CHAPTER 7. SAVING IS THE ACCOUNTING RECORD OF INVESTMENT

"The extent to which one sees one's destination before one discovers the route is the most obscure problem of all in the psychology of original work… It is the destination which one sees first, [though] a good many of the destinations so seen turn out to be mirages."
John Maynard Keynes, Moggridge, 1992; 552.

"In real life research is dependent on the human capacity for making predictions that are wrong, and on the even more human gift for bouncing back to try again. This is the way the work goes. The predictions, especially the really important ones that turn out, from time to time, to be correct, are pure guesses. Error is the mode. … We all know this in our bones, whether engaged in science or in the ordinary business of life." Lewis Thomas, 1983; 82.

"The accounting identities equating aggregate expenditures to production and of both to incomes at market prices are inescapable, no matter which variety of Keynesian or classical economics you espouse. I tell students that respect for identities is the first piece of wisdom that distinguishes economists from others who expiate on economics. The second?… Identities say nothing about causation." James Tobin, 1997, 300.

1. VOLITIONAL AND NON-VOLITIONAL SAVING

Economists have traditionally viewed saving and investment as independent behavioral relationships undertaken by households, firms and governments. Business firms, the administrators of the economy's capital stock are responsible for most investment spending. Households, the ultimate owners of the economy's private net worth undertake most of the economy's saving. Governments tax and spend, and save by running a budget surplus and not spending all their tax income. Saving and investment are identical *ex post* as a national income identity. The unresolved question concerns the mechanism that brings these two independent volitional magnitudes into *ex post* equality?

The dilemma is conventionally been resolved by distinguishing *ex ante* (planned*)* saving and investment, which are not identical, from *ex post* saving and investment, which represent the definitional accounting identity. Classical and neoclassical economists have long regarded saving and investment *ex ante* as equilibrated in the market for loanable funds. Like commodities, the supply and demand for funds were believed equilibrated by changes in their market price which in the case of saving and investment is expressed as a rate of interest. Both saving and investment are regarded as the sum of the volitional decision of individual savers and investors.

Keynes strongly disagreed with the neoclassical theory of interest, and argued that saving and investment were equilibrated by changes in the level of income and output, and not by changes in interest rates. He argued that an excess of planned investment over planned saving would cause AD to rise and an excess of planned saving over planned investment would cause AD to fall. The level of income would continue to adjust, until in equilibrium total *planned* saving was equal to total *planned* investment. The postwar "neoclassical synthesis" of Samuelson combined both positions, and argued that in GE both interest rates and income adjusted to equilibrate saving and investment.

In the conventional mainstream view saving establishes the physical limit of the resources available for investment. The Competitiveness Policy Council expresses this position clearly:

"Economic theory teaches us that the allocation of a nation's resources between consumption and investment is determined by saving. In practical terms, private individuals decide how much of their income to save rather than consume; private businesses decide how much of their earnings to retain rather than pay out as dividends; and governments decide how much to spend and tax, with surpluses augmenting and deficits diminishing the saving done in the private sector."[1]

Many mainstream economists argue that so long as unemployed resources of labor and capital exist the expansionary Keynesian investment-led multiplier-accelerator process will raise AD. But as the economy reaches its full employment potential saving reestablishes the physical constraints on investment. The logic of a saving-constrained expansion prevails in the long run. Mainstream economists hold low saving ratios responsible for low rates of capital formation, and low rates of growth for the economy. A host of policy mainstream measures have been proposed and enacted in response to increase public and private savings rates, and encourage "domestic resource mobilization". Summers well-characterizes the mainstream view as follows:

"It is widely recognized that low national saving is the most serious problem facing the US economy. Low saving accounted for the trade deficit and the slow growth in standards of living that continued through the 1980's. Part of the reason for low national saving is the excessive federal deficit. But the low U.S. saving rate is increasingly the result of insufficient personal saving by U. S. households".[2]

[1] Competitiveness Policy Council, 1993, 303. Quoted in Baker, 1997, 36.
[2] Summers, 1990, 153. Quoted in Pollin, 1997, 2-3.

Post Keynesian critics of mainstream theory argue that saving, the difference between income and consumption, is passive at all levels less than full employment. The difficult question then becomes how to determine when the economy reaches full employment. The argument tends to deteriorate into technical questions about how "saving" and "full employment" should be defined.[3] Tobin has argued:

"*Experience recommends an eclectic view to which Keynes himself and even Pigou … subscribed. Sometimes economies are in one regime, sometimes in the other. That leaves plenty of room for debate about their relative frequencies and for diagnosing which is the effective constraint at any particular time*".[4]

The saving rate plays the central role in all equilibrium growth models by determining the economy's "natural" rate of growth. In a much-cited 1980 study, Feldstein and Horioka found extremely high correlations between domestic saving and domestic investment for the industrialized OECD countries. They reasoned that if international capital markets were perfect, when domestic saving was added to a world saving pool and investment competed for funds in that same pool, there should be little or no correlation between a country's saving rate and investment rate. As a result they interpreted their findings as evidence of the existence of severe imperfections in international capital markets.[5]

The core proposition that delineates the heterodox Post Keynesian view from mainstream views concerns the direction of the causal process by which saving and investment are equated.[6] Mainstream economists accept the classical position that economies are saving constrained. Many would concede that over the short run, movements in economic activity will be dominated by movements in investment spending and AD. But over the longer run, the direction of causality is

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[3] See the discussion in Pollin, 1997.
[4] Tobin, 1997, 300.
5 Feldstein and Horioka, 1980. In a subsequent study they concluded that more recent data supported their earlier conclusions that domestic investment responds to changes in domestic saving. They concluded that government budget deficits therefore 'crowd out' private investment. Feldstein and Bacchetta, 1991. For a critique see Dalziel and Harcourt, 1997.
6 Sawyer, 1996.
7. Solow, 1997; 230.

from saving to investment.[7] Saving is necessary to provide the resources for investment and so is the constraining factor in determining the rate of economic growth.[8]

"*The trend movement [in output] is predominately driven by the supply side of the economy*".[9]

Post Keynesians maintain in contrast that capitalist economies are demand constrained, and the direction of causation runs from investment to saving. The future is strictly unknowable, and so investment expenditures are shaped by investors' "animal spirits". By increasing aggregate demand (AD) the Keynesian argument is that investment creates the saving necessary to finance itself.[10] Output is demand-led, so no unique long run equilibrium "natural" growth path exists.

