BANCO DE **ESPAÑA**

Eurosistema

# CONSUMPTION RECOVERY IN 2021: AN ANALYSIS DRAWING ON CONSUMER EXPECTATIONS

Pablo Aguilar

ABSTRACT

Consumers' expectations of economic developments are a fundamental determinant of their spending decisions. This article estimates, using simple expectation formation rules in the context of a general equilibrium model, the degree of persistence that households assign to the economic impact of the pandemic. The findings show that households have perceived that the COVID-19 shock has a lower degree of persistence than other previous negative shocks. According to the model used, this would signal an uptick in private consumption, once the health crisis is over, that would tend to offset the decline observed during the pandemic.

**Keywords:** expectations, consumption, learning.

**JEL classification:** C53, D84, E30, E44.

The author of this article is Pablo Aguilar of the Directorate General Economics, Statistics and Research.

## Introduction

Agents' expectations are a fundamental channel for transmission of economic shocks. Specifically, the effects of a shock may be amplified or mitigated according to how agents perceive its consequences. This article analyses the role of households' expectations in the current crisis and assesses the extent to which they could leverage the recovery in private consumption expected once the health crisis is over.

The idea that agents' expectations play a vital role in understanding fluctuations in activity has been present in economic theory for almost a century in the idea of "animal spirits": the Great Depression would have been even worse had it been accompanied by a collapse in households' and firms' expectations for the future.[1] The most recent literature gives shape to this idea, treating agents' sentiment as an endogenous variable determined by households' and firms' perception of the future of the economy and which, in turn, shapes their economic decisions.[2] Thus formulated, activity and expectations fuel each other.

The onset of the pandemic in early 2020 and the measures taken to contain the spread of infection adopted immediately afterwards were reflected not only in a sharp drop in GDP and household spending, but also in a rapid deterioration in economic sentiment indicators. Chart 1.1 shows the change for Spain in the component of the European Commission's consumer confidence indicator that measures households' perception of the general economic outlook for the next 12 months. The decline observed between the first two quarters of 2020 is the largest in the historical series, far exceeding that observed at the start of the global financial crisis. In the following three quarters, the indicator recovered half of the ground initially lost, in contrast to the case of the previous crisis in which the fall continued over six quarters. This suggests that, in this case, the perceived degree of persistence of the effects of the shock on the economy has been particularly low.

A daily survey of the Federal Reserve Bank of Cleveland tends to reinforce this idea.[3] The survey explores how consumers' expectations in the United States regarding

---

1 For a more detailed description, see Keynes (1936).

2 See Barsky and Sims (2012) and the references contained in this article.

3 The data are available on the Federal Reserve Bank of Cleveland's website. For an initial exploitation of these data, see Knotek et al. (2020).
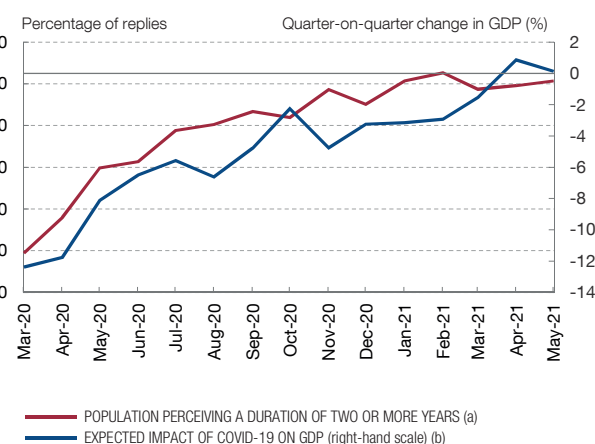
The impact of the pandemic on agents' confidence was sudden and severe, albeit largely transitory, which could contribute to a more robust recovery of activity once the containment measures are lifted.

1 SPAIN. GENERAL ECONOMIC OUTLOOK FOR THE NEXT TWELVE MONTHS
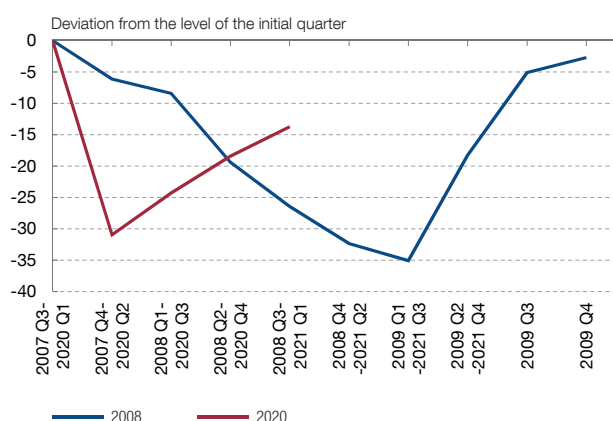
2 UNITED STATES. IMPACT OF COVID-19 ON GDP AND ON AGENTS' EXPECTATIONS



