

Antoinette Schoar

Editor's Note: This is an abbreviated version of EF's conversation with Antoinette Schoar. For additional content, go to our website: www.richmondfed.org/publications

Antoinette Schoar, an economist at the Massachusetts Institute of Technology, is known for uncovering surprising trends in corporate finance, but her original economic interests lay elsewhere. “I grew up in Germany, but my father is originally from Iran,” she says. “Seeing the differences in income inequality and poverty between those countries, I felt this is something I want to understand.”

But upon arriving at the University of Chicago for her Ph.D., Schoar realized a wide range of economic decisions — affecting issues ranging from labor markets to development to economic growth — ultimately run through finance. Her academic adviser, Sherwin Rosen, suggested she talk to colleagues at the business school, and the rest is history.

Schoar's body of work is as wide-ranging as the field of corporate finance itself. A particular focus has been entrepreneurship: New firms have become an increasingly important source of growth and productivity, but data on them have historically been scarce. Schoar's work has shed light on the many ways new firms get funded and the managerial capital that investors bring to startups, as well as the role of management styles generally in a firm's success. She has documented that the so-called “subprime” housing crisis centered largely on middle- and upper-middle-class households. And Schoar's recent work has branched out to consumer credit, finding that credit card firms target more-shrouded offers to less-sophisticated consumers. She discusses all these topics and more in this interview.

Schoar co-chairs the National Bureau of Economic Research's program on corporate finance. She was previously a co-organizer of the NBER's Entrepreneurship Working Group. In 2009 she won the Kauffman Prize Medal for research in entrepreneurship. She also co-founded ideas42, a nonprofit that uses social sciences research to solve social problems.

Successful academics need to be excited by the research itself, Schoar says. “And with the freedom you have of designing what you do, the exciting people you can work with, the great students... I really feel very privileged.”

Renee Haltom interviewed Schoar in her office at MIT in September 2018.



EF: There has been a lot of talk recently about declining business dynamism in this country — that is, fewer businesses are being opened or closed. There's concern that this may be lowering productivity and economic growth. Do you see a problem here?

Schoar: There is lots of research showing that the number of people who are employed in small and young firms has gone down dramatically over the last two decades in the United States. Also, the number of small businesses that are being started is going down. It's very concerning for the United States, which has always prided itself on entrepreneurship. This trend is very strong in the data, but I also believe it's not the full story.

It's not that there are no startups in the United States, especially on the high-tech side. If anything, the United States is where startup financing like venture capital or angel finance is really the most vibrant.

A second trend that is very concerning is that the way small businesses exit has changed dramatically over the last 20 years. It used to be that the large fraction of them went IPO. Now, the vast majority are sold to companies and end up being small divisions of a much larger company. In the long run, we might be worried if it means the whole economy becomes more concentrated. That's a big debate. It's not so clear yet whether these firms have almost natural monopolies, in which case we should be worried about rent extraction, or whether it's

technological innovation giving some big firms an advantage.

EF: Is access to credit for new firms part of the problem?

Schoar: I would say credit is not the culprit here. One has to be very careful in differentiating between the startups that are new, disruptive technologies — think about Boston, Silicon Valley — and the kind of small businesses that are not necessarily disrupting existing firms.

Post-2008, credit to small businesses did initially plummet. Lots of small businesses went bankrupt, and the flow of new ones into the economy dropped. But the rate of startup creation recovered relatively quickly. Venture capital at the coasts, where there is a lot of entrepreneurship, recovered, and these areas have been very vibrant. If anything, the startup economy in the sense of disruptive financing is very deep in the United States. Some people have said there was even an oversupply of entrepreneurs.

Where I worry is growing firms beyond the startup level. That's why it's not a good trend that we're seeing fewer IPOs and many more acquisitions. It's not at the startup level where the pipeline is broken; where something seems to be changing is that these small firms don't become the next Google, the next disruptive big firm.

