UNIVERSITY of GUELPH

DEPARTMENT OF ECONOMICS AND FINANCE

Lectures on John Maynard Keynes' *General Theory of Employment, Interest and Money* (6):

Chapters 8, 9 and 10: Keynes' Theory of Consumer Behaviour

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July 2013

Abstract

Chapters 8, 9 and 10 set out Keynes' theory of consumer behavior. Chapter 8 is entitled The Propensity to Consume: I. The Objective Factors, Chapter 9 is The Propensity to Consume: II. The Subjective Factors, and Chapter 10 is The Marginal Propensity to Consume and the Multiplier. Contrary to the widely held belief, Keynes saw the consumer as an intertemporally optimizing agent, in a manner which is quite consistent with Frank Ramsey's model of intertemporal saving behavior and with modern theories of the behavior of the optimizing consumer. While he did conclude that in the short run income would be the dominant factor underlying consumer behavior, this was an empirical judgement, not simply an assumption about fundamental psychological propensities. Chapter 10 formally introduces the marginal propensity to consume and the multiplier.

Lectures on John Maynard Keynes' *General Theory* (6):

Chapters 8, 9 and 10: Keynes' Theory of Consumer Behaviour

Chapters 8 & 9: Determinants of the Propensity to Consume: Subjective and Objective Factors:

The first point to make about Chapters 8 and 9 is that, while both are titled "The Propensity to Consume", neither has the word "Marginal" in its title. The Marginal Propensity to Consume (mpc) doesn't make its formal entrance until Chapter 10. Chapters 8 and 9 are, however, very important for our understanding of Keynes' model or, perhaps more accurately, important for our understanding of why one of the most commonly expressed criticisms of Keynes is wrong.

It is often said that Keynes' model lacks a micro-theoretical foundation based on the optimizing behaviour of economic agents. On the consumer side, this is largely because back in Chapter 3 of the *General Theory* where he first introduced what we now know as the Keynesian mpc, he referred to it as a fundamental psychological law. This terminology has created the impression that Keynes was some sort of 1930s behavioural economist, as opposed to being an economist whose work was grounded in the theory of optimizing individual agents. This impression is wrong. It is true that Keynes put a lot of weight on the psychology of individual consumers and entrepreneurs, but his economic agents are optimizers. The psychology comes in through their preferences and in the way they tackle the problem of choice under uncertainty.

Chapters 8 and 9 of the *General Theory* set out the factors which Keynes sees as affecting the proportion of their income which individuals spend on consumption and the relative importance of those factors. Chapter 8 deals with what he terms objective factors and Chapter 9 with subjective factors, but when we are of looking at the argument he is making it is convenient to mix the chapters together and in fact to start with his list of objective factors. Keynes lists eight of these, and despite the fact that one continuing theme of the *General Theory* is that saving is a residual, he refers to them as factors which lead individuals to refrain from spending out of their

incomes, i.e. to make a deliberate decision about how much to save out of current income. The

subjective factors are:

> (i) To build up a reserve against unforeseen contingencies;

> (ii) To provide for an anticipated future relation between the income and the needs of
> the individual or his family different from that which exists in the present, as, for
> example, in relation to old age, family education, or the maintenance of dependents;

> (iii) To enjoy interest and appreciation, *i.e.* because a larger real consumption at a later
> date is preferred to a smaller immediate consumption;

> (iv) To enjoy a gradually increasing expenditure, since it gratifies a common instinct to
> look forward to a gradually improving standard of life rather than the contrary, even
> though the capacity for enjoyment may be diminishing;

> (v) To enjoy a sense of independence and the power to do things, though without a
> clear idea or definite intention of specific action;

> (vi) To secure a *masse de manoeuvre* to carry out speculative or business projects;

> (vii) To bequeath a fortune;

> (viii) To satisfy pure miserliness, *i.e.* unreasonable but insistent inhibitions against acts of
> expenditure as such.

