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Inside Debt and Economic Growth: A Cambridge - Kaleckian Analysis

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Abstract

Inside debt is a fundamental feature of capitalist economies. This paper examines the growth effects of consumer and corporate debt using a Cambridge – Kaleckian growth framework. According to the Cambridge – Kaleckian model inside debt has an ambiguous effect on growth. This is counter to the intuition of static short-run macro models in which higher debt levels lower economic activity and shows intuitions derived from short run macroeconomics do not always carry over to growth theory.

Growth is faster in endogenous money economies than in pure credit economies, *ceteris paribus*. That is because lending in endogenous money economies creates money wealth that increases spending and lowers saving.

Interest payments from debtors to creditors are a critical channel whereby debt affects growth. In the consumer debt model this interest transfer mechanism exerts a negative influence on growth. However, in the corporate debt model the transfer can raise growth if the marginal propensity to consume of creditor households exceeds the marginal propensity to invest of firms.

Keywords: Growth, Debt, Interest transfers, Cambridge distribution theory, Kaleckian growth theory.

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I Introduction: inside debt, macroeconomics and growth

Recently, there has been a surge of interest in the economic effects of inside (private sector) debt owing to rising indebtedness in many countries. The current paper explores the effects of inside debt on economic growth within a Cambridge - Kaleckian framework.[1] The Cambridge dimension reflects the paper's use of the theory of income distribution developed by Kaldor (1956) and Pasinetti (1962). The Kaleckian dimension reflects the paper's use of the model of economic growth developed by such authors as Rowthorn (1982), Taylor (1983) and Dutt (1984, 1990). In these models growth is determined by the rate of capital accumulation which depends on the profit rate and the rate of capacity utilization.

After long being ignored, inside debt effects have become a major focus of interest in macroeconomics. One strand of literature explores Fisher's (1933) debt-deflation theory of depressions whereby debt causes price level reductions and deflation to be destabilizing (Tobin, 1980, Caskey and Fazzari, 1987, Palley, 1992, 1996a, 1997a, 1999, 2008a, b).[2]

A second strand of literature concerns the effect of inside debt on the business cycle. Most of this literature has focused on the effect of corporate debt, which creates balance sheet congestion that limits investment spending. This congestion mechanism applies to both Keynesian (Gallegati and Gardini, 1991; Jarsulic, 1989; Semmler and Franke, 1991; Skott, 1994) and new Keynesian models (Bernanke et al., 1996, 1999; Kiyotaki and Moore, 1997). However, in Keynesian models corporate debt congestion

[1] The issue of government (outside) debt is a separate question that requires a treatment of its own.

[2] Tobin (1975) and De Long and Summers (1986) are widely cited articles on deflation but they do not have debt effects. Instead, the destabilizing impact of deflation operates via the Tobin-Mundell real interest rate effect whereby deflation increases the return to money. That increases the money demand, raising the real interest rate and lowering aggregate demand.

effects operate via the aggregate demand channel whereas in new Keynesian models they operate via the aggregate supply channel with lower investment lowering the capital stock and output.

Household debt is another channel whereby debt affects the business cycle. The mechanism here is transfer of interest service from free spending debtors to thrifty creditors, which lowers aggregate consumption (Palley, 1994. 1997b). Debt is therefore a double-edged sword: borrowing is initially expansionary but it leaves behind a debt burden that is contractionary.

Palley (2004) presents a corporate debt model of the business cycle that also uses an interest transfer mechanism, only now interest transfers are between firms and households. In that model, debt can be expansionary or contractionary, depending on the relative size of households' propensity to consume versus firms' propensity to invest.

The current paper applies these insights regarding the effects of interest transfers to the economics of growth, and examines how debtor – creditor interest service transfers affect steady state growth. The paper adds a new dimension to the burgeoning literature on "financialization" that argues that changes in the financial system over last 25 years may have lowered growth (Hein and Van Treeck, 2007; Skott and Ryoo, 2007; Stockhammer, 2004). The existing financialization literature tends to focus on the growth effects of higher asset prices and an increased profit share, whereas the current paper focuses on the growth effect of higher indebtedness.

The effect of debt on growth operates through two channels. The first channel is the effect of debt on capacity utilization, via which debt affects investment and growth. This is the Kaleckian channel. The second channel is the effect of debt on the profit rate, via which debt also affects investment and growth. This is the Cambridge income distribution channel.

Additionally, debt can have impacts on the firm's mark-up which determines the wage – profit share, and via this share effect debt can potentially impact both capacity utilization and the profit rate. This is an additional Kaleckian channel that is discussed in section VI of the paper. The key issue is whether debt levels affect firms' mark-ups.

The paper is structured as follows. Section II discusses the basic Cambridge – Kaleckian growth model. Section III examines an economy with consumer debt issued through a bond market. Section IV examines an economy with consumer debt financed by an endogenous money banking system. Section V examines an economy with corporate debt financed by an endogenous money banking system. Section VI discusses the implications of including an endogenous mark-up. Section VII summarizes the conclusions. One major take-away is that intuitions derived from short run macroeconomics can be misleading for growth theory. Thus, in short-run macro models higher inside debt levels lower economic activity but in a growth context higher debt can theoretically raise growth rates.

