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A theory of aggregate consumption*

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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).

Keywords: *consumption, household borrowing, household debt, relative income hypothesis*

JEL codes: *E12, E21*

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/Fazzari 2008; Barba/Pivetti 2009).¹ 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.²

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

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1. For more recent contributions to this literature, see Setterfield (2012; 2013) and Cynamon/Fazzari (2013).

2. See also Kumhof et al. (2012) and van Treeck/Sturm (2012) for discussion of the international dimension of these dynamics, linking inequality to current account imbalances and hence financial fragility.

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of income as a first approximation for the size distribution of income,³ 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 3 decades have resulted partly from increases in the profit share, they have also been associated with burgeoning wage inequality.⁴ 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/Fazzari (2008; 2013) regarding household debt accumulation and consumption spending in the presence of emulation effects.⁵ 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,⁶ 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/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 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. This task 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. Finally, Section 6 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

3. On which, see Atkinson (2009) and Glyn (2009).

4. For empirical evidence of rising wage inequality in the US, see Heathcote et al. (2010).

5. 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 (2005) 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*.

6. See D'Orlando/Sanfilippo (2010) on the Keynesian pedigree of this principle as it applies to the theory of consumption spending.

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/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 wellbeing 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.⁷ 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/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.⁸ 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,⁹ as households pursue consumption targets that are incompatible with their real incomes. For example, Barba/Pivetti (2009), Foster/Magdoff (2009), and Setterfield (2012; 2013), among others, argue that increasing income inequality coupled with the working class's desire to emulate wealthier households is one of the main causes of the pattern of household debt accumulation in recent US experience.¹⁰ Cynamon/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.¹¹ Cynamon/Fazzari also reflect on the contribution this has

7. 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.

8. The importance of relative income in understanding consumption behavior has been well understood by heterodox economists since Veblen.

9. 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.

10. Krueger/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, they report that the standard deviation of log consumption rose only by half as much as that of income between 1980 and 2003.

11. As important as these processes are for explaining contemporary developments, it must be acknowledged that they are by no means new. See Olney (1991) on the role played by advertising and the expansion of consumer credit in the increase in consumption spending during the interwar period. Brown (1997) and Wisman (2013) discuss the origins and implications of expanding consumer credit prior to and during the Great Depression.

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 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, in a manner that is stock-flow consistent.¹² We begin by writing:

$$Y = \omega + \Pi \quad (1)$$

$$\omega = W_p \varphi N + W_r (1 - \varphi) N, \quad (2)$$

where Y denotes nominal income, ω is the nominal wage bill, Π denotes total nominal profits, W_p is the nominal wage of production and non-supervisory workers, W_r is the nominal wage of supervisory workers (including the 'working rich'),¹³ N is the level of employment, and φ denotes the proportion of production and non-supervisory workers among total employees. It follows upon substitution that:

$$Y = W_p \varphi N + [W_r (1 - \varphi) N + \Pi]. \quad (3)$$

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 supervisory workers). In other words, the three types of income recipients (production and non-supervisory workers, supervisory

12. See, for example, Godley/Lavoie (2007) on the stock-flow consistent method in macroeconomic modeling.

13. Following Wolff/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 30 years. See Piketty/Saez (2003), Wolff/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.'

workers, and capitalists) define *two* types of households (working and rentier households).¹⁴ 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.¹⁵ Second, we assume that working households borrow to finance some part of their current consumption, whereas rentier households do not.¹⁶

