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The Wall Street Journal panel of economists: How did they do in predicting economic growth in a time of pandemic?

Karlyn Mitchell
Department of Business Management, North Carolina State University

Douglas K. Pearce
Department of Economics, North Carolina State University

Abstract

The Covid- 19 pandemic was an unexpected shock to the U.S. economy, which made the already fraught task of forecasting economic activity even harder. This paper investigates how forecasts of real GDP growth from a monthly survey of professional economists conducted by the Wall Street Journal evolved over 2020 as the economic repercussions of the pandemic grew. We document how the economists initially underestimated the size of the economic contraction initiated by the pandemic and then underestimated the size of the ensuing economic recovery until after it had occurred. We also document how the economists' forecasting errors evolved over the year as they revised their predictions in response to incoming economic data. We suggest that forecasters underestimated the recovery in 2020III due, in part, to the unprecedented sizes of the fiscal stimulus and the mobility constraints imposed by the pandemic.

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Contact: Karlyn Mitchell - kmitchel@ncsu.edu, Douglas K. Pearce - dkpearce@ncsu.edu.
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1. Introduction

Covid-19 sent shock waves through the U.S. economy when it arrived early in 2020, more than a hundred years after the last pandemic. Three years later, researchers are assessing the economic costs of Covid, evaluating the effectiveness of economic remedies, and devising strategies to mitigate damage from future pandemics. We seek to add to this discussion by analyzing how expectations of Covid's economic impacts evolved during the first year of the pandemic.

Specifically, we study the evolution of monthly real GDP growth rate predictions made by professional forecasters in 2020 and assess their accuracy. GDP predictions are important to economic actors because they influence actors' economic decisions now. Professional forecasters' predictions are watched closely due to forecasters' skill, access to data, and incentives. High-frequency (i.e., monthly) predictions are especially useful early in a pandemic when new information arrives daily. Accurate predictions imply that forecasters understand how a pandemic propagates throughout the economy whereas inaccurate predictions imply knowledge gaps that need to be filled.

The paper is organized as follows. We start with a brief chronology of the pandemic and the economic policy responses to it. Next, we describe the evolution of forecasters' real GDP growth rate predictions, the accuracy of their predictions, and what the predictions implied about the speed of economic recovery. Finally, we assess our findings and draw conclusions.

2. Arrival of Covid-19 and Policy Responses: A Brief Chronology

The novel coronavirus, first reported in the Chinese city of Wuhan in mid-December 2019, spread across the globe and emerged as a dominant concern within a few months. The first documented case in the U.S. appeared on January 20. When President Trump declared a national emergency seven weeks later, documented cases numbered nearly 4,000; by May 1, cases numbered over 1.1 million. By year-end, more than 20 million Americans had contracted the virus.

2.1 Monetary Policy Responses to Covid-19

Financial market conditions deteriorated soon after the January 29 meeting of the Federal Open Market Committee. The S&P 500 slid from its peak on February14, losing a third of its value within five weeks. Selling pressure quickly spread from stocks to bonds. To ease credit, the FOMC reduced the target range for the Fed funds rate by 50 basis points at its March 3 meeting, to 1.00 – 1.25%. Starting on March 9, unprecedented sales of U.S. Treasury securities by foreigners, mutual funds and households overwhelmed government securities dealers, causing bond yields to spike. After its March 15 meeting, the FOMC cut the Fed funds rate's target range to 0.00 – 0.25% and announced Federal Reserve purchases of at least $500 billion of Treasury securities and $200 billion of mortgage-backed securities. By March 23, the FOMC had committed the Fed to unlimited purchases of Treasuries and MBS. To return order to bond markets, the Fed also restarted old lending facilities and initiated new ones, effectively becoming the lender of last resort to corporate borrowers for the first time in the Fed's history. By the end of 2020, the Fed held $2.4 trillion more Treasury securities and $0.6 trillion more MBS than at year-start.

2.2 Fiscal Policy Responses to Covid-19

Four pieces of legislation enacted early in 2020 constitute the federal government's main fiscal policy response to Covid-19. The Coronavirus Preparedness and Response Supplemental Appropriations Act, signed on March 6, appropriated $8.3 billion to develop Covid-19 remedies and to combat Covid's spread. The Families First Coronavirus Response Act, signed on March 18 and projected to cost $192 billion, provided funds for free Covid-19 testing, increased unemployment insurance benefits, and covered Covid-19-related sick leave at small firms. The Coronavirus Aid, Relief and Economy Security (CARES) Act, signed on March 27, appropriated $2.3 trillion mainly for one-time cash payments to eligible households ($1,200 per adult, $500 per child); for more unemployment insurance benefits and additional $600 weekly benefit checks for eligible workers; and for wage replacement at small firms through the new Paycheck Protection Program. The Paycheck Protection Program and Health Care Enhancement Act, signed on April 24, appropriated $484 billion for more wage replacement at small firms. The Congressional Budget Office projected that these four acts would widen the federal deficit by about $3 trillion, nearly14% of nominal GDP in 2019.

3. Macroeconomic Forecasting In 2020

As the U.S economy shut down in spring 2020, the public's attention shifted to predicting the depth of the impending recession and the speed and strength of the subsequent recovery. Would real GDP growth take a V-shaped or U-shaped trajectory? While many forecasting services exist, the *Wall Street Journal* Economic Forecasting Survey (*WSJ* EFS) is especially useful because it polls forecasters monthly and publishes their forecasts alongside forecasters' names, facilitating currency and accountability.[1] The *WSJ* EFS collects predictions over a 5-day interval in the first or second week of each month and reports them two days later. The forecasters predict (annualized) real GDP growth for the current quarter and each of the next four quarters. The forecasters are professional economists at large commercial and investment banks (36%), forecasting firms (23%), financial services firms (16%), business associations (11%), academia (10%), and other firms (4%). Over ninety forecasters contributed GDP growth rate predictions in 2020; of these about one-third participated in all the surveys covering 2020. First, we examine how forecasters' growth rate predictions evolved over 2020; next, we investigate prediction accuracy for the subset of forecasters who participated in all the 2020 surveys; finally, we look at the evolution of the shape of the recovery predicted by all *WSJ* EFS forecasters for 2020.

