

SPANISH HOUSEHOLD DEBT DEFAULTS: RESULTS OF THE SPANISH SURVEY  
OF HOUSEHOLD FINANCES (2002-2014)

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## SPANISH HOUSEHOLD DEBT DEFAULTS: RESULTS OF THE SPANISH SURVEY OF HOUSEHOLD FINANCES (2002-2014)

### Abstract

According to the EFF (the Spanish Survey of Household Finances), the proportion of indebted households that had incurred a debt default over the past 12 months increased from 13.7% in 2002 to 21.1% in 2014. This article has two objectives. First, to characterise the population groups among whom debt defaults have most increased, drawing on EFF data from 2002 to 2014. And second, using panel and cross-section components of the EFF, to estimate how defaults respond to declines in the income and changes in the labour market status of household members throughout the economic cycle. The results suggest that the high incidence of declines in household income and changes in the labour market status of the main household earner are important factors when seeking to understand the increase in debt defaults over the 2002-2014 period. Throughout the economic cycle, one-fifth of indebted households underwent reductions in their income that led them to fall, at least, to a lower quartile of the income distribution. During the recession, the probability of incurring debt defaults following declines in income on this scale increased substantially. Further, among the 10% of indebted households, the main earner experienced job loss during the three years between the survey span. Such job loss was associated with a high probability of incurring defaults during the recession. These results confirm that the course of household defaults during the recession was closely linked to changes in their disposable income.

### 1 Introduction

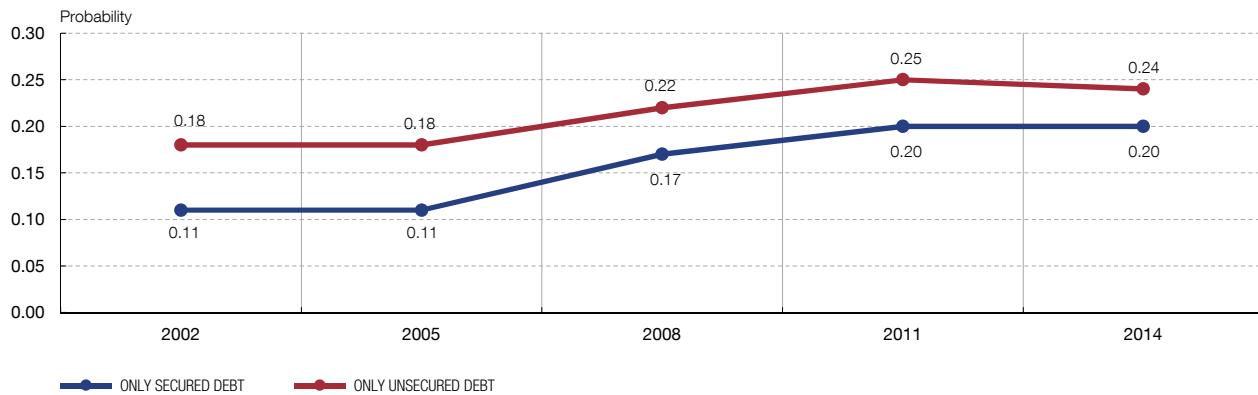
According to the EFF (the Spanish Survey of Household Finances), the proportion of indebted households that had incurred debt defaults over the past 12 months increased from 13.7% in 2002 to 18.6% in 2008. Since then the proportion has held around 20%, rising in 2014 to 21.1% of indebted households. The percentage of all households (indebted or not) incurring defaults rose from 6% in 2002 to 10.3% in 2014.

We first examine the incidence of default by type of debt. Among the households that solely have unsecured debt, the percentage that incurred defaults grew from 18% in 2002 to 24% in 2014. Among the households that only had secured debt, the incidence of defaults rose from 11% in 2002 to 20% in 2014 (see Chart 1).

This article seeks to analyse the causes inherent in the increase in debt defaults, compared with the explanations offered by the recent economic literature. Thus, on one hand, we have emphasised the role of the greater incidence of unemployment and of the decline in household income as from 2008. An increase in unemployment would result in debt defaults if households did not have financial savings enabling them to offset discrete declines in their level of income. There is also an alternative explanation which argues that households have adopted a more permissive attitude towards debt default even when their resources allow repayment. For example, Guiso, Sapienza and Zingales (2013) use US survey-based information to document the fact that the percentage of households that would cease to pay their mortgage in the face of hypothetical declines in the value of their house increased by 10 pp between 2009 and 2010. Underpinning this attitude is the perception that defaults do not entail significant consequences for wealth, even in those States where all debtors' assets are liable when it comes to responding to the payment of their debts.<sup>1</sup>

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<sup>1</sup> This perception would suggest that many households are not aware of the legal and economic consequences of default. In Spain, there is less direct evidence on perceptions and attitudes in the face of household defaults than



SOURCE: Spanish Survey of Household Finances 2002-2014 (Banco de España).

NOTE: Households which have both secured and unsecured debt are excluded from both series and, consequently, the percentage of defaults and that presented in the text for the total population do not coincide.

This article has two aims. First, to characterise the population groups among whom debt defaults have most increased, drawing on EFF data from 2002 to 2014. And second, to estimate how defaults respond to declines in income and changes in the labour market status of household members during the economic cycle. The results suggest that the changes in the employment status of the main main earner and declines in income have had an especially high impact on the probability of incurring defaults between 2008 and 2014, substantially greater than that observed during the economic expansion from 2002 to 2005.

## 2 Previous papers

Blanco and Gimeno (2012) use aggregate, provincial-level data from the Banco de España Central Credit Register to analyse what impact unemployment and the debt burden have on the increase in defaults during the period from 1984 to 2009. These authors find that the strong increase in the unemployment rate between 2008 and 2009 explains the increase in defaults at the start of the recession that began in 2008.

Aller and Grant (2018) analyse a related issue. Starting with the fact that the incidence of unemployment grew as from 2008, but that household income and formation also changed, they ask what the proportion of households incurring debt defaults would have been had the characteristics of the indebted not changed. If this hypothetical proportion were similar to that observed, it could be concluded that changes in the level of employment or income did not account for the increase in defaults. Using cross-section data from the EFF between 2002 and 2011, they conclude that the changes in the characteristics of the indebted explain at most 20% of the increase in defaults. They further argue that the increase in late payments was due to a change in household preferences, with the latter perceiving there to be less stigma associated with not repaying debts.<sup>2</sup>

The differences between both studies may lie in the change in the behaviour of unemployed or low-income households during the recession. According to the findings of Aller and Grant, unemployment was more of an explanation for defaults during the expansion than

in the case of the United States.

<sup>2</sup> Apart from the differences caused by the use of data with a different aggregation level, Blanco and Gimeno (2012) do not consider the role of household income, whereas Aller and Grant (2018) do not consider the role of the debt burden.

during the recession, a result contrary to that of Blanco and Gimeno (2012). According to Aller and Grant, being unemployed in 2002 increased the odds ratio of incurring debt defaults by 2.85 times compared with being in paid employment. In 2011, the ratio had fallen to 1.95.<sup>3</sup> As regards the effect of income on defaults, in 2002 the odds ratio of households incurring defaults in the second lowest quartile of the income distribution was 50% compared with those of the lower quartile. In 2011 this difference had disappeared.<sup>4</sup> The fact that defaults should increase among groups that are not unemployed, or whose income is not low, might be due to changes in attitude towards defaults.

