INDEBTEDNESS OF PORTUGUESE HOUSEHOLDS: RECENT EVIDENCE BASED ON THE HOUSEHOLD WEALTH SURVEY 2006-2007*

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1. INTRODUCTION

During the 1990s, in the context of the convergence process leading to monetary union, the fast growth of household indebtedness could be anticipated as part of the catching-up process. In fact, in that period, the marked decline in nominal and real interest rates, in an environment of liberalisation and increased bank competition contributed to extend access to credit to a wider group of households than in the previous decade.[1] In the case of housing loans, the effect was amplified by the system of subsidised interest rates intended to enable households with lower income to have access to house purchase.[2] The increase in indebtedness was also the result of a range of other factors, namely demographic, as for instance the fact that the baby-boomers who were born during the relatively prosperous late 60s/early 70s were entering into adulthood. Other institutional issues are also worthy of reference, such as legislation on rentals, whose discouraging effect continued to be behind the shortage of rented accommodation.[3]

In the course of the present decade, the indebtedness of Portuguese households continued to grow at rates well above their disposable income. The total value of household debt at the end of 2006 accounted for 124 per cent of their disposable income (compared with 86 per cent in 2000).[4] In this more recent period, some factors on the credit supply side were also crucial to the continued high growth rate of housing loans. In particular, the conditions of access to credit underwent some changes in recent years, aiming at mitigating the effect of rising interest rates in the debt service, thereby improving the ability of households to service debt and sustaining the demand for credit. The widening of loan maturities was among those changes, for which some anecdotal evidence was available.

The evaluation of the financial situation of households is rather important from two perspectives: from a macroeconomic perspective, given that the increase in indebtedness may restraint consumption and investment, as a larger fraction of income has to be assigned to debt service. This is particularly noticeable in the case of loans for house purchase, due to the nature of housing as a necessary good, and to possible severe social consequences if rising default would lead to the insolvency of households and to mortgage execution.

From a financial stability perspective, fast debt accumulation by households also calls for strengthened monitoring of their ability to repay debt. If their ability to continue servicing debt in a regular and timely manner is particularly affected, and a significant number of households cease to repay debt,

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(1) Luz (1992) presents evidence that, in the early 1990s, approximately 60 per cent of Portuguese households were subject to liquidity constraints.

(2) See Martins and Villanueva (2006).

(3) See Ribeiro (2007).

(4) These figures refer to household indebtedness, a concept in financial accounts that includes, in addition to households, non-profit institutions serving households. It also includes the results of household activity as producers of goods and services, when it is not possible to distinguish that activity from their activity as consumers.

consequences for financial stability may be two-fold. On the one hand, it would directly affect the financial situation of households. On the other hand, lenders could experience losses if, in the case of mortgage foreclosure, the asset used as collateral could not be sold for a value at least equal to the outstanding amount of the loan. The stability of the financial intermediation process would be at stake if such losses were very high, which would depend on the frequency of these situations and the magnitude of the exposures.

The analysis of these topics is usually based on aggregate data, such as financial and non-financial national accounts, chiefly because these data are made available more frequently (at least annually) and are easier to collect. However, aggregate indicators on the household sector as a whole provide much limited information, as they do not distinguish between indebted and non-indebted households. For instance, it is not possible to obtain information on the number of indebted households based on aggregate data. Moreover, indicators built from aggregate data correspond to average values, referring to a representative household, which may even not apply to an actual household. The evaluation of indebtedness implications, from either a financial stability or macroeconomic perspective, requires detailed information on the distribution of the relevant variables, such as income, wealth or indebtedness and, in particular, the characterisation of the observations in the tails of the distribution. In the early 2000s, microeconomic data obtained from household wealth surveys were rather useful for understanding the development of private consumption, in the context of decelerating income and of an aggregate indebtedness level well above the level observed in the corresponding stage of the previous economic cycle.[5]

The analysis of the financial situation of households based on aggregate data has revealed that, as a whole, credit risk associated with the household sector is moderate, since in banks' credit portfolios default has remained at historically low levels. In spite of rising interest rates, the debt service ratio represents, on average, a relatively low share of disposable income. This conclusion based on an average situation does not prevent that, in the distribution of indebted households, some fringes of the population show a relatively heavy debt service. The financial situation of those households could be particularly affected by rising interest rates or by a significant fall in their income, for instance as a result of a move into unemployment. Information on the distribution of income, wealth and debt, as well as on the composition of wealth is essential to obtain a diagnosis of the situation and recommend any policy measures.

This article aims at analysing the financial situation of Portuguese households based on data taken from the latest Household Wealth and Indebtedness Survey (*Inquérito ao Património e Endividamente das Famílias - IPEF*) (hereinafter referred to as IPEF), carried out by Statistics Portugal and Banco de Portugal during the last quarter of 2006 and the first quarter of 2007. Particular emphasis is laid on the analysis of the factors underlying their indebtedness level and their debt service ratio.

Section 2 of this article presents the data. Section 3 examines the distribution of household indebtedness according to some socio-economic characteristics, presenting some summary statistics and the results of a regression analysis. Section 4 presents some indicators on the particular situation of indebted households. The conclusions and prospects for future research are presented in Section 5.

2. THE DATA

This article was based on data obtained from the IPEF, which was carried out for the third time in 2006/07. This survey was launched in 1994, intended to meet the need to collect data on the distribu-

(5) See Farinha (2003, 2004).

tion of income and wealth of Portuguese households. In effect, in the late 1980s concerns about the macroeconomic consequences of the decline in savings levels were common in OECD countries, and Portugal was no exception. The first IPEF was implemented as a module of the Employment Survey in the third quarter of 1994. It was thus possible to link data on household wealth and debt to data on their income and other socio-economic and demographic characteristics. After the mid-1990s the fast growth of household indebtedness raised concerns about debt sustainability. The second wave of the IPEF was carried out in 2000 and was linked to another important survey to households, the Survey to Household Budgets (*Inquérito aos Orçamentos Familiares - IOF*).[6] In its latest issue, in 2006-07, the IPEF was linked to the Survey on Household Expenditure (*Inquérito às Despesas das Famílias - IDEF*) which replaced the Survey to Household Budgets. Hence, the possibility was kept to link, at the micro-economic level, data on household wealth and debt to data on their income and other socio-economic and demographic characteristics.

IPEF data is obtained from directly surveying a probabilistic sample of randomly selected households. The questionnaire, which is long and complex, focuses mainly on details of the financial situation of households (mainly on their non-financial and financial assets and their debts). The response rates in wealth surveys stand, in general, at around 50 per cent, below the rates usually obtained in other official surveys to households, not only in Portugal but in other countries carrying out similar surveys.[7] In the latest issue of the IPEF, its target sample comprised the respondents to the 2005 IDEF. The rate of reply, measured by the ratio of the number of IPEF respondent households to the number of IDEF respondent households was approximately 78 per cent, which is rather high in terms of usual standards.[8]

In the 2006/07 wave, the sample of the IPEF was designed and scaled for the implementation of the IDEF. Thus, in general terms, its objective was to ensure the representativeness of expenditure in each of the seven NUTS II regions, under some level of precision.[9] This criterion, however, is not the most appropriate for a wealth survey, whose distribution is much more asymmetric than the distribution of expenditure. In addition, in wealth surveys non-response rates are in general higher. In order to obtain aggregate indicators for the population sample weights may be used, as it is usual[10]. However these weights were based in the sample design of the IDEF. Therefore, their use in the extrapolation of wealth variables may correct only partially the consequences of the specific problems associated with the inquiry of wealth. Thus the extrapolated variables should be analysed with due caution. It would be possible to control, even if partly, the consequences of this problem, by calibrating the available weights using data on the distribution in the population of a variable closely related to wealth. However population data for such a variable is not currently available. Therefore, as it is not possible to satisfactorily control for the effect of the sample design on wealth variables, this article avoids comparisons between the two periods merely based on descriptive statistics. This does exclude, however, the results of a regression analysis, whose purpose is to identify economic relations among certain variables at the household level. This analysis is potentially less affected by problems associated with sample representativeness.

For the purposes of the analysis presented in this article, some inconsistencies in the original data were corrected and observations were excluded from the sample whenever household monetary in-

(6) In the 2000 issue, the IPEF interview was carried out in the last visit in the context of the Survey to Household Budgets.

(7) See, for instance, in Bover (2004) the description and presentation of the methodology of the survey carried out by Banco de España.

(8) This rate of reply is not fully comparable with the usual standard, as it depends on the fact that the households selected for the IPEF sample were the same households that had previously replied to the IDEF.

(9) NUTS II: Nomenclature of Territorial Units for Statistics 2002: North, Centre, Lisbon, Alentejo, Algarve, Autonomous Region of the Azores and Autonomous Region of Madeira.

(10) In a probability sample, each unit is associated with a weight that is equal to the inverse of the probability of that unit being selected to be part of the sample. In the IDEF, the initial weights, based on the sample design, were subsequently calibrated taking into account the structure of the population vis-à-vis the following variables: number of persons in the household, type of geographical agglomeration (rural or urban), age, gender, and level of education of the household members.

come was lower than minimum wage. Moreover, some observations with nil values were eliminated in the case of certain key variables.[11] The results for the 2006/07 IPEF presented in the tables were based on data from 6,631 households. In order to obtain aggregate values for the population and respective sub-sets, the weights used were obtained by calibrating the original weights, so that their sum remained equal to the number of households in the population. No weights were used in the regression analysis.[12] Data on the 5,197 households responding to the 2000 IPEF were also used in the regressions.[13]

3. CHARACTERISATION OF HOUSEHOLD INDEBTEDNESS

3.1. Summary statistics in 2006-2007

The purpose of this section is to characterise household indebtedness according to the following socio-economic variables: household income and age, level of education and labour market situation of the household reference person.