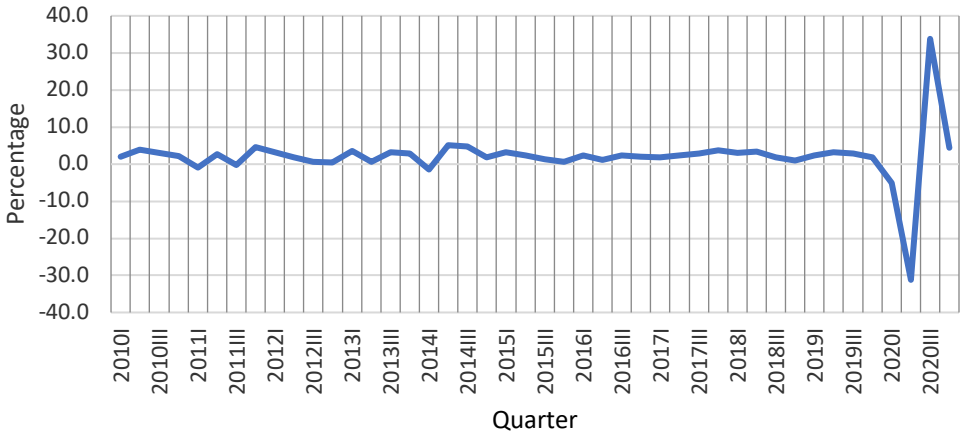
3.1 Actual and Predicted Real GDP Growth Rates During 2020

Figure 1 shows actual (annualized) quarterly growth rates of real GDP from 2010I to 2020IV. Quarterly growth rates before 2020I are modestly positive and quite stable after 2014, ranging from -1.4% to 5.2%. Growth declined in 2020I (-5.1%) and plummeted in 2020II (-31.2%), the largest quarterly declines since the 2008 financial crisis and Great Depression, respectively. Growth rebounded sharply in 2020III (33.8%, the largest quarterly increase since

[1] The *Wall Street Journal* switched from monthly to quarterly surveys in April 2021, which explains our focus on 2020. The survey data and the articles that report on the surveys may be found at https://www.wsj.com/articles/economic-forecasting-survey-archive-11617814998.

the Great Depression), suggesting a V-shaped recovery. Growth returned to a more normal level in 2020IV (4.5%).

Figure 1
Quarterly Annualized Growth Rate of Real GDP, 2010I-2020IV



Figures 2A-2D plot monthly predictions of annualized quarterly real GDP growth rates for 2020I -2020IV. Each figure shows a survey's median forecast, the 25th- and 75th-percentile forecasts, the minimum and maximum forecasts, and the actual growth rate.

Figure 2A plots growth rate predictions for 2020I from surveys done between February 2019 and April 2020.[2] From February 2019 to February 2020 the median predictions are all nearly 2%, the interquartile predictions closely bracket the medians, and the maximum and minimum forecasts differ by less than 4 percentage points. The explosion of Covid cases in February 2020 led forecasters to reduce their growth rate predictions in the March survey, yielding a median of 1.4%. Worsening economic news in March led forecasters to further reduce their predictions in the April survey, producing a median of -3.4%, a decline slightly smaller than the actual decline of -5.1%.

[2] Results of the February 2019 (April 2020) survey were reported in the *WSJ* on February 7 (April 8), showing that a given survey reflects mainly information available at the end of the prior month. Also, the *WSJ* EFS often reports forecasters' predictions of a quarter's GDP growth for up to three months after the quarter ends because the Bureau of Economic Analysis (BEA) revises each GDP number several times.

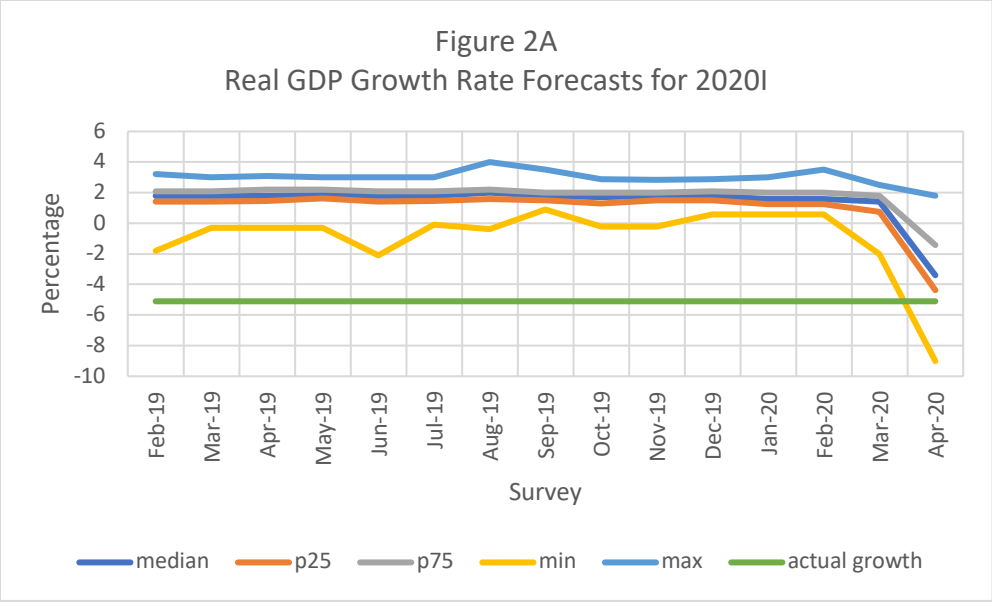


Figure 2B shows growth rate predictions for 2020II from surveys done between June 2019 and July 2020. Through the February 2020 survey the median, interquartile and extreme predictions are near 2%. This changes in the March survey: the median prediction falls to 0.1%, the interquartile range widens slightly to 1.6 percentage points (-0.6% to 1.0%) and the sample range more than quadruples to 14.8 percentage points (-12.0% to 2.8%), showing that many forecasters expected GDP to contract sharply. After worse economic news in March, forecasters dramatically reduced their growth predictions in the April survey: the median prediction falls to -26.5%, the interquartile range widens to 10 percentage points (-30.0% to -20.0%), and the sample range widens to 51 percentage points (-50.6% to 0.4%). Only 4 of 56 forecasters predicted GDP growth greater than -10.0%. Forecasters further reduced their 2020II growth rate predictions in the May, June, and July surveys, yielding median predictions slightly below the actual growth rate of -31.2%.