This article uses the EFF between 2002 and 2014 to understand in which population groups debt defaults have been concentrated. Secondly, it examines in detail the influence of unemployment and income on defaults using both the cross-section and panel components of the EFF. It is important to combine both information sources. On one hand, using the panel component enables households to be monitored throughout the cycle and to identify whether a household begins to incur defaults when the main earner loses his/her job or the household's income falls. This type of analysis is very different from that which compares households with a different labour market status or income level at a given moment in time. The reason is that the panel analysis enables the same individuals to be followed over time and characteristics such as the initial amount of credit granted or the availability of guarantees, for example, to be held constant. On the other hand, both access to credit by new households and the characteristics of indebted households may change over time if credit institutions change their lending standards. Given that these changes are difficult to detect in the panel, it is important to combine the panel dimension with the representativeness of the data in the cross-sections.

### 3 Information sources and methodology

As earlier stated, the main source used in this article is the EFF. The three-year survey was launched in 2002 and contains information on households' assets and debts, and on their demographic composition and the labour market status of each of their adult members. Section 4 uses all the indebted households in the survey (the cross-section) and Section 5 uses its panel component, which allows for examination of income transitions, labour market status and debt defaults of the same households between each pair of waves of the survey.

The information on debt defaults in the EFF arises from the question: "In the last 12 months, have you had any financial difficulties which resulted in your delaying the payment of any of your debts?".<sup>5</sup>

As regards the definition of the characteristics of a household in this article, we use either those of the person that best knows the household's financial situation (the reference person) or those of the latter's partner, if they live together. For example, in order to define a household's educational level, we consider both that of the reference person and that of

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3 In this case, the odds ratio is defined as the ratio of two quotients. The quotient in the numerator is the probability of an unemployed person incurring defaults with respect to the probability of not doing so. The quotient in the denominator is the probability of a person in paid employment incurring defaults with respect to the probability of not doing so.

4 Blanco and Gimeno do not explicitly compare the influence of unemployment in expansions and recessions, but they do examine the differential effects of increases and declines in unemployment. They consider a sample period with two recessions (1992 and 2008), whereas Aller and Grant consider only the 2008 recession.

5 This measure is not strictly compatible with that of other sources, such as the Central Credit Register, which considers that a household incurs a default when the debt payment is at least 30 days late. Moreover, the evidence available from other surveys (e.g. the Survey of Financial Competences) suggests that some households may include under this heading late payments of non-bank debts.

their partner, if any. Hence, the household educational level refers to that of the person who has the highest level of educational attainment from among the reference person and the partner. Similarly defined are age – that of the reference person or that of their partner – and labour market status – that of the reference person or the partner if the latter receives higher income from work, unemployment benefit or pensions.<sup>6</sup>

The first row of Table 1.A shows the changes in the proportion of households that have incurred payment delays between 2002 and 2014, and in other household characteristics. Table 1.B shows changes in the characteristics of indebted households. Analysing the households as a whole, Table 1.A shows that the proportion of under-35s households has fallen from 15% of the total in 2002 to 7% in 2014. Secondly, the proportion of households in which the main earner is inactive or unemployed has increased from 17% to 21% (with the proportion of those employed falling similarly) and, finally, the proportion of households with a single adult has increased by 10 pp.

These three trends are observed in indebted households as a whole. The decline in the proportion of young households is even more marked among the indebted than in the total population, with the under 35s accounting in 2014 for one-third of their weight in 2002. As regards labour market status, the proportion of indebted households in which the reference person is in paid employment has fallen by 6 pp between 2002 and 2014 (the most pronounced decline is between 2005 and 2008), with the weight of the unemployed or inactive increasing in parallel from 11% to 18%. Moreover, the proportion of indebted households in which the reference person has a partner has declined by 10 pp, on a similar scale to the increase in the proportion of indebted households in which there is a single adult.

Turning to income distribution, the proportion of indebted households in the lower quartile of the distribution has increased slightly from 11% in 2002 to 14% in 2014, with the proportion of households in the highest income quartile holding constant at around 34%. Section 5 shows that these limited changes mask high mobility between income quartiles.

By way of summary, factors such as the increase in unemployment or the greater presence of single-adult households would denote a lesser ability to pay on the part of households and, therefore, a greater incidence of defaults, particularly between 2005 and 2008. However, other characteristics would indicate that the indebted would have more resources in 2014 than in 2002; for instance, the proportion of individuals with debts and a university education increased. Given that the different effects counter one another, a detailed analysis based on characteristics is needed to explain both the increase observed in the proportion of defaults between 2005 and 2008, and their subsequent persistence.

### 3.1 METHODOLOGY

In order to separately examine the contribution of each characteristic, we examine the changes in the probability of default for a reference group of the population. The characteristics of this reference group are defined by age, labour market status, household composition, level of educational attainment of the household members

<sup>6</sup> In order to reflect the characteristics of the two main household members when the reference person has a partner, Tables 1.A and 1.B include the age, educational level and labour market status of the second member. Specifically, the difference in age between the reference person and partner is included, as is an indicator of whether the reference person and their partner have different educational levels. Finally, there is an indicator of whether the person with the lowest income level is employed. See Bover et al. (2016) for a discussion on the advisability of reflecting a household's characteristics in this way.

## CHARACTERISTICS OF ALL HOUSEHOLDS

TABLE 1.A

Percentage

<b>Panel A: all households</b>	2002	2005	2008	2011	2014
Households incurring payment delays	6.0	6.6	9.3	10.7	10.3
Age (a)					
16-34	14.7	13.2	12.0	9.5	7.6
35-44	22.3	21.6	22.6	22.2	21.7
45-54	19.4	20.8	21.0	21.3	22.4
55-64	16.5	16.1	16.0	17.5	18.2
Over 64	27.1	28.3	28.3	29.4	30.2
Age difference between reference person and their partner (median of absolute value)	2.0	2.0	2.0	2.0	2.0
Education (b)					
Primary	54.0	49.1	49.3	47.1	44.9
Secondary	19.0	18.5	19.9	19.4	17.1
University	27.0	32.3	30.8	33.5	37.9
Indicator that the reference person and their partner have different educational levels	29.5	28.3	25.1	26.6	27.1
Employment status (c)					
Employee	47.3	49.1	44.9	43.5	42.0
Self-employed	11.5	10.1	10.7	10.4	9.4
Retired	24.5	25.1	23.8	28.1	27.2
Inactive/unemployed	16.6	15.7	20.7	18.1	21.4
Other main member of household works (c)	20.5	27.4	31.2	27.3	26.4
Number of adults					
One	16.7	17.8	19.9	21.5	27.0
Two	46.2	47.0	49.8	50.5	48.8
Three	20.8	19.6	17.7	17.3	14.6
Four or more	16.2	15.6	12.7	10.7	9.6
Reference person has partner	71.0	67.8	66.7	66.0	62.0
<b>Number of observations</b>	<b>5,143</b>	<b>5,962</b>	<b>6,197</b>	<b>6,106</b>	<b>6,120</b>

SOURCE: Spanish Survey of Household Finances 2002-2014 (Banco de España).

