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Rising household debt: Its causes and macroeconomic implications—a long-period analysis

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The article analyses the rise in household indebtedness from the point of view of its causes and long-run macroeconomic implications. The analysis is focussed on the US case. Differently from life-cycle interpretations of the phenomenon, and from interpretations in terms of erratic deviations of current income flows from their long-run trend, the rising household debt is viewed as the outcome of persistent changes in income distribution and growing income inequalities. Through household debt, low wages appear to have been brought to coexist with relatively high levels of aggregate demand, thus providing the solution to the contradiction between the necessity of high and rising consumption levels, for the growth of the system's actual output, and a framework of antagonistic conditions of distribution which keeps within limits the real income of the vast majority of society. The question of the long-run sustainability of this substitution of loans for wages is finally discussed.

Key words: Household debt, Wages, Aggregate consumption, Saving rate, Income distribution
JEL classifications: D11, D14, E21, E25

1. Introduction

Household indebtedness has grown considerably in most developed countries over the past 25 years, sustaining consumption growth and contributing to the decline in the household saving rate. In many countries, over the first part of the current decade, debt service as a share of household income has reached levels close to historical highs, despite the reduction in borrowing rates also enjoyed by households since the second half of the 1990s. Data from a number of countries show that, although households with higher incomes tend naturally to have the greatest share of the stock of the debt, amongst the population of indebted households: (i) the highest debt-to-income ratios are found at the low and

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middle-sections of the income distribution; (ii) debt relative to the value of assets held also tends to be the highest among indebted households at the low and middle sections of income distribution; and (iii) the debt–service ratio of indebted households is highest for lower-income households (see Debelle, 2004).

In addition to credit card debt and non-bank debt, still the forms of debt that are highly prevalent amongst low-income households, the rise in household indebtedness has largely reflected a growing tendency of households to extract equity from the value of their houses to finance consumption. The equity extracted from the housing stock can of course also be used for purchasing other assets, such as shares or bonds. To the extent that it is so used, housing equity withdrawal does not perforce bring about a rise in total household debt relative to the value of the assets held, nor a rise in debt service as a share of total household income. Thus, as with the other forms of household debt, it is the use of equity withdrawal to increase consumption spending on durables or non-durable goods and services that is especially relevant for the macroeconomic implications of rising household indebtedness.

Among developed countries, it is especially in the USA that the phenomenon of a rapidly rising household indebtedness has manifested itself, in association with a marked fall in the household saving rate. In what follows, we shall focus on the US experience. The mere size of the US economy makes the macroeconomic implications of its rising household debt of primary importance, also for the macroeconomic performance of the world at large. Moreover, from an analysis of the US experience one may gain useful insights into the problems of a rising household debt likely to be encountered by the other developed countries, as well as by a number of ex-centrally planned economies, whose household borrowing appears likely to rise over the coming years as rapidly as it rose in the USA over the past few decades.[1]

Household debt growth has been normally explained in the literature as a rational response of forward looking agents to hump-shaped time earning profiles or to temporary deviations of income from its long-run trend. Contrary to these views, we maintain that the rising household indebtedness should be seen principally as a response to stagnant real wages and retrenchments in the welfare state, i.e. as the counterpart of enduring changes in income distribution. In our view, the key issue concerns the sustainability of the process. In fact, whilst we argue that household debt can exert a significant negative impact on the aggregate savings rate, helping to sustain demand and activity, the real challenge concerns the feasibility of containing the long-run shortcomings of a growing stock of household debt. Our position here is that while the widespread worries about the sustainability of rising debt levels are generally ill-placed when referred to public debt, they do retain their relevance with respect to household debt. The article is organised as follows. The following section presents some data on the diffusion of household debt in the USA. We then review the leading arguments of the debate on the growth of household debt. The subsequent sections put forward our view of its role, from a perspective centred on distributional changes and effective demand effects. Household debt is ultimately interpreted as a substitute for both higher wages and higher public debt levels, and the long-run

[1] For an assessment of the data in some European continental countries, the UK, Japan and Australia see Debelle (2004). Girouard *et al.* (2007) offers a general review of the main developments in household balance sheets for a number of Organisation for Economic Cooperation and Development (OECD) countries. For continental Europe, see also Rinaldi and Sanchis-Arellano (2006). For central and eastern European countries see Hilbers *et al.* (2005), and Duenwald *et al.* (2005) for the cases of Bulgaria, Romania and the Ukraine. Chapter III of BIS (2005) reviews the developments in some emerging economies.

sustainability of this process of substitution is critically analysed. Two appendices will help the reader to follow our line of reasoning.

2. Some data on household debt and consumption

In the USA, according to the figures of the Federal Reserve Board, consumer credit outstanding reached 25% of disposable personal income (DPI) in 2006. This was the peak of an upward trend that has characterised the period since the first half of the 1980s, following 15 years during which the consumer credit–income ratio averaged around 18%, albeit with oscillations (Figure 1; Table 1). From 1982 onward, consumer credit expanded robustly, with the exception of the 1986–92 interval, when a downward phase occurred starting in 1986 (when the Reagan administration cancelled the tax deducibility of interest paid on consumer loans) and ending after the 1989–91 recession. Afterwards, the rise in consumer credit was especially rapid, with its growth rate averaging 8% in the period 1992–2006.

The data in Table 1 substantially underestimate the amount of household debt used to finance consumption. In fact, in addition to credit card debt and instalment loans, the rise

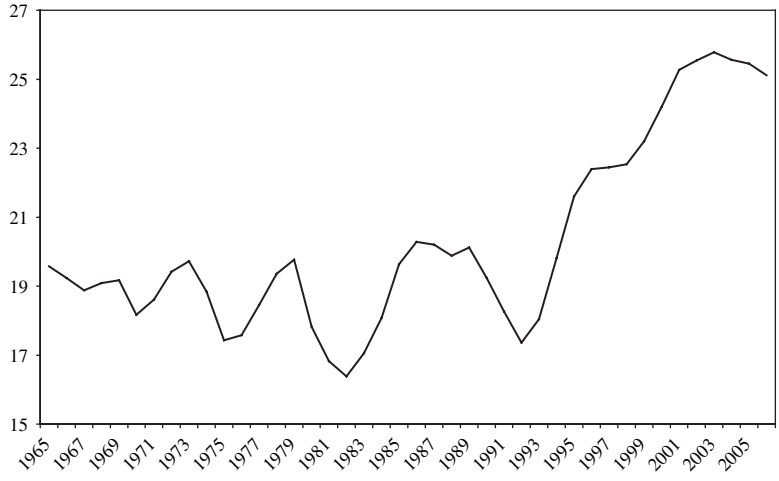

Fig. 1. *Consumer credit outstanding as a percentage of disposable personal income.* Source: *Federal Reserve Board, Flow of Funds Account.*

Table 1. *Household debt as percentage of disposable personal income*

	Consumer credit	Home mortgages	Other	Total debt
1980	17.8	46.2	8.1	72.1
1985	19.6	46.5	9.9	76.0
1990	19.2	58.3	9.1	86.7
1995	21.6	61.6	10.3	93.6
2000	24.2	66.7	11.7	102.8
2005	24.5	97.5	11.1	134.1
2006	25.1	102.3	12.3	139.7

Source: Federal Reserve Board, Flow of Funds Account.

Fig. 2. *Mortgage equity withdrawal as a percentage of disposable personal income. Source: Federal Reserve Board and US Census Bureau.*

in mortgage loans over this period has significantly reflected a growing tendency of households to extract equity from the value of their houses.[1] A rough estimate of this mortgage equity withdrawal (MEW) activity is offered by the difference between the net increase in home mortgages and the value of new houses sold during each year. From 1965 to 1979, MEW was equal to an average annual rate of 1.4% of DPI; from 1980 to 1994 the rate was about 2.3%; from 1995 to 2006, MEW averaged 4.2% of DPI (Figure 2). Of course, as already pointed out, the cash extracted from housing by borrowing in the mortgage market could have been used in ways alternative to consumption. However, in spite of some disagreement about orders of magnitudes, a variety of quantitative analyses points out that, due in particular to the refinancing of existing mortgages and home equity loans,[2] a substantial and increasing fraction of the rise in mortgage debt between 1980 and 2006 was used for purchasing goods and services.[3] Adding to MEW the flow of consumer credit, plus that of other forms of household debt, which can be partly identified as consumer debt,[4] an indicative trend of the overall debt flow available for consumption in percent of DPI can be obtained for the period 1980–2006 (Figure 3).

