



## The structure of income helps to understand changes in the household saving ratio in France

The rise in the household saving ratio since the end of 2018 and, more generally, its significant fluctuations over the last ten years call for a fresh look at its macroeconomic determinants. This article proposes a model of household consumption, and thus of the saving ratio, using the share in income of some of its components. This model reflects the idea that changes in the composition of aggregate income are linked to changes in the distribution of income among households with heterogeneous marginal propensities to consume. This approach makes it possible to better explain recent trends in the saving ratio, in particular its decline since 2012 and its subsequent recent rise, with financial income and taxes and social security contributions playing a specific role in these developments.

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14.6%

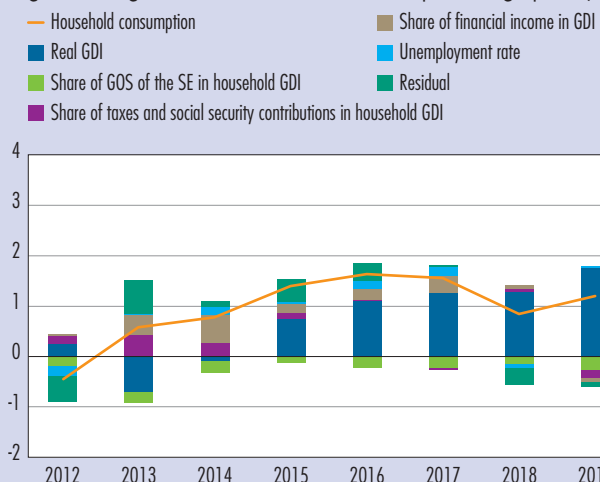
the average household saving ratio for 2000-2018

+1 percentage point  
change in the saving ratio between 2017 and 2019

-1 percentage point of gross disposable income (GDI)  
change in the share of taxes and social security contributions in household gross disposable income between 2017 and 2019

### Dynamic contributions to household consumption

(average annual growth as a %; contributions in percentage points)



Source: *Institut national de la statistique et des études économiques* (INSEE); authors' calculations.

Note: GDI, Gross disposable income; GOS, Gross operating surplus; SE, self employed.



The household saving ratio peaked at 16.1% in 2009 and then fell to 13.8% in 2017. It has been climbing rapidly since then, with a last recorded peak of 14.8% in the third quarter of 2019. How should we interpret these trends? In particular, is the rise in the saving ratio since the end of 2018 sustainable in a context of continued gains in purchasing power? This article provides an analysis of these trends, with a focus on the structure of household gross disposable income. The results presented in this article are an important component of the macroeconomic assessment used by the Banque de France in its projections since December 2017.<sup>1</sup>

### 1 At the macroeconomic level, the household saving ratio varies over time

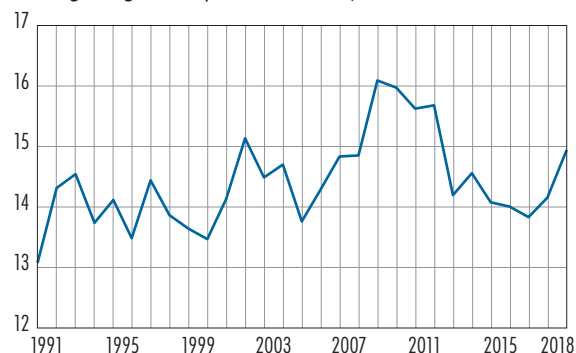
The household saving ratio can vary significantly over time. Starting from a level of over 17% of disposable income in the late 1970s, it declined sharply until the mid-1980s (11.1% in 1987) and then recovered in the late 1980s. Since 1991,<sup>2</sup> the reference period of this study, the saving ratio has experienced smaller swings, in a range of around 13-16%, but has not been stationary: it grew at a trend rate until 2008, and has since experienced significant fluctuations.

According to the national accounts, household savings are what remains of their gross disposable income after consumer spending. For a given income level, therefore, looking at the saving ratio is equivalent to considering household consumption. This article is thus part of a long tradition of macroeconomic studies on household consumption based on French data, notably following Bonnet and Dubois (1995), and Sicsic and Villetelle (1995).

