The Twin Circuits: Aggregate Demand and the Expenditure Multiplier

in a Monetary Economy

Abstract

This paper seeks to expand the theory of aggregate demand so as to take account of the monetary nature of exchange. The economy is represented in terms of twin circuits of income generation and financial asset transacting. Money is not extinguished when spent, but instead partakes in these twin circuits of exchange. Money embodies potential purchasing power, and the extent to which it generates spending in goods markets is affected by agents' liquidity preferences.

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I Introduction.

A number of authors have emphasized the value logical time process analysis (Chick (1985), Earl (1990), and Dalziel (1996)). This paper uses such analysis to explore the relationship between the expenditure multiplier, liquidity preference, and endogenous money. The paper shows how the size of the multiplier depends directly on leakages out of the circular flow of income, and indirectly on reinjections back in. This process of leakage and reinjection is at the heart of monetary macroeconomics, and underlies many controversies that have divided Keynesians.

The paper represents the economy in terms of "twin circuits". The familiar "circular flow of income" constitutes one circuit. However, it is supplemented by a "circular flow of financial transactions" which details the pattern of money flows within the financial sector. These two circuits are linked. In combination with the pattern of transactions within the financial sector, they establish a relationship between liquidity preference, endogenous money, and the expenditure multiplier. This generates a new formulation of the Keynesian multiplier. These issues have also been addressed by Matthews (1961) in a paper that deserves greater recognition.

II Reconceptualizing money: the twin circuits

The role of money in determining macroeconomic outcomes has been a persistent source of controversy. Within the neo-Keynesian ISLM model, the focus is on money as a "stock" and as an "asset". The stock of money affects interest rates through its impact on the supply of liquidity. Since money earns no explicit interest, getting agents to willingly hold the money stock necessitates adjustment of interest rates in other asset market. Outside money is also an asset and part of private wealth. Changes in the price level therefore affect AD through their impact on the real value of money holdings.

This emphasis on the "asset stock" properties of money derives from The General Theory, and contrasts with theories that emphasize money's "circulatory" role in a monetary economy. In modern macroeconomics, monetarism (Friedman, 1974) has emphasized this latter feature through its reliance on the identity of exchange. Money remains a stock, but its significance for nominal income derives from its circulating property as captured by the velocity of circulation.

Keynes was also aware of the significance of money's circulatory role, and emphasized this feature in the Treatise on Money, although he neglected it in The General Theory. In the Treatise, not only is there an emphasis on the circulation of money, but there is also a recognition that capitalist economies are characterized by twin circuits. One circuit governs the circulation of money within goods markets, and corresponds to the circular flow of income. The other circuit governs the circulation of money within financial markets, and can be labelled the circular flow of financial transactions. Moreover, these two circuits are inter-linked, so that money flows can pass from the income circuit into the financial circuit through (a) hoarding, (b) purchases of financial claims, and (c) debt repayment. Similarly, money flows can pass from the financial circuit into the income circuit through (a) dishoarding, (b) expenditure of receipts from sales of financial claims, and (c) new borrowing.

Recognition of the twin circuits has significant implications for macroeconomics. First, it is important for the issue of endogenous money. Thus, in the event of an economic expansion, money balances that are tied up in the financial circuit can be released to finance production and exchange in the goods circuit (circular flow of income). Analytically, this is analogous to a reallocation of money demand from speculative/precautionary balances to transactions balances, which constitutes the Keynesian portfolio channel whereby money balances are freed up during an economic expansion.

Second, a twin circuits approach is revealing of the nature of leakages out of the circular flow, as well as reinjections back into it. This has implications for the scale of the expenditure multiplier.

Third, recognition of the twin circuits provides new insights regarding the monetary dimensions of the theory of AD. It does so by showing the connection between liquidity preference and the multiplier.