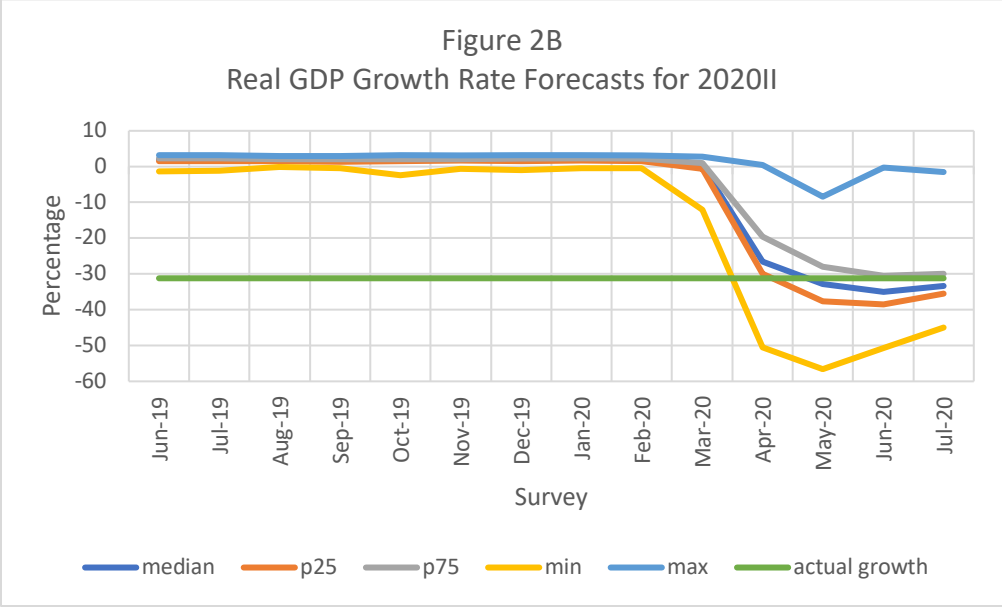


Figure 2C plots growth rate predictions for 2020III from surveys done between August 2019 and November 2020. Pandemic-related news had little effect on forecasters' predictions as late as the March 2020 survey. Predictions in the April survey are more diverse: the interquartile range widens to 17 percentage points (-2% to 15%) from less than 2 percentage points in March and the sample range widens to 69 percentage points (-14.0% to 55.0%) from less than 9 percentage points in March. Twenty-three of the fifty-six forecasters predicted negative growth while only three predicted growth of more than 25%; the median prediction is just 2%. In the May through November surveys forecasters gradually raised their growth rate predictions, raising the median prediction monotonically; however, the median did not reach the actual growth rate of 33.8% until the November survey.

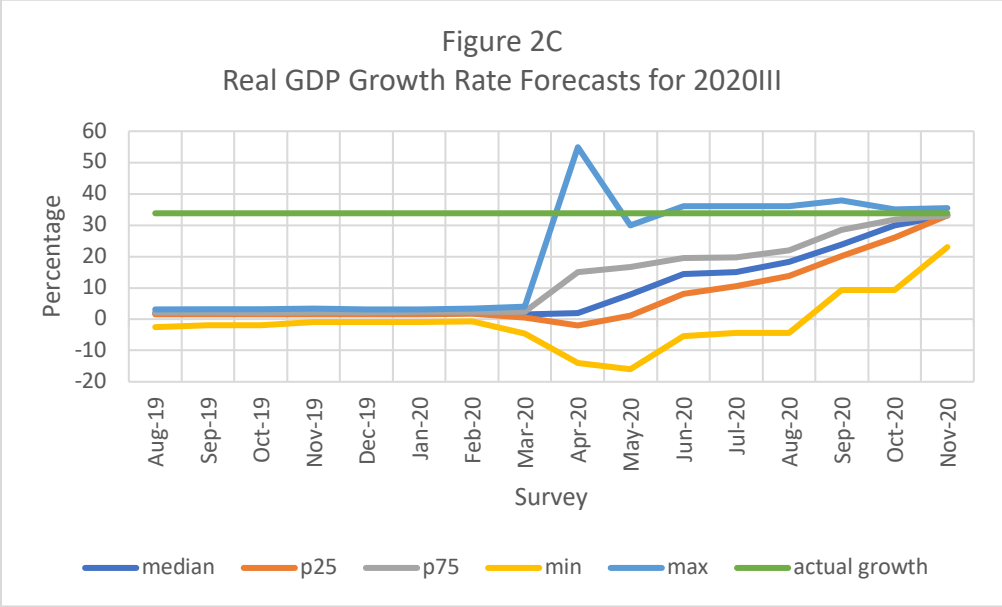
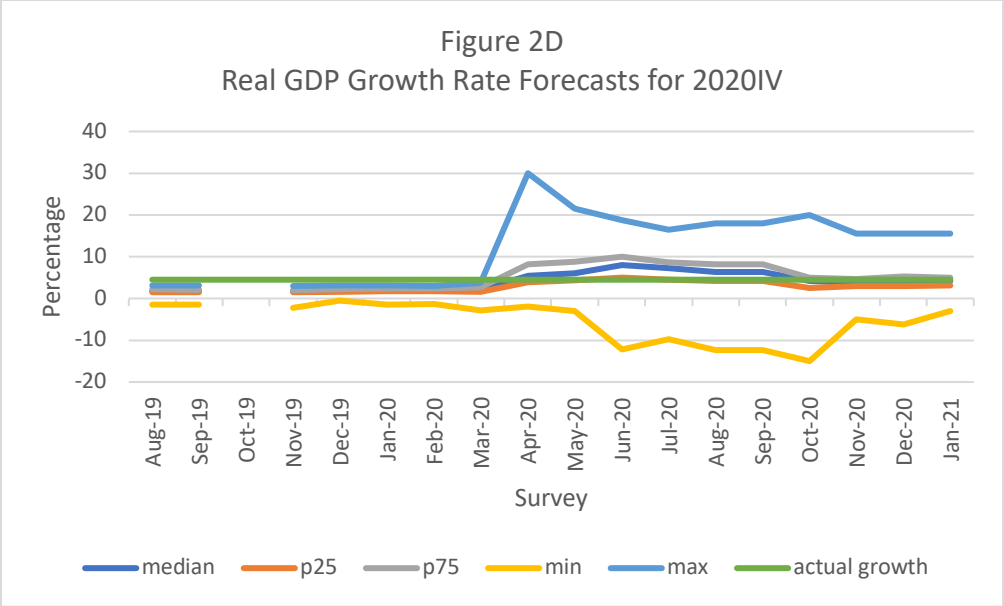