Both the mainstream and its critics accept the National Income Accounting definition that saving is identical to investment *ex post*. Both agree on the desirability of saving for more rapid economic growth. [11] But they disagree strongly about policy. Mainstream economists put forward a set of supply-side policy recommendations designed to stimulate additional saving and investment and lead to an expansion of aggregate supply (AS). Scarcity is viewed as the core economic constraint. Market economies are assumed to be supply-constrained, and to operate near their production possibility frontiers.

In contrast Post Keynesians espouse a set of demand-side policy recommendations designed to stimulate additional consumption and investment spending and expand AD. They maintain that policy measures should be undertaken to raise the saving ratio only after full employment has been

[9] To the extent mainstream economists embrace the Keynesian multiplier process, where AD drives income and saving in the short run, they exhibit in Solow's terms, "a lack of real coupling between the short run picture and the long run picture". Solow, 1997; 232.

[8] See e.g. Keynes, 1936; Davidson, 1990; 1994.

[8] Equilibrium analysis cannot be reconciled with causality. Simultaneous determination must be distinguished from mutual interdependence. Causation plays a role in the former. See Pasinetti, 1974, 43-4. Mathematical theorists sometimes argue that since everything is related to everything else the concept of causality is otiose. But such a position is unenlightening for understanding economic activity and unhelpful for policy analysis.

[10] As Abba Lerner frequently used to proclaim, "*In the long run we are always in the short run.*" Class notes, The John Hopkins University, 1957.

[11] The World Bank is currently pursuing a major international saving study on what factors drive private saving rates: www.worldbank.org/research/projects/savings/policies.htm

attained. Ignorance is viewed by Post Keynesians as the central economic constraint. Market economies operate well inside their production possibility frontier and are demand-constrained.[12]

But both the mainstream and its critics agree that saving and investment are independent behavioral relationships *ex ante*. But this chapter demonstrates that since total saving is the accounting record of investment, it cannot be the product of individual saving units total saving. Saving is identical to investment *ex post* as an accounting identity. Since S and I are by definition identities it is not possible to sort out the direction of causality between S and I by empirical analysis. An accurate explanation of the dynamic process how saving, investment and income are interrelated over real (historical) time must be developed.[13] This chapter addresses the causal relationship between saving and investment, and argues that the true nature of the relationship between saving and investment has not as yet been perceived. Introspection and intuition to the contrary aggregate saving is not as it appears to individual savers the sum of volitional saving behavior.

2. SAVING IS IDENTICAL TO INVESTMENT {$Y \equiv C + I \equiv C + S$}

In a simple one-sector model it is trivial to demonstrate that aggregate saving is the accounting record of investment. But it will be demonstrated that so long as **capital budgeting is consistently carried out** this identity is maintained in any more complex multi-sector model. The underlying ground for this may be shown very simply as follows: All goods may be characterized as consumption goods with an expected lifetime less than one year, and investment goods with an expected lifetime more than one year. Consumption and investment thus exhaust the National Product. There are no other types of goods.

Once saving is recognized as the accounting record of investment, it ceases to be surprising that S and I are extremely highly correlated. If there were no accounting and measurement errors as an accounting identity the two must be identical in all economies no matter how complex. As the accounting record of investment a change in saving can never be the "cause" of a change in

[12] Keynes, 1936, Davidson, 1994.

[13] The World Bank research project has identified eight factors that purportedly drive saving: income, growth, fiscal policy, pension reform, financial liberalization, external borrowing and foreign aid, demographics, and uncertainty.

investment, no matter how high the correlation beween S and I. The accounting identity that saving is identical to investment holds continually, however close or however far away the economy is to "full" employment.

The belief that aggregate saving is the sum of volitional saving decisions by individual economic units is a spectacular macroeconomic illustration of the "fallacy of composition". This fallacy has been reinforced by the unfortunate use of the colloquial verb "to save", with its very powerful transitive volitional connotations for an economic term which is simply an intransitive accounting definition: "income not consumed". As economists know it is a "fallacy of composition" that what is true for the part is also necessarily true for the whole. Total 'saving' is of course the sum of total saving undertaken by individual 'savers'. But since saving is the accounting record of investment, it cannot also be the sum of volitional saving decisions. Aggregate saving is not the sum of individual savers volitional decisions to save and in all monetary economies most 'saving' is "non-volitional".

An analogous argument applies to the supply and demand for money. Individual agents by changes in spending or borrowing can volitionally increase their own money balances or reduce them to zero. But when one agent reduces her balances to zero by writing checks, another agent necessarily acquires deposit balances. Individuals are unable collectively by spending to reduce their aggregate holdings of money balances, unless they purchase marketable financial assets or repay the non-marketable loans held in bank portfolios. Individuals do not "demand" to hold money balances as a function of their income, wealth, and relative interest rates as they "demand" individual commodities.

The total quantity of money supplied is always identical to the total quantity of money demanded, since money as the payments medium is always accepted ("demanded"). But the total quantity of money balances outstanding is not determined by the sum of individual depositors' volitional demands for money. Money is generally accepted in exchange for the sale of goods, implying no accompanying volitional demand to increase the share of money in wealth portfolios. The quantity of credit money in existence is determined by the quantity of bank loans demanded by credit-worthy borrowers, not by the quantity of deposits demanded by bank depositors. "Loans create deposits".

The recognition that saving is the accounting record of investment leads directly to the insight that in all monetary economies, most deposit accumulation and most "saving" undertaken is non-volitional.

If the total quantity of money supplied were exogenously determined by the amount of reserves provided by the central bank, as the mainstream view maintains, the total supply of money would also not be determined by the total quantity of money demanded by individual depositors. Post Keynesians emphasize that the supply of credit money is endogenously credit-driven and demand-determined. As will be demonstrated in Part III, the supply of bank money is not determined by the high-powered base nor by the quantity of deposits demanded by bank depositors. It is determined by the total amount of bank credit demanded by credit-worthy bank borrowers, and the total amount of securities purchased by the banking system.[14] The belief that the total supply of deposits outstanding is governed by the total quantity of deposits demanded is another fallacy of composition.

There are a number of ways of demonstrating that aggregate saving when defined as 'income not consumed' is in fact the accounting record of aggregate investment:

A. Consider the familiar textbook demonstration that saving and investment are identical. In a simple one-sector model with no government or international trade nominal income (Y) is defined as the total value of final currently-produced consumption (C) and investment (I) goods measured at current market prices.

