Political Aspects of Household Debt

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Abstract

The recent literature has shown that income inequality is one of the main causes of borrowing and debt accumulation by working households. This paper explores a different dimension. We investigate whether household indebtedness is an important cause for rising income inequality. If workers experience rising debt burden, workers job security and bargaining power for a higher wage can diminishes as they need income to continue debt service payments. This in turn increases income inequality and induces workers to borrow more. We believe this is an important channel why we observed rising income inequality and household debt accumulation simultaneously in the countries that experienced a crisis recently. To explore this channel, we develop an employment rent framework that explicitly considers the impact of workers indebtedness on their cost of job loss. Furthermore, based on this employment rent framework, we develop a neo-Kaleckian macro model to analyze the dynamic relationship between household debt and income inequality.

1 Introduction

Since the 1980s, we have observed rising household debt and rising income inequality in the US. Prior to the Great Recession of 2007, the US experienced consumption expansion accompanied by significant household debt accumulation. The ratio of personal outlays to disposable personal income increased from about 88 percent in the early 1980s to nearly 100 percent in 2007. Household debt outstanding as a share of GDP increased from about 58 percent in 1975 to nearly 129 percent in 2007. In literature, there has been an argument that income inequality is one of the main causes of borrowing and debt accumulation by working household (for example, to maintain their standard of living and keep up with

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their consumption reference group). This paper will explore a different dimension. We will investigate whether debt itself was an important factor for rising income inequality as debt can reduce the workers job security and bargaining power in their work places. Workers will need their income to continue debt service payment. This means workers job security and bargaining power for higher wages diminishes, as they are more desperate to hold on to their current job. This in turn increase wage inequality and induces workers further borrowing. We believe this is an important channel why we have observed rising income inequality and household debt accumulation simultaneously in the US, which turned out to be unsustainable as evidenced by the Great Recession.

Our paper is organized as follows. Section 2 presents the basic theoretical framework. Section 4 develops consumer debt dynamics and distribution dynamics. The effect of emulation-driven borrowing, and interaction between debt accumulation and functional income inequality will then be investigated. Section 5 offers concluding comments.

2 Accounting and Behavior

2.1 Social Accounting Matrices

We begin laying out the model by providing a basic accounting framework, which closely follows Lavoie and Godley (2002). We distinguish four types of agents in this model: workers, capitalists, banks, and non-financial firms. To focus our discussion, we assume a closed economy with no government contribution to aggregate demand.

Table 1 is the balance sheet matrix for our model economy. It shows the asset and liability allocations across our four types of agent. There are four classes of assets: physical capital (K), equity (E), net loans to households (D_W), and the net bank deposits of capitalists (D_W). A column sum for a class of agent produces its net worth, while a row sum (across workers, capitalists, banks, and firms) produces the net value of a class of assets.

Associated with this balance sheet matrix is the transaction flow matrix in table 2.

Table 1: Balance Sheet Matrix

	Workers	Capitalists	Firms	Banks	Sum
Capital			K		K
Deposits		D_W		$-D_W$	0
Loans	$-D_W$			D_W	0
Equities		E	$-E$		0
Net worth	NW_W	NW_R	NW_F	NW_B	K

Household real wage income ($W_r L$) can be supplemented by new borrowing ($\dot{D}_W$) to finance the sum of consumption (C_W) and interest on past borrowing (iD_W). Capitalists earn income on their net deposits (iD_W) and profits (Π), which they use for consumption (C_R), to make new deposits ($\dot{D}_W$), or to purchase equities ($\dot{E}$). In the case of firms, we distinguish between capital and current transactions. Firms can finance investment (I) with new funds provided by capitalists ($\dot{E}$) and firms distribute all earnings to capitalists.[1] For the transaction matrix, we note that the sums across the rows must equal zero as a consistency condition.[2] The columns also sum to zero, reflecting budget constraints.

Table 2: Transaction Flow Matrix

			Firms		Banks		
	Workers	Capitalists	Current	Capital	Current	Capital	Sum
Consumption	$-C_W$	$-C_R$	$C_W + C_R$				0
Investment			I	$-I$			0
Wages	$W_r L$		$-W_r L$				0
Firms' profits		Π	$-\Pi$				0
Deposit interest		iD_W			$-iD_W$		0
Loan interest	$-iD_W$				iD_W		0
Change in deposit		$-\dot{D}_W$				$\dot{D}_W$	0
Change in loans	$\dot{D}_W$					$-\dot{D}_W$	0
Issues of equities		$-\dot{E}$		$\dot{E}$			0
Sum	0	0	0	0	0	0	0

[1] For simplicity, the price of equity is fixed and normalized to one.

[2] This consistency condition reflects that one agent's expenditure must be equal to another agent's income in a macroeconomy as a whole.

