THE COVID-19 INSTRUMENTS' EFFECTIVENESS IN MITIGATING THE PANDEMIC IMPACT ON SPANISH CONSUMPTION*

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Abstract.
This study evaluates how the pandemic affected non-durable household spending in 2020. Using panel data from the Spanish Survey of Household Finances, we compare actual expenditures with predicted values from a consumption model. Results reveal smaller individual-level income and spending declines than National Accounts data suggests. The estimated reduction in non-durable consumption is positively related to wealth but negatively to income. Additionally, we regress each individual estimated decline in non-durable spending on a set of indicators for different COVID-19 policy measures. Results indicate that these interventions did not significantly support non-durable expenditure, potentially explaining increased savings during the pandemic.

Keywords: Consumer Spending, Panel data, COVID-19, Fiscal Policy.
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1. Introduction.

In 2020 a pandemic hit the world and caused governments to impose severe lockdown and social distancing measures. Currently, although the COVID-19 has not entirely vanished, appears to have turned chronic after causing significant negative effects on the economy and individuals' health. In this context, this study aims to examine how the pandemic affected Spanish consumption in 2020, the year it was formally declared, using data from the Spanish Survey of Household Finances (SHF), and to evaluate the effectiveness of the Spanish government's actions at the time to lessen its adverse effects.

Even though the epidemic and its impacts have been extensively studied, there are few attempts to carefully examine its economic implications due to the short period since the pandemic's beginning and the lack of statistical data meeting the required standards. According to the Spanish National Accounts (NA), in 2020 the pandemic caused a decline in the national aggregates of production and spending of a similar order of magnitude, between 10% and 12%. Considering that the fall in consumption was notably greater, this does not seem to be a significant decline.[1] According to Eurostat, individual consumption spending in Spain decreased by 20.3% (15.1% in the EU) in the second quarter of 2020 compared to the first.

Carvalho et al. (2021), using transaction data information for the Spanish case, found that the decline in consumption was neither geographically homogeneous nor consistent throughout the pandemic various phases. They also identify the most affected categories of expenditure and uncover a positive association between the wealthiest postcodes and the decline in total consumption, indicating that the decline was significantly higher for this group. According to Baker et al. (2020), who also use transaction data for the U.S., the response of consumer spending to the pandemic has not been homogeneous throughout time. While

[1] Eichenbaum et al. (2020), concludes that the U.S. aggregate consumption decline ranged from 7% to 22%.

spending increased dramatically before the pandemic declaration, it declined significantly after it was announced. This pattern has been confirmed by other studies, such as Chronopoulos et al. (2020) for the U.K. Borras et al. (2024), using data from the Spanish Household Budget Survey (SHBS), found that the lockdown affected the household intratemporal distribution of total expenditure in a non-homogeneous way, indicating that this could explain the observed increase in saving rates.

In this paper, using information from the Bank of Spain SHF database, we propose and implement a method to calculate the drop in non-durable household income and consumption for the year the pandemic was declared. By using panel data techniques to estimate the parameters of the consumption function, we can estimate the decline in non-durable consumption in 2020.[2] This is undertaken by comparing the registered expenditures of a household in 2020 with an econometric prediction for the same household consumption. Since the SHF provides information on some of the public aid individuals received during COVID-19, this procedure would enable the evaluation of the efficacy of these economic policy initiatives implemented to counteract the pandemic detrimental consequences.[3,4]

As for the results, on the one hand, non-durable consumption in the SHF shows a much smaller drop than that of final expenditure in the Spanish national accounts, contrary to what occurs when analysing household income in the SHF. On the other hand, our estimated decline in non-durable consumption is positively related to household wealth but negatively to income. Additionally, all variables measuring the labour activity of the head of the household show no

[2] Christelis et al. (2020) also use panel data for six nations, including Spain, however, their goal differs greatly from ours and their data is limited to the period of April to October 2020. They investigate if spending was impacted by concerns about a household's financial situation as a result of COVID-19.

[3] Porcher (2020) provides a dataset of over 180 countries on the government public health responses to COVID-19, which is then used to generate an index of the speed and degree of intensity with which countries responded to the shock. This indicator places the Spanish pandemic reaction in the upper percentile of the distribution of governmental public health responses.

[4] This research is related to the literature that examines how consumption reacts to income tax rebates, particularly for the U.S. case (see Shapiro and Slemrod, 2003a and 2003b).

impact on consumption, except for the case of unemployment, which has a negative effect. On the contrary, our results allow us to conclude that retirees experienced the highest estimated downfall in non-durable consumption due to the pandemic. Finally, our results also allow us to conclude that the economic policy measures against the COVID-19 were unsuccessful in sustaining the level of consumption, which may have contributed to increased savings during the pandemic. The contribution of our work to this literature consists of assessing the effectiveness of the economic policy against COVID-19 impacts. Further, we also identify which households were most impacted in terms of non-durable expenditure. The policy inability to sustain consumption, while it was more successful in preserving income, can explain the increase in savings rates (probably associated with the worsening of expectations).

The rest of the paper is organised as follows. The second section presents a review of the literature on the economic effect of COVID-19 in Spain, while the third section presents the theoretical model and the equation we estimate. In section four, we present our empirical strategy to analyse the pandemic effect at the individual level. In the fifth section, we analyse the data and the pandemic impact on consumption and income with Spanish aggregate data, comparing it with the effect in SHF data. Section six presents the empirical results and we conclude in section seven.

2. Literature review.

The pandemic has been examined in the literature as a shock with new features. Thus, Woodford (2022) analyses the asymmetric sectorial effects of the pandemic, which produced a disruption of the circular flow of payments between sectors. This resulted in a failure of Keynes' effective demand theory. Guerrieri et al. (2022) adopted this concept of asymmetry and proposed a model in which "Keynesian supply shocks" produce a reduction of the potential output in some sectors of the economy while reducing demand in others. These two studies

examine the relevance of the mechanism via which impacts are transmitted between sectors and diminish the ability of economic policy to alleviate the effects of these shocks. However, while Woodford (2022) believes that fiscal policy is still effective, Guerrieri et al. (2022) consider that the fiscal multiplier might reduce its effectiveness while maintaining the insurance benefit component of fiscal transfers. Finally, Baqaee and Farhi (2022) analyse the pandemic impact as a combination of supply and demand shocks using a disaggregated model with numerous sectors, downward nominal rigidities, credit constraints, and a zero lower bound. As noted by Woodford (2022) and Guerrieri et al. (2022), Baqaee and Farhi (2022) highlight the relevance of spillover effects between sectors, indicating that complementarities between sectors moderate the effectiveness of aggregate demand stimulus.

The economic analysis of the pandemic effects has generated a great deal of interest because one of the main measures to avoid the spreading of the virus, population confinement, had important consequences on the demand and supply sides. This shock was novel in the developed world as there is not any similar precedent. Furthermore, the trade-off between the economy and the health policy was highly appealing to researchers. However, analysing the economic literature on COVID-19 is difficult due to the numerous published studies on the pandemic's effects on many countries. The interested reader can check Brodeur et al. (2021) for a comparative review. In this work, we will revise the Spanish evidence.

There are numerous studies, using diverse data sources and perspectives that have focused on the case of Spain to evaluate the impact of COVID-19. The difficulty of assessing the pandemic's evolution in real-time justifies that some of the initial studies used transaction data. Thus, Montalvo and Reynal-Querol (2020) and Carvalho et al. (2021) uncover an initial decline in consumption as a result of the pandemic, although the former confirms a later

rebound.[5] These fluctuations show that the spending reaction was far more complicated than anticipated. Still, since the data for both studies ends in June 2020, it is not possible to investigate this further using the transaction data. Additionally, Carvalho et al. (2021) discover a greater impact on consumption in wealthier neighbourhoods. After analysing the pandemic impact on inequality, Aspachs et al. (2022) concluded that the economic policy implemented successfully reduced it.[6]

As for studies that do not use transaction data, Cantó (2021) confirms, through a simulation analysis, that inequality levels were stable, but she concludes that the poverty rate must have increased, particularly for the most sensitive groups of the population (the youth and single-parent households).[7] About the effect of the pandemic on consumption and income, Cuenca et al. (2021) note the extraordinary increase in the savings rate during 2020. According to Alvargonzález et al. (2022) analysis using the ECB Consumer Survey of Expectations, the negative relationship between income and the evolution of consumption (caused by the pandemic) moderated over time, and there was a significant recovery in consumption in the third quarter of 2020. These authors also argue the existence of forced savings as a result of unsatisfied consumption during confinement and emphasise the role played by uncertainty during the pandemic. As a result, they expected that consumption would rebound as soon as both of these phenomena disappeared. Finally, Borras et al. (2024) examine the impact of

[5] Unlike other studies for other countries using similar data, Montalvo and Reynal-Querol (2020) do not discover statistically significant differences in the evolution of Spanish total expenditure (by categories of income) over time throughout the pandemic.