Keynesian macroeconomics over emphasizes the stock dimension of money at the expense of its circulating dimension. A twin circuits approach remedies this. Money is not extinguished when it is spent. Instead, it passes from hand to hand, conferring potential purchasing power on the recipient. The extent to which this purchasing power gets converted into actual goods market demand depends on (i) the nature of the transaction giving rise to the transfer of the money balance, and particularly whether it is a goods market or financial market transaction, (ii) the marginal propensity to spend out of income, and

(iii) liquidity preferences.

There is a distinction between goods and financial market transactions. The former generate income, which is the principal source for financing consumption spending. The latter are capital account (portfolio) transactions and involve transfers of ownership. If the marginal propensity to spend out of portfolio receipts is lower than that of income receipts, then the nature of the transaction matters.

Liquidity preference is also important because having received a money flow and decided how much to save, agents must allocate saving between money and other assets. If agents decide to hold money, the balances are deactivated (i.e. they sit idly in a bank account). If they decide to hold bonds, then the money remains active, being spent in another transaction involving the purchase of bonds.

Figure 1 illustrates the simplest of twin circuits. It describes an economy in which autonomous consumption is the only form of autonomous spending. If investment and working capital considerations were included, firms would also participate in the circuit of financial transactions. The right hand circuit represents the familiar circular flow of income in which money income circulates from firms to households, and AD circulates from households to firms. The left hand circuit represents the circuit of financial transactions. Households save part of their income, thereby draining money out of the income circuit. These savings are then used to purchase bonds/equities or add to money hoards. In addition, bonds/equities can be purchased by using existing money hoards. Buyers and sellers of assets swap money for title. Sellers of assets then use the proceeds either to buy new assets, add to money hoards, or purchase goods. The latter results in a reinjection of money into the income circuit as part of autonomous consumption spending. Money can also be injected into the income circuit if agents decide to spend part of their existing money hoards.

Lastly, the far left loop between banks and money hoards captures the effects of endogenous credit money. If agents borrow from banks, their money holdings are instantaneously augmented by the loan, and money is injected into the twin circuits when the loan is used to purchase assets or goods. If agents repay loans, their money balances are reduced by the size of the repayment.

III Liquidity preference and the multiplier

Figure 1 provides an anatomy of the twin circuits. It can be used to understand the Keynesian expenditure multiplier. There is a need to distinguish betwen a "one shot" increase in AD, and a "continuing" increase. For a $1 one shot increase, the logical time spending flow is:

1, b, b2, b3,......, 0

where b = marginal propensity to consume. AD initially rises by $1, and then dies back to its original level owing to successive leakages out of the circular flow of income. For a continuing increase, AD initially rises by $1 and then continues rising until it has increased by 1/[1-b].

These familiar results are predicated upon particular assumptions regarding the twin circuits pattern of transactions. For the one shot case, the assumptions are that (i) the initial increase in AD is financed by either new money balances or by the activation of existing money hoards, and (ii) that all saving ends up in money hoards and is permanently deactivated from the circular flow of income. Thus, there is an initial spending injection of $1, and this $1 is gradually drained off through saving into idle money hoards, and does not re-enter the goods market spending circuit.

For the continuing increase case, there is an injection of $1 each period, but earlier injections are progressively diminished by saving into money hoards. In this case, the assumptions are that (i) each period there is a fresh injection of $1, (ii) the injection of money spending comes from either bank borrowing or the activation of money hoards, and (iii) saving either goes into money hoards or is used to pay off loans so that saving permanently deactivates money.

A multiplier with reflux from the financial circuit

The conventional multiplier takes no account of reinjections back from the financial circuit. Suppose there is a continuing $1 increase in spending financed by bank lending, so that each period banks inject $1 of spending into the economy. A fraction "h" of savings is directed to money hoards, and [1 - h] is used to purchase bonds. A fraction "e" of the procceds from bond sales is then spent in goods markets. Thus, e[1 - h] of each dollar saved is reinjected from the financial circuit back into the goods circuit. The then generates a new expression for the multiplier given by:

$$m = 1/\{1 - [b + [1 - b][1 - h]e]\} > 1/[1 - b].$$

The additional term in the denominator, [1 - b][1 - h]e, reflects the impact on AD of reinjecting saving back into the circular flow of income. Agents who sell financial assets spend part of their asset sale receipts, which partially reinjects the saving leakage back into the circular flow and raises the multiplier.