**SOURCES:** European Commission, INE, Banco de España and Federal Reserve Bank of Cleveland.

**a** Percentage of the population who believe that the pandemic will last two or more years.
**b** Median for the next twelve months. See Dietrich et al. (2020).

various aspects of the pandemic, including its duration and its effects on GDP, have evolved. Chart 1.2 shows that the proportion of respondents who expect the pandemic to last for two or more years has gradually increased, from 20% in March 2020 to around 60% a year later. But it is striking that, over the same period, the expected impact on GDP one year ahead has gradually declined significantly.[4] In consequence, consumers in the United States appear to have substantially revised their expectations as to the persistence of the effects of the pandemic on activity, disconnecting them from the duration of the pandemic.

## Expectation formation mechanism

To explore the persistence of the effects of the pandemic perceived by Spanish households, a general equilibrium model has been used, similar to that of Smets and Wouters (2007), to which an explicit expectation formation mechanism has been added, as in Vázquez and Aguilar (2021). This model is a stylised representation of

4  The question on the impact on GDP is formulated for a 12-month time horizon. Arguably, the gradual decline in the size of the impact could be explained by the fact that the time remaining up to the medical solution of the crisis is gradually decreasing. But an approximately monotone decline is also observed in another indicator in the survey that measures the fear of job loss, which should have a lower correlation to the expected residual duration of the pandemic.

the structure of the economy, in which in each quarter households form their expectations for three macroeconomic variables (private consumption, business investment and inflation) and make optimal decisions consistent with these expectations. This model allows us to analyse the macroeconomic impact of a shock, the transmission channels through which it moves, and the role played by agents' expectations.

The expectation formation mechanism is adaptive; this is an increasingly common realistic alternative to the traditional rational expectations hypothesis.[5] For each of the three variables (private consumption, business investment and inflation), the expectations existing at each moment in time are influenced by the impact of recent shocks.[6] In addition, the model allows us to estimate the importance that households afford, in each quarter, to recent changes in the variable concerned when they form their expectations as to its future development. This determines the extent to which these expectations may, in the future, amplify or mitigate the shock.

This persistence of the changes observed in a variable when it comes to determining expectations as to how it may change in the future is captured in the model through a parameter ($\beta_{c_1, t-1}$) that agents update each quarter.[7] In the specific case of consumption, the expectations updating rule is as follows:

$$E_t c_{t+1} = \alpha t-1 + \beta_{c_1, t-1} \, c_{t-1}$$

where $c_{t-1}$ represents the last difference observed between the rates of change in spending in the current period and in the historical average (since in the model the variables are defined as differences versus that average). The expression indicates that the agents' learning mechanism is such that they transfer to their consumption expectations for the following period a proportion $\beta_{c_1, t-1}$ of the deviation in spending from its historical average observed in the previous quarter.[8]

The parameter value is normally slightly less than 1, which indicates that households transfer to their consumption expectations most of the deviation observed in spending growth compared with its historical average value, or in other words, that shocks have a high level of persistence. A hypothetical parameter value of 0 would

---

5  Under the rational expectations hypothesis, agents observe and efficiently process all economic information to form their expectations, being able to comprehend perfectly the nature of the shocks and their duration. Alternatively, under the adaptive expectations hypothesis, agents use a narrow set of information and gradually update the weights they assign to the different variables according to the mistakes they make in their forecasts (that is, they learn to form their expectations drawing on the little information available to them). For a detailed description of the different hypotheses and the related literature, see Aguilar and Vázquez (2019).

6  This mechanism draws on the models of Slobodyan and Wouters (2012) and Vázquez and Aguilar (2021).

7  Subindex t–1 denotes that households in period t form their expectations for the following period (t+1) drawing on the information available, which runs up to the previous quarter (t–1).

8  In addition, this learning rule captures through parameter $\alpha_{t-1}$ the possibility that expectations may be formed assuming that part of the past deviations in the rate of change of consumption versus its historical average have a permanent impact.

imply that agents do not revise their expectations, despite observing a change in consumption that does not match that of the historical average (and, therefore, that they believe that the shock is not persistent). Exceptionally, the parameter value may be less than 0, which would mean that a shock of a specific sign is associated with expectations of the opposite sign for the future, or it may be more than 1, which is interpreted as an overreaction of expectations to the deviations observed.