[6] These authors come to the conclusion that, in the absence of such policies, job losses and salary decreases would have caused inequality to rise by about 30% in just one month. Given the well-established link between unemployment and inequality in Spain, Malo (2021) concludes that the pandemic had a negligible effect on unemployment. He also concludes that the employment adjustment mechanism during the epidemic was to suspend and reduce working hours, which mostly affected temporary workers.

[7] According to Martínez-Bravo and Sanz (2021), who examined two online surveys conducted in May and November 2020, the average household income fell by 16% in May compared to the pre-pandemic level. This decline was highly uneven, with the poorest households experiencing a larger decline. When evaluating these numbers, it is important to keep in mind that the survey conducted in November lowers this fall by five percentage points. Finally, Cantó (2021) also finds a significant delay in the perception of public benefits.

confinement on the intra-temporal distribution of total expenditure using data from the Spanish Household Budget Survey. They discovered that the extent of the decline varied depending on the type of goods and the relationship with the observed evolution of savings.

3. Permanent income and individual marginal propensities to consume.

We consider the consumption behaviour of an infinitely lived individual in a world in which the return of real wealth is certain and constant over time. So, the total resources available for consumption consist of current non-human wealth at the beginning of period *t*, $A_{i,t}$, and the stream of regular income that individuals receive at the end of each period, $y_{i,t+k}$ k=0,1,…,∞.

In an uncertain world, individuals will determine their consumption level based on their expectations about the future. So, we follow Flavin (1978) and Deaton (1992) in expressing the individual permanent income in optimizing period *t* as:

$$y_{i,t}^{P} = \frac{r}{1+r}\left[A_{i,t} + \sum_{k=0}^{\infty}\left(\frac{1}{1+r}\right)^{k} E_t y_{i,t+k}\right] \quad (1)$$

where *r* is the real rate of return, assumed constant, and E_t is the mathematical expectations operator, conditional on the information set available to the individual in period *t*. In this setting, permanent income is the flow of consumption that maintains constant the individual net worth in the infinite horizon case.[8]

From here, we will assume that the individual income follows an autoregressive process of order 1, AR(1):

$$y_{i,t+k} = \rho y_{i,t+k-1} + \varepsilon_{i,t+k} \quad (2)$$

[8] Even though the theoretical model is for individual behaviour, the available data refer to households. We address this issue assuming the income pooling hypothesis, which implies that all household members pool their resources to spend them collectively and behave as a single unit.

where $\varepsilon_{i,t+k}$ is a white noise error term. In this case, the individual's *permanent income* will be defined as:

$$y_{i,t}^{P} = r\left[\frac{A_{i,t}}{1+r} + \frac{1}{1+r-\rho} y_{i,t}\right] \quad (3)$$

Defining α as the marginal propensity to consume out of permanent income, then the individual *permanent consumption* in period *t*, $c_{i,t}$, will be given by:[9]

$$c_{i,t} = \alpha y_{i,t}^{P} = \alpha r\left[\frac{A_{i,t}}{1+r} + \frac{1}{1+r-\rho} y_{i,t}\right] = \beta_o A_{i,t} + \beta_1 y_{i,t} \quad (4)$$

According to the model, the individual marginal propensities to consume out of non-human wealth and regular income are, respectively, $\beta_o = \frac{\alpha r}{1+r}$ and $\beta_1 = \frac{\alpha r}{1+r-\rho}$. Note that, in line with expectations, these two marginal propensities are lower than the marginal propensity to consume out of the permanent income. In an uncertain world, the true consumption level might deviate from the value provided by the model, thus we need to add a stochastic term $v_{i,t}$,

$$c_{i,t} = \beta_o A_{i,t} + \beta_1 y_{i,t} + v_{i,t} \quad (5)$$

We suppose that this error term is white noise, provided that the agents' expectations are rational.

4. The empirical strategy to analyse the effect of COVID-19.

From this setting, we aim to provide an empirical procedure to assess the effects on consumption of an exogenous event, such as the COVID-19 pandemic. For this analysis, we assume that we have access to individual consumption and wealth data for a particular sample period, t+1, during which the pandemic strikes. The population is confined as a result of the epidemic, which has an impact on its consumption and overall economic behaviour. The characteristics of the pandemic ensure that the economy experiences a structural break at period t+1, hence changing the parameters of the model. Consequently, we are in a situation where

[9] Flavin (1978) assumes that α=1, i.e., she equals permanent consumption to permanent income. However, we assume that $\alpha \leq 1$.

the Lucas Critique applies, and we cannot use the data of period t+1 to estimate the model as this will result in downward biased estimations. Nevertheless, we may still estimate the model using data from all the previous periods, as the resulting estimated parameters would not be affected by the *pandemic bias*. The bias can be interpreted as an indicator of the effect of the pandemic on consumption, since it would be a measure of the magnitude of the individual consumption level lost, or not realised, as a direct consequence of the pandemic. In what follows, we propose a procedure for estimating such a pandemic bias.

To calculate the size of the bias, we start with the expected individual level of consumption for that period, $\hat{c}_{i,t+1}$, estimated from equation (5),

$$\hat{c}_{i,t+1} = \hat{\beta}_o A_{i,t+1} + \hat{\beta}_1 y_{i,t+1} \quad (6)$$

It should be noted that to estimate the parameters used for this prediction we excluded the pandemic period, t+1. This is so as these parameters, in accordance with the Lucas Critique, might have been altered as a direct result of the pandemic, which would impact the model capacity to predict.

Now, assuming that expression (5) accurately provides the consumption individual level in absence of pandemic, $c_{i,t+1}$, the value of consumption in the pandemic, denoted as $c^P_{i,t+1}$, which we observe in data, will be,

$$c^P_{i,t+1} = c_{i,t+1} - p_{i,t+1} = \beta_o A_{i,t+1} + \beta_1 y_{i,t+1} - p_{i,t+1} + \upsilon_{i,t+1} \quad (7)$$

where the term $p_{i,t+1}$ picks up the effect of the pandemic on individual consumption. Therefore, we can estimate the impact of the pandemic on individual consumption using the difference between the individual predicted consumption in t+1 (using equation (6)), and the effective consumption for the same period (using equation (7)),

$$\hat{c}_{i,t+1} - c^P_{i,t+1} = \hat{p}_{i,t+1} - \upsilon_{i,t+1} \quad (8)$$

This estimate will be affected by a standard prediction error, $v_{i,t+1}$, that will have the usually assumed properties. In particular, we may reasonably expect that the aggregate outcome for all of the predictions be equal to zero, even if it will differ from zero for each individual prediction, provided there are a sizable enough number of participants in the sample. Therefore, our estimate for the impact of the pandemic on aggregate consumption, $\hat{P}_{t+1}$, is given by,

$$\sum_N \left(\hat{c}_{i,t+1} - c^P_{i,t+1}\right) = \sum_N \left(\hat{p}_{i,t+1} - v_{i,t+1}\right) = \hat{P}_{t+1} \qquad (9)$$

where *N* is the number of individuals in the sample. We assume that $\sum_N v_{i,t+1} \approx 0$, if *N* is high enough.[10]

After estimating the effect of the pandemic at the individual ($\hat{p}_{i,t+1}$) and aggregate ($\hat{P}_{t+1}$) levels, we will exploit the individual structure of the database to derive conclusions about the impact of the pandemic on consumption, conditional on demographic and economic variables. Finally, we particularize out this exercise to consider in the analysis other interesting variables available in the SHF related to the impact of the pandemic on consumption. The SHF provides information on the effects of the pandemic on the labour situation of the head of household. And, finally, the SHF also allows separating those households that receive some kind of public aid or subsidy directly related to the pandemic. So, our final econometric exercise consists of regressing the individual estimates of the effect of the pandemic, that correspond to the left side of expression (8), expressed in relative terms on the previous individual expenditure level, on several explicative variables for the SHF 2020 cross-section, as follows:[11]

[10] It should be noted, however, that one can reasonably expect that the pandemic bias was larger than the standard prediction error for any prior non-pandemic year given the specific characteristics of the effect of the pandemic on consumption, which are directly related to the length of the lockdown period, which in Spain amounted to approximately three months.