Before proceeding with our analysis, it is worth reflecting further on the distinction between households made above. It is conventional in Keynesian analyses of aggregate consumption to associate differences between the consumption behavior of households with the positions of these households in the size distribution of income (see, for example, Bunting 1998). The distinction between households made above, however, is based on positions in the production process and is therefore related to the functional distribution of income. Simply put, we subscribe to the view that the two distributions are closely related. First, as argued by Palley (2013), the class structure of households can be related to the size distribution of income, with working households associated with the bottom 80 percent of the distribution, the majority of supervisory workers associated with the next 19 percentiles, and the working rich and capitalists making up the top 1 percent of the distribution. This correspondence accords with the facts that 80 percent of all employees in the US are production and non-supervisory workers, while both income and wealth in the US are heavily concentrated in the top 20 percent of their respective distributions (and in particular, the top 1 percent) and decline rapidly beneath the 80th percentile (Palley 2013: 2–4). Second, because the distribution of wealth is so highly concentrated, changes in the functional distribution of income can be thought of as a driver of changes in the size distribution of income (Atkinson 2009; Glyn 2009). Hence, as shown by Palley (2009: 23–25), the disconnect between the rates of growth of productivity and real wages in the US – which dates to the 1970s and explains the falling wage share of income in the US thereafter – coincides with similar disconnects between productivity growth and median household income, and between income growth at the 95th percentile of the size distribution of income and that at the 20th percentile.

Bearing in mind the different borrowing behavior of households as described 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.

Table 1 Balance sheet matrix

	Working households	Rentier households	Firms	Banks	Sum
Capital	0	0	K	0	K
Deposits	D_W	D_R	0	$-(D_W + D_R)$	0
Loans (total debt)	$-L_W$	0	0	L_W	0
Equity	0	E	$-E$	0	0
Net worth	$D_W - L_W$	$D_R + E$	$K - E$	$L_W - (D_W + D_R)$	K

14. As explained by Palley (2012: 462), this is equivalent to assuming that capitalists receive some part of the wage bill as remuneration for their role as managers.

15. The importance of this distinction will become clear subsequently.

16. Rentier households lend to working households, but, as will become clear, working households engage in saving and therefore finance some of their own borrowing.

Table 2 Transaction flow matrix

	Working households	Rentier households	Firms	Banks		Sum
				Current	Capital	
Consumption from income	$-C_W$	$-C_R$	$C_W + C_R$	0	0	0
Consumption from borrowing	$-B$	0	B	0	0	0
Investment	0	0	0	0	0	0
Wages	$W_p \varphi N$	$W_r(1 - \varphi)N$	$-\omega$	0	0	0
Profits	0	Π	$-\Pi$	0	0	0
Deposit interest	iD_W	iD_R	0	$-i(D_W + D_R)$	0	0
Loan interest	$-iL_W$	0	0	iL_W	0	0
Deposit flows (current saving)	$-S_W$	$-S_R$	0	0	$(S_W + S_R)$	0
Loan flows	B	0	0	0	$-B$	0
Sum	0	0	0	0	0	0

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.¹⁷ Meanwhile, it follows from the transactions flow matrix in Table 2 that:

$$-i(D_W + D_R) + iL_W = 0 \quad (4)$$

$$\Rightarrow D_W + D_R = L_W. \quad (5)$$

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:

$$D_R = L_W - D_W. \quad (6)$$

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.¹⁸

17. 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.

18. 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.

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

$$S_W + S_R = B. \quad (7)$$

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 macro-economic 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 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.¹⁹

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:

$$C = C_W + C_R + B. \quad (8)$$

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 households (see Table 1).²⁰ 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:

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

19. 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.

20. 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.

where C^T denotes a target level of consumption and $C^T > C_W$ by assumption.²¹ The exact size of the adjustment parameter β 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 accordance with Equation (9), they determine what to borrow.²² Substituting Equation (9) into (8), we arrive at:

$$C = (1 - \beta)C_W + \beta C^T + C_R. \quad (10)$$

It follows from Equation (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. According to Kahneman et al. (1986), seemingly subjective aspirations are, in fact, affected by objective ‘reference outcomes’ with which individuals are familiar, through observation, from personal experience.²³ In the case of C^T , reference outcomes might include standards of consumption established in the past and/or the level of consumption achieved by other individuals and groups. In addition, C^T may be influenced by expected future income and wealth – although, in-keeping with the Keynesian foundations of the model developed here, these expectations should be thought of as being subject to fundamental uncertainty (see, for example, Dequech 1999). For the purposes of the short-run modeling exercise undertaken in this paper, C^T is taken as given.²⁴