Figure 2D shows growth rate predictions for 2020IV from surveys done between August 2019 and January 2021.[3] Pandemic-related news had little impact on forecasters' predictions until the April survey, when the median prediction rose to 5.4%. In the surveys from May through September most forecasters overestimated GDP growth: the median and 25th-percentile forecasts consistently exceeded the actual growth rate of 4.5%, the former by amounts ranging from 1.5 to 4.0 percentage points. The median settled near 4.5% after the September survey.[4]

[3] The October 2019 survey omitted forecasts for 2020IV.

[4] Section 1 of the paper supplement presents diagrams analogous to Figures 2A – 2D for 2008I – 2009II, the first six calendar quarters of the Great Recession. Owing to an 11-year gap between the Covid recession and the Great Recession, the forecasters in the two periods are substantially different. Comparing the predictions from the two periods yields no insights into why forecasters underpredicted real GDP growth in 2020III.



3.2 Prediction Errors for a Subset of Forecasters

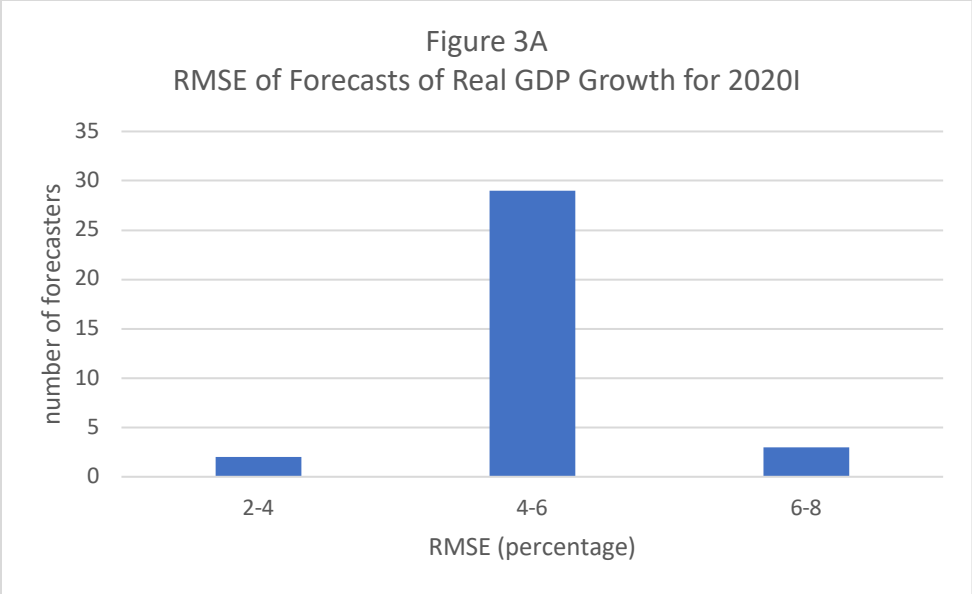
To investigate forecasters' predictive accuracy, we focus on the 34 forecasters who predicted GDP growth in every survey from March 2020 to January 2021.[5] We compute the root mean squared error (RMSE) for each forecaster for each quarter as well as the RMSE for the mean and median predictions.[6] Figures 3A-3D summarize our calculations.[7]

Figure 3A shows a bar chart of RMSEs calculated from forecasters' predictions for 2020I, when the number of Covid cases was still small. Forecasters' RMSEs range from 2% to 8% (i.e., their predictions are off by 2 to 8 percentages points, on average), with 28 of 34 RMSEs in the 4 to 6% range. The RMSE of the mean (median) forecasts is 4.82% (4.66%).

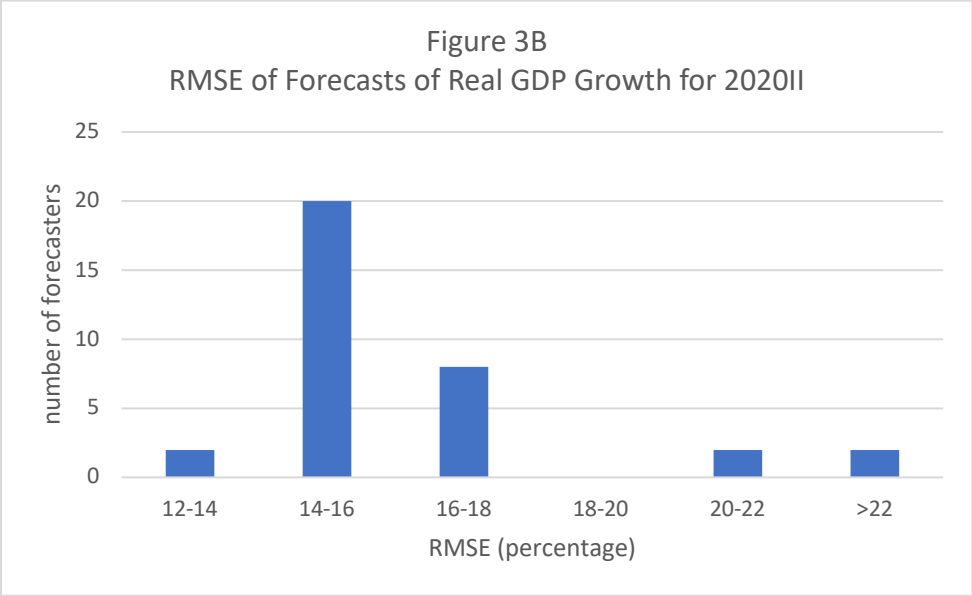
[5] We use a balanced panel to limit the impact of forecasters who might behave strategically by omitting forecasts when uncertainty makes forecasting fraught. Section 2 of the paper supplement compares the predictive accuracy of the balanced and unbalanced panels by presenting survey-by-survey RMSEs for each. We find little difference in the predictive accuracy of the two panels.