- a The age is that of the reference person. If the household includes their partner, and the partner is older than the reference person, the partner's age is shown.  
 b The educational level is that of the reference person. If the household includes their partner who has achieved a higher educational level than the reference person, the partner's educational level is shown.  
 c The employment status is that of the reference person. If the household includes their partner who has a higher level of income than the reference person, the partner's employment status is shown. The variable "other main member works" takes a value of 1 if the member with the lower income works.

and the income level of the household as a whole. This article focuses on the characteristics most closely relating to the household's ability to pay, in both the short and long term.

One initial variable of interest is educational level. Households with a higher educational level have higher wage earnings on average throughout their life [see Carrasco et al. (2015) and Bonhomme and Hospido (2017)]. Accordingly, comparisons of the propensity to incur defaults across households with different levels of educational attainment indicate the extent to which debt defaults are due to their ability to generate income in the long term. In the absence of credit constraints, individuals with higher income during their life may finance one-off losses in income by applying for a loan, for example.

CHARACTERISTICS OF INDEBTED HOUSEHOLDS

TABLE 1.B

Percentage

<b>Panel B: indebted households</b>	2002	2005	2008	2011	2014
Households incurring payment delays	13.7	13.4	18.7	21.7	21.1
Age (a)					
16-34	22.3	16.5	14.2	14.2	7.5
35-44	32.1	31.6	33.0	32.0	33.5
45-54	22.4	26.8	25.5	27.7	29.4
55-64	15.4	16.6	16.9	16.3	17.7
Over 64	7.7	8.5	10.4	9.8	12.0
Age difference between reference person and their partner (median of absolute value)	2.0	2.0	2.0	2.0	2.0
Education (b)					
Primary	40.3	38.2	37.3	38.9	33.2
Secondary	36.1	35.1	35.6	32.5	32.7
University	23.7	26.6	27.1	28.6	34.0
Indicator that the reference person and their partner have different educational levels	39.2	41.0	41.2	38.7	42.3
Employment status (c)					
Employee	64.5	67.3	60.9	61.5	59.1
Self-employed	15.4	13.1	13.2	13.3	11.3
Retired	9.4	9.7	10.4	10.7	11.4
Inactive/unemployed	10.7	9.9	15.5	14.5	18.2
Other main member of household works (c)	33.4	38.7	41.9	38.6	35.6
Number of adults					
One	6.8	8.4	11.4	11.4	17.6
Two	53.7	54.0	56.4	59.4	55.7
Three	21.2	20.2	17.7	17.6	16.9
Four or more	18.3	17.3	14.5	11.6	9.8
Reference person has partner	84.0	80.2	78.1	77.3	72.8
Total income (d)					
25% lower	11.0	11.1	9.5	13.0	14.5
Between 25% lower and the median	23.3	24.6	25.7	22.9	21.3
Between the median and 25% higher	31.1	31.2	31.3	30.4	29.6
25% higher	34.5	33.0	33.5	33.6	34.6
<b>Number of observations</b>	<b>1,691</b>	<b>2,437</b>	<b>2,456</b>	<b>2,406</b>	<b>2,433</b>

SOURCE: Spanish Survey of Household Finances 2002-2014 (Banco de España).

- a The age is that of the reference person. If the household includes their partner, and the partner is older than the reference person, the partner's age is shown.
- b The educational level is that of the reference person. If the household includes their partner who has achieved a higher educational level than the reference person, the partner's educational level is shown.
- c The employment status is that of the reference person. If the household includes their partner who has a higher level of income than the reference person, the partner's employment status is shown. The variable "other main member works" takes a value of 1 if the member with the lower income works.
- d Household income is that of the year prior to the survey.

Consideration is given to variables that measure the household's disposable funds in the short term: total income in the year prior to the survey and, at the time of the survey, the labour market status of the main household members. Insofar as households have accumulated financial savings or can gain access to the credit market, job loss or a fall in income would not prevent the household from continuing to satisfy repayment of its debts. Therefore, a high

sensitivity of defaults to declines in income or job loss would indicate that indebted households have limited access to credit and that they have a limited amount of financial savings.

The reference household considered in this article comprises two people aged 35–44, with secondary education, in which the person who earns most is in paid employment both in the year of the survey and the previous year, and whose total gross income is in the second-to-bottom quartile of the income distribution. The demographic characteristics of the reference group (age, labour market status, household composition, educational level) have been chosen as they are particularly common to the indebted. The choice of income group, however, responds to a group with sufficient population-based weight and, in turn, with a propensity to incur comparatively high debt defaults.<sup>7</sup>

The changes between survey waves of the incidence in respect of the reference group's defaults enables comparisons adjusted for the population changes detected in Tables 1.A and 1.B to be made. Secondly, to determine how household defaults change according to each characteristic, a comparison is made of the incidence of the defaults according to this characteristic keeping the rest of the variables constant. For example, to compare the effect of household income on the probability of incurring debt defaults, the frequency of defaults is compared among households with different income levels, but whose members have a similar educational level, age and labour market status.<sup>8</sup>

#### 4 Cross-section results

First, the role of the composition effects in debt payment defaults is documented. Then, the breakdowns of the population by education, labour market status and level of income are presented.

##### 4.1 COMPOSITION-ADJUSTED DIFFERENCES

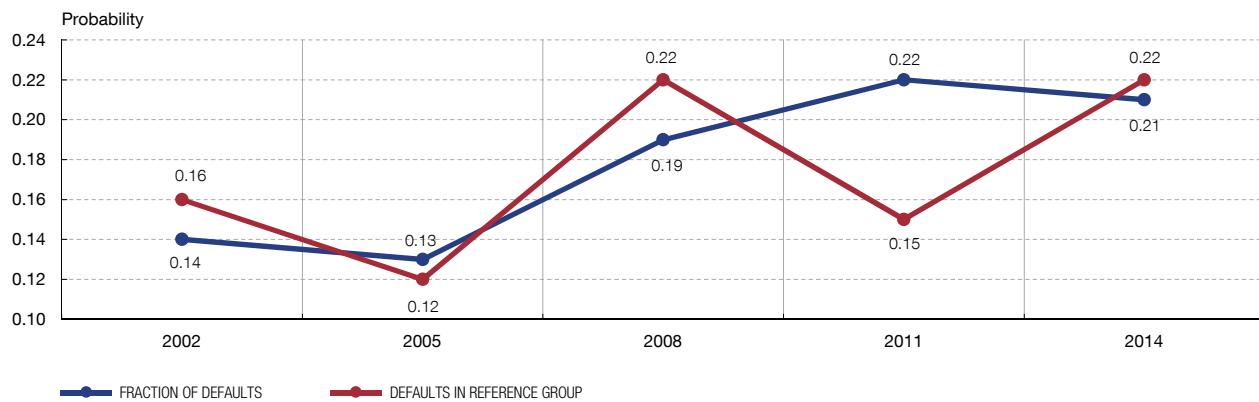
An initial look at the data suggests that the changes in the distribution of indebted household characteristics in the cross-section do not alone explain the course of defaults, a similar finding to that in Aller and Grant (2018). By way of illustration, Chart 2 tracks the probability of incurring defaults in the period 2002–2014 for the reference household, one comprising two adult members, and in which the main earner is in paid employment.