According to data from the 2006 IPEF, slightly over 40 per cent of households participate in the debt market (Table 1). This figure is mainly accounted for by the value of the rate of participation in the housing loan market, involving more than 30 per cent of households. However, approximately 10 per cent only participate in the market for other lending.

According to IPEF data, debt is very asymmetrically distributed across households. A synthetic measure of this asymmetry may be given by the ratio between the average and the median (Table 2). In some household classes, such as those with lower income and with a less educated, older and in a less stable labour market situation reference person, more than half of the households do not participate in the debt market (*i.e.* the median value of debt in these classes is zero). In effect, according to the life cycle hypothesis, individuals, subject to an intertemporal budget constraint, smooth consumption throughout life, in spite of the very marked income pattern. Therefore, individuals tend to borrow in periods when their current income is lower, typically when they are younger and with lower current labour income but with prospects of future increases. Participation in the debt market and indebtedness tend to peak between 30 and 40 years of age. At this age they have already overcome restrictions in access to credit that generally apply to very young individuals with very low or non-existent labour income.

The increase in indebtedness does not necessarily imply that household financing conditions have deteriorated. The importance of indebtedness in household budgets and their ability to meet debt payments largely depend on the level of their income.[14] Hence, the ratios of debt to income and debt service to income are usually considered as measures of the household ability to meet debt payments from current income. However, their ability to meet financial responsibilities depends not only on income but also on accumulated wealth. Thus, Table 3 also presents the average and median values of

(11) In the cases where the interviewee indicated that the household held a certain asset (or liability) but did not wish to assign it a specific value. This is one of the situations in which literature points to non-response correction (see, for instance, Groves et al., 2004). An alternative manner to deal with this problem consists in imputing missing values via model estimation. This procedure has been adopted in surveys in the United States and Spain, whereas in Italy the other procedure has been used (see, for instance, Bover, 2004).

(12) The use of sample weights in the case of regression analysis is not consensual in the literature. It may be irrelevant when the objective is modelling economic relationships. But it may also lead to the estimation of ratios falling outside the scope of possible logical values (see, for instance, Peracchi (2007)

(13) Results for 2000 may differ from those presented in Farinha (2003 and 2004), namely because the sample used in the analysis presented in those studies excluded the households whose reference person was older then 65 years.

(14) Not necessarily their current income, but the sum of the actual values of their future income. Usually, when making borrowing decisions, households take into account their intertemporal budget restriction which depends on expectations about their future income. Problems may arise in case permanent shocks occur, moving income development away from those expectations.

Table 1

HOUSEHOLD PARTICIPATION IN THE DEBT MARKET IN 2006

		Participation in the debt market (%)				
	% of households	Debt	Housing loans	Other lending	Both types of loans	No debt
Total	100	41.6	22.3	10.1	9.3	58.4
Income bracket [(a)]						
1	10	12.6	5.9	4.9	1.8	87.4
2	15	21.4	11.5	6.9	2.9	78.6
3	25	39.6	21.0	11.0	7.7	60.4
4	25	49.1	24.7	13.1	11.4	50.9
5	15	57.5	33.7	11.5	12.4	42.5
6	10	63.9	35.0	8.6	20.3	36.1
Age						
20-30	4	57.9	32.8	12.6	12.5	42.1
30-40	19	66.2	38.8	10.0	17.5	33.8
40-50	25	56.7	29.5	13.4	13.8	43.3
50-65	28	36.7	19.0	11.5	6.3	63.3
>65	25	10.7	4.5	5.0	1.3	89.3
Level of education (maximum completed)						
First stage of basic education or less	50	24.5	10.8	9.3	4.4	75.5
Second or third stage of basic education	28	55.6	30.5	12.9	12.2	44.4
Upper secondary education	11	65.6	37.3	9.0	19.3	34.4
Tertiary education	10	61.4	39.4	7.8	14.2	38.6
Situation in the labour market						
Employed						
self-employed	13	43.9	22.1	14.4	7.5	56.1
employees	48	58.7	32.1	11.5	15.1	41.3
Unemployed	5	35.1	20.2	10.7	4.3	64.9
Retired	29	15.3	7.6	5.7	2.1	84.7
Other situations	4	29.1	14.8	10.3	4.0	70.9

Source: Household Wealth and Indebtedness Survey. Calculations made by the author.
Note: (a) The extreme values of the income brackets considered are the following: 1st bracket - €375-500; 2nd bracket - €500-700; 3rd bracket - €700-1060; 4th bracket - €1060-1630; 5th bracket - €1630-2630; 6th bracket - €2630 and plus.

the ratio of debt to assets calculated for the different types of households. Notice that these indicators simultaneously consider the indebted and the non-indebted households. The average value (average of the individual ratios)[15] of the ratio of debt to income is higher than 90 per cent. It grows with income, peaking in the third bracket, declines with age and level of education and is much higher in households whose reference person is employed. The ratio of debt service to monthly income is especially high in the case of younger households. Debts represent little more than a fourth of total assets for households sector as a whole. The ratio is higher than 50 per cent in households whose reference person is unemployed.

(15) It is worth noting that the average value estimated for households as a whole is 0.93, and cannot be directly compared to the aggregated indicator for a number of reasons. First, it is an average of individual ratios and not of the average ratio (the latter is measured as the ratio of the sum of debts to the sum of income). In addition, the income in question in this indicator corresponds to the sum of net monetary income reported by the aggregates in their replies to the survey, which cannot coincide with the definition of disposable income in national accounting.

Table 2

HOUSEHOLD INDEBTEDNESS: SUMMARY STATISTICS IN 2006
EUR

		Total debt		Housing loans		Other lending	
	% of households	Average	Median	Average	Median	Average	Median
Total	100	17 771.4	0	15 706.8	0	2 064.7	0
Income brackets [(a)]							
1	10	3 032.7	0	2 717.9	0	314.8	0
2	15	6 422.1	0	5 944.7	0	477.4	0
3	25	13 949.7	0	12 101.8	0	1 847.9	0
4	25	18 765.3	0	16 350.3	0	2 415.0	0
5	15	27 814.8	4 971	24 764.7	0	3 050.1	0
6	10	41 723.5	18 000	37 322.6	12 000	4 400.9	0
Age							
20-30	4	31 536.1	3 900	30 039.1	0	1 497.0	0
30-40	19	37 051.8	23 895	34 266.2	18 000	2 785.5	0
40-50	25	24 795.1	3 000	21 834.0	0	2 961.1	0
50-65	28	10 417.7	0	8 192.9	0	2 224.9	0
>65	25	2 090.6	0	1 576.1	0	514.5	0
Level of education (maximum completed)							
First stage of basic education or less	50	6 258.1	0	5 048.9	0	1 209.2	0
Second or third stage of basic education	28	24 311.3	2 500	21 555.9	0	2 755.4	0
Upper secondary education	11	36 584.7	20 000	32 964.8	15 000	3 619.9	0
Tertiary education	10	36 002.0	11 220	33 302.6	4 100	2 699.4	0
Labour market situation							
Employed							
self-employed	13	19 217.8	0	15 508.3	0	3 709.6	0
employee	48	27 874.2	5 000	25 189.1	0	2 685.1	0
Unemployed	5	9 785.8	0	8 778.6	0	1 007.1	0
Retired	29	3 354.9	0	2 676.0	0	678.8	0
Other situation	4	7 274.9	0	6 616.0	0	658.9	0

Source: Household Wealth and Indebtedness Survey. Calculations made by the author.
Note: (a) The extreme values of the income brackets considered are the following: 1st bracket - €375-500; 2nd bracket - €500-700; 3rd bracket - €700-1060; 4th bracket - €1060-1630; 5th bracket - €1630-2630; 6th bracket - €2630 and plus.

3.2. Regression analysis

3.2.1. Methodology

The regression analysis presented in this article aims at examining the factors behind household indebtedness. The effect of age, income, etc. on indebtedness can only be identified through the estimation of a model, in order to control for the effect of the other variables included in the model. This analysis pooled data from the 2000 and 2006/07 surveys. However, the data do not have a longitudinal character, *i.e.*, the same households are not observed for more than a period of time. The estimation of a model simultaneously including observations for 2000 and 2006/07 makes it possible to test whether