II The basic Cambridge – Kaleckian growth model

The basic Cambridge - Kaleckian growth model has the rate of growth determined by the rate of capital accumulation. The rate of capital accumulation in turn depends on the rate of capacity utilization and the profit rate. The profit rate is determined by the requirements of saving – investment equilibrium and it adjusts to bring saving into alignment with investment. This is the central insight of Kaldor's (1956) Cambridge theory of income distribution.

According to Cambridge distribution theory, saving out of profits play a critical role determining the profit rate. The Kalecki (1943) – Kaldor (1956) assumption is that rule of thumb behavior has households consume all wage income and save exclusively out of profits. A second line of reasoning attributable to Pasinetti (1962) is that if the capitalist class's only source of income is profits, only capitalists' saving behavior matters for the determination of the rate of profit.

The equations of the basic Cambridge – Kalecki growth model are given by:

(1) $S/K = I/K$

(2) $I/K = g = \alpha_0 + \alpha_1[P/K] + \alpha_2 u$ $\qquad \alpha_0, \alpha_1, \alpha_2 > 0$

(3) $S/K = sP/K$ $\qquad 0 < \alpha_1 < s < 1$

where g is the growth rate, I denotes investment spending, K is the capital stock, P is total profits, u is the capacity utilization rate, S denotes total saving, and s is the propensity to save out of profits. For the time being the utilization rate is taken as exogenous. The inclusion of utilization as an argument affecting investment allows the level of economic activity to affect investment spending, and capacity utilization will be an important channel through which debt affects growth.[3]

The assumption $s > \alpha_1$ is the "Keynesian" stability condition that ensures the model is stable. Induced leakages must exceed induced injections or else the model will be unstable owing to either cumulative expansions of aggregate demand (AD) or cumulative contractions of AD. Figure 1 provides a representation of the model. Graphically, the Keynesian stability condition requires that investment schedule be flatter

[3] Equation (2) specifies investment as a positive function of the profit rate. A theoretically superior specification is to specify investment as a positive function of the ratio of the profit rate and the interest rate in a vein similar to Tobin's q (Tobin and Brainard, 1968). However, because the interest rate is assumed to be exogenous, it is suppressed in equation (2) to simplify algebraic manipulations.

than the saving schedule. Saving – investment equilibrium determines the profit rate, which determines investment, which in turn determines the growth rate.

Figure 1 here

III A growth model with loanable funds consumer debt

The first model to be considered is an economy in which there is consumer debt provided through a loanable funds credit market (i.e. a bond market) where debtor households borrow from creditor households.[4] The bond market therefore transfers income claims from creditors to debtors.

III.a The basic model

The equations of the short-run static macro model are:

(4) $Y = C + I$

(5) $C = C_D + C_C$

(6) $C_D = \varphi Y - iD + B$ $\quad 0 < \varphi < 1$

(7) $C_C = \gamma_1\{[1-\varphi]Y + iD\}$ $\quad 0 < \gamma_1 < 1,\ 0 < \varphi < 1$

where φ is the wage share (and 1 – φ the profit share), i denotes the interest rate, D is the level of debt, B is current period borrowing, and γ_1 is the MPC of creditors.

The short run equilibrium for a given investment level is

(9) $Y = \{[\gamma_1 - 1]iD + B + I\}/\ \{1 - \varphi - \gamma_1[1-\varphi]\}$

[4] The model has similarities to that of Palley (1996) which examined the implications of including debt in an over-lapping generations framework for Pasinetti's (1962) Cambridge theory of income distribution. The current model includes capacity utilization effects and assumes infinitely lived households so that there is no inter-generational trade.

In the short run increased borrowing (B) is expansionary. Increased debt (D) is contractionary because of the resulting interest transfer payments from high spending debtors to lower spending creditors.

Steady state equilibrium requires that the debt stock grow at the rate of capital accumulation, which implies[5]

(10) $B/D = I/K$

Cross-multiplying by D, substituting in for $g = I/K$, and multiplying both sides by 1/K, yields an expression for steady state borrowing given by

(11) $B/K = gD/K$

Equation (9) can then be expressed in terms of capacity utilization, yielding

(12) $u = Y/K = \{[\gamma_1 - 1]iD/K + B/K + I/K\}/\{1 - \varphi - \gamma_1[1-\varphi]\}$

$= \{[\gamma_1 - 1]iD/K + gD/K + g\}/Z$

where $Z = 1 - \varphi - \gamma_1[1-\varphi]$ and $0 < Z < 1$. Debt service payments (iD/K) have a negative effect on steady state capacity utilization reflecting the fact that interest transfers reduce debtor income and increase creditor income. Every dollar of interest transfers increases creditor consumption by γ_1 but decreases debtor consumption by 1, where $\gamma_1 - 1 < 0$. However, steady state borrowing (gD/K) has a positive impact on capacity utilization. This opposition between the effects of steady state debt service (iD/K) and steady state borrowing (gD/K) on capacity utilization is one reason why the growth effects of debt are theoretically ambiguous.