Taken in conjunction with Equation (9), the discussion of C^T above 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/Fazzari 2008; 2013). This immediately draws attention to the fact that while the model developed thus far is understood to capture salient features of advanced capitalism in general, its outcomes will vary between specific capitalist economies in accordance with their institutional structures. In particular, financial institutions (including lending and borrowing norms) will affect the size of the parameter β . Meanwhile, the visibility of the consumption patterns of the very rich (via the media, for example) and/or the degree of social segmentation and hence the visibility of the consumption of ‘near neighbors’ in the distribution of income (which will affect the strength of Frank et al.’s (2010) ‘expenditure cascades’) will factor into the determination of C^T . Moreover, since the norms associated with B include reference outcomes such as consumption standards set in the past and the consumption patterns of other households,

21. 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 Equation (7), but obviously the assumption could be relaxed in a more elaborate model of the private sector that included, for example, corporate investment spending.

22. The first two steps are discussed in detail below.

23. The terminology that Kahneman et al. (1986) use is ‘reference transactions,’ but this is broadened here since transactions are only a subset of the economic outcomes that may, in principle, affect aspirations.

24. For a more explicit specification of the target level of consumption in a similar model, see Setterfield/Kim (2013).

the consumption function we are modeling here shares a clear affinity with Duesenberry's (1949) relative income hypothesis.²⁵

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 re-allocating 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 term if increasing financial fragility eventually puts a brake on credit-financed household spending.²⁶

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: 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)

25. This claim is clearly demonstrated by inspection of Equation (10). Note that if C^T is given in the short run, then aggregate consumption in Equation (10) will vary less in response to changes in current income (and hence changes in C_W and C_R) in the short run than in the long run, when changes in income and consumption can also be expected to induce variation in C^T . 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.

26. 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: 20–22) 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 percent – prior to what Cynamon/Fazzari (2008: 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 3 decades prior to the onset of the Great Recession. Weller/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.

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 instance, borrowing provides a fillip to household spending? As will become clear, the precise answers to these questions depend crucially on how households service their debts, as reflected in 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.²⁷

5.1 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:

$$C_W = c_w(W_p\varphi N - i[L_W - D_W])$$

$$C_R = c_\pi(W_r[1 - \varphi]N + \Pi + i[L_W - D_W])$$

where c_w and c_π 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:

$$C = c_w(W_p\varphi N - i[L_W - D_W]) + c_\pi(W_r[1 - \varphi]N + \Pi + i[L_W - D_W]) + B \quad (11)$$

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 disposable income. Assuming for simplicity that $0 = c_\pi < c_w < 1$ and recalling Equation (9), we obtain:²⁸

$$\begin{aligned} C &= c_w(W_p\varphi N - i[L_W - D_W]) + \beta(C^T - C_W) \\ \Rightarrow C &= (1 - \beta)c_w(W_p\varphi N - i[L_W - D_W]) + \beta C^T. \end{aligned} \quad (12)$$

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

$$Y = C = (1 - \beta)c_w(W_p\varphi N - i[L_W - D_W]) + \beta C^T.$$

27. There may, in fact, be more than two plausible scenarios, but we leave the pursuit of this issue to further research. Broadly speaking, our first scenario treats debt servicing as a deduction from household income, whereas our second scenario treats it as a monetary outlay undertaken by households (see Cynamon/Fazzari 2012). As will become clear, the second approach forces explicit consideration of whether consumption or saving (or some combination of the two) makes way for debt servicing; the first approach addresses this issue only implicitly.

28. The assumption that $0 = c_\pi < c_w < 1$ formalizes our earlier assumption that working households consume a larger fraction of their current income than do rentier households. As demonstrated in the Appendix, the qualitative results reported below – which show that debt-servicing behavior has an important effect on aggregate consumption – are unaffected if we relax the assumption that $c_\pi = 0$.