From 2002 to 2014, the course of debt payment defaults has been very similar in indebted households as a whole and in the reference group. That is to say, a group whose labour market status, education and position in the income distribution has held constant throughout the cycle has incurred defaults in a similar way to all indebted households.<sup>9</sup> The role of each characteristic is separately examined below.

7 Note that household income refers to the year prior to the survey, while labour market status and the number of adults are measured at the time of the survey. The time difference enables the influence of labour market status to be examined while holding constant household gross income for the year prior to the survey, for example. Moreover, the specification of the cross-section also includes indicators of labour market status for the year prior to the survey, for retirees, dependent employees and the inactive.

8 Finally, to predict the probability of the reference group defaulting, Logit models are used in which the dependent variable is dichotomous and takes the value one when the household has incurred defaults over the last 12 months. The independent variables are the age group of the person (in 10-year groups), education (three dichotomous variables which indicate whether the person with the highest level of educational attainment has a primary or university education and whether the other member has a lower level), labour market status (self-employed, retired, inactive), number of adults in the household (the logarithm of the number of adults) and household income.

9 Note that the distribution of educational level differences is similar in 2002 and 2011, despite the fact that in the second year the average fraction of defaults was greater (21% in 2011 and 13.7% in 2002). The reason for this is that the estimates in Chart 2 assess the probability of incurring defaults for the reference group, which is aged 35–44 and whose income is in the second quartile of the income distribution. The behaviour of both groups was similar in 2002 and 2011, since the defaults were concentrated in the lower quartile of the income distribution, as shown in Chart 5.



SOURCE: Spanish Survey of Household Finances 2002-2014 (Banco de España).

NOTE: Default in the reference group is the predicted probability of incurring delays for households with some type of debt and formed by two adults aged 35-44, with secondary education, who are employees and whose income is in the second quartile of the distribution.

#### 4.2 EDUCATIONAL LEVEL DIFFERENCES

First, educational level differences in the propensity to incur defaults are examined. In 2002, the probability of a university-educated household incurring defaults was 13 pp lower than primary-education households (see Chart 3); that said, it is notable that the proportion of defaults should have doubled between 2005 and 2014 among households with a university education. Insofar as educational level measures the resources available over the course of the life cycle, the increase in defaults is observed even among households whose permanent income is high.<sup>10</sup>

#### 4.3 LABOUR MARKET STATUS DIFFERENCES

We examine below the differences in the probability of incurring defaults according to the labour market status of the main main earner. In 2002, the indebted groups with a greater probability of incurring defaults were the unemployed and the inactive, among whom 22% had paid their debts late (see Chart 4). Among the other groups with a similar age, income or demographic composition, but whose main main earner was employed or retired, the probability was 15% at most.

Between 2005 and 2008, the year the recession began, payment delays increased in all groups, but the increase was particularly marked among those in self employment (a group in which delayed payments increased from 22% to 44%) and among the inactive or unemployed (among whom it increased from 19% to 48%). In the longer term, comparing the 2014 wave with that of 2002, the probability of incurring debt payment defaults has increased irrespective of the main earner's labour market status.<sup>11</sup> Section 5 further discusses this result.

#### 4.4 LEVEL OF INCOME

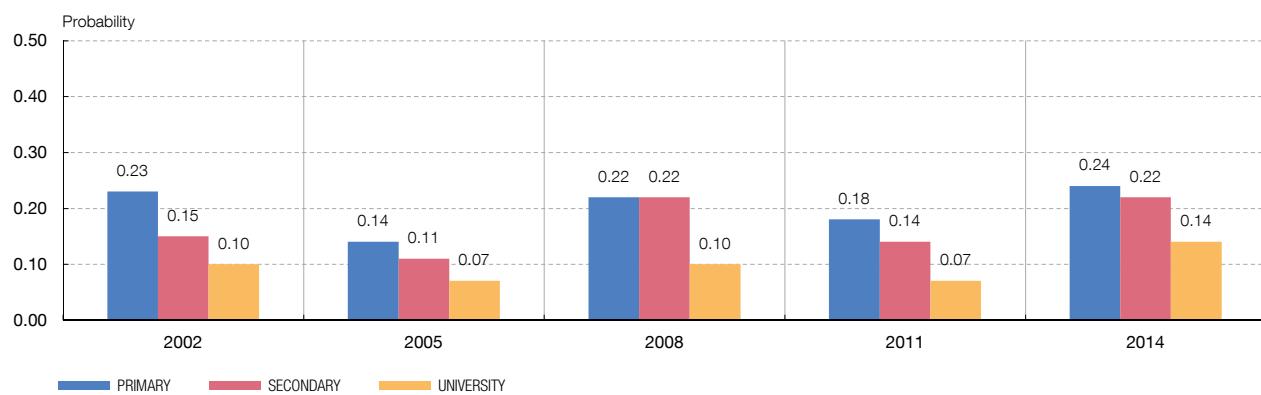
The probability of incurring debt payment delays diminishes with the household's level of income, indicating the importance of short-term resources when punctually meeting debt payments. The distribution of payment delays has indeed varied substantially across

<sup>10</sup> Another possible explanation for this phenomenon is the fact that households with a high educational level have seen their long-term income fall. However, the aforementioned papers by Carrasco et al. (2015) or Bonhomme and Hospido (2017) suggest that in the period considered the differences in wage income associated with holding a university qualification will, in any event, have increased.

<sup>11</sup> Aller and Grant (2018) present their results in the form of odds ratios, instead of probabilities. Expressing the estimates in Chart 3 in terms of odds ratios, unemployment is seen to increase the odds of incurring debt payment delays (relative to being in paid employment) by 2.05 in 2002, and by 1.74 in 2014. The differences arise because their sample differs slightly from ours (it excludes the under-30s) and because the reference group considered is different.

## PAYMENT DELAYS AMONG INDEBTED HOUSEHOLDS: BREAKDOWN BY EDUCATIONAL LEVEL

CHART 3

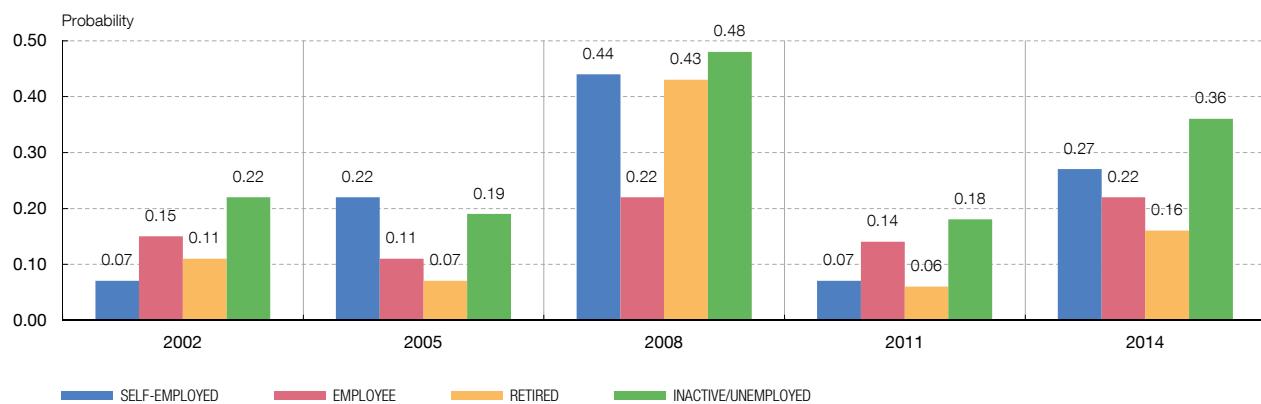


SOURCE: Spanish Survey of Household Finances 2002-2014 (Banco de España).

