

Janice Eberly

In 1980, President Jimmy Carter ordered an embargo restricting grain exports to the Soviet Union in response to the country's invasion of Afghanistan. At the time, the embargo was widely blamed for collapsing commodity and farmland values. It was a formative event for Janice Eberly, who grew up in rural California. "I started studying economics because I was interested in the global dynamics that I saw happening. People's lives and livelihoods were being impacted by these forces that were so much bigger than they were, and I wanted to understand what they were."

Today, Eberly is the James R. and Helen D. Russell Distinguished Professor of Finance at Northwestern University's Kellogg School of Management. Her research covers topics including firms' capital investment decisions, household consumption choices, and how these decisions influence, and are influenced by, macroeconomic trends. Most recently, Eberly has been studying the implications of rising "intangible" investment — the investments firms make in software, intellectual property, and the like — for aggregate investment, market concentration, and productivity growth.

In 2011, she was confirmed by the Senate as assistant secretary for economic policy and chief economist at the U.S. Treasury, a role she held for two years. Eberly's office was responsible for analyzing data and developments in the U.S. and global economies and advising the Treasury secretary on economic policies.

Eberly serves as vice president of the American Economic Association. She is the editor of the *Brookings Papers on Economic Activity*, a senior associate editor of the *Journal of Monetary Economics*, and a former associate editor of the *American Economic Review*.

Jessie Romero interviewed Eberly in her office at Northwestern University in November 2019.



EF: Much of your research has focused on firms' investment decisions. But why do we need detailed theoretical models of these decisions? The average manager probably isn't thinking, "Well, my adjustment costs are convex instead of quadratic, so I'm going to wait until next year to buy a new machine."

Eberly: In many cases, the macro models that are simple metaphors for how we get from capital budgeting investment decisions to an actual expansion of capacity in the economy work fine. They provide a simple way of explaining how capital gets put in place in the economy and how you grow the capital stock that increases production and output. But there are instances, especially in policy, where the mechanism really matters.

A great example of that is the monthly employment report. If the unemployment rate goes up, people think, "Oh, that's bad news for the economy." But did the unemployment rate go up because the labor force grew, in which case it's not such bad news, or because more people were losing their jobs? The mechanism can make a big difference for how you interpret the data.

Let's say we see a dramatic collapse in investment, like we saw during the financial crisis. Does that mean that the whole economy is collapsing? Should we be really worried, because firms apparently think the future is really bleak? Or is it that there was a relatively minor shock but firms can afford to wait on investment projects so they just put

them on the shelf? If many firms do that, investment can collapse dramatically even if the shock wasn't that severe.

Understanding how those dynamics work can affect your interpretation of what's happening in the economy.

EF: What's different about investment in the technology arena?

Eberly: We're familiar with investments in physical capital, by which I mean property, plant, and equipment — the things most people would recognize as capital. That's tangible capital. But today we also have intangible capital — the investments you can't touch, such as software and intellectual property. You can expand the definition to include things like worker skills that are specific to the firm; when a firm invests in its employees, it's also developing its capital in some broad sense. The metaphor we often use is that Amazon's software platform is as crucial for its business model as an oil platform is for an energy extraction firm.

These types of investments are increasingly important: Intangible capital is the fastest-growing part of investment. It also seems to be playing a greater role in the success of firms. Not only is intangible capital a larger and larger share of investment overall, but it's also especially important for the firms that end up being the leading firms in their industries.

Amazon's business is built on intangible capital; Walmart's logistics technology is all intangible capital. Retail is a sector where efficiency has risen dramatically and labor productivity has gone up. This is very highly associated with the increase in intangible capital, so in retail especially you see a very strong role for intangible capital among the most successful firms.

EF: Some recent research has found that business investment has been weak since the early 2000s relative to measures of corporate profitability. How does that jibe with increasing investment in intangible capital?

Eberly: Investment as we traditionally knew it is definitely weak — investment in physical capital has been rising but relatively slowly over time. And it looks especially slow when you see that the valuation of firms is booming. Investment is not going up nearly as quickly as valuations. What has continued to rise is intangible capital, but it's not well captured in the data, although there have been improvements over time both in Europe and the United States in trying to measure it.

