A Theory of Aggregate Consumption

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Abstract

We develop a Keynesian model of aggregate consumption. Our theory emphasizes the importance of the relative income hypothesis and debt-finance for understanding household consumption behavior. It is shown that particular importance attaches to how net debtor households service their debts, and that the treatment of debt servicing commitments as a substitute for savings by these households creates the potential for “sudden stops” in consumption spending (and hence aggregate demand). The implications for aggregate consumption of changes in the distribution of income and changes in the composition of employment are also explored.

J.E.L. Codes: E12, E21

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1. Introduction

Even prior to the onset of the financial crisis and Great Recession, Keynesian macroeconomists had begun to draw attention to low- and middle-income households’ use of debt to supplement stagnating wage income in the pursuit of consumption expenditures (Palley, 2002; Cynamon and Fazzari, 2008; Barba and Pivetti, 2009). Of particular concern among these economists was the possibility that household debt accumulation would prove to be unsustainable, offsetting real wage stagnation and buttressing consumption spending (and, by extension, aggregate demand) only for as long as it took the consequences of mounting household financial fragility to materialize and force a retrenchment.

Motivated by these observations, the purpose of this paper is to develop a theory of aggregate consumption spending that draws on two existing traditions in Keynesian macroeconomic modeling. The first is the Kaleckian distinction between consumption by wage earners and consumption by profit earners. Using the functional distribution of income as a first approximation for the size distribution of income, this allows for the possibility that the distribution of income affects aggregate consumption spending. We modify the basic Kaleckian approach in two important respects. First, following Palley (2005) and Lavoie (2009), we distinguish between two groups of wage earners: production and lower-level supervisory workers, and upper level managers. This is motivated by the observation that while increases in income inequality over the past three decades have resulted partly from increases in the profit share, they have also been

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1 For more recent contributions to this literature, see Setterfield (2012, 2013) and Cynamon and Fazzari (2013).
2 On which, see Glyn (2009) and Atkinson (2009).
associated with burgeoning wage inequality. Second, following Pasinetti (1962) and Palley (2012), we allow for the fact that all workers who save derive some of their income from property. This follows from the fact that if workers save they accumulate wealth, which must, in turn, attract profit, interest and/or rental income.

The second and, for our purposes, most important existing tradition on which we draw is the relative income hypothesis (Duesenberry, 1949) and the contemporary insights of Cynamon and Fazzari (2008, 2013) regarding household debt accumulation and consumption spending in the presence of emulation effects. In our model, working households rely on borrowing in order to finance consumption expenditures that cannot be funded by current income, in an environment of fundamental uncertainty in which: a) the future consequences of current debt accumulation cannot be systematically predicted; and b) households rely on norms to guide behavior, including a desired or target level of consumption that is influenced by (inter alia) consumption standards set by other (wealthier) households. In so doing, we seek not only to formalize but also to extend the insights of authors such as Cynamon and Fazzari (2008, 2013) regarding the interplay of borrowing, debt accumulation, and aggregate consumption. In particular, we look more closely at how, exactly, households manage debt servicing commitments, and how these commitments can, in turn, be expected to affect consumption spending.

The remainder of the paper is organized as follows. In section 2, we briefly discuss the recent literature that draws upon the relative income hypothesis, drawing

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3 For empirical evidence of rising wage inequality in the U.S., see Heathcote et al. (2010).
4 For kindred theories see Palley (1994) and Dutt (2005). Palley (1994), who uses a linear multiplier-accelerator model, studies the implications of household borrowing for macroeconomic stability. Dutt (2006) investigates the macroeconomic effect of consumer debt within a neo-Kaleckian growth and distribution framework. Note, however, that the primary concern of these authors is understanding the macrodynamic implications of consumer debt, rather than developing the theory of consumption per se.
5 See D’Orlando and Sanfilippo (2010) on the Keynesian pedigree of this principle as it applies to the theory of consumption spending.
attention to the gap in this literature that we seek to fill. In section 3, we outline the basic accounting relationships that show how the heterogeneous households in our model are related to one another. Section 4 begins development of the model in earnest, a task that is continued in section 5, where we consider various ways in which households might respond to rising debt servicing commitments, and how this affects their consumption spending. Section 6 demonstrates the effects of income re-distribution and changes in the composition of employment on aggregate consumption. Finally, section 7 offers some conclusions.

2. Literature Review

A number of empirical studies, rooted in a variety of different theoretical traditions, lend support to the consumption behavior predicted by Duesenberry’s (1949) relative income hypothesis. For example, Ravina (2007) finds that the consumption of the reference group is an important determinant of household consumption behavior in her study based on estimations of the Euler equations associated with intertemporal optimization by a representative household. Bowles and Park (2005), meanwhile, show that work hours tend to increase as income inequality increases in ten advanced economies (including the US), and suggest that this is due to the desire of those less well-off to emulate the consumption standards of the rich. The relative income hypothesis has also featured prominently in the recent literature on the macroeconomics of happiness. For example, Luttmer (2005) and Alpizar et al (2005) find that individual well-being depends on relative consumption as well as the absolute level of consumption.
It is perhaps not surprising, then, to find that efforts have been made to incorporate the relative income hypothesis into the mainstream permanent income/life-cycle hypothesis based on dynamic optimization. In Dybvig (1995), utility maximizing households experience addiction effects, as a result of which consumption rises in response to increases in income by more than it falls in response to commensurate reductions in income. Alvarez-Cuadrado and Van Long (2011), meanwhile, construct a model in which individual utility depends (inter alia) on the utility achieved by a reference group, so that the consumption behavior of each individual agent is dependent upon the reference group’s lifetime income as well as the agent’s own lifetime income.