In all of these studies, household gross disposable income, or the expectations of it, play a key role as a long-term anchor of consumer spending. The principle of macroeconomic consumption equations is generally to determine a long-term target towards which, excluding

### CI Household saving ratio since 1991

(percentage of gross disposable income)



Source: Institut national de la statistique et des études économiques (INSEE).

the effects of short-term shocks, the saving ratio would tend to converge. However, determining this target is a complex task. Chart 1 shows that, between the early 1990s and the 2008 crisis, the household saving ratio tended to trend upwards. It then may be insufficient to simply consider the historical average for the target of the saving ratio, and the aim of this article is therefore to try to identify long-term macroeconomic factors influencing household consumption and household savings.

### 2 Many macroeconomic factors can affect household consumption and savings

In addition to the fundamental relationship between consumption and income, the literature examines other factors that may affect household consumption and savings in the short or long term.

A number of studies point to “precautionary saving” behaviour that causes households to increase or decrease their savings effort in certain circumstances. This can be captured at the macroeconomic level by unemployment or its variations (Faubert and Olivella Moppett, 2015) or by household confidence surveys (Faure et al., 2012). In the same vein, Bardaji et al. (2014) suggest the existence of “Ricardian effects”, i.e. an adjustment of

<sup>1</sup> See in particular the boxes providing the initial results in line with the detailed results in the rest of this Bulletin, in Banque de France (2018; 2019).

<sup>2</sup> See, for example, Bonnet and Dubois (1995), and Sicsic and Villetelle (1995) for an analysis of trends in the 1980s.



household behaviour to changes in the government's budget balance in anticipation of future increases or decreases in taxes and social security contributions or transfers. Inflation can also be seen as an autonomous determinant of household consumption (Bardaji et al., 2014).

Some studies focus instead on financial factors. Interest rates (nominal or real) can in theory have opposite impacts on consumption with a "substitution" effect and an "income" effect (Bonnet and Dubois, 1995; Faure et al., 2012): higher interest rates provide an incentive to consume less today if there is a higher return on savings, but they also generate additional income, making it possible to fund additional spending. Other studies show that credit flows are a significant explanatory factor behind changes in household consumption (Sicsic and Villetelle, 1995; Bardaji et al. 2014; Faubert and Olivella Moppett, 2015).

The empirical literature generally finds limited wealth effects in France at the macroeconomic level. Indeed, Slacalek (2009) finds that France's marginal propensity to consume by households is not significantly different from zero for their housing wealth and less than three cents on an additional dollar for financial wealth, which is among the lowest in a large group of developed countries. However, these estimates based on aggregate data do not take into account differences in household income or in the composition of wealth. For instance, Arrondel, Lamarche and Savignac (2015) use individual data to highlight heterogeneous wealth effects with a marginal propensity to consume out of wealth that decreases across the wealth distribution.

The consumption equations of the main semi-structural models for France are based on the determinants we have just outlined. For example, in the *Mésange* model developed and used by the *Institut national de la statistique et des études économiques* (INSEE) and the French Treasury (Bardaji et al., 2017), household consumption is modelled in the long term with a constant saving ratio estimated for the 1999-2014 period.

Over the short term, changes in the unemployment rate and in short-term interest rates affect household consumption. In the Banque de France's new forecasting model, FR-BDF (Lemoine et al., 2019), household consumption is determined in the long run by income expectations, constructed in a satellite autoregressive model, and by real interest rates.

### 3 What role has been played by the significant distortion in the structure of household gross disposable income since 2008?

In this article, we examine an additional factor: the structure of aggregate household income that is closely linked to the heterogeneity of households.

Bonnet and Poncet (2004) focus, for instance, on the structural effects associated with the different types of income, and put forward certain theoretical arguments. The life-cycle model results in different marginal propensities to consume according to age, which are linked to income distributions that are also age-dependent. Empirically, Bonnet and Poncet (2004) find that income structure effects are "dominant" and outweigh other factors. They show that the marginal propensity to consume is higher for the payroll, taxes and social security benefits and the income of the self employed (gross operating surplus of the self employed), compared to other forms of income.

Beatriz, Billot and Laboureau (2019) also show that the different components of income represent a very different share of income depending on the level of income (see table). For example, net wages represent only 36% of the income of the first quintile, compared to 64% of the income of the fourth quintile. The income of the first quintile consists mainly of social security benefits, but these also account for a just as significant proportion of the income of the upper quintiles. Conversely, net financial income is significant mainly in the last quintile and the share of taxes and social security contributions increases sharply with income quintiles.