[11] As we do not observe the individual prior year expenditure, $c_{i,t}$, and given the SHF three-yearly periodicity, we increased each individual expenditure in 2017 by 5%, as it is the growth in the NA final consumption from 2017 and 2019. While this makes the comparison with annual aggregate measures easier, it has no effect on the econometric results. Refer to section 5.

$$\frac{\hat{c}_{i,t+1} - c^{P}_{i,t+1}}{c_{i,t}} = \frac{\hat{p}_{i,t+1} - v_{i,t+1}}{c_{i,t}} = \gamma_o + \gamma_1 A_{i,t+1} + \gamma_2 y_{i,t+1} + \gamma_3 \theta_{i,t+1} + \gamma_4 S_{i,t+1} + \omega_{i,t+1} \quad (10)$$

where $\theta_{i,t+1}$is a vector of demographic and labour variables and $S_{i,t+1}$is a vector composed by a set of dummy variables capturing the effect of different economic policy measures. From expression (10), after reordering the terms we have:

$$\frac{\hat{p}_{i,t+1}}{c_{i,t}} = \gamma_o + \gamma_1 A_{i,t+1} + \gamma_2 y_{i,t+1} + \gamma_3 \theta_{i,t+1} + \gamma_4 S_{i,t+1} + \frac{v_{i,t+1}}{c_{i,t}} + \omega_{i,t+1} \quad (11)$$

Which can be expressed as,

$$\frac{\hat{p}_{i,t+1}}{c_{i,t}} = \gamma_o + \gamma_1 A_{i,t+1} + \gamma_2 y_{i,t+1} + \gamma_3 \theta_{i,t+1} + \gamma_4 S_{i,t+1} + \varepsilon_{i,t+1} \quad (12)$$

where the error term of this regression, $\varepsilon_{i,t+1}$, has two components: a prediction error, $\frac{v_{i,t+1}}{c_{i,t}}$; and a regression error, $\omega_{i,t+1}$. We assume that both components have the standard properties. Since the pandemic's effects did not occur regularly over time, we need to appropriately consider these time-different effects in the estimation of equation (12). To solve this issue, we include monthly dummies, as the SHF provides information on the month of response. Further, we also introduce a time trend to account for potential pre-existing trends in key variables.[12]

The empirical study of consumption functions might be affected by endogeneity issues. This implies the need of using appropriate econometric approaches to prevent these issues. The traditional method to deal with this problem is to use an instrumental variables methodology. Due to the challenges in finding valid external instruments, the conventional approach to solving this issue has been to use lags of the explanatory variables themselves. The aim of this work is to estimate consumption function with the best possible econometric fit, in order to obtain prediction with a minimum prediction error, when we use the model to predict consumption. In our case, we consider that the endogeneity problem might be particularly

[12] We are grateful to an anonymous referee for pointing out this issue.

relevant, provided that both consumption and income were simultaneously affected by the pandemic.

We will estimate the consumption function used to predict consumption using the Generalized Method of Moments with instrumental variables (IV-GMM).[13] We will use lagged values of the explanatory variables to instrument those affected by the endogeneity problem.[14] We will assess the validity of the instrument used using the Hansen test of over-identifying restrictions.[15]

5. The data.

The data we use in this study have been drawn from the Spanish Survey on Household Finances (SHF), a panel data set provided by the Bank of Spain.[16] All of the post-2008 crisis waves accessible before the epidemic, from 2014 to 2017, are used for estimation. The rationale for this is that the Spanish economy experienced a structural break in 2008 due to the burst of the real state bubble and the starting of the financial crisis. The SHF gathers information on expenditure, income, labour supply, assets and liabilities of the Spanish households.[17]

[13] To rule out potential biases associated with individual unobserved effects, we differentiate the consumption function before estimating it by GMM.

[14] The list of the instruments used in every case is detailed in the notes to the corresponding tables.

[15] As we only have one point in time observation to measure the impact of the pandemic and the economic policy measures proposed minimise its impact, it is unfeasible to use lags of the economic policy variables to instrument them.

[16] The SHF is a rotating unbalanced panel interviewing about 6000 individuals in each wave.

[17] The SHF is similar to the Bank of Italy Survey on Household Income and Wealth (SHIW), to the U.S. Federal Reserve Survey of Consumer Finances (SCF), and the European Central Bank Household Finance and Consumption Survey (HFCS), and was designed to analyse households' saving decisions. As a result, it overrepresents the wealthier fraction of the population. For more information on the SHF, see Cutanda and Sanchis-Llopis (2023a and 2023b).

The consumption measure we use is total non-durable expenditure, that is a question asked to the respondents of the survey.[18] To deflate nominal values, we calculate a Stone price index for this measure of non-durable consumption, using the corresponding CPI for the expenditures that compose this aggregate, taken from the Spanish Statistical Office (INE). The wealth measure we use is total net wealth, that is obtained by adding all the household's assets reported in the survey, net of liabilities.[19]

To measure regular income, we do not include any asset income as stated by the model. Therefore, total regular income has been calculated by adding up all declared monthly income that does not come from any assets. In particular, we include all declared cash and in-kind income from work, self-employment, unemployment insurance, pensions, and any other declared perceived income that does not come from any asset.

Table 1 presents key demographic and economic indicators for the SHF samples from 2017 and 2020 (the pandemic year). For 2020, we also include descriptive statistics for the subset of individuals who reported being affected by COVID-19 (third column),[20], and those within this group who received public aid (fourth column).[21] When comparing the overall samples from both years, we observe that all categories of nominal expenditures decreased during the pandemic year, except supply-related expenses (such as electricity, water, gas,

[18] The survey question is: "How much does your household spend on consumer goods, including food, on average each month? Consider all expenses, including electricity, water, cell phone, community fees, recreation, education, travel, etc. Spending on durable items like furniture, appliances, rent, insurance, mortgage payments, and cars should be excluded".

[19] We apply standard cleansing sample filters. Thus, we remove all households with zero total non-durable expenditure, zero expenditure on food and zero total household income. Additionally, we remove all the households reporting non-durable consumption below 1% or above 95% of the household's income distribution. After applying this cleansing process, we end up with a sample of 16.749 observations for the period 2014-2020.

[20] In this sample we include all households whose main breadwinner reported experiencing a change in their employment status or income due to the pandemic.

[21] This sample consists of heads of households affected by COVID-19 (see footnote 20), who reported receiving unemployment benefits, either general or related to a furlough scheme, or public aid for the self-employed or other forms of public aid.

internet, television, and telephone expenses), which increased, likely due to the greater amount of time spent at home during the lockdown period. When analysing the sample of individuals affected by COVID-19 (third column), the decline in expenditures is considerably higher, as expected, except for spending on supplies and tourism. Notably, the reduction is even more pronounced among those within this group who received public support (fourth column).[22]

Nominal regular monthly income for the overall SHF sample increased by over 5% in 2020 compared to 2017, but it declined by 2.8% among individuals affected by COVID-19. The decrease was even higher (exceeding 7%) for those in this group who received public assistance, indicating that aid predominantly reached the most severely impacted or disadvantaged households. The sharper decline in both income and expenditure among individuals who declared being impacted by COVID-19 (who represent 29.5% of the total sample) can be attributed to the fact that nearly all of them experienced a reduction in working hours and/or income. Notably, both the sample of individuals affected by COVID-19 and the subset who received public aid exhibit significantly lower average values across all measures of wealth.

With respect to demographics, we observe that over 60% of households were headed by men in both 2017 and 2020, although this proportion is lower among households affected by COVID-19. Regarding other demographic factors, in contrast to the general trend in the Spanish population, the average age of household heads in both years exceeds 40. Notably, the average age is significantly lower within the sample of individuals affected by COVID-19, and even lower among those who received public aid. Similarly, the younger average age accounts for

[22] This evidence does not demonstrate the ineffectiveness of the aid, as it is plausible that, without such support, the contraction in spending would have been even greater.

the lower average income, as these individuals are typically in the early stages of their life cycle. This also largely explains the lower levels of wealth, as previously discussed.

Additionally, in 2017 and 2020, we observe that more than 30% of the individuals in the full SHF sample are employees, and about 10% are self-employed. Compared to the average unemployment rate in Spain over those years, the unemployment rate seems low. Nevertheless, the unemployment rate in the full SHF sample rose in 2020, as did the overall unemployment rate, most likely due to the pandemic effect. Finally, the pensioners still account for more than 30% of the full SHF sample in both years.[23] This picture changes significantly when we examine the SHF sample of individuals affected by COVID-19 and, in particular, those receiving public aid. In these groups, the proportions of employees and self-employed individuals rise notably, while the average unemployment rate approaches the overall sample value.[24] At the same time, the share of pensioners declines sharply.

In Spain, the main economic policy measures used to counteract the negative effects of the COVID-19 containment were: a special unemployment subsidy connected to a furlough scheme (ERTE, *Expediente de Regulación Temporal de Empleo*); a reduction of working hours for care workers; extraordinary unemployment benefits for particularly vulnerable sectors, such as artists, show technicians and assistants, bullfighting professionals, or similar; aids for self-employed; and various bonuses in the furlough schemes, which were in effect until March 2022. Additionally, we could also add the easing

[23] In 2020, 27.5% of the population was retired, according to the Spanish Labour Force Survey (*Encuesta de Población Activa*, EPA).