Some of it might be financing, but I feel a lot of it is that the structure of industries is changing. Venture capitalists call it "escape velocity"; many firms don't have the escape velocity to become standalone. It's much better for them to just be acquired and benefit from the fact that big existing firms have a big network of customers.

But what I worry about is that for entrepreneurs, it's not great if there are few exit options — say, being bought by Google, Facebook, and Amazon. If these three firms determine price, for entrepreneurs it may mean that their valuations will be depressed. Growing up in Germany, I have seen a market where there are few IPO opportunities, where entrepreneurs know that the only exit options are a few large firms like Siemens or Bosch that dictate the price at which you can sell out. In the long run, this reduces incentives for entrepreneurs. American venture capital firms came into Germany and really shook up the dynamism.

To me, the real sticking point in the United States is that access to data is becoming more difficult for small startups that want to disrupt a market. In the modern digital world, the quality of the machine learning algorithms that you can set up depends on how much data you have and how good they are. This network effect story means that it becomes tougher in those industries for newcomers to disrupt incumbents.

I feel policy should be more mindful about this in the United States. Right now, if you talk to people who think about cartel enforcement, they look at whether

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pricing is still competitive. But for Amazon and other large firms, it really is not about how to price one widget versus another but rather having more and more data about how consumers shop, how their preferences manifest. For the consumer, it's great — it keeps prices down and gives free access to all the search functions. Disrupters would make that industry less efficient.

EF: Do angel investors have a special role in facilitating these coveted high-growth startups? Your work with Josh Lerner of Harvard Business School on angel investors has been some of the first on the topic.

Schoar: In the United States over the last decade, we've seen many new online models of angel financing. In research with Josh, we show that the impact of angels is very positive on the firms where they invest. We test this by looking at firms that were just on the cusp of being accepted versus rejected by angels, the idea being that these firms are probably quite similar, and we compare their ultimate outcomes.

Getting financing from angels has a very positive impact on your survival, growth rate, and revenues three to five years out. What we were very surprised about is that it doesn't seem that it is the funding that the angels facilitate; the two sets of firms were equal in the amount of funding they received over the next five years, so it's not the case that without an angel you don't get more capital. We think it's the advice, connections, and help the angels are giving that really makes the difference — giving you a sense of when to grow the business, who to hire at each stage, course correction, all that. It's actually much more the human or "managerial" capital that comes with the angel.

We did another paper using similar data with angels around the world, in Europe and South America. Again, we found angels have a very big and positive impact, but there a lot of it was because of financing. There we found that if you didn't get angel financing, it was much less likely for you to get follow-on funding. On top of that, we found in most countries outside the United States, the firms that get angel funding are much older and already mature; they are already cash-flow-positive compared to the United States.

EF: As informational frictions decrease, do you think angels will become even more important as a source of financing for new businesses? In terms of freer access to information raising the marginal value of angels' unique expertise identifying the highest-potential startups?

Schoar: Some informational frictions have reduced because of technology, but a lot of the judgment about the

quality of an entrepreneur, the subtle differences in the quality of the business, are still very difficult to decide for investors.

I think the rise of angels comes from the fact that we have more and more people in the United States who were successful entrepreneurs and made some money and now have a combination of skills required to understand what an entrepreneur needs. They are often still very young, so they have the energy to want to do more than just sit at home. After firms like Google and Facebook went public, you had a wave of people leaving these firms who were maybe 35, who made a lot of money, and who turned themselves into angels.

It spurs entrepreneurship — in certain pockets of the country, this activity feeds on itself. These successful early entrepreneurs become angels, and they support the ecosystem of entrepreneurship. In emerging markets like India and China, it looks very similar — in places where you have a lot of entrepreneurship, the process has a positive loop.

Our research looked at some of the most successful angel groups in the country, and it would be interesting to have an even wider lens on all the different angels who are active in the United States and in other countries and see how much heterogeneity there is.