Apart from the difficulty of detecting all forms of consumer debt that are not formally classified as such, aggregate data on consumer credit as percentage of DPI suffer from lack of indications about holdings of consumer debt across family income groups. Indeed, if one looks into the distribution of the different types of households' liabilities among families,

[1] See, for example, Canner *et al.* (2002), Greenspan and Kennedy (2005) and Chomsisengphet and Pennington-Cross (2006).

[2] Home equity loans are second mortgages obtained in the form of a one-time lump sum. Home equity lines of credit, also known as HELOCs, have a revolving balance like a credit card. A HELOC allows one to borrow a certain amount for the time of the loan. A variety of repayment formulas, such as interest-only formulas, are widely utilised in the mortgage refinancing market. Usually it is also possible to refinance the unpaid amount or renegotiate repayments terms.

[3] See on this Klyuev and Mills (2006) and McConnell *et al.* (2003). The Congressional Budget Office, 2007, pp. 8–12, offers a detailed review of several empirical studies on the impact of MEW on consumer spending.

[4] Several forms of lending not classified by the Flow of Funds Account Statistics as mortgages and consumer credit are, as a matter of fact, used to finance consumption. Among them, 'bank loans' and 'other loans and advances' are the most easily identifiable items.

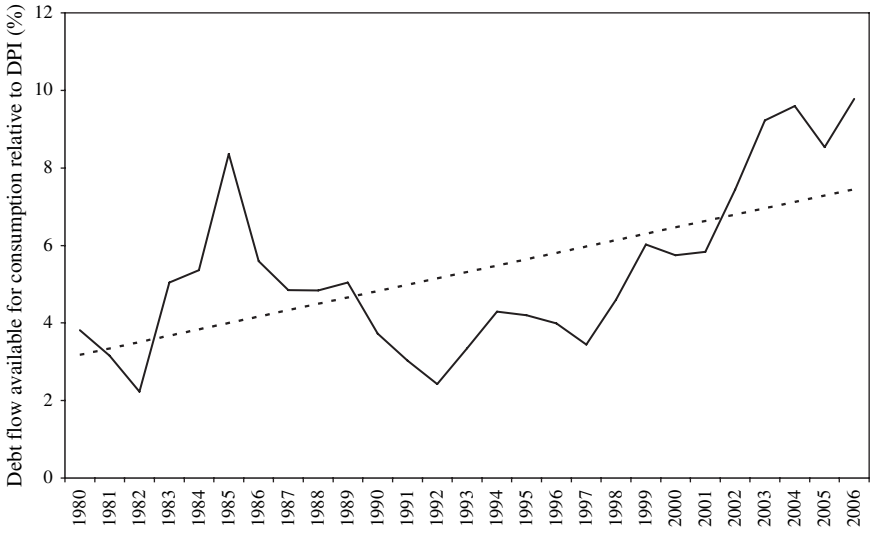

Fig. 3. *Debt flow available for consumption as a percentage of disposable personal income (unbroken line). Broken line represents the linear trend for the same measure.*
Source: Federal Reserve Board and US Census Bureau.

striking discrepancies surface across the different income groups. According to the Survey of Consumer Finance (SCF), in the lowest income quintile the share of families with credit card debt rose from 11.9% in 1983 to 30.3% in 2004, while the share of families with instalment loans tripled over the same period (Table 2). Significant increases are also registered for both credit card and instalment loans in the second, third and fourth quintile.[1] Concerning debt amounts across income groups, the 2004 SCF shows that in the lowest quintile instalment loans account for more than 50% of DPI, and credit card debts for about 9%, although median debt tends to rise with income. In the top income decile the same ratios drop to 9% and 2%, respectively (Table 3).[2] Thus, data from the SCF show that consumer credit proper, in proportion to income, is heavily concentrated in the bottom 80% of the income distribution, and that this proportion climbs for those lower in the distribution. Taking also into account that the use of MEW to finance consumption spending can hardly be of any significance for upper-income households, one may safely conclude that the overall household debt used to finance consumption essentially concerns the bottom 80% of the income distribution.

3. Consumer credit and growth theory

The phenomenon of rising household indebtedness has been viewed with favour by a large section of the economic profession, and in countries where household borrowing over the past

[1] Although the diffusion and the increase in mortgage finance remains the largest amongst the highest income group, during the 1983–2004 period the percentage of families with mortgage debt grew significantly in the first three quintiles as well. For more on debt distribution among income groups, see Kennickell and Shack-Marquez (1992) and Bucks *et al.* (2006).

[2] The pattern of financial distress across income groups resembles the pattern of the consumer credit–income ratios. In 2004, debtors with a debt service ratio greater than 40% corresponded to 27% of the families in the first quintile, and to 1.8% of the families in the top earners' decile. The share of debtors with any payment past the due 60 days or more was equal to 16% in the lowest quintile, and 0.3% in the highest decile (cf. Bucks *et al.*, 2006, pp. 34–6).

Table 2. *Percentage of families holding debt by income groups*

	Home mortgages	Instalment loans	Credit card
1983 Survey			
10,000	9.9	8.8	11.9
10,000–19,999	20.1	21.7	26.3
20,000–29,999	34.0	32.9	45.5
30,000–49,999	56.4	40.0	53.0
50,000	66.8	40.1	48.4
2004 survey			
Lowest quintile	13.8	25.5	30.3
Second quintile	27.0	43.2	44.5
Third quintile	44.4	51.9	52.8
Fourth quintile	61.8	56.7	52.6
80–89.9	76.9	55.7	50.3
90–100	75.4	41.2	33.1

Source: Survey of Consumer Finances.

Table 3. *Main household liabilities as percentage of disposable personal income by income groups*[a]

	Home mortgages	Instalment loans	Credit card
2004 survey			
Lowest quintile	333.3	50.5	9.0
Second quintile	207.4	31.1	7.4
Third quintile	180.6	25.0	5.1
Fourth quintile	142.4	20.4	4.4
80–89.9	127.0	14.4	2.6
90–100	100.1	9.7	2.2

Source: Survey of Consumer Finances.
[a]Median value of holdings for families holding debt.

two decades has not increased as markedly as in the USA a certain pressure was put on domestic households, by the authorities, to conform their behaviour to that of their US counterparts.[1]

This is somewhat at odds with the mainstream thinking insistence on the necessity to contain the share of any given 'natural output' that is allotted to consumption so that a larger share of it is saved and allotted to capital formation. Indeed, up until a few years ago, it was the decrease in the rate of private saving in most developed countries the very phenomenon that both the profession and policy makers regarded, with great preoccupation, as a sure cause of less capital formation and lower output levels in the future. Correspondingly, attention was kept focused on such measures as were deemed capable of increasing the personal savings rate. One may here recall the widespread drive to pension reforms, advocated and designed in

[1] An interesting case in point is that of Italy. In 2003, in the face of sluggish wages and consumption expenditures, the then Minister of State for the economy struggled to include provisions in the government white paper on economic and financial policy, which aimed at encouraging massive recourse to housing equity withdrawals by Italian households (cf. Ministero dell'Economia e delle Finanze, 2003, pp. 23–7). His efforts, however, did not succeed, owing to the presence amongst the population of a strong aversion not only to the risk of losing one's home but also to the prospect of substituting lifetime incomes for housing assets.

manners believed to be capable of supporting growth through increased saving, as well as the generalised shift towards more 'saving friendly' tax systems: tax cuts on capital incomes and capital gains, reductions in death duties and in the overall progressiveness of tax systems, almost everywhere accompanied by increases in the relative weight of taxes on labour incomes and consumption. The bonanza thus enjoyed over the past 25 years by the wealthiest taxpayers in the developed world can be said to have largely reflected a true reinstatement of 'the belief that the growth of capital depends upon the strength of the motive towards individual saving and that for a large proportion of this growth we are dependent on the savings of the rich out of their superfluity' (Keynes, 1936, p. 372). It seems, therefore, worth pausing to contrast the neoclassical theory of accumulation and growth with the favour with which the phenomenon of rising household indebtedness has been looked upon within the economic profession and the encouragement it has received from policy makers.

