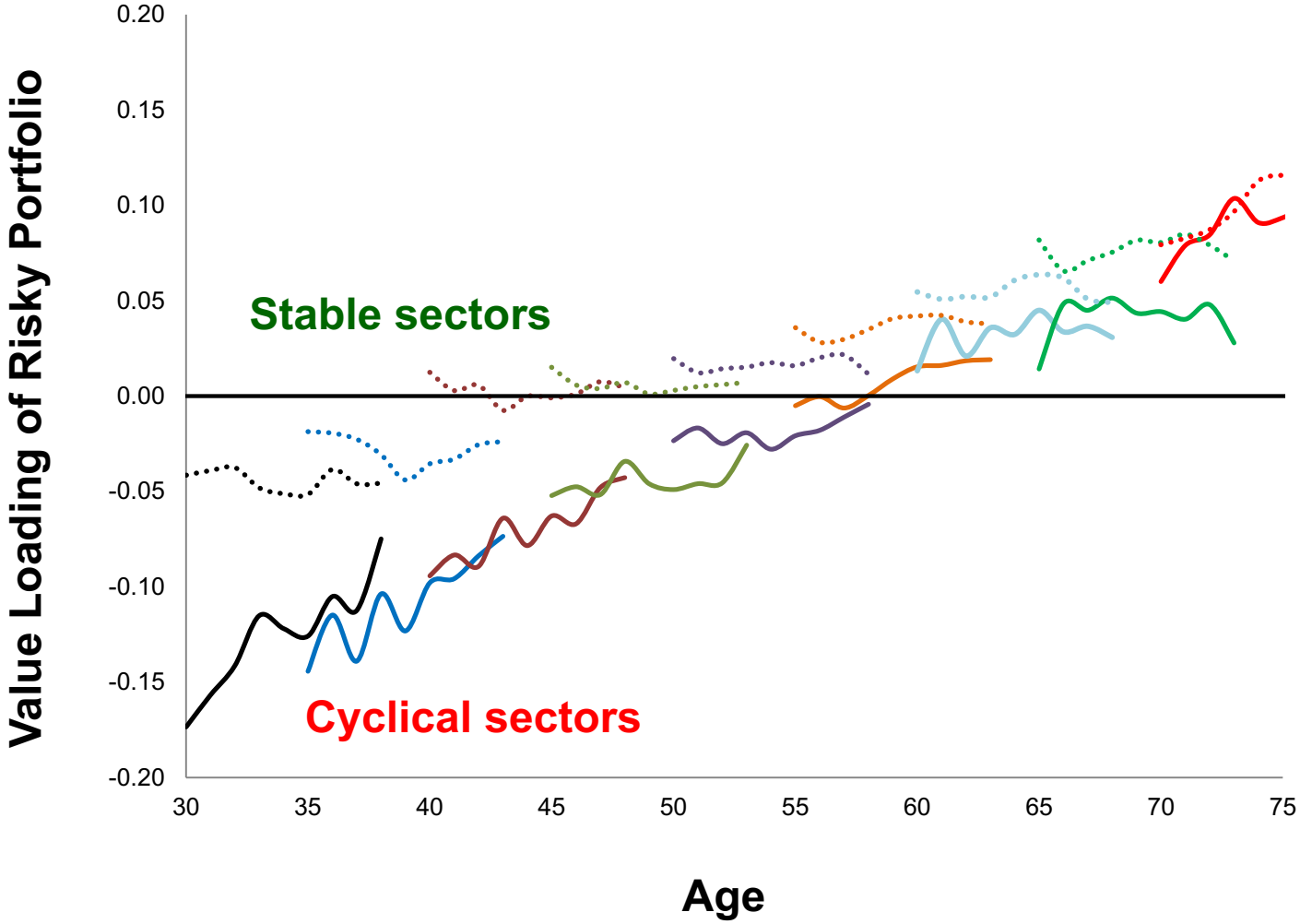
What drives the value ladder?

Higher explanatory power for households with better diversified stock portfolios



Age (beginning in 1999 for each cohort)

The Value Ladder across Industries



CONCLUSIONS

- Households seem to respond to their economical conditions according to standard-neoclassical theories of optimal portfolio choice
  - In some cases the findings are ahead of theory
  - The explained variation is not large but the findings survive controlling for typically unobservable characteristics
- Sophisticated households with more at stake follow more closely financial precepts -> household make **mistakes**
- Which heuristics do households use?
- When do mistakes turn into biases? In which areas of decision making is it more likely to happen?
- Which role does the retail banking sector play?