Table 3

INDEBTEDNESS LEVEL AND DEBT BURDEN RATIO: SUMMARY STATISTICS IN 2006

		Total debt / Income		Housing loans / Income		Total debt / Wealth		Housing loans / Wealth		Debt service / Monthly income		Housing debt service / Monthly income	
	% of households	Average	Median	Average	Median	Average	Median	Average	Median	Average	Median	Average	Median
Total	100	0.930	0.000	0.821	0.000	0.263	0.000	0.130	0.000	0.114	0.000	0.070	0.000
Income brackets [(a)]													
1	10	0.490	0.000	0.438	0.000	0.211	0.000	0.037	0.000	0.059	0.000	0.037	0.000
2	15	0.760	0.000	0.705	0.000	0.330	0.000	0.070	0.000	0.081	0.000	0.054	0.000
3	25	1.129	0.000	0.979	0.000	0.353	0.000	0.168	0.000	0.121	0.000	0.082	0.000
4	25	1.036	0.000	0.903	0.000	0.220	0.000	0.141	0.000	0.158	0.000	0.079	0.000
5	15	0.989	0.161	0.883	0.000	0.218	0.038	0.163	0.000	0.118	0.038	0.077	0.000
6	10	0.777	0.323	0.692	0.181	0.169	0.078	0.145	0.034	0.082	0.039	0.061	0.023
Age													
20-30	3.5	2.207	0.284	2.110	0.000	0.352	0.205	0.287	0.000	0.275	0.047	0.145	0.000
30-40	19.3	2.055	1.119	1.900	0.936	0.386	0.233	0.310	0.145	0.194	0.146	0.145	0.084
40-50	24.5	1.206	0.179	1.052	0.000	0.477	0.046	0.151	0.000	0.154	0.034	0.094	0.000
50-65	27.9	0.465	0.000	0.356	0.000	0.153	0.000	0.066	0.000	0.083	0.000	0.040	0.000
>65	24.7	0.121	0.000	0.090	0.000	0.067	0.000	0.019	0.000	0.023	0.000	0.009	0.000
Level of education (maximum completed)													
First stage of basic education or less	50.4	0.426	0.000	0.346	0.000	0.140	0.000	0.072	0.000	0.070	0.000	0.035	0.000
Second or third stage of basic education	28.2	1.483	0.131	1.321	0.000	0.421	0.032	0.184	0.000	0.174	0.025	0.103	0.000
Upper secondary education	11.0	1.683	0.795	1.539	0.513	0.503	0.190	0.234	0.075	0.161	0.094	0.123	0.050
Tertiary education	10.4	1.082	0.235	1.015	0.113	0.183	0.062	0.156	0.026	0.112	0.043	0.089	0.025
Labour market situation													
Employed													
self-employed	13.3	1.112	0.000	0.903	0.000	0.120	0.000	0.088	0.000	0.140	0.000	0.080	0.000
employee	48.1	1.407	0.258	1.272	0.000	0.383	0.075	0.216	0.000	0.169	0.067	0.106	0.000
Unemployed	5.3	0.740	0.000	0.678	0.000	0.577	0.000	0.093	0.000	0.067	0.000	0.048	0.000
Retired	29.1	0.160	0.000	0.125	0.000	0.086	0.000	0.027	0.000	0.027	0.000	0.013	0.000
Other situation	4.1	0.455	0.000	0.400	0.000	0.176	0.000	0.047	0.000	0.056	0.000	0.036	0.000

Source: Household Wealth and Indebtedness Survey. Calculations made by the author.
Note: (a) The extreme values of the income brackets considered are the following: 1st bracket - €375-500; 2nd bracket - €500-700; 3rd bracket - €700-1060; 4th bracket - €1060-1630; 5th bracket - €1630-2630; 6th bracket - €2630 and plus.

the differences in the effects of explanatory variables in the two moments in time, are statistically significant.

The objective of this analysis is to identify the effects of some socio-economic factors on household debt. First, their effects on the probability of holding debt (intensive margin) are investigated. Then, the same variables are included in the model of indebtedness (extensive margin) as measured by the ratios of debt to income and the ratio of debt service to income. In the intensive margin model, the variable to be explained is a binary variable taking the value one if the household is indebted and zero otherwise. Hence, the results of the estimation of a linear model would be biased, wherefore the most appropriate methodology is to estimate a probit model formulated as follows:[16]

$$P\left(y = 1|x\right) = P\left(y^* > 0|x\right)$$

where y is the variable to be explained, x is the vector of explanatory variables and y* is the latent variable underlying the model, so that:

$$y^* = x\beta + \varepsilon \quad \text{if} \quad y = 1\left(y^* > 0\right)$$

In extensive margin models, the variables are continuous for values above zero, but may take the value zero with a non-zero probability. In this case, the appropriate methodology is to estimate a tobit model, generally represented as:

$$y = \max\left(0, y^*\right)$$

$$y^* = x\beta + \mu \quad \textit{in which} \quad \mu|x \sim \text{Normal}\left(0, \sigma^2\right)$$

The explanatory variables considered are broadly the same household characteristics presented in the descriptive tables (income bracket of the household, age, level of education and labour market situation of the household reference person). The estimated models also include as control variables family size and region of residence. In order to facilitate the interpretation of results, the explanatory variables are measured as dummy variables, that is, they take only the values one or zero, depending on the type of household. Therefore, the estimated coefficients shall be interpreted as differences vis-à-vis the category omitted in the regression which, in this case, corresponds to households in the third income bracket (those between the 25 and 50 percentiles), residing in the North region, formed by three persons and whose reference person is between 30 and 40 years old and has completed basic education.

In models of limited dependent variable, such as probit and tobit, differently from the linear model, the expected value of the dependent variable, given the value of explanatory variables, is not a linear function of estimated coefficients, and these are not equal to the marginal effects of explanatory variables on the dependent variable. Nonetheless, in both cases, the marginal effects are a positive function of the estimated coefficients, and therefore have the same sign. The marginal effects depend not only on the value of the parameters, but also on the value taken by the explanatory variables.

(16) This model results from considering that å, the residual term in the latent variable model, has a standardised normal distribution. See, for instance, Wooldridge (2002).

3.2.2. Model estimation results for the probability of holding debt

Tables 4A, 4B and 4C present the results of the estimation of the models for the probabilities of holding any type of debt, housing loans and other lending respectively. Columns 1 and 3 refer to the marginal effects of each of the explanatory variables resulting from the estimation of the models with 2006 and 2000 data respectively. Columns 2 and 4 present the respective t-ratios. The estimation of a specification that simultaneously includes observations relative to the 2000 and 2006 surveys makes it possible to test whether the differences between the marginal effects in the two years are statistically significant. In this specification, such information is provided by the statistical significance of the coefficients associated with the interactive variables resulting from multiplying a temporal binary variable (whose observations take the value one in 2000 and zero in 2006) for each of the other explanatory variables. In addition, including the temporal binary variable as explanatory variable makes it possible to test whether the differences in the probability of holding debt in the two years, for a reference household, are statistically significant. Column 5 presents the pvalues associated with those coefficients.[17]

In the estimation of the specification that includes the observations for both years, the estimated effect associated with the dummy variable taking the value one for observations in 2000 is negative and significant in both types of debt, suggesting broadly that the probability of holding debt increased from 2000 to 2006.

Income

The probability of holding debt is strongly related to household income: households in lower income brackets have a significantly lower probability of holding debt than those in the third bracket. The opposite relationship is observed in higher brackets. The impact of income intensifies, with different signs, when approaching the tails of distribution. The relation between the probability of holding debt and income is observed in the two years under analysis, and, in general, no significant differences are detected between 2000 and 2006. Moreover, the results suggest that it is observed in both types of debt, *i.e.* housing loans and other lending. In 2006, however, the probability of a household in the highest income bracket holding debt for purposes other than housing is only significantly higher than in the third bracket with 10 per cent significance, differing from the result for 2000. The results for 2000 suggest that participation in this debt market by higher-income households was significantly higher than by medium-income households with a level of significance of 1 per cent.

Age

The probability of holding debt is also related to the age of the reference person. The results suggest that the probability is the highest in the 30-40 year old group, and significantly lower in the other age brackets. This result is even more evident in the case of housing loans. In the case of other lending, the results suggest that, in 2006, there were no significant differences in the probability of holding debt among the households in the first three age brackets. These results differ from those obtained from 2000 data, which suggests an upward trend in recourse to this type of credit by younger households.

(17) The marginal effects for 2006 and 2000 obtained in the estimation of the pooled model are very similar to those reported in the Tables, obtained by using the observations in both years separately.

Table 4A

RESULTS OF THE PROBIT MODEL ESTIMATION
Dependent variable (participation in the debt market)

	(1)	(2)	(3)	(4)	(5)
	2006		2000		Difference between marginal effects pvalue
	Marginal effect	t-ratio	Marginal effect	t-ratio	
Dummy: 1st income bracket	-0.13634	-5.12	-0.10740	-4.43	0.817
Dummy: 2nd income bracket	-0.11131	-5.28	-0.05478	-2.73	0.210
Dummy: 4th income bracket	0.05077	2.92	0.06603	4.02	0.247
Dummy: 5th income bracket	0.13290	6.25	0.13368	6.51	0.408
Dummy: 6th income bracket	0.16167	5.99	0.22404	8.07	0.027
Dummy: 20-30 years	-0.06309	-1.81	-0.04856	-1.68	0.987
Dummy: 40-50 years	-0.08494	-4.54	-0.04117	-2.46	0.252
Dummy: 50-60 years	-0.17452	-8.86	-0.10402	-5.87	0.175
Dummy: over 65 years	-0.34242	-13.15	-0.19936	-8.53	0.022
Dummy: household with 1 person	-0.06656	-2.59	0.00587	0.22	0.072
Dummy: household with 2 persons	-0.06169	-3.58	0.00098	0.06	0.022
Dummy: household with 4 persons	-0.00969	-0.56	0.01341	0.83	0.318
Dummy: household with more than 4 persons	-0.02562	-1.16	0.01298	0.67	0.201
Dummy: first stage of basic education or less	-0.10816	-6.73	-0.09193	-5.90	0.839
Dummy: second stage of basic education	0.01974	0.83	0.03749	1.49	0.500
Dummy: upper secondary or tertiary education	-0.01744	-0.65	-0.02799	-1.09	0.653
Dummy: self-employed	-0.04209	-2.39	-0.03539	-2.20	0.887
Dummy: unemployed	-0.07163	-2.51	0.04523	1.05	0.030
Dummy: retired	-0.09869	-4.46	-0.02753	-1.32	0.063
Dummy: other situation	-0.08253	-2.92	-0.00440	-0.18	0.056
Dummy: *IPEF* 2000					0.000

Source: Household Wealth and Indebtedness Survey. Calculations made by the author.
Note: The figures in columns (1) and (2) are the result of the estimation of the model using only observations relative to the 2006-07 *IPEF*; the figures in columns (3) and (4) are the result of the estimation of the model using only observations relative to the 2000 *IPEF*; column (5) presents the pvalues associated with interactive variables in the estimation of the model using observations of both periods.