The relative income hypothesis has long been an important intellectual source for Post Keynesian economists, of course, particularly as part of their efforts to understand household consumption behavior and its relationship to debt accumulation. Emulation effects (based on “keeping up with the Joneses” and/or the desire to surpass previous standards of living) are associated with quantitative and qualitative changes in household debt accumulation, as households pursue consumption targets that are incompatible with their real incomes. For example, Barba and Pivetti (2009), Foster and Magdoff (2009), and Setterfield (2012, 2013), among others, argue that increasing income inequality coupled with the working class’ desire to emulate wealthier households is one of the main causes of the pattern of household debt accumulation in recent US experience.

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6 See Palley (2010) for a parallel attempt to incorporate insights from the permanent income hypothesis into a structural model based on the relative income hypothesis.
7 The importance of relative income in understanding consumption behavior has been well-understood by heterodox economists since Veblen.
8 The qualitative changes include such phenomena as cash-out mortgage refinancing, which effectively allows households to consume (rather than steadily accumulate) equity in the homes they own.
9 Krueger and Perri (2006), using Consumer Expenditure Survey data, document that rising income inequality was not matched by rising consumption inequality during the period 1980 to 2003. For example,
and Fazzari (2008), meanwhile, provide a detailed explanation of this behavior based on the notion that consumer preferences endogenously evolve in a world of social cues. Drawing on the insights of the relative income hypothesis, they suggest that households tend to learn consumption patterns from social reference groups, arguing that the expansion of social reference groups (through advertising and the mass media, for example) has been an important cause of US household debt accumulation since the 1980s. Cynamon and Fazzari also reflect on the contribution this has made to household financial fragility and hence the vulnerability of the economy to a Minsky crisis.

Clearly, the relative income hypothesis has played an important role in understanding recent patterns of consumption behavior and debt accumulation in the Post Keynesian tradition. But little attention has been paid to the development of a formal theory of consumption that, based on the insights of the relative income hypothesis, links debt accumulation to consumption behavior, and draws out the implications for aggregate consumption of borrowing, debt accumulation, and different possible responses to debt servicing obligations by net debtor households. As noted earlier, the contributions of Palley (1994) and Dutt (2005) make inroads into these tasks, but are chiefly concerned with the properties of macrodynamic models rather than developing the theory of consumption per se. Palley (2010), meanwhile, is devoted to developing the theory of consumption (by combining the relative and permanent income hypotheses), but the main purpose of this paper is to provide a microfoundation for the differing propensities to spend of social classes: it does not address debt accumulation and the subsequent

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they report that the standard deviation of log consumption rose only by half as much as that of income between 1980 and 2003.
implications of debt-servicing obligations for aggregate consumption. One of the goals of our paper is to fill this gap in the literature.

3. Some preliminary accounting relationships

It is useful to begin by setting out some accounting relationships that show how the heterogeneous households whose behavior we model in the following sections are related to one another, and to the rest of the economy. We begin by writing:

\[ Y = \omega + \Pi \]  \hspace{1cm} \text{[1]}
\[ \omega = W_p \varphi N + W_r (1 - \varphi) N \]  \hspace{1cm} \text{[2]}

where \( Y \) denotes nominal income, \( \omega \) is the nominal wage bill, \( \Pi \) denotes total nominal profits, \( W_p \) is the nominal wage of production and lower-level supervisory workers, \( W_r \) is the nominal wage of the “working rich”, \( N \) is the level of employment, and \( \varphi \) denotes the proportion of production and lower-level supervisory workers among total employees. It follows upon substitution that:

\[ Y = W_p \varphi N + [W_r (1 - \varphi) N + \Pi] \]  \hspace{1cm} \text{[3]}

In this formulation, \( W_p \varphi N \) is the income of working households and \( W_r (1 - \varphi) N + \Pi \) is the income of rentier households (capitalists and the working rich). In other words, the three types of income recipients (production and lower-level supervisory workers, the “working rich,” and capitalists) define two types of households (working and rentier

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10 Following Wolff and Zacharias (2009), the term “working rich” refers to upper-level salaried employees who have, in increasing numbers, joined capitalist households at the very top of the income distribution over the last thirty years. See Piketty and Saez (2003), Wolff and Zacharias (2009) and Atkinson et al (2011) on the evolution of “top incomes” in the US. See also Mohun (2006) on the correct accounting treatment of the “wage” income earned by the “working rich”.
households). Our purpose in making this bilateral distinction between households is that we can impute to each identifiably different characteristics when it comes to consumption behavior. First, we assume that working households conventionally consume a larger fraction of their current income than do rentier households. Second, we assume that working households borrow to finance some part of their current consumption, whereas rentier households do not.

Bearing in mind the second of the two assumptions stated above, the balance sheet and transaction flow relationships between working and rentier households and the rest of the domestic economy are described in the social accounting matrices (SAMs) in Tables 1 and 2.