Intangible capital seems to be where firms' innovative investments are reflected. Historically, we thought

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technological change was embodied in tangible capital: When firms put new equipment in place, it came with new software and new capabilities. So a way of increasing productivity was to put new equipment in place. Today, you can buy the software separately. So the ques-

tion is whether physical capital is embodying technological change in the way that it used to. Is the technological change actually in the intangible capital? In that case, you want to think about it as an augmentation to physical capital.

We're still learning about what role intangible capital is playing in the economy, but there are some clues in that you do see more of it in the firms that are growing most quickly. So that's an indication that it's associated with competitive advantage.

EF: A lot of research indicates that market concentration is increasing. In general, there are two schools of thought about the explanation: The firms with increasing market share are exercising more market power; or the firms with increasing market share have earned it by being more productive. What does your research suggest about the extent to which market concentration reflects one trend versus the other?

Eberly: It can be both. They're not mutually exclusive. In the work that I did with Nicolas Crouzet, instead of just looking at the aggregate economy data, we looked at firm-level data and broke it out by industry to see if that variation was meaningful.

In manufacturing, for example, you don't see a substantial accumulation of intangible capital and you don't see a big change in price-cost markups. In retail, you see much more intangible capital and a big increase in productivity but not a big increase in markups, so that industry looks very competitive.

In health care, we were looking at publicly traded firms, so our data included primarily pharmaceutical firms and device firms. There, you see a lot of intangible capital, because they're making large investments in intellectual property. We found a rise in concentration, and we also found a rise in markups. Now, that doesn't necessarily mean those firms are exercising monopoly power, but you do see a measureable increase in markups.

In the technology sector, the big tech firms are a mix of the two. There's a lot of investment in intangible capital, both software and intellectual property, and we found a big increase in concentration but a more modest increase in markups. Of course, high-tech is a very diverse field, so there's probably variation even within the industry.

In short, these are very heterogeneous industries, so there isn't a one-size-fits-all answer. When it comes to

intangible capital such as intellectual property, patents and trademarks can make a company more efficient and more effective. But when you have a patent, for example on a pharmaceutical, that also gives you market power because no one else can use that technology. So it's not surprising to see rising concentration and rising markups in sectors that depend on intellectual property. But in a sector like retail, investments in intangible capital can lead to greater market concentration without higher markups.

EF: Does the increase in intangible capital have any policy implications, fiscal or monetary?

Eberly: Intangible capital does seem less sensitive to traditional monetary policy. It tends to depreciate quickly, and it's not an interest-rate-sensitive spending category. That tends to make it less responsive to monetary policy that moves interest rates.

Financial innovation could reverse that effect, though. If intellectual property was "financialized," for example, becoming more like liquid assets, you could definitely see credit markets arising behind intangible capital, as there are for machinery and equipment. Now, intangible capital tends to be embedded in a firm. But there are new markets developing all the time that could make intangible capital more marketable. There are already markets for some types of intangible capital — patents can be bought, sold, and licensed, for example.

EF: Your research has also documented the "hollowing out" of investment. How does this parallel the hollowing out that's been observed in the labor market?

Eberly: In labor market research, the hollowing-out idea was motivated by the observation that starting in the 1980s there was job growth in both the least-skilled and the most-skilled jobs in the economy. So we saw an increase in low-skill service jobs, such as home health care workers, and also in jobs that required a lot of education. But there were job losses in what we call "middle-skill" jobs, such as manufacturing or administrative assistants.

That was a real change, because previously researchers had thought that skill-biased technological change would bias job growth consistently toward more-skilled

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► Present Positions

James R. and Helen D. Russell
Distinguished Professor of Finance,
Kellogg School of Management,
Northwestern University
Faculty Director, Kellogg Public-Private
Initiative (KPPI)

► Selected Additional Affiliations

Vice President, American Economic
Association
Fellow, American Academy of Arts and
Sciences

► Selected Past Positions

Assistant Secretary for Economic Policy
and Chief Economist, U.S. Treasury
(2011-2013); Associate Professor,
Kellogg School of Management,
Northwestern University (1998-2002);
Associate Professor, The Wharton
School, University of Pennsylvania
(1997-98); Assistant Professor, The
Wharton School, University of
Pennsylvania (1991-97)

► Education

Ph.D. (1991), Massachusetts Institute of
Technology; B.S. (1986), University of
California at Davis

jobs. Hollowing out challenged that narrative.