In particular, in the United States, if the benefit of angels really comes from the managerial capital they're bringing, there's probably a lot of differences between people, and so it would be good to see the distribution of the angel quality, the matching between entrepreneurs and angels, and whether that can be better facilitated. There are online networks like AngelList that are trying to improve the introduction between investors and entrepreneurs, but I think we are still in the process of figuring out if this is even possible to do on a digital platform and how scalable that is.

EF: One of your most famous papers documented persistence among private equity firms: that the best-performing funds tend to continue being the best performers. Can you explain why this was such a surprising result?

Schoar: That paper, from 2005 with Steve Kaplan at the University of Chicago, was the first to have large-scale

Antoinette Schoar

► Present Position

Michael M. Koerner (1949) Professor of Entrepreneurship, Massachusetts Institute of Technology; Co-Director, Corporate Finance Program, National Bureau of Economic Research

► Education

Ph.D. (2000), University of Chicago; Diploma in Economics (1995), University of Cologne

► Selected Publications

"Managing with Style: The Effect of Managers on Firm Policies," *Quarterly Journal of Economics*, 2003 (with Marianne Bertrand); "Private Equity Performance: Returns, Persistence and Capital Flows," *Journal of Finance*, 2005 (with Steven N. Kaplan); "The Market for Financial Advice: An Audit Study," NBER Working Paper, 2012 (with Sendhil Mullainathan and Markus Noeth); "Loan Originations and Defaults in the Mortgage Crisis: The Role of the Middle Class," *Review of Financial Studies*, 2016 (with Manuel Adelino and Felipe Severino); "House Prices, Collateral, and Self-Employment," *Journal of Financial Economics*, 2015 (with Manuel Adelino and Felipe Severino); "Do Credit Card Companies Screen for Behavioral Biases?" NBER Working Paper, 2016 (with Hong Ru)

data on private equity returns. The paper got a bit of notoriety because we found three things that were very stunning and counterintuitive in finance.

First, as you said, we found that there was persistence in returns even over quite long time periods, on both the good end and the bad end. Partnerships that had good performance tended to have good performance from one fund to the next, and funds that were in the top 25 percent persistently stayed there. But partnerships that were in the bottom had several funds in the bottom. Persistence basically means predictability, and that's obviously very different from public asset classes where you have no predictability. That's bizarre.

On top of that, we found that in venture capital and private equity, the relationship between performance and fund flow is concave when everywhere else it's convex; in other words, the best funds in venture capital and private equity don't grow as quickly as the medium-good funds. If you look at the mutual fund industry, it's exactly the opposite. There's a ton of research over more than two decades finding that mutual funds that perform slightly better get

massive increases in fund flows, and the ones that are in the middle might see outflows.

Why this was particularly puzzling at the time is that the top venture capital firms are what people call "oversubscribed," meaning lots of investors would love to invest with them. But in that time period, the 1990s and early 2000s, they seemed to voluntarily stay smaller. What we concluded is that this seems to be an industry where the quality of the manager, the general partner, matters a lot. At the beginning, the high-performing managers didn't say, "Let's take all the money we can," which might dilute the marginal performance. We saw in our data that funds that grow very quickly see a reduction in performance. It seems that manager quality is an asset, a type, an area where it's tougher to scale up.

For a mutual fund, once I identify one great investment strategy, given how big the public market is, it's more scalable. If you invest in Google, say, it is possible to scale your investment — to invest \$5 million, \$50 million, or maybe even \$500 million. But with venture capital, even if I identify a few really good startups, I can't invest \$500 million. Maybe I can invest \$10 million, but then I

have to go and find another firm; it's less scalable.

So that's what we found. Lots of people found it very surprising because it shows how different this industry is from other financial industries.

What then happened was a misinterpretation of our findings. A lot of investors in venture capital and private equity said, "Because Kaplan and Schoar find there is persistence, all you need to do is identify good firms and then keep on investing no matter what." But it's not as easy as that. Venture capital funds, in particular, might go through cycles. They were really good and had fantastic past performance, but that might change if they lose one of their top managers.