[TABLES 1 AND 2 HERE]

Tables 1 and 2 serve to illustrate both how working and rentier households are related to each other, and how the household sector and corporate sector of the economy fit together. There are several noteworthy features of these SAMs. First, observe that because our purpose in this paper is to model aggregate consumption spending, our behavioral analysis inevitably focuses on households. The image of firms and banks that emerges from the SAMs in Tables 1 and 2 is highly stylized and simplified. Firms, for example, are represented as static production processes whose capital does not depreciate and who do not engage in investment. Meanwhile, it follows from the transactions flow matrix in Table 2 that:

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11 As explained by Palley (2012, p.462), this is equivalent to assuming that capitalists receive some part of the wage bill as remuneration for their role as managers.
12 The importance of this distinction will become clear subsequently.
13 Rentier households lend to working households, but as will become clear, working households engage in saving and therefore finance some of their own borrowing.
14 There is, then, no growth in the economy we are contemplating. Put differently, ours is a static analysis of an economy at a particular point in time.
\[-i(D_w + D_R) + iL_w = 0\] \[\Rightarrow D_w + D_R = L_w\]

In other words, banks are no more than passive intermediaries between households who earn no income from the intermediation services they provide (equation \([4]\)) and accumulate no net worth (equation \([5]\)). Note also that it follows from equation \([5]\) that:

\[D_R = L_w - D_w\]

This tells us that the deposits of rentier households fund only part of the debt accumulated by working households for the purpose of consumption expenditure. As intimated earlier, part of the debt accumulated by working households is funded by other working households, as a result of the fact that working households are assumed to engage in some amount of saving out of their current income.\(^{15}\)

Finally, the capital account of banks’ transactions flow matrix in Table 2 reveals that:

\[S_w + S_R = B\]

Equation \([7]\) is the flow counterpart of equation \([5]\). In the simple closed economy with no investment described in Tables 1 and 2, it simply amounts to the short run macroeconomic equilibrium condition that leakages (total savings, \(S_w + S_R\)) equal injections (autonomous, credit-financed consumption spending by working households, \(B\)). Also, equation \([7]\) again draws attention to the fact that working households are assumed to engage in saving out of current income even as they accumulate debt to

\(^{15}\) As is clear from Tables 1 and 2, saving by working households results in the latter accumulating wealth exclusively in the form of interest-earning bank deposits: all corporate equity is owned by rentier households. This is a departure from the approach taken by Pasinetti (1962) and Palley (2012), in which physical capital is the only asset that households can own, as a result of which workers who save receive some share of profit income. Clearly, the two approaches need not be mutually exclusive.
finance current consumption. This behavior is consistent with stylized facts, and may be explained as follows. First, working households are, themselves, heterogeneous: some engage in saving and do not debt-finance current consumption, while others do not save and simultaneously consume more than they earn by borrowing. Second, in an environment of fundamental uncertainty and imperfect credit markets, it is rational for any individual household that wishes to consume in excess of current income to simultaneously save and borrow. This is because uncertainty implies a precautionary demand for liquidity to meet unforeseen contingencies, while imperfect credit markets mean that dis-saving and borrowing are not perfect substitutes: a household is always legally entitled to draw down its previously accumulated wealth, but has no similar entitlement to borrow.\footnote{Based on an analysis of data from the 2009 TNS Global Economic Crisis Survey of households in 13 countries, Lusardi et al (2011) find that a large proportion of households tend to resort first to depletion of their savings as a coping method in the event of a financial emergency.}

4. A model of aggregate consumption

Our purpose in this section is to develop a model of aggregate consumption that pays particular attention to the relationship between consumption spending and household debt accumulation. Recall that, by assumption, only working households borrow to finance current consumption.

On the basis of the SAM in Table 2, aggregate consumption ($C$) can be written as:

$$C = C_w + C_r + B$$  \[8\]

Note that borrowing by working households to finance consumption spending independently of current income ($B$) results in the accumulation of a stock of debt by these households and the accumulation of an equivalent stock of financial assets by other

$$C = C_w + C_r + B$$
households (see Table 1). The influence of debt on consumption will become clear below when we explicitly model $C_W$ and $C_R$. The influence of financial assets (and, indeed, wealth more generally) on consumption spending is, however, overlooked in what follows for the sake of simplicity. Stylized facts (an extremely unequal distribution of wealth coupled with small marginal propensities to spend on the part of the richest members of society) suggest that the impact of wealth on aggregate consumption is positive but modest.

We next model borrowing by working households as:

$$B = \beta(C^T - C_W), \quad 0 < \beta < 1$$  \[9\]

where $C_T$ denotes a target level of consumption and $C_T > C_W$ by assumption. The exact size of the adjustment parameter $\beta$ is sensitive to (inter alia) household borrowing norms and financial market lending norms. Borrowing only partially closes the gap between $C_T$ and $C_W$ at any point in time, so that households typically consume at a level that differs from (specifically, lies below) the level of consumption to which they aspire.

Implicit in equations [8] and [9] is the notion that working households engage in a three-step decision making process when determining their current consumption spending. First, they identify a target level of consumption, $C_T$; second, they decide what part of current income to devote to consumption spending ($C_W$); and finally, in

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17 Note also that, as will become clear below, the exact definition of $B$ varies in response to the precise way in which working households’ consumption out of current income is modeled.

18 In other words, $B \gg 0$, and deleveraging by working households ($C_T < C_W \Rightarrow B < 0$) is ruled out by assumption. This is necessary to make sense of the equilibrium condition in [7], but obviously the assumption could be relaxed in a more elaborate model of the private sector that included, for example, corporate investment spending.
accordance with equation [9], they determine what to borrow. Substituting [9] into [8], we arrive at:

\[ C = (1 - \beta)C_w + \beta C^T + C_R \]  

[10]

It follows from [10] that aggregate consumption is increasing in \( C_w, C_R, \) and \( C^T. \)

The consumption target \( C^T \) captures the level of consumption to which working households aspire in any given period, and is written as:

\[ C^T = \eta_n \alpha C_n + \eta_r C_R + \eta_E E(W_r \phi N | \Omega) \]  

