EconoFact Chats: What Do a Billion Prices Tell Us About Inflation?

Alberto Cavallo, Harvard Business School

Published on 24th October, 2021

Michael Klein:

I'm Michael Klein, executive editor of EconoFact, a non-partisan web-based publication of the Fletcher School at Tufts University. At EconoFact we bring key facts, and incisive analysis to the national debate on economic, and social policies. Publishing work from leading economists across the country. You can learn more about us and see our work at www.EconoFact.org

Michael Klein:

Public opinion polls in the 1970s identified inflation as the most pressing problem facing the United States. Not crime, not poverty, not the threat of nuclear war, but the general rise in prices. The recession engineered by the Federal Reserve that began in late 1979, wrung inflation out of the system, but at the cost of what was at that time, the biggest economic downturn since the 1930s. Inflation stayed low for the next four decades, in what former Federal Reserve chairman Ben Bernanke called the great moderation, but now inflation is back. The big question is whether this is a return to the 1970s or whether we are just seeing a temporary blip due to supply chain disruption and other conditions caused by the pandemic. One way to try to get at the question of the durability of inflation is to take a more fine grained, look and consider price changes of individual goods and services, and not just the overall price index. An expert in this area is my guest today; Harvard Business School professor Alberto Cavallo. Alberto pioneered the use of online data to measure inflation. Co-founding The Billion Price Project in 2008, as well as PriceStats in 2011, the leading private source of inflation statistics in over 20 countries. Alberto welcome to EconoFact chats.

Alberto Cavallo:

Thanks, Michael, it is great to be here.

Michael Klein:

Alberto, let's start off with some basics. Inflation is a rise in all prices in the economy. If I'm paying more for orange juice, rent, restaurant meals, and gasoline, but also my wages are going up in line with these other price changes, why do I care?

Alberto Cavallo:

Well, the problem is that things are never so smooth, there are many distortions along the way.

Michael Klein:

What do you mean by distortions?

Alberto Cavallo:

Well, first inflation is defined as the general change in prices, but not all prices go up together at the same time, so there are winners and losers depending on what people are actually buying. And second inflation tends to hurt people whose wages do not go up, those whom fixed incomes, and others who may not see wage gains so quickly.

Michael Klein:

Who are the others who wouldn't see wage gains like that?

Alberto Cavallo:

Well, for example, usually low income people, those in the informal sector who may not have negotiation power with their wages, or even anyone who does not have access to financial instruments that can protect their incomes from inflation. In fact, in practice, what happens is that wages and incomes tend to adjust to inflation with the lag. So anytime there's a rapid increase in inflation, it's usually a time when there're are many distortions. Also as inflation rises, it also becomes more volatile. So it tends to introduce a lot of uncertainty into consumption, investment decisions, and that's basically what we're seeing right now in the U.S.

Michael Klein:

So macro economists look at the economy as a whole, but as I mentioned in the introduction, you've pioneered the use of online price data to look at a billion prices or so the projects name suggests. Do you really have a billion prices?

Alberto Cavallo:

Yes, well, the price data accumulates very quickly. We are now collecting about 25 million prices a day in 50 countries, and that means we get about a billion in just 40 days. So to give you a sense of the magnitude versus traditional sources, in the U.S. alone, we collect two million prices per day, while the U.S. bureau of labor statistics, the BLS collects about 80,000 prices once a month for the official CPI. So, yes, we do have a lot of data, particularly for goods that are well represented online.

Michael Klein:

So what are some of the major takeaways from the analysis that you and others have found from all this online data in particular? Do we need to rethink the idea of inflation as not a rise in all prices together, but instead of kind of mash up of price increases and price decreases?

Alberto Cavallo:

Yes, there is a, growing academic literature that uses micro data to study how pricing decisions are made, and how this can affect inflation dynamics, and we have learned that there are a lot of differences in pricing behaviors, depending on the type of retailer, even within sectors and that the type of disruption or crisis that affects companies can, actually matter a lot for the pricing behaviors.