Capacity utilization impacts growth via its impact on investment spending. Substituting equation (12) into equation (2) yields

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[5] Debtor consumption, C_D, must also grow at the rate of output growth in steady state to ensure constant consumption shares. This condition is satisfied if debtor borrowing grows at the rate of output growth.

(13) $I/K = g = \alpha_0 + \alpha_1[P/K] + \alpha_2\{[\gamma_1 - 1]iD/K + gD/K + g\}/Z$

Rearranging (13) then yields

(14) $g = \{\alpha_0 + \alpha_1[P/K] + \alpha_2[\gamma_1 - 1]id/Z\}/[1 - d/Z - 1/Z]$

where d = D/K. Growth is an unambiguous positive function of the profit rate. Though an incomplete solution because the profit rate has yet to be determined, equation (14) is useful for understanding some of the the growth effects of debt. The direct effect of interest transfers (id) on growth, operating via the impact of capacity utilization on investment, is unambiguously negative ($\alpha_2[\gamma_1 - 1]id/Z < 0$). However, increased borrowing to sustain a greater steady stock level of debt has a positive effect on growth via the term in the denominator ($1 - d/Z - 1/Z$).

Differentiating (14) with respect to d yields

$$dg/dd = \underbrace{\{\alpha_2[\gamma_1 - 1]i/Z\}/[1 - d/Z - 1/Z]}_{(-)} + \underbrace{\{\alpha_2[\gamma_1 - 1]id/Z\}/[1 - d/Z - 1/Z]^2}_{(+)} \gtrless 0$$

The growth function can be positively or negatively sloped with respect to d. On one hand higher steady-state debt lowers growth, reflecting the depressing effects of increased interest transfers to thrifty creditors. However, higher steady-state debt means debtor households are persistently borrowing more, and that borrowing finances spending. If this latter effect dominates, growth could potentially increase.

On top of these direct effects of debt there are indirect effects that work through the profit rate ($\alpha_1[P/K]$). This is where Cambridge distribution theory enters, with the profit rate adjusting to ensure goods market equilibrium. It is to this matter we now turn.

The Cambridge distribution channel involves both saving and investment, both of which are affected by debt. Aggregate saving is given by

(15) $S/K = [1 - \gamma_1][P/K + iD/K] – B/K$

The first part of equation (15) is saving by creditor households, which includes saving by creditors out of interest paid to them by debtor households. The second part is dis-saving by debtor households who continue borrowing each period. The creditor saving channel will be shown to have an unambiguous negative impact on growth via its effect on the profit rate. The debtor dis-saving channel will be shown to have an unambiguous positive impact, again via the profit rate.

Goods market equilibrium requires that saving equal investment, which requires:

(16) $I/K = S/K$

Using (11), (14), (15) and (16) then enables solution for the steady state profit rate which is given by the following expression:

(17) $P/K = \{\{[1 + d]\{\alpha_0 + \alpha_2[\gamma_1 - 1]id/Z\}/[1 – d/Z – 1/Z]\} - [1 - \gamma_1]id\}/$

$[1 + d]\{1 - \gamma_1 - \alpha_1/[1 – d/Z – 1/Z]\}$

This complicated expression actually makes the economics of debt effects easy to understand.[6] First, higher debt directly reduces aggregate saving through the ongoing dis-saving of debtor households. This debtor dis-saving effect shows up in the numerator via the term $[1+ d]$, and it elicits a higher profit rate to maintain saving – investment balance. Second, higher debt lowers aggregate consumption and capacity utilization by raising interest transfers from free-spending debtors to thrifty creditors. This lowers investment, therefore requiring a lower profit rate to ensure saving – investment balance ($\alpha_2[\gamma_1 - 1]id/Z < 0$). Third, higher debt increases transfers to creditors, which increases creditor

[6] The denominator must be positive for saving to be more responsive than investment to the profit rate. This is needed if the profit rate is to be able to equilibrate saving and investment. That means the numerator must be positive to have a positive profit rate, implying $\{[1 + d]\{\alpha_0 + \alpha_2[\gamma_1 - 1]id/Z\}/[1 – d/Z – 1/Z]\}\} > [1 - \gamma_1]id$.

saving (- [1 - γ_1]id < 0). This also requires a lower profit rate to ensure saving – investment balance. Fourth, higher debt induces a higher rate of steady state borrowing, which adds to AD and raises capacity utilization and investment. This last effect (1 – d/Z – 1/Z) is present in the denominator of (17) and increases the profit rate.

These four effects of higher debt are captured in Figure 2, which shows the determination of the profit rate in terms of investment - saving balance. The first effect shifts the saving function down. The second effect shifts the investment function down. The third effect shifts the saving function up. The fourth effect rotates the investment function counter-clockwise.[7] The first and fourth effects are expansionary. The second and third effects are contractionary. Figure 2 shows the case where increased debt lowers the profit rate.