If we assume that $N = \alpha y$ (where y is real output and α 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:²⁹

$$\begin{aligned}\frac{N}{\alpha} &= (1 - \beta)c_w(W_p\phi N - i[L_W - D_W]) + \beta C^T \\ \Rightarrow N &= \frac{\alpha(\beta C^T - [1 - \beta]c_w i[L_W - D_W])}{1 - (1 - \beta)c_w\sigma_p}\end{aligned}\quad (13)$$

where $\sigma_p = \alpha W_p\phi = W_p\phi N/Y$ is the share in total income of production and non-supervisory workers. Observe that $1 - (1 - \beta)c_w\sigma_p > 0$ 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 Equation (13) to be economically meaningful.³⁰

Inspection of Equations (12) and (13) reveals that, in this first scenario, current borrowing by working households boosts total consumption. Formally:³¹

$$\begin{aligned}\frac{dC}{dC^T} &= \frac{\partial C}{\partial C^T} + \frac{\partial C}{\partial N} \frac{dN}{dC^T} \\ &= \beta \left(1 + \frac{[1 - \beta]c_w\sigma_p}{1 - [1 - \beta]c_w\sigma_p} \right) > 0.\end{aligned}$$

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

$$\begin{aligned}\frac{dC}{d(L_W - D_W)} &= \frac{\partial C}{\partial (L_W - D_W)} + \frac{\partial C}{\partial N} \frac{dN}{d(L_W - D_W)} \\ &= -(1 - \beta)c_w i \left(1 + \frac{[1 - \beta]c_w\sigma_p}{1 - [1 - \beta]c_w\sigma_p} \right) < 0.\end{aligned}$$

In Scenario 1, then, at any point in time, more borrowing boosts aggregate consumption (*ceteris paribus*) while a higher stock of debt (that raises the debt-service burden) will reduce aggregate consumption, *ceteris paribus*.³²

29. The same expression for N can be obtained from Equation (7).

30. Note that the solutions to Equations (12) and (13) involve the distributional parameters σ_p (the income share of production and non-supervisory workers) and ϕ (the proportion of employees who are production and non-supervisory workers – on which, see Gordon 1996). According to Bunting (1991; 1998; 2001) – and contrary to the canonical life cycle hypothesis – distributional changes affect aggregate consumption due to heterogeneity in the consumption behavior of households. Exploring the precise effects of redistribution on consumption is beyond the scope of the present paper, but see Setterfield/Kim (2013) for further analysis.

31. Recall from Equation (9) that borrowing to finance consumption varies directly with the target level of consumption, C^T .

32. 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.

5.2 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 (*ceteris paribus*) reduce both consumption and saving out of current income. However, 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: 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.³³ 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.³⁴ In this case, we can write:

$$C_W = c_w W_p \varphi N$$

$$C_R = c_\pi (W_r [1 - \varphi] N + \Pi + i[L_W - D_W]).$$

Substituting these expressions into Equation (8), the aggregate consumption function can now be written as:

$$C = c_w W_p \varphi N + c_\pi (W_r [1 - \varphi] N + \Pi + i[L_W - D_W]) + B \quad (14)$$

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:

$$S_W = (1 - c_w) W_p \varphi N - i(L_W - D_W) \quad (15)$$

33. 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.

34. 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 percent of Americans self-report that they certainly could not come up with \$2000 in 30 days, while a further 19 percent claim that they could only do so by pawning or selling possessions or taking payday loans.

and we assume that $i(L_W - D_W) \leq (1 - c_w)W_p\phi N$.³⁵ Assuming once again that $0 = c_\pi < c_w < 1$ and recalling Equation (9), we now find that:

$$\begin{aligned} C &= c_w W_p \phi N + \beta(C^T - C_W) \\ \Rightarrow C &= (1 - \beta)c_w W_p \phi N + \beta C^T. \end{aligned} \quad (16)$$

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

$$Y = C = (1 - \beta)c_w W_p \phi N + \beta C^T.$$

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

$$N = \frac{\alpha \beta C^T}{1 - (1 - \beta)c_w \sigma_p}. \quad (17)$$

Inspection of Equations (15), (16), and (17) reveals that in this second scenario (as in the first), borrowing by working households will boost aggregate consumption. Hence:³⁶

$$\begin{aligned} \frac{dC}{dC^T} &= \frac{\partial C}{\partial C^T} + \frac{\partial C}{\partial N} \frac{dN}{dC^T} \\ &= \beta \left(1 + \frac{[1 - \beta]c_w \sigma_p}{1 - [1 - \beta]c_w \sigma_p} \right) > 0. \end{aligned}$$