[24] The higher rate of temporary employment among younger cohorts, along with the lower average number of adults in younger households (noting that only the employment status of the household head is recorded), are also important factors in explaining these differences.

of the eligibility requirements for certain pre-existing public aid, such as the Minimum Living Income or the suspension of eviction for vulnerable households, among others.[25]

As regards the impact of COVID-19, in the survey, we find that 5.53% of the heads of households were dismissed and 1.08% left due to COVID-19. Additionally, the number of public aid recipients does not exceed 20% of the sample, which seems small given the high confinement rate in Spain. The furlough scheme was the most prominent measure in these numbers, followed by the specific unemployment subsidy for COVID-19 and the self-employed help to a lesser degree. Thus, while 11.2% of the heads of household (589) declared to have perceived the unemployment subsidy linked to a furlough scheme, 4.4% of them (230) declared to have perceived the general unemployment subsidy due to COVID-19, 38.1% of self-employed (182) declared to have perceived the corresponding aid. In any case, despite the low impact of COVID-19 that these figures suggest, every household head surveyed reported experiencing financial difficulties due to COVID-19. Additionally, almost 20% of respondents declared they did not expect their income level to return to normal after the pandemic, indicating an evident decline in household expectations.

Next, we compare the pandemic consequences as documented in the SHF data and the Spanish National Account (NA). In 2020, according to the NA Spain's GDP contracted by 9.9% in nominal terms (10.9% in real terms), while household final consumption expenditures decreased by 12.1% in nominal terms (12.2% in real terms).[26] However, we are unable to directly compare these rates to those suggested by the SHF averages for two reasons. First, the three-year periodicity of the SHF suggests that the impact of the pandemic was larger than the

[25] A detailed description of the economic policy to alleviate the COVID-19 effects in Spain can be found in García (2021).

[26] These figures imply that consumer prices did not change while producer prices increased at a 1% rate. The use of data on prices for 2020 might be problematic given that the lockdown reduced dramatically the number of exchanges. See Diewert and Fox (2022).

growth rates calculated from SHF averages. In this regard, Table 1 shows that while monthly regular income increased by 5.5% between 2017 and 2020, overall expenditures decreased by 2.6% (about 3% for non-durable expenditures).[27] If household income and consumption had increased between 2017 and 2019 at the household final consumption and GDP growth rates (5.3% and 7%, respectively), their SHF observed averages would have decreased by 7.5% and 1.5%, respectively, in 2020. Second, the two consumption measures in these two statistical sources may differ for some reasons. Specifically, one of the reasons is that the NA definition of final consumption does not match our measure of individual consumption. Additionally, there is no correspondence between the NA income definition at the individual level. Despite these differences, we believe that comparing our estimates with those from the NA may help to obtain a picture of the pandemic overall effects on consumption.

One of the main motivations for this work is the contrast between the evolution of aggregate and individual measures of income and the minor difference between those of expenditure. A plausible explanation for this discrepancy is that while lockdown measures severely impacted aggregate output, household income was maintained by the economic policy measures implemented to lessen the pandemic effects. Further, containment measures also had an impact on household spending. This means that the policies that kept households' incomes afloat throughout the pandemic, along with the reduction in consumption, may explain the observed rise in savings during the outbreak and the following burst in consumer spending after the worst was over.[28,29] This evidence makes it possible to discuss the effectiveness of the

[27] Our measure of total expenditure does not contain expenses on transportation, tourism and housing. Note that these categories of expenditure were especially affected during the pandemic.

[28] The increase in savings during the pandemic has been well-documented, see, for example, Fernández (2021).

[29] This could explain the unexpected surge in tourism, both domestically and abroad, that the Spanish economy experienced in the summers after 2020, when the pandemic had not yet ended. Unfortunately, we are unable to verify this hypothesis because our data does not continue beyond 2020.

income-sustaining economic policy measures implemented during the epidemic on consumer spending.

6. Empirical results.

In this section, we present the main results of our study and report two robustness exercises related to the effectiveness of the policy instruments to alleviate the pandemic.

6.1. The consumption function and the effectiveness of the policy instruments.

We start by reporting the estimates corresponding to the consumption function with the panel of the SHF, using data only for the pre-pandemic period, 2014-17. With these estimates, we can predict the difference between the effective consumption for the year of the pandemic and the predicted consumption in the event the pandemic had not occurred, i.e. $\hat{p}_{i,t+1}$. Second, we will report the estimates corresponding to equation (12), where we regress the predicted differences on a set of explanatory variables (including household demographics, wealth and income, and labour related variables) and a series of variables capturing the policies implemented to mitigate the effect of the pandemic on household income, especially focused on specific groups of individuals.

In Table 2 we present the results of the estimation of the consumption function according to equation (5). As we aim to predict consumption and compare it with actual values of consumption during the pandemic, we have opted to estimate the model in levels, as they provide better results when estimating a shock, such as the one produced by the pandemic. As pointed out above, our primary objective is to guarantee that the estimated model has the highest predictive capacity to be able to estimate the impact of the pandemic on individual consumption as precisely as possible. In this regard, one relevant difference between the estimation reported

in Table 2 and other empirical research in the literature is the inclusion of wealth as a regressor in addition to income and other variables.[30]

We begin our examination of the findings by assessing the fit of the reported estimates. We obtain that the Hansen's test of over-identification restrictions reaches a significance level of 39 %, which suggests that we can rely on our data for predictive analyses. It should be noted that to achieve this goal, we have selected a wide range of explanatory variables, including income and wealth as well as a significant number of demographic variables, educational dummies, labour variables and time dummies, in the set of explanatory variables.

As can be checked in Table 2, the variable *income* has a positive and statistically significant impact on consumption, as one could expect. The relevance of income in explaining consumption behaviour during the pandemic has been pointed out in many previous works (see Chetty et al., 2020; or Carvalho et al., 2021, for the Spanish case). However, we obtain that the variable *wealth* is not statistically significant. When evaluating this result, it is important to consider that the SHF sample over-represents households in the highest income and wealth distribution intervals. Additionally, our dependent variable (the increase in non-durable consumption) has an unclear relationship with the increase in wealth.[31]

As regards the demographic variables, we get that none of the education dummies are statistically significant. Finally, regarding the labour dummies, we find that only the variable *employee* is statistically significant at the 10% level, showing a negative relationship with

[30] In general, the most common practices are either to estimate an equation for the increase in the log of consumption (see Fisher et al., 2020), without including wealth among the explanatory variables, or to estimate a version of the model that relates the ratios of the relevant variables to income (see Paiella, 2007, or Cutanda and Sanchis-Llopis, 2023b, for the Spanish case).

[31] The majority of expenses within non-durable consumption are categories (such as food) that once the consumers reach a certain level, do not increase with household wealth or do so to a much lower rate than other types of expenditures.

consumption, while the variable *pensioner* has a positive and statistically significant effect at the same significance level.

Further, we also get that the dummy variables capturing that the head of the household is unemployed, a multiple jobs employee, a part-time or a temporary worker are not statistically significant. To interpret this result, it is important to consider that we are focusing on non-durable expenditure and that income may be capturing the effects of these variables. These results show that variables that account for the individual economic activity are negatively correlated with non-durable expenditure, while those that account for economic inactivity are positively correlated with it once we control for the effects of income, household size and age.

After estimating the parameters for the consumption function (reported in Table 2), we derive an individual estimate for the size of the drop occurred in consumption during the COVID-19. This drop is calculated by comparing the predicted non-durable consumption for the year 2020, estimated using the parameters of the consumption function in Table 2, with the actual non-durable consumption recorded that year for each family. As it is established in equation (12), we measure the drop in consumption in relative terms, taking as reference the household's previous non-durable consumption. This drop in non-durable expenditure amounts to 5.5% on average in our sample and is larger than the drop we reported in Table 1 for the period 2017-2020.[32] Using this measure as a dependent variable in a reduced form equation, we aim to study the determinants of the reduction in consumption due to the pandemic and whether the policies adopted to alleviate the pandemic effects were effective. The results we obtain for these exercises are presented in Table 3.

The covariates used in the estimation of the consumption function (see Table 2) are included in the specifications to analyse the impact of the policies to help people cope with the

[32] The average estimate amounts to 8.4%, evaluated over the 2020 effective non-durable expenditure.

pandemic. We also include variables that account for the sector in which the individuals work (either the head of household or his wife) [33] and a set of dummy variables that account for the various economic policy measures that were implemented during the pandemic to maintain non-durable consumption and lessen its impact.[34] Concerning the different support measures targeted at specific groups during the pandemic, our analysis initially incorporates all policies captured in the dataset, to allow for the identification of distinct effects associated with each. These COVID-19 instruments are: a subsidy for the unemployed head of households; unemployment benefits linked to a furlough scheme; a public aid for self-employed workers linked to the pandemic; and, finally, other public aid, not considered before, linked to the pandemic. We incorporate them in the specification as dummy variables.[35] Further, we combine all of them into a single dummy variable called *Total public aid*, to avoid the possibility that including all of them in the same regression may give a partial result on the effectiveness of the economic policies against COVID-19. This variable takes value one when any of the political variables we consider take value one. Additionally, we include a variable that accounts for the number of months the household has received any public aid related to the pandemic.