[6] The root mean square error is the square root of the average squared prediction error and weights positive and negative prediction errors equally.

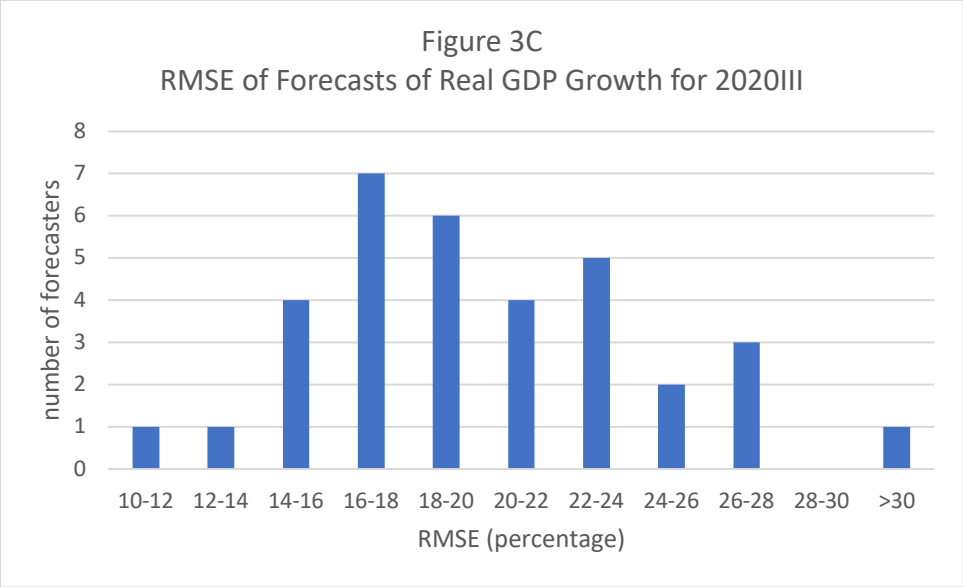
[7] Each forecaster gave two growth rate predictions for 2020I (in the March and April 2020 surveys); five for 2020II (in the March through July 2020 surveys), eight for 2020III (in the March through October 2020 surveys), and eleven for 2020IV (in the March 2020 through January 2021 surveys).



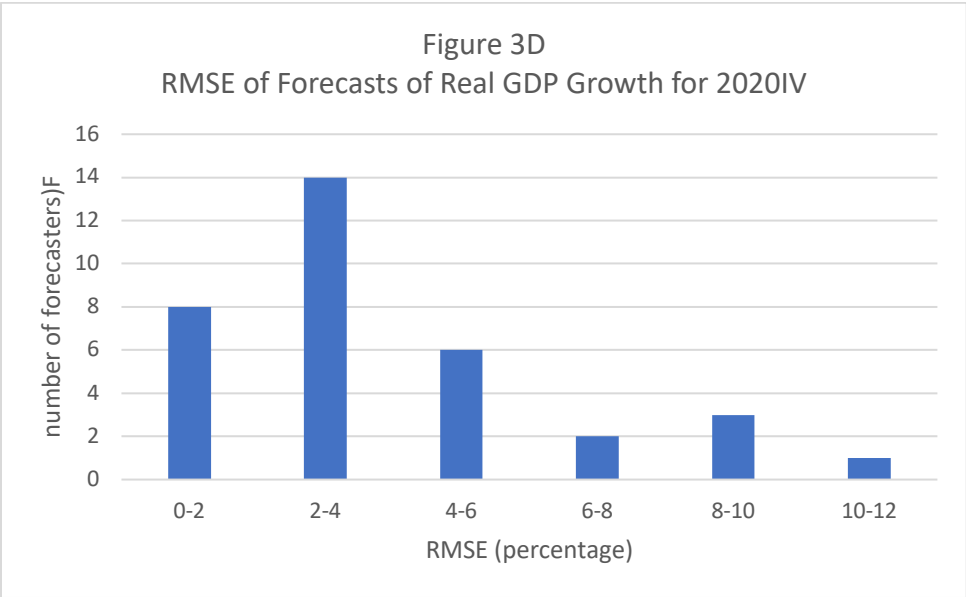
Forecasters' predictions for 2020II (Figure 3B), when real GDP fell 31.2%, are far less accurate than their predictions for 2020I. Twenty forecasters have RMSEs ranging from 14 to 16%; eight have RMSEs ranging from 16 to 18%; and four have RMSEs greater than 20%. The RMSE of the mean (median) forecasts is 14.29% (14.39%), lower than the RSMEs of all but two forecasters.



Forecasters' predictions for 2020III (Figure 3C), when real GDP grew 33.8%, are even less accurate than their predictions for 2020II: twenty-eight forecasters have RMSEs greater than 16% versus six with RMSEs less than 16%. The RMSE of the mean (median) forecasts is 19.5% (20.3%).