(7.1) $Y \equiv C + I$

The definition of consumption and investment is exhaustive. All economic goods are either consumption or investment goods, even though as shown it is never possible to know precisely where to draw the line. There is no additional third category of goods.

Nominal saving (S) is defined as all income not consumed:

(7.2) $S \equiv Y - C$

[14] Consider the "hat check theory of money". Suppose tokens given out in the check room of a leading opera house came to circulate as the money supply. Individuals would then demand to hold tokens as a function of their income, wealth, and relative interest rates. But the total quantity of tokens in existence in the economy is determined by the number of hats checked by opera patrons, and not by the transactions demand for tokens. With credit money bank loans correspond to hats in the hat check theory. "Loans make deposits." See Ch. 9-10.

Keynes argued that a “fundamental psychological law” linked consumption spending with income earned. This can be expressed as a behavioral relationship termed the ‘consumption function’. Equation 7.2 looks superficially like a saving function and is frequently so denoted in the textbooks.[15]. But Eq.7.2 can be very simply rearranged into a third identity which simply states that all income is either consumed or saved:

(7.2a) $Y \equiv C + S$

Equation (7.2a) is another definitional identity. It no more implies the existence of a behavioral relationship between saving and income than Equation 7.1 implies a behavioral relation between consumption and income. Equation 7.1 defines income measured as an output flow, as the sum of consumption and investment goods. Equation 7.2a) defines income measured as an income flow, as the sum of consumption and saving. Equating 7.1 and 7.2a, saving is identical to investment.

(7.3) $S \equiv I$

The above is the argument presented in all the textbooks. But its implications have not been fully absorbed. It is universally recognized that $S \equiv I$ *ex post.* But in the internal paradigm of most economists and as explicitly categorized in many textbooks, ***ex post*** is interpreted as designating **past** events. **It is not explicitly recognized that *ex post* comprises the PRESENT as well as the past.**[16] Equation (7.3) is simply a timeless accounting identity. Saving is always identical to investment, irrespective of the time unit or the time period over which they are measured, or how investment is defined. If investment is highly volatile over time, so is saving. It follows that for the economy as a whole, there can be no behavioral volitional “savings” relationship.[17]

B. The two saving identities, equation 7.2, saving is identical to income not consumed ($S \equiv Y - C$), and equation 7.4, saving is identical to investment ($S \equiv I$), logically imply that whenever the definition of income, consumption, or investment are changed, so is ‘saving’, without any

[15] Since the savings-income ratio is the inverse of the consumption-income ratio, if there is a stable behavioral relationship between consumption and income, there must also be a stable behavioral relationship between saving and income, the ‘savings function’. Keynes, 1936, Ch. 8-10.

[16] Even though the relation is frequently expressed as **actual** saving equals **actual** investment.

[17] This logically implies there is also no stable behavioral ‘consumption function’ for the economy.

volitional or even conscious behavior on the part of savers.[18] On pragmatic grounds due to the impossibility of precisely defining the relevant time period for services, as described in the previous chapter in the US and in many other countries NIPA conventions arbitrarily completely excluded all expenditures on services, training, and education as investment, since the time period of most services must be arbitrarily imposed. In consequence the NIPA substantially underestimated the "true" amount of investment activity undertaken.[19]

Suppose in the attempt to better explain productivity growth investment expenditures were defined more inclusively to include all expenditures on investment services and on human capital.[20] As shown in Ch. 6, recorded "investment" would then increase substantially, and recorded "saving" would also increase by an identical amount without any volitional decision on the part of savers. Saving is equal to investment as an accounting identity and the quantity changes whenever investment is redefined. Suppose that the price of investment goods were to fall relative to consumption goods, so real investment increased. Real saving would then increase by the same amount, in the absence of any change in volitional saving behavior.[21]

C. Suppose saving were to be defined as what **it is, net wealth accumulation**, rather than **what it is not**, **income not consumed.** If income is not spent on consumption goods it must necessarily be spent on or held in the form of non-consumption goods. When individuals 'save' their net worth ownership increases. So long as all asset prices remain constant saving may be defined as the change in the unit's net worth. When asset prices change, wealth owners receive capital gains and losses. Only if these capital gains are included in the definition of income can saving be defined as 'income not consumed' and as 'net wealth accumulation' measured in current prices. [22]
When saving is defined as the change in net worth, it is very easily seen to be simply the accounting record of investment. From the National Balance Sheet the total wealth in an economy consists of financial and tangible assets. Financial assets (IOU's) are simply the accounting record of the

[18] This alone provides conclusive proof that 'saving' cannot be a volitional relationship.
[19] See Eisner, 1989. The US National Income Accounts have recently been revised to include computer services eg. computer software, as investment.
[20] Such a revision was recently undertaken in the US.
[21] This offers conclusive proof that saving when defined as 'income not consumed' is simply an accounting identity.
[22] This issue is discussed at length in the following chapter where the pluses and minuses of defining current income to include capital gains and losses are considered.

existing claims of creditor units against debtor units. Under double-entry bookkeeping for every financial asset outstanding there is an identical financial liability. Apart from differences in valuation, for the economy as a whole total financial assets (excluding equities) must equal total financial liabilities and so cancel out.[23] The Balance Sheet accounting identity holds in first differences as well for totals. The fact that saving is the accounting record of investment is then immediately obvious from the National Balance Sheet identity.

NATIONAL BALANCE SHEET			
Δ Financial Assets	XX	Δ Financial Liabilities	XX
Δ Tangible Assets	XX	Δ Net Worth	XX
(Investment)		(Saving)	

The total value of financial assets and the net change in financial assets are necessarily equal to the value of total financial liabilities and the net change in financial liabilities, since IOU's must

[23] Equities represent a complication to the above. Equities constitute ownership claims to business net worth. Their book value is equal to the accounting value of business net worth, total assets minus total liabilities. Standard accounting principles measure business tangible assets at historical cost minus estimated depreciation. This constitutes the book value of equities. But the market value of equities as determined on stock exchanges represents the market's weighted consensus of the discounted present value of all expected future dividends and capital gains by all participants. Kaldor termed the ratio of the market value of equities to their replacement value the "Valuation" ratio. Tobin termed the ratio the "Q" ratio. When firms chose to retain earnings rather than distribute them as dividends, and when wealth-holders expect the future growth of corporate earnings to increase, stock prices concurrently rise and shareholders receive income in the form of capital gains. Capital gain income is not included in the NIPA measure of GDP since GDP is a measure of the value of real output, and so includes only the real income derived from current output.