This favour has tended to be rationalised in the literature in terms of utility maximisation behaviours. To obtain maximum utility, households rearrange their income flows over their whole life to *smooth* consumption; household debt allows agents to flatten their consumption profile in the face of an unsteady and erratic income flow. The primary source of the mismatch between actual income and desired consumption is generally singled out, in line with the life cycle income hypothesis of aggregate consumption behaviour, in a hump-shaped time–earning profile.[1] Households would tend to borrow to fund current consumption in periods when income is low, relative to average income over their lifetime, with a view to then repaying the loans in periods when income will be high, relative to average lifetime income. During the early stage of life, to anticipate consumption, the more the income flow is hump-shaped, the higher the level of household debt needed.

According to this line of reasoning, until the beginning of the 1980s household debt was constrained to insufficient levels by credit rationing. Financial liberalisation over the past 25 years, and the concomitant easing of liquidity constraints on households, would have allowed them to *actually* increase their borrowing and thus achieve a more desirable path of consumption over their life cycle.[2] The financial liberalisation of the 1980s thus emerges as an explanation of both the rising household debt and the economic rationality of that rise: the increase in debt is consistent and cannot be considered excessive, being motivated by previously precluded utility maximising choices. In sum, according to this view, household indebtedness and the factors favourable to fostering its actual growth should be seen as sources of a maximum satisfaction of household needs and hence of the greatest possible advantage to society.

As a matter of fact, however, life cycle interpretations of recent consumer credit developments have been questioned on the grounds of the weak empirical evidence of saving behaviours based on differences in the timing of life.[3] More fundamentally, from a theoretical perspective, this interpretation gives rise to a serious ambiguity. A characteristic

[1] See, for example, Barnes and Young (2003) and Debelle (2004).

[2] For an overall picture of the role assigned to financial liberalisation and its impact on liquidity constraints on households, see Large (2004), p. 2.

[3] According to de Serres and Pelgrin (2003), 'while the empirical evidence of the life-cycle effect tends to vary quite considerably across studies, the bulk of the more recent evidence, based on more sophisticated estimation techniques, points towards a relatively small, albeit significant, positive response of aggregate saving to different measures of dependency ratios' (p. 125). Referring in particular to the USA, Bosworth *et al.* (1991) report: '[E]ven under a definition of household saving that exaggerates the extent of private saving among young households and understates saving among the elderly, we find that changes in the age structure of population have had and will continue to have only a modest effect on the overall saving rate. Virtually all of the recent fluctuation in saving has occurred because middle-aged and older consumer have sharply reduced their saving" (Bosworth and others, 1991, p. 204). Along similar lines, Dynan *et al.* (2004) displays results that 'are not consistent with life cycle explanation based on differences in the timing of income' (p. 435).

feature of the long-run analysis of household debt is that, being output as potential, consumer credit impinges on production as it affects the amount of saving channelled into investment. If consumer loans cancel out against some of household savings, aggregate saving shrinks.[1] Since a higher propensity to save lets the economy achieve higher output per head (or higher growth rates in endogenous growth models), the immediate conclusion is one of unfavourable long-term effects of consumer credit. Liquidity constraints, limiting dissaving by many young consumers, may sustain the aggregate propensity to save and hence lead to higher capital–employment ratios. Thus, looking at the rising household debt through the lens of neoclassical growth theory, its role remains controversial. It is true that in life-cycle models the lessening of the liquidity constraints may allow unconstrained consumption plans and thus be welfare increasing. Yet, to the extent that dissaving in some sections of the household sector is *not* matched by additional saving in others, this increase in welfare would come at the expense of a slower accumulation pace and a lower steady state level of per capita output and consumption.[2]

Apart from what we may call the 'hump-shaped income profile theory of consumer debt', a second strand of contributions locates the source of the mismatch between desired consumption and actual income in erratic deviations of current income flows from its long-run trend.[3] Maximising agents, when exposed to increasing transitory income shocks, make use of a growing amount of debt in order to smooth consumption. Moving from the belief that changes in income distribution also reflect increases in the volatility of the transitory component of income, household debt growth is seen as the way in which agents insulate consumption from those changes, provided they are not credit constrained. We will return to the relationship between household debt and income distribution in the next sections of this article. For the moment, let us simply stress that this 'income distribution theory of consumer debt' bears a very limited significance. This is because, within the neoclassical framework, rational agents with forward-looking consumption choices will react to *permanent* changes in distribution with corresponding changes in consumption levels, so that debt would be unaffected; it is only *temporary* income changes that can be smoothed through consumer credit.

In this respect, it can be added that the worries that have appeared occasionally in the literature about financial fragility and the possible unsustainability of household indebtedness paths[4] are rather extraneous to the theoretical framework of life cycle and

[1] From the perspective of the inter-temporal choice, that household debt is detrimental to aggregate saving is not such a clear cut conclusion since consumer credit downsizes the aggregate propensity to save only in the short run (see Bayoumi, 1993, p. 1434). The life-cycle theory of consumption, however, implies that the softening of liquidity constraints will reduce the propensity to save *permanently* when there is productivity growth (see Farrell, 1970, and Russell, 1977).

[2] If the capital stock of the balanced growth path is below or equal to the golden rule level, from the relaxing of consumer credit constraints each generation increases present utility by consuming more in the current period, but, at the same time, moving the balanced growth path further from the golden rule, lowers future consumption and thus future utility. If the former effect outpaces the latter, the overcoming of the liquidity constraints increases steady state welfare. See, for a general assessment of the subject, Abel *et al.* (1989) and, on this specific issue, Jappelli and Pagano (1994), p. 90.

[3] See, for example, Krueger and Perri (2006) and Iacoviello (2006).

[4] Serious concerns about the consequences of loose lending practices in the US housing market started spreading at the beginning of 2007, due to a climbing number of distressed sub-prime mortgage borrowers, an increasing number of mortgage lenders entering foreclosure processes and a deceleration in consumer and mortgage lending. For continental and eastern Europe, instead, the prevailing outlook has remained that, although in several countries families have very leveraged balance sheets with increased sensitivity to interest rate variations, their financial position remains sound and indebted households can cushion against negative shocks.

permanent income hypotheses.[1] Mainstream theories can encompass the concept of excessive indebtedness only supposing that agents' maximising behaviour results from a less than perfect rationality and foresight. Adverse shocks, such as abrupt changes in interest rates or unexpected reductions in income flows, could jeopardise household ability to repay the debt, giving rise to a 'cycle of indebtedness'. In this case, although the use of debt for the satisfaction of consumers' preferences could prove detrimental to indebted households, it remains true, nevertheless, that there is not much room for concerns about the macroeconomic implications of unsustainable household indebtedness. Should the increase in debt prove to be unsustainable, decreases in consumption would eventually come about; but since overall investment tends to adapt to saving, so that ultimately output and employment are not demand-constrained, one does not see why this decline in consumption spending should have any substantial negative impact on the macroeconomy. It would thus appear that, in actual fact, genuine effective-demand preoccupations ultimately permeate through the discussion on the growth of household indebtedness and its long-run sustainability, in spite of the whole question being generally approached and wrapped up in neoclassical conceptual garments.[2]

It can be said, in conclusion, that from the point of view of the neoclassical approach the relationship between credit constraints and saving generates an alternative to choose from: if the easing of liquidity constraints is conceived as neutral with respect to saving—if it is believed, that is to say, that some compensation occurs within the household sector, which leaves its saving rate unaffected over the long run—then a favour for consumer credit does not conflict with the neoclassical theory of accumulation, but at the cost of denying that household debt growth has had anything to do with the actual lowering of the household saving rate. If instead it is admitted that consumer credit does downsize the savings rate, then an obvious conflict emerges between the favour with which consumer credit has been looked upon and the neoclassical theory of accumulation. Consumer credit can be rationalised by reference to maximum intertemporal welfare—a rather indefinite notion, though, especially when comparisons between utility levels of different generations are involved—but at the cost of putting aside the tenet that savings drive accumulation.