### Structure of household gross disposable income by income quintile

(percentage of gross disposable income)

	Q1	Q2	Q3	Q4	Q5	Households as a whole
GOS of self employed	10	7	4	3	9	7
GOS of pure households	8	11	15	16	16	14
Wages net of social security contributions	36	49	57	64	54	54
Social benefits	53	43	36	30	26	33
Net financial income	0	0	0	2	14	6
Other transfers	-3	-2	-1	-1	2	0
Taxes	-5	-9	-11	-4	-20	-15

Sources: *Institut national de la statistique et des études économiques* (INSEE); Beatriz, Billot and Laboureau (2019).

Note: 36% of the gross disposable income of households in the first quintile (Q1) consists of wages net of social security contributions. GOS, Gross operating surplus; SE, self employed.

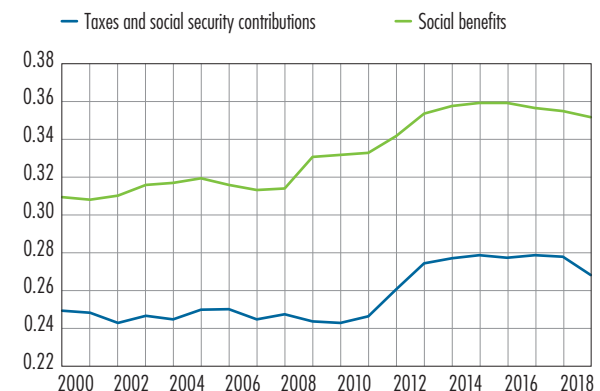
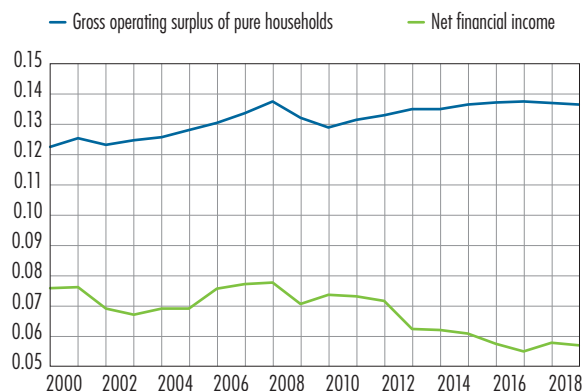
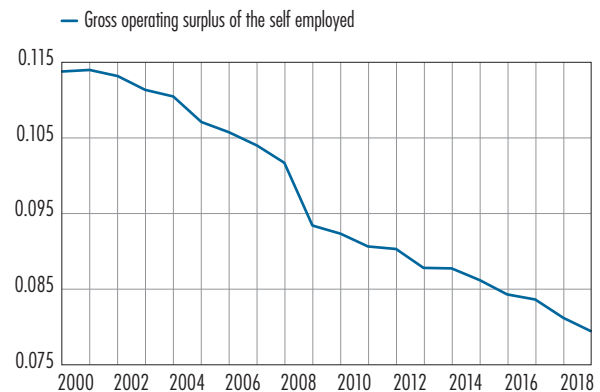
Accardo, Billot and Buron (2017) also show, using national accounts data, that the large tax increases in 2012 affected the highest income households and that the latter reacted by reducing savings rather than consumption. These observations, combined with the fact that the saving ratio varies greatly across the income distribution (Beatriz, Billot and Laboureau, 2019), suggest that we should look at the structure of aggregate household income as an overall explanatory factor for

household consumption. This structure could indeed make it possible to capture some of the effects of the heterogeneity of income levels among households.

Indeed, national accounts data reveal that the structure of household gross disposable income, after taxes and social security contributions, has become distorted since 2008 (see Chart 2). The share of taxes and employees' taxes and social security contributions was

### C2 Structure of household gross disposable income

(percentage points of gross disposable income)



Source: *Institut national de la statistique et des études économiques* (INSEE).



relatively stable at around 25% in the 2000s and increased from 2012 onwards to reach 28% in 2018. At the same time, the share of gross wages (61% in 2008 and 64% in 2018) and social security benefits (31% in 2008 and 35% in 2018) has increased. This higher share of wages and benefits can be partly attributed to a rise in taxes and contributions, which reduce disposable income.

However, the share of net financial income<sup>3</sup> has declined from 8% in 2008 to 6% in 2018, and the share of the gross operating surplus of the self employed has continued the downward trend observed since 1990.<sup>4</sup>

#### 4 A model of household consumption incorporating the structure of aggregate income

It is possible to capture these structural effects by introducing into a macroeconomic equation the shares of each source of income (wages, financial income, taxes and social security contributions, etc.) in aggregate household income.