Measured consumption and saving 'ratios' are extremely sensitive to how income and saving are defined and in particular to whether capital gains on existing assets are excluded or included in the definition of income. If capital gains are excluded total saving becomes the accounting measure of total investment spending measured at historical cost.

But the historical cost or book value of business capital provides an extremely distorted measure of the role of wealth in consumption and investment behavior, and of the value of total household assets. Due to their very high marketability equities are conventionally valued by their owners at their current market price. Capitl gains received by households were particularly relevant for US consumption spending in the 1990's, when equity price-earning ratios soared, and the accompanying capital gains amounted to nearly 70 percent of Total Personal Income. The total market value of equities in the US in the 1990's amounted to more than 200 percent of Personal Income. It follows that current NIPA income data very substantially understate the value of wealth ownership and the flow of resources to the household sector. Capital gains on corporate equities financed the rapid growth of consumption expenditures which provided the foundation for the prosperity of the 90's. In the decade of 2000 capital gains on housing has played a similar role in sustaining household consumption expenditures, and household saving is similarly misleadingly stated as a near zero or even negative figure.

necessarily sum to zero. The change in tangible assets is the definition of net investment, and net worth is the definition of net saving. But how net worth is calculated depends on how assets are valued, at historical cost or at current market value. Saving changes both with changes in the volume of investment and with changes in how investment is defined.[24] As the accounting record of total investment total saving is necessarily equal to total net investment. As such total saving is not determined by the volitional behavior of savers, and so is largely non-volitional.[25]

Saving is the accounting record of investment. But if total measured saving were always identical to total measured investment, this simple accounting identity could not have remained quasi-unrecognized by the profession for so long, more than half a century. Even economists are not so obtuse. There are a number of extenuating reasons for the present unhappy state of National Income Accounting having to do with the highly politicized nature of many government statistics..

3. WIDENING THE MODEL: THE GOVERNMENT SECTOR

One reason why saving and investment have not been recognized to be a simple accounting identity is because when the government sector and the rest-of-the-world sector are added to the model, the National Income Accounts have not been correctly extended. Current and capital transactions for the government and import sector are not consistently distinguished, as has been done in the household and business sector. Due primarily to sloppy accounting procedures, it appears that the identity of saving and investment in multi-sector models no longer holds.

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[24] In the 1990's there was widespread concern about the rise in household debt and the fall in the personal saving rate. But if properly calculated household debt in fact fell as a ratio of household assets. When realized capital gains are included in income the US personal saving rate, rather than falling below zero remained broadly constant at about 10 percent. When unrealized capital gains are included in income, the personal saving rate rose actually very substantially, to about 40 percent of income. To adequately explain recent consumption behavior income must be redefined along Hicksian lines to include capital gains and losses. In this case NIPA conventions must then be fundamentally revised. (See Ch. 8, Peach and Steindal, 2000)

[25] Changes in asset prices result in capital gains and losses to asset-owners. If saving is defined as net wealth accumulation and as income not consumed, for consistency income must be redefined to include holding gains and losses. The following chapter makes a formal case for following a Hicksian definition of income in the NIA's. The identity of changes in saving with changes in investment, and the non-volitional character of most household saving are then highlighted and the saving relationship becomes more transparent.

Total, private, public, and foreign saving are conventionally presented in macro textbooks as follows:

7.4. $Y \equiv C + I + G + X$ and

7.5. $Y \equiv C + S + T + M$

Equating r.h.s. it appears that:

7.6. $I + G + X \equiv S + T + M$ or

7.7. $(I - S) + (G - T) + (X - M) \equiv 0$ or

7.8. $(S - I) \equiv (G - T) + (X - M)$

where G = Government spending, T = Government tax receipts, X = Exports, M = Imports.

From Eq.7.8 private saving and investment appear to differ by the size of the government deficit or surplus (G - T) and the current account deficit or surplus (X - M). In multi-sector models it appears to be the case that private saving is equal to private investment only if the government sector runs a balanced budget (G = T) and the current account is also balanced (M = X). Since governments never exactly balance their budgets, and countries never exactly balance their current accounts, in the conventional NIA's private saving is never identical to private investment.. Whenever the government runs a budget deficit, and the economy concurrently has a deficit on current account, (the 'twin deficit' problem as it was frequently termed in the US) the inequality between the two becomes substantial. It then becomes an easy reach for mainstream economists to then exclaim that *"government deficits are crowding out private saving."*

But capital budgeting must be applied consistently not only to the government sector, as the U.N. has long recommended, but also to the foreign sector, which for some reason appears to have been overlooked. Current and capital components of income, consumption, investment, saving, government expenditures, and imports must be consistently defined. In the ROW accounts GNP must be replaced by GDP to designate the product of a particular geographic area. Once these changes have been made, saving becomes the accounting record of investment in all multi-sector models no matter how the model is extended, or how many sectors are included.

A. Capital Budgeting for the Government Sector [26]

Consider the government sector in isolation. Under the conventional NI accounts saving appears to differ from investment by the size of the government's deficit or surplus:

7.9 $I - S \equiv (T - G)$

But for consistent capital budgeting, consumption and investment spending must be systematically distinguished in the public sector as is done in the private sector:

$(I \equiv Ip+Ig)$, $(S \equiv Sp+Sg)$, $(C \equiv Cp+Cg)$, $(G \equiv Ig +Cg)$. $(Sg \equiv T – Cg)$ [27]

So long as capital budgeting is done consistently government saving is always the accounting record of government investment, irrespective of how government spending is financed or the size of the government budget deficit. Distinguishing government consumption and capital expenditure and rewriting, Eq. 7.9 becomes:

7.10 $I \equiv Ip + Ig \equiv S \equiv Sp + Sg \equiv Sp + (T – Cg)$

Government saving is no longer the excess of total tax receipts over total expenditures. Government saving is the difference between total tax receipts and total government spending on consumption goods. Suppose at one extreme government tax receipts are equal to government consumption spending, so the government budget is balanced on current account. $[(T – Cg) = 0]$ In this case all government investment is externally financed by borrowing. Government saving is then zero and all saving is undertaken by the private sector. Total saving remains the accounting record of total investment:

7.11 $I \equiv Ip + Ig \equiv S \equiv Sp$

Suppose at the other extreme that government tax receipts equal total government spending so the government budget is balanced on capital account. $[T = Cg + Ig]$

7.12 $S \equiv Sp + Sg \equiv Ip + Ig \equiv I$

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[26] The required capital budgeting changes in the ROW accounts are even more important for theory and policy, and are considered in Ch 17 under Part V, Open Economy Considerations.