4. Debt as a substitute for wages

Rather than as an aspect of the postulated rational choice by households between consumption and saving over their life cycle, the phenomenon of rising household debt will be approached in what follows in terms of the effort by low and middle-income households

[1] As has been pointed out, '[o]verall. . .much of the public and media portrayal of the consumer "debt problem" (whether of low-income families or of families in general) is somewhat perverse to the economist. After all, the life-cycle hypothesis of saving suggests that individuals will spend some parts of their life in debt whilst saving and decumulating assets in other parts of the life-cycle. Even in low-income households, persistent debt over a number of years may not be a concern if those households expect to improve their economic situation in future years. As with poverty analyses, a "snapshot" of debt at a certain point of the life cycle gives only limited insight' (Bridges and Disney, 2004, p. 4).

[2] In the literature, explicit effective demand preoccupations are generally restricted to the short run, when it is admitted that the temporary presence of stickiness and frictions may prevent aggregate demand from being brought in line with natural employment supply. Even if the convergence between actual and potential output tends to reaffirm itself after some perturbation, an enhanced ability to borrow is clearly perceived by many as a needed support to expansionary phases (cf. Campbell and Hercowitz, 2005; Iacoviello, 2005; Krueger and Perri, 2006).

to maintain, as long as possible, their relative standards of consumption in the face of persistent changes in income distribution in favour of households with higher incomes. This interpretation points, on the one hand, to a tendency of consumption to be inelastic with respect to reductions in household incomes; on the other, it reveals a tendency of consumption spending to rise even when individual incomes stagnate, provided that household *aggregate* income keeps on rising.

Our suggestion, thus, ultimately, is that rising household debt should be seen as the counterpart of the conspicuous redistribution of income that has taken place in the USA since the beginning of the 1980s. In a context of financial deregulation and an easing of liquidity constraints on low and middle-income households, which would have acted as significant permissive factors (as in the life-cycle interpretation), the rising household debt is viewed as the response to falling or stagnant real wages and salaries—and even as the response to rising wages that were, however, persistently not keeping pace with productivity growth (Figure 4).

The idea that households struggle to preserve not only their absolute but also their relative standards of consumption is not novel. It can be traced back to authors such as Veblen (1899) and Duesenberry (1949). The effort amongst households to maintain acquired positions in the social ranking of living standards is essentially based on the 'social visibility' of consumption, which determines a net bias towards consumption at the expense of accumulated net wealth, whose social visibility is much lower. But before considering the aspects of this approach to the analysis of consumption that are more directly relevant to the matter in hand, let us proceed to an overview of the growth in income disparities which has taken place in the USA over the past 25 years and which, according to our suggested interpretation, would have resulted in the growth of borrowing to finance consumption.

Fig. 4. *Output per hour (unbroken line) and real compensation per hour (broken line) for non farm business sector (1965=100).*
Source: Bureau of Labor Statistics.

Table 4. *Household after tax income distribution*

Year/quintile	First	Second	Third	Fourth	Highest	Top (10%)
1980	6.8	12.1	16.5	22.3	42.8	27.9
1985	5.5	10.9	15.8	22.0	46.7	31.7
1990	5.3	10.8	15.8	21.9	47.3	32.3
1995	5.5	10.9	15.9	21.9	46.8	31.9
2000	4.9	9.7	14.7	20.2	51.3	37.1
2004	4.9	10.0	15.0	21.1	50.0	35.5
2005	4.8	9.6	14.4	20.6	51.6	37.4

Source: Congressional Budget Office.

5. Rising income inequality and falling savings rates

It is a well established fact that the time span from 1980 to 2005 has been a period of substantial increase in household income inequality in the USA.[1] According to the tax data of the Congressional Budget Office, in 1980 the post-tax income share accruing to the lowest quintile of income distribution was 6.8%; the share of the highest quintile amounted to 42.8%; the second, third and fourth quintiles accounted for the remaining 50%. In 2005, the income share of the poorest quintile fell to 4.8%, the income share appropriated by the richest quintile rose to 51.6%, while the share of the intermediate quintiles dropped to about 44% (Table 4).[2] Thus, in a quarter of a century, 9 percentage points in the share of DPI moved from the bottom 80% of distribution to the highest quintile, with the bulk of this shift accruing to the top 10%.

During the same period, the private saving rate registered a marked decline, largely concentrated in the household sector, reaching its lowest level since the end of the Great Depression. Indeed, households' net savings as a percentage of DPI fell from 10% in 1980, to a low of 0.5% in 2005.[3] As the personal saving rate equals the difference between the flows of net assets and the flows of net liabilities in percentage of DPI, its decline reflected a growth in financial liability acquisitions that, especially since the beginning of the 1990s, outpaced the growth of financial and housing assets. So, the following three phenomena have manifested themselves in the USA over the past 25 years: (i) substantial shifts in distribution away from low and middle-income classes; (ii) a large drop in the personal saving rate and (iii) massive increases in households' liabilities. Let us now turn our attention to their mutual connections.

6. Income distribution and household consumption behaviour

As inequality rose in the USA, the share of consumption relative to disposable income should have become smaller. This, however, has not been the case. As shown in Figure 5, consumption grew over the past quarter of a century more rapidly than disposable income, greater income inequality notwithstanding, and the household savings rate fell to very low

[1] For empirical assessments of the increased American income inequality, as well as for a recent useful assessment of its several proposed explanations, including the declining influence of unions, the reduction in the real minimum wage, immigration and free trade, see Dew-Becker and Gordon (2005, 2007) and Piketty and Saez (2006, 2007).

[2] This loss, almost equally distributed among the bottom quintiles, corresponded to a proportional reduction of 28% for the lowest, 17% for the second, 9% for the third and 5% for the fourth.

[3] In 2005, the net household saving rate reached its lowest level since 1932–33.

values. In practice, the rise in the household savings rate that would have been brought about, *ceteris paribus*, by the concentration of the increases in total income that occurred over a long period of time on the upper 10% of the income distribution, was more than compensated, thanks largely to increased access to consumer credit, by the fall in the savings rates of the remaining 90% of the distribution.[1]

Now, one may usefully distinguish between three different routes through which the growing inequality is likely to have brought about the phenomenon of the rapidly rising indebtedness by low and middle-income households experienced in the USA: (i) declining or stagnant real incomes for significant sections of the population; (ii) the tendency of employee compensations to decline, as a share of total income, even when overall increases in real wages and salaries did take place (i.e. the tendency of real wages not to keep pace with productivity growth); (iii) an increasing divergency between top and bottom employee compensation. Let us see how the growing indebtedness by low and middle-income households may have resulted from these aspects of the growing income inequality.

The experience of the USA over the past 25 years or so seems strongly to confirm, first of all, that households struggle at least to maintain their living standards, so that when they see their inflation-adjusted disposable incomes fall they tend to save less and borrow more to make up the difference in the family budget. The English Classical Economists referred to the workers' acquired standards of living as their 'customary necessities', which become 'second nature', and they maintained that these historically developed necessities tend to

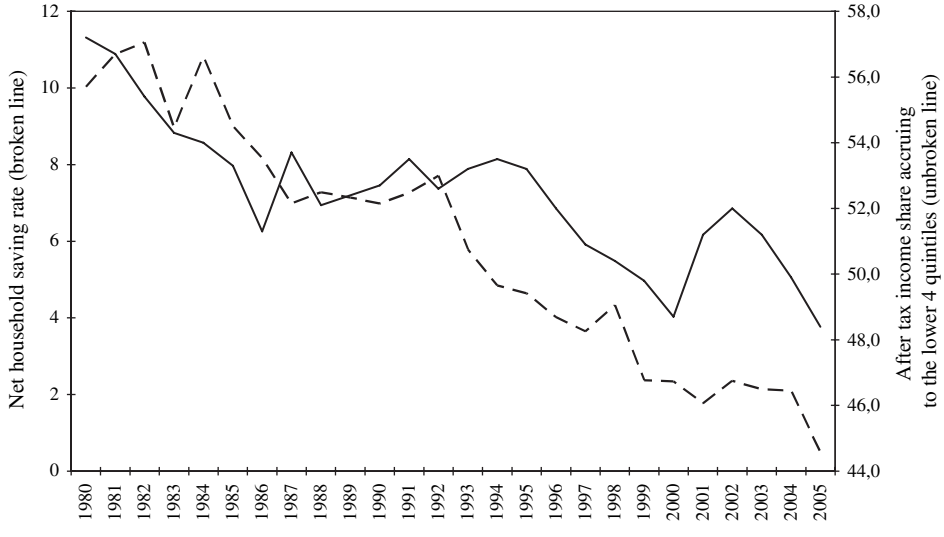

Fig. 5. *Household saving rate and after tax income distribution. Source: NIPA and Congressional Budget Office.*