It is important to note that the dependent variable in the specifications presented in Table 3 contains current non-durable consumption, which might imply an endogeneity problem for the regressors *income* and *wealth* included in the regressions. Therefore, we estimate the models using OLS, and to avoid the hypothetical bias associated with this problem we estimate IV-

[33] It is advisable to investigate potential variations in the response of nondurable expenses based on the productive sector where household members work, given that dropout rates were different across sectors (see to Carvalho et al., 2020). Specifically, we include 5 sector dummies for the job of the head of the household and his wife. However, the results we obtain do not show a differential effect on non-durable consumption according to the sector of activity. For the sake of brevity, we do not report these results in the tables, but are available upon request.
[34] Carvalho et al. (2021) examine changes in the market shares of various spending categories using transaction data for the Spanish economy. As expected, they find that goods with very low demand elasticity (such as tobacco) and basic necessities (like food) have smaller changes in market share. The SHF does not allow this detailed disaggregation of its non-durable spending measure. However, based on the findings of Carvalho et al. (2021), the only high market share expenditure that is considered in our measure of expenditure is restaurant expenditure.
[35] See Table A.1 in the Appendix for a further definition of these variables.

GMM regressions where income and wealth are instrumented using their lags. Thus, in each table we report in columns (1) and (3) the OLS estimates and in columns (2) and (4) we report the IV-GMM estimates, which allow us to assess the relevance of the endogeneity bias.

Now, we turn to discuss the results in Table 3. In the first column, we report the OLS estimation results, where we incorporate all the public aid variables mentioned above. In this specification we observe that the *income* (when included in the specification with its current value) is positive and statistically significant, being wealth statistically not significant.

In column (2) of Table 3, we present the results of estimating this same specification but using an IV-GMM estimator to control for the potential endogeneity of income and wealth. The estimates show a strong goodness of fit, as confirmed by the Hansen's test. The variable wealth does not have a statistically significant effect on the decline in consumption due to COVID-19, whereas income shows a negative and statistically significant impact. We attribute the discrepancy between these findings and the OLS results to the endogeneity bias and consider the IV-GMM estimates to be more reliable, aligning more closely with the results reported in Table 2.

Previous evidence based on transaction data has found that, during the pandemic, higher-income households experienced a higher decline in consumption (see Chetty et al., 2020; Carvalho et al., 2021). However, we consider that this contradiction is more apparent than real for several reasons. First, these studies have typically examined total expenditure rather than non-durable expenditure. Second, when these studies disaggregate consumption by type of expenditure, as in Carvalho et al. (2021), they observed that traditional non-durable expenditures increase their share of the market, while durable expenditures had a relative decline.[36] Third, these analyses typically capture only the initial drops in consumption, often

[36] This evidence is relevant, given the change in consumption patterns across the income distribution. In this regard, Meyer et al. (2022), using the CEX data, find that individuals at the bottom of the consumption distribution did

limited to the first month following the pandemic declaration, rather than considering the trends over the entire year.[37] The results are different when a longer period is examined. Carvalho et al. (2021) report that following the lockdown, all the expenditure categories return to their pre-pandemic level, while Lau et al. (2022) report that following an initial aggregate spending decline of almost 30% in Denmark, spending recovered nearly entirely following the first pandemic wave.[38] Lau et al. (2022) also discover that while expenditure rose in unrestricted categories, it fell in those impacted by supply constraints.

Now, we discuss the IV-GMM results for the demographic variables. The age of the head of the household has a negative and statistically significant relationship with the decline in consumption due to COVID-19. As regards the educational dummies, we obtain that all variables have a negative and statistically significant relationship with the drop in consumption related to the pandemic (the illiterate dummy is the reference category). Concerning the labour variables, the dummy variable *employee head* of the household is not statistically significant, possibly because its effect is captured by income, while the dummy *employee partner* is significant. The dummy variable *unemployed head* is statistically significant and negative, but it is not that for the unemployed partner. The dummy variables *self-employed head* of the household and *self-employed partner* are statistically significant and positive. Finally, households with a retired head and/or retired partner experienced a drop in their non-durable consumption.

According to our results, being a retired head of household appears to be a key factor in identifying households whose non-durable consumption was most affected by the pandemic, as

not reduce it, or did so very little, while those at the top of the distribution experienced larger and more significant drops, generally in the second quarter of 2020, what explains the sharp decline in aggregate consumption. Further, they also find that the largest drops in consumption are experienced by higher income households.

[37] Cox et al. (2020) study just the early effects of the pandemic, looking at transaction data for just two months in 2020 (April and May).

[38] It should be noted that our data show the decline in spending for the entire year 2020, in contrast to these studies that just measure the initial partial decline.

it is the only dummy variable, along with that for unemployment, that remains statistically significant in our second estimation exercise (see Column 4).[39] Considering that retired households' earnings have been among the least impacted by the crisis and that they are not considered as households affected by COVID-19 in the survey, as reported, it is puzzling that these households display one of the largest consumption responses to the pandemic. We believe that a reasonable explanation for why families with a retired breadwinner simultaneously experienced a larger decline in consumption and reduced income uncertainty, is that retired people saw themselves as a disproportionately high-risk population group facing COVID-19.[40] In this regard, it is important to keep in mind the initial widespread uncertainty over the length, severity, and health effects of the epidemic.[41,42]

Concerning the dummy variables that reflect the economic policy actions against COVID-19, according to the results, none of them is relevant in maintaining non-durable consumption during the pandemic. These economic policy variables are included in the specification separately (Column 2), or combining all of them (Column 4). In both cases, we get that they are not statistically significant, except for the *number of months* the household has received public aid (that is positive and statistically significant in one of our two sets of estimates). These results support the idea that the different policy measures adopted were not successful in maintaining consumption, given that the decline in consumption was not reduced by them.

[39] In line with this result, Montalvo and Reynal-Querol (2020) find that the recovery of household expenditures after the lockdown was faster for younger households than for elder ones.

[40] In any case, it does not seem that the pandemic had an impact on retirement decisions. On the contrary, the average rate of retirement was 0.10% in 2020 in the EPA, compared to 0.94% for the period 2002-19. Further, it does not appear either that the higher mortality caused by the pandemic could invalidate this result.

[41] In this sense, Berthold (2023) finds that while standard crises are best characterised by a combination of uncertainty and risk aversion shocks, uncertainty shocks were more important during COVID-19.

[42] In principle, the containment increased internet online shopping, therefore the retirees' weaker digital abilities could account for their reduced consumption during the pandemic. However, it has been proven that the least digitalized populations before the pandemic are the ones who most improved their digitalization profile, even the elderly, see Carbó et al. (2021).

Considering the disparity between household income and consumption drops during the pandemic, there is no reason to consider that public aid was insufficient, or that it did not reach the most affected households. Regarding this, for an analysis of the impact of the economic policies against the pandemic, see García (2021) and Salas (2021). Furthermore, there is no reason to believe that the population of individuals in the SHF sample received less aid than the whole population, particularly because the percentage of respondents who received public assistance in the survey is nearly identical across all quartiles of the total income distribution.[43] In any case, given that the SHF over-represents wealthier households, it is reasonable to assume that, even if the survey sample received the same benefits as the general population, the effect of these benefits in their case was smaller, given their characteristics. So, the effectiveness of these policies might be understated in our sample.

However, even if economic policy interventions were successful in maintaining the average household income, the pandemic could have still worsened income inequality, particularly if lower-income households were more severely affected (see Martínez-Bravo and Sanz, 2021, and Cantó, 2021).