[27] As argued in Chapter 6 where the line is drawn between limit consumption goods, investment goods, and intermediate goods and services must frequently be arbitrary. If it were recognized that many public goods are really

All government investment is then financed internally by government saving. Government borrowing is zero and private saving finances private investment. Total saving remains the accounting record of total investment.

4. WORDS AND TERMS: "SAVING" IN ECONOMICS IS INTRANSITIVE

A more insidious reason why the profession has failed to recognize that 'saving' is the accounting record of investment formation is the unfortunate choice of the common verb **'to save,'** with its robust colloquial **transitive** meanings, to designate an economic term that is an **intransitive accounting definition**. The result is perhaps the most damaging fallacy of composition ever to have confounded macro economics.

Since capital gains and losses are not included in the accounting definition of National Income saving cannot be defined as what it is, the addition to the agents' net worth, unless all asset prices are assumed to remain constant or unless wealth is calculated at historical cost rather than at current market prices. As a result Keynes was forced to define saving as what it was not, 'income not consumed'.[28] But his definition was not immediately unanimously accepted. Although now largely unread a large economic literature was written in the 1930's on the identity between saving and investment. This literature for the most part accepted the linguistic presumption that saving and investment were separate behavioral and volitional relationships, and attempted to puzzle out and establish the manner how and why they were brought into equality.[29]

Economists have continued more or less unquestioningly to construe saving in the colloquial sense as an independent transitive behavioral relationship, which is implicitly assumed to be undertaken volitionally by different individual units. The colloquial meaning of the verb **'to save'** denotes a host

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intermediate rather than final goods, e.g. police services, national defense, etc., measured GDP would be smaller. See Eisner, 1989.

[28] Keynes could not define saving as the net accumulation of wealth because he had accepted Simon Kuznet's definition of National Income as the value of current output and current earned income excluding all capital gains. As will be shown in Chapter 8, under even moderate rates of inflation most wealth accumulation is attributable to changing wealth values and not to net capital formation. Substantial capital gain income is generated in all economies even when inflation is quite modest.

of meanings, all except one pertaining to **transitive volitional individual behavior.** The confusion in economics has been caused by the use of the verb 'to save', with its strong transitive, volitional and behavioral overtones, for an economic term that denotes an **accounting identity.**

Webster's Collegiate Dictionary lists 4 broad different meanings of the verb "to save" with 12 distinct sub-connotations:

1. TO SAVE
 a) to deliver from sin.
 b) to rescue or deliver from danger or harm.
 c) to preserve or guard from injury.

2. TO AVOID
 a) to make unnecessary.
 b) to keep from being lost to an opponent.
 c) to prevent an opponent from scoring or winning.

3. TO ACCUMULATE
 a) to put aside a store or reserve.
 b) to spend less by ~, to economize or to abstain.

4. TO PRESERVE
 a) to rescue or to deliver someone.
 b) to put aside money.
 c) to avoid unnecessary waste or expense.
 d) to spend less money.

Note that each the above meanings except 3b), to spend less, to economize, to abstain, refer to volitional action. With the sole exception of 3b) each is deeply transitive. One saves, avoids, accumulates or preserves "something". When used in its colloquial sense, it appears self-evident that saving "governs" investment. If investment demand is to be effective it must somehow be financed. In order to be able to finance investment expenditures economic units must **first** save and abstain from consumption. But the term 'save' is used in and implies two quite different meanings, so the problem is falsely posed. The confusion stems from the misleading association of the verb 'to save', which in economics is an accounting relationship which applies collectively to an economy with no implication of volition, with the common verb 'to save' with an identical appellation, which applies

[29] For a summary of this literature see Lerner, 1939.

to individual behavior, and is accompanied by a host of strong **volitional** and colloquial associations and overtones.

'Saving' defined as 'income not consumed' appears superficially to be broadly equivalent to two of the four colloquial meanings of the verb 'to save', 'to accumulate' and 'to preserve'.[30] For individuals, saving does denote volitional and transitive actions, and their meaning superficially appears to be synonymous with to save or to spend less. Both can refer either to individuals or to the collective action of groups. But on reflection there is a subtle difference: 'To accumulate' and 'to preserve' are transitive. But 'to spend less,' is intransitive.

Saving is regarded as 'abstention from consumption'. The dictionary defines 'to abstain' as "to refrain deliberately with an effort of self-denial from an action or practice." Economists have retained this deliberative volitional meaning when thinking about saving. In its colloquial use "to save" implies to individuals' volitional actions. It is an extremely short logical step to associate the **volitional** meaning of 'saving': 'to accumulate'; with the **non-volitional** accounting identity: 'to spend less than total income on consumption'. But this equation constitutes a serious error in logic, which has had extremely deleterious consequences for the analysis of 'saving' in macroeconomics.

The common sense conclusion appears to be that
a) individuals volitionally decide on the amount they wish to save, and
b) aggregate saving may be regarded as the sum of these independent behavioral functions.

But this is in fact the fallacy of composition. What is true for the individual is not necessarily true for the group.[31] 'Saving' is defined in macroeconomics as an accounting relationship, which may,

[30] It can be shown that under rudimentary financial conditions – a barter economy where all investment is internally financed - the two meanings are identical. But in modern financial environments where more than half of total investment spending is typically deficit-financed, the two concepts differ substantially.