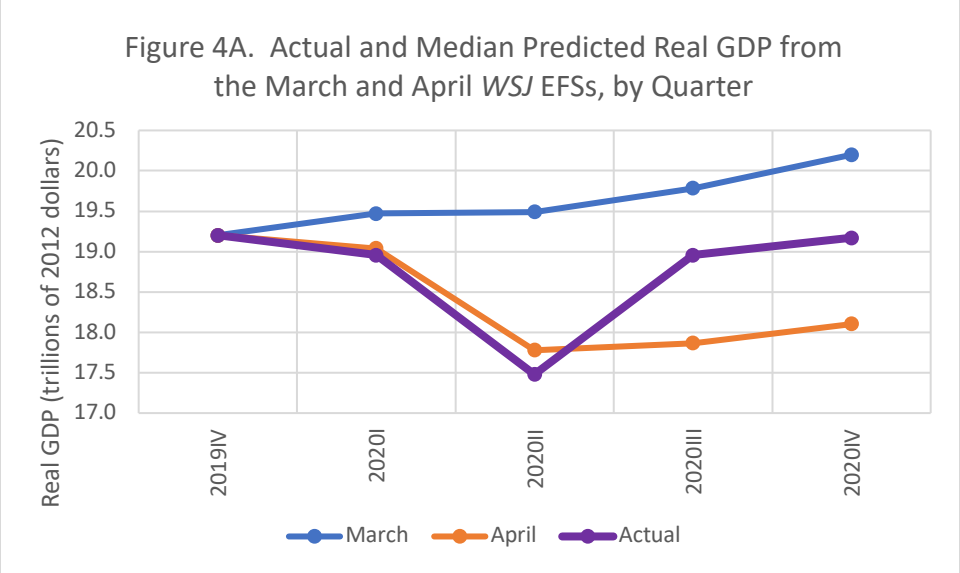
Forecasters' prediction accuracy in 2020IV (Figure 3D) approaches that in 2020I: twenty-two forecasters have RMSEs from 0 to 4%; eight have RMSEs from 4 to 8%, and four have RMSEs from 8 to 12%. The RMSE of the mean (median) forecast is 1.8% (1.8%); about one-quarter of the 34 forecasters have a RMSE below 1.8%.

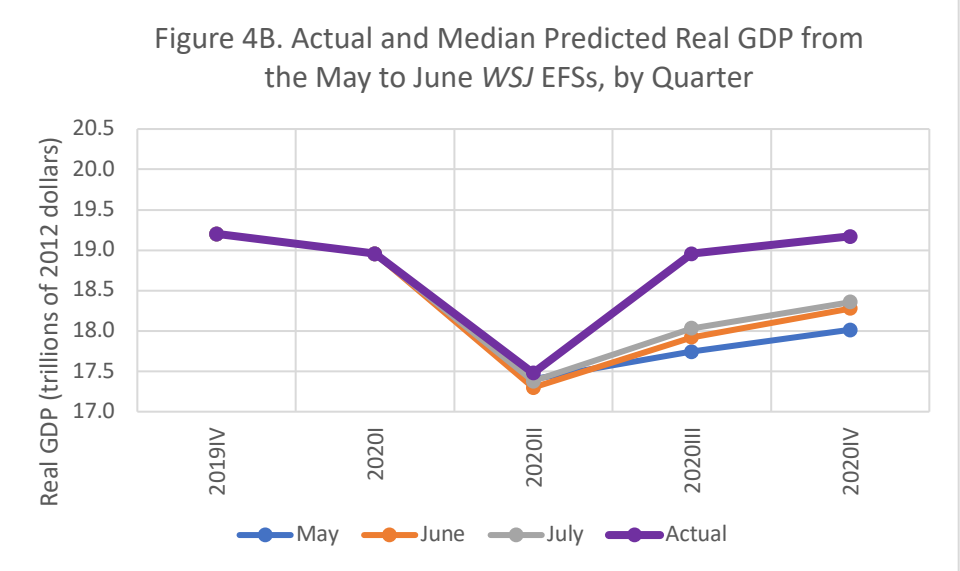


3.3 Actual and Predicted Recovery Shapes

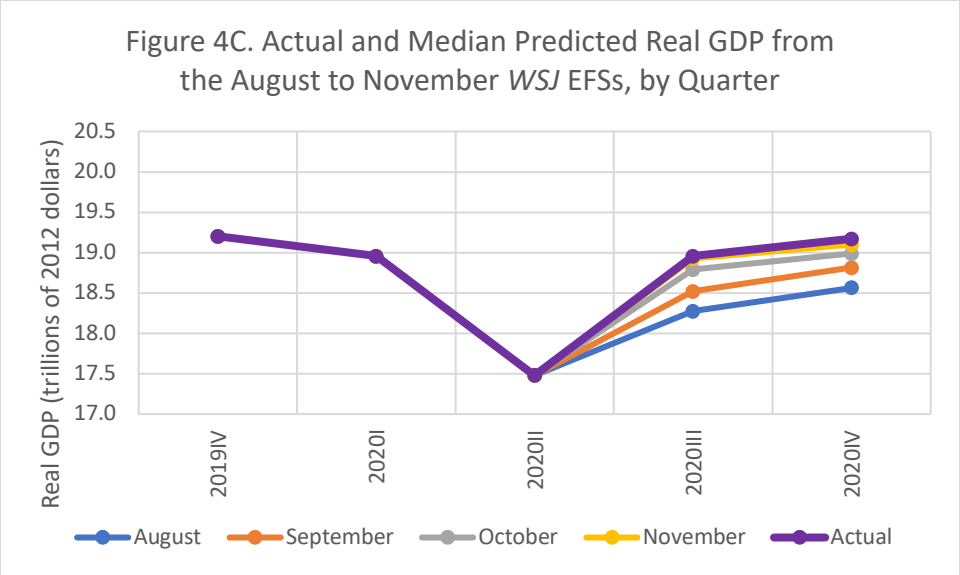
Figures 4A – 4D show the predicted shape of the recovery based on median real GDP growth rate predictions from the *WSJ* EFSs done between March 2020 and January 2021. Each figure plots actual (annualized) real GDP for 2019IV (in 2012 dollars) followed by predicted real GDP for 2020I - 2020IV using the median quarterly GDP growth rates from the surveys. Actual (annualized) real GDP for 2020I - 2020IV is also shown.