## Changes in consumption expectations in Spain during the health crisis

Under this simple framework of household learning and shaping of household expectations, it is possible to estimate how transitory the impact on consumption perceived by Spanish households is in the wake of a shock such as that arising during the COVID-19 pandemic, which will be reflected in their spending decisions.[9]

During expansions, the estimated value of the parameter for consumption expectations has historically tended to be close to 1 (see the line depicting the parameter's historical average in Charts 2.1 and 2.3). This is because consumption is usually quite persistent during upturns, when small successive positive shocks tend to build up, and this is reflected in the expectations. In other words, when households see that their spending growth outstrips its equilibrium value, they tend to transfer a significant portion of this deviation to their expectations of a future increase in this variable. Conversely, recessions tend to be associated with strong negative shocks in shorter time windows, so households' perception of their persistence is also generally lower, and this is reflected in a decline in the value of this parameter.

Based on this model, Chart 2.2 analyses the current pandemic crisis episode, which is marked by a sharp year-on-year fall in consumption and GDP in 2020 Q2, and a strong, albeit partial, recovery in 2020 Q3.[10]

On that basis, agents estimate the degree of persistence of the shock to be much lower than usual. In the model, this translates into a decrease, from 2020 Q4, in the coefficient that measures the persistence of consumption expectations (see Chart 2.1). This decline in the estimated parameter has been particularly marked, with the coefficient even changing sign in the first two quarters of 2021, indicating that households expected the sharp fall in spending in 2020 to be largely offset by a subsequent strong recovery. Thus, according to the model, households have

---

9   Specifically, investment, consumption and inflation expectations can be estimated based on this model. For this purpose, it uses the quarterly series for Spain of the core inflation rate (measured by the HICP for services and non-energy industrial goods), the monetary policy interest rate set by the European Central Bank (ECB), Spanish nominal 1-year bond yields, hours worked, real private consumption, real investment, compensation per employee and real GDP.

10   In the chart, the year-on-year rates are expressed as deviations from their historical average.

Chart 2

**MACROECONOMIC DEVELOPMENTS AND ESTIMATED CONSUMER EXPECTATION COEFFICIENTS DURING THE COVID-19 CRISIS AND THE FINANCIAL CRISIS**

Consumer perception is that the crisis will not have a very persistent impact, so growing household spending should bolster economic recovery.

1 ESTIMATED COEFFICIENTS ASSOCIATED WITH PERSISTENCE OF SHOCKS IN CONSUMPTION EXPECTATIONS



CONSUMPTION COEFFICIENT
HISTORICAL AVERAGE CONSUMPTION COEFFICIENT

2 GDP AND CONSUMPTION

Deviation of year-on-year rate from its historical average (%)
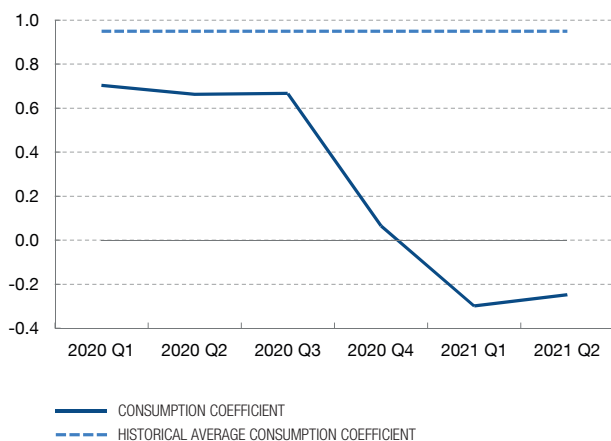


GDP (a)        CONSUMPTION

3 COEFFICIENT ASSOCIATED WITH PERSISTENCE OF SHOCKS IN CONSUMPTION EXPECTATIONS



CONSUMPTION COEFFICIENT
HISTORICAL AVERAGE CONSUMPTION COEFFICIENT

4 GDP AND CONSUMPTION

Deviation of year-on-year rate from trend (%)
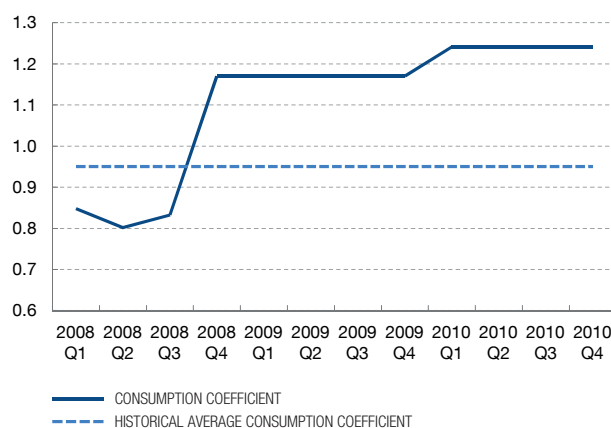


GDP        CONSUMPTION

**SOURCES:** INE and Banco de España.

**a** The broken lines denote the baseline scenario of the Banco de España's March 2021 macroeconomic projections (in deviations from trend).

perceived the impact of the crisis to be transitory, expecting a strong recovery in consumption after a few quarters. This is in keeping with the perception that has emerged from the surveys of Spanish and US households referred to earlier.