EF: You also found that persistence has declined recently. What changed, and why does it matter?

Schoar: Here we are 20 years later. In a paper we just finished with co-authors, Josh Lerner and I look at this same question using data from State Street, which is one of the biggest custodians for investors in private equity and venture capital. We found that this industry has really transformed, and some of the puzzles we identified in the 1980s and the 1990s have changed.

First, we showed there are big differences between limited partners — that is, the investors in a private equity or venture capital fund. Some investors seem to be very smart about identifying top funds but also about predicting when they will turn south. Other investors don't have that skill. We found that foundations, endowments, and some of the experienced public pension funds are good at making those decisions, but sovereign wealth funds and banks that invest money on behalf of their clients are much worse at it. They stay in a partnership even when performance goes down.

Also, the way firms set themselves up has changed. Before, most partnerships would raise money from lots of limited partners and invest it, and all the investors would get the same terms. Once you made it into a top fund, your chances of getting great returns were quite high. And if you went into a bad fund, everybody got the same returns — in that case, bad returns.

The puzzle Steve and I originally identified was why partnerships were willing to give different investors the same terms. It's like leaving money on the table, right? If I'm a fund trying to raise money from one of the top limited partners, I will be willing to give better terms to a prestigious limited partner than when I'm trying to raise money from a no-name investor who doesn't bring as much to the table in terms of liquidity or accreditation.

The industry is not stupid. If we as academics could see and test this, they surely can see it too. So in the paper with Josh Lerner, we show that firms have started to offer different deals and different investment vehicles to different investors according to the bargaining power of the investor. Even the very top funds give top limited partners access to

their best deals, but for less high-powered investors, they provide investment vehicles that have lower returns.

It matters because as the industry is becoming more competitive, it leaves much less rent on the table. It also means the general partners are capturing more of that rent.

I think the shift was caused by a combination of competition and the fact that some firms have really manifested their reputation. In the 1980s and 1990s, this was still a very young industry. Once you have that reputation, you monetize it. Now everybody is bidding like crazy to get into the top funds, and they can now dictate the prices to different limited partners.

EF: Switching to consumer finance: How are technology, big data, and fintech changing consumer financial services?

Schoar: Fintech and big data and machine learning have really changed the face of many financial services, away from brick and mortar provision to online, on your cell phone; it's much more personalized than in the past.

The credit card industry was really early in this. In the early 1990s, that was the closest to a machine-learning, big-data approach one could get, mailing something to your personal mailbox that's very much targeted at you. If I know that you are an educated young woman who is interested in a certain type of leisure activity, I might send you a credit card mailer that shows international travel or going to a museum, things that might appeal to you.

EF: How granular are they getting? At this juncture, are they profiling someone like you, or are they actually exploiting individual data for you?

Schoar: It's a bit of both, actually. Machine-learning algorithms are using information about what you just did and what people who look like you then did after they made a similar choice. Once you buy a house, what are the other financial services you might now need? Maybe you will start renovating your house and therefore might want certain financial products.

On top of that, many financial subfirms are starting to find that looking at your past financial behavior is very predictive of your future behavior. If you are somebody who always pays on time and is mindful of your bills, it's a very good predictor of whether you will fall late or default in the future. That's very valuable information to financial service companies. To be honest, it's very valuable information to you too, because if you are a well-organized, mindful person, it means a lower cost of financial services.

So there's definitely a good side to the fact that firms can target your type better — it reduces the cost of capital for everyone. I don't want to lose sight of that. If you think about the story of American personal finance over the last 30 years, it's really that personal finance was able to expand so much because the banks were becoming better

at predicting who is a good payer and who is a bad payer.