NOTE: Chart 3 shows how the predicted probability of incurring payment delays varies due to educational level differences for households with some type of debt and formed by two adults aged 35-44, who are employees and whose income is in the second quartile of the distribution.

## PAYMENT DELAYS AMONG INDEBTED HOUSEHOLDS: BREAKDOWN BY EMPLOYMENT STATUS

CHART 4



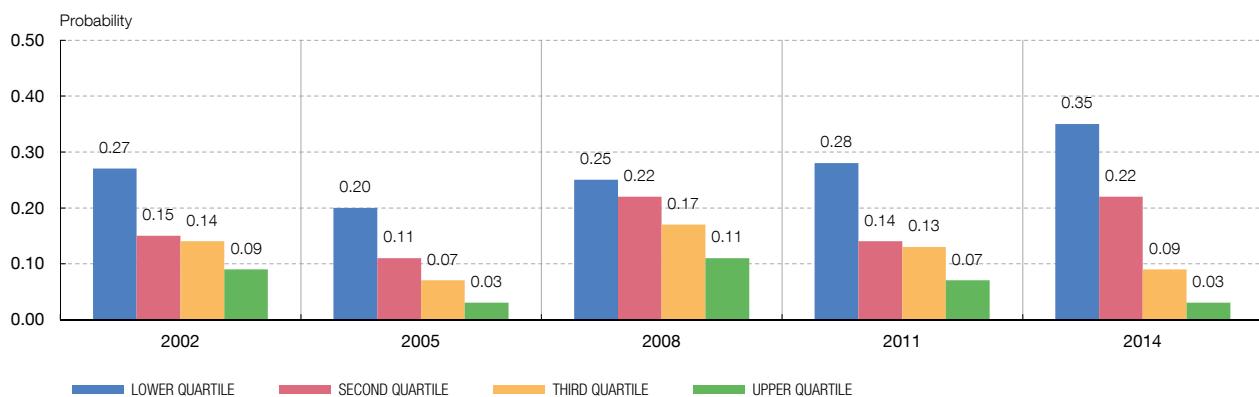
SOURCE: Spanish Survey of Household Finances 2002-2014 (Banco de España).

NOTE: Chart 4 shows the predicted probability of incurring payment delays according to the employment status of the household member who earns the highest income. The comparison is for households with some type of debt and formed by two adults aged 35-44, with secondary education and whose income is in the second quartile of the distribution.

income groups during the 2002-2014 period. In 2008 – at the start of the recession – the percentage of households with payment delays doubled in all quartiles of the income distribution except the lower one (see Chart 5). However, comparing 2005 and 2014, there is widely differing behaviour between households whose income is above or below the median. Specifically, payment delays have increased by 10 pp among households whose income is below the median, and declined for the remaining households.

To summarise this section, between 2002 and 2008 – the start of the recession – the percentage of households with debt payment delays increased among all income, education and labour market status groups. As from that date, debt payment delays continued increasing among households whose income stood in the lower quartile of the distribution, holding constant or falling for the other income groups.

When the population is broken down by labour market status of the main earner, defaults are seen to have doubled from 2005 to 2014 among households whose main



SOURCE: Spanish Survey of Household Finances 2002-2014 (Banco de España).

NOTE: Chart 5 shows the predicted probability of incurring debt payment delays by household income quartile, for households with some type of debt and formed by two individuals aged 35-44, who are employees with secondary education.

earner is in paid employment, a similar increase to that observed among the unemployed. As to educational level, defaults have increased among households with a university education to a greater extent than among primary-education households. Both results would suggest that household resources – in both the short and long term – have had a limited explanatory power in accounting for the rise in debt defaults.

However, concluding that income and employment do not affect defaults on the sole basis of cross-sectional comparisons between households may be mistaken. There are differences between households in terms of characteristics which banks use to grant credit, such as their credit history or the availability of guarantees, which are difficult to observe. It is thus illustrative to analyse the debt payments of these same households before or after a decline in their income or a job loss. The panel component of the EFF enables such analysis to be conducted, the results of which are shown below.

## 5 Debt payment delays: income dynamics and household size

The increase in the probability of incurring delays may be due to two factors. The first is that households that had not incurred debt payment delays in one period may then pay with a delay in the following wave. Alternatively, the proportion may increase owing to greater persistence in the delay in debt payment: those who had previously incurred delays in early periods have a greater propensity to incur delays in subsequent periods. Given that the proportion of indebted households that incurred delays was relatively small before the recession (13.7% in 2002), it is useful to focus on the group of indebted households that pay a debt with a delay after not having incurred defaults in the previous wave. This analysis is directed at the earlier-mentioned variables that may change from wave to wave, whereby education (which is time-invariant) and age (which changes mechanically) are excluded.

Table 2 shows the changes in characteristics in those indebted households that had not yet incurred debt payment delays in the initial period. Among the indebted households, whereas from 2002 to 2005 the proportion of household main earners whose labour market status changed from employed to unemployed was 6.5%, from 2011 to 2014 this figure climbed to close to 10%. The proportion of main earners whose status changed from inactive to employed also increased during the recession, although on a lesser scale. Possibly, this increase is associated with the high labour turnover in the Spanish labour market.

CHANGES IN THE COMPOSITION, INCOME AND EMPLOYMENT OF INDEBTED HOUSEHOLDS WHICH DID NOT DEFAULT IN WAVE T (a)

TABLE 2

Percentage	2002-2005	2005-2008	2008-2011	2011-2014
Households incurring defaults in wave t + 3	8.1	14.8	16.0	13.6
Labour market transitions of the main earner				
From employment to unemployment	6.5	7.8	10.6	9.6
From unemployment to employment	2.1	3.4	3.5	4.3
Change in the number of adults in the household				
Increases	12.1	12.2	9.9	6.9
Decreases	10.1	10.5	11.4	10.3
Remains the same	77.8	77.2	78.7	82.8
Changes in the income quartile (b)				
Moves into a higher income quartile	21.3	27.3	24.9	21.3
Same income quartile	52.9	51.0	52.0	55.9
Moves into a lower income quartile	25.8	21.7	23.1	22.8
Magnitude of change in household income (median, €) (c)				
Moves into a higher income quartile	15,996.0	20,307.0	14,396.0	9,984.4
Moves into a lower income quartile	-18,328.0	-10,935.0	-14,338.0	-17,360.0
<b>Number of observations</b>	<b>606</b>	<b>1,022</b>	<b>953</b>	<b>830</b>

SOURCE: Spanish Survey of Household Finances 2002-2014 (Banco de España).

a In each pair of waves indebted households which had not defaulted in the initial wave are included.

b Income is annual income of the year prior to each wave. For example, the increase in the income quartile between 2005 and 2008 measures the proportion of households whose income in 2007 was in a higher quartile than the household's quartile in the distribution of income in 2004.