Michael Klein:

Well already all for example, the U.S. Government publishes core inflation, which excludes food and fuels. So what you're doing is a little bit like this, but a mega version of that, correct?

Alberto Cavallo:

Yeah, that's correct. So some of these ideas of sectoral differences for example, are old ideas. And the reason why national statisticians in the U.S. have traditionally ignored food and fuel, that tend to be very volatile in the short run, and focus on the concept of core inflation. But with micro data, we can just go much deeper in trying to understand the mechanisms that are taking place and how different pricing behaviors are made in different settings.

Michael Klein:

Are there some particular examples you'd like to point to?

Alberto Cavallo:

Sure, so for example, in a paper I wrote with co-authors in 2019, looking at the price impact of the trade war, we found that retailers tended to delay price changes when they perceived that the impact on their costs was going to be temporary, or they could find alternative ways to adjust. So the pass through in the retail prices was low in that case. Another example based on my own research was that if the retailers are competing online with, retailers that have an expertise in pricing algorithms, for example, they actually tend to adjust their prices much faster to whatever cost pressures they're experiencing, and that leads to quicker pass trough with the prices. Both of these things are important right now in the context of COVID because we have a lot of uncertainty about the persistence of the cost pressures that many retailers are, facing and also a lot of transactions have moved online during COVID.

Michael Klein:

I like the fact that this is so linked to what's happening now, with the uncertainty about the persistence and the online transactions. But another thing that we've seen over the period of the pandemic is that people have changed the set of things they buy, for example, many fewer restaurant meals and movie tickets, and much more, money spent on appliances for the home and for exercise equipment. I imagine that the basket of goods used by the government to gauge inflation has not kept up with these changes, but you have a research paper don't you, where with your price data, you're able to track these shifts. What did you find?

Alberto Cavallo:

Right, so early on in the pandemic, it became obvious that everyone's consumption patterns were going to change with the lockdowns and the restrictions, but it was not clear how much this was really going to impact the measurement of inflation. So as you pointed out, the problem is that the official CPIs in the U.S. and other countries, they're built with a relatively fixed set of weights across sectors. And, they only get updated once every two years in the case of the U.S. And the last time was in December 2019.

Michael Klein:

Which was just before COVID hit?

Alberto Cavallo:

Exactly, and to be clear, this is fine in normal times, but when you get a crisis like COVID, it can completely disrupt the consumption patterns. And we may be getting for a while, a very biased measure of inflation. And in particular, COVID was making all of us consume a lot more food and a lot less transportation during this period.

Michael Klein:

I mean the food sort of manifested itself in myself and a lot of others gaining weight.

Alberto Cavallo:

Absolutely, but it's important also for inflation, because these two sectors were initially having very different inflation rates, and the CPI was just not able to adjust for that. Fortunately, just like, as there are new data sources for prices, like the ones I'm using online, they're also great new data sources for expenditure patterns. And I was able to construct my own COVID basket.

Michael Klein:

Do you really want to use that word? [laughing]

Alberto Cavallo:

Right, so my own set of weights for the CPI. And I did this by relying on the work of Opportunity Insights, which is another academic initiative based at Harvard that relies on data from credit and debit card transactions in the U.S. to monitor spending patterns in real time. And using this data, I was able to recompute the CPI weights on a monthly basis and recalculate the U.S. Inflation rate.

Michael Klein:

What did you find with that?

Alberto Cavallo:

So, I found that during 2020, the inflation rate was being underestimated and the intuition is simple. The official CPI was simply giving too much weight to transportation and other recreation sectors where prices were falling, even though none of us were able to consume much of them, because we were not traveling and doing things we would normally do.

Michael Klein:

Do you have information for 2021 as well?