It should be noted that the ineffectiveness of the economic measures adopted to sustain consumption during the pandemic in the Spanish economy is not unique. In this regard, Parker et al. (2022) conclude that U.S. households spent barely 10% of the aid received on non-durable

[43] The percentage of the beneficiaries receiving any kind of aid in the SHF is approximately the same for the first three quartiles of the distribution of total income (17.4, 20.1, and 19.6%, respectively), which only drops to 13.6% for the fourth quartile (for households whose total income is above 75500 €). In addition, although the unemployment rate decreases monotonically with income, from 14.9% in the first quartile to 2.3% in the last one, the contrary occurs with the rate of self-employed breadwinners, going from 3.6% in the first quartile to 17.6% in the last one. The number of individuals is about the same in each quartile.

goods and services and practically nothing on durable goods, a considerably lower response than the widely documented tax cuts of 2001 and 2008.[44,45]

Given the differences between the decreases in non-durable consumption and income shown in Table 3, our results seem to indicate that the policy measures might have contributed to the increase in savings, to the extent that they might have been successful in maintaining household income.[46] Parker et al (2022) also consider that the explanation may lie in the fact that the objective of the economic policy measures against COVID-19 was insurance, as opposed to the standard tax cuts, which are usually the increase in demand.[47] Thus, it raises a number of interesting issues for further study. Provided the smaller margin individuals had for consumption by the various containment measures adopted, it seems important to study to what extent private savings generated during the pandemic had a forced nature. Further, it also seems interesting to analyse how much of the notable increase in spending that occurred during the pandemic last stages, when social distancing measures were relaxed, can be explained by such savings (see Cuenca et al., 2021, and Borras et al., 2024). Alvargonzález et al. (2022) study Spanish households spending using the qualitative data from the Consumers Survey

[44] This paper also highlights the difference in their results with respect to papers analysing transaction data. One of the reasons they point out that may explain the differences, among others, is the possibility that the debt payments have been mis-accounted as consumption-related.

[45] Related to this, Clemens et al. (2022) find that the estimated multipliers of the US federal aid to state and local governments across the pandemic are centred on zero.

[46] Coibion et al. (2020), using a survey of U.S. consumers, point out that "…most respondents report that they primarily saved or paid down debts with their transfers, with only about 15 percent reporting that they mostly spent it…". Additionally, "…individuals report having spent or planning to spend only around 40 percent of the total transfer on average".

[47] The aid had been initially saved and then used to cover a later loss. They find it consistent with the fact that the aids were poorly targeted. In this sense, Meyer et al. (2022) point out that "the pandemic impacted consumption beyond the normal recessionary channel of income shocks and employment uncertainty".

Expectations, collected by the ECB. They confirm a strong negative correlation between consumption and different income definitions.[48,49]

Finally, in Columns (3) and (4) of Table 3 we present the results where we have replaced the set of economic policy variables with a unique dummy variable, *Total public aid*, that encompasses all of them. This dummy variable is statistically significant at the 10% level in the OLS estimates (see Column 3) but it is not in the GMM estimates (see Column 4), with the rest of the results of the first two columns of the Table remaining practically identical, except for the dummy of unemployed partner, which is not statistically significant now. The variable for the number of months receiving aid is not statistically significant in Column (4). So, our previous conclusion on the effectiveness of the economic policy instruments in sustaining consumption is maintained.

6.2. Robustness analysis.

In this section, we carry out two robustness tests on the effectiveness of the economic policy measures against COVID-19 on non-durable consumption in Spain. Thus, in Table 4 we present a first exercise aimed at confirming the limited effectiveness of the economic policy on consumption. To this end, we repeat the regressions of Table 3, but interacting each of the economic policy dummies considered with income, using the most appropriate income variable for each COVID-19 instrument. In particular, the unemployment subsidy dummy is interacted with the unemployment benefits received when the head of household is unemployed; the subsidy furlough scheme dummy is interacted with the income received from the furlough

[48] Additionally, MacGee et al. (2022), through simulating the paths of consumption, debt and savings, find that high-income households accumulated notably unplanned savings during the pandemic.

[49] According to Georgarakos and Kenny (2022), public perceptions of the fiscal assistance measures intended to lessen the impact of COVID-19 may have influenced consumer spending on major purchases like vehicles or vacations, and also household income expectations.

scheme when the head declares to be affected by a furlough scheme;[50] the self-employment dummy is interacted with the household self-employed income in the case of a self-employed head of the household; and, with the regular income of the household in the other two cases.

As can be seen, the results we report in Table 4 are very similar to those reported in Table 3. As for the specifications in Columns 1 and 2, in which we include all the dummies for economic policy, we observe that none of the variables are statistically significant (see Column 2, with the IV-GMM estimates). In Columns 3 and 4, we report the estimates for the specifications where we group all the economic policy variables in one indicator. This dummy variable is not statistically significant either, consistent with the previous results.

All in all, even when using interactions with the policy instruments, we do not detect any statistically significant impacts on the effectiveness of these instruments. Thus, our results cast doubt on the effectiveness of the economic policy instruments aimed at maintaining non-durable consumption during the pandemic.

Finally, if one considers that every economic policy measure implemented during COVID-19 was an increase in income, it is plausible to think that income, being one of the explanatory variables, is capturing the impact of those measures on non-durable expenditures. Thus, income would be capturing the effect of the economic policy instruments. We have performed a final exercise to rule out this possibility, where we repeat the previous regressions, removing income from the explanatory variables and the set of instruments. The results for this specification are reported in Table 5. As it can be verified, removing income does not alter our earlier conclusion on the inefficacy of the economic policy measures in supporting non-durable spending in Spain throughout the epidemic.

[50] We calculate the furlough scheme income by multiplying the monthly furlough scheme income declared by the months in which the assistance was received.

7. Conclusions

The economic consequences of the COVID-19 pandemic in developed countries have been far more complex than initially anticipated. The only comparable precedent is the so-called Spanish flu of 1918, given that any previous pandemic occurred in socio-sanitary and developmental conditions far removed from today's standards.[51] The remoteness with which this episode is perceived, together with the fact that no similar episodes have occurred since, and that those that did occur were quickly contained and controlled, contributed to an excessive complacency, which explains why the reaction has generally been very poor.

In the economic sphere, things have been no different. When the pandemic broke out, we did not have a rigorous analysis of the economic implications of such a phenomenon, nor of the economic policy measures to adopt in the face of it. It was not until 2020, once the emergency had been declared, that the economic aspect of the epidemiological model began to be analysed, at which point it became clear that the harsher social containment measures entailed a higher economic cost, which greatly complicated the management of the pandemic.

Additionally, the pandemic economic impact has been more complex than anticipated. Clearly, the social distancing measures involved both a fall in income and a fall in consumption. The former has apparently been the easier problem to deal with, through subsidies and direct aid, but we are only now beginning to understand the complexities of its effect on consumption.[52] Although transactions data, which have been the most widely used data in the analysis so far, seem to be specially designed to follow the time evolution of economic variables, they cannot analyse the economic decisions behind this evolution as well as other

[51] Influenza broke out at the end of the Great War, and population movements at the end of the conflict contributed to its spread.

[52] In this respect, Spain had a previous measure that has proved effective to counteract the fall in revenues: a furlough scheme.

types of data can. The analysis of transaction data is still at a very early stage of application and development, which hardly allows to extend the analysis by a few months. Moreover, the reaction of consumption has been particularly complex, with very different durable and non-durable spending behaviour. This paper analyses the fall in individual non-durable expenditure for the period 2014-2020, based on the SHF panel for the period 2002-2020, taking advantage of the fact that the survey introduces in the 2020 wave a set of questions on the COVID-19 aid received by individuals.

First, our results allow us to conclude that the fall in individual non-durable expenditure has been much smaller than that indicated by the NA (around 5% versus 12%). When interpreting this result, it is important to note that our analysis is limited to non-durable expenditure, while the national accounts (NA) figure includes durables, which was one of the categories most impacted by the pandemic. Second, panel data allow for a rigorous analysis of the determinants of the fall in non-durable expenditure during the pandemic. This analysis shows that higher levels of household wealth and income are positively and negatively related, respectively, to the fall in non-durable expenditure. This is noteworthy, as studies using transaction data have associated the largest drop in spending with higher income households. In our opinion, this contradiction is explained because this finding usually refers to total expenditure, whereas the fall in durable expenditure has been significantly larger than the fall in non-durable expenditure, and also because these studies focus on the immediate effect after the declaration of the pandemic, without taking into account subsequent developments.

Our results also show that differences in labour status (of the head of the household or his/her partner) have produced minor differences in the fall in non-durable expenditure, except in the case of the head of household being unemployed, and so the type of labour contract (permanent/temporary). However, the fact that the main breadwinner is retired is an important clear determinant. Pensioners' non-durable spending declined considerably during the

pandemic, despite their incomes were generally not affected. Our results also show that only certain labour status situations of the head of the household or his/her partner have determined minor differences in the fall in non-durable expenditure.

Finally, the fall in non-durable expenditure does not seem to have been affected by the implemented policy measures, which might reflect both the small proportion of the population that received public aid and the fact that many recipients saved the funds in response to heightened uncertainty. This finding is consistent with evidence from other countries and with the economic policy implications obtained in the early studies examining the impact of the pandemic (Woodford, 20022; Baqaee and Farhi, 2022; and Guerrieri et al., 2022). Since these measures primarily took the form of income benefits, this finding is consistent, on the one hand, with the negative relationship we have uncovered between non-durable expenditure and income during the pandemic. On the other hand, our results suggest that the adopted measures may have overlooked one of the most affected groups (pensioners). However, if pensioners' consumption was mainly driven by heightened perceptions of uncertainty, it remains highly debatable whether a reorientation of these policies would have meaningfully altered the outcome.