[11]

where \( C_n \) denotes a “normal” level of consumption established in the past, \( C_R \) is the level of consumption of a contemporaneous reference group (in this model, rentier households), \( \alpha \geq 1 \) reflects the fact that households currently aspire to consume more than the previously established norm \( C_n, \eta_n + \eta_r + \eta_E = 1 \) are weights reflecting the relative importance of \( C_n, C_R, \) and expected future income in the determination of \( C^T, \) and \( \Omega^T = [\Psi \Theta \Phi], \) where \( \Psi \) denotes the information set (which in an environment of uncertainty is incomplete by hypothesis), \( \Theta \) denotes animal spirits, and \( \Phi \) denotes imagination/creativity. Taken in conjunction with equation [9], equation [11] is consistent with the treatment of \( B \) as being determined by norms in a world where fundamental uncertainty imposes limited information and deficient foresight on decision makers (as in, for example, Cynamon and Fazzari, 2008, 2013). And since the norms in

19 The first two steps are explicitly modeled below.
20 The inspiration for equation [11] is the work of Kahneman et al (1986) on aspiration formation. See, for example, Ball and Moffitt (2001) and Setterfield and Lovejoy (2006) for earlier work drawing on this same source, in the context of models of the wage bargain.
21 See Dequech (1999) on the influence of these variables on decision making under uncertainty, and Lima and Setterfield (2008) for further discussion of the expectations postulated in the last term on the right hand side of [11].
22 Note that in this formulation, the animal spirits associated with decision making under uncertainty influence aggregate consumption via the target level of consumption and hence the proclivity to borrow. They may also exert a separate influence on consumption via the conventional propensity to consume.
[7] clearly include “reference behaviors” such as consumption standards set in the past and the consumption patterns of other households, the consumption function we are modeling here shares an affinity with the relative income hypothesis associated with Duesenberry (1949). The obvious contrast is with the canonical life cycle hypothesis, in which the representative household makes no reference to past consumption experience or the consumption of other individuals or groups when choosing current consumption, and where debt is accumulated in a manner consistent with rational expectations of future income streams and purely to facilitate the smoothing of consumption over time in accordance with an optimal dynamic plan. In the theory of consumption developed here, not only are intertemporal and interpersonal comparisons of consumption standards an important determinant of current consumption spending, but also (and because of deficient foresight) borrowing in the pursuit of these standards may result in unsustainable patterns of household debt accumulation. In other words, the model is consistent with the possibility that seemingly well-motivated household behavior will, in fact, cause increasing household financial fragility. In this way, rather than constituting a neutral tool for reallocating expenditures over time, debt accumulation by households can provide both a fillip to consumption in the near term (by relaxing the budget constraint) and be a source of potentially negative effects on aggregate consumption in the longer-

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23 This claim is clearly demonstrated upon substitution of equation [11] into equation [10]. Note that if the arguments on the right hand side of [11] are given in the short run, then aggregate consumption in [10] will vary less in response to changes in current income (and hence changes in \( C_p \) and \( C_h \)) in the short run than in the long run, when there is accompanying variation in \( C^L \). This is the basic stylized fact that motivated the development of not just the relative income hypothesis, but also the permanent income and life cycle hypotheses.
term if increasing financial fragility eventually puts a brake on credit-financed household spending.\(^\text{24}\)

5. Borrowing, debt and aggregate consumption

We are now in a position to contemplate exactly how borrowing and debt accumulation affect aggregate consumption. It is generally understood that debt accumulation is the “yin and yang” of real economic expansion in Post Keynesian macroeconomics (Palley, 1996, pp.11, 13-15). When (as through fractional reserve lending by commercial banks) it involves endogenous money creation, debt accumulation relaxes the private sector’s budget constraint, allowing aggregate consumption to exceed what might otherwise be funded by current income and wealth. But as debt accumulates and debt servicing obligations rise, the resulting redistribution of purchasing power from debtors to creditors with different propensities to spend can act as a drag on aggregate demand formation. Indeed, when debt accumulation is associated with increasing financial fragility, it can eventually cause sharp contractions in spending as a result of default and subsequent (and potentially cumulative) wealth destruction and credit-flow contractions. The question that we confront is: how, if at all, are these generalities reflected in the model of consumption developed in this paper? More specifically, how does the accumulation of debt come to adversely affect consumption even as, in the first

\(^{24}\) Although there is no single agreed-upon metric for measuring financial fragility (in either the corporate or household sectors), many economists regard increasing financial fragility as a stylized fact of the pre-2008 build towards the Great Recession. Hence Palley (2002, pp.20-2) draws attention to the fact that even as early as the late 1990s, the bottom two-thirds of US households had debt to income ratios close to 300% – prior to what Cynamon and Fazzari (2008, pp.17-18), based on their analysis of total household debt relative to GDP, identify as the second major acceleration of US household debt to income ratios during the three decades prior to the onset of the Great Recession. Weller and Sabatini (2008), meanwhile, examine four measures of household financial vulnerability: leverage; the ratio of debt to income; lack of asset diversification; and exposure to variable interest rate debt. They conclude that whichever (or however many) of these indicators are used, US household financial fragility began to increase after 2001.
instance, borrowing provides a fillip to household spending? As will become clear, the
answers to these questions depend crucially on the modeling of $C_W$ and the associated
definition of $B$. Two plausible scenarios can be identified, and each of these is explored,
in turn, below. $^{25}$

i) Scenario #1

Our first scenario involves the simplest and seemingly most obvious treatment of
$C_W$. In this first scenario, we assume that workers consume a conventional fraction of
their disposable income, defined as gross wage income minus debt servicing. Bearing this
assumption in mind, and drawing on the decomposition of income in equation [3]
between working and rentier households, we can therefore write:

$$
C_W = c_w(W_p\varphi N - i[L_w - D_w])
$$

$$
C_R = c_x(W_r[1 - \varphi]N + \Pi + i[L_w - D_w])
$$

where $c_w$ and $c_x$ are the propensities to consume of working and rentier households
(respectively). Substituting these expressions for $C_W$ and $C_R$ into equation [8], the
aggregate consumption function can be written as:

$$
C = c_w(W_p\varphi N - i[L_w - D_w]) + c_x(W_r[1 - \varphi]N + \Pi + i[L_w - D_w]) + B
$$