[1] A radically different interpretation of the falling saving rate of the overall household sector has been put forward by Maki and Palumbo (2001). These authors trace back the fall in the saving rate to the consumption behaviour of the highest quintile of distribution. Notwithstanding the significant changes in distribution in favour of top income earners, wealth effects would have increased their propensity to consume to such an extent as to turn their saving rate negative. Admittedly, the suggestion that wealth effects might have led rich people to consume over their *rising* incomes is hard to swallow—also because it is associated with the idea that low- and middle-income households would have nearly doubled their saving rate in spite of the decline in the share of income allotted to them. For an empirical confirmation of the common sense notion that 'the rich save more', see Dynan *et al.* (2004).

determine the course of normal real wages. Actual US experience since the beginning of the 1980s seems to suggest that workers' acquired standards of living tend to determine their consumption levels, rather than their real wages, with the corollary that workers' consumption tends to be inelastic with respect to reductions in real wages. If, however, social and historical conditions are such that they result in persistently declining real wages, living standards and 'customary necessities' will, in the end, be squeezed up, so that conveniences that were customary at an earlier period may eventually become 'luxuries' (on this, see Pivetti, 1999).[1] In the long run, in other words, workers' consumption levels tend to adapt to the course of their normal real wages (more on this below).

As workers and their families struggled to keep up their living standards as long as possible, the overall household savings rate fell and household debt rose to unprecedented levels, accompanied by a marked shift in bank lending activities from business to household loans.[2] The point here is simply that already made by Duesenberry at the end of the 1940s, based on his study of consumption behaviour during the depression of the 1930s: consumption does not merely depend on the absolute level of current income, but also on current income relative to past income; people whose incomes are low relative to their past incomes reduce saving and incur deficits, if they have the necessary assets or credit, to protect their living standards (cf. Duesenberry, 1949, pp. 76–89).

Also families who saw their inflation-adjusted incomes remain constant are most likely to have turned to increased credit to finance consumption. A first reason for this is the availability of new goods and services—the most obvious example for the period under consideration being cellphones and other ICT household devices, which did not exist up to the end of the 1970s. One can say that even if the income of low and middle-income families had remained constant from the end of the 1970s to the end of the 1990s, the 'attraction' of these new goods was so 'irresistible' that they would have incurred deficits to get them (Duesenberry, 1949, p. 79). Apart from contact with new goods and services, increased recourse to credit by households who saw their inflation-adjusted incomes remain constant must have been prompted, in the period under consideration, by the reduction of the overall progressiveness of the tax system and the substitution of public by private provision in such areas as pensions, healthcare and education, which is likely to have diverted previous discretionary income that was used for other family needs.[3]

Finally, the drive for a *higher* standard of living and social recognition, as well as imitation of the upper classes, should be taken into consideration.[4] They appear most likely to have accounted for the rising recourse to consumer loans, not only by people whose real

[1] This is what is likely to have happened over the 1980s and up until the mid-1990s to many categories of US workers, with (i) the declining influence of unions and the fall in real average hourly earnings for all production and non-supervisory employees in private non-agricultural industries; (ii) the increase in the number of low-paying jobs, which occurred at the expense of the jobs offering wages close to the median; (iii) the marked reduction in the real value of the minimum wage through the 1980s and the first half of the 1990s; (iv) the marked increase in the poverty rate, with the rising share of low-income individuals in the population under 65 (cf. Pivetti, 1999, p. 282; Council of Economic Advisers, 1997, pp. 142, 146, 174, 179, 186).

[2] In 2006, bank lending to households (mortgage plus consumer loans) was more than twice the amount of bank lending to business, whilst in 1995 loans to households were slightly less than 70% of total lending to business (cf. Federal Reserve Board, Flow of Funds Account).

[3] In Europe, a declining government commitment to the welfare state has been accelerated by the Treaty of Maastricht and the Stability Pact, i.e. by each EU member country's renunciation of national sovereignty in the monetary and fiscal fields (see Pivetti, 1998).

[4] 'A rising standard of living is one of the major goals of our society. . . . In the individual sphere people do not expect to live as their parents did, but more comfortably and conveniently. . . . In view of this attitude it is easy to see why consumption will increase with income. But . . . what makes people with a given income increase their consumption?' (Duesenberry, 1949, p. 26).

incomes remained constant, but also by people whose real wages and salaries *did* rise over the past 20 years, though in the context of a declining employee compensation as a share of national income, as well as of increasing divergencies between top and bottom employee compensations. Duesenberry called this the 'demonstration effect', for which the frequency of impulses to increase expenditure depend on every individual's frequency of contact with people with higher standards of consumption and hence of higher social status than his own.[1] The strength of these impulses, in turn, ultimately depends on the ratio of his income to that of others with whom he comes into contact: 'It seems quite possible that after some minimum income is reached, the frequency and strength of impulses to increase expenditures for an individual depend entirely on the ratio of his expenditure to the expenditures of those with whom he associates' (Duesenberry, 1949, p. 32). As for Veblen, he stressed the role of the emulation motive, pointing out that any class has a constant tendency to expect its standard of living to go higher and to act accordingly, and that 'the propensity for emulation is probably the strongest and most alert and persistent of the economic motives proper' (Veblen, 1899, p. 110).

In sum, the point here is that, in the face of growing income inequalities such as those experienced by the USA over the past 25 years, the drive to continuously improve one's standard of living and 'keep up with the Joneses' contribute to bring about, if households are not credit constrained, a growing indebtedness to finance consumption in excess of current income. In consequence the household savings rate drops to very low values, as the savings of the upper 10% of the income distribution are increasingly compensated for by the dissavings of the lower 90% of the distribution.

In Appendix 1, we propose a 'Class Determined Aggregate Consumption Function' developed along the lines that we have just been putting forward.

7. Income inequality and consumption inequality

The inelasticity of consumption with respect to reductions in households' real incomes, the availability of new goods and services, the drive for a continuous rise in the standard of living and imitation of the upper classes are thus seen in our analysis as capable of sustaining consumption in the face of rising income inequalities. And in fact, as is widely acknowledged in the literature, the increase in income inequality experienced by the USA over the past 25 years has not been accompanied by a corresponding increase in consumption inequality.[2] The easing of liquidity constraints on low and middle-income households—financial deregulation and all of the circumstances that have increased households' accessibility to credit, starting from their enhanced capability to extract equity from the value of their houses—would have acted as the permissive factor, thanks to which the above-mentioned aspects of consumption behaviour were allowed to actually exert their positive impact on consumption expenditure.

This analysis seems to suggest that through household indebtedness it is possible to bring about the best outcome from the point of view of the capitalist system, i.e. that through household debt low wages can be brought to coexist with high levels of aggregate

[1] 'Contact' with people with higher standards of living can also occur through TV viewing. As has been pointed out, '[i]t is partly because of television that the top 20 percent of the income distribution, and even the top 5 percent within it, has become so important in setting and escalating consumption standards for more than just the people immediately below them' (Schor, 1998, p. 81). It has also been found that as television was introduced in America in the 1950s the type of crime that jumped up significantly was larceny (cf. Henningan *et al.*, 1982, quoted in Schor, 1998, p. 82).