Table 4B

RESULTS OF THE PROBIT MODEL ESTIMATION
Dependent variable (participation in the housing loan market)

	(1)	(2)	(3)	(4)	(5)
	2006		2000		Difference between marginal effects pvalue
	Marginal effect	t-ratio	Marginal effect	t-ratio	
Dummy: 1st income bracket	-0.08808	-3.72	-0.04586	-2.37	0.700
Dummy: 2nd income bracket	-0.07575	-4.14	-0.01718	-1.08	0.095
Dummy: 4th income bracket	0.03321	2.25	0.04082	3.30	0.238
Dummy: 5th income bracket	0.10783	5.87	0.07575	4.87	0.906
Dummy: 6th income bracket	0.17221	7.14	0.12242	5.75	0.988
Dummy: 20-30 years	-0.08055	-3.21	-0.02458	-1.26	0.249
Dummy: 40-50 years	-0.07954	-5.59	-0.01917	-1.68	0.023
Dummy: 50-60 years	-0.15662	-10.33	-0.07239	-6.01	0.071
Dummy: over 65 years	-0.27631	-13.25	-0.12884	-7.43	0.019
Dummy: household with 1 person	-0.03596	-1.63	-0.02170	-1.13	0.975
Dummy: household with 2 persons	-0.02899	-2.00	0.00176	0.14	0.189
Dummy: household with 4 persons	0.00521	0.37	0.01344	1.17	0.496
Dummy: household with more than 4 persons	-0.06827	-3.97	-0.00868	-0.63	0.034
Dummy: first stage of basic education or less	-0.08563	-6.35	-0.05541	-4.90	0.902
Dummy: second stage of basic education	0.04982	2.53	-0.00673	-0.42	0.068
Dummy: upper secondary or tertiary education	0.01759	0.79	-0.01422	-0.82	0.259
Dummy: self-employed	-0.06192	-4.41	-0.04487	-4.13	0.593
Dummy: unemployed	-0.05876	-2.54	0.02004	0.65	0.070
Dummy: retired	-0.07135	-3.84	-0.02887	-1.79	0.405
Dummy: other situation	-0.05202	-2.20	-0.00954	-0.55	0.280
Dummy *IPEF*2000					0.000

Source: Household Wealth and Indebtedness Survey. Calculations made by the author.
Nota: The figures in columns (1) and (2) are the result of the estimation of the model using only observations relative to the 2006-07 *IPEF*; the figures in columns (3) and (4) are the result of the estimation of the model using only observations relative to the 2000 *IPEF*; column (5) presents the pvalues associated with interactive variables in the estimation of the model using observations of both periods.

Table 4C

RESULTS OF THE PROBIT MODEL ESTIMATION
Dependent variable (participation in the other lending market)

	(1)	(2)	(3)	(4)	(5)
	2006		2000		Difference between marginal effects pvalue
	Marginal effect	t-ratio	Marginal effect	t-ratio	
Dummy: 1st income bracket	-0.06712	-3.72	-0.07233	-3.90	0.405
Dummy: 2nd income bracket	-0.05019	-3.53	-0.04239	-2.79	0.999
Dummy: 4th income bracket	0.02643	2.22	0.04704	3.64	0.160
Dummy: 5th income bracket	0.04309	2.97	0.09930	6.05	0.007
Dummy: 6th income bracket	0.03117	1.76	0.16816	7.59	0.000
Dummy: 20-30 years	0.03227	1.29	-0.03444	-1.65	0.036
Dummy: 40-50 years	-0.01895	-1.56	-0.03515	-2.96	0.205
Dummy: 50-60 years	-0.03864	-2.91	-0.05587	-4.30	0.156
Dummy: over 65 years	-0.12169	-6.42	-0.10976	-6.44	0.729
Dummy: household with 1 person	-0.05264	-3.11	0.02382	1.15	0.004
Dummy: household with 2 persons	-0.04236	-3.60	0.00747	0.57	0.007
Dummy: household with 4 persons	-0.00388	-0.34	0.00382	0.32	0.643
Dummy: household with more than 4 persons	0.03905	2.54	0.02938	1.97	0.846
Dummy: first stage of basic education or less	-0.02997	-2.71	-0.04667	-3.98	0.192
Dummy: second stage of basic education	-0.01362	-0.92	0.06119	3.17	0.002
Dummy: upper secondary or tertiary education	-0.04046	-2.46	0.01618	0.82	0.027
Dummy: self-employed	-0.00001	0.00	0.01574	1.23	0.343
Dummy: unemployed	-0.03814	-2.06	0.03445	1.00	0.059
Dummy: retired	-0.04511	-2.86	-0.00120	-0.08	0.063
Dummy: other situation	-0.05120	-2.78	0.01375	0.73	0.013
Dummy *IPEF*2000					0.010

Source: Household Wealth and Indebtedness Survey. Calculations made by the author.
Nota: The figures in columns (1) and (2) are the result of the estimation of the model using only observations relative to the 2006-07 *IPEF*; the figures in columns (3) and (4) are the result of the estimation of the model using only observations relative to the 2000 *IPEF*; column (5) presents the pvalues associated with interactive variables in the estimation of the model using observations of both periods.

Family size

The results also suggest that a household with one or two members has a lower probability of holding debt than a household with three members. This effect is not observed in 2000 data. As regards larger households, the probability of holding debt is not significantly different, but this effect results from opposite (and significant) effects on the probability of holding housing loans and on the probability of holding other lending.

Education

Even though adjusted for the income and age effect, the households whose reference person has completed, at most, the first stage of basic education have a significantly lower probability of holding debt than those whose reference person has completed the second stage of basic education. This result, which is observed in both types of credit and in the two years under review, is consistent with the hypothesis that literacy is a relevant advantage in access to the credit market. In particular, it may be capturing, to a large extent, the effect of the job category of the reference person. In fact, there is evidence that in Portugal the level of education and type of job are strongly correlated. In 2006, households whose reference person has completed tertiary education have a higher probability of holding housing loans, in contrast to the results obtained from 2000 data, when this type of households had a higher probability of holding other lending.

Labour market situation

Finally, as regards the labour market situation, results suggest that the probability of holding debt is higher in the case of employees. The probability of holding housing loans by self-employed persons is

significantly lower, although the same does not apply in the case of the probability of holding other lending. Results indicate that in households whose reference person is unemployed the probability of holding debt is significantly lower in 2006 than in 2000. In the former year this situation did not significantly influence the probability of holding debt. This result may be interpreted as evidence of a stronger tightening in access to credit based on the labour situation. This conclusion should be drawn with some caution, given that an indebted household whose reference person is unemployed at the time of the interview might have incurred debt in a previous period, possibly under a different labour situation.

3.2.3. Model estimation results for indebtedness level

Tables 5A and 5B present the results of estimating the model where the dependent variable is the ratio of total debt to income and the ratio of housing loans to income respectively. Columns 1 and 3 present the marginal effects of the explanatory variables on the indebtedness ratio, conditional on indebtedness being strictly positive, based on the 2006 and 2000 observations respectively. Columns 2 and 4 present the respective t-ratios and column 5 the pvalues associated with the test of the hypothesis that the effects in the two years are equal.[18]

The statistical significance of the coefficient associated with the temporal binary variable in the models for the two years suggests that the extensive margin (total and housing loans) for a household with the characteristics of the reference household is higher in 2006 than in 2000. This conclusion stands in contrast to the conclusions drawn from the comparison between the IPEFs for 2000 and 1994. The results of the comparative analysis between these two periods, based on a similar methodology, suggested that, from the point of view of individual households, indebtedness in 2000 was not significantly higher than in 1994. This result supported the view that the high increase in aggregate indebtedness in the second half of the 1990s was chiefly due to the high increase in the number of households with access to credit.[19] There were significant differences in the extensive margin of indebtedness (total and housing loans) according to the characteristics of the households that are considered in this article.

Income

The results suggest that indebtedness is particularly sensitive to household income and to the age of its reference person. Households in the two lowest income brackets have a significantly lower level of total indebtedness and housing loans than households in the third income bracket. The opposite relation is also observed in the case of the two highest income brackets, but only for housing debt. In this type of debt, the income dependence of indebtedness is stronger near the tails of the distribution. When comparing the income effect in the two years, the results suggest that in higher income brackets it was stronger in 2000 than in 2006. Moreover, the results indicate that in 2006 there are no significant differences in indebtedness between the 3rd and 4th income brackets. In 2000, indebtedness level in the 2nd and 3rd income brackets was not significantly different.

Age

The effect of age on indebtedness level seems to have been higher in 2006, except in the case of the lowest age bracket. Results suggest that in 2000 indebtedness level in this age bracket was significantly higher than in the 30-40 age bracket. This is not apparent in data for 2006.