If h = 1, all saving is deactivated in the form of money hoards, and the expression is the same as the conventional multiplier. If e = 0, the expression is also the same as the conventional multiplier: those selling bonds hold all their bond sales proceeds as money hoards, and there is no reflux into the circular flow.

Moore (1994) suggests that the multiplier is equal to the velocity of money. This result can be derived under restrictive assumptions. Velocity is scaled to be unity (i.e. the income accounting period is equal to one round in the circular flow of income). Moore appears to consider the case of a "one shot" $1 increase in investment spending financed by bank lending, which causes a $1 increase in the money supply. There are a number of different configurations that produce a multiplier of unity:

(a) If the marginal propensity to save is zero, then income is permanently increased by $1. The initial injection remains in the circular flow generating $1 of income each time period.

(b) Alternatively, if all saving is directed to the purchase of assets (h = 0) and all asset sale proceeds are spent in the goods market (e = 1), the multiplier is again unity. $1 is injected into the circular flow and creates $1 of income: it leaks out but is fully reinjected through spending of asset sale proceeds. This is a special case of full reflux.

For the case of a continuing $1 increase in autonomous spending (i.e. $1 of new borrowing each period), the needed assumptions are that (i) the spending is loan financed and creates $1 of money, (ii) the marginal propensity to save is unity, and (iii) there is no reflux from saving. In this case

there is a $1 injection each period that creates $1 of income, and it then leaks out in full. In all cases the logic of the Keynesian multiplier process remains fully intact. However, particular behavioral propensities render the multiplier equal to velocity.

IV The twin circuits, saving and the financing of investment

   Introducing investment requires adding a corporate sector. In terms of Figure 1, it means that firms are also involved in the circuit of financial transactions. If firms accumulate money hoards through retained profits, then income can leak out of the circular flow into idle corporate money hoards. If firms decide to spend their money hoards, this is a way of reinjecting money demand into the circular flow. If these hoards are used to finance investment spending, AD increases dollar for dollar: if these hoards are used to pay dividends or buy back corporate bonds, then the effect on AD depends on what households do with the dividend income and bond repurchase proceeds. Finally, if corporate hoards are used to repay corporate bank loans, then the money supply is reduced.

   A key feature of a monetary economy is that firms need finance to undertake investment. The simplest form of financing is through retained profits. If firms fully finance investment out of the flow of profits, they have no recourse to the financial system. In this case, firms are only involved in the circular flow of income. Bond finance represents another means of financing investment. In this case firms sell bonds in the financial markets, and spend the proceeds. Lastly, firms can finance investment by borrowing from banks. In this case the money supply goes up when they spend their loans.

   A long-standing Post Keynesian controversy, initiated by Asimakopulos (1983), is whether investment can be constrained by lack of saving. Keynesians have long recognized that this can occur at full employment. At this stage, all productive resources are employed, and if society

wishes to produce additional investment goods, then resources must be released from the production of consumption goods. This requires a decrease in consumption and increased household saving.

Keynesians also recognize that investment can be constrained below full employment by the availability of finance. In this case, there are productive resources available to produce additional investment goods, but firms either lack inside finance or are unable to obtain outside finance. Consequently, they are unable to order investment goods which go unproduced.