Alberto Cavallo:

So interestingly, if you look at 2021, the opposite thing started to happen. And to be clear, the CPI was still putting too much weight on transportation, but now prices in that sector were increasing very quickly at the beginning of 2021, particularly in sub-categories such as used cars and trucks. So I found that if you adjusted the basket of the CPI to take that into account, the annual inflation rate in the U.S. would that now be about half a percent lower. So there's an underestimation in 2020, and now an overestimation right now, simply because we haven't been adjusting the basket of consumption in our statistics. And anyone of you is interested, you can see the latest numbers. I update them every single month. You can simply google 'Harvard COVID inflation,' and you can see the latest numbers.

Michael Klein:

So, that's really interesting because as macro economists, we look at the whole economy. And this whole move to look at micro data, very micro data in this case really can help inform us as to what's going on at the macro level. Another feature of the pandemic is shortages, especially at the beginning of the pandemic, there seemed to be panic buying. So for example, stores ran out of toilet paper. More recently transportation difficulties due to the pandemic have led to shortages in a range of goods from cars to electronics. You recently published an EconoFact memo with your co-author Oleksiy Kryvtsov on shortages. Can you describe what you found?

Alberto Cavallo:

So, in the paper we show that shortages and stockouts have been present all along since COVID started and for a very wide range of consumer goods. They actually have become a distinguishing feature of this crisis. And they're still very important in some sectors, such as electronics and food, but they have recovered. The stockouts have fallen in other sectors, such as healthcare goods and personal care items.

Michael Klein:

You and Oleksiy make a very important distinction between temporary stockouts and discontinued products. Discontinued products, it's a permanent change while temporary stockouts it's temporary by the name, it's a temporary disruption. What was the relative prevalence of temporary stockouts versus discontinued products? And did you find a pattern in what types of goods were temporarily unavailable and which were discontinued?

Alberto Cavallo:

Yes, so right. We, we distinguished this because in some sense, the stockouts were very visible at the beginning of the pandemic. The stores would put up these labels, and signs that showed products had been out of stock. And we call these in the paper temporary stockouts because implicitly, the retailers are telling their customers that they hope they'll be able to bring these goods back in stock very soon. And many of them did. Things like toilet, paper wipes, and hand sanitizer. They all went back, and became available once again. But after a few months, we noticed that many other goods were starting to disappear completely from the stores, and these discontinued goods we called them permanent stockouts in the paper. They're not so obvious to consumers, but they really became the main type of stockouts early on, and they have continued to be very important since then.

Michael Klein:

How did you track that? That seems like a challenge.

Alberto Cavallo:

So, we are simply looking at how many goods are available for sale now, relative to pre pandemic levels. And we can and keep track of that over time. And, it is a good way to detect these supply problems because it truly shows that the retailers are having a hard time bringing many of these goods back into their stores. And even though, as I said, some sectors have recovered others such as food and electronics, we're still seeing very large numbers of permanent stockouts, and they come in cycles that have lasted much longer than we all anticipated.

Michael Klein:

So these shortages are very important in and of themselves, but you're also able to draw some implications about inflation from what you find about the relationship between shortages and price changes. Going back to the question I posed in the introduction, does your analysis suggest that the recent surge in inflation will likely abate? Or is inflation just something we need to get used to like people did in the 1970s? I guess we also have to get used to disco music again.

Alberto Cavallo:

Right, so our results, I would say in general, they tend to suggest that inflation will likely abate eventually. In particular we find that if you take into account, the increasing costs, the price impact in sector experiencing a lot of the shortages, it's rather quick and large. It peaks at around two months. But it also becomes transitory and it disappears after three or four months. And some sectors are also recovering, so that's a sign that this is a temporary source of pressure on the cost side, and therefore on inflation.

Michael Klein:

But there's a problem that we don't really know how long COVID will last. Right?

Alberto Cavallo:

That's exactly right. So COVID is kind of an unprecedented shock, and as long as the health crisis continues to cause some of these supply disruptions, we may end up with high levels of inflation for quite a while.