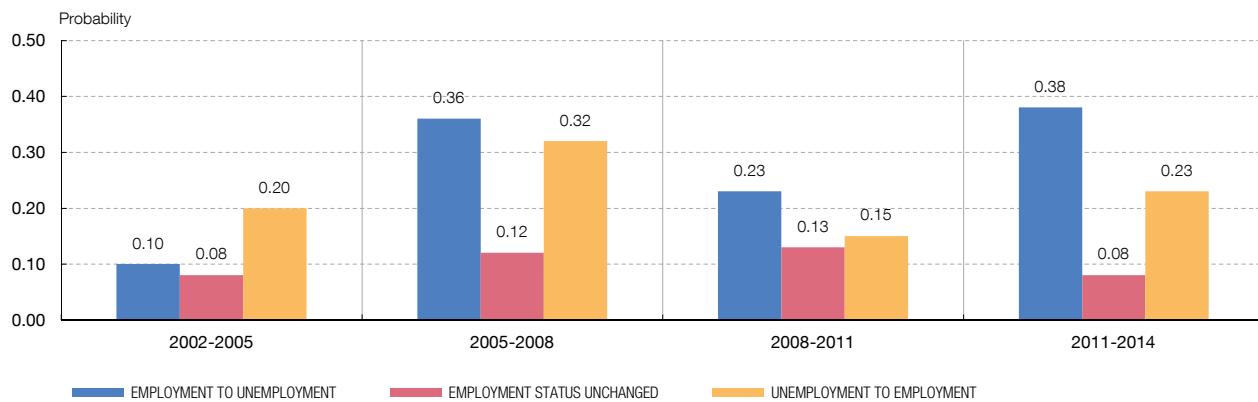
As regards the demographic composition of households, Table 2 confirms the reduction in household size shown in Table 1.B. Hence, the proportion of indebted households in which the number of adults increases fell from 12% between 2002 and 2005 to 6.9% between 2011 and 2014, with the proportion of households undergoing a reduction in the number of members holding constant.

Finally, the mobility of indebted households' income between the waves of the survey was high, but varied little over the course of the cycle. The proportion of indebted households whose income fell to a lower quartile held at around 23% throughout the economic cycle, in both the upturn and in the recession.<sup>12</sup> The probability of increases in households' income grew slightly during the recession. Thus, while the probability of indebted households moving up an income quartile was 21% from 2002 to 2005, this percentage reached 25% between 2008 and 2011.<sup>13</sup>

In sum, the changes in the characteristics of indebted households are along the lines of a reduction in their disposable resources. Firstly, the proportion of households in which the

12 An analysis of the instability of Spanish households' income before the recession can be found in Bover (2008). This paper shows that in households with a stable demographic composition (whether indebted or not), the probability that a household whose income was between the 40th and 60th percentiles in 2002 might fall to a lower quintile stood at 34% in 2005.

13 The increase in the proportion of households whose income increases between 2005 and 2008 may be a consequence of the fact that the income included in each wave is that of the previous year. Thus, income in the EFF2008 relates to 2007, before the recession.



SOURCE: Spanish Survey of Household Finances 2002-2014 (Banco de España).

NOTE: Chart 6 shows the predicted probability of incurring debt payment delays in wave  $t + 3$  among indebted households in wave  $t$  according to changes in the employment status of the main earner in wave  $t$ . The comparison is made for households with some type of debt in which the number of adults does not change and whose income remains in the same quartile.

main earner has lost his/her job increases to 4 pp, while the proportion of households in which the main earner's status changes from inactive to employed increases to a lesser extent. The proportion of households whose income declined held constant from 2002 to 2014.

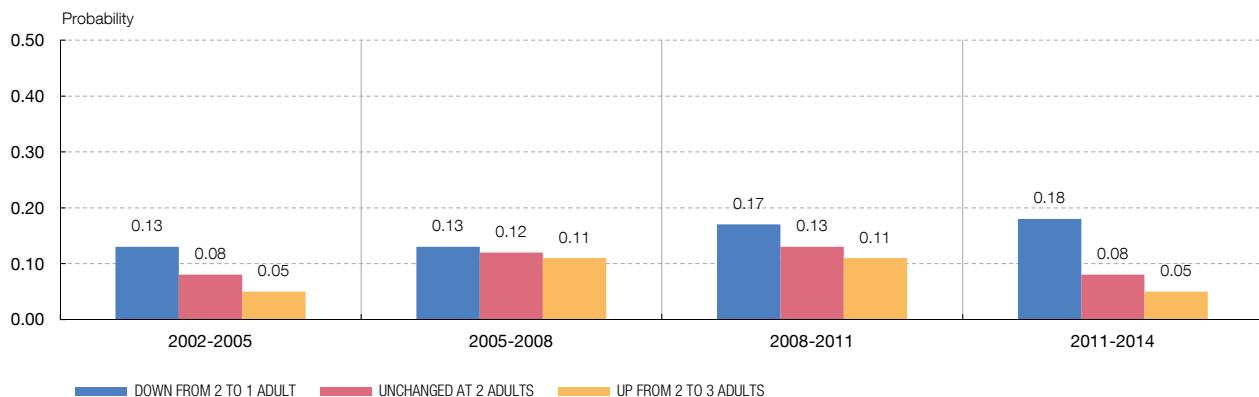
We examine below the probability of a transition to incurring defaults on the basis of demographic, employment and income-related changes. As in the previous section we analyse the impact of each characteristic, holding the others constant. In this case, the reference household is one in which the main earner's employment status has not changed, the number of adults in the household has held constant and the household's income has held in the same quartile.

#### 5.1 EFFECT OF CHANGES IN LABOUR MARKET STATUS

Chart 6 shows that, during the period of expansion from 2002 to 2005, changes in the labour market status of an indebted household's main earner played a modest role in predicting whether a household might begin to incur debt payment delays. Hence the probability of incurring delays among households in which main earners maintained their labour market status in both waves was 8%, only slightly below the figure of 10% relating to households whose main earner went from employed to unemployed. Note that these effects are estimated holding income and the number of adults in the household constant. Notably, too, the probability of incurring delays was 20% among indebted households in which the main earner's status changed from inactive to employed. This positive effect on delays of what in principle should be an increase in household resources may be due to the fact that households in which the main earner's labour market status changes generally have unstable and low income, and therefore have a greater propensity to incur defaults.<sup>14</sup>

From 2005 to 2008, the first year of the recession, the probability of beginning to incur delays grew by around 4 pp among those households whose labour market status, income or demographic composition did not change (rising from 8% to 12%). In contrast, the probability of incurring defaults exceeded 30% among households whose main earner's status changed from employed to unemployed between 2005 and 2008.

<sup>14</sup> Alternatively, it may reflect the fact that in the face of difficulties resulting in debt payment delays, the main earner may opt to work.



SOURCE: Spanish Survey of Household Finances 2002-2014 (Banco de España).

NOTE: Chart 7 shows the predicted probability of incurring debt payment delays in wave  $t + 3$  among indebted households in wave  $t$  by changes in the number of adults. The comparison is for households with some type of debt whose income remains in the same quartile and in which the employment status of the main earner remains unchanged.