##### A consumption equation incorporating the share of taxes and social security contributions and that of gross operating surplus of the self employed in income

As a first step, we start from a simple error-correction equation with the following variables: (i) household gross disposable income (GDI) deflated by consumer prices (real GDI or purchasing power), which determines long-term consumption expenditure with a unitary elasticity; (ii) the unemployment rate, whose fluctuation may be linked in the short term to changes in precautionary savings; and (iii) variables measuring certain one-off events such as “scrapping premium” schemes, which improve the fit of the equation.

In a second step, we introduce income structure effects using a methodical approach. This consists in first testing the shares of each income component separately and

then aggregating these components in a way that seems to be the most relevant.<sup>5</sup> We thus select a set of specifications in which all the coefficients associated with the shares are statistically significant. In this set, we finally select the equation that has the best explanatory power over the long term and that best captures the changes in the saving ratio and in particular the “bell-shaped” profile observed between 2009 and 2013.

This household consumption equation uses disposable income excluding net financial income ( $Y_{xd4}$ ) in the equation below) with a unitary elasticity and two terms capturing income structure effects: the share of taxes and social security contributions ( $\omega_{taxes}$ ) and that of the gross operating surplus of the self-employed in household gross disposable income excluding net financial income ( $\omega_{gos}$ ). The equation also includes short-term determinants: Total real GDI ( $Y$ ), change in the unemployment rate ( $U$ ), as well as indicators for exceptional events ( $DUMMIES$ ):

$$\begin{aligned} \Delta \ln C = & -0.07 + 0.11 \Delta \ln Y \\ & (-3.6) \quad (1.7) \\ & -0.54\% \Delta U + DUMMIES \\ & (-3.1) \\ & -0.25 (\ln C_{-1} - \ln Y_{xd4-1} \\ & (-5.3) \\ & -0.3 \omega_{taxes-1} - 1.2 \omega_{gos-1}) \end{aligned}$$

$$Adjusted R^2 = 60.0\%$$

The share of taxes and social security contributions ( $\omega_{taxes}$  in the equation) is associated with a relatively low coefficient. This suggests that a reduction in the share of taxes leads to an increase in the saving ratio or, in other words, that a reduction in the level of taxes and social security contributions results in a less than proportional rise in the level of consumption. Conversely, the high coefficient associated with the gross operating surplus of the self employed suggests that an increase in this share leads to a decrease in the saving ratio.

<sup>3</sup> Net financial income = net interest received + dividends + other net income (income attributable to policyholders, land rents).

<sup>4</sup> The gross operating surplus of “pure households”, which corresponds to the output of housing services, less the intermediate consumption required to generate this output, has trended upwards since 2000.

<sup>5</sup> For example, wages received by households net of employee contributions, or the wages and gross operating surplus of the self-employed combined in an aggregate “labour income”, etc.



This latter result, also reported in Bonnet and Poncet (2004) and Bardaji et al. (2014), may be justified if we consider that self-employed workers (e.g. farmers) are particularly financially constrained with a severely limited savings capacity.

### A marginal propensity to consume net financial income and reductions in taxes and social security contributions lower than for other income