(18) As in the models of the previous section, this was also obtained from the estimation of the specification that includes the observations for both years.
(19) See Farinha (2003, 2004).

Table 5A

RESULTS OF THE TOBIT MODEL ESTIMATION
Dependent variable (debt/annual income)

	(1)	(2)	(3)	(4)	(5)
	2006		2000		Difference between marginal effects pvalue
	Marginal effect	t-ratio	Marginal effect	t-ratio	
Dummy: 1st income bracket	-0.24830	-3.30	-0.23497	-3.24	0.552
Dummy: 2nd income bracket	-0.17816	-3.15	-0.07637	-1.42	0.440
Dummy: 4th income bracket	0.01802	0.42	0.13240	3.34	0.019
Dummy: 5th income bracket	0.09940	2.01	0.19026	4.16	0.042
Dummy: 6th income bracket	0.02878	0.47	0.26684	4.73	0.001
Dummy: 20-30 years	-0.08735	-1.05	0.20283	2.82	0.008
Dummy: 40-50 years	-0.31978	-7.15	-0.10713	-2.55	0.010
Dummy: 50-60 years	-0.60763	-12.12	-0.29789	-6.36	0.005
Dummy: over 65 years	-1.17019	-14.75	-0.55670	-8.08	0.000
Dummy: household with 1 person	-0.09956	-1.49	0.04755	0.72	0.149
Dummy: household with 2 persons	-0.13888	-3.18	0.01294	0.30	0.031
Dummy: household with 4 persons	-0.05329	-1.29	0.01601	0.41	0.251
Dummy: household with more than 4 persons	-0.07648	-1.43	0.01271	0.27	0.246
Dummy: first stage of basic education or less	-0.36093	-9.22	-0.23650	-6.47	0.388
Dummy: second stage of basic education	0.05710	1.05	0.04282	0.77	0.986
Dummy: upper secondary or tertiary education	-0.05786	-0.92	-0.07914	-1.23	0.669
Dummy: self-employed	0.05261	1.19	-0.01566	-0.38	0.259
Dummy: unemployed	-0.15910	-2.18	0.06196	0.61	0.112
Dummy: retired	-0.22223	-3.72	-0.08842	-1.65	0.248
Dummy: other situation	-0.21497	-2.80	0.01772	0.30	0.031
Dummy *IPEF*2000					0.000

Source: Household Wealth and Indebtedness Survey. Calculations made by the author.
Nota: The figures in columns (1) and (2) are the result of the estimation of the model using only observations relative to the 2006-07 *IPEF*; the figures in columns (3) and (4) are the result of the estimation of the model using only observations relative to the 2000 *IPEF*; column (5) presents the pvalues associated with interactive variables in the estimation of the model using observations of both periods.

Table 5B

RESULTS OF THE TOBIT MODEL ESTIMATION
Dependent variable (housing loans/annual income)

	(1)	(2)	(3)	(4)	(5)
	2006		2000		Difference between marginal effects pvalue
	Marginal effect	t-ratio	Marginal effect	t-ratio	
Dummy: 1st income bracket	-0.21547	-2.57	-0.12471	-1.75	0.959
Dummy: 2nd income bracket	-0.13750	-2.21	-0.06844	-1.28	0.777
Dummy: 4th income bracket	0.01678	0.36	0.09948	2.58	0.063
Dummy: 5th income bracket	0.12437	2.34	0.14651	3.30	0.191
Dummy: 6th income bracket	0.12701	1.96	0.19772	3.61	0.060
Dummy: 20-30 years	-0.14459	-1.66	0.10236	1.55	0.045
Dummy: 40-50 years	-0.33235	-7.16	-0.08641	-2.22	0.005
Dummy: 50-60 years	-0.65556	-12.31	-0.29636	-6.55	0.011
Dummy: over 65 years	-1.21398	-13.59	-0.54029	-7.73	0.004
Dummy: household with 1 person	-0.05257	-0.73	0.02849	0.44	0.528
Dummy: household with 2 persons	-0.09865	-2.09	0.01851	0.44	0.121
Dummy: household with 4 persons	-0.04288	-0.98	0.03236	0.88	0.184
Dummy: household with more than 4 persons	-0.19339	-3.26	-0.02670	-0.58	0.099
Dummy: first stage of basic education or less	-0.36200	-8.58	-0.19749	-5.64	0.305
Dummy: second stage of basic education	0.11133	1.97	-0.03287	-0.62	0.105
Dummy: upper secondary or tertiary education	0.00724	0.11	-0.06318	-1.04	0.378
Dummy: self-employed	-0.06262	-1.30	-0.11625	-2.82	0.115
Dummy: unemployed	-0.15528	-1.97	0.02740	0.28	0.233
Dummy: retired	-0.21507	-3.22	-0.10663	-1.98	0.609
Dummy: other situation	-0.18220	-2.18	0.01560	0.27	0.105
Dummy *IPEF*2000					0.000

Source: Household Wealth and Indebtedness Survey. Calculations made by the author.
Nota: The figures in columns (1) and (2) are the result of the estimation of the model using only observations relative to the 2006-07 *IPEF*; the figures in columns (3) and (4) are the result of the estimation of the model using only observations relative to the 2000 *IPEF*; column (5) presents the pvalues associated with interactive variables in the estimation of the model using observations of both periods.

Education

Regarding the effect of education, the results suggest that households whose reference person has completed, at most, the first stage of basic education are significantly less indebted than those in the reference group (whose reference person has completed the second stage of basic education). The effects of education in 2006 and in 2000 are not statistically different.

Labour market situation

The results of the estimation of the models with data for 2006 suggest that indebtedness is significantly lower in households whose reference person is unemployed or inactive than when he/she is employed, both in the case of total and housing debt. This evidence stands in clear contrast to that obtained from data for 2000. In this year, in general, indebtedness is less sensitive to the labour market situation. However, the results also suggest that the differences between the effects of these variables in 2006 and 2000 are not significant, which is due to the high imprecision of their estimation (resulting from the low number of observations in some of these classes and from the high variability of the indebtedness level).

3.2.4. Model estimation results for debt burden

Tables 6A and 6B, with a similar structure as the previous tables, present the marginal effects for the models in which the dependent variable is the ratio of the debt service to monthly income and the ratio of housing loans to monthly income respectively.

In the models including observations for both years, the estimated effect associated with the dummy variable taking the value one for observations in 2000 is negative and significant, suggesting that the debt service is significantly higher in 2006 than in 2000. This evidence stands also in clear contrast to that obtained when comparing data from the 2000 and 1994 surveys, where no significant differences were observed. Is should be mentioned that this result is obtained, irrespective of the fact that the interest rate level of loans granted to households (either for house purchase or other lending) was lower in 2006 than in 2000.

Income

Results also suggest that the debt burden is sensitive to household income. Households in the two lowest income brackets have a significantly lower debt burden, for both total and housing loans, than households in the third income bracket. The opposite relation is observed in the two highest income brackets, in the case of debt burden associated with housing loans. There is no evidence of significant differences between income effects in 2000 and 2006.

Age

Debt burden is also sensitive to the age of the household reference person. In the three highest age brackets debt burden is significantly lower than in the 30-40 age bracket. There are no significant differences between the effects of age in the two years.

Table 6A

RESULTS OF THE TOBIT MODEL ESTIMATION
Dependent variable (debt burden/monthly income)

	(1)	(2)	(3)	(4)	(5)
	2006		2000		Difference between marginal effects pvalue
	Marginal effect	t-ratio	Marginal effect	t-ratio	
Dummy: 1st income bracket	-0.03114	-2.20	-0.03135	-4.07	0.046
Dummy: 2nd income bracket	-0.04350	-4.01	-0.01354	-2.41	0.425
Dummy: 4th income bracket	0.01230	1.56	0.01248	3.04	0.186
Dummy: 5th income bracket	0.02628	2.88	0.01532	3.22	0.295
Dummy: 6th income bracket	0.01700	1.51	0.02307	3.92	0.006
Dummy: 20-30 years	-0.01486	-0.95	-0.00487	-0.62	0.962
Dummy: 40-50 years	-0.02577	-3.12	-0.00793	-1.80	0.340
Dummy: 50-60 years	-0.05917	-6.39	-0.02835	-5.79	0.550
Dummy: over 65 years	-0.16312	-10.97	-0.05727	-8.00	0.019
Dummy: household with 1 person	-0.03174	-2.51	-0.00803	-1.14	0.363
Dummy: household with 2 persons	-0.02360	-2.91	-0.00407	-0.92	0.218
Dummy: household with 4 persons	-0.00705	-0.92	0.00289	0.72	0.220
Dummy: household with more than 4 persons	-0.00668	-0.67	0.00091	0.19	0.536
Dummy: first stage of basic education or less	-0.04586	-6.31	-0.02763	-7.24	0.516
Dummy: second stage of basic education	0.00084	0.08	0.00761	1.30	0.390
Dummy: upper secondary or tertiary education	-0.01145	-0.99	-0.00857	-1.26	0.754
Dummy: self-employed	0.00415	0.51	-0.00070	-0.16	0.310
Dummy: unemployed	-0.04558	-3.31	0.01271	1.21	0.006
Dummy: retired	-0.04960	-4.46	-0.01078	-1.94	0.067
Dummy: other situation	-0.05222	-3.60	-0.00151	-0.24	0.008
Dummy *IPEF*2000					0.000

Source: Household Wealth and Indebtedness Survey. Calculations made by the author.
Nota: The figures in columns (1) and (2) are the result of the estimation of the model using only observations relative to the 2006-07 *IPEF*; the figures in columns (3) and (4) are the result of the estimation of the model using only observations relative to the 2000 *IPEF*; column (5) presents the pvalues associated with interactive variables in the estimation of the model using observations of both periods.