Can insufficient household saving also constrain investment below full employment? The twin circuits approach is revealing of an intersection of saving and finance constraints. In a credit money economy, as long as the economy is below full employment and either banks are willing to lend or firms have sufficient retained profits, then investment is unconstrained by either saving or finance. However, profits are not always sufficient, and neither are banks always willing to lend. The latter is particularly true in recessions, a point made by Wolfson (1996). Indeed, unwillingness to lend is why credit money systems have a propensity to instability. In booms banks increase their willingness to lend, which is when stability demands that they restrain lending: conversely, in recessions banks tighten lending standards and reduce their willingness to lend, which is when stability demands that they increase lending.

If firms are short of inside finance and banks are unwilling to lend owing to lack of confidence, firms must find alternative sources of finance. This requires selling bonds which must be purchased either with new savings out of income or with existing money hoards. If existing money holders are unwilling to purchase bonds or if saving is low, then firms will be unable to raise investment finance. This is an instance in which a combination of high liquidity preference and low saving can constrain investment. Given this conjunctural scenario -- an absence of bank credit, limited inside

finance, and high liquidity preference -- low saving can constrain investment. Thus, saving can provide finance, thereby relaxing the financial constraint and enabling investment. This conjunctural scenario is most likely to occur in recessionary conditions. However, increasing saving is not the "best" policy response: increasing the availability of finance is.

Appendix

This appendix derives the expenditure multiplier in a twin circuit economy. Let

b = marginal propensity to consume
h = marginal propensity to hoard money
e = marginal propensity to spend out of asset market sale proceeds.

The conventional multiplier is:

$$m = 1 + b + b2 + \ldots\ldots = 1/[1 - b]$$

The twin circuits multiplier is:

$$m = 1 + \{b + [1-b][1-h]e\} + \{b + [1-b][1-h]e\}2 + \ldots\ldots$$
$$= 1/\{1 - \{b + [1-b][1-h]e\}\}$$

The additional term reflects the spending out of asset sale proceeds. [1-b] is saved, of which a fraction [1-h] is directed to asset purchases. This generates an equal amount of sale proceeds, of which e is spent.

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                                                        Y


                                    -SE'


              -SM'            Sellers

                    +MH'                          A

      +L = +M
Banks        Money          Financial        Households           Firms
         Hoards         Markets
      -L = -M
                                                  S


          +SM        -MH                  +SE
                          Buyers


                                                  AD



Figure 1  The twin circuits of income generation and financial transacting.

                 +/-L  = increase/decrease in bank lending
                 +/-M  = increase/decrease in money supply
                 +/-SM = saving/disaving in/out of money hoards
                 +/-MH = additions/withdrawls to/from money hoards
                 +/-SE = saving/dissaving in/from equities
                    S  = gross saving
                    A  = autonomous consumption financing
                    Y  = income
                   AD  = aggregate demandÿ
               S - A  = net saving
                    S  = SE + SM
                    A  = |SM'| + |SE'|
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$1 one shot increase AD   1, b, b2, b3,....., 0

$1 continuing increase AD   1, 1 + b, 1 + b + b2, ..., 1/[1 - b]

Table 1 The time profile of AD for a $1 one shot and $1 continuing
increase in AD.