2.2 Banks and Firms

$$p = (1 + \tau)wL/Y \tag{1}$$

Here $p > 0$ is the price level, $w > 0$ is the nominal wage, $\tau > 0$ is the markup rate (which represents Kalecki's degree of monopoly), and $L/Y > 0$ is the labor-output ratio (i.e., the inverse of the average product of labor). Such markup pricing behavior implies a standard expression for the gross profit share ($\pi = \Pi/Y$):

$$\pi = \frac{\tau}{1 + \tau} \tag{2}$$

Our exposition will treat τ and hence π as model parameters in the short run. For the medium-run, τ and π become endogenous variables as a result of distributional conflict.

Let $r = \Pi/K$ denote the profit rate. Following Stockhammer (1999), our desired investment rate ($g_K = I/K$) responds positively to the profit rate.

$$g_K = \kappa_0 + \kappa_r r + \kappa_u u \tag{3}$$

The parameters are positive: κ_0 captures the state of business confidence[3], κ_r captures the sensitivity of desired investment to the profit rate, and κ_u represnets the sensitivity of desired investment to demand, so called an accelerator effect on the investment behavior. The current profit rate approximates the expected rate of return, and hence induces the investment demand (Blecker, 1999; Stockhammer, 1999).

Note that the profit rate, and the accumulation rate can be expressed in terms of capacity utilization rate ($u = Y/K$). The gross profit rate is just the product of the gross profit share and the capacity utilization rate—a relationship that allows us to reduce the expression for

[3]This term is often referred to as animal spirit.

the accumulation rate as well.

$$r = \pi u \tag{4}$$

$$g_K = \kappa_0 + \kappa_r \pi u + \kappa_u u \tag{5}$$

2.3 Workers

$$C_W = W_r L - iD_W + \beta C_R \tag{6}$$

The term $W_r L - iD_W$ is after-interest disposable income. The term βC_R ($\beta > 0$) captures consumption emulation. .

Recall that the workers' budget constraint from Table 2 requires that $\dot{D}_W = C_W + iD_W - W_r L$. Therefore, equation (6) implies the following borrowing behavior of workers.

$$\dot{D}_W = \beta C_R \tag{7}$$

Workers observe the consumption pattern of the capitalists and borrow to emulate their consumption. The larger the emulation parameter β is, the more debt financed consumption by workers.

2.3.1 Capitalists

$$C_R = (1 - s_R)(\Pi + iD_W) \tag{8}$$

Here s_R is the capitalists' saving coefficient. (Equivalently, capitalist's saving is $S_R = s_R(\Pi + iD_W)$) Recall from the capitalists' column in the transaction flow matrix (table 2) that the capitalists' budget constraint implies

$$C_R = \Pi + iD_W - (\dot{D}_W + \dot{E}) \tag{9}$$

Equations (8) and (9) imply the following supply of consumer credit:

$$\dot{D}_W = s_R(\Pi + iD_W) - \dot{E} \tag{10}$$

2.4 Temporary Equilibrium

Commodity market equilibrium in this model has a standard representation:

$$Y = C_W + C_R + I \tag{11}$$

$$u = (1-\pi)u - id_W + \beta(1-s_R)(\pi u + id_W) + (1-s_R)(\pi u + id_W) + g_K \tag{12}$$

Recall that $u = Y/K$ denotes capacity utilization. Here $d_W = D_W/K$ denotes the normalized indebtedness of workers. After substituting the investment demand equation (5) and solving for u, we find a reduced form expression for capacity utilization. We will make the standard Keynesian stability assumption that $\pi(s_R + s_R\beta - \kappa_r - \beta) - \kappa_u > 0$.

$$u = \frac{1}{\pi(s_R + s_R\beta - \kappa_r - \beta) - \kappa_u}[\kappa_0 - (s_R + s_R\beta - \beta)id_W)] \tag{13}$$

Substituting (23) into (4) and (5), we produce reduced forms for the profit rate, and the accumulation rate.

$$r = \frac{\pi}{\pi(s_R + s_R\beta - \kappa_r - \beta) - \kappa_u}[\kappa_0 - (s_R + s_R\beta - \beta)id_W)] \tag{14}$$

$$g_K = \frac{1}{\pi(s_R + s_R\beta - \kappa_r - \beta) - \kappa_u}[(\kappa_u + \kappa_r\pi)id_W - \kappa_0\pi][(1-s_R)\beta 1 - s_R] \tag{15}$$

3 Household debt and the cost of job loss

Our starting point is employment rent framework following Bowles (2004), This we write as:

$$E = W_r - \left(hW_u + \left[1 - h \right] W_r{}' \right) \tag{16}$$

where W_r is the real wage that a worker will receive if she remains in their current employment, h is a probability for which an unemployed worker will remain unemployed if she loses her current job (i.e., unemployment duration), W_u is the income that a worker will receive while unemployed (e.g., unemployment insurance benefits), $W_r{}' > W_u$ is the per period real wage that the worker will receive if they are re-employed having first lost their current employment. We assume, for the sake of simplicity, that h is exogenously given and that there is no discounting of future values during the reference interval. We assume further that W_r, W_u, and $W_r{}'$ are all known rather than expected magnitudes (or alternatively, that workers have perfect foresight with respect to the key variables in equation (16), so that E represents the both the *ex ante* anticipated employment rent *and* the *ex post* actual employment rent.