[12]

where $B$ (net new borrowing by working households) is defined in this first scenario as
the difference between workers’ total consumption and their consumption from

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$^{25}$ There may, in fact, be more than two plausible scenarios. We leave the pursuit of this issue to further research.
disposable income. Assuming for simplicity that \( 0 = c_x < c_w < 1 \) and recalling equation [9], we obtain:

\[
C = c_w (W_p \varphi N - i[L_w - D_w]) + \beta (C^T - C_w)
\]

\[
\Rightarrow C = (1 - \beta) c_w (W_p \varphi N - i[L_w - D_w]) + \beta C^T
\]

[13]

In the simplified economy we are modeling, goods market equilibrium can then be written as:

\[
Y = C = (1 - \beta) c_w (W_p \varphi N - i[L_w - D_w]) + \beta C^T
\]

If we assume that \( N = \alpha y \) (where \( y \) is real output and \( \alpha \) is the labor to output ratio), write \( y = Y/P \) (where \( P \) is the general price level), and normalize \( P \) to one so that \( y = Y \), it follows that \( Y = N/\alpha \) which, upon substitution into the expression above, yields:

\[
\frac{N}{\alpha} = (1 - \beta) c_w (W_p \varphi N - i[L_w - D_w]) + \beta C^T
\]

\[
\Rightarrow N = \frac{\alpha (\beta C^T - [1 - \beta] c_w i[L_w - D_w])}{1 - \alpha(1 - \beta) c_w W_p \varphi}
\]

[14]

Observe that since \( \alpha = N/Y \), it follows that \( 1 - \alpha(1 - \beta) c_w W_p \varphi = 1 - (1 - \beta) c_w \sigma_p > 0 \) (where \( \sigma_p = W_p \varphi N / Y \) is the share in total income of production and non-supervisory workers), since \( \beta, c_w, \sigma_p < 1 \). It must therefore be the case that \( \beta C^T > [1 - \beta] c_w i[L_w - D_w] \) in order for the solution for \( N \) in [14] to be economically meaningful.

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26 The assumption that \( 0 = c_x < c_w < 1 \) formalizes our earlier assumption that working households consume a larger fraction of their current income than do rentier households. Note that \( c_x = 0 \Rightarrow C_y = 0 \), which means that this last term will disappear from the determination of \( C^T \) in the special case we consider hereafter. In general, however, we will observe \( c_x, C_y > 0 \) and \( C_R \) will therefore influence \( C^T \), as per equation [11]. The results reported in this paper are unaltered if we relax the assumption that \( c_x, C_y = 0 \).

27 The same expression for \( N \) can be obtained from equation [7].
Inspection of equations [13] and [14] reveals that in this first scenario, current borrowing by working households boosts total consumption. Formally:\(^28\)

\[
\frac{dC}{dT} = \frac{\partial C}{\partial T} + \frac{\partial C}{\partial N} \frac{dN}{dT}
\]

\[
= \beta \left( 1 + \frac{\alpha[1-\beta]c_wW_p\phi}{1-\alpha[1-\beta]c_wW_p\phi} \right) > 0
\]

Meanwhile, increased indebtedness raises the debt servicing commitments of working households, which diminishes their disposable income and therefore reduces total consumption. Formally:

\[
\frac{dC}{d(L_w - D_w)} = \frac{\partial C}{\partial (L_w - D_w)} + \frac{\partial C}{\partial N} \frac{dN}{d[L_w - D_w]}
\]

\[
= -(1-\beta)c_w \left( 1 + \frac{\alpha[1-\beta]c_wW_p\phi}{1-\alpha[1-\beta]c_wW_p\phi} \right) < 0
\]

In scenario #1, then, at any point in time, more borrowing boosts aggregate consumption (\textit{ceteris paribus}) while a higher stock of debt (that raises the debt service burden) will reduce aggregate consumption, \textit{ceteris paribus}.\(^29\)

\textit{ii) Scenario #2}

In the previous scenario, working households first use their income to meet debt servicing obligations, and then consume a conventional fraction of what remains of this income after servicing their existing debts. In this way, any increase in debt servicing will (\textit{ceteris paribus}) reduce both consumption and saving out of current income. However,

\(^28\) Recall from equation [9] that borrowing to finance consumption varies directly with the target level of consumption, \(C^t\).

\(^29\) Obviously these effects are related to one another since the stock of debt will vary with the extent of current borrowing, but these interactions are not captured by the static model developed here.
households could pursue more ordered methods of coping with increased financial obligations. According to Lusardi et al (2011), based on their analysis of data from the 2009 TNS Global Economic Crisis Survey of households in 13 countries, “it appears that just as corporations tend to fund themselves first by drawing upon internal funds, households address financial shocks first by drawing down savings” (Lusardi et al, 2011, p.27). If households first sacrifice savings (rather than savings and consumption) in response to increased financial demands, then the consumption function in scenario #1 is misspecified. To allow for the “pecking order” theory of how households cope with increasing financial demands that is suggested by the discussion above, we therefore consider a second scenario in which workers are assumed to consume a conventional fraction of their gross wage income, using the residual to fund either debt servicing or current saving, as the demands of the former allow. In this second scenario, then, working households regard saving as a luxury that is foregone first (before consumption out of current income is affected) in the event that they confront higher debt servicing obligations. In this case, we can write:

\[
C_w = c_w W_p \phi N \\
C_r = c_r (W_r [1 - \phi] N + \Pi + i[L_w - D_w])
\]

30 Lusardi et al (2011) study the ways in which households come up with emergency funds of $2000 in 30 days in the event of a financial shock, finding that savings is the primary source of emergency funds for a large proportion of households. Their study does not provide direct evidence that households sacrifice savings to preserve their consumption expenditures following a financial shock. However, their results do suggest that, in the event of a financial shock, households are willing to sacrifice savings while attempting to maintain their consumption expenditures.