Why is the hollowing out happening? One idea is that the jobs in the middle are being offshored. Another possibility is that the jobs in the middle are being automated. The latter has been an especially prominent explanation recently. Lewis Alexander and I thought we might see a reflection of that industrial change in capital investment as well.

In a paper for the International Monetary Fund, we looked at the industries that correspond to the hollowing-out story in the labor market — but instead of jobs shifting, you can look at how investment is shifting. You would expect to see investment shifting out of industries that are declining or being offshored, in particular manufacturing and some durable goods industries, and shifting into high-tech industries where the jobs are high skill and hard to automate or offshore.

You'd also expect to see investment shifting toward industries where the physical capital is hard to offshore — industries that have to be physically located here, such as energy extraction. Even if you wanted to offshore the jobs, you can't offshore the capital because the energy is physically located here. It's the same thing with transmission — cell phone towers, for example, are physically grounded capital. Just like job growth has shifted toward the service jobs you can't send overseas, investment has shifted toward the industries where you can't offshore the capital and away from the durable goods and manufacturing industries.

The curious thing was that we saw job growth in the high-skilled, high-tech sectors, but we didn't see the counterpart in investment growth. We saw the hollowing out of investment away from manufacturing, but we didn't see it going toward high-tech. This was my first inkling that something was going on with investment that was different from what we'd seen historically. The physical capital was the dog that didn't bark.

But high-tech is where there's been a big increase in intangible capital. So when you add that in, you do see a rise in not only high-tech jobs, but also high-tech investment — it's just that the high-tech investment is not the tangible kind.

EF: How are these investment trends related to broader conversations people are having about

secular stagnation — the idea that we are in a prolonged period of weak demand, slow economic growth, and low interest rates?

Eberly: The idea with secular stagnation is that because of weak demand, interest rates have become very low over time. Normally, one would expect to see an investment boom as a result, since low interest rates reduce the cost of capital and make investment less expensive. But we haven't seen that boom — investment in physical capital has remained weak.

One could argue that what we've experienced instead is this move toward intangible capital. But the productivity implications of that move have remained fairly narrow — we've seen productivity improvements in retail and some consumer goods, but we haven't seen a broad boom in productivity. That's a puzzle that makes people think hard about the secular stagnation idea. If we are investing in all this technology and it's so important, then why hasn't productivity taken off? I think that gives some force to the secular stagnation argument.

The counterargument to that is, the weak productivity itself is the puzzle. The problem isn't that demand is weak, it's that productivity is weak and that's why firms are not investing.

Put another way, is it demand or supply? Is weak demand keeping interest rates low, but then those low interest rates don't induce firms to invest because demand is weak? Or is it that productivity is weak, so that there's not a great incentive to invest even though interest rates are low?

EF: What do you think?

Eberly: I think the data haven't spoken definitively on this. But as policymakers we may have to do something anyway. Policymakers have to make choices (and in effect, waiting to do something is a choice).

What I find interesting about this discussion is that regardless of your diagnosis, the prescription is very similar. Both diagnoses argue for increasing investment. For example, the secular stagnation group argues for more investment in, say, infrastructure to try to boost demand, and the group that worries about low productivity is also arguing for productivity-enhancing investments. They're coming to similar conclusions from very different places.

The worry is that we have a hammer — investment! — so everything looks like a nail.



EF: Speaking of policy, are there challenges beyond the scope of monetary policymakers?

Eberly: I've been thinking about this a lot. If you didn't know anything about the institutional history of the Fed or the country's economic history and you came to the United States and saw that unemployment was around 3.5 percent and the inflation rate was under 2 percent, you would probably think economic policymakers are pretty happy. And GDP growth has been running around 2 percent; in a mature economy, that seems pretty successful. So it's probably worth keeping that perspective in mind.

But the concern is that there hasn't been booming growth in the economic recovery. You also might have expected some inflationary pressures to arise. That makes people think more about other imbalances in the economy that aren't captured by the "stars" of the unemployment rate and the inflation rate.

People worry about inequality, the role of inequality in the labor market, and the fact that the unemployment rate doesn't capture all of the variation in people's experiences in the labor market. We worry about how strong economic growth will be going forward because the underlying productivity doesn't seem as strong. Fiscal policy is also constrained by rising budget deficits.