We also lose track of the fact that when you look at emerging market countries, like India or Cambodia, people have very little access to personal finance. The financial service industry is not at the same level yet, some of

it because the banks themselves are not as sophisticated, some of it because the infrastructure, such as credit scores, isn't there. That's a bad thing; it means a mother whose child is sick might not be able to get a loan for the treatment even though she would have the ability to pay it back in the future. Or a small business that has a great idea that might be relatively safe can't get the credit.

But what my research with a former student, Hong Ru, shows is that there is also a darker side to that personalization. Now that they can predict whether you're less financially literate, in the credit card industry they target you with offers that are deliberately more complicated and more shrouded. Not only are they more complicated in the deal terms, there are more hidden and back-loaded fees. We even see that the offer itself is more complicated — there is more distracting material on the first page and more enticing material that shows you the great shopping experience you can have. The cost of credit is buried on the last page, and, we show linguistically, using more complicated language when the consumer is less educated.

We believe it's deliberate. More financially sophisticated people know that somewhere you have to tell me what is the cost of credit — so please don't hide it from me because maybe then I will be upset with the offerer. Whereas somebody who is not as financially attuned might just think, wow, you are offering me a card with a zero APR! They don't think about the fact that the bank also has a cost, so it must be hidden somewhere.

In our data, we only see the offer side. There is research by Sumit Agarwal, John Driscoll, Xavier Gabaix, and David Laibson showing that customers who make mistakes in the financial contracts they take up indeed pay much more for credit and would be better off taking a contract with fewer hidden fees. That seems to get worse as consumers age. Right now we are working to match the offer data with the user data, and then we will see basically the entire universe.

EF: The implications for consumers are important in their own right, but at this year's annual Jackson Hole central banking conference you also touched on potential monetary policy implications. Could you talk about that?

Schoar: If you look at how monetary policy passes through to the consumer, typically what we look at is when the fed fund rate changes, how the interest rate offered on credit

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cards or small business loans changes.

But what we found is that for the cards that have all these shrouded features, when the interest rate goes up, the APR doesn't immediately go up with it. Instead, some of the back-loaded costs go up — late fees, over-limit fees, penalty APR, all the things that are hidden from less-sophisticated customers. Those customers may not even understand that the cost just went up; they just look at the low APR and keep on borrowing.

But this can have a delayed effect on monetary policy. Instead of immediately changing people's demand for credit, it might only change people's demand for credit once the fees really hit. But then once the fees hit, it might also mean that now people are really shocked because the costs are much higher than they thought they were. It might even create some credit risk for the banks and for the people themselves.

What I wanted to highlight in Jackson Hole is that right now there is only a subset of consumer financial products that uses these strategies intensively. But given how much data are becoming available, this will become a bigger channel. It might be something that actually affects how the Fed should think about the asymmetric effect that monetary policy can have on people who are financially savvy and those who are not.

EF: Innovations in credit also played a role in housing. The housing boom and bust was initially interpreted as primarily a phenomenon centered on subprime borrowers. To what extent has that view held up?

Schoar: Research I did with Manuel Adelino at Duke and Felipe Severino at Dartmouth suggests it's unfair to blame it on subprime. It was a broad phenomenon across most income classes.

In dollar value terms, mortgage credit to households from 2000 to 2007 grew in particular for middle-class and upper-middle-class people. They buy the big houses, and therefore take the big mortgages. It's stunning: If you look at the top 1 percent, you see a drop in leverage, the only group for which we don't see an increase. It's almost like houses were not getting big enough, their income was growing so quickly over that time period.

Why we think it's so important is that we also find that the largest growth in the dollar value of defaults post-2008 happened in the middle class and upper middle class.

This is really where the big dollars defaulted and also where the banks were most caught off guard. I did some research just after the financial crisis where we found that in many cases the banks couldn't even reach the prime customers who defaulted. They hadn't even bothered to take a phone number, they were so sure the customer would

never need to be reached again. This is the same bank that is phenomenal at barraging you when you're even just one day late on your credit card payment. It was a mindset that middle-class American customers never default on their mortgages, so if the collateral is good enough, we don't have to worry about the quality or personality of the borrower.