The longitudinal analysis in Chart 6 complements the cross-section results in Chart 4. Firstly, during the recession, the probability of incurring defaults was much greater among households in which there is a transition to unemployment; this is a relative increase that is not discerned in the cross-section comparisons of Chart 4, as is later set out in Section 5.4. Secondly, while Chart 4 shows that the incidence of defaults doubled at least between 2005 and 2008 among those in paid employment and the self-employed, Chart 6 suggests that among indebted households whose main earner is employed there is a group that moves between employment and inactivity, and which has a high propensity to incur debt payment delays. The presence of this group would explain the increase in defaults among the self-employed and those in paid employment observed in Chart 4.

## 5.2 EFFECT OF CHANGES IN THE NUMBER OF ADULTS

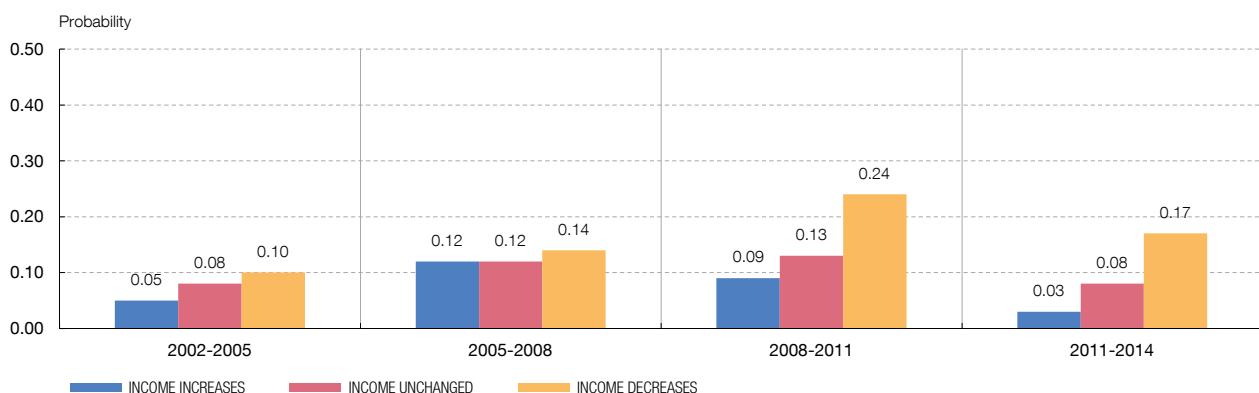
Among the indebted households with the same number of adults in 2002 and 2005, the probability of incurring delays was 8% (see Chart 7). The probability was 4 pp greater among households that now had one adult as opposed to two. Probably, the reductions in the number of adults in the household are associated with divorces, deaths or people leaving the family home, which tend to reduce the future income of a household. The negative relationship between the growth in the number of adults in the household and the probability of incurring defaults has held practically constant throughout the economic cycle.<sup>15</sup>

## 5.3 EFFECT OF CHANGES IN INCOME

Chart 8 shows that, during the expansion, changes in the income quartiles of indebted households had a limited explanatory power when predicting that the household would begin to incur debt payment delays three years later. Thus, in the 2002-2005 period, among households whose income stepped up a quartile, the probability of incurring defaults was 5 pp less than among households whose income fell to a lower quartile, compared with 14 pp from 2011 to 2014, the recession phase.

These panel results complement, once again, the cross-section results. Chart 5 shows that payment delays are concentrated among households in the lower quartile of the

<sup>15</sup> It may be concluded that, during the period considered, there have been composition effects whereunder households incur defaults when new members join that have been obliged to abandon their dwelling owing to failure to pay their debts. If this were the case, payment delays would be concentrated in households whose number of adults grows. Chart 7 does not detect this relationship.



SOURCE: Spanish Survey of Household Finances 2002-2014 (Banco de España).

NOTE: Chart 8 shows the predicted probability of incurring debt payment delays in wave  $t + 3$  among indebted households in wave  $t$  by changes between waves in the household income quartile. The comparison is for indebted households in which the number of adults and the employment status of the main earner in wave  $t$  do not change.

income distribution. Chart 8 suggests that the concentration of payment delays in the lower income quartile is not so much due to households with permanently low income having a particular propensity to incur delays as to the fact that a high proportion of households has experienced substantial declines in their income which, during the recession, has entailed a high probability of incurring defaults. Accordingly, defaults in the lower income quartile detected in Chart 5 reflect the outcome of substantial declines in household income.

Table 3 shows the coefficients of the Logit regressions with which the results presented in Charts 6, 7 and 8 are obtained. The results quantify the greater sensitivity of defaults to transitions from employment to unemployment and to declines in household income.

#### 5.4 COMPARISON OF CROSS-SECTION AND PANEL RESULTS

The cross-sectional analysis found that defaults increased between 2005 and 2014 by around 7 pp among households with university education and among those with primary education. Similarly, defaults rose by 10 pp among households whose main earner was inactive or unemployed and among those whose main income earner was employed. For Aller and Grant (2018), this kind of result suggests that there are households which had funds to pay their debts but preferred not to do so.

However, this interpretation does not seem valid, since comparing the default rates of households of differing labour market status, as cross-sectional analysis implicitly does, is not the best way to analyse whether households did or did not have funds to pay their debts. The reason is that the risk profile of households whose main earner is unemployed – or at risk of being unemployed – differs greatly from that of households whose main earner is employed, since jobholders can borrow more easily and in larger amounts.<sup>16</sup> Therefore households which have a different labour market status not only have different levels of income with which to pay their debts, but also different debt service burdens.

<sup>16</sup> Akin et al. (2014) show that the loan-to-value ratios granted in the expansion were lower for the households hit by unemployment.

Variables	2002-2005	2005-2008	2008-2011	2011-2014
Change between waves in the number of adults				
Growth in the number of adults in the household (b)	-0.920* (0.515)	-0.0975 (0.460)	-0.442 (0.565)	-1.235*** (0.466)
Changes between waves in household income				
Income quartile in final wave higher than in initial wave	-0.341 (0.560)	0.0543 (0.370)	-0.427 (0.696)	-0.952* (0.578)
Income quartile in final wave lower than in initial wave	0.327 (0.474)	0.162 (0.355)	0.756** (0.371)	0.842** (0.411)
Change of labour status of main breadwinner				
Transition from employee to unemployed/inactive	0.276 (0.816)	1.422*** (0.485)	0.692 (0.446)	1.921*** (0.542)
Transition from unemployed/inactive to employee	1.095 (1.116)	1.253 (0.862)	0.163 (0.730)	1.191* (0.705)
Constant	-2.507*** (0.316)	-2.013*** (0.214)	-1.887*** (0.226)	-2.394*** (0.266)
<b>Number of observations</b>	<b>606</b>	<b>1,022</b>	<b>953</b>	<b>830</b>

SOURCE: Spanish Survey of Household Finances 2002-2014 (Banco de España).

NOTE: \*\*, \*\*\* over an estimate indicates that the estimate is significantly different from zero at the 10, 5 and 1 percent confidence level, respectively.

- a Sample of indebted homes present in consecutive waves which had not incurred debt payment delays in the initial wave. The dependant variable takes a value of 1 if the household incurs in debt payment delays in the final wave, and a value of zero, if the opposite occurs.