[2] See, for example, Krueger and Perri (2006), Boushey and Weller (2006), Iacoviello (2006).

demand, without it being necessary, for this coexistence to be persistently ensured, to have recourse to state intervention and bigger government. Household debt thus appears to be capable of providing the solution to the fundamental contradiction between the necessity of high and rising levels of consumption, for the growth of the system's actual output, and a framework of antagonistic conditions of distribution, which keeps within limits the real income of the vast majority of society.[1] Indeed, not only the solution to this fundamental contradiction of capitalism, but the best of all possible worlds seems to have been brought about for the richest section of society. This is because with the substitution of loans for wages the share of actual income accruing to capitalists *et hoc genus omne*[2] is fed also by interest that wage earners must pay on the loans they obtain; moreover, the burden of servicing their debt pushes them, sooner or later, to work harder and for longer hours[3]—that burden, in other words, eventually enhances the workers' willingness to 'go anywhere and do anything' on such terms as can be got, thereby contributing to the persistence of low wages and labour costs.

8. On the long-run sustainability of household debt

Things, however, are not quite so simple. In fact, the question of the long-run sustainability of substituting loans for wages must be taken into account.

The algebra to which one may have recourse for understanding the gist of the question is substantially the same as that which is normally used to analyse the ratio of public debt to gross domestic product (GDP) and the determinants of its dynamic. Also with respect to household debt, the crucial factor is the difference between the rate of interest and the rate of growth of income. For an indebted household that eventually resolves on keeping consumption expenditure equal to its disposable income—which would correspond to a balanced primary budget in the dynamic of public debt—the debt–income ratio actually keeps on rising if $i > w$, where i is the rate of the interest and w is the rate of growth of the household's disposable income. In order to prevent this from occurring, our household's consumption will have to be reduced *below* its disposable income, the more so the larger the difference between i and w and the higher the debt–income ratio already reached (on the algebra of family debt sustainability, cf. Appendix 2).

The point is that, whilst in the case of public debt the rate of growth of total income is not exogenous with respect to the dynamic of the debt, in the case of indebted households the course of their incomes must be regarded as independent of the course of their debts. The

[1] Marx expressed this contradiction in the following terms: 'The workers are important for the market as buyers of commodities. But as the sellers of their commodity—labour power—capitalist society has the tendency to restrict them to their minimum price' (1893, p. 391). He then pointed out that the workers' limited levels of consumption cannot be compensated for by the accumulation of real capital because the latter 'never takes place for its own sake, but solely because more of this capital is needed in those spheres of production whose products pass into individual consumption' (1894, p. 359).

[2] Especially in the case of the USA, it appears that *hoc genus omne*, rather than capital owners, have been the greatest beneficiaries of the increase in income inequality (see, e.g., Piketty and Saez, 2006). A pace of productivity significantly exceeding that of real wages over time seems to have resulted in an especially marked increase in the income share accruing to business income and executive compensation. The increased ability of top executives to set their own pay and extract income at the expense of both labour and capital has brought about a dramatic change in their position relative to that of workers (cf. on this Piketty and Saez, 2007, table 5B.4, p. 220).

[3] According to Schor, 'average hours of work have risen about 10 percent in the last twenty-five years' (Schor, 1998, pp. 19–20). The Bureau of Labor Statistics provides a significantly more conservative assessment, though confirming the rise, from 1964 to 1999, in average hours of work for the private non-service sector (cf. Kirkland, 2000, table 1, p. 27).

budget deficits of the individual worker's family and the dynamic of his debt obviously do not affect, by themselves, the individual worker's wage. In the situation we are considering, this is substantially true also for the *whole* of wage earners; in fact, the growth of wage earners' debt is generated by the fact that their real wages do not rise, or their rise does not keep pace with productivity—a situation, that is to say, in which the growth of output, sustained also by debt-financed consumption expenditures, results in total income increases that tend to concentrate on the upper 10% of the income distribution. In the case of indebted households, therefore, the denominator of the debt–income ratio must be regarded as substantially exogenous with respect to the course of the numerator—not because it reflects some 'natural' output of the economy, but because of sluggish real wages and the changes in income distribution that accompany the growth of actual output. Even when the real income of low and middle-income households is to some extent positively affected by the growth of their debt and of actual output,[1] the difference between i and w remains in any case too large to be compensated for without having to cut down, eventually, on consumption. One should keep in mind in this regard that the relevant rate of interest here is not the rate to be earned on long-term riskless financial assets, but the significantly higher rates to be paid on the different types of consumption credit.

Beyond certain levels of indebtedness, the service of the debt on the part of the indebted households actually becomes no longer collectable. The process of substitution of loans for wages cannot therefore go on indefinitely, for the individual wage earners already involved in it, unless one could assume that the credit system may end up extending them sunk sums deliberately, counting on interventions in its favour on the part of the lender of last resort. But this would amount to assuming a sort of *systematic* monetisation of household debt, by which, in practice, the lender of last resort would keep ensuring wage earners, through the banks, the sums they need to maintain or increase their standards of living. Obviously, this most unrealistic assumption is something quite different from recourse to exceptional injections of liquidity by the central bank aimed at providing some relief to the banking system, once the latter is confronted by the crisis of household debt, so as to contain the impact of the ensuing financial turmoil on the real economy.

9. Managing a rising debt

As actual experience seems to suggest, the macroeconomic sustainability of the process of substitution of loans for wages is prone to being significantly protracted by two means: (i) by the expansion of the population caught in it, i.e. by trying to involve an increasing number of wage and salary earners in the indebtedness process. The considerable expansion over the last few years of the so-called subprime loans may be regarded as the most conspicuous aspect of this first means of protracting the process; (ii) by a policy of progressive lowering of interest rates, such as that followed by the Federal Reserve over the 1995–2005 decade.

Thanks to that policy, the increase in the ratio of debt–DPI was accompanied in the USA (at least up until 2002) by an increase also in the ratio of household net worth to disposable income, owing to the rise in prices of securities and in the value of houses brought about by the downtrend in long-term interest rates. What is more, as interest rates kept on falling,

[1] Provided that the growth of output is sufficiently robust to allow for increases in employment, then sluggish real wages for the average worker and the rise in wage and income inequality can be counterbalanced, at least partly, by the increase in the number of members within a family who work for money. According to Boushey and Weller (2006), income inequality rose in the USA over the past few decades notwithstanding the parallel increase in the number of wives and mothers who worked outside the home, as well as in the number of hours worked by them (see also Mishel *et al.*, 2005).

the debt service burden, as measured by debt service as a share of DPI, did not rise—indeed, this share remained below the value it had reached in the late 1980s, notwithstanding the continuous rise in the overall household debt and in its ratio to DPI. Declining interest rates, in sum, contained over a few years the share of DPI of indebted households required to service the increasing outstanding stock of their debt, thus freeing up income that could be devoted to consumption expenditures (largely through huge flows of mortgage refinancing). Finally, parallel to the cheap money policy and the decline in interest rates, a temporary upward trend in real wages was brought about in the USA over the second half of the 1990s (cf. Joint Economic Committee, 2003, p. 16; see also Juhn *et al.*, 2002, and Mishel *et al.*, 2003). Without that change in the trend of wages, household indebtedness would have probably grown still more rapidly.

It should be observed, however, that these effects of the downtrend in interest rates do not seem to have checked the increase in consumer bankrupt cases, whose rate, after a short interruption between 1992 and 1994, resumed its rise in the USA in the second half of the past decade (cf. Sullivan *et al.*, 2000). There can be no doubt, in any case, that the possible consolidation of an overall dearer monetary policy, or the emergence of a situation in which the value of houses dropped faster than interest rates could be lowered, would rapidly exacerbate the financial distress of low and middle-income households, thereby accelerating the *redde rationem* of the process of substituting loans for wages. In fact, even if the government steps in and buys, through the central bank, some of the worst household debt, with a view of easing the difficulties in the interbank markets and thus check the impact of households' financial distress on the real economy, borrowing by households in any case must drop, bringing to an end the expansion of wage earners' expenditure through the substitution of loans for wages.

10. Household debt versus public debt

Before closing this article, it is worth returning briefly to the question of private versus public debt. In all likelihood, the rise in household indebtedness experienced by several developed countries over the past 25 years has been fed also by changes in secondary distribution, i.e. by falling relative weights of capital and direct taxation, accompanied, especially in Europe, by a declining government commitment to the welfare state and overall budgetary stringencies aimed at the formation of primary surpluses. To the extent that this has been the case, then one may say that, besides the substitution of loans for wages, a process of substituting household debt for public debt has also taken place in a number of countries over the past few decades.