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 $i(L_W - D_W) \leq (1 - c_w)W_p\phi N$, there will be *no impact* on aggregate consumption. Hence, as is clear from Equations (16) and (17):

$$\frac{dC}{d(L_W - D_W)} = \frac{\partial C}{\partial(L_W - D_W)} + \frac{\partial C}{\partial N} \frac{dN}{d(L_W - D_W)} = 0.$$

Instead, from Equations (15) and (17):

$$\frac{dS_W}{d(L_W - D_W)} = \frac{\partial S_W}{\partial(L_W - D_W)} + \frac{\partial S_W}{\partial N} \frac{dN}{d(L_W - D_W)} = -i < 0.$$

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

35. Notice that, as in Scenario 1, we have:

$$c_w W_p \phi N + S_W = c_w W_p \phi N + (1 - c_w)W_p \phi N - i(L_W - D_W) = W_p \phi N - i(L_W - D_W).$$

In other words, working households consume or save all of their disposable income (given by $W_p \phi N - i(L_W - D_W)$), 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 (14)).

36. Again, recall that borrowing varies directly with C^T .

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.

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 $i(L_W - D_W) > (1 - c_w)W_p\phi N$.³⁷ At this point, two possible courses of action present themselves.³⁸ 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 (16) and (17):

$$\begin{aligned}\frac{dC}{dc_w} &= \frac{\partial C}{\partial c_w} + \frac{\partial C}{\partial N} \frac{dN}{dc_w} \\ &= (1 - \beta)W_p\phi \left(N + \frac{c_w\alpha\beta[1 - \beta]\sigma_p C^T}{[1 - (1 - \beta)c_w\sigma_p]^2} \right) > 0.\end{aligned}$$

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 β). The effects on aggregate consumption in this case are more nuanced. Other things being equal, as β falls, so must aggregate consumption. Hence it follows from Equations (16) and (17) that:

$$\begin{aligned}\frac{dC}{d\beta} &= \frac{\partial C}{\partial \beta} + \frac{\partial C}{\partial N} \frac{dN}{d\beta} \\ &= C^T - c_wW_p\phi N + \frac{(1 - \beta)c_w\sigma_p C^T(1 - c_w\sigma_p)}{(1 - [1 - \beta]c_w\sigma_p)^2} > 0\end{aligned}$$

since $C^T - c_wW_p\phi N > 0$ by hypothesis and $1 - c_w\sigma_p > 0$. 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,

37. 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.

38. 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.

working households will find that they are once again saving at the positive rate $S_w = (1 - c_w)W_p\phi\bar{N}$. Hence, working households can, in principle, maintain consumption at its current level by setting $dc_w/d\beta$ to satisfy:

$$\begin{aligned}\frac{dC}{d\beta} &= \frac{\partial C}{\partial \beta} + \frac{\partial C}{\partial c_w} \frac{dc_w}{d\beta} = 0 \\ \Rightarrow C^T - c_w W_p \phi \bar{N} + (1 - \beta) W_p \phi \bar{N} \frac{dc_w}{d\beta} &= 0 \\ \Rightarrow \frac{dc_w}{d\beta} &= \frac{-(C^T - c_w W_p \phi \bar{N})}{(1 - \beta) W_p \phi \bar{N}}\end{aligned}$$

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.

5.3 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/Fazzari 2008: 21–24).

6 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 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.

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APPENDIX

The purpose of this appendix is to verify that the main qualitative result of this paper – that households' debt-servicing behavior affects aggregate consumption – is not dependent upon the simplifying assumption that $c_\pi = 0$.