Michael Klein:

This echo is something that your Harvard colleague, Greg Mankiw said, and in an EconoFact Chats podcast about a year ago, when I asked, how long do you think the downturn and the effects of the pandemic will last? He said, it's very hard to say, because we don't know how long the pandemic will last. And so that's really the big source of uncertainty, and what's driving everything. A lot just depends upon dealing with the pandemic.

Alberto Cavallo:

That is exactly right.

Michael Klein:

Alberto, you're from Argentina. It's a country that has a long history of high inflation, and economic instability. And I imagine that in some ways, this background prompted your research interest in prices and inflation. Are there any lessons from Argentina that are appropriate for the United States today? Or are the two situations just so different? One doesn't really inform the other for example.

Alberto Cavallo:

Yes. Well, it's true. I grew up in a very high inflation setting. I saw at a very young age, the problems that inflation can create in people's daily lives. So I guess my takeaway for the U.S. is that even though these temporary disruptions are appeared to be a major driver of inflation right now, it is very important for policy makers to stay vigilant, and not be complacent. We really need to keep monitoring these pricing dynamics and understanding what is driving them. Economies have a role to play in that. And I'm optimistic that we can do a good job thanks to many of these new data sources that are becoming available. And I guess I'm also optimistic that U.S. policy makers will not behave as many Argentine politicians have in the past, and in particular that they will instead acknowledge the impact that their policies are having on inflation and adjust accordingly. So, I am optimistic about the U.S. relative to Argentina.

Michael Klein:

Another source of inflation is discussed in a memo by Menzie Chinn is just expectations of inflation can drive inflation itself. What do you think is happening with expectations of inflation in the United States? We've had this long, great moderation as Ben Bernanke called it. Is that coming to an end? Do you think, I know this is really speculative on your part, but do you have any thoughts about that?

Alberto Cavallo:

So, I think it's important to distinguish different kinds of inflation expectations. Most people focus on investors for many of the macro discussions. The expectations we also care about are those of firms and consumers. And we have some surveys, good surveys in the U.S. Some of them done for example, by the Federal Reserve of New York that have been showing that consumer inflation expectations are increasing, but most of those are at short term horizons. So one year from now, and people then expect things to go back to normal later on. So my sense is that even though there is some increase in consumer inflation expectations, we are very far away from a situation where they would spiral out of control. And of course, what the Fed and other in the policy makers in general do in the U.S. will matter a lot for how these expectations behave in the future. And part of my answer to the previous question was trying to get at this. I am optimistic that if inflation due to the supply disruptions, or potentially an increase in demand continues to be high, the Federal Reserve will react, and try to bring it down.

Michael Klein:

Because I guess what you saw in Argentina was that the work of the policy makers actually helped inflation feed on itself, and became even hyperinflation in those countries. Hopefully we don't get to that, right?

Alberto Cavallo:

Absolutely. It, I will say it does take a long time of mismanagement on the policy side to get to inflation rates like you seen Argentina, which is currently about 40 to 50%. But it is important that, as I said, policy makers acknowledge that their policies have an impact on the inflation rate. And in Argentina for decades, we saw many of them blaming anyone else but the policies itself, and that led to a very bad outcome.

Michael Klein:

Well, Alberto thank you very much for speaking with me today. The efforts that you've put into detailed data collection are incredibly valuable, especially with the insights that you can provide in the current environment, where inflation has become, once again, a focus of policy concern. There is so much uncertainty about what's going on. Your work has really helped the public at this point. And thank you for that.

Alberto Cavallo:

Thank you, Michael.

Michael Klein:

This has been EconoFact chats. To learn more about EconoFact and to see the work on our site. You can log into www.EconoFact.org. You can subscribe on our site for newsletter that will let you know when we publish new memos and new podcast episodes. Please feel free to share this podcast and our memos with friends, colleagues, and on social media. The EconoFact is a publication of the Fletcher School at Tufts University. Thanks for listening.