To simplify the analysis, we begin by assuming that h is the (known) probability that the worker will be unemployed rather than employed in this instant in the event of job loss. In light of the aggregate level at which our model is developed, we also need to redefine the employment rent so that it represents the value of remaining in employment to all currently employed workers. We also have $W_r{}' = W_r$ as our model is one sector growth model with homogenous labor. Multiplying by the level of employment, L, the expression in (16) becomes:

$$E = W_r L - \left(hW_u L + \left[1 - h \right] W_r L \right) \tag{17}$$

Now consider how the value of E is modified by the fact that workers borrow to finance some part of their consumption spending and (as a consequence) carry debt that must be serviced from current income. We assume that workers can only borrow in this fashion if they are currently employed: in other words, *jobs effectively act as collateral for loans.* In this case, borrowing privileges are part of the benefit of employment, whereas loss of borrowing privileges is part of the cost of being unemployed. In light of all this, the value of E becomes:

$$E = W_r L + \dot{D_W} - iD_W - \left(h[W_u L - iD_W] + \left[1 - h\right][W_r L + \dot{D_W} - iD_W] \right) \tag{18}$$

which represents the *aggregate employment rent with household debt.* Note that the current setting is consistent with budget constraint of workers with the understanding that having job works as a collateral to borrowing. (Unemployed means $\dot{D_W} = 0$.) Note that this simplifies to:

$$E = h[W_r L - W_u L + \dot{D_W}] \tag{19}$$

But note that

$$\dot{D_W} = \beta C_R \tag{20}$$

Therefore,

$$E = h[W_r L - W_u L + \beta C_R] = h[W_r L - W_u L + \beta(1 - s_R)(\Pi + iD_W)] \tag{21}$$

Now we have intuitive and direct relationship between employment rent and household debt!

Finally, standardizing by the capital stock and setting $W_u = 0$, we obtain the *standardized aggregate employment rent with household debt*:

$$e = \frac{E}{K} = h[(1 - \pi)u + \beta(1 - s_R)(\pi u + id_W)] \tag{22}$$

Note that temporary equilibrium level of capacity utilization rate will take a place for u, and that is given by

$$u = \frac{1}{\pi(s_R + s_R\beta - \kappa_r - \beta) - \kappa_u}[\kappa_0 - (s_R + s_R\beta - \beta)id_W)] \tag{23}$$

We can see that we could observe some interesting short run comparative statics result in this employment framework.

Now note that we have employment rent depends on :

$$e = e(d_w, \psi))$$

In fact, we have a explicit reduced form for this.

We now link the employment rent into the distribution:

$$\dot{W}_r = f(e(d_w, \psi))$$

where $f_e < 0$

Of course, we could use a specific functional form for this:

$$\dot{W}_r = \phi_0 - \phi_e e(d_w, \psi))$$

Note that $\psi = W_r L/Y$, where Y is real output and hence L/Y is an inverse of labor productivity. Assuming the absence of technological change,

$$\widehat{\psi} = \widehat{W_r}$$

$$\dot{\psi} = \frac{L}{Y}\dot{W}_r = a\dot{W}_r$$

where $a = \frac{L}{Y}$

We finally have wage share dynamics in a compact form:

$$\dot{\psi} = a\dot{W}_r = af(e(d_w, \psi)) = \rho(d_W, \psi)$$

4 Dynamics

In this section, dynamics of consumer debt and distribution dynamics are first described. We then analyse the implications of consumption emulation through borrowing on debt-distribution dynamics.

From the definition of d_W and $\dot{D}_W$, we see that

$$\begin{aligned} \dot{d}_W &= \dot{D}_W/K - g_K d_W \\ &= \beta(1-s_R)(\pi u + i d_W) - g_K d_W \end{aligned} \tag{24}$$

So we can use our reduced form for g_K (equation (15)) to determine the reduced form for $\dot{d}_W$.

$$\dot{d}_W = \frac{[-\kappa_0 \pi + d_W i(\kappa_u + \kappa_r \pi)][d_W s_R + (1+d_W)(s_R - 1)\beta]}{\pi(s_R + s_R\beta - \kappa_r - \beta) - \kappa_u} \tag{25}$$

5 Conclusion

Coming soon —.

References

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