What Keynes is describing here are basically the considerations which go into the intertemporal

utility function and the factors which determine intertemporal preferences over consumption –

the subjective or preference-related factors which lead people to allocate their consumption over

time in a manner which doesn't match exactly with the pattern in which their income arrives over

time. Providing for old age, for example, is an intertemporal motive for saving in a world where

there will be periods in the future when income is either considerably less than it is today, or

when the individual will have no source of consumption other than the assets he accumulates

during his working years (this factor becomes important in Keynes' exposition of his interest rate

theory, several chapters later on)[1]. The reference to a tendency to prefer larger real consumption

at a later date and the related observation about enjoying a gradually improving standard of

living might be taken as meaning that Keynes is thinking in terms of people discounting the

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[1] Keynes also refers to needs of the family different from those which exist in the present, so we can include
household formation, saving for the costs of children's education and a whole set of family-related motives for
reallocating consumption over time under heading number (ii).

present relative to the future rather than discounting the future relative to the present, but we have to notice that in motive (iii) he refers to enjoying interest and appreciation, which can simply mean that the rate of interest is assumed to be greater than the rate of time preference (we will have more to say about the rate of interest when we back-track to Chapter 8). We should probably also take account of the way capital markets worked at the time Keynes was writing, in particular in as far as the individual saver was concerned. To the extent that borrowing was difficult for the individual there would be a tendency to save with an eye to future consumption rather than to borrow to shift consumption into the present – an expectation, driven by taking as given the workings of the markets for individual-level finance, for example, that one accumulated a significant down-payment before buying a house, rather than having easy and early access to mortgage finance for the full market price of the house. Further, one of Keynes' other motives for saving was to bequeath a fortune: not necessarily a large fortune, but his inclusion of a bequest motive certainly suggests that Keynes' consumer is a forward looking intertemporal optimizer.

This impression is strengthened when we turn back to Chapter 8 and look at the list of objective factors which play into the saving decision. Keynes goes into these in considerably more detail than he does the subjective factors – presumably he takes the elements and properties of the intertemporal utility function itself as non-controversial. The objective factors (setting aside Keynes' detailed discussion of each for the moment) are:

(1) A change in the wage-unit.

(2) A change in the difference between income and net income.

(3) Windfall changes in capital-values not allowed for in calculating net income.

(4) Changes in the rate of time-discounting, i.e. in the ratio of exchange between present goods and future goods.

(5) Changes in fiscal policy.

(6) Changes in expectations of the relation between the present and the future level of income.

To take these out of order, i.e. to look at them in an order which better fits the way we think about intertemporal consumption choice, we start with number (4), changes in the rate of time-discounting. This terminology would tend to lead us to think that this factor really belongs in the list of subjective factors, but it actually relates to a range of factors affecting the rate at which we can trade consumption today for consumption tomorrow:

> This is not quite the same thing as the rate of interest, since it allows for future changes in the purchasing power of money in so far as these are foreseen. Account has also to be taken of all kinds of risks, such as the prospect of not living to enjoy the future goods or of confiscatory taxation. As an approximation, however, we can identify this with the rate of interest.

So when Keynes speaks of the rate of time discount he's including the interest rate and expectations about future prices relative to current prices as well as our own subjective assessment of our survival probabilities into the future.

There are also places where Keynes' terminology differs from that which we would use today: when he speaks of fiscal policy, for example, in objective factor (5) he is not referring to government spending or the deficit but to the tax system:

> In so far as the inducement to the individual to save depends on the future return which he expects, it clearly depends not only on the rate of interest but on the fiscal policy of the Government. Income taxes, especially when they discriminate against "unearned" income, taxes on capital-profits, death-duties and the like are as relevant as the rate of interest…

And by net income in objective factor (2) he does not mean after-tax income; he is referring to income net of user cost and supplementary cost – back in Chapter 6, when he introduced the term net income, he referred to it as the concept of income which played into the entrepreneur's decision as to how much he was free to spend or save.

The first of the items in the objective factors list – a change in the wage unit – is less immediately interpretable in terms of our current usage. Here we have to remember that the wage unit is the money wage of basic labour, so when he speaks of income and consumption expenditure in wage units, Keynes is dividing the nominal amounts by the basic money wage to get a measure of real income and real consumption, both measured in terms of the amount of basic labour which could be bought with those money amounts. Thus:

Consumption (C) is obviously much more a function of (in some sense) real income than of money-income. In a given state of technique and tastes and of social conditions determining the distribution of income, a man's real income will rise and fall with the amount of his command over labour-units, *i.e.* with the amount of his income measured in wage-units; though when the aggregate volume of output changes, his real income will (owing to the operation of decreasing returns) rise less than in proportion to his income measured in wage-units. As a first approximation, therefore, we can reasonably assume that, if the wage-unit changes, the expenditure on consumption corresponding to a given level of employment will, like prices, change in the same proportion; though in some circumstances we may have to make an allowance for the possible reactions on aggregate consumption of the change in the distribution of a given real income between entrepreneurs and rentiers resulting from a change in the wage-unit.

