

Confessions of a Data Dependent

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The views expressed are my own and do not necessarily reflect official positions of the Federal Reserve System.

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I am grateful for your invitation to speak before the NYABE today. My dear friend of decades and director of research at the Dallas Fed, Harvey Rosenblum, was once the president of NABE and spoke to this fine assemblage of minds back in 2002. That speaks volumes about the quality and importance of this forum. It is an honor to appear before you.

In keeping with today's popular obsession with disclosing any and all personal faults to as large a public as possible, I have a confession to make: I am data dependent. I have developed a strong and growing addiction to ever more refined and pure economic data. Alas, the stuff I need to feed my habit is not available on the street. So I am here today to suggest to you that there might be a profitable market for clever economists to exploit.

Before I get into that, please allow me to issue two disclosures. First, the thoughts I am about to share with you are my own and not those of any other Federal Reserve official or of the Federal Open Market Committee. Second, I am not a trained economist and make no pretense whatsoever of being a formal practitioner of the dismal science. To me, "dismal" is a misnomer; economics is a vibrant and exciting field of study, especially in a capitalist society where it best applies itself to the conundrums of capital markets and the intricacies of monetary policy.

I came to economics and the markets late in life. I started out as a midshipman at the Naval Academy, then migrated from learning to navigate the seas to navigating through the undergraduate basics of economics at Harvard. After a brief detour to Oxford—principally to find my wife and perfect my taste for good beer—it was onward to Stanford Business School, where I discovered what has become a lifelong passion, with its own branch of economics: decisionmaking under conditions of uncertainty.

For over a decade before I took up public service in 1997, I was able to profit from that passion as a hedge fund manager. Back in those days, the investors in funds actually made more than the managers of those funds—imagine that! Now I have the responsibility to apply what I have learned over the years in a different context—the making of monetary policy.

Successful hedge fund managers and effective central bankers share at least one trait: They abide by what I refer to as "the Gretzky principle." Hockey's Great One, Wayne Gretzky, once proclaimed, "I skate to where the puck is going to be, not to where it has been." It seems to me that success, whether for central bankers, hedge fund managers or business economists, comes with anticipating what comes next and acting decisively to be positioned for where the economic "puck" is likely to go.

To apply the Gretzky principle, good judgment, not a small amount of good luck and good data are needed.

Good judgment certainly characterizes the men and women I have the honor of serving beside on the FOMC. For today's purposes, I want to duly note their good judgment, politely brush aside

luck—we will always take as much as the monetary gods are willing to grant us—and focus on an essential element in the art of making fruitful decisions in an uncertain world: good data.

I hardly need to explain the importance of good data to any of you. We all know the consequences of data being wrong or arriving too late. Our reputations rest on the data we use. The better the data, the less our uncertainty. And the less our uncertainty, the better our ability to make sound decisions.

Without a doubt, both the quantity and quality of the data I review now as a Fed bank president and FOMC participant are far beyond what I had access to in the past. The Fed's data resources are unmatched, as is the interpretation of that data offered by the exceptional minds of its regional and Washington research staffs. Yet one can never be satisfied. As good as the data are, they are never good enough. We have a great deal of accounting and analytical work left to do as we seek to refine our ability to make monetary policy in an increasingly complex world.

Let me give you some examples of data inadequacy.

To begin with, most economic data are inherently backward looking, often to a disconcerting degree. Obviously, there is no way around this. Obtaining completely accurate forward-looking data would require extensive investment and research into that other dismal science, science fiction. Yet time-travel aside, we must strive to develop reliable real-time data collection technologies and ever more practicable models based on the limited framework of historical observations. That process is ongoing. To paraphrase singer-songwriter Robert Earl Keen, the road goes on forever and the analytical party never ends.

This is not to suggest that simply developing more enhanced models using available data is all that is needed for us to do our job better. In a rapidly changing world where microeconomic operators, enabled by expanding economic geography and technological innovation, are constantly pushing the envelope of production and profits, one can never be confident in the insights provided by even the most sophisticated econometric models.

Each month, as I prepare for an FOMC meeting, I spend a great deal of time talking with CEOs and CFOs of companies to gather their impressions of the current state of the economy. To prepare for this last FOMC meeting, for example, I spoke to the leaders of companies whose annual revenues aggregated to a little over \$1 trillion and whose operating income easily exceeded \$110 billion last year. In these monthly interviews, I ask about activity and trends in their businesses and what they see happening with their production lines, customer bases and competitors in hopes of gaining insight into current growth and inflation dynamics in the economy. Recognizing the limits and risks of anecdotal evidence, even coming from the most disciplined and experienced corporate operators, I personally find this an effective way to bridge the gap between what our economic models tell us—based as they are upon historical data and various theoretical assumptions about the future—and what is happening in the real economy.