Figure 2 here

The effect of higher debt on growth (see equation (14)) operates via the combination of the effects of debt on capacity utilization *and* the profit rate. Both of these effects are theoretically ambiguous so that the overall effect of increased debt is ambiguous. This illustrates how the insights of short-run macroeconomics do not necessarily carry over to a long-run growth context. Higher debt unambiguously lowers short-run macroeconomic activity (see equation (12)), yet it can theoretically increase the growth rate because it spurs higher steady state borrowing that can raise both capacity utilization and the profit rate.

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[7] The investment function cannot rotate too much or else the model becomes unstable with a higher profit rate inducing more investment, which in turn calls for a higher profit rate to maintain saving – investment balance.

Whereas the growth effect of higher debt is ambiguous, the growth effect of higher interest rates is not. Equations (14) and (17) reveal that the effect of a higher interest rate unambiguously lowers growth. From (14) it can be seen a higher interest rate lowers investment spending by reducing capacity utilization.[8] This capacity utilization effect is because debtors must make larger interest payments to creditors, which reduces their consumption more than it raises creditor consumption. From (17) it can be seen higher interest rates lower the profit rate by increasing the saving of creditors and reducing investment demand. Putting the pieces together higher interest rates unambiguously lower growth because they lower both capacity utilization and the profit rate.

III.b Endogenous debt ratios

So far the model has assumed exogenous debt ratios. However, debt can be endogenized by assuming households are borrowing constrained and that their constraint varies with economic activity. One possibility is credit markets impose on debtors a maximum debt interest service to income ratio given by[9]

(18) $iD/\varphi Y \leq k \qquad k > 0$

This condition implies a maximum D/K ratio given by

(19) $D/K_{MAX} = [\varphi k u(g(D/K))]/i = z \qquad u_g > 0, k > 0$

If k = 1, inequality (18) is the equivalent of a "no Ponzi" finance condition (i.e. no borrowing to pay debts). Figure 3 shows the determination of the set of feasible debt ratios under the assumption that the partial derivative $g_{D/K}$ is negative (i.e. higher debt

[8] Additionally, a higher interest rate will raise the cost of capital, which will lower Tobin's q and reduce investment. This cost of capital channel is suppressed in the current model (see footnote 3).

[9] (Palley, 1994) has a condition $D/\varphi Y = k$. Since the interest rate is constant that specification is equivalent to embedding the interest rate in the constant, k.

ratios reduce steady state growth).[10] Increases in the wage share (φ) raise the ceiling given by (19).

Figure 3 here

If debtors are at their ceiling then D/K = kφu/i and the actual debt ratio becomes endogenous as it is affected by the level of economic activity. That adds another channel of complication. For instance, increases in credit limits (k), perhaps due to financial innovation, will raise the sensitivity of borrowing and debt to economic activity. The resulting endogeneity of debt then increases the likelihood that debt will be expansionary and might even create instability.

This effect of debt endogeneity is easily seen by setting d = kφu/i. Combining this condition with equations (12) and (13) yields new expressions for capacity utilization and capital accumulation given by

(12.a) $u = Y/K = g/Z\{1 - [\gamma_1 - 1]k\varphi/Z - gk\varphi/iZ\}$

(14.a) $g = \{\alpha_0 + \alpha_1[P/K]\}/\{1 - \alpha_2/Z\{1 - [\gamma_1 - 1]k\varphi/Z - gk\varphi/iZ\}$

The debt ceiling coefficient, k, appears in the denominator. Increases in k steepen the investment function in [P/K, g] space. As shown in Figure 2 that makes it more likely increased debt will be expansionary, and it is also more likely the model violates the Keynesian stability condition described in section II.[11]

For the balance of the paper it is assumed that the steady-state debt-capital ratio is exogenous, which is equivalent to saying d < z. This treatment enables direct examination

[10] If $g_{D/K} > 0$, the z function in Figure 3 is positively sloped.
[11] The logic of potential instability is clear. A higher debt ceiling raises borrowing, which increases AD and capacity utilization. That further raises the debt ceiling, opening the way for more borrowing and a cumulatively explosive process of expansion. The reverse can happen for reductions in the debt ceiling.

of the impact of variations in d rather than having to examine debt effects indirectly via variations in k, the maximum debt – income ratio.

IV Growth with endogenous money bank financed consumer debt

The previous section examined the growth effects of debt when debt is financed through a bond market. This section presents a model in which there is endogenous money and debt is financed through the banking sector which creates loans. Previously, Palley (1997) has examined the business cycle effects of such arrangements, while Dutt (2006) has examined such effects in a Cambridge - Kaleckian model that incorporates capacity utilization effects. However, Dutt's model lacks money despite nominally being a model with endogenous money. Furthermore, it does not take account of the effect of debt on the profit rate. From a Cambridge distribution perspective, that makes it a partial analysis of the steady-state growth effects of debt

The critical feature of a model with endogenous money is that lending creates money balances. Loans are issued to borrowers and the process of loan issuance creates money. Those money balances are spent by debtors and accumulated by creditors who own the businesses that produce the goods and services debtor households purchase.