This behaviour is unlike that observed in other recessions. Charts 2.3 and 2.4 show how, at the onset of the previous financial crisis, expectations initially mitigated the shock, but in a far more subdued manner than at present, with the estimated coefficient falling to slightly below 1. Subsequently, when the crisis became

prolonged, agents began to perceive the impact of the shock on their consumption as more persistent, and the coefficient rose above 1.

The analytical framework used does not allow for exploration of the reasons why consumers have assigned such a low degree of persistence to the effects of the shock caused by the pandemic. In addition to the transitory nature attributed to this type of shock, compared with previous recessions, one possible explanation could be the decisive economic policy response, which sought to strengthen agents' expectations and thus contribute to the recovery. The economic literature points to improved confidence as a very powerful channel for the transmission of fiscal and monetary policy stimuli to economic activity.[11] In the particular case of consumers, the furlough schemes (ERTEs), loan moratoria and the preservation of highly favourable financial conditions appear not only to have strengthened their income and financial position but also to have boosted their confidence in a swift economic recovery.

Moreover, the rapid improvement in agents' expectations about the future of the economy could also, in part, be a reflection of the processes implemented to adapt to the pandemic and the measures adopted to contain its spread. These processes, which have included the use of remote working and e-commerce, have meant that, for a specific level of restrictions, the impact on economic activity has gradually lessened.[12]

Also, during the pandemic, households built up substantial savings, partly due to the impossibility of consuming certain goods and services and partly owing to the uncertainty surrounding their future income. There are several arguments suggesting that only a limited part of these savings will be used for consumption once the health crisis is over. First, it is chiefly high-income households that have saved and they have a comparatively lower propensity to consume. Second, part of the suppressed consumption cannot be recovered (such as dining out, for example). Lastly, agents may perceive that the sharp increase in public debt will lead to higher taxes in the future. Without questioning the merits of these arguments, this article suggests that agents' expectations would appear to be consistent with the relatively fast disappearance of the precautionary reasons that have accounted for part of the increase in saving.

16.7.2021.

---

[11]  For fiscal policy, see Bachmann and Sims (2012) and Guimaraes, Machado and Ribeiro (2016).

[12]  See Ghirelli et al. (2021) for an empirical approach to measuring the impact of the processes implemented to adapt to the pandemic.

## REFERENCES

Aguilar, P. and J. Vázquez (2019). "An estimated DSGE model with learning based on term structure information", *Macroeconomic Dynamics,* pp. 1-31.

Bachmann, R. and E. R. Sims (2012). "Confidence and the transmission of government spending shocks", *Journal of Monetary Economics,* 59 (3), pp. 235-249.

Barsky, R. B. and E. R. Sims (2012). "Information, animal spirits, and the meaning of innovations in consumer confidence", *The American Economic Review,* No 102(4), pp. 1343-1377.

Dietrich, A., K. Keuster, G. J. Müller and R. Schoenle (2020). *News and uncertainty about COVID-19: survey evidence and short run economic impact,* Working Paper No 20-12 (consulted on 12.5.2021).

Ghirelli, C., M. Gil, S. Hurtado and A. Urtasun (2021). *The relationship between pandemic containment measures, mobility and economic activity,* Occasional Paper No 2109, Banco de España.

Guimaraes, B., C. Machado and M. Ribeiro (2016). "A model of the confidence channel of fiscal policy", *Journal of Money, Credit and Banking,* 48 (7), pp. 1363-1395.

Keynes, J. M. (1936). *The general theory of employment, interest, and money,* Palgrave Macmillan.

Knotek, E. S., R. S. Schoenle, A. M. Dietrich, K. Kuester, G. J. Müller, K. O. Myrseth and M. Weber (2020). "Consumers and COVID-19: a real-time survey", *Economic Commentary,* 2020-08, April, Federal Reserve of Cleveland.

Slobodyan, S. and R. Wouters (2012). "Learning in a medium-scale DSGE model with expectations based on small forecasting models", *American Economic Journal: Macroeconomics,* 4, pp. 65-101.

Smets, F. and R. Wouters (2007). "Shocks and frictions in US business cycles: a Bayesian DSGE approach", *American Economic Review,* 97, pp. 586-606.

Vázquez, J. and P. Aguilar (2021). "Adaptive Learning and Term Structure", *European Economic Review,* Vol. 134.