So it wasn't just a story of banks all making a mistake by lending to subprime borrowers. The mistake, really, was not caring enough about what would happen if collateral values went down. This is important for Fed policy because regulating misaligned incentives is much easier than regulating stupidity. The economics profession is reasonably good at understanding agency problems, but we are still grappling with what the Fed should do to deflate a bubble. First, you have to understand what a bubble truly is, the thing we are worst at as economists. Even if you could, it's politically very difficult for a central bank to pull the brake when everything is going well.

EF: Have policymakers responded adequately to correcting misaligned incentives in housing finance, or is there more that should be done?

Schoar: I feel many good things were put in place, and I do strongly believe that incentives for banks improved.

The place where I've been disappointed is around mortgage loans. Fannie Mae and Freddie Mac were nationalized, and the taxpayer absorbed the losses from these institutions. But we didn't make any progress on their regulation and their incentives. We are almost back to a point where mortgage leverage is very similar to what it was pre-crisis. The private securitization market has shut down, which means the banks would not be as caught in the fire if house prices were to go down, but there might be losses on Fannie and Freddie and ultimately the taxpayer.

The other thing that really worries me is the mortgage origination sector. The big banks have significantly reduced their origination activity, so now you have many fintech lenders that are doing origination and securitizing these loans via Fannie and Freddie. And while they have very nice data because of the other services they provide, we don't know how good they are at being originators. They all have one thing in common, which is that they are extremely thinly capitalized, so they are bearing no true mortgage risk; it all immediately gets passed on to Fannie and Freddie.

To me that is worrisome, because Fannie and Freddie, by the nature of being government institutions, may not price credit risks correctly and therefore might indeed feed a bubble again in the housing market. That could feed a different form of downturn — in this case maybe not a disruption in the banking industry, but tax money

being used to bail out the housing market and being made unavailable for other services.

EF: Corporate finance is a subfield of economics that is not particularly known for its diversity. Have your experiences there led you to believe the economics profession should do more to improve diversity — and if so, what?

Schoar: Obviously diversity is a big topic, and I think it's a subtle topic. There are some areas in economics I feel have made bigger progress, in particular labor, public finance, and development. And then there are areas like finance, corporate and asset pricing, economic theory, and macroeconomics that really have made very little progress.

Part of it might be that women have interest in some areas versus not. But finance especially is very broad. Many of the questions are very close to labor and to public finance, and so there is no reason why a woman shouldn't be interested in corporate finance if she is interested in labor.

I have never experienced outright sexism in my field. But in all of us, including women, there are implicit biases, and I do think that matters. Even well-meaning people might not be fully aware of the fact that when they listen to a woman they somehow don't take everything she says as seriously, or they are more willing to believe that somebody else made that comment first and therefore attribute it more to a man than a woman. What I see a lot is when a man gets hired that somebody doesn't like, it's attributed to a hiring mistake. But if there's a woman hired whom they feel didn't fit in or deserve it, then it goes, "She was hired because she's a woman." I think it's not very helpful, and it's detrimental.

There is some interesting work by Anusha Chari and Paul Goldsmith-Pinkham that has looked at participation of economists in large, important industry institutions like the National Bureau of Economic Research. They find that the fraction of women who present, especially in corporate finance and asset pricing, is low relative to the fraction of women in the field. But they also find that the average woman who presents at those meetings has a much more illustrious CV than the average man. So it's by far not the case that women are so subsidized that less-qualified women get to present anywhere, even though that narrative sometimes exists.

There are lots of efforts now to be aware of the biases and to support women in the hiring process. But seeing female role models, especially in finance, is still very rare. I feel what really has to happen is that more women have to study economics. If the pipeline is rich and is strong, that will make a difference. But that can't be the only thing, because it would take many years before something changes. **EF**