This simple schema results in a re-specified short-run model given by:

(22) $Y = C + I$

(23) $C = C_D + C_C$

(34) $C_D = \varphi Y - iD + B \qquad 0 < \varphi < 1$

(25) $C_C = \gamma_1\{[1-\varphi]Y + iD\} + \gamma_2 M \qquad 0 < \gamma_1 < 1,\ 0 < \gamma_2 < 1,\ 0 < \varphi < 1$

(26) $M = D$

where M is the money supply. Creditor consumption (equation (25)) is amended to include a wealth effect from money (γ_2), and equation (26) has the money supply determined by bank lending.

The short-run equilibrium is given by

(27) $Y = \{\gamma_2 M + [\gamma_1 - 1]iD + B + I\}/\{1 - \varphi - \gamma_1[1-\varphi]\}$

Comparison with equation (9) shows short-run equilibrium output is higher in a world with endogenous money owing to the wealth effect of money on creditor consumption.

Capacity utilization and the rate of accumulation are respectively given by

(28) $u = Y/K = \{\gamma_2 M/K + [\gamma_1 - 1]iD/K + B/K + I/K\}/\{1 - \varphi - \gamma_1[1-\varphi]\}$

$= \{[\gamma_2 + \gamma_1 - 1]id + gd + g\}/Z$

(29) $I/K = g = \{\alpha_0 + \alpha_1[P/K] + \alpha_2[\gamma_2 + \gamma_1 - 1]id/Z\}/[1 - d/Z - 1/Z]$

where $Z = 1 - \varphi - \gamma_1[1-\varphi] > 0$. Equation (28) shows that capacity utilization is higher in an endogenous money bank credit economy than in a bond market credit economy for a given debt level. That higher rate of capacity utilization in turn raises the rate of capital accumulation determined by equation (29).

The profit rate is again determined by Cambridge distribution theory. Aggregate saving is given by

(30) $S/K = [1 - \gamma_1][P/K + iD/K] - \gamma_2 M/K - B/K$

Aggregate saving is now reduced by consumption spending due to the wealth effect of money balances. That will be another factor raising growth in an endogenous money economy because reduced saving requires a higher profit rate to ensure saving – investment balance.

Substituting equations (11), (26), (29) and (30) into the saving – investment equilibrium condition then yields a steady state profit rate given by:

$$(31)\ P/K= \{[1 + d]\{\alpha_0 + \alpha_2[\gamma_2 + \gamma_1 - 1]id/Z\}/[1 - d/Z – 1/Z] - [1 - \gamma_1]id + \gamma_2 d\}/ [1 + d]\{1 - \gamma_1 - \alpha_1/[1 - d/Z – 1/Z]\}$$

The only differences from the earlier loanable funds model are the two terms involving the coefficient γ_2 in the numerator. Both of these terms enter positively and raise the profit rate. The first term ($\alpha_2\gamma_2 id/Z$) reflects the fact that moneywealtheffect spending raises capacity utilization, which increases investment and calls for a higher profit rate to maintain saving – investment balance. The second term ($\gamma_2 d$) reflects the fact that the money wealth effect on consumption lowers saving, which also calls for a higher profit rate to maintain saving – investment balance.

The net result is that growth will be higher for a given debt ratio (d) in an endogenous money economy compared to a loanable funds bond market economy. This is because both capacity utilization and the profit rate are higher. Capacity utilization is higher because of additional spending by creditor households, and the profit rate is higher because of reduced saving by creditor households and because of increased investment due to higher capacity utilization.

Lastly, endogenous money also means that an increase in the steady state debt ratio is more likely to be expansionary. That is because higher debt raises creditor consumption relatively more in an endogenous money economy, while it increases saving relatively less. That makes it more likely higher debt ratios will raise growth.

V Growth effects of corporate debt

Corporations also issue debt and that gives rise to transfers between corporations and creditor households (Palley 2004). This section presents a simple Cambridge – Kaleckian growth model with corporate debt. Once again debt financing can be through bond markets or through banks, or a combination of both. The model that is presented assumes bank financing.

The major innovation in the model is re-specification of the investment function to include a corporate cash flow effect, an effect that has been emphasized in the empirical literature on investment (Fazzari et al., 1988). Corporate debt has a positive growth effect because it increases household income through payment of interest. That spurs consumption, raising capacity utilization and investment.

Balanced against this corporate debt has two negative growth effects. First, interest payments to households reduce corporate cash flows which in turn reduce investment spending. Second, increased household income increases household saving, which tends to reduce the profit rate according to Cambridge distribution theory and lowers investment spending.

The only change to the short run macro model given by equations (22) – (26) is the replacement of the creditor and debtor household consumption functions with a new household consumption function given by

(32) $C = \varphi Y + \beta_1\{[1 - \gamma][1 - \varphi]Y + iD\} + \beta_2 M \quad 0 < \beta_1 < 1, 0 < \beta_2 < 1, 0 < \varphi < 1, 0 < \gamma < 1$

Because there is no household borrowing there is only a single type of household. Households are assumed to adopt a "rule of thumb" approach to saving whereby they consume all wage income and save out of profits, as originally assumed by Kalecki (1943) and Kaldor (1955/56).