During these conversations, I usually hear a keyboard clicking away in the background as these CEOs and CFOs punch in a few commands in response to my inquiries. And presto, accurate data emerge from their desktops about new orders, inventory levels, capacity utilization, input prices and a slew of other indicators that are minutes—not months—old.

To be sure, the ubiquitous nature of the data available to today's business operators raises the risk of drowning in information as they search for knowledge. Nevertheless, a significant disconnect persists between the instant and accurate data available to the hands-on operators in the economy and the inadequate and delayed data our macroeconomists are given to contemplate.

I do not envy the statisticians charged with tracking the U.S. economy. We are a behemoth—\$13 trillion in GDP, 300 million mouths to feed, 140 million workers, billions of transactions on any given day. But working with incomplete and belated information limits our ability to “skate ahead of the puck.” For example, the service sector now represents 70 percent of the U.S. economy, yet we remain incapable of forecasting with service-sector data because such data do not exist. When I was a deputy U.S. trade representative, I could access reliable and nearly immediate data on trade in goods, while the latest services trade data would be up to a year old. Unfortunately, the services trade data represent only a smidgeon of the total impact services have on our economy.

A good central banker knows how costly imperfect data can be for the economy. This is especially true of inflation data. In late 2002 and early 2003, for example, core PCE measurements were indicating inflation rates that were crossing below the 1 percent “lower boundary.” At the time, the economy was expanding in fits and starts. Given the incidence of negative shocks during the prior two years, the Fed was worried about the economy's ability to withstand another one. Determined to get growth going in this potentially deflationary environment, the FOMC adopted an easy policy and promised to keep rates low. A couple of years later, however, after the inflation numbers had undergone a few revisions, we learned that inflation had actually been a half point higher than first thought.

In retrospect, the real fed funds rate turned out to be lower than what was deemed appropriate at the time and was held lower longer than it should have been. In this case, poor data led to a policy action that amplified speculative activity in the housing and other markets. Today, as anybody not from the former planet of Pluto knows, the housing market is undergoing a substantial correction and inflicting real costs to millions of homeowners across the country. It is complicating the task of achieving our monetary objective of creating the conditions for sustainable non-inflationary growth.

When we consider the potential consequences of poor or incomplete data leading to suboptimal policy, central bankers must be, by necessity, knights errant of sorts, searching for the Holy Grail of economic data that is both timely and accurate.

In this regard, I want to brag on my team at the Dallas Fed for a minute. The Dallas Fed has had some success at making our region's data more timely and accurate, a significant feat when you consider that Texas is the second most populous state, has the fastest growing manufacturing base in the country, grew its real output at a 9 percent rate in the first quarter, leads the nation in exports and boasts an economic machine larger than Korea or Brazil or Mexico and 25 percent larger than India in dollar terms.

One area of our staff's success is with employment data. In March of each year, job growth estimates through the preceding September are revised using unemployment insurance records. But these records are released quarterly, not just annually, so we take advantage of this fact to

revise our estimates of Texas jobs on an accelerated schedule. In March 2005, for example, the initial release put job gains for the month at 10,600. When official revisions were released a year later, the public found out that many new jobs had not been counted and that the initially reported figure was less than half the 21,700 jobs that had actually been created. But this was something we at the Dallas Fed already knew. Five months earlier, in August 2005, our analysts had estimated that 17,000 jobs had been added in March. In other words, we anticipated much of the official revision well before it was released seven months later. Moreover, our analysts devised a two-step procedure for seasonally adjusting official Texas employment data that was later adopted by the BLS. These procedures for refining existing data help explain why the Dallas Fed's jobs-growth forecasts consistently outperform those of other analysts for timeliness and accuracy.

We also have developed a measure of inflation that is, I believe, a better predictive tool for future price movements. The Trimmed Mean PCE inflation rate that we calculate in Dallas looks at monthly price movements and sets aside those price categories that rose and fell most sharply, so that extreme swings in the prices of individual components do not distort our sense of the underlying trend. It does not automatically exclude food, energy or any particular set of items. For September, the most recent month available, our Trimmed Mean showed inflation running at an annualized rate of 1.7 percent, below the 2.1 percent annualized rate registered by the ex food and energy measure of core PCE inflation. For the past year—September 2005 to September 2006—the Trimmed Mean showed inflation running at 2.6 percent, slightly ahead of the ex food and energy measure of 2.4 percent.

