Personal Recommendations and Portfolio Quality

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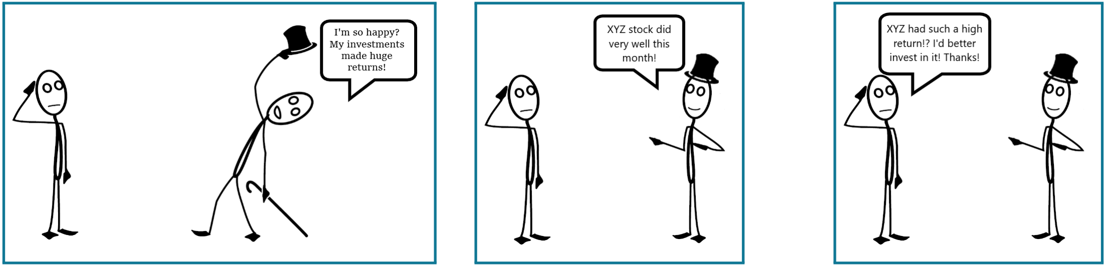
Personal finance is a hit on TikTok

The Economist, 2022

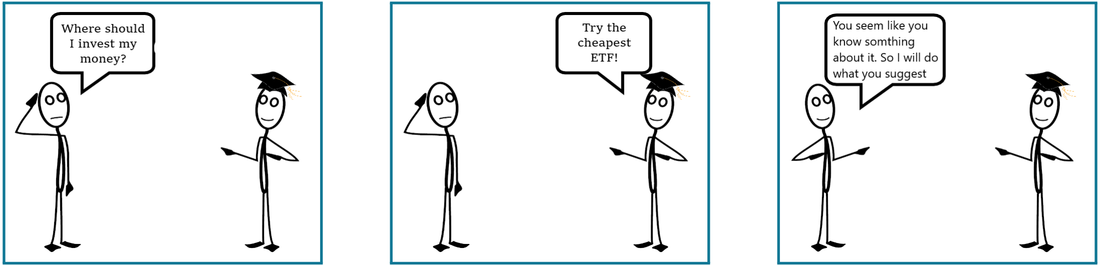
Introduction

How social interaction about finances can work (theory (Han *et al.* , 2022) and empirical (Heimer & Simon, 2015; Escobar Pradilla & Pedraza, 2019; Lim *et al.* , 2020; Huang *et al.* , 2021)):



Return-biased transmission

An alternative view on social interaction in finance



Expertise-based transmission

This paper

We test predictions on

	Expertise-based	***Return-biased***
What determines social interactions?	Recommender's experience and portfolio quality	Recommender's portfolio returns
What assets are passed on?	Lower volatility and fees, higher expected returns Active or passive funds	Assets with higher and extreme returns Lottery stocks

This paper

Investigates what drives the social interaction about finance among personally connected individuals:

- Expertise vs Returns

And what are the consequences of social interaction for Followers' portfolios?

Using referral campaign from an online bank + Detailed portfolio information

Findings

Strong overlap between Recommenders and Followers' portfolios:

- $\approx 17\%$ vs $\approx 0\%$ (placebo matched peers);

Decisions to recommend and follow (positive overlap) are

- **NOT** related to Recommenders' *portfolio returns*;
- $(+)$ associated with Recommender's age, income and AUM;
- $(+)$ correlated with Recommender's portfolio quality (RL & RSRL);
- More likely if Recommender invests in ETFs $(\approx 20\%)$.