The short run equilibrium level of output and rate of capacity utilization are given by:

(33) $Y = \{I + \beta_1 iD + \beta_2 M\}/\{1 - \varphi - \beta_1[1 - \gamma][1 - \varphi]]\}$

(34) $u = Y/K = \{I + \beta_1 iD + \beta_2 M\}/\{1 - \varphi - \beta_1[1 - \gamma][1 - \varphi]]\}K$

$= \{g + \beta_1 id + \beta_2 d\}/H$

where $H = \{1 - \varphi - \beta_1[1 - \gamma][1 - \varphi]]\}$ and $0 < H < 1$. For a given level of investment, debt service payments to consumers add to aggregate demand by increasing household disposable income and consumption ($\beta_1 iD$) and in a world with endogenous money there is an additional fillip to consumption from the creation of money ($\beta_2 M$). Setting $M = 0$ transforms the model into a model of a bond market economy.

The second change to the model concerns investment and the determination of the rate of capital accumulation which is given by

(35) $I/K = g = \alpha_0 + \alpha_1[P/K] + \alpha_2 u + \alpha_3 F/K \qquad \alpha_0, \alpha_1, \alpha_2, \alpha_3 > 0$

where F = real retained cash flows. Investment spending is affected by a cash flow effect, where cash flows are defined as

(36) $F = \gamma[1-\varphi]Y - iD + B$

with γ denoting firms' profit retention ratio.

Substituting equations (34) and (36) into (35) then yields:

(37) $g = \{\alpha_0 + \alpha_1[P/K] + \{\alpha_2 + \alpha_3\gamma[1-\varphi]\}\{\beta_1 i + \beta_2\}d/H - \alpha_3 id\}/\{1 - \alpha_2 - \alpha_3\gamma[1-\varphi] - \alpha_3 d\}$

Interest service transfers now have opposing effects. The payment of interest to households raises household disposable income, which raises consumption and capacity utilization ($\alpha_2 + \alpha_3\gamma[1-\varphi]\}\beta_1 i$). However, interest payments also lower cash flows which reduces investment spending ($- \alpha_3 id$).

Interest transfers from firms to households affect both investment and saving, and that means they affect the profit rate. Aggregate saving consists of household saving (S_H) and corporate saving (S_C) and is determined as follows

(38) $S/K = S_H/K + S_C/K$

(39) $S_H/K = [1 - \beta_1]\{[1 - \gamma]P/K + iD/K]\} - \beta_2 M/K$

(40) $S_C/K = \gamma P/K$

Corporate saving consists of retained profits. Substituting (39) and (40) into (38) yields aggregate saving of

(41) $S/K = [1 - \beta_1 + \beta_1\gamma]P/K + [1 - \beta_1]iD/K - \beta_2 M/K$

Substituting into the saving - investment equilibrium condition enables solution for the steady state profit rate which is given by

(42) $P/K = \{\{\alpha_0+\{\alpha_2+\alpha_3\gamma[1-\varphi]\}\{\beta_1 id+\beta_2 d\}/H - \alpha_3 id\}/\{1-\alpha_2-\alpha_3\gamma[1-\varphi]-\alpha_3 d\} - [1-\beta_1]id+\beta_2 d\}/\{1 - \beta_1 + \beta_1\gamma - \alpha_1\}$

The steady state profit rate is determined according to Cambridge distribution theory and the profit rate adjusts to ensure saving – investment balance in a manner similar to that described earlier in Figure 2.

Increases in the steady state corporate debt to capital ratio have an ambiguous effect on the profit rate because of multiple differently signed impacts on investment and saving. First, higher corporate debt means higher interest transfers to households that raise consumption. This raises capacity utilization, increasing investment, which necessitates a higher profit rate to maintain saving – investment equilibrium ($\{\alpha_2+\alpha_3\gamma[1-\varphi]\}\beta_1 id > 0$). Second, increased debt raises the money supply which has a similar positive effect on consumption, capacity utilization and investment ($\{\alpha_2+\alpha_3\gamma[1-\varphi]\}\beta_2 d > 0$). Third, increased corporate debt lowers firms' cash flows which directly lowers investment, requiring a lower profit rate for saving investment equilibrium ($- \alpha_3 id < 0$). Fourth, increased debt raises interest transfers to households, raising income and saving, which necessitates a lower profit rate ($- [1-\beta_1]id < 0$). Fifth, increased debt raises money balances, which increases consumption, reduces saving, and necessitates a higher profit rate ($\beta_2 d > 0$). The profit rate may therefore rise or fall, depending on the magnitude of these various shifts of the investment and saving functions.

The effect of a higher corporate debt ratio on growth (equation (37)) is therefore ambiguous because the effect of debt on both capacity utilization and the profit rate is ambiguous. The weaker the cash flow effect of interest payments on investment and the stronger the impact of interest transfer payments on consumption, the more likely debt will be expansionary. If investment spending is little affected by reduced cash flows but there is a strong consumption response to higher interest income, capacity utilization increases, which raises investment and growth. At the same time, the strong consumption response means saving is little changed, so that higher investment will raise the profit rate thereby additionally stimulating investment and growth. The reverse holds (i.e. steady state growth falls) when investment is strongly affected by cash flows and consumption is only weakly affected by interest payments and money wealth.