31 The notion that working households treat saving as a luxury and otherwise live “hand to mouth,” using current income in the first instance to fund current consumption and debt servicing obligations, dovetails with a second empirical observation of Lusardi et al (2011) – that approximately 25% of Americans self-report that they certainly could not come up with $2,000 in 30 days, while a further 19% claim that they could only do so by pawning or selling possessions or taking payday loans.
Substituting these expressions into equation [8], the aggregate consumption function can now be written as:

\[ C = c_w W_p \varphi N + c_\pi (W_r [1 - \varphi] N + \Pi + i[L_w - D_w]) + B \]  \[15\]

where \( B \) once again denotes net new borrowing by working households (now defined specifically as the difference between working households’ total consumption and the consumption that can be funded by gross wage income, given the propensity to consume \( c_w \)), total saving by working households is:

\[ S_w = (1 - c_w)W_p \varphi N - i(L_w - D_w) \]  \[16\]

and we assume that \( i(L_w - D_w) \leq (1 - c_w)W_p \varphi N \). \(^{32}\) Assuming once again that \( 0 = c_z < c_w < 1 \) and recalling equation [9], we now find that:

\[ C = c_w W_p \varphi N + \beta(C^T - C_w) \]
\[ \Rightarrow C = (1 - \beta)c_w W_p \varphi N + \beta C^T \]  \[17\]

The condition for goods market equilibrium can now be written as:

\[ Y = C = (1 - \beta)c_w W_p \varphi N + \beta C^T \]

Utilizing the assumptions made earlier relating \( N \) to \( Y \) and solving the resulting expression for \( N \) yields:

\[ N = \frac{\alpha \beta C^T}{1 - \alpha(1 - \beta)c_w W_p \varphi} \]  \[18\]

\(^{32}\) Notice that, as in scenario #1, we have:

\[ c_w W_p \varphi N + S_w = c_w W_p \varphi N + (1 - c_w)W_p \varphi N - i(L_w - D_w) = W_p \varphi N - i(L_w - D_w) \]

In other words, working households consume or save all of their disposable income (given by \( W_p \varphi N - i(L_w - D_w) \)), with the transfer payments resulting from debt servicing augmenting rentier households’ income and hence their ability to consume and/or save (as in the second term on the RHS of equation [15]).
Inspection of equations [16], [17] and [18] reveals that in this second scenario (as in the first), borrowing by working households will boost aggregate consumption. Hence:

\[
\frac{dC}{dC^T} = \frac{\partial C}{\partial C^T} + \frac{\partial C}{\partial N} \frac{dN}{dC^T}
\]

\[
= \beta \left( 1 + \frac{\alpha [1 - \beta] c_w W_p \varphi}{1 - \alpha [1 - \beta] c_w W_p \varphi} \right) > 0
\]

Moreover, an increase in the indebtedness of working households will once again increase the debt servicing commitments of these households. But this time, as long as

\[
i(L_w - D_w) \leq (1 - c_w) W_p \varphi N
\]

there will be no impact on aggregate consumption. Hence as is clear from [17] and [18]:

\[
\frac{dC}{d[L_w - D_w]} = \frac{\partial C}{\partial [L_w - D_w]} + \frac{\partial C}{\partial N} \frac{dN}{d[L_w - D_w]} = 0
\]

Instead, from [16] and [18]:

\[
\frac{dS_w}{d[L_w - D_w]} = \frac{\partial S_w}{\partial [L_w - D_w]} + \frac{\partial S_w}{\partial N} \frac{dN}{d[L_w - D_w]} = -i < 0
\]

Note that there is no secondary or indirect effect of an increase in working households’ indebtedness, working through changes in \(N\), on either \(C\) or \(S_w\). This is because rentier households save all of their income, so the transfer of income towards rentiers resulting from an increase in working households’ debt servicing has no effect on rentier consumption spending, leaving \(C\), \(Y\), \(N\), and total saving unaltered. Instead, the initial diminution of working households’ saving is offset by an increase in rentier saving of identical magnitude, leaving total saving unaltered.

---

\(^{33}\) Again recall that borrowing varies directly with \(C^T\).
In scenario #2, then, as long as the conventional consumption behavior of working households captured by \( c_w \) is rendered feasible by 
\[
i(L_w - D_w) \leq (1 - c_w)W_p\phi N ,
\]
borrowing boosts consumption spending while debt accumulation exerts no offsetting “drag” on consumption. Note, however, that as debt accumulates as a consequence of borrowing, we may eventually observe
\[
i(L_w - D_w) > (1 - c_w)W_p\phi N .
\]
At this point, two possible courses of action present themselves. First, workers may choose to reduce \( c_w \) in order to “release” gross wage income so that it can be used to service existing debt obligations. In this case, aggregate consumption will unequivocally fall. Referring again to equations [17] and [18]:
\[
\frac{dC}{dc_w} = \frac{\partial C}{\partial c_w} + \frac{\partial C}{\partial N} \frac{dN}{dc_w}
\]
\[
= (1 - \beta)W_p\phi \left( N + \frac{c_w\alpha^2 \beta[1 - \beta]W_p\phi c_T}{1 - \alpha(1 - \beta)c_wW_p\phi} \right) > 0
\]
A second course of action involves workers defaulting on current debt servicing obligations, which will impair their ability to borrow (as reflected in the size of the parameter \( \beta \)). The effects on aggregate consumption in this case are more nuanced. Other things being equal, as \( \beta \) falls, so must aggregate consumption. Hence it follows form [17] and [18] that:

34 Since borrowing raises both indebtedness and (by stimulating aggregate demand) employment, when – or even whether – this last inequality will actually be observed cannot be ascertained by the static model developed here. But the inequality stated in the text is a possibility arising from the dynamic interaction of borrowing, income generation, and debt accumulation.

35 Strictly speaking, \( i(L_w - D_w) > (1 - c_w)W_p\phi N \) need not immediately trigger either of the outcomes outlined here. This is because working households own a stock of previously accumulated savings on which they can draw in the short-term to meet their debt-servicing obligations. This is obviously an exhaustible process, however, its logical limit being the point at which rentier households own all of the outstanding debt obligations of working households. As such, and for the sake of simplicity, we abstract from it altogether in the analysis that follows.
\[
\frac{dC}{d\beta} = \frac{\partial C}{\partial \beta} + \frac{\partial C}{\partial N} \frac{dN}{d\beta}
\]

\[
= C^T - c_w W_p \varphi N + \frac{(1-\beta)c_w W_p \varphi \alpha C^T (1-\alpha c_w W_p \varphi)}{(1-\alpha(1-\beta)c_w W_p \varphi)^2} > 0
\]

since \( C^T - c_w W_p \varphi N > 0 \) by hypothesis and, recalling the definition of \( \alpha \),

\[1 - \alpha c_w W_p \varphi = 1 - c_w \sigma > 0\]. But suppose that the value of \( c_w \) is allowed to simultaneously

*rise* in a deliberate effort by working households to offset the adverse effects of a fall in borrowing on their current consumption. Note that this is possible since, upon default and the subsequent cessation of debt servicing payments, working households will find that they are once again saving at the positive rate \( S_w = (1-c_w)W_p \varphi N \). Hence, working households can, in principle, maintain consumption at its current level by setting \( dc_w/d\beta \) to satisfy:

\[
\frac{dC}{d\beta} = \frac{\partial C}{\partial \beta} + \frac{\partial C}{\partial c_w} \frac{d c_w}{d \beta} = 0
\]

\[
\Rightarrow C^T - c_w W_p \varphi N + (1-\beta)W_p \varphi N \frac{dc_w}{d \beta} = 0
\]

\[
\Rightarrow \frac{dc_w}{d \beta} = -\frac{(C^T - c_w W_p \varphi \bar{N})}{(1-\beta)W_p \varphi \bar{N}}
\]

where \( \bar{N} \) is the constant level of employment resulting from the maintenance of consumption (and hence aggregate demand and output) at its current level. Whether or not this adjustment is even feasible depends, of course, on relative orders of magnitude, since \( c_w \) is a bounded variable. But the derivative above suffices to demonstrate that in the event of default, the impact of debt accumulation on aggregate consumption is, in principle, ambiguous.
iii) Summary and further discussion

The two scenarios explored above show that borrowing and debt accumulation can have differing effects on current consumption, depending principally on whether or not debt servicing is treated by debtor households as a strict substitute for saving (as in scenario #2). If it is, then while borrowing will boost consumption, debt accumulation will exert no accompanying drag on consumption unless a critical point (where debt servicing obligations exceed current income less consumption expenditures) is reached. At this point, the burden of accumulated debt may (but depending on household behavior, need not) exert a sudden negative influence on aggregate consumption spending. Otherwise (as in scenario #1), we would expect borrowing to boost consumption even as debt accumulation exerts a simultaneous drag on household spending, owing to the negative impact of increased debt servicing commitments on the consumption of (proportionally) higher spending net debtor households. Clearly, then, the behavior of households modeled in scenario #2 is most obviously compatible with the idea that credit-financed consumption may eventually, through the adverse consequences of rising financial fragility brought about by an unsustainable pattern of debt accumulation, bring about a discontinuous “sudden stop” or crisis emanating from the demand side of the economy that can be associated with a “Minsky moment” (see Cynamon and Fazzari, 2008, pp.21-4).
6. Inequality, structural change, and consumption

According to Bunting (1991, 1998, 2001) – and contrary to the canonical life cycle hypothesis – changes in the distribution of income have a demonstrable effect on aggregate consumption due to heterogeneity in the consumption behavior of households. It is clearly important, then, to examine this observation in the context of the model of consumption developed here. Note that in our model, households are heterogeneous not only by virtue of the different propensities to consume of workers and rentiers, but also by virtue of whether or not a household that derives its income from the sale of labor is considered to be a member of the “working rich”. We can therefore study the sensitivity of aggregate consumption both to the redistribution of income between households, and to the related phenomenon of structural change in the labor market that alters the composition of employment as between supervisory and non-supervisory/production workers.