From my perspective, the Dallas Fed's Trimmed Mean measure is especially helpful because it is designed to forecast the underlying trend in *overall* consumer price inflation six months to a year ahead. From the numbers I just mentioned, I draw two conclusions. First the good news: It is possible that the trend in overall consumer inflation has peaked and is finally heading lower. Next, the not-so-good news: The overall inflation trend remains at a level above my comfort zone. I am encouraged by the change in direction of trend inflation, and I hope that in the future my CEO and CFO contacts will be telling me that the competitive forces of globalization have kept their pricing power limited or nonexistent.

So the good economists at the Dallas Fed are making progress.

But these are relatively simple accomplishments when we consider what is needed to maximize our analytical efficiency in a globalized, cyber-enhanced world. Even before we start to develop better measurement techniques to capture the influences of new economic entrants and technologies that continue accelerating at the pace of Moore's Law, we first need to ask some basic questions.

Bear with me as I present an analogy that might strike you as a bit over the top but will, I hope, ease us into a discussion of contemplating the vital data we may need to inform Federal Reserve policymaking in a dramatically changed world.

Suppose I were to create from thin air an imaginary new currency to replace the U.S. dollar in my home state of Texas. Since the Canadians already have the loonie—I know how you New Yorkers look at Texans—let's just call this new Texas money the "burrito."

Now imagine Texas changed its relationship to the U.S. in no other way but for the creation of the new burrito and the establishment of an independent central bank with responsibility solely for Texas. The burrito would be backed by the full faith and credit of the government in Austin, and the Central Bank of Texas would have exactly the same mandate as the Federal Reserve, but only for the Texas economy.

In every other way, business would proceed as usual. No laws would change. We would stay connected as we are now to the world around us. We would have the same flows of goods, people, ideas and capital that we do today as part of the United States.

How would the Central Bank of Texas accomplish its mission? What economic indicators would we find useful in seeking to formulate a monetary policy designed to preserve the value of the burrito and the sustainability of Texas' economic growth? Would we look only within Texas' borders? Would our inflation rate policies differ significantly from those of the United States sans Texas? Would real Texas interest rates be fully independent of or highly influenced—or perhaps even determined—by U.S. rates? Would we need to take into account the monetary policy of the rest of the U.S. to determine our own proper monetary stimulus or restraint?

Of course, we know that, as with any central bank, the hypothetical Central Bank of Texas would have the power to debase the burrito by printing too much of it or by maladministering the Central Bank's franchise. But, could we affect our employment and output, given our real and virtual connections to the U.S. and the world around us? If not, should we then just rewrite our central banking mandate to focus solely on prices? And even if we did, would we be able to make the variability in Texas' inflation, and the corresponding inflation risk premium, less than that of the United States? Or would the inflationary impulses of the U.S. condition the dynamics of Texas' inflation?

Now, let's come back to the real world. Is it really possible to assume that like the fictional, independent Central Bank of Texas, the Federal Reserve can make monetary policy without taking into account capacity constraints, levels of resource utilization, global liquidity and other factors impacting price developments in the rest of the world? How do we know what our true potential growth is without properly accounting for the world's resource potential? How can we calculate our NAIRU without an accurate sense of workforce dynamics and price movements outside our geographic boundaries?

Your gut-level answers to these questions may be similar to mine. I would venture that the Open Market Committee of a Texas central bank would pay quite a bit of attention to economic trends in the U.S. and the rest of the world. Reliance on Texas data and econometric models alone would be insufficient, perhaps even foolhardy.

The Federal Reserve has an impressive assortment of highly sophisticated, regularly measured and accurate data to put into its existing domestic models. But I would argue that we need to supplement them with data that incorporate global trends. We cannot dismiss the worldwide resources that can be brought to bear to increase production and the aggregate supply of goods and services. These inputs dictate the level of competition in the marketplace. In the real world, developments in faraway places like China impact the ability here at home to grow employment and profits and to raise or lower prices. Just look at Ford Motor Co.'s recently announced plans to cut production costs by doubling its purchases of Chinese-made parts. Searching the globe for

better, cheaper and faster inputs is a basic instinct of the millions of middle managers who run supply chains for countless U.S. businesses, large and small.