In the consumer debt model a higher interest rate unambiguously lowered growth since it increased transfers from free spending debtors to thrifty creditors. In a corporate debt world the effect of higher interest rates is theoretically ambiguous. The interest rate - cost of capital channel (α_1) will unambiguously lower investment and contribute to lower growth. However, interest service payments can increase AD if consumers have a higher propensity to consume than firms' propensity to invest out of cash flows, which will increase capacity utilization and investment. This latter possibility means higher interest rates can theoretically raise growth.

A last issue is the growth effect of higher dividend distributions (lower γ). Once again this is ambiguous because the effect on both capacity utilization and the profit rate is ambiguous. Capacity utilization is positively affected by increased consumption resulting from increased dividend payouts to households, but it is negatively impacted by reduced investment resulting from reduced cash flows. Consequently, the impact on capacity utilization is ambiguous.

The profit rate is positively affected by decreased aggregate saving (equation (31)). Though household saving increases because of increased disposable income, the increase is less than the decline in corporate saving. Household saving rises by the marginal propensity to save ($[1 - \beta_1] < 1$) but corporate saving falls by a full dollar. However, the profit rate is negatively affected by reduced investment spending owing to reduced cash flows. Consequently, the impact on the profit rate is ambiguous.

Putting the pieces together, higher dividend payouts will raise growth if the cash flow investment effect is weak and the consumption response to increased payouts is large. They will lower growth if the reverse holds.

VI Further considerations: the mark-up and endogenous wage and profit shares

So far the wage (φ) and profit ($1 - \varphi$) shares have been assumed exogenous. In the Kaleckian macro model these shares are a function of the mark-up (m) and are given by

(55) $\varphi = 1/[1 - m]$

(56) $1 - \varphi = m/[1 - m]$

Lavoie (1995) presents Cambridge – Kaleckian growth model with endogenous wage and profit shares, with the wage share being affected by capacity utilization as follows

(57) $\varphi = \Phi(m(u))$ $\Phi_m < 0, m_u > 0$

According to Lavoie higher capacity utilization raises the mark-up, which raises the profit share and lowers the wage share. An alternative possibility is that the mark-up falls with capacity utilization as has been argued by Rotemberg and Saloner (1986).

Adding such an endogenous mark-up to the models of consumer and corporate debt means debt will affect income shares, and thereby further affect AD, capacity utilization, capital accumulation and growth. How income shares respond to changes in debt will depend on (a) how debt affects capacity utilization, and (b) how the mark-up responds to changes in capacity utilization.

Table 1 shows there are four cases to be considered.

Case 1 ($u_d > 0$, $m_u > 0$): higher debt raises capacity utilization which raises the mark-up and reduces the wage share.

Case 2 ($u_d > 0$, $m_u < 0$): higher debt raises capacity utilization which lowers the mark-up and raises the wage share.

Case 3 ($u_d < 0$, $m_u > 0$): higher debt lowers capacity utilization which lowers the mark-up and increases the wage share.

Case 4 ($u_d < 0$, $m_u < 0$): higher debt lowers capacity utilization which raises the mark-up and lowers the wage share.

The economic effects of changing wage and profit shares will then depend on whether the economy is "wage-led" or "profit-led" (see Bhaduri and Marglin, 1990).[12] An economy is wage – led if an increase in the wage share increases AD and it is profit-led if an increased wage share decreases AD. All of the models developed in this paper have been wage-led because the wage share affected consumption but the profit share was absent from investment. To introduce debt driven income share effects therefore requires re-specifying the investment function to include a profit share term and introducing an endogenous mark-up.

If this is done, there are eight cases to consider: the four cases in table 1 in a wage-led and profit-led regime, respectively. The analytically important feature is that capacity utilization effects of debt can be either amplified or damped. Whether they are amplified or damped will depend on the combination of how the mark-up responds to changes in capacity utilization and the character of the economy (i.e. whether it is wage- or profit-led).

A second channel whereby the mark-up can affect growth is full-cost target return pricing. This channel only applies to corporate debt. Many Post Keynesians believe firms treat interest payments as a cost and prices include a mark-up on interest costs. In that case higher corporate debt levels will add to the cost base, resulting in higher prices and a reduced wage share. The effect of these full-cost markups on capacity utilization depends on whether the economy is wage- or profit led. If wage-led, such additional mark-ups will tend to reduce consumption, thereby reducing capacity utilization, investment and growth. Furthermore, the higher mark-ups will raise the profit share, thereby increasing

[12] Bhaduri and Marglin (1990) actually term wage-led economies as "stagnationist" and profit-led economies as "exhilarationist".

saving and lowering the profit rate. That will also lower investment and growth. Thus, full cost pricing in a wage-led economy will tend to make corporate debt a drag on growth. The reverse holds for full-cost pricing in a profit-led economy.