Followers are:

- 49% more likely to invest in funds if the Recommender invests in funds;
- twice less likely to copy lottery and attention stocks than funds from the Recommender;
- better diversified with portfolio quality highly correlated with Recommenders' portfolios

Data and methodology

Data from a large German online bank 2003 - 2017

Data

258,000 randomly selected clients with a detailed transaction (including securities accounts) and sociodemographic (age, gender, income) data

- Detailed data on portfolio composition
- Investors have access to 900,000 assets

Referral campaign active from 2012 - 2017

- Bank customers can recommend a person via their online bank by sending a Facebook message or a link via email
- 20 Euro or non-cash (mixers, suitcases, headphones or coffee machines)
- 515 Recommender - Follower pairs
- On average ≈ 1 successful referral per Recommender

Sample selection

Portfolio Overlap

Overlap analysis helps separate true peer effects

Methodology

Most factors that could explain peer effects operate at the level of the portfolio

- Correlated risk aversion, background risk, or local bias

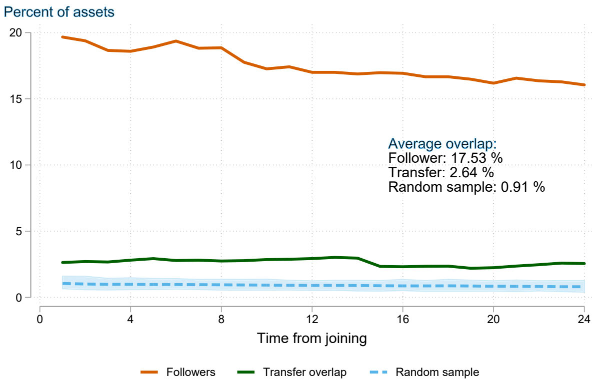
→ The overlap (share of common securities in Follower portfolio) in individual assets is our evidence for peer effects

$$Overlap_i^F = \frac{\sum_{k=1}^{K} V_k \mathbb{1}_{k=m}}{\sum_{k=1}^{K} V_k}$$

We fix the Recommender's portfolio one month prior to the Follower joining the bank to establish the direction of causality and construct placebo pairs to examine how rare overlap is

Overlap is significantly higher for Followers

Overlap



Placebos: Matched Followers & Matched Recommenders.

Overlap distribution | Overlap with all investors

Social Interaction

Testing predictions on social interactions

	Expertise-based	*Return-biased*
What determines social interactions?	**Recommender's experience and portfolio quality**	**Recommender's portfolio returns**
What assets are passed on?	Lower volatility and fees, higher expected returns Active or passive funds	Assets with higher and extreme returns Lottery stocks

Sending Recommendation

Sending function - Recommender's decision to talk about the investment

$$s(R, Q) = \beta R + \gamma Q + \delta$$

where R - return on Recommender's investment and β is sensitivity to the return;

– δ is the rate of *conversability* of the investment - propensity to provide financial advice;

– Q - Recommender's portfolio quality and γ - propensity for investors of different quality to give financial advice (addition to Han *et al.* (2022))

- measured by Log Return Loss and Log Relative Sharpe Ratio Loss Details

Sending advice is not related to returns among Recommenders

$$Recommendation_{i,t} = \alpha + \beta_1 R^R_{i,t} + \gamma_1 Q^R_i + \mathbf{X_i'}\mu_1 + \delta_{k,t} + \epsilon_{i,t}$$

	All Recommenders			Successful recommendation		
Portfolio returns		-0.0000**	-0.0000*	0.0052	0.0116	0.0117
		(0.0000)	(0.0000)	(0.0136)	(0.0117)	(0.0118)
Passive returns	0.0130			0.0039		
	(0.0107)			(0.0140)		
Active returns	0.0017			0.0173		
	(0.0027)			(0.0159)		
R: Log Return loss	-0.0004		-0.0004	-0.0005		-0.0004
	(0.0004)		(0.0004)	(0.0010)		(0.0010)
R: RSRL	0.0000		-0.0000	0.0000		-0.0000
	(0.0007)		(0.0007)	(0.0015)		(0.0015)
Demographics	Yes	Yes	Yes	Yes	Yes	Yes
Region#Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	111,643	111,643	111,643	23,809	23,809	23,809