Table 6B

RESULTS OF THE TOBIT MODEL ESTIMATION
Dependent variable (housing loans/monthly income)

	(1)	(2)	(3)	(4)	(5)
	2006		2000		Difference between marginal effects pvalue
	Marginal effect	t-ratio	Marginal effect	t-ratio	
Dummy: 1st income bracket	-0.01807	-2.37	-0.02029	-2.90	0.383
Dummy: 2nd income bracket	-0.02028	-3.52	-0.00715	-1.44	0.253
Dummy: 4th income bracket	0.00307	0.75	0.00943	2.63	0.106
Dummy: 5th income bracket	0.01371	2.91	0.01398	3.38	0.371
Dummy: 6th income bracket	0.01353	2.36	0.01807	3.52	0.139
Dummy: 20-30 years	-0.01856	-2.37	-0.00043	-0.07	0.143
Dummy: 40-50 years	-0.02315	-5.63	-0.00555	-1.52	0.014
Dummy: 50-60 years	-0.04667	-9.90	-0.02855	-6.71	0.254
Dummy: over 65 years	-0.09953	-12.38	-0.05129	-7.94	0.013
Dummy: household with 1 person	-0.00813	-1.25	-0.00704	-1.12	0.853
Dummy: household with 2 persons	-0.00881	-2.09	-0.00214	-0.55	0.390
Dummy: household with 4 persons	-0.00076	-0.20	0.00165	0.48	0.595
Dummy: household with more than 4 persons	-0.01817	-3.44	-0.00737	-1.71	0.286
Dummy: first stage of basic education or less	-0.02719	-7.25	-0.02019	-6.17	0.987
Dummy: second stage of basic education	0.00950	1.91	-0.00287	-0.58	0.115
Dummy: upper secondary or tertiary education	0.00316	0.55	-0.00626	-1.09	0.237
Dummy: self-employed	-0.00520	-1.23	-0.01168	-3.05	0.093
Dummy: unemployed	-0.02196	-3.06	0.01041	1.17	0.011
Dummy: retired	-0.02321	-3.91	-0.00925	-1.86	0.235
Dummy: other situation	-0.01990	-2.65	0.00148	0.27	0.037
Dummy *IPEF*2000					0.000

Source: Household Wealth and Indebtedness Survey. Calculations made by the author.
Nota: The figures in columns (1) and (2) are the result of the estimation of the model using only observations relative to the 2006-07 *IPEF*; the figures in columns (3) and (4) are the result of the estimation of the model using only observations relative to the 2000 *IPEF*; column (5) presents the pvalues associated with interactive variables in the estimation of the model using observations of both periods.

Education

Evidence regarding the effect of education on debt burden is consistent with evidence obtained for its effect on indebtedness level. Households whose reference person has completed, at most, the first stage of basic education have a significantly lower debt burden than households in the reference group (those with the third stage of basic education). The effects of education in 2006 and 2000 are statistically similar.

Labour market situation

As regards the labour market situation, the results based on data for 2006 suggest that in households whose reference person is unemployed or inactive, the debt burden is significantly lower than in those where he/she is employed. This result holds in terms of both total debt and housing loans, contrasting with the results obtained from data for 2000, in which a significant effect is only observed when the household reference person is retired. The results also suggest that the difference between the effects of the unemployment situation in 2006 and 2000 is statistically significant, which may be partly due to a tightening of credit standards, *i.e.* unemployed persons have more limited access to credit. However, this result may be contaminated by a possible inconsistency between the reference period for income and for the labour market situation.[20]

4. INDEBTED HOUSEHOLDS – MAIN VULNERABILITIES IN 2006-07

The analysis presented in the previous section suggests that household participation in the debt market, indebtedness level and the debt service burden, per household, were higher in 2006/07 than in 2000. Hence, the rise in household aggregate indebtedness from 2000 to 2006 may have been the result of an increase in the number of households holding debt, and of the rise in the average indebtedness level of indebted households.

With a view to characterising in more detail the specific financial situation of indebted households, in order to identify potential vulnerabilities, some additional indicators are presented in this section. For a more accurate notion as to the vulnerability of the household financial situation, the analysis which is usually centred on average or reference values shall be complemented with additional information on the distribution of debt by indebted households. Additional indicators presented in this section are not, in any way, exhaustive, and are an initial approach to information contained in the latest IPEF.

When considering only indebted households, the IPEF results indicate that, on average, their debt account for approximately twice their annual income and 63 per cent of their total gross wealth (Table 7). Debt service ratio shows an average value of 30 per cent. Given that indebtedness is rather asymmetrically distributed among households, the median is more appropriate than the average as an indicator of the typical value of the distribution. The median values of those ratios for indebted households as a whole are somewhat lower.

The variability of these indicators on indebtedness and debt service is high. It is especially apparent in Charts 1 to 5 that they depend on household characteristics. In order to evaluate the importance of sit-

(20) Income corresponds to the situation in the previous year and the labour market situation to the date of the survey.

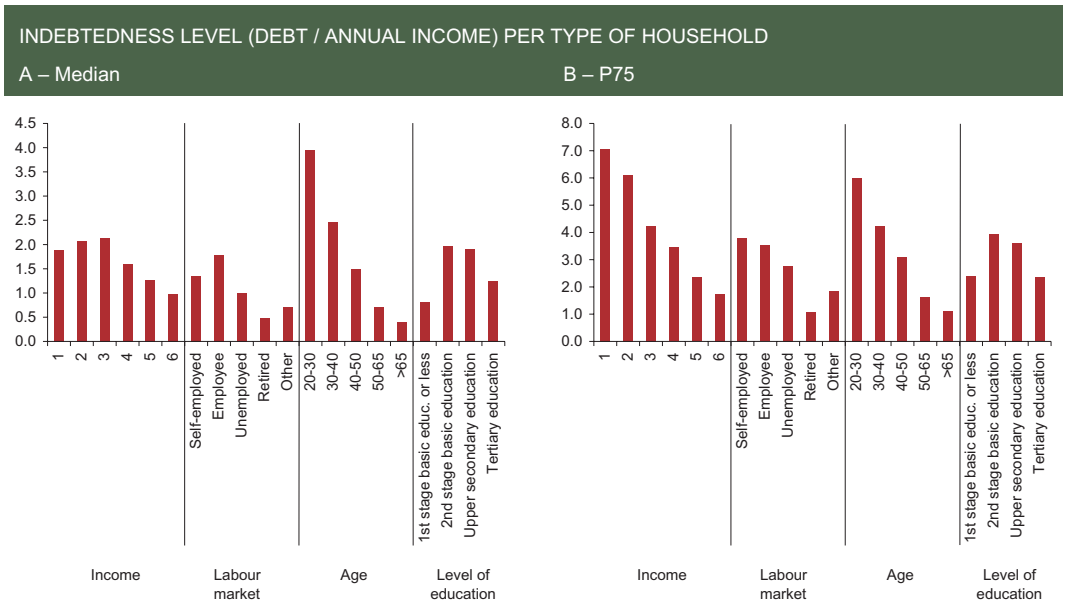
Table 7

INDEBTEDNESS LEVEL AND DEBT BURDEN RATIO OF INDEBTED HOUSEHOLDS: SUMMARY STATISTICS IN 2006

	Total debt / Income		Housing loans / Income		Total debt / Wealth		Housing loans / Wealth		Debt service / Monthly income		Housing debt service / Monthly income	
	Average	Median	Average	Median	Average	Median	Average	Median	Average	Median	Average	Median
Total	2.233	1.443	2.603	1.961	0.632	0.278	0.413	0.304	0.300	0.219	0.237	0.204
Income brackets [(a)]												
1	3.890	1.887	5.677	6.213	1.678	0.389	0.476	0.330	0.554	0.413	0.549	0.552
2	3.557	2.081	4.876	4.754	1.543	0.433	0.486	0.452	0.432	0.374	0.422	0.382
3	2.850	2.143	3.416	3.034	0.892	0.357	0.586	0.410	0.336	0.283	0.308	0.278
4	2.109	1.598	2.501	2.338	0.447	0.296	0.390	0.333	0.354	0.233	0.237	0.219
5	1.719	1.275	1.917	1.532	0.379	0.257	0.355	0.257	0.219	0.159	0.177	0.148
6	1.217	0.976	1.251	1.004	0.264	0.212	0.263	0.212	0.140	0.119	0.116	0.100
Age												
20-30	3.814	3.943	4.660	4.762	0.609	0.609	0.634	0.658	0.531	0.300	0.345	0.300
30-40	3.103	2.464	3.377	2.727	0.583	0.433	0.552	0.433	0.311	0.261	0.271	0.249
40-50	2.127	1.492	2.430	1.825	0.841	0.276	0.349	0.291	0.296	0.205	0.234	0.191
50-65	1.265	0.700	1.410	0.877	0.418	0.134	0.262	0.140	0.253	0.164	0.174	0.141
>65	1.125	0.400	1.572	0.495	0.626	0.063	0.336	0.076	0.259	0.157	0.183	0.149
Level of education (maximum completed)												
First stage of basic education or less	1.735	0.815	2.263	1.491	0.570	0.188	0.475	0.215	0.322	0.216	0.255	0.207
Second or third stage of basic education	2.667	1.967	3.093	2.657	0.757	0.353	0.431	0.381	0.343	0.258	0.262	0.244
Upper secondary education	2.565	1.906	2.717	2.028	0.767	0.357	0.413	0.323	0.260	0.213	0.229	0.191
Tertiary education	1.762	1.249	1.892	1.370	0.298	0.232	0.290	0.253	0.197	0.162	0.173	0.138
Labour market situation												
Employed												
Self-employed	2.532	1.348	3.054	2.143	0.272	0.180	0.299	0.199	0.364	0.274	0.291	0.258
employee	2.396	1.786	2.696	2.147	0.652	0.351	0.458	0.357	0.307	0.224	0.238	0.208
unemployed	2.108	1.004	2.772	1.879	1.643	0.256	0.382	0.298	0.226	0.176	0.227	0.179
Retired	1.044	0.490	1.287	0.568	0.563	0.086	0.274	0.086	0.212	0.143	0.156	0.117
Other situation	1.562	0.714	2.120	1.129	0.603	0.198	0.252	0.123	0.229	0.200	0.225	0.220