Both public and household debt may well act as demand management tools.[1] But apart from their different distributive underpinnings and implications, they differ significantly also as regards the sustainability of recourse to them over time. As already pointed out in Section 8, GDP and total income cannot be regarded as given in the face of government budget surpluses or deficits and the consequent changes in the stock of public debt. The rate of growth of output, in other words, is not exogenous with respect to the rate of growth of public debt, with the corollary that a continually rising public debt does not necessarily imply a continually rising public debt–GDP ratio, nor rising interest payments on the debt

[1] It is a firm, though rather unnoticed fact, that countries with lower public debt to GDP ratios tend to exhibit higher private debt to GDP ratios (see Pasinetti, 1998). This seems to suggest that systematic recourse to debt has been a common feature of most advanced economies, and that, when considering the overall debt, public and private debt (both household and business debt) come out as alternative and potentially substitutive demand management tools.

as a share of total disposable income. If the rate of growth of public debt does happen to exceed the rate of growth of GDP then, of course, the debt–GDP ratio rises, but, as is widely acknowledged, no critical level of this ratio is definable beyond which its rise would become economically unsustainable (see, on this, Ciccone, 2002). Concerning in particular the rise in the share of interest payments in total disposable income, the likely counterpart of a rising debt–GDP ratio, however objectionable this rise is from a socio-distributional point of view, nevertheless it poses by itself no problem for the living standard of wage earners, unless it is accompanied by a falling *absolute* level of their net incomes. Moreover, the service of public debt can always be kept under manageable control, as long as the government is willing to exploit its tax capacity. In actual fact, a substantial fraction of taxes needed to service the public debt impinges upon wage earners, while interest largely accrues to a *rentier* class, which does not overlap with the working population. In principle, however, an adequate degree of progressiveness of the tax system, together with the inclusion of all capital income in the tax base, could ensure that interest income received by the *rentier* class is offset by what that same class pays out in taxes. In the case of private debt, instead, it is obvious that the possibility that the lender is burdened with the cost of the debt service must be ruled out, and hence that the burden of household debt must fall entirely upon the indebted households themselves. In comparing, therefore, the long-run sustainability of household and public debt, one should keep in mind that not only is the gap between the rate of interest and the rate of growth of income much higher for the former, but also that there is no way to water down the burden of its service by making the hand that repays principal and interest belong to one and the same body as that which pockets them.

In addition to the sustainability question, the case for public rather than household debt will appear further reinforced if one considers the likely necessity for the government to eventually intervene to safeguard a financial system severely stressed by an excessive amount of no longer collectable outstanding debts. In the end, the piling up of household debt would thus actually result in a rising public debt, unless taxpayers could be called upon to provide for the funds to be used to preserve the financial system's capacity to extend credit.

The inner dynamics of both public and household debt depend largely on interest rates. With respect to public debt, for any given primary deficit, the rise in the public debt–GDP ratio, as well as the rise in the share of government interest spending in total disposable income, can be checked by interest rate control. With respect to household debt, we have already pointed out how a persistent cheap money policy is likely to have significantly delayed, in the USA, the *redde rationem* of its rapid rise. The fact is, however, that the position of the dollar as the key international currency has allowed the USA to keep a fair amount of control over the level of domestic interest rates, overall financial liberalisation notwithstanding. For the rest of the world, financial liberalisation may interfere severely with demand management through debt, owing to the greater loss of control over the level of domestic interest rates that it entails, actually acting as a stricter constraint. But though this constraint acts upon both public and household debt, our analysis suggests strongly that it is especially the economic sustainability of demand management *through household debt* that can be made extremely problematic, at any moment, by the free flow of capital and the consequent loss of interest rate control.

In the light of the above we may simply conclude, first, that for any capitalist economy, in a long-run perspective, recourse to public debt appears decidedly more appropriate than recourse to household debt for sustaining aggregate demand and activity levels; second, that for any economy other than the American one—for the European economies in the first place—their capabilities to bring high levels of demand to coexist over time with both

low wages and a shrinking intervention of the state appear to be even more restricted than for the US economy.

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Appendix 1

A class determined aggregate consumption function

In period t, aggregate consumption of low and middle-class households (C_t^L) can be represented by the following function

$$C_t^L = a^L Y_t^L + b^L\left(Y_t^U / Y_t^L\right) + c^L\left(Y_O^L / Y_t^L\right) + n^L\left(NG\&S_t^L\right) - w^L\left(WS_t^L\right) \qquad (1)$$

where Y_t^L is the current personal disposable income of the members of low and middle classes; Y_t^U is the current income of the upper class; Y_O^L is the highest income attained by class L before period t; $NGeS_t^L$ is the current availability of new goods and services; WS_t^L is the amount of goods and services provided by the welfare state, and a^L, b^L, c^L, n^L and w^L are positive consumption parameters.

The ratio Y_t^U / Y_t^L can be regarded as a measure of the inequality in the income distribution between classes. Following Dusenberry's relative income theory of consumption, we assume that when this ratio grows, low-income and middle-income classes, in order to 'keep up with the Joneses', devote a higher share of their disposable income to consumption. We suppose that there is also a positive relationship between consumption and the ratio between past and current income Y_O^L / Y_t^L. This relationship expresses a second feature of our consumption function *a la* Dusenberry: due to habit ratchet effects, households oppose retrenchment in their acquired standard of consumption. The availability and attractiveness of new goods and services exerts a positive influence on consumption, while an increase in the amount of public-provided goods and services influences consumption in the opposite direction.

Totally differentiating our 'class consumption function', we get:

$$dC_t^L = a_t^L dY_t^L + b_t^L\left[\left(dY_t^U / Y_t^U\right) - \left(dY_t^L / Y_t^L\right)\right]\frac{Y_t^U}{Y_t^L} + c_t^L\left[\left(dY_O^L / Y_O^L\right) - \left(dY_t^L / Y_t^L\right)\right]\frac{Y_O^L}{Y_t^L} + \\ + n_t^L dNGeS_t^L - w_t^L dWS_t^L \qquad (2)$$

The term in the first square bracket expresses variations in income distribution. When aggregate income changes, if this change is distributed between income groups in the same proportion they bear to total distribution, the term is zero. On the contrary, if most of the income increase is reaped by high-income families, the relative positions of low- and middle-class households worsens and their consumption rises. The term in the second square bracket is negative as long as there is an increase in aggregate low- and middle-class income (being Y_O^L the highest income attained by class L before time t, and hence at $Y_O^L / Y_O^L = 0$). This formulation thus excludes any positive influence of the habit ratchet effect on consumption unless current income falls (i.e. $dY_t^L < 0$). A different interpretation of this effect can be easily

developed interpreting Y_O^L as representing the income level *expected* by low- and middle-class households. The difference between dY_O^L/Y_O^L and dY_t^L/Y_t^L represents, in this case, the discrepancy between the expected and the realised growth rate of DPI. If this difference is positive, families' expectations for improvement in their income position are frustrated and they will react, implementing their desired improved standard of living at the expense of saving. When households' relative income position is unchanged (both in the horizontal class dimension and in the vertical time dimension), and the availability of new and public-provided goods and services does not vary, the consumption function reduces to a customary income–consumption relationship with a marginal propensity to consume equal to a^L.