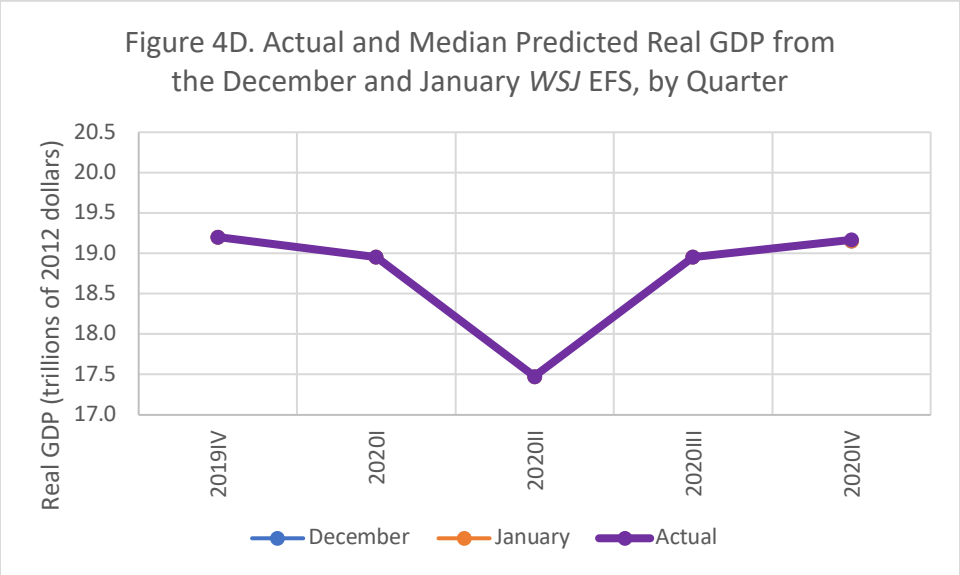
The figures show a predicted recovery more U-shaped than the actual recovery, as forecasters consistently underestimated GDP growth in 2020III. Forecasters responded to the barrage of news between the March and April surveys mainly by reducing their predicted growth rates for 2020I and 2020II (Figure 4A). In the May, June and July surveys forecasters made small adjustments to their growth rate predictions for 2020II and 2020IV but persisted in significantly underpredicting growth in 2020III (Figure 4B). In the next four surveys forecasters gradually raised their growth rate predictions for 2020III and lowered their growth rate predictions for 2020IV (Figure 4C) but not until the October, November, December, and January surveys did forecasters' predictions yield a more V-shaped recovery (Figure 4D).[8]





[8] Forecasters' underprediction of real GDP growth in 2020III is reflected in their predictions of the unemployment rate and the probability of a recession, metrics the *WSJ* EFS asks respondents to predict. These forecasts are discussed in Section 3 of the paper supplement.





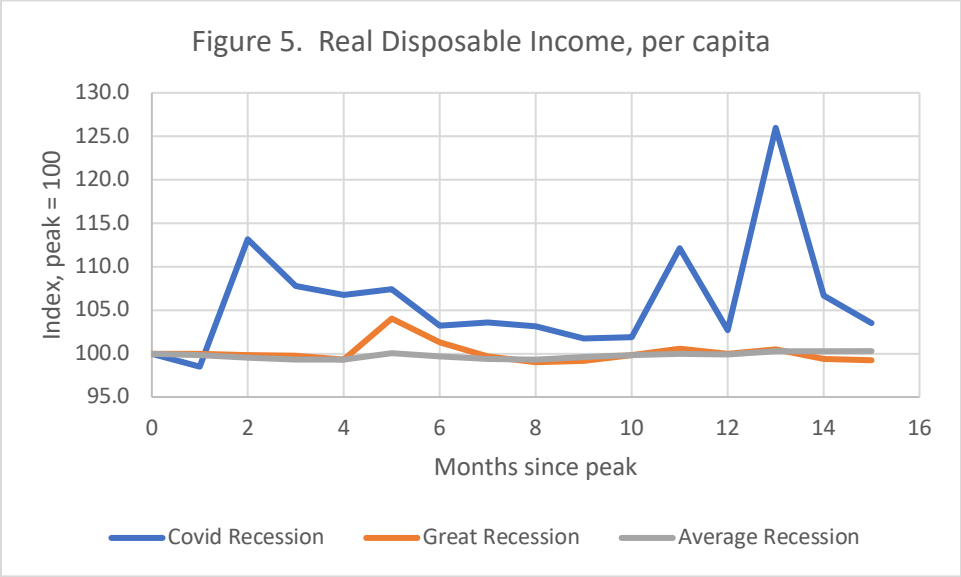
3.4 Why Did *WSJ* EFS Forecasters Underestimate Growth in 2020III?

The preceding sections show that the *WSJ* EFS forecasters quickly revised their real GDP growth rate predictions as the effects of Covid spread, excepting their predictions for 2020III. Why might they have persisted in expecting lower growth? We offer two potential factors.[9]

One is that fiscal stimulus came faster and in larger amounts than in previous recessions. The federal government appropriated $3 trillion in spending within seven weeks of Covid's arrival, much of it

[9] Ross and Ross (2020) and Ho (2021) discuss the problems forecasters face when confronted with unique events like the pandemic while Primiceri and Tambalotti (2020) outline a forecasting methodology. Schorfheide and Song (2020) estimate a mixed-frequency VAR and predict a slow economic recovery in 2020.

transfer payments to Americans believed to be in peril of economic hardship.[10] Figure 5 shows real personal disposable income per capita from March 2020 through May 2021 relative to February 2020, the NBER-determined peak before the Covid recession. The spikes 2, 11 and 13 months after the peak reflect large disbursements in pandemic-related relief.[11] By comparison, disposable income from January 2008 through March 2009, the early months of the Great Recession, shows only a modest bump from the Economic Stimulus Act of 2008. When averaged, disposable income in the early months of the eight recessions from 1960 through 2010 shows no measurable effect of fiscal stimulus. Absent precedent, forecasters using historical data to inform predictions of real GDP growth might have been led to underestimate growth in 2020III.[12]



Another factor is that mobility constraints imposed to limit the pandemic's spread had unprecedented effects on consumer spending.[13] Figure 6A plots real personal consumption expenditures on services from March 2020 through May 2021 relative to its peak in February 2020. Spending on services had fallen 20% below peak by April 2020 and was still below peak one year later. In contrast, mobility constraints catalyzed spending on durables. Figure 6B shows