[31] Consider the supply of credit money. Economic units demand to hold deposits as a function of their income, wealth, and relative interest rates. Each individual unit decides on the amount of deposits it wishes to hold. Since a deposit cannot exist without an owner the total quantity of deposits outstanding is identical to the sum of deposits held by all depositors. But the money supply is not **determined** by the total quantity of deposits demanded by individual economic units. The mainstream holds that total deposits are exogenously determined by the CB by controlling the high-powered base. Post Keynesians insist deposits are endogenously created by the act of bank lending. In overdraft systems bank loans are determined by the demand for credit by bank borrowers. Total deposits outstanding represent the accounting record of bank loans and securities. Individuals decide on the amount of deposits they wish to hold. But

but need not, represent volitional behavior. Since 'saving' is defined as the accounting **record** of investment, saving cannot logically also be regarded as the **'cause'** of investment.[32]

There is an important exception to the above statement which has served to further add to the confusion. Changes in household saving, when directed to the accumulation of previously-produced and non-producible financial or tangible assets, result in inverse changes in AD. Whenever such changes in AD are not completely anticipated by firms, which in a complex world is typically the case, they "cause" (are responsible for) unintended changes in inventory accumulation and decumulation. The latter are recorded as changes in net investment and saving in the National Accounts. As a result it is correct to regard **unanticipated changes in business inventories (investment) as 'caused' by unanticipated changes in saving.** [33]

In all overdraft systems unintended increases in business inventories are usually automatically financed by additional bank credit. They are also offset by firms as soon as they are perceived by volitional reductions in output, as firms attempt to adjust inventories to their desired target ratio to sales. Only business **volitional** saving which represents the **planned** internal finance of planned investment projects constitutes the accounting record of volitional business increases in capital formation.[34]

So long as investment and saving are viewed by economists as independent behavioral relationships students and scholars alike are presented with an insuperable difficulty in comprehending how and

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the total amount of deposits outstanding is determined by the total amount of deposits created and so by the amount of loans granted and securities purchased. Total liabilities in bank balance sheets are the accounting record of the total volume of loans and securities in bank asset portfolios. (See Moore, 1988, 2000).

[32] If instead of using the verb 'to save', economists were to use the more correct verb 'to abstain', the statement that saving (abstention) is the accounting record of investment would not appear so shocking. Income consists of two kinds of goods, consumption goods and investment goods. When saving is defined as to abstain from consuming one's income, it becomes transparent that total abstention is identical to total investment.

[33] The analysis of investment behavior when financial assets are absent is illuminating. National Income Accounting, with the exception of rent on owner-occupied housing, does not attempt to impute the value of consumption or production services-in-kind received on durable assets. But the non-pecuniary services from many tangible assets can be 'saved' in the colloquial sense by volitional abstention. Such 'saving' results in an equal increase in internally-financed net investment, and is defined as the net accumulation of tangible assets. For wealth owners the decision to 'save' (in the sense of 'conserve' rather than to consume) is entirely volitional. As a result, all such volitional saving 'causes' investment. This serves powerfully to reinforce our robust colloquial volitional understanding of 'saving'.

[34] The extent that corporate decisions to finance investment spending by retain earnings induce household decisions to abstain from consumption of wealth will be explored in the next chapter. Such household savings does not require volitional action. Agents must simply to do nothing and take no action, and the consequence is to hold assets of greater market value.

why savings is always identical to investment. In modern economies ‘saving’ and ‘investment’ have become increasingly specialized activities and are now largely performed by quite different economic groups. Unless planned saving and planned investment were exchanged as a market transaction so prices and/or incomes change instantaneously, how is it possible that the equality between saving and investment is continuously maintained?

The answer is that, if saving and investment are indeed independent, behavioral relationships leading to such continuous equality could occur in only one case: when the planned saving and investment undertaken by each individual unit is identical. This is the condition that is precisely satisfied in all barter economies where there are no financial assets, so that all investment must be internally financed. In economies without financial assets, all economic units must necessarily run a balanced budget, and all investment must be internally financed. In this case the saving and investment volitionally undertaken by individual units, as well as aggregate saving and investment in the economy are identical. The mainstream vision is then correct, but is applicable only to non-monetary Crusoe economies.[35]

5. VOLITIONAL AND NON-VOLITIONAL SAVING

Economists have loosely equated the **colloquial meaning** of saving, the volitional accumulation of wealth, with the **economic definition** of saving, the (not necessarily volitional) decision not to consume all one’s income. On the surface they appear to be much the same thing. But closer examination reveals a crucial difference. Investment designates an increase in the quantity of capital in an economy. Saving is the accounting record of all such investment. All changes in investment result in identical changes in saving. But the accompanying saving undertaken may be **volitional** or **non-volitional**.

[35] Barter economies, where financial assets do not exist, correspond to services-in-kind on tangible assets in monetary economies. Only in such circumstances do the colloquial and accounting meanings of ‘saving’ coincide. ‘To accumulate’ then denotes ‘to spend less on consumption goods’. All decisions to spend on investment goods are volitional, and are necessarily accompanied by identical volitional decisions to save. This is an example of how institutional circumstances affect the validity of theoretical propositions.

In monetary economies all investment spending must be financed with money balances. The money balances used to finance investment spending may be acquired in two ways:

1) internal finance (volitional saving) and
2) external finance (non-volitional saving). [36]

When investment is internally financed, the money to finance the investment must **first** be saved before any investment goods can be purchased. Such saving is volitional. Changes in volitional saving to finance real investment involve identical opposite changes in consumption and investment spending. Changes in volitional saving to accumulate internally-financed currently-produced investment goods result in equal opposite changes in consumption spending, leaving the level of AD unaffected. Changes in volitional saving to accumulate previously-produced and non-reproducible assets were termed "hoarding," and result in an inverse change in AD.[37] Such saving is volitional in the sense that agents volitionally decides to save and invest. In modern corporations the volitional decision to retain earnings and invest is undertaken by business management and not by shareholders, who are the ultimate owners of business firms. As a result most saving associated with internal finance is non-volitional from the point of view of the ultimate owners of business firms.

When investment spending is externally financed the accompanying saving may be volitional or non-volitional, depending on whether the external finance results in the creation of monetary or non-monetary financial assets. Only the purchase of newly-created non-monetary financial assets, such as stocks and bonds, that directly finance current investment spending represent increases in volitional saving. Non-volitional saving occurs whenever investment expenditures are externally financed by the issue of debt sold to the banking system, resulting in newly-created bank deposits. Such saving is non-volitional, need not be consciously regarded by the saving agents as saving, and

[36] Most non-market saving and investment goes unrecorded. All saving and investment that involves the conserving of the services-in-kind on tangible assets does not involve a market transaction and so is excluded from the National Income Accounts.