Recall that, in general:

$$C = (1 - \beta)C_W + \beta C^T + C_R. \quad (10)$$

In Scenario 1:

$$C_W = c_w(W_p \varphi N - i[L_W - D_W])$$

$$C_R = c_\pi(W_r[1 - \varphi]N + \Pi + i[L_W - D_W]).$$

Substituting into Equation (10), it follows that:

$$C = (1 - \beta)c_w(W_p \varphi N - i[L_W - D_W]) + c_\pi(W_r[1 - \varphi]N + \Pi + i[L_W - D_W]) + \beta C^T. \quad (A1)$$

Setting $Y = \frac{N}{\alpha} = C$ and solving for N , we obtain:

$$N = \frac{\alpha(\beta C^T + c_\pi \Pi + [c_\pi - (1 - \beta)c_w]i[L_W - D_W])}{1 - (1 - \beta)c_w \sigma_p - c_\pi \sigma_r} \quad (A2)$$

where $\sigma_r = \alpha W_r(1 - \varphi) = W_r(1 - \varphi)N/Y$ is the income share of supervisory workers. It then follows from Equations (A1) and (A2) that:

$$\begin{aligned} \frac{dC}{dC^T} &= \frac{\partial C}{\partial C^T} + \frac{\partial C}{\partial N} \frac{dN}{dC^T} \\ &= \beta \left(1 + \frac{[1 - \beta]c_w \sigma_p + c_\pi \sigma_r}{1 - [1 - \beta]c_w \sigma_p - c_\pi \sigma_r} \right) > 0 \end{aligned}$$

and:

$$\begin{aligned}\frac{dC}{d(L_W - D_W)} &= \frac{\partial C}{\partial(L_W - D_W)} + \frac{\partial C}{\partial N} \frac{dN}{d(L_W - D_W)} \\ &= (c_\pi - [1 - \beta]c_w)i \left(1 + \frac{[1 - \beta]c_w\sigma_p + c_\pi\sigma_r}{1 - [1 - \beta]c_w\sigma_p - c_\pi\sigma_r} \right) < 0\end{aligned}$$

as long as $c_\pi < (1 - \beta)c_w$. In Scenario 2, meanwhile:

$$\begin{aligned}C_W &= c_w W_p \Phi N \\ C_R &= c_\pi (W_r [1 - \phi] N + \Pi + i[L_W - D_W]).\end{aligned}$$

Substituting these expressions into Equation (10), we arrive at:

$$C = (1 - \beta)c_w W_p \Phi N + c_\pi (W_r [1 - \phi] N + \Pi + i[L_W - D_W]) + \beta C^T. \quad (A3)$$

Once again setting $Y = \frac{N}{\alpha} = C$ and solving for N , we now obtain:

$$N = \frac{\alpha(\beta C^T + c_\pi[\Pi + i(L_w - D_w)])}{1 - (1 - \beta)c_w\sigma_p - c_\pi\sigma_r}. \quad (A4)$$

It then follows from Equations (A3) and (A4) that:

$$\begin{aligned}\frac{dC}{dC^T} &= \frac{\partial C}{\partial C^T} + \frac{\partial C}{\partial N} \frac{dN}{dC^T} \\ &= \beta \left(1 + \frac{[1 - \beta]c_w\sigma_p + c_\pi\sigma_r}{1 - [1 - \beta]c_w\sigma_p - c_\pi\sigma_r} \right) > 0\end{aligned}$$

and:

$$\begin{aligned}\frac{dC}{d(L_W - D_W)} &= \frac{\partial C}{\partial(L_W - D_W)} + \frac{\partial C}{\partial N} \frac{dN}{d(L_W - D_W)} \\ &= c_\pi i \left(1 + \frac{[1 - \beta]c_w\sigma_p + c_\pi\sigma_r}{1 - [1 - \beta]c_w\sigma_p - c_\pi\sigma_r} \right) > 0.\end{aligned}$$

Note that the sign of this last expression is unambiguously *positive* when $c_\pi > 0$ (as opposed to zero when $c_\pi = 0$). This is because as debt servicing rises, reducing the saving of working households, the transfer of income toward rentier households now increases consumption spending by the latter, creating a net injection into the circular flow of income. Nevertheless, the key qualitative result established in the main body of the paper – that debt-servicing behavior affects consumption – remains intact.