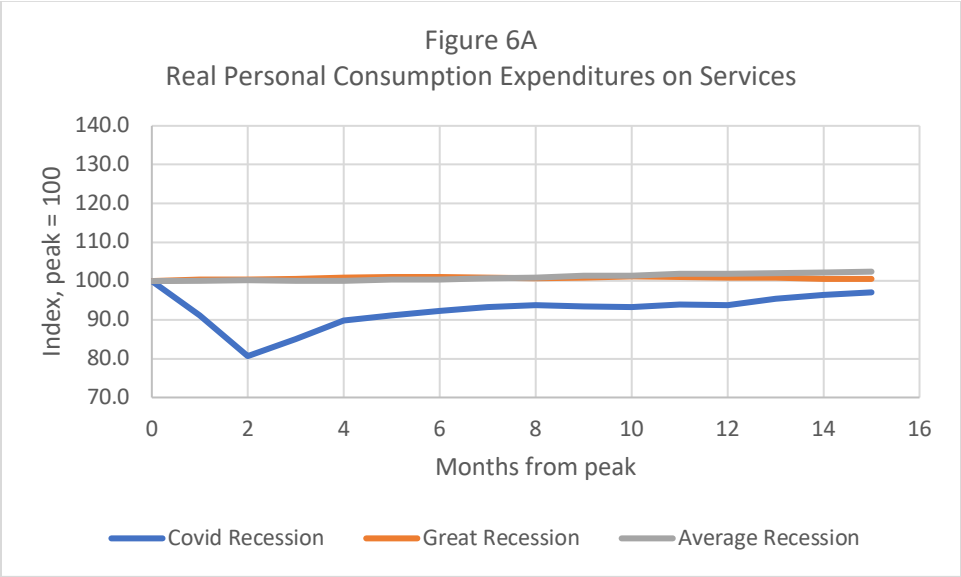
[10] These groups include employees of firms in the Paycheck Protection Program (16%); the unemployed (14%); and state- and local-government employees at risk of job loss from falling tax revenues (11%). The percentages are estimates from Romer (2021).

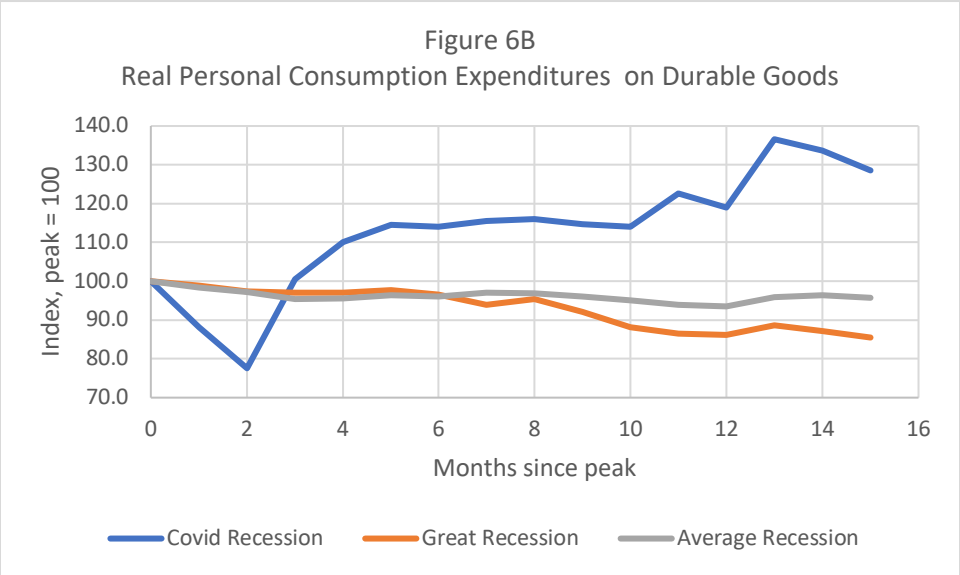
[11] See Tauber and Van Zandweghe (2021) for a more detailed discussion. Also, the BEA noted in news releases that the effect of stimulus spending on personal income was underreported due to aggregation in the source data. See, for example, the news release "Person Income and Outlays, June 2020 and Annual Update" dated July 31, 2020.

[12] Another possible source of the forecast error is underestimation of the amount of accommodation from the Fed through U.S. debt purchases: the Fed increased its holdings of U.S. debt by $1.5 trillion from March 4, 2020 to May 6, 2020. Chadha *et al.* (2021) present econometric evidence that aggressively expansionary monetary policy enhanced the effectiveness of fiscal policy by preventing higher interest rates from diminishing the fiscal stimulus. Cúrdia (2020) makes a similar point.

[13] Moreland et al. (2020) note that 42 states adopted mandatory stay-at-home orders between March 1 and May 31, 2020, causing widespread declines in population mobility as measured from cellphone data.

that spending was 10% above peak in June 2020 and reached 37% above peak by March 2021.[14] Consumer spending on non-durables exhibits a similar trend.[15] The spending shift from services to goods in the Covid recession is unparalleled in prior recessions. With no precedent for a shift, forecasters using history to guide real GDP growth rate predictions might have been led to underpredict growth in 2020III.





[14] Tauber and Van Zandweghe (2021) attribute half of the increase in durables spending to a Covid fixed-effect and half to an income effect.

[15] Consumer spending on non-durables is shown in Section 4 of the paper supplement. Bivens (2019) documents that the indirect effect of creating a job varies across industries: the number of indirect jobs created from 100 new jobs in durable manufacturing (nondurable manufacturing, services) is 744.1 (514.3, from134.5 to 378.5). Hence reduced spending on services is not incompatible with net job creation.

4. Conclusions

The shock to the U.S. economy from the arrival of Covid-19 was comparable to a shock caused by the onset of a major war. Under normal conditions, economic actors use real GDP growth rate predictions from professional forecasters to make important economic decisions. Situations of extreme uncertainty call for predictions that are frequent (to keep pace with rapidly changing circumstances) and accurate (to facilitate sound decisions). This paper examined growth rate predictions in 2020 by forecasters in the *WSJ* EFS, whose livelihoods depend on understanding the economy. We found that these forecasters revised their predictions in the direction of actual outcomes but were less accurate in 2020III when they persisted in predicting a U-shaped recovery. Our finding corroborates former Federal Reserve Chairman Ben Bernanke's observation that "…the recovery in the second half of 2020, before vaccines became available, was faster than almost anyone expected." (p. 313). We showed that the dimensions of the fiscal policy response to Covid and the compositional change in consumer spending following containment efforts are unprecedented in recent history and posited that the *WSJ* EFS forecasters may have underweighted them when predicting growth in 2020III. By adding data points to the historical record, the 2020 pandemic may yield improved economic predictions in future pandemics.

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