[37] Classical economists emphasized the antisocial consequences of saving to accumulate money balances. They denoted the accumulation of money balances as 'hoarding', which resulted in a reduction in AD, since they regarded the supply of the money commodity as exogenous (Moore, 1988). As Keynes repeatedly emphasized saving directed to the accumulation of land has the same negative effect on the level of AD. Depending on their liquidity non-reproducible and previously-produced assets may be used as temporary stores of purchasing power, and the accumulation of such assets reduces AD for current output.

need not involve a decision to abstain from consumption.[38] Whenever investment expenditure is financed by bank credit newly-created deposits are generally accepted in exchange for goods. The money supply and AD both increase, without any accompanying volitional decision to increase "saving".[39] Deficit spending, deficit finance and non-volitional saving cannot exist in non-monetary economies. In non-monetary economies all saving is volitional and transitive, and all investment is internally financed. In non-monetary economies it may be correctly concluded that saving "causes" investment. The mainstream view is correct. Unfortunately only barter 'Crusoe' economies fit the mainstream paradigm.[40]

Since saving is the accounting record of investment saving can never be in excess of investment spending, and investment can never be constrained by "too little" saving. Investment is only constrained by the inability to find sufficient finance for the amount of credit demanded, and by too high an interest cost of borrowing. In developed capitalist economies we are taught that saving is a supreme virtue, the sole path to increased wealth and greater economic security. It is true that in order to accumulate wealth, economic units must refrain from consuming all their income. Nevertheless most saving is non-volitional and in modern economies only a small proportion of total saving is volitional.

Mainstream economists have been too inclined to accept the classical dichotomy. They have been predisposed to believe that economic analysis must "pierce the veil of money" and focus on the underlying "real" phenomena that lie beneath. But in reality there is no underlying "real" economy that somehow lies below and exists independently of the nominal economy. There is only the nominal economy. Real variables are merely nominal variables that are deflated by a price index by the analyst. Mainstream economists have failed to recognize the implications of the radical historical change in business and banking practices for how money is supplied, and for the causal relation between saving and investment and money and income.[41] In monetary economies, saving comprises

[38] When investment is deficit-financed by bank credit it is technically correct to state that "investment creates the saving necessary to finance itself". But since saving is the accounting record of investment, the statement is also misleading, since it appears to imply that saving is something that can be independently 'created'.

[39] If consumption is financed by bank credit, this implies a simultaneous decrease in volitional saving.

[41] This explains why Crusoe metaphors are so frequently used to illustrate mainstream theorems.

[41] See Nell (2001) on Hicks' evolving views on the institutional changes accompanying the evolution of the money asset.

the volitional and non-volitional acquisition of money balances, in exchange for externally-financed currently-produced investment goods. In credit money economies investment is no longer solely internally-financed and saving is no longer solely volitional. In modern developed economies about one half of investment is internally-financed and one half is externally-financed.

Most investment spending is volitional, with the exception of unintended inventory accumulation. Investment can be internally or externally financed. The internal financing of investment decisions is the result of volitional decisions undertaken by the managers of private business firms and the appointed bureaucrats of public corporations. These are the administrators but not the owners of the economy's real wealth and do not personally undertake the accompanying saving. The accompanying saving is volitionally and non-volitionally undertaken by shareholders and citizens, the ultimate owners of the economy's wealth.

The saving that corresponds to internally-financed investment by private and public corporations is non-volitional from the point of view of the ultimate shareholder wealth owners. Volitional saving by wealth-owners corresponds only to internal finance of investment spending undertaken by non-incorporated businesses. Such saving represents the volitional joint preferences by wealth-owners to save and invest a proportion of their income.

The purchase of previously-existing financial assets by economic units, although it constitutes saving from the viewpoint of individual economic units, represents portfolio allocation and not income allocation decisions from the point of view of the economy. From the viewpoint of the economy such saving does not result in new investment spending, but determines the distribution of ownership of the existing net worth among economic agents. *Ceteris paribus* volitional decisions to increase saving by surplus-spending units denote a volitional decision to reduce current spending on consumption. The attempt by surplus units to save in aggregate an amount in excess of total planned volitional deficit spending by deficit units leads to the net demand for previously-existing assets. When surplus-spending units desire to acquire existing financial assets in excess of the quantity of

newly-issued financial assets of deficit-spending units, the result is a reduction in expenditure on current output, AD, income and saving. The result was termed by Keynes the "paradox of thrift".[42]

In economic behavior many expectations about the unknowable future are self-fulfilling. Since for most things, their future is unknowable, but nevertheless their present value must be formulated. Expectations are formed largely by the extrapolation of observed behavior into perceived trends. A fall in current AD thus generates negative expectations about future AD, profits, and output, which in turn further impacts negatively on current AD. As a result a current decision to volitionally increase surplus-spending and saving is likely to reduce investment spending by reducing current consumption spending. Conversely volitional decisions to increase current deficit-spend *ceteris paribus* raise the growth of AD. The increase in current spending is likely to lead to expectations of increases in future spending of other units, and so of future growth of AD. A rise in current AD by changing current expectations of future AD is frequently self-fulfilling, and likely to result in future increases in consumption, investment, saving and wealth accumulation.

Classical economists had a general equilibrium view of all markets. They believed an increase in saving would reduce the level of interest rates by increasing the supply of "loanable funds," and the lower cost of capital would induce businesses to increase investment spending. Keynes was at pains to demonstrate why and how this Classical argument was incorrect. He argued that the level of AD and income would not remain constant in the face of increases in planed saving, but generally would fall *pari pasu.* In the *General Theory* Keynes argued that the level of interest rates was determined by the supply and demand for liquidity, not the supply and demand for loanable funds. He then assumed for simplicity that the money supply was set by the monetary authorities.[43] Once it is recognized that the short-term rate of interest, rather than the money supply, is the chief policy instrument of the monetary authorities this opens the door to understand how saving behavior indirectly affects the level of planned and actual investment by affecting the interest rate set by the central bank.[44]

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[42] Keynes, 1936, Ch. 13-18.

[43] Keynes, 1936, Ch. 18. *"we can sometimes regard our ultimate independent variables as consisting of…(3) the untity of money as determine3d by the action of the central bank"* 247..

[44] Economic recessions are associated with falls in AD which may be viewed as an increase in volitional saving. If the reduction in AD results in a sufficiently large reduction in income, the total quantity saved will decrease. Assuming that

6. CONCLUSIONS: SAVING IS THE ACCOUNTING RECORD OF INVESTMENT

Investment is the terrain and saving is the accounting measure of that terrain. Investment spending depends on firms' expectations of future quasi-rents and profits, which are then compared with their expectations of the present and future costs of labor and capital and with the future costs and availability of finance. Aggregate saving is the accounting record of investment spending .Its quantity depends on how investment is defined. Investment can never be limited by an 'insufficiency' of saving,, since saving is simply the accounting record of investment Apart from involuntary inventory accumulation, the decision how much to invest is volitional. But in all monetary economies the decision how much to save is primarily non-volitional.

