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Alternative Economic Indicators

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Policymakers and business practitioners are eager to gain access to reliable information on the state of the economy for timely decision making. Traditional economic indicators have been criticized for delayed reporting, out-of-date methodology, and neglecting some aspects of the economy. Recent advances in economic theory, econometrics, and information technology have fueled research in building broader, more accurate, and higher-frequency economic indicators. The 2018–2019 Werner Sichel Lecture Series invited six prominent economists to speak on their current research on alternative economic indicators, including indicators in the financial market, indicators for business cycles, and indicators of economic uncertainty. Their lectures have been compiled in this volume.

In Chapter 2, William Barnett and Kun He argue that the growing complexity of financial instruments has made the traditional simple-sum monetary aggregates such as M1–M4 obsolete. The authors outline the evidence showing how the Fed’s simple-sum monetary aggregates have provided misleading information about the economy and monetary policy. In contrast, they show how their Divisia monetary aggregates have been more in line with the true liquidity conditions in the economy. Unlike the simple-sum aggregates, which assume that all monetary components contribute equally to the aggregate, the Divisia monetary aggregates weight the growth of each component using a formula based upon its user cost to reflect its liquidity in making transactions. Barnett and He describe the latest efforts in constructing the Divisia monetary aggregates by incorporating credit card services and distinguishing between the demand-side and the supply-side money services.

In Chapter 3, Scott Brave introduces the National Financial Conditions Index (NFCI) and Adjusted National Financial Conditions Index (ANFCI) as measures of the overall financial market condition pro-

vided by the Federal Reserve Bank of Chicago. The latter is adjusted for the state of the business cycle and the level of inflation. Since the global financial crisis, economists at the Chicago Fed have constructed composite indices that aim to measure the overall tightness of the U.S. financial system. The NFCI is a weekly summary statistic estimated by a mixed-frequency dynamic factor model on a panel of 105 weekly, monthly, and quarterly financial time series. In the chapter, Brave shows that the index aligns closely with the historical episodes of financial stress and has been a useful tool in monitoring financial stability.

As to alternative business cycle indicators, numerous efforts have been devoted to replacing the traditional GDP measure. Many have adopted data-dimension reduction techniques such as principal components analysis and dynamic factor analysis to extract as much information from as many variables as efficiently as possible. Brave introduces the Chicago Fed National Activity Index (CFNAI), a monthly summary statistic for U.S. economic growth estimated by principal components analysis using 85 monthly indicators. The CFNAI has been shown to be roughly 95 percent accurate historically in identifying U.S. recessions (as defined by the National Bureau of Economic Research) since 1967.

Based on a dynamic factor model, the New York Fed Staff Nowcast is an early estimate of GDP growth for the current and subsequent quarters. In Chapter 4, Domenico Giannone and his coauthors, Patrick Adams, Eric Qian, Argia Sbordone, and Mihir Trivedi, present in detail this automated platform for monitoring U.S. macroeconomic conditions in real time. This nowcasting model synthesizes a large number of variables (macroeconomic big data) monitored by economists, incorporating new information within minutes of the data releases. It is entirely automated and mimics best practices without relying on any subjective judgment. This platform provides a model-based counterpart to the analysis traditionally based on expert knowledge. The authors show that the New York Fed Staff Nowcast provided accurate early estimates of the U.S. GDP during the Great Recession.

In Chapter 5, Alessandro Barbarino and Chiara Scotti provided an estimate of the probability of a recession occurring in 2019 by comparing various models and employing a mix of macroeconomic and financial indicators, including the Aruoba-Diebold-Scotti (ADS) real business condition index and Scotti's surprise and uncertainty indexes, explained below. The ADS index, maintained and updated by the Phila-

delphia Fed, is derived from a dynamic factor model as well. It is a daily index that measures the latent real business conditions in real time, emphasizing that a business cycle is about the dynamics and interactions of many economic indicators from various frequencies. The surprise and uncertainty indexes are daily measures of surprises and uncertainty about the U.S. real activity, as measured by the ADS index. Scotti and Barbarino conclude that real variables are more powerful in signaling recessions at shorter horizons, while financial variables are valuable leading indicators at longer horizons. Their model, using real variables, did not show a high recession probability in 2019 (as of mid-March of that year), contrary to what was suggested by the Congressional Budget Office and several published surveys.

In addition to Scotti's index of uncertainty about the real activity, the following chapter presents another index for uncertainty—the economic policy uncertainty index. In Chapter 6, Steven Davis details the construction of the index and highlights the effect of the shift in U.S. trade policy under the Trump administration on economic uncertainty. The index is constructed from newspaper coverage of policy-related economic uncertainty by using computer-automated newspaper searches. Davis shows that the U.S.-China conflict over trade and commercial policies has become a major source not only of economic policy uncertainty but also of increased equity market volatility. The trade conflict, however, has a limited impact on U.S. domestic investment. Conversely, the Chinese economy is more vulnerable to trade policy shocks and uncertainty.

In the past decade, thanks to revolutions in computer science, engineering, and geography, data compiled by sensors on satellites have become publicly accessible for researchers. The satellite night lights data have been increasingly used by social scientists as an alternative measure of economic activity. In the book's final chapter, Adam Storeygard highlights six key advantages of using satellite data for economic research and policymaking. These include 1) providing data for data-poor contexts, 2) high spatial resolution, 3) low-cost repeat measurements, 4) data available for the whole world, 5) consistency across borders of different systems, and 6) avoiding possible data manipulations by traditional data collectors. Storeygard provides examples of research on deforestation, pollution, urban growth, transportation, and political economy. Although not a complete substitute for traditional

administrative or survey data, the satellite night lights technology holds great promise as the cost of obtaining these data goes down and the algorithms for analyzing them keep advancing.

All the economic indicators presented in the lecture series are publicly available. They are so well accepted that researchers around the world have been adopting the presented ideas and methodologies to build comparable indicators for many countries. Looking ahead, we expect emerging technologies in big data platforms and artificial intelligence to further advance the research in how data are collected and analyzed, which should lead to more innovative and informative economic indicators, resulting in better policymaking and business decisions.