                                                             Y

                                              A
     +L = +M
Banks   Money   Households   Firms
             Hoards

         +SM   S

                                                             AD

                     S = +SM
                     A = +M
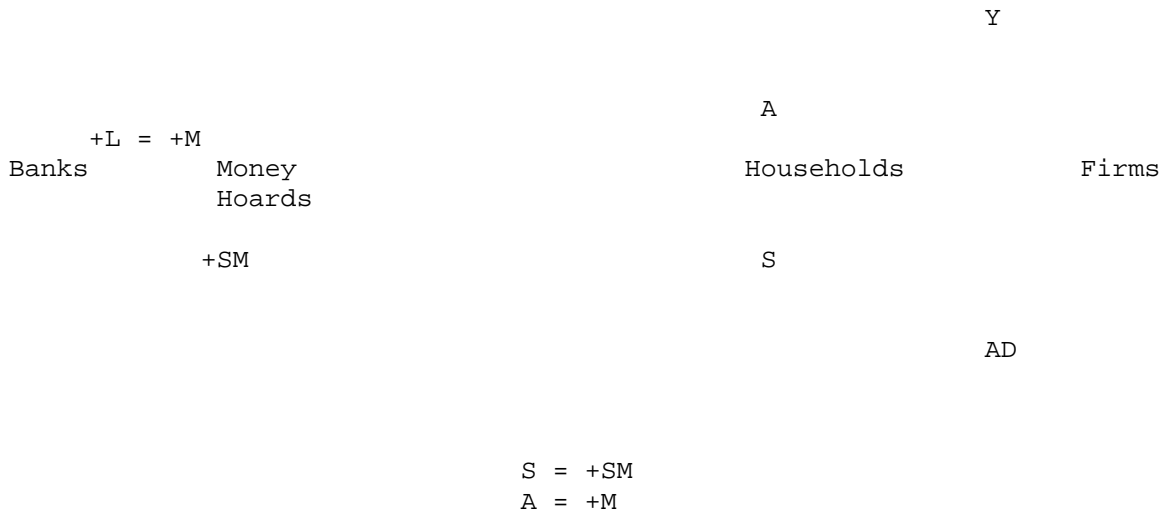
Figure 2 The twin circuits of income generation and financial transacting for
the conventional multiplier.

                                                       Y

                                          A
     +L = +M
Banks   Money   Households   Firms
             Hoards

                                                             AD

Figure 3 The twin circuits of income generation and financial transacting in Moore's (1994) multiplier.

$$Y$$

$$-SE$$

Sellers

$$A$$

+L = +M

Banks   Money   Financial   Households   Firms

Hoards   Markets

$$S$$

+SE

Buyers

$$AD$$

$$S = +SE = \left|-SE\right|$$

Figure 4 An alternative construction of Moore's (1994) multiplier in the twin circuits of income generation and financial transacting.

⌐.This is also the subject of papers by Dalziel, Kregel (1988) and Wray (1992). These papers recognize the monetary flow dimension of the multiplier.

⌐.This approach to money derives from Hicks' (1935) seminal paper "A Suggestion for Simplifying the Theory of Money" which provided the inspiration for the Yale school of macroeconomics associated with Tobin (1969, 1982).

⌐.This characterization of the economy has recently been emphasized by Rousseas (1994). Kohn (1981) develops a Wicksellian model of unemployment that rests on money flows being drained out of the income circuit into the banking system. Palley (1995) has empirically shown the significance of financial transactions for money demand.

⌐.In a commodity money world, extinction of money only occurs when money is transformed into a commodity (for instance gold is transformed into jewellery). In a credit money world of bank created inside monies, money is only extinguished when bank loans are repaid. It can also be transformed from "narrow" money into "broad" money, and vice-versa, by shifting between demand deposits and time deposits.

⌐.Matthews (1961) also sought to incorporate the effects of liquidity preference into the formulation of the multiplier. The critical innovation in the current model is the recognition of the significance of the financial sector circuit. In Matthews' formulation of the multiplier process, agents receiving income were assumed to spend part and save part. Part of saving was held as money, and hence the relevance of liquidity preference for the multiplier process: however, the balance was assumed to be placed in the loanable funds market, and therefore recirculated as additional investment demand. In the current formulation, the loanable funds market is replaced with a bond market, and there is no requirement that sellers of bonds spend all their sale proceeds. Instead, they may choose to augment their money balances.

⌐.This seems a reasonable assumption. Money receipts from portfolio and asset sales tend to get largely reinvested. Thus the marginal propensity to spend out of such receipts is less than that out income.

⌐.In this particular instance there is no aggregate saving. The saving by some households is balanced by the dissaving of others, and this dissaving finances autonomous consumption spending.

⌐.The derivation is contained in the appendix.