Recommenders have higher portfolio quality relative to other investors

	All Recommenders			Successful recommendation		
	(1)	(2)	(3)	(4)	(5)	(6)
Portfolio returns $\times$ 100	0.0003	0.0003	0.0003	-0.0001**	-0.0000	-0.0001**
	(0.0007)	(0.0007)	(0.0007)	(0.0000)	(0.0000)	(0.0000)
Log return loss		-0.0002***			-0.0004***	
		(0.0000)			(0.0000)	
Log Relative Sharpe ratio loss			-0.0017***			-0.0009***
			(0.0001)			(0.0000)
Demographics	Yes	Yes	Yes	Yes	Yes	Yes
Region#Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,996,207	4,996,205	4,996,207	4,911,863	4,911,861	4,911,863

Recommenders also have higher income, almost 3 times larger AUM, and 2 times as large portfolios.

Receiving recommendation

Receiving Function - the probability the investor adopts Recommender's investment strategy

$$r(R) = aR + bR^2 + cQ + d,$$

where $\boldsymbol{a}$ - persuasiveness of higher Recommender's return;

– $\boldsymbol{b}$ - more/less attentio to extreme returns;

– $\boldsymbol{d}$ - fixed propensity to follow advice;

– $\boldsymbol{c}$ the importance of Recommender's portfolio quality (innovation to Han *et al.* (2022))

What drives the decision to follow the recommendation (*positive overlap*)?

Receiving Function

$$PosOverlap_{f,t+x} = \alpha + \boldsymbol{\beta_1} R^R_{f,t} + \boldsymbol{\mu_1} Q^R_{f,t} + \mathbf{X_i}'\mu_1 + \delta_{k,t} + \epsilon_{i,t}$$

	Returns			Portfolio quality		Combined	
R: Portfolio return	0.565					0.655	0.608
	(0.614)					(0.597)	(0.607)
R: Active return		-0.115					
		(0.232)					
R: Passive return			1.898**				
			(0.830)				
R: Log Return loss				-0.061**		-0.062**	
				(0.026)		(0.027)	
R: RSRL					-0.092**		-0.093***
					(0.036)		(0.036)
Demographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region#Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	374	374	374	374	374	374	374

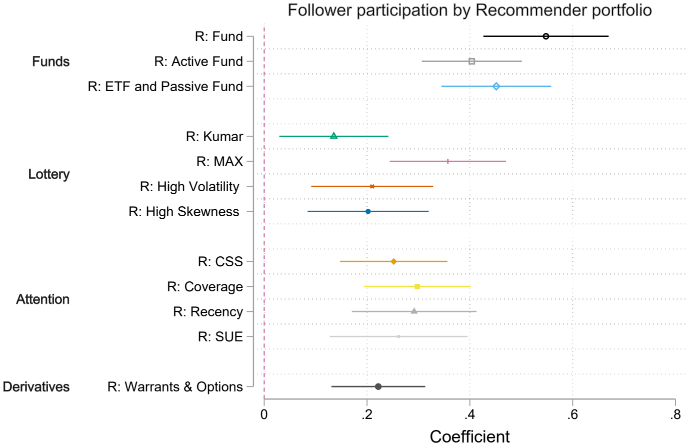
Asset Class Participation and Portfolio Quality

Testing predictions on portfolio composition

	Expertise-based	***Return-biased***
What determines social interactions?	Recommender's experience and portfolio quality	Recommender's portfolio returns
What assets are passed on?	**Lower volatility and fees, higher expected returns** **Active or passive funds**	**Assets with higher and extreme returns** **Lottery stocks**

Participation in different asset classes

$$Participation^{j}_{i,k,t} = \alpha + \gamma RecommenderParticipation^{j}_{i,k,t} + \mathbf{X'_{i,k,t}}\beta + \delta_{i,k} + \epsilon_{i,k,t}$$



Participation across assets

Followers vs General Sample

Peer effects in portfolio quality

$$y_{i,k} = \alpha + \gamma Follower_{i,k} + \mathbf{X'_{i,k}}\beta + \delta_{i,k} + \epsilon_{i,k}$$