First, observe that in scenario #1:

\[ c = \frac{C}{Y} = c_w (\sigma_p - i_d) + b \]  \hspace{1cm} \text{[19]}

where \( d = \frac{[L_W - D_W]}{Y} \) is the debt to income ratio of working households, and \( b = \beta[C^T - C_W]/Y \) is the deficit to income ratio of working households. In scenario #2, meanwhile:

\[ c = c_w \sigma_p + b \]  \hspace{1cm} \text{[20]}

It follows from equations [19] and [20] that in either of the scenarios described above,

\[ \frac{dc}{d\sigma_p} = c_w > 0 \]. In other words, any decline in the income share of working households –

36 The canonical life cycle model is necessarily blind to this heterogeneity by virtue of its being articulated in terms of the behavior of a single representative household.
37 Strictly speaking, \( d \) is the ratio of debt owed to rentier households to the wage income of working households.
whether due to redistribution towards profits or redistribution towards the wages of the working rich – will reduce the aggregate propensity to consume, \( c \), and hence total consumption out of any given aggregate income.\(^{38}\) It also follows from equations [19] and [20] that:

\[
\frac{dc}{d\varphi} = \frac{dc}{d\sigma_p} \frac{d\sigma_p}{d\varphi} = \frac{c_u \sigma_p}{\varphi} > 0.
\]

In other words (and as a corollary of the previous result), any growth in the proportion of employees who are supervisory workers (on which see, for example, Gordon, 1996) will reduce the aggregate propensity to consume, \( c \), and hence total consumption out of any given aggregate income. Again, this result holds regardless of the way in which working households seek to meet their debt servicing obligations.

The impact of inequality on consumption therefore functions independently of the precise way in which the interplay of debt dynamics and consumption are modeled. Moreover, our results show that either increased income inequality \textit{per se} or (more specifically) a change in the composition of employment that increases the proportion of supervisory workers will tend to reduce aggregate consumption, \textit{ceteris paribus}.

7. Conclusion

This paper develops a theory of aggregate consumption spending that draws on the relative income hypothesis and contemporary insights regarding household debt accumulation and consumption spending. The model shows that borrowing and debt accumulation can have differing effects on current consumption, depending principally

\(^{38}\) In fact, \textit{both} the profit share of income \textit{and} the income share of the working rich have been increasing over the past three decades. See, for example, Palley (2002), Piketty and Saez (2003), Wolff and Zacharias (2009), Atkinson et al (2011).
on whether or not debt servicing is treated (by debtor households) as a strict substitute for saving. If it is, then while borrowing will boost consumption, debt accumulation will exert no accompanying drag on consumption unless a critical point (where debt servicing obligations exceed current savings) is reached. At this point, the burden of accumulated debt may exert a sudden negative influence on aggregate consumption spending and *(ceteris paribus)* an associated drop in overall economic activity.

The theory of consumption developed in this paper posits important differences in the consumption behavior of households distinguished by their position in the distribution of income. In particular, the borrowing behavior of working households is largely governed by a social consumption norm based on *(inter alia)* past consumption patterns and the consumption behavior of a reference group. We then describe working households as accumulating debt in order to finance consumption that they cannot fund from current income subject to deficient foresight regarding the long-term consequences of this behavior. Our theory of aggregate consumption thus emphasizes the important interplay of consumption spending, relative income, and household debt accumulation, and the potential contribution of these factors to household financial fragility and macroeconomic instability.
References


**Table 1: Balance Sheet Matrix**

<table>
<thead>
<tr>
<th></th>
<th>Working households</th>
<th>Rentier households</th>
<th>Firms</th>
<th>Banks</th>
<th>Sum</th>
</tr>
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<tbody>
<tr>
<td>Capital</td>
<td>0</td>
<td>0</td>
<td>K</td>
<td>0</td>
<td>K</td>
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<tr>
<td>Deposits</td>
<td>$D_W$</td>
<td>$D_R$</td>
<td>0</td>
<td>$-(D_W + D_R)$</td>
<td>0</td>
</tr>
<tr>
<td>Loans (total debt)</td>
<td>$-L_W$</td>
<td>0</td>
<td>0</td>
<td>$L_W$</td>
<td>0</td>
</tr>
<tr>
<td>Equity</td>
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<td>$-E$</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Net worth</td>
<td>$D_W - L_W$</td>
<td>$D_R + E$</td>
<td>$K - E$</td>
<td>$L_W - (D_W + D_R)$</td>
<td>K</td>
</tr>
</tbody>
</table>

**Table 2: Transaction Flow Matrix**

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<thead>
<tr>
<th></th>
<th>Working households</th>
<th>Rentier households</th>
<th>Firms</th>
<th>Banks</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumption from income</td>
<td>$-C_W$</td>
<td>$-C_R$</td>
<td>$C_W + C_R$</td>
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<td>0</td>
</tr>
<tr>
<td>Consumption from borrowing</td>
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<td>$B$</td>
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<td>0</td>
</tr>
<tr>
<td>Investment</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Wages</td>
<td>$W_w \varphi N$</td>
<td>$W_r (1 - \varphi) N$</td>
<td>$-\omega$</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Profits</td>
<td>0</td>
<td>$\Pi$</td>
<td>$-\Pi$</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Deposit interest</td>
<td>$iD_W$</td>
<td>$iD_R$</td>
<td>0</td>
<td>$-i(D_W - D_R)$</td>
<td>0</td>
</tr>
<tr>
<td>Loan interest</td>
<td>$-iL_W$</td>
<td>0</td>
<td>0</td>
<td>$iL_W$</td>
<td>0</td>
</tr>
<tr>
<td>Deposit flows (current saving)</td>
<td>$-S_W$</td>
<td>$-S_R$</td>
<td>0</td>
<td>0</td>
<td>$(S_W + S_R)$</td>
</tr>
<tr>
<td>Loan flows</td>
<td>$B$</td>
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<td>0</td>
<td>0</td>
<td>$-B$</td>
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<tr>
<td>Sum</td>
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