By contrast, panel analysis, which examines households over time, allows characteristics such as the risk profile at the loan date to be kept constant, so the effect of job loss or lower income can be isolated. Therefore panel results are considered to provide a more reliable estimate of the default response of households to changes in income and labour market status than cross-section results. Thus, when the panel component of the EFF was used, it was observed that during the recession the upturn in defaults was concentrated in households beset by job losses or income falls.

The estimates from the panel analysis are used below to decompose the increase in defaults into changes in borrowers' characteristics (changes in characteristics) and changes in the reaction of borrower households (changes in coefficients).

## 6 What factors explain the increase in loan defaults?

The increase in the probability of default may be due to various factors, the main three of which are as follows: a change in the composition of the population; a change in the composition of borrower households; and a change in the propensity to default given the same household profile.

Rigorously distinguishing between the contribution of changes in the overall population and in the population of borrower households requires a complex estimation of the contributions from, firstly, changes in the probability of applying for a loan and, secondly, the credit standards applied by banks (see Grant and Padula, 2016). This study analyses the contributions of changes in population characteristics and of changes in the propensity to default in two groups: the total population of households and borrower households. If the results for the two samples differ, it can be inferred that the changes in the borrower household population significantly influence defaults.

	2002-2005	2005-2008	2008-2011	2011-2014
Total households				
1 Percentage incurring defaults in the following wave (observed)	2.9	5.8	6.0	5.1
2 Percentage incurring defaults in the following wave (characteristics of 2002) (a)	2.9	5.6	5.9	4.8
3 Percentage of change between waves explained by characteristics	—	6.4	3.3	14.5
Total indebted households				
4 Percentage incurring defaults in the following wave (observed)	8.2	14.9	16.1	13.6
5 Percentage incurring defaults in the following wave (characteristics of 2002) (a)	8.2	14.4	15.8	12.1
6 Percentage of change between waves explained by characteristics	—	7.6	3.4	27.7

SOURCE: Spanish Survey of Household Finances 2002-2014 (Banco de España).

a The characteristics of the population of households in 2002 considered are those in Table 3, namely: an indicator that the main earner in wave  $t - 3$  is employed in that wave but not in the following wave; an indicator that the main earner in wave  $t - 3$  is not employed in that wave but is employed in the following wave; an indicator that household income is in a lower quartile in wave  $t$  than in wave  $t - 3$ ; an indicator that household income is in a higher quartile in wave  $t$  than in wave  $t - 3$ ; and the growth in the number of adults between waves.

#### 6.1 EFFECT OF CHANGES IN THE CHARACTERISTICS OF THE POPULATION ON DEFAULTS.

Between 2002 and 2014 there were three significant changes in the population. The first two changes are demographic: the proportion of young households has fallen and the size of households has decreased. As for the income dynamic, the incidence of both unemployment-inactivity among the main earners as well as the number of households in which the main earner has experienced job loss has increased between waves.

In order to quantify the importance of the changes observed, Table 4 shows the findings of the following simulation: what would have been the probability of incurring defaults between 2011 and 2014 if the changes in labour market status, household income and household size had been similar to those which occurred during the boom of 2002-05? This type of simulation isolates the contribution of changes in the characteristics to the probability of incurring defaults.<sup>17</sup> As can be seen, if during 2011 and 2014 the population had experienced changes in its income, labour market status or demographic breakdown similar to those that occurred during the boom between 2002 and 2005, the probability of incurring defaults would have been 4.8% (instead of 5.1%). The change in these three characteristics would therefore explain 15% of the higher probability of incurring defaults between 2011 and 2014.

A second source of changes in defaults is that, owing to changes in access to credit, the characteristics of borrowers may have represented a group which is gradually becoming different to the population as a whole. Accordingly, if between 2011 and 2014 indebted households had experienced changes in labour market status, household size and income similar to those which happened during the boom, the probability of incurring defaults would have been 12.1% (instead of 13.6%). That is to say, changes in the characteristics of the indebted would explain 27% of the increase in defaults, possibly because the incidence of transitions from employment to unemployment between 2011 and 2014 was relatively higher among the indebted.

<sup>17</sup> Age does not have a clear or stable effect on defaults during the recession or during the boom and, consequently, it was not included among the factors which may explain changes in defaults. The simulation was undertaken by re-weighting the sample, following Di Nardo, Fortin and Lemieux (1996).

In short, the increase in the incidence of unemployment, falls in income or reductions in household size would account for up to 27% of the increase in the probability of incurring defaults between 2002 and 2014. The evidence from Table 4 suggests, therefore, that most of the increase in defaults would be explained because during the recession defaults became more sensitive to falls in income or job loss.

## 6.2 The increase in the sensitivity of defaults to falls in income or employment status.

Understanding the increase in the sensitivity of late payment to changes in income would require a detailed analysis of households' financial positions which is beyond the scope of this study. Nevertheless, there is evidence which indicates that during the recession indebted households had low financial savings and limited access to credit. Under these conditions, the financial decisions of these household would be closely linked to changes in their income. In Banco de España (2014) it is shown that, during the recession, 22% of indebted households had a spending level above that of their income, whereas for households without debt the percentage stood at around 16%. The same study documents the fact that there was a higher probability that new loan applications by the indebted would be rejected in full or in part than those of households without debt. Finally, the elasticity of spending to increases in income was 0.35 among the more indebted households and 0.2 among those that had no debt.<sup>18</sup> A limited amount of financial savings, together with greater difficulties in access to credit during the recession, would explain the increase in the sensitivity of the delays in the repayment of debt to changes in income.<sup>19</sup>

## 7 Conclusions

Between 2002 and 2014, the proportion of indebted households which repaid their debts late grew from 13.7% to 21%. This study used the cross-section and longitudinal components of the EFF to assess the determinants of the increase in defaults.

First, it is documented that the increase in the late payment of debt has been similar among groups with very different educational levels – an indicator of greater resources over the life cycle. In a setting where the ability of households to change the conditions governing their loans is limited, their ability to generate long-term resources may be less significant for avoiding delays in repayments than the immediate availability of liquid resources.

Based on the longitudinal component of the EFF, it can be seen that the high incidence of falls in household income and changes in the labour market status of the household main earner are important factors when understanding the increase in the delays in debt repayment between 2002 and 2014. During the economic cycle, one-fifth of indebted households saw declines in their income which led them to drop, at least, one quartile lower in the income distribution. During the recession, the probability of incurring delays in debt payments following declines in income on this scale rose substantially. Secondly, among the 10% of indebted households, the main earner experienced job losses during the three years between the surveys. These job losses were associated with a high probability of incurring defaults during the recession. The results confirm that developments

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<sup>18</sup> These features would be associated with access to credit during the boom. In the United States, Mian and Sufi (2009) show that during the boom mortgages were acquired by households with a low ability to repay their debts faced with changes in the value of the asset securing the loan. In Spain, Masier and Villanueva (2011) interpret that around 30% of those who acquired mortgages during the boom acted as though they had credit restrictions. These households would have limited saving capacity and would trust in changes in their income to repay their debts.

<sup>19</sup> Another alternative explanation is that, given the greater uncertainty and change in expectations, households perceived that a decline in income meant a greater decrease in their present and future resources in a recession than in a boom. This possibility would not explain the higher incidence of total or partial rejections of loan applications during the recession.

in household defaults during the recession were closely tied to those in their disposable income.

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