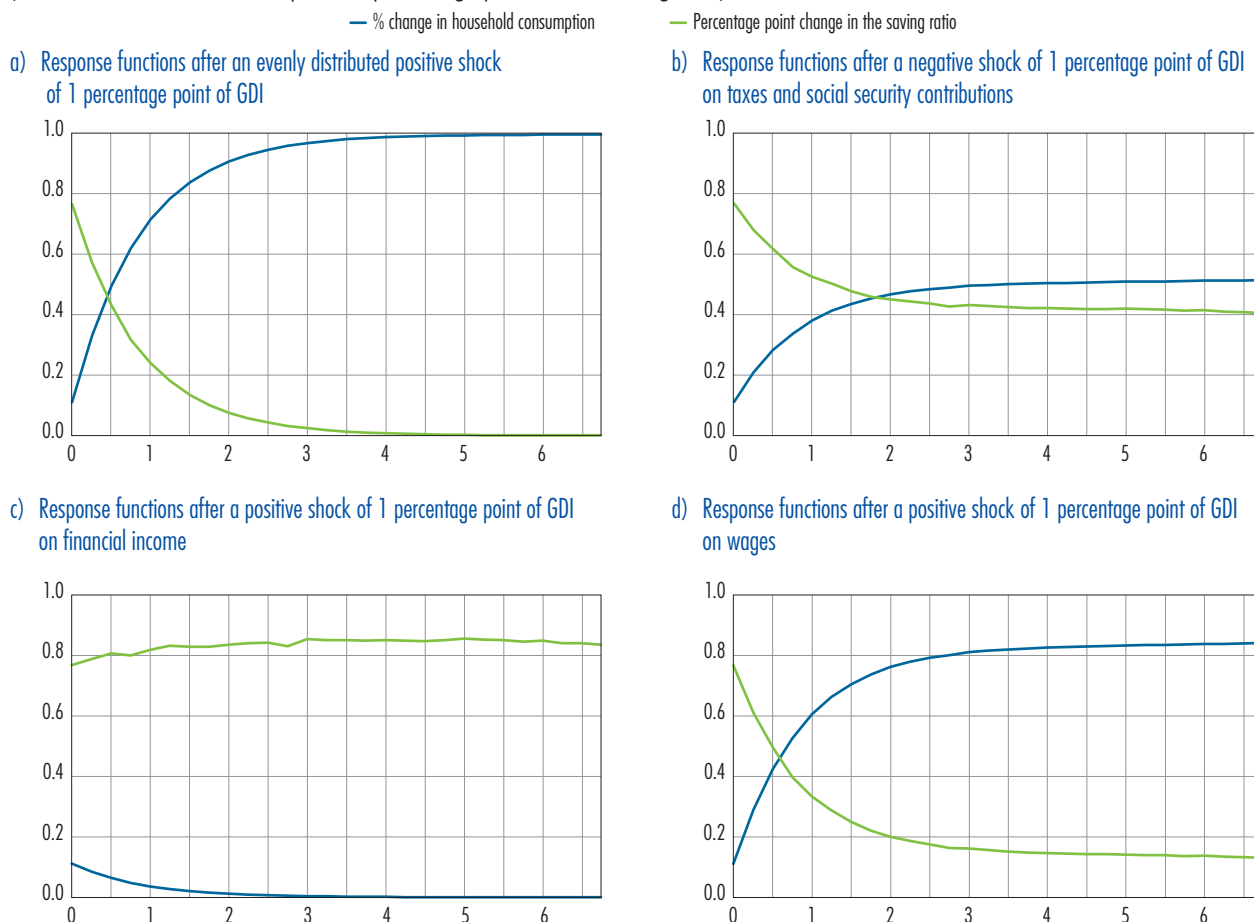
With an equation specified in this way, Chart 3 shows that household consumption reacts in a fairly conventional way to a 1% shock to real GDI with no change in income structure: households smooth out their purchasing power gains over time with a temporary increase in their saving ratio. Over the long term, consumption increases by 1%

in line with income and the saving ratio returns to equilibrium.

In addition, the equation suggests different marginal propensities to consume depending on the source of income (wages, social benefits, dividends or lower taxes and social security contributions). In particular, it assumes that the propensity to consume financial income is virtually zero<sup>6</sup> and that the propensity to consume reductions in taxes and social security contributions is close to 0.5: a reduction in taxes and social security contributions is approximately half consumed and half saved. Charts 3a to 3d show a lasting downward impact on consumption as a proportion of income, and therefore an upward impact on the saving ratio, as a result of a reduction in the share of taxes and social security contributions or

### C3 Response functions of the consumption equation

(As a % for household consumption, in percentage points for the saving ratio)



Source: *Institut national de la statistique et des études économiques* (INSEE); authors' calculations.

<sup>6</sup> Financial income accounts for a larger share of the income of households with the highest incomes, whose propensity to consume is relatively low (see Table).



an increase in the share of financial income. Naturally, these average-based approaches need to be refined to reflect the exact nature of taxes and social security contributions (e.g. taxes on capital income as opposed to employees' social security contributions on low wages), but here we are confronted with the limits of the macroeconomic approach. Lastly, according to our approach, the propensity to consume wages (0.7) is slightly lower than the average propensity leaving the saving ratio unchanged (0.85). Thus, a shock of 1 percentage point of GDI on wages leads in the long term to a less than proportional increase in consumption and a slight increase in the saving ratio (see Chart 3 above).