The decision to increase volitional saving is recorded in the market for current output as a reduction in current consumption expenditure, and so in AD. Increases in volitional saving do not, as the mainstream view has it, raise the supply and lower the cost of loanable funds. Increases in volitional saving are volitional decisions to reduce the level of current consumption spending, and so necessarily reduce AD. To the extent current AD affects expected future AD, an increase in volitional saving is more likely to reduce rather than increase current investment spending. Current investment will fall whenever increases in volitional saving depress the expected future level of AD.

Total saving is the sum of volitional and non-volitional saving. Investment spending is internally and externally financed. The volitional saving that is associated with internal finance strictly comprises only internal finance of volitional investment spending undertaken by unincorporated businesses. If income is redefined to include capital gains, the internal finance of investment by business corporations is accompanied by an increase in non-volitional saving by shareholders of business units.

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the CB attempts to reach its full employment stabilization objective, the CB will respond by lowering short term interest rates. Keynes' paradox of thrift was a description of the process where a rise in planned saving rates reduces AD and investment, and so a fall in actual saving. If households and firms persistently maintain high volitional saving rates the CB would be forced to lower interest rates to achieve its stabilization goals. Depending on the CB's reaction function, an increase or reduction in volitional saving may indirectly affect the volume of investment by inducing the CB to reduce or increase the rate of interest. This is discussed at greater length in Ch. 16.

When business units are incorporated and their shares publicly traded, internal finance results in an increase in the market value of equities, which results in capital gain income to shareholders. To the extent shareholders do not spend most of their capital gain income, most such saving is non-volitional. Volitional saving associated with external finance comprises only the volitional purchase by households of new non-monetary debt issues. Non-volitional saving associated with external finance is associated with borrowing from the banking system. This leads to the non-volitional accumulation by savers of newly-issued deposits.

As will be developed in the following chapter the household saving associated with internally-financed investment spending is much more transparent when a Hicksian definition of income is adopted. In this case all capital gain income that is not consumed is seen to result in an equal increase in non-volitional saving. When increases in volitional saving by households are associated with equal reductions in consumption expenditures AD will fall, even though the money supply may initially increase to finance business' unintended inventory accumulation.

Non-volitional saving by households, businesses and governments take the form of the net accumulation of deposit balances ('convenience lending' of fiat money to the banking system) and the passive accumulation of corporate equities of greater market value. Non-volitional saving by bank depositors occurs whenever investment spending is deficit-financed in part by net new bank loans. Over time the expansion of deposits provokes a complex dynamic process of portfolio allocation from shorter-term to longer-term financial assets.

As stated, mainstream macroeconomics has traditionally regarded saving and investment as separate behavioral relationships undertaken by different groups. The question becomes, "what is the mechanism by which saving and investment are equilibrated?" The classical view was that the level of interest rates would adjust to a new 'equilibrium' level where planned saving was again equal to planned investment. The Keynesian view was that the level of income would adjust to a new 'equilibrium' level where planed saving was again equal to planned investment. The neoclassical synthesis concluded that both interest rates and income would continue to adjust, until at the margin all variables attained a new "general equilibrium" position where all markets cleared.

The direction of causality has meaning with identities. The recognition that saving is the accounting record of investment implies that the "direction of causality" goes from investment to saving. Changes in investment cause changes in saving. With the exception of unplanned inventory accumulation, all decisions to invest are volitional, while saving behavior is primarily non-volitional. Investment is never constrained by an "insufficiency" of saving but only by an insufficient supply of credit, or too a high level of interest rates. Volitional and non-volitional saving are identical in the sense that they are the accounting record of investment. But there is no future position of "general equilibrium" where planned saving is precisely equal to planned investment. In complex systems change is continual.

The recognition that saving is the accounting record of investment will have the effect of a neutron bomb on the logic of mainstream macroeconomic modeling once it has been thoroughly accepted. As soon as it is recognized that there is no independent behavioral saving function, it becomes clear that neither income, interest rates, prices or anything else can have a tendency to approach some future "equilibrium" level where the amount that saving units plan to save is exactly equal to the amount that spending units plan to invest. Most saving is not volitional, planned saving is never equal to planned investment, and total investment determines total saving.

Volitional increases in planned saving do not provide additional resources to finance additional investment spending, but simply result in a reduction in the level of AD. Increases in volitional saving that involve abstention from consumption do result in a reduction in AD. If the reduction in AD due to an increase in volitional saving leads to expectations of lower future AD growth, this will cause investment, AD and AS to fall. An increase in "planned saving" will then result in a reduction in "actual saving" (Keynes' "Paradox of Thrift"). When an increase in planned saving reduces planned consumption spending and so the level of AD and current income, it will result in a reduction in actual investment and saving.

Keynes' conclusion that income tends to an "equilibrium" level, where planned saving is equal to planned investment, was due to methodological error, the application of comparative static equilibrium analysis to complex systems. AD and AS are continually changing over time. Actual saving is identical to actual investment at every level of income and over every instant of time, by

definition since it is an accounting identity. Income does not adjust to eliminate differences between planned saving and planned investment, but falls in response to an increase in planned saving. This becomes obvious when an increase in volitional saving is defined as increased abstinence from consumption. Planned saving is never identical to planned investment, but actual saving is always identical to actual investment. So long as output in the economy is below its potential full employment level, real income and AS will change continually over time, in response to continual changes in AD. An increase in deficit-spending for consumption goods has the same one-for-one effect in increasing AD as does an increase in deficit-spending for investment goods.

One year after *The General Theory* was written Keynes wrote:

"banks hold the key position in the transition from a lower to a higher scale of activity. … The investment market can become congested through a shortage of cash. It can never become congested through a shortage of saving. This is the most fundamental of my conclusions within this field." [45]

Keynes was correct in the "destination" of his vision. But he was mistaken in how it came about. An increase in planned saving does not result directly in a reduction in interest rates, nor an increase in investment spending. It results in a reduction in AD, and is more likely to result in a reduction in investment spending.

[45] Keynes, CW XIV, 222.