So there's a set of forward-looking metrics that make people concerned about longer-run growth, and the realization that we shouldn't be relying on the Fed to solve all policy problems for us. There are economic challenges. Some of them will restrain the effectiveness of the Fed, but we should also not rely exclusively on the effectiveness of the Fed.

EF: Turning from the investments firms make to the investments people make, you've linked the increase in student loan debt to a decrease in home equity lending. What's the connection?

Eberly: What everyone notices when you look at the student loan data is this increase in loans outstanding over the course of the 2000s. Then it accelerates during the financial crisis. Some of that is due to more students going to school and students borrowing larger amounts, but my co-authors Gene Amromin and John Mondragon and I thought it wasn't a coincidence that this acceleration happened at the same time the housing market was collapsing. One of the most common uses of home equity loans was to pay for school — that was one of the ways

banks advertised home equity loans. People had tried to look at this correlation before, but it was very muddy in more aggregated data. So we looked at household-level data that actually tracks families over time, where you can see the parents and the kids and their housing.

When the value of a family's house goes down, they're less able to tap that home equity to finance education. But the family doesn't change their educational aspirations; the students tend to stay in the same schools. They just finance it differently and tend to switch to student loans. We found that among families with a student in school, a dollar decline in home equity led to a 50 cent increase in student loans. That's a large effect.

Then we looked at the effect that switch has on both the students and their families. Consistent with other work in the literature, we found that students are less likely to borrow later in life, such as taking out a mortgage or getting an auto loan, and they're less likely to form their own households.

We also found that their parents were actually financially better off in the long run. There's a generational switch: The financial responsibility for education is being transferred from the parents to the students. When the parents lost access to home equity, they reduced spending on many things, but they reduced their spending on education more than on other parts of their budget. The student loans help the family to insure the student's education, but there's a reallocation of consumption within the family as well.

So far, the switch hasn't reversed. So there does seem to be a longer-run shift toward students self-financing their educations. Some of that is a change in the composition of the student body, so you're seeing more students who are self-funding.

EF: On average, workers with at least a college degree earn more than workers with a high school degree or less. Basic supply and demand would suggest that this gap should shrink over time as more students are enticed to go to college. But that hasn't happened — what's going on?

Eberly: The college premium — the income gap between college-educated workers and those with only a high school education — is large and continues to grow. Nonetheless, college attainment, the percentage of the population with a college degree, hasn't increased as quickly.

One common response is to encourage more people to go to college. But the college attendance rate is actually quite high: About 70 percent of students who graduate from high school do go on to some form of higher education.

The real challenge is the degree completion rate. It's only about 50 percent [for public four-year colleges]. In work that I have done with Kartik Athreya, which is going to be published soon, the bottleneck we see is really completion risk. Even if more students go to college — for

example, because you make it less expensive or subsidize it further — those students face a greater risk of not completing. Our work really emphasizes preparing students to be successful in college. We're pretty successful (although not universally) at getting students in the door, but the probabilities of finishing are relatively low.

EF: What if the college premium continues to increase but we aren't able to improve preparedness and completion rates?

Eberly: The students who complete are the ones who receive that college premium. So you'd have a small group of people getting a larger and larger premium, versus the group of people who aren't completing college and aren't getting that premium. The gap, and hence inequality, would just get larger and larger.

The stakes are high with trying to improve preparedness and college completion. It's worth noting that there's a lot of heterogeneity across schools in college completion. Some schools are very successful at completion, but a lot of the new entrants into college are going to schools that are less successful. It's that interaction between who goes to school, where they go, and how likely they are to finish that really poses challenges for rising wages and rising inequality.

EF: You were recently elected vice president of the American Economic Association. What are your goals for your term?

Eberly: The AEA is grappling with a range of equality and inclusion issues. Those issues are challenging and difficult, but I think we do better when we run toward the problem. We're professional social scientists. We should be able to use the tools of our profession to better understand the issues and also to think about how to implement improvements.

EF: What changes would you like to see?

Eberly: We need to hear and speak the experiences that women and underrepresented minorities have in the field, because we're well past silence now. And we need to increase the visibility of the work of talented economists of every type.

EF: Your research spans such a broad set of issues. Do you see a common thread?

Eberly: I think of all my research as being about intertemporal decision-making, making choices about the future. What do you do today that affects the future? Physical capital, intangible capital, human capital, fiscal policy, monetary policy — they're all about trade-offs between today and tomorrow.

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