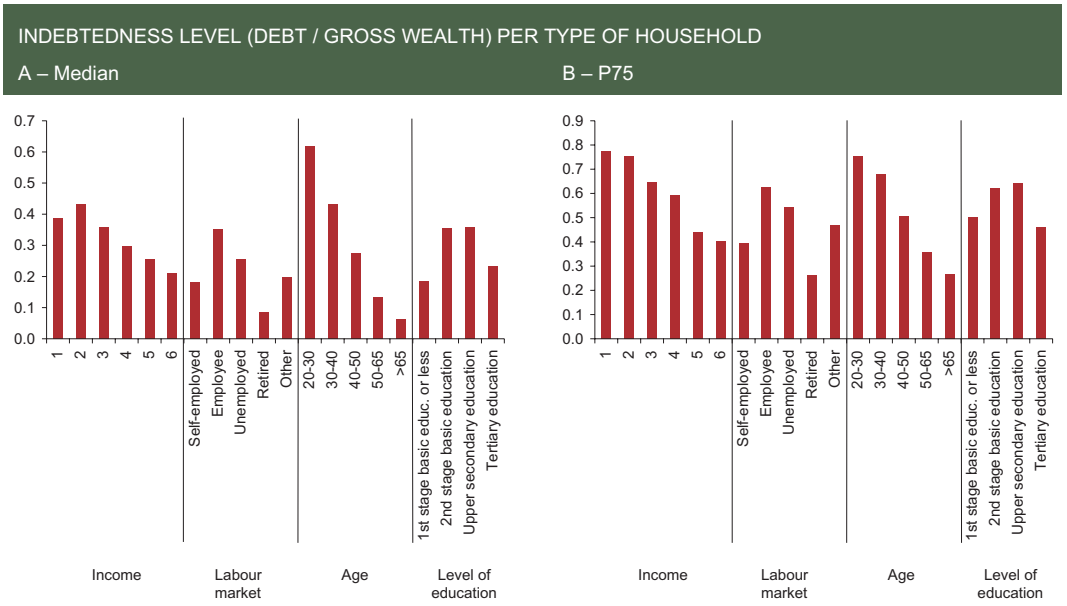
Source: Household Wealth and Indebtedness Survey. Calculations made by the author.
Nota: (a) The extreme values of the income brackets considered are the following: 1st bracket - €375-500; 2nd bracket - €500-700; 3rd bracket - €700-1060; 4th bracket - €1060-1630; 5th bracket - €1630-2630; 6th bracket - €2630 and plus.

Chart 1



Source: Household Wealth and Indebtedness Survey. Calculations made by the author.

Chart 2

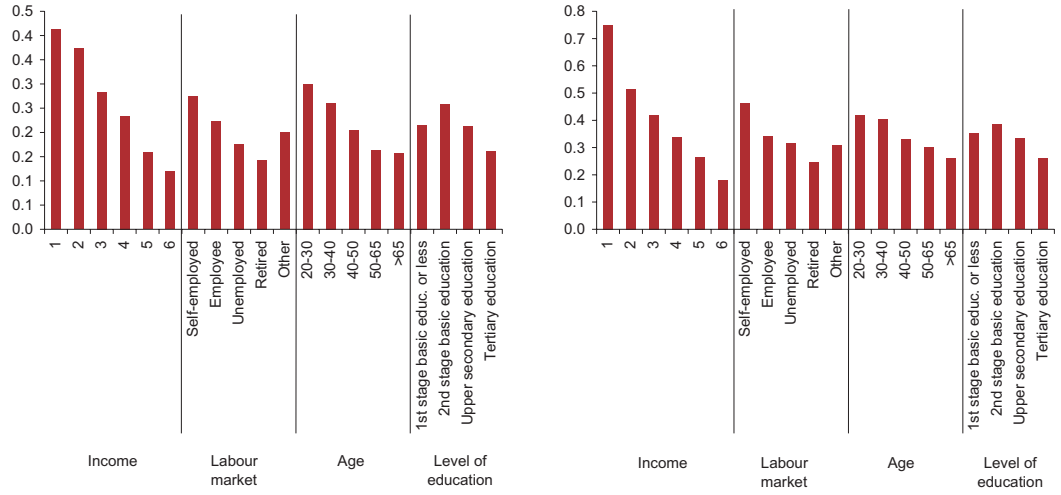


Source: Household Wealth and Indebtedness Survey. Calculations made by the author.

Chart 3

DEBT BURDEN (DEBT SERVICE / MONTHLY INCOME) PER TYPE OF HOUSEHOLD

A – Median B – P75

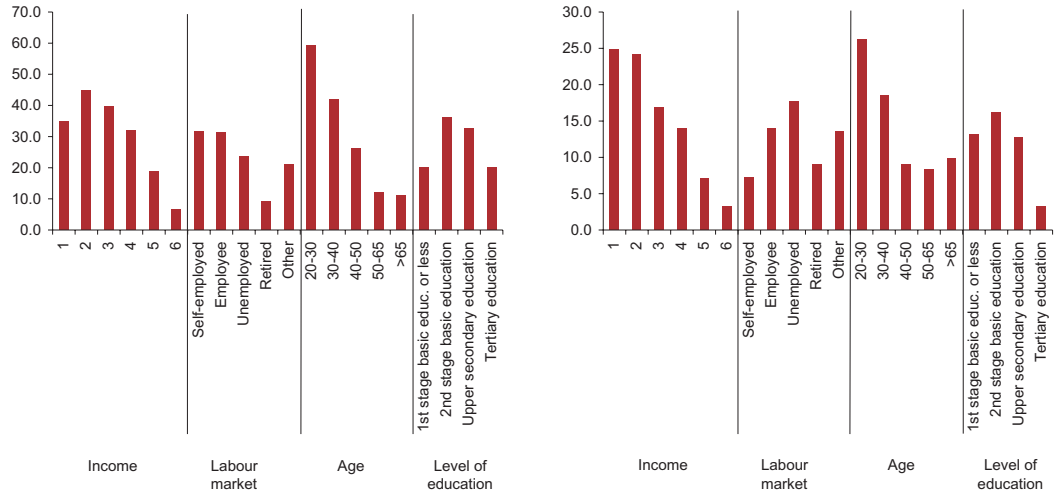


Source: Household Wealth and Indebtedness Survey. Calculations made by the author.

Chart 4

CRITICAL VALUES OF INDEBTEDNESS LEVEL, PER TYPE OF HOUSEHOLD

A – Debt / income: % households with a ratio > 3 B – Debt / wealth: % of households with ratio > 0.75

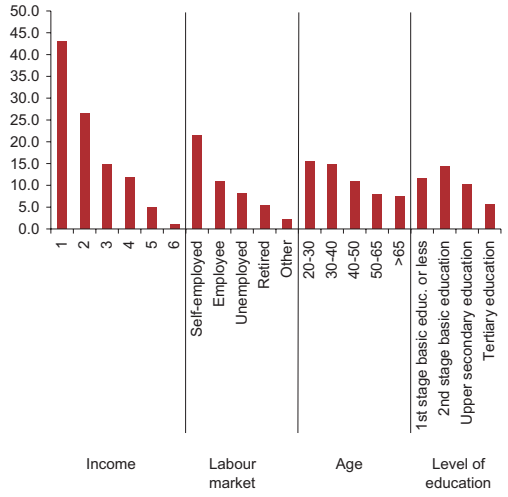


Source: Household Wealth and Indebtedness Survey. Calculations made by the author.

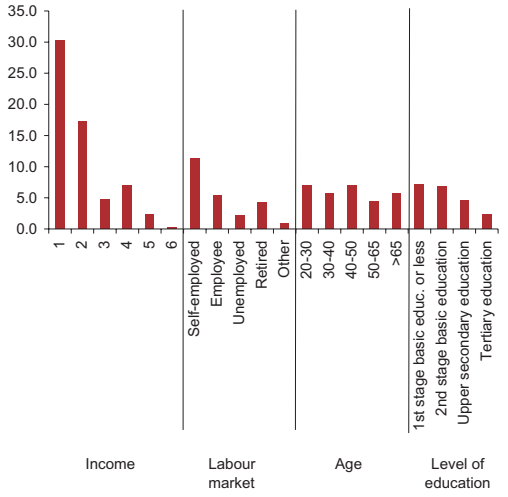
Chart 5

CRITICAL VALUES OF DEBT BURDEN, PER TYPE OF HOUSEHOLD

A – Debt service / income: % of households with a ratio > 1/2



B – Debt service / income: % of households with ratio > 2/3



Source: Household Wealth and Indebtedness Survey. Calculations made by the author.

uations that may generate higher risk, the 75 percentile of the indicators in each household category is also presented, in addition to the median.[21]

These charts suggest that younger households frequently show very high debt-to-income ratios, which are largely due to the importance of loans for house purchase for this type of household (Chart 1). This interpretation is consistent with the observation that the value of gross total wealth (*i.e.* financial and non-financial wealth) exceeds the value of debt with a rather comfortable margin for most of these households (Charts 2 and 4B). The debt service ratio is lower than 50 per cent for more than 75 per cent of the younger households (Chart 3B). The ratio is higher than 2/3 for approximately 10 per cent of younger households (Chart 5B).