Thus, our results support the hypothesis that income benefits are a relevant factor in explaining the increase in savings during the pandemic. In this sense, its effectiveness on expenditure would have occurred with a time lag. It is not unreasonable to think that, although the economic policy could not have prevented the fall in consumption during the pandemic, it could have been a relevant driving factor in the increase in spending, surely on goods with a greater component of durability, when the worst was over, although testing this hypothesis will require further work.

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Table 1. Economic and demographic variables statistics.

	2017	2020	2020 (COVID)	2020 (COVID with public aid)
Economic variables				
Non-durable expenditure	15832	15353	14345	13943
Expenditure on food (in and out)	6923	6846	6421	6303
Expenditure on supplies	256	262	256	248
Expenditure on tourism	1502	517	509	483
Total expenditure	16860	16424	15455	14978
Monthly regular income (pre-tax)	2874	3031	2795	2662
Net total non-human wealth	689729	613384	419878	300110
Net housing wealth	384015	330856	242450	187331
Financial wealth	191777	190454	86801	48419
Demographics				
Male (%)	62.95	60.03	56.95	54.68
Age	46.68	42.39	34.40	32.82
Number of members	2.58	2.57	3.00	3.02
Number of adults	2.27	2.14	2.39	2.38
Education 1	1.41	0.53	0.19	0.32
Education 2	23.66	15.68	8.24	6.67

Education 3	28.38	35.16	44.13	46.40
Education 4	13.46	13.41	15.97	17.75
Education 5	28.46	30.16	25.69	23.56
Education 6	4.63	5.06	5.60	5.30
Labour status				
Employee	30.83	33.66	40.14	42.59
Self-employed	10.50	9.09	18.62	15.14
Unemployed	6.62	7.30	11.60	13.83
Pensioner	31.48	30.74	7.60	4.79
Other	20.57	19.21	22.04	19.59
Number of observations	4820	5261	1552	918

Notes:

a) The educational categories are: Education 1 corresponds to illiterate individuals (reference category); Education 2 includes primary education and education for labour market insertion (requiring less than 300 hours of secondary school instruction); Education 3 corresponds to individuals with secondary education; Education 4 captures specialized courses and labour insertion programmes in Spain; Education 5 corresponds to college education; and, Education 6 corresponds to any special education requiring to have previously completed secondary education.

b) The different categories of expenditures are directly consigned by respondents in the survey's questionnaire, except the total expenditure which has been obtained by adding to the non-durable expenditure the expenditure in home equipment.

c) *Monthly regular income (pre-tax)* is our measure for household's income obtained by adding the different regular income perceived by the different member of the household. It corresponds to the year of reference of the survey. *Net total non-human wealth* is obtained by adding all the declared assets by the household, less their total debts; *net housing wealth* is obtained by adding the declared value of all the houses belonging to the households, net of mortgages; and *financial wealth* is the total amount of declared value of the financial assets.

~~d)~~ In column 3, 2020 (COVID), we report the descriptives for those individuals who declared being affected by COVID-1. And in column 4, 2020 (COVID with public aid), we report the descriptives for those individuals who declared being affected by COVID and who received any public aid~~.~~

e) Source: Survey of the Household Finances (SHF).

Table 2. Estimation results for the consumption equation. 2011-2017.

Wealth	-0.001
	(0.002)
Income	7.646**
	(3.890)
Number of members	-70.957
	(161.268)
Number of adults	209.587
	(170.407)
Age head	224.431
	(162.445)
Age head sq.	-3.369
	(2.101)
Male head	213.050
	(269.097)
Education 2	-674.989
	(520.315)
Education 3	-911.741
	(649.376)
Education 4	-605.798
	(706.798)
Education 5	-603.253
	(531.862)
Education 6	-482.463
	(440.909)
Employee	-875.643*
	(472.590)
Unemployed head	-70.363
	(142.932)
Pensioner head	891.350*
	(468.918)
Self-employed head	-810.628
	(549.691)
Multiple job employee head	-117.446
	(321.535)
Part time Jobs	335.069
	(254.952)
Temporary job	97.559
	(192.700)

Number observations	2752
Hansen Test of overidentifying restrictions	
Chi2(4)	4.119
p-value	(0.391)

Notes:

a) The educational dummies are defined in Table 1.
b) We include a linear trend and monthly dummies.
c) The instrument variables set used is: lagged gross financial wealth, lagged debt and lagged real wealth, all of them in real terms; lagged real non-durable expenditure and lagged nominal food expenditure; the lags of the number of members of the family, the lag of the number of adults and the lag of the age of the head of the household and its square; the dummies for the sex, educational level and for all the situations considered in the labour market of the head of the household; and, monthly dummies and the time trend.
d) ***, ** and * mean statistically significant at the 1, 5 and 10%, respectively.

Table 3. The effectiveness of the policy measures on maintaining non-durable consumption during the pandemic.

	OLS	**IV-GMM**	**OLS**	**IV-GMM**
	(1)	**(2)**	**(3)**	**(4)**
Wealth	-0.000	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Income	0.031***	-0.030***	0.031***	-0.033***
	(0.006)	(0.007)	(0.006)	(0.008)
Number of members	-2.276	-2.404	-2.300	-0.924
	(1.585)	(2.198)	(1.583)	(1.865)
Number of adults	2.557	0.282	2.557	4.371*
	(2.254)	(2.943)	(2.251)	(2.391)
Age head	-0.335**	-0.442**	-0.336**	-0.426**
	(0.136)	(0.198)	(0.136)	(0.168)
Male head	-0.757	1.669	-0.661	1.523
	(2.539)	(2.643)	(2.534)	(2.620)
Education 2	-100.006***	-97.012***	-100.014***	-96.461***
	(14.183)	(27.061)	(14.174)	(27.293)
Education 3	-101.135***	-96.387***	-101.106***	-95.652***
	(14.399)	(27.117)	(14.388)	(27.347)
Education 4	-107.040***	-94.736***	-107.088***	-93.667***
	(15.718)	(27.304)	(15.707)	(27.527)
Education 5	-108.501***	-97.353***	-108.614***	-95.708***
	(15.117)	(27.883)	(15.104)	(28.101)
Education 6	-102.128***	-96.164***	-102.029***	-95.173***
	(14.152)	(26.983)	(14.142)	(27.228)
Employee head	-5.956*	0.817	-6.118*	0.921

	(3.601)	(4.300)	(3.601)	(4.172)
Unemployed head	-13.916***	-15.328**	-13.328***	-16.598**
	(5.227)	(7.007)	(5.057)	(6.865)
Pensioner head	8.918**	10.330**	8.929**	11.493***
	(3.935)	(4.157)	(3.928)	(4.019)
Self-employed head	1.342	8.612**	-0.103	7.652*
	(4.925)	(4.299)	(4.747)	(4.173)
Temporary job head	-10.454*	-16.632*	-10.471*	-18.034*
	(5.699)	(9.361)	(5.690)	(9.306)
Employee partner	0.074	12.994**	0.256	6.403
	(4.817)	(5.773)	(4.804)	(4.838)
Unemployed partner	-4.222	0.035	-3.958	-6.808
	(5.906)	(6.811)	(5.893)	(6.383)
Pensioner partner	18.173*	28.716**	18.486*	22.700**
	(9.907)	(11.648)	(9.885)	(11.248)
Self-employed partner	11.595	26.972**	10.419	19.716
	(14.308)	(12.940)	(14.258)	(12.174)
Temporary job	-4.163	-7.895	-3.963	-8.358
	(5.064)	(7.272)	(5.049)	(7.019)
Months aid for COVID-19	0.119	0.278	-0.225	-0.059
	(0.690)	(0.885)	(0.730)	(1.004)
Subsidy COVID-19	7.111	7.705		
	(6.776)	(8.793)		
Subsidy furlough scheme COVID-19	4.922	4.553		
	(4.893)	(6.260)		
Public aid for self-employed COVID-19	-2.196	0.858		
	(7.082)	(6.735)		
Other public aid COVID-19	6.097	2.118		
	(11.961)	(14.775)		
Total public aid COVID-19			8.123*	6.080
			(4.928)	(6.604)
Constant	111.939***	137.873***	111.837***	124.803***
	(16.694)	(30.165)	(16.675)	(29.265)
Number of observations	3011	3011	3011	3011
Hansen Test of overidentifying restrictions				
Chi2(4)		0.648		1.282
p-value		(0.957)		(0.989)

Notes:

a) See Table A.1 in the Appendix for a description of the political economy measures.

b) The instrument variables set in columns (2) and (4) is: lagged income and lagged net total wealth in real terms; a dummy variable reflecting the household's subjective probability on the value of its income after the pandemic (less than 25%, between 25% and 50%, between 50% and 75%, or more

than 75% of the value of their income before the pandemic); a dummy for the total drop of income as a result of COVID-19; and, the maximum credit available.

c) ***, ** and * mean statistically significant at the 1, 5 and 10%, respectively.