Let us now derive an aggregate consumption function adding, for the sake of simplicity, just another class (the upper) to the low- and middle-income group. The consumption function of the upper class is

$$C_t^U = a^U Y_t^U + c^U\left(Y_O^U/Y_t^U\right) + n^U\left(NG\&S_t^U\right) \tag{3}$$

where we are assuming no impact of the welfare state on the upper class consumption choices and no emulation effect. Aggregate consumption is then equal to

$$C_t = C_t^U + C_t^L \tag{4}$$

while aggregate DPI is

$$Y_t = Y_t^U + Y_t^L \tag{5}$$

Indicating with δ the share of total disposable income appropriated by the upper class, and assuming that expectations of income growth are fulfilled in both classes and that no changes occur in $NGeS_t$ and WS_t, after differentiating the aggregate consumption function with respect to changes in aggregate disposable income and distribution we get

$$dC_t = [a^U\delta + a^L(1-\delta)]dY_t + \left[(a^U - a^L)Y_t + b^L\Big/(1-\delta)^2\right]d\delta \tag{6}$$

The first term in the second square bracket expresses the effect that shifts in income shares exert by themselves on consumption, regardless of the influence that changes in relative income positions exert on consumption through emulation. Under the well established assumption that the higher the income the lower the propensity to consume ($a^L > a^U$), increases in the share of income allotted to the upper class exert a negative impact on the aggregate consumption–income ratio. Yet, since this change worsens low- and middle-class relative income position, their consumption behaviour will exert a countervailing impact. If $\left[(a^U - a^L)Y_t + b^L\Big/(1-\delta)^2\right] > 0$, then the latter impact outpaces the former and a more unequal income distribution may well exercise a net negative impact on the saving rate. Habit ratchet choices may reinforce this possibility. Until changes in distribution acquire the permanence necessary to foster a revision in expectations, this second channel will exert a negative influence on the saving rate of low- and middle-income class (partly compensated by an increase of the upper class savings). Taking into account habit ratchet effects, the following terms need to be added to the right-hand side of equation (6):

$$c^L\left\{\left(dY_o^L/Y_o^L\right) - \left[\left(dY_t/Y_t\right) - d\delta/(1-\delta)\right]\right\}\frac{Y_o^L}{(1-\delta)Y_t} + c^U\left\{\left(dY_o^U/Y_o^U\right) - \left[\left(dY_t/Y_t\right) + d\delta/\delta\right]\right\}\frac{Y_o^U}{\delta Y_t} \tag{7}$$

The term in the first (second) square bracket indicates the difference between expected and realised income growth of the low- and middle- (upper) income class. If $d\delta > 0$, the

change in distribution widens the gap between expected and realised income growth for low- and middle-income families. As they attempt to conform their standard of living to the desired higher plateau, their saving rate will fall. The high income class, on the contrary, will see its aspiration gap reduced, and will retrench consumption accordingly. Significant differences between c^L and c^U increase the likelihood of a prevalence of the former effect on the latter. Moreover, if we introduce the additional assumption that as the effective growth rate slows households tend to revise their expected income growth at a snail's pace, while when the effective growth rate increases they suddenly revise expectations accordingly, the pro-saving effect of income share shifts toward upper income classes will be considerably reduced.

Appendix 2

The algebra of family debt sustainability

The two financial sources of household balance (income and credit) can be spent on consumption, to invest in financial and housing assets or to service the debt

$$DPI_t + NAFL_t = C_t + (NAFA_t + NAHA_t) + iFL_{t-1} \quad (1)$$

where DPI_t is disposable personal income gross of interest payments, $NAFL_t$ is the net acquisition of financial liabilities, C_t is personal consumption expenditures, $NAFA_t + NAHA_t$ is the net acquisition of financial housing and assets, and iFL_{t-1} is the amount of interest due on the stock of family debt.

The stock of family financial liabilities (FL) evolves through time according to the following relation

$$FL_t = FL_{t-1} + NAFL_t \quad (2)$$

Substituting the former identity into the latter and expressing relative to DPI, we obtain

$$\frac{FL_t}{DPI_t} = \frac{FL_{t-1}}{DPI_{t-1}} \frac{(1+i)}{(1+w)} - (s-k) \quad (3)$$

where w is the growth rate of DPI, s is the saving rate, and k is the share of income devoted to net acquisitions of tangible and financial assets. The saving rate s can be seen as a sort of primary surplus of the personal sector; $(s-k)$ is thus the amount of this surplus devoted to repay debt obligations, expressed as a percentage of DPI.

We can now impose on the household unit the customary public debt sustainability condition. The condition centres, in this case, on the stock–flow ratio between the level of household financial liabilities and family DPI (FL/DPI)

$$\frac{FL_t}{DPI_t} \leq \frac{FL_{t-1}}{DPI_{t-1}} \quad (4)$$

Family debt is sustainable if the $\frac{FL}{DPI}$ ratio decreases or remains constant through time. Given that $\frac{1+i}{1+w}$ can be conveniently approximated by $(1 + i - w)$, the sustainability condition becomes

$$(s-k) \geq (i-w)\frac{FL}{DPI} \quad (5)$$

For a family devoting no primary surplus to repay debt obligations ($s - k = 0$), the debt–income ratio will rise if the average interest rate on the stock of debt (i) outpaces the rate of

growth of its income (w). The $\frac{FL}{DPI}$ ratio will remain constant or will decrease, instead, if the amount of primary surplus devoted to repay debt obligations ($s - k$) is such as to equal or offset $(i - w)\ \frac{FL}{DPI} > 0$. The higher the ratio of financial liabilities to income, the higher the saving rate that assures sustainability will need to be.

To illustrate the significance of the sustainability condition let us consider the case of a hypothetical family starting with a FL/DPI ratio of 100%, an average interest rate on the stock of debt of 10%, a growth rate of family income of 4%, a saving rate gross of interest payment of 3% and a nil net assets acquisition–income ratio. As can be seen, this case violates the sustainability condition [3%<(10%–4%)100%]. With a 3% saving rate, the FL/DPI ratio will duplicate in about 20 years. To stabilise the FL/DPI ratio at the initial level (100%), the difference between s and k should be 6%. This value could be obtained, leaving unchanged the net acquisition of assets–DPI ratio, with a saving rate equal to 6%, i.e. personal consumption expenditures in percentage of DPI should fall by 3%. With an unchanged saving rate, the family can avert the growth of the debt–income ratio, becoming a net seller of assets by an order of 3% of DPI. Alternatively, if the net assets acquisitions ratio remains unaffected, the debt–income ratio could be stabilised with a DPI growth rate of 7% or with an average interest rate of 7%.

As one can see from our example, the difference between the average interest rate on the stock of debt and the growth rate of family income is critical in order to assure family debt sustainability. If $(i - w) = 0$, *any* FL/DPI ratio could be stabilised with no saving and zero net selling of assets. On the contrary, to assure sustainability, a high $(i - w)$ imposes a high $(s - k)$, even to families with relatively contained FL/DPI ratios. This point is well known from the algebra of public debt sustainability, but it acquires particular relevance when referred to the household sector. In fact, the average interest rate on the stock of private debt is much higher than the average rate on the stock of public debt. Furthermore, due to the recorded shifts in income distribution, the growth rate of indebted families' income is lower than the income growth in the aggregate. For example, interest rates on instalment loans were equal to 17.7% in 1985, 13.9% in 1995 and 13.6% in 2000 (cf. Dynan *et al.*, 2003, p. 419); the rates on US Treasury Securities with a 10 year constant maturity reached, in the corresponding years, 10.6%, 6.6% and 6%, respectively. The aggregate growth rate of DPI averaged around 4% from 2000 to 2005, while no more than a 3.5% DPI growth rate can be attributed to families falling in a range comprised between the first and the third quintile of distribution. Many indebted families, thus, are forced to deal with a $(i - w)$ difference which is more than twice as large as that of the public sector figure.

A second fundamental difference between the algebra of public and private debt concerns the sustainability condition. The condition described by equation (4) allows the debtor to roll over a non increasing FL/DPI ratio indefinitely. While for the public sector this appears appropiate, for a single household unit it may not. Families can stretch, to some extent, the repayment period through a number of arrangements, such as the renegotiation of the loan or the switching from one lender to another. Nevertheless, for many borrowers, the access to new and alternative credit lines is made conditional upon the repayment of the preceding loan. The proper sustainability condition for a very large number of household units, therefore, is bound to impose the settlement of the loan (partially or in full) over a more or less extended repayment period. For example, if condition (4) is replaced by $\frac{FL_{t-1+19}}{DPI_{t-1+19}} = 0$, i.e. the debt has to be settled completely over 20 years, the constant saving rate that assures sustainability moves from 6% to about 9%.

Even if every individual household unit was forced to repay the debt in full before entering into a new debt arrangement, additional lines of credit can be opened in the

economy quite independently from existing debt positions, provided that non-indebted households are involved in the process. The condition described by (4), therefore, retains some significance when referred to the private sector as a *whole*. Both the involvement of new non-indebted families and the diffusion of arrangements that let households extend the repayment period favour the roll-over of the debt, with the former operating only in the aggregate and the latter acting positively at the individual level.