	Log Return loss			Log Relative Sharpe ratio loss		
	(1)	(2)	(3)	(4)	(5)	(6)
Follower	-0.27***	-0.11**	-0.05	-0.28***	-0.10***	-0.08**
	(0.05)	(0.05)	(0.05)	(0.03)	(0.03)	(0.03)
Follower Controls	No	No	Yes	No	No	Yes
Region FE	No	Yes	Yes	No	Yes	Yes
Year FE	No	Yes	Yes	No	Yes	Yes
Region#Year FE	No	Yes	Yes	No	Yes	Yes
Observations	25605	25605	25605	25605	25605	25605
Adjusted R^2	0.001	0.055	0.086	0.002	0.212	0.222

Controls: gender, age, age sq, income proxy, academic title, main bank dummy, joint account dummy, robo-advice user.

Decomposition

Conclusions

Conclusion I

Peer effects lead to overlap in portfolio composition and similarities in portfolio quality

$\longrightarrow$ Scope for both good and bad advice about individual assets to spread through social networks

Understanding the social-advice mechanism in personal interaction is paramount for understanding whether peer effects propagate good or bad investment behavior

- Decision to recommend is **NOT** correlated to returns;
- Decision to follow is **NOT** correlated to returns and $(+)$ related to Recommednder's portfolio quality and participation in ETFs;

Expertise-based transmission mechanism is supported.

Conclusion II – we observe a different type of social links

Recommenders-Follower pairs are characterized by a personal relationship that likely precedes the observed financial advice

→ Recommenders may be incentivized by reputational costs, social utility (Bursztyn *et al.* , 2014), or 'warm glow' to recommend sound financial advice

Resulting Followers' portfolios are on average *better diversified* and Followers are more likely to invest in *ETFs*.

Appendix

References I

Bursztyn, Leonardo, Ederer, Florian, Ferman, Bruno, & Yuchtman, Noam. 2014. Understanding mechanisms underlying peer effects: Evidence from a field experiment on financial decisions. *Econometrica*, **82**(4), 1273–1301.

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Lim, Sonya, Lane, Jacqueline, & Uzzi, Brian. 2020. Biased information transmission in investor social networks: Evidence from professional traders. *Page 18198 of: Academy of Management Proceedings*, vol. 2020. Academy of Management Briarcliff Manor, NY 10510.

Sample selection and methodology

Data

Sample selection:

- We select customers with active trading accounts and with non-zero AUM
- Select individuals who joined the bank after 2012
- We select the first twelve months of trading to avoid learning and luck influencing portfolio choice

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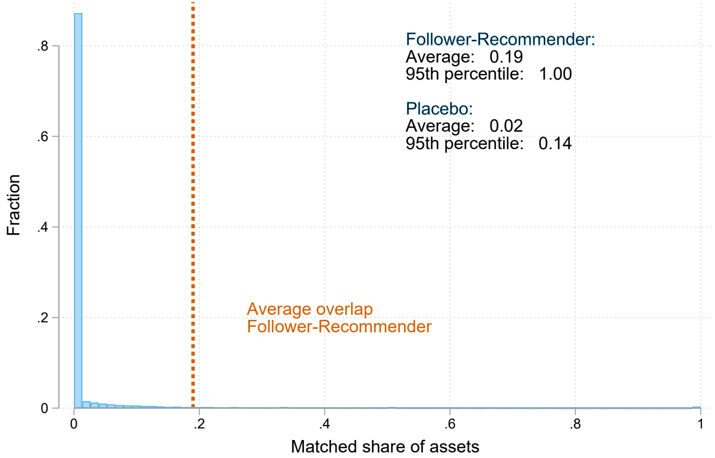
Overlap between each Follower with ALL investors