VII Conclusion

Inside debt is a fundamental feature of capitalist economies. This paper has examined the growth effects of consumer and corporate debt using a Cambridge – Kaleckian growth framework. According to the Cambridge – Kaleckian growth model inside debt has an ambiguous effect on growth. This is counter to the intuition of static short-run macro models in which higher debt levels lower economic activity and shows that intuitions of short run macroeconomics do not always carry over to growth theory.

Growth is faster in endogenous money economies than in pure credit economies, *ceteris paribus*. That is because lending in endogenous money economies creates money wealth that increases spending and lowers saving.

Interest payments from debtors to creditors are a critical channel whereby debt affects growth. In the consumer debt model this interest transfer mechanism exerts a negative influence on growth. However, in the corporate debt model the transfer can raise growth if the marginal propensity to consume of creditor households exceeds the marginal propensity to invest of firms.

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Figure 1. The basic Cambridge – Kaleckian growth model

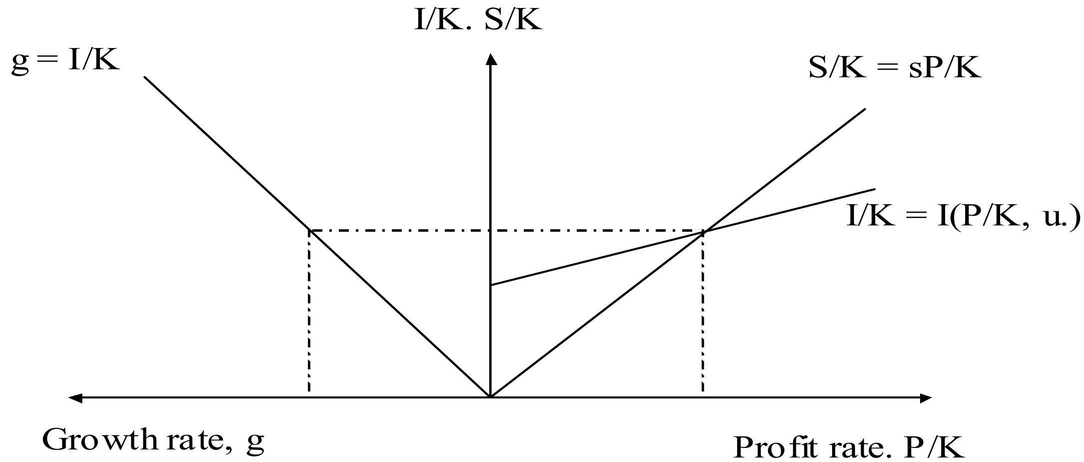

Figure 2: The case where increased steady state consumer debt ($d_1 > d_0$) lowers the profit rate.

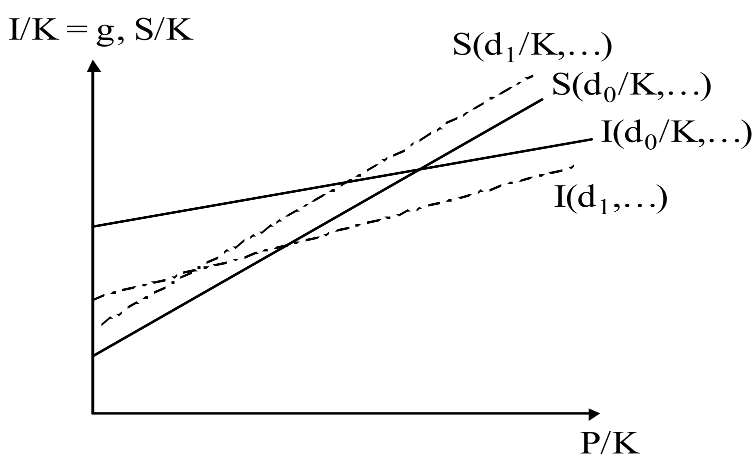

Figure 3. Debt Ceiling determined by maximum debt income ratio (k) allowed by credit markets.

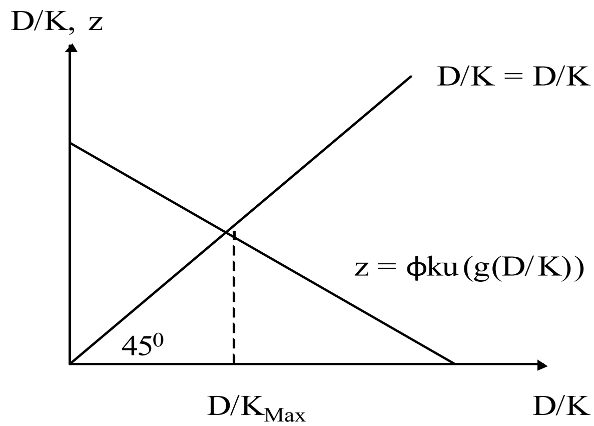

Table 1. Possible configurations of mark-up (m) – capacity utilization (u) – debt (d) effects.

		Effect of u on m	
		$m_u > 0$	$m_u < 0$
Effect of d on u	$u_d > 0$	Case 1	Case 2
	$u_d < 0$	Case 3	Case 4

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