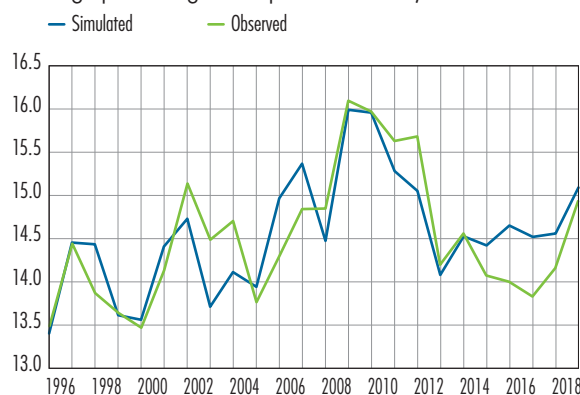
### 5 In 2013 and then in 2019, the shocks to taxes and social security contributions and financial income made a negative and then positive contribution to the saving ratio

Chart 4 compares the simulated saving ratio with our equation and the observed saving ratio. The model used makes it possible to reproduce fairly accurately trends in the saving ratio, in particular its fall in 2013 and its rise since 2018.

Chart 5 shows the dynamic contributions of the different variables in our equation to the annual percentage change in household consumption. We can draw some conclusions from this. First, overall purchasing power is indeed the main determinant of household consumption

### C4 Observed and simulated household saving ratio

(percentage points of gross disposable income)



Source: *Institut national de la statistique et des études économiques* (INSEE); authors' calculations.

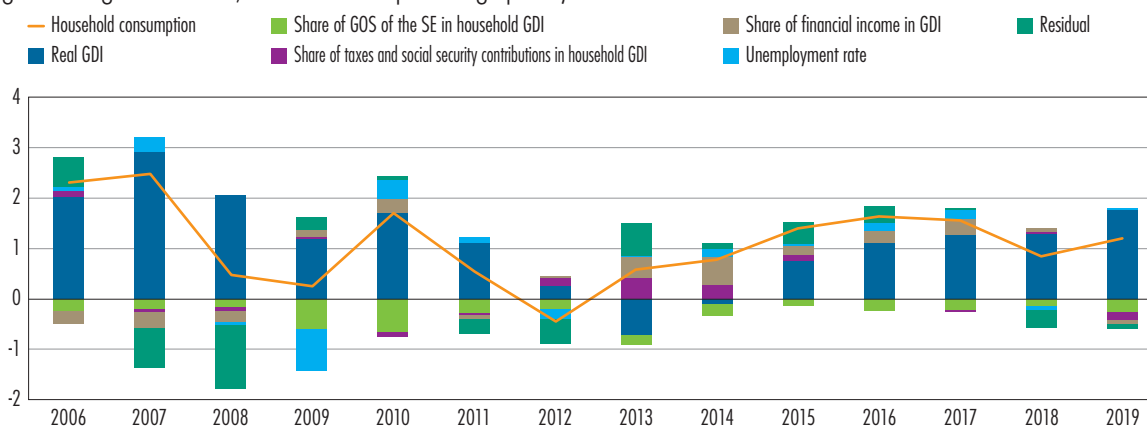
Note: The simulated saving ratio is obtained from a dynamic simulation of household consumption derived from the equation presented in Section 4 above.

dynamics. The unemployment rate also contributes in a more temporary way, via a precautionary savings effect which became particularly evident during the 2009 crisis.

Income structure effects play a significant role. The trend decline in the share of the gross operating surplus of the self employed pushes the savings rate up overall throughout the period. In 2013-2014, the resilience of household consumption despite low purchasing power, i.e. the sharp fall in the saving ratio, can be explained by structural effects. The rise in the share of taxes and social security contributions and the fall in financial income dampen real income, but also have a negative

### C5 Dynamic contributions to household consumption

(average annual growth as a %; contributions in percentage points)



Source: *Institut national de la statistique et des études économiques* (INSEE); authors' calculations.

Note: GDI, Gross disposable income; GOS, Gross operating surplus; SE, self employed.



impact on the saving ratio. This is reflected in their positive contribution to the change in household consumption, partly offsetting the small increase in purchasing power. Conversely, in 2018 and 2019, the increase in the share of financial income, which led to a break in the almost continuous decline since 2010, and the decrease in the share of taxes and social security

contributions are factors in the rise in the saving ratio. According to our most recent macroeconomic projections, income composition effects are expected to continue to play a role in the coming years and, in particular, the decline in taxes and social security contributions is expected to have a somewhat positive impact on the saving ratio.





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