So what specific things might we want to look at? Luckily, we do not have to look very hard to find clues about the best answer to this question. Looking beyond borders, as you all know, is standard operating procedure for central banks all over the world, including our neighbors to the north.

You know the old saw about Canada being the *vichyssoise* of nations: cold, half-French and difficult to stir. Well, the Canadians are hardly stereotypical when it comes to making monetary policy. In addition to looking at essential domestic and international indicators—inflation, output gaps, GDP growth, terms of trade, commodity prices, exchange rates, international interest rates and so on—they begin their analysis and estimates of the future with an outlook for global GDP growth and global growth projections.

Canada resembles the U.S. in openness to the world economy. But its economy is much smaller. Indeed, Canada's output in real dollars is only a little bit greater than Texas'. Economic theory supports the idea that small open economies like Canada's or Texas' have to look beyond their borders to understand inflationary pressures because they lack the heft to influence world prices and the capacity to be largely self-reliant. Small economies, so the theory goes, are price takers.

Big economies like the U.S. are price makers, and in theory, international price developments follow our lead, thus relegating external developments to a lesser status. Yet the euro zone nations constitute an equally large economy. At the European Central Bank, the very first item reviewed in its regular *Monthly Bulletin* is "The External Environment of the Euro Area." This consists of a review of real economic developments in the U.S., Japan and the non-euro-area OECD, as well as the U.K., other European countries, Latin America and Asia. Next, the ECB reviews developments in commodity markets and discusses the outlook for the external environment. Only after looking beyond their borders do they go into a very standard review of monetary and financial developments in the euro area and exchange rate and balance of payments indicators.

Here we have a big economy and an influential central bank demonstrating the importance of monitoring external developments along with their domestic analysis. Maybe we can learn something from the ECB when it comes to working global economic developments into our deliberations.

This is not to say that the Federal Reserve doesn't do its level best to look beyond domestic economic indicators. We certainly do. Nor am I suggesting that the Federal Reserve does not ultimately have the power to control inflation in the United States. We have it well within our grasp to debase or enhance the value of our currency. But I would argue that international data deserve closer examination in order to understand the influences an integrated global economy has on our economy and our currency and the implications of that integration for our monetary policymaking. Last week, my counterpart at the New York Fed, Tim Geithner, put it this way: "Integration does not, and should not, limit our ability to achieve our objectives. Rather, it forces us to think harder about how our economies are evolving and how developments in the rest of the world affect our markets." If this is so, we have to focus on how best to improve our collection and analysis of global data.

The Dallas Fed is undertaking a significant research effort to examine the issues I've addressed today and to answer many other questions globalization poses for the economy and for monetary policy. To guide our research on this front, we have put together an advisory board consisting of Martin Feldstein, John Taylor, Ken Rogoff, Glenn Hubbard and Nobel laureate Finn Kydland.

I will tell you one thing we have already learned from our nascent work in Dallas and that is that we know less about the rest of the world than we think we do. To illustrate my point, consider that there is no reliable measurement of the capital stock of China. This handicaps any calculation of China's resource utilization and invalidates any measurement of China's "output gap." In reality, we've no idea how much capacity exists should a gaggle of Fords seek to cut production costs by turning to Chinese parts suppliers.

Globalizing econometric models, though, could help us fly a little less blindly. To extend that metaphor, let's go back to my home base of Texas. When I get on an airplane to fly to speak to you here in New York, I put myself in the hands of that plane's pilots. To carry me to LaGuardia, they determine the best course to fly by accounting for headwinds, tailwinds, updrafts and downdrafts in order to aeronautically skate ahead of the puck and get us there on time and in one piece.

Globalization brings new influences into the Fed's navigation calculations to determine the best flight path for the U.S. economy. To determine that course—and to most efficiently and safely reach our mandated destination of sustained non-inflationary growth—we must develop a better understanding of the new forces exerting themselves on the aircraft we have been charged with flying. That aircraft no longer flies solely in domestic space, affected solely by domestic factors. Rather, it flies all over the world, requiring more sophisticated navigation instruments to monitor changing global and domestic economic conditions, enabling us to pilot the craft safely and efficiently.

Herein lies the opportunity for enterprising economists, such as yourselves, to rise to the challenge I've presented here today and to profit from the development of that new, sophisticated navigation equipment. I hope you do.

I realize many of you would prefer to discuss the more immediate outlook for the economy and for monetary policy. So I will stop here and do my best to not answer your questions.

Thank you.