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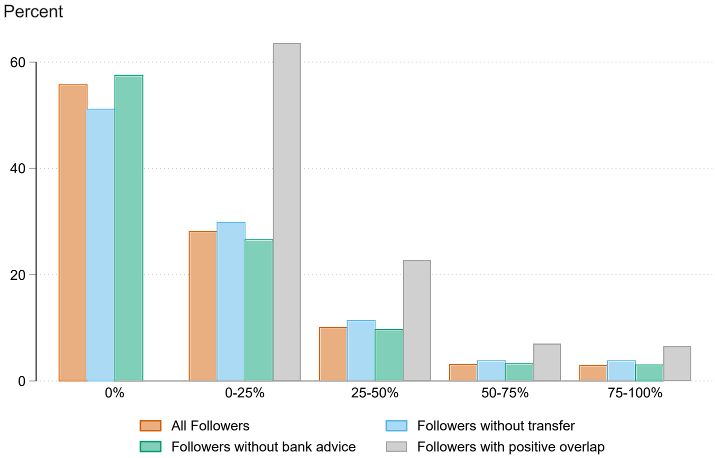
Overlap Distribution



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Portfolio quality based on a CAPM-model Calvet *et al.* (2007)

Relative Sharpe Ratio loss – Measure of diversification loss

$$RSRL_i = 1 - \frac{\overbrace{S_i}^{\text{Sharpe ratio portfolio}}}{\underbrace{S_B}_{\text{Sharpe ratio benchmark}}}.$$

Return Loss – Lost return due to choosing portfolio instead of benchmark and cash

$$RL_i = \underbrace{(Er_m^e)}_{\text{Expected excess return on market portfolio}} \times \overbrace{w_i \beta_i}^{\text{Weight on stocks x beta}} \times \underbrace{\left(\frac{RSRL_i}{1 - RSRL_i}\right)}_{\text{Sharpe ratio loss transformation}}$$

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Participation across asset classes

	(1) Fund	(2) Lottery	(3) Attention
Recommender: Funds	0.526***	-0.207***	-0.203***
	(0.062)	(0.064)	(0.064)
Recommender: Lottery	-0.255***	0.326***	0.349***
	(0.046)	(0.060)	(0.058)
Recommender: Attention	-0.264***	0.325***	0.322***
	(0.046)	(0.060)	(0.059)

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Participation: Followers vs General Sample

	Funds			Lottery				Attention			
	(1) Fund	(2) Active	(3) Passive	(4) Kumar	(5) MAX	(6) Volatility	(7) Skewness	(8) CSS	(9) CVRG	(10) Recency	(11) |SUE|
Follower	0.045**	0.054**	0.054**	-0.006	-0.008	-0.001	-0.011	-0.011	0.003	0.004	0.004
	(0.018)	(0.021)	(0.021)	(0.013)	(0.018)	(0.014)	(0.017)	(0.016)	(0.016)	(0.018)	(0.013)
Region#Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dep. var. mean	0.687	0.346	0.440	0.150	0.371	0.152	0.249	0.227	0.212	0.340	0.133
Dep. var. std dev	(0.464)	(0.476)	(0.496)	(0.358)	(0.483)	(0.359)	(0.433)	(0.419)	(0.409)	(0.474)	(0.339)
Observations	25605	25605	25605	25605	25605	25605	25605	25605	25605	25605	25605
Adjusted R^2	0.072	0.047	0.155	0.089	0.244	0.080	0.138	0.132	0.118	0.226	0.120

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Return Loss components

$$\ln RL_i = \ln(Er_m^e) + \ln w_i + \ln \beta_i + \ln \left(\frac{RSRL_i}{1 - RSRL_i} \right).$$

	Return loss $\ln(RL_i)$	Risky share $\ln w_i$	Risky portfolio beta $\ln \beta_i$	Diversification loss $\ln\left(\frac{RSRL_i}{1-RSRL_i}\right)$
Follower	-0.05	0.16***	0.08***	-0.14***
	(0.05)	(0.04)	(0.03)	(0.05)
Follower Controls	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Region#Year FE	Yes	Yes	Yes	Yes
Observations	25605	25587	25605	25605
Adjusted R^2	0.086	0.046	0.131	0.241

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