Table 4. The effectiveness of the policy measures using interactions with income.

	OLS	IV-GMM	OLS	IV-GMM
	(1)	(2)	(3)	(4)
Wealth	-0.000	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Income	0.031***	-0.035***	0.030***	-0.035***
	(0.006)	(0.008)	(0.006)	(0.008)
Number of members	-2.354	-0.654	-2.302	-0.785
	(1.585)	(1.912)	(1.584)	(1.847)
Number of adults	2.553	4.629*	2.497	4.178*
	(2.254)	(2.503)	(2.253)	(2.372)
Age head	-0.346**	-0.403**	-0.346**	-0.422**
	(0.136)	(0.173)	(0.136)	(0.168)
Sex head	-0.772	2.030	-0.698	1.551
	(2.539)	(2.769)	(2.535)	(2.622)
Education 2	-100.078***	-98.339***	-100.028***	-96.289***
	(14.186)	(27.024)	(14.179)	(27.218)
Education 3	-101.236***	-97.487***	-101.155***	-95.428***
	(14.400)	(27.106)	(14.393)	(27.271)
Education 4	-107.281***	-96.051***	-107.076***	-93.450***
	(15.721)	(27.302)	(15.714)	(27.456)
Education 5	-108.876***	-102.232***	-108.819***	-96.007***
	(15.121)	(28.569)	(15.108)	(28.029)
Education 6	-102.383***	-97.973***	-102.185***	-95.080***
	(14.154)	(27.052)	(14.148)	(27.154)
Employee head	-5.846	6.250	-5.840	0.852
	(3.633)	(8.091)	(3.599)	(4.177)
Unemployed head	-13.627***	-12.530	-13.004**	-16.531**
	(5.169)	(9.347)	(5.055)	(6.880)
Pensioner head	8.880**	14.445**	8.961**	11.310***
	(3.946)	(5.822)	(3.930)	(4.009)
Self-employed head	0.900	12.840*	0.252	7.599*
	(4.903)	(7.584)	(4.747)	(4.175)
Temporary job head	-10.262*	-18.653*	-10.305*	-17.851*
	(5.695)	(9.548)	(5.692)	(9.326)
Employee partner	0.425	8.489	0.482	6.578
	(4.813)	(5.518)	(4.804)	(4.832)

Unemployed partner	-3.961	-8.642	-3.735	-6.645
	(5.910)	(7.416)	(5.893)	(6.384)
Pensioner partner	18.257*	23.640**	18.49[8]*	22.721**
	(9.905)	(11.730)	(9.889)	(11.250)
Self-employed partner	11.028	24.918*	10.060	18.888
	(14.327)	(14.233)	(14.278)	(12.179)
Temporary job	-3.854	-8.683	-3.583	-8.323
	(5.063)	(7.684)	(5.045)	(7.061)
Months aid for COVID	0.766	-3.545	0.372	0.092
	(0.609)	(5.417)	(0.629)	(0.987)
Subsidy COVID-19 x unemployment benefits	0.001	0.023		
	(0.003)	(0.023)		
Subsidy RTER COVID-19 x RTERs income	-0.000	0.011		
	(0.001)	(0.015)		
Public aid for self-employed COVID-19 x self-employment income	-0.000	0.001		
	(0.000)	(0.001)		
Other public aid COVID-19 x household regular income	0.000	0.000		
	(0.000)	(0.001)		
Total Public aid COVID-19 x household regular income			0.000	0.000
			(0.000)	(0.000)
Constant	112.764***	121.875***	113.024***	125.182***
	(16.687)	(29.290)	(16.672)	(29.239)
Number of observations	3011	3011	3011	3011
Hansen Test of overidentifying restrictions				
Chi2(4)		0.567		1.568
p-value		(0.967)		(0.980)

Notes:

a) See Table A.1 in the Appendix for the political economy dummies description.

b) The instruments set in column (2) and (4) are the lagged income and wealth and a dummy variable reflecting the household's subjective probability on the value of its income after the pandemic (less than 25%, between 25% and 50%, between 50% and 75%, or more than 75% of the value of their income before the pandemic).

c) ***, ** and * mean statistically significant at the 1, 5 and 10%, respectively.

Table 5. The effectiveness of the policy measures excluding income.

	IV-GMM	**IV-GMM**

	(1)	(2)
Wealth	-0.000	-0.000
	(0.000)	(0.000)
Number of members	-1.507	-1.359
	(1.849)	(1.826)
Number of adults	3.265	3.208
	(2.344)	(2.337)
Age head	-0.377**	-0.359**
	(0.166)	(0.164)
Sex head	0.395	0.443
	(2.605)	(2.583)
Education 2	-97.970***	-97.701***
	(27.024)	(27.034)
Education 3	-98.188***	-97.770***
	(27.076)	(27.087)
Education 4	-100.349***	-99.786***
	(27.253)	(27.251)
Education 5	-102.992***	-102.753***
	(27.702)	(27.691)
Education 6	-98.639***	-98.402***
	(26.953)	(26.965)
Employee head	-2.501	-2.562
	(4.038)	(4.034)
Unemployed head	-14.262***	-14.670**
	(6.845)	(6.813)
Pensioner head	10.449***	10.126**
	(4.001)	(3.971)
Self-employed head	5.005	4.376
	(4.136)	(4.084)
Temporary job head	-14.174	-14.035
	(9.309)	(9.311)
Employee partner	3.072	3.332
	(4.533)	(4.497)
Unemployed partner	-5.732	-6.080
	(6.368)	(6.316)
Pensioner partner	19.900*	21.053*
	(11.346)	(11.194)
Self-employed partner	15.959	14.943
	(10.910)	(10.766)
Temporary job	-6.699	-6.236
	(7.226)	(7.016)

Months aid for COVID	0.071	-0.102
	(0.877)	(0.999)
Subsidy COVID	7.702	
	(8.699)	
Subsidy RTER COVID	4.486	
	(6.107)	
Public aid for self-employed COVID	-0.517	
	(6.649)	
Other public aid COVID	3.555	
	(14.835)	
Total public aid COVID		5.393
		(6.532)
Constant	117.776***	116.650***
	(28.840)	(28.812)
Number of observations	3011	3011
Hansen Test of overidentifying restrictions		
Chi2(4)	0.818	1.615
p-value	(0.936)	(0.978)

Notes:

a) See Table A.1 in the Appendix for a description of the political economy measures.

b) The instruments used in columns (1) and (2) are the same as those used in columns (2) and (4) of Table 3, excluding lagged income.

c) ***, ** and * mean statistically significant at the 1, 5 and 10%, respectively.

Appendix.

Table A.1. Economic policy instruments to mitigate the effects of the COVID-19.

Subsidy COVID-19	Dummy variable that takes value 1 if the head of the household has received an unemployment benefit because the COVID-19; and 0 otherwise.
Subsidy furlough scheme COVID-19	Dummy variable that takes value 1 if the unemployment benefit received by the head of the household is linked to a furlough scheme (ERTE, *Expediente de Regulación Temporal de Empleo*); and 0 otherwise.
Public aid for self-employed COVID-19	Dummy variable that takes value 1 if the head of the household is self-employed and has received any kind of public aid linked to the COVID-19; and 0 otherwise.
Other public aid COVID-19	Dummy variable that takes value 1 if the head of the household has received any other kind of public aid, not

	considered above, linked to the COVID-19; and 0 otherwise.
Total public aid COVID-19	Dummy variable that takes value 1 if the household has received at least one of the previous subsidies; and 0 otherwise.
Months aid for the COVID-19	Number of months that the household has received any public aid because of the COVID-19.
Subsidy COVID-19 x unemployment benefits	Subsidy COVID-19 interacted with the household's unemployment benefits.
Subsidy furlough scheme COVID-19 x furlough scheme income	Subsidy furlough scheme COVID-19 interacted with the monthly income received in the furlough scheme (accounting for the number of months that the aid has been received).
Public aid for Self-employed COVID-19 x self-employment income	Public aid for self-employed COVID-19 interacted with household's self-employment income.
Other public aid COVID-19 x household's regular income	Other public aid COVID-19 interacted with household's regular total income.
Interacted total public aid COVID-19 x household's regular income	Total public aid COVID-19 interacted with household's regular income