The households in more vulnerable situations as measured by debt service ratio are found in the lower income bracket (accounting for approximately 10 per cent of households). According to data in Charts 3, 5A and 5B, the ratio is higher than 40 per cent for 50 per cent of these households, whereas for approximately 30 per cent the ratio is higher than 2/3.

In households whose reference person is unemployed the values for the median and the 75 percentile, either of the indebtedness ratio or debt service ratio, are lower than in households whose reference person is employed. As previously mentioned, this situation apparently shows that a potentially high risk is under control. However, this interpretation should be made with caution because indebtedness may have occurred under a labour market situation that is different from the observed at the moment of interview.

In short, the situations revealing more vulnerability refer to households with lower income and whose reference person is younger. In these categories, particularly high values in the indebtedness ratio

(21) For each type of household, the median of an indicator is the value dividing observations in half, *i.e.*, 50 per cent of households of that type have a value above the median and 50 per cent a lower value. The 75 percentile value divides observations in such a manner that 25 per cent of the observations have a higher value while 75 per cent of the observations have a lower value.

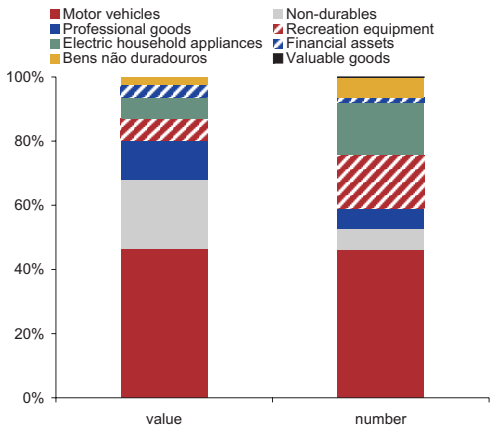
may be observed. This is partly mitigated by the fact that, even in these brackets, debt is covered by collateral, given that most loans are intended for house purchase. From the point of view of credit institutions, housing mortgage loans, in general, have a lower risk level. This situation also benefits from the fact that there is evidence that prices in the residential real-estate market are not overvalued.[22] Moreover, given the social importance of housing and the higher stigma associated with delinquency in this segment of credit, its default rates are usually low. The category "other lending" includes all other loans having purposes other than house purchase, (or house construction, reconstruction and conversion). Based on IPEF data for 2006, little less than 50 per cent of these loans were intended for the purchase of motor vehicles (the percentage is similar in both number and value of the loans) and approximately 20 per cent (in value) for the acquisition of property not intended for housing (see Chart 6). These two categories represented 70 per cent of the total value of other lending. This value, in principle, is guaranteed by the goods being purchased.

As regards the debt service burden, the fact that situations of higher vulnerability are limited to a relatively small percentage of households may in part be the result of some action taken by banks, in recent years, with a view to limiting the effect of the interest rate rise on debt burden, in particular widening loan maturities. IPEF data suggest that during the last decade the weight of longer maturities in loans for house purchase showed an upward trend, that partly reflects the large incidence of renegotiation of previous credit contracts (Chart 7).[23]

Furthermore, to evaluate the risks of the more vulnerable situations for the financial system, it is important to gauge the weight of debt held by the different types of households on total household debt. The IPEF results suggest that total debt granted to households in more vulnerable situations (with lower income and younger) or that may become potentially more vulnerable (whose reference person is unemployed) has a relatively small weight on the total (Table 8).

Chart 6

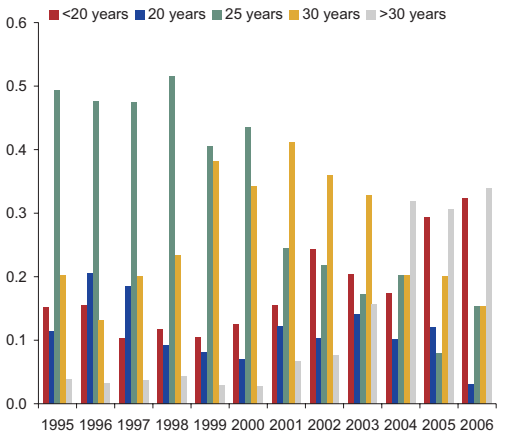
DISTRIBUTION OF OTHER LENDING, PER PURPOSE IN 2006



Source: Household Wealth and Indebtedness Survey. Calculations made by the author.

Chart 7

WEIGHT OF DIFFERENT INITIAL MATURITIES OF LOANS FOR HOUSE PURCHASE, PER YEAR OF THE LOAN



Source: Household Wealth and Indebtedness Survey. Calculations made by the author.

(22) See the "Box Housing prices in Portugal and macroeconomic fundamentals: Evidence of quantile regression", Banco de Portugal, Financial Stability Report-2005.

(23) Strictly speaking, the interviewed household should report the year of the latest renegotiation as the year of the loan.

Table 8

VULNERABILITY INDICATORS OF INDEBTED HOUSEHOLDS IN 2006

	Weight in total debt %		
	Total	**Housing**	**Other**
Total	100.0	100.0	100.0
Income brackets [(a)]			
1	1.7	1.8	1.6
2	5.4	5.6	3.4
3	19.6	19.3	22.4
4	26.4	26.0	29.2
5	23.5	23.7	22.2
6	23.4	23.7	21.2
Age			
20-30	6.3	6.8	2.6
30-40	40.3	42.1	26.0
40-50	34.2	34.1	35.1
50-65	16.4	14.6	30.1
>65	2.9	2.5	6.2
Level of education			
First stage of basic education or less	17.8	16.2	29.5
Second stage of basic education	38.6	38.7	37.6
Upper secondary education	22.6	23.0	19.2
Tertiary education	21.1	22.1	13.6
Labour market situation			
Employed			
self-employed	14.4	13.1	23.9
employee	75.5	77.2	62.6
Unemployed	2.9	3.0	2.6
Retired	5.5	5.0	9.6
Other situation	1.7	1.7	1.3

Source: Household Wealth and Indebtedness Survey. Calculations made by the author.
Nota: (a) The extreme values of the income brackets considered are the following: 1st bracket - €375-500; 2nd bracket - €500-700; 3rd bracket - €700-1060; 4th bracket - €1060-1630; 5th bracket - €1630-2630; 6th bracket - €2630 and plus.

5. CONCLUSIONS AND PROSPECTS FOR FUTURE RESEARCH

The sustained growth of household indebtedness at rather higher rates than their disposable income has raised concerns as to the ability of households to continue serving their debts. Aggregate information has revealed that, as a whole, the credit risk associated with the household sector is moderate, because past-due credit in banks' portfolios, despite an upward trend, remains at historically low levels. In effect, notwithstanding the interest rate hike, the debt service burden has maintained, on average, a relatively low ratio to disposable income. The analysis of aggregate indicators raises the problem that these do not provide information on the number of indebted households, nor do they make it possible to distinguish between the situation of indebted and non-indebted households. In order to evaluate the implications of indebtedness, either from a financial stability or macroeconomic perspective, it is crucial to have detailed information on its distribution, so that extreme observations, in particular, may be characterised.

This article examines the financial situation of households from data obtained in the 2000 and 2006/07 IPEF, based on the results of econometric analysis. The results obtained suggest that participation in

the debt market, the average indebtedness ratio and average debt service ratio, in the case of indebted households, rose from 2000 to 2006. In particular, as regards participation in the debt market for other purposes than house purchase, the results indicate that access to this market has increased, chiefly for households in intermediate income brackets and whose reference person is relatively young.

It is worth stressing that the conclusions drawn on the development of indebtedness and debt service ratio from 2000 to 2006 are in contrast to the conclusions resulting from the comparison between 1994 and 2000 results, obtained with a similar methodology. These conclusions on the most recent developments are particularly noteworthy due to the fact that the interest rates on credit to households in 2006 are lower than in 2000.

In order to identify possible situations of higher vulnerability at present, an analysis is made of the 75 percentile values of the ratio of the debt service income, the ratio of debt to income and the ratio of debt to total wealth, as well as of the percentage of households whose ratios stand above certain critical values. These data suggest that the situations of more vulnerability arise in lower income and younger brackets. The rise in credit default associated with these cases would certainly have social consequences, but the situation should not jeopardise the stability of the financial system, since the debt of more vulnerable households has a relatively small weight on the total.

An accurate estimation of the consequences of sustained growth of household indebtedness requires the formulation of a model in order to identify the factors that explain debt as, for instance, in Tudela and Young (2005) who found theoretical support in life cycle theory. Their model, which is applied to data from the British Household Panel Survey, is used to simulate the effect of some shocks. An analysis of this type would be desirable, but it is beyond the objectives of this article and will therefore be left for future research.

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