Note in here the reference to real income rising by less than income measured in wage units: when he refers to the aggregate volume of output changing, Keynes is thinking in terms of an economic expansion causing the wage unit to change rather than an exogenous change in the wage unit. Real income changes by less than income measured in wage units – this caveat to the use of income divided by the wage unit as a measure of real income was mentioned back when Keynes introduced the notion of the wage unit in Chapter 4. He made the point then that deflating by the wage unit didn't give an exact measure of real income, but it was better than anything else available and income measured in wage units did move consistently in the same direction as real income.

In the second part of the excerpt above, though, he is thinking more in terms of the effect of an exogenous change in the wage unit. When that happens, prices will change in the same proportion as the change in the wage unit[2] and, because we are just looking at nominal changes, nominal consumption expenditure will also change in that same proportion.

When we take Chapters 8 and 9 together, then, we are given an unequivocal picture of the consumer as an intertemporal utility maximizer, with Chapter 9 summarizing the elements of the model which go directly into the intertemporal utility function itself (saving for a particular future spending goal, the bequest motive etc.) and Chapter 8 discussing the elements which enter the problem through the intertemporal budget constraint (the interest rate, expectations about prices and income etc.). It is not surprising that Keynes would think in these terms: Frank

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[2] This relates to the argument he made in Chapter 2 about general changes in nominal wages not translating into equivalent changes in real wages because they will lead to changes in prices.

Ramsey's mathematical model of savings behavior had been published[3] in 1928, and Keynes referred[4] to that paper as "one of the most remarkable contributions to mathematical economics ever made". Yet when we teach the Keynesian model we generally write something along the lines of

$$C_t = C_0 + cY_t$$

Where C_t is current aggregate consumption and Y_t is current aggregate income, and in Chapter 8 of the *General Theory*, Keynes wrote:

> We will therefore define what we shall call *the propensity to consume* as the functional relationship χ between Y_w a given level of income in terms of wage-units, and C_w the expenditure on consumption out of that level of income, so that
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> $$C_w = \chi(Y_w) \text{ or } C = W.\chi(Y_w).$$

Where the "w" subscript refers to a nominal value measured in wage units – i.e. divided by the nominal wage (W) for an hour of basic labour[5]. He goes on to expand on this, saying:

> The amount that the community spends on consumption obviously depends (i) partly on the amount of its income, (ii) partly on the other objective attendant circumstances, and (iii) partly on the subjective needs and the psychological propensities and habits of the individuals composing it and the principles on which the income is divided between them (which may suffer modification as output is increased).

where it is clear that when Keynes speaks of subjective needs, psychological propensities and habits he is referring to what we would today call preferences and which we would enter into the model through the intertemporal utility function. Still, his focus is undoubtedly on income as the major determinant of consumption expenditure.

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[3] Frank P. Ramsey (1928) : "A Mathematical Theory of Saving" <u>The Economic Journal</u> 38(152), December, 543-559. In his draft notes for the savings paper, Ramsey wrote "…in a problem covering a considerable term of years saving cannot be considered as a use of income with its own utility. Its utility is indirect and arises from the consumption it makes possible later; ….". See Pedro Garcia Duarte (2009): "Frank Ramsey's Notes on Saving and Taxation" <u>History of Political Economy</u> 41(3), 471-489.

[4] J. M. Keynes (1933 [1972]): "F. P. Ramsey" in <u>Essays in Biography</u> Volume 10 of *The Collected Writings of John Maynard Keynes*

[5] Keynes notes that since he has been working up to this point with labour on the horizontal axis of his aggregate diagrams – see the discussion of his aggregate demand and supply price curves – consistency might demand that he relate C to N rather than to Y. He proposes, though, that it will be more convenient to relate C to Y, although since what matters are real rather than nominal values, he still measures C and Y in wage units.

The Effects of Income and Interest Rates on Consumption:

As described in Chapters 8 and 9 of the *General Theory*, Keynes' consumer was essentially the sort of individual we represent as in the two period diagram in Figure 1 below, where we are assuming that the endowment point is on the horizontal axis, so that he receives income in period t but not in t+1, consistent with Keynes' comments about the need to prepare for old age. The slope of the budget line between the two periods depends on the interest rate and expectations about prices (since the utility from consumption comes from consumption in real, rather than nominal terms) and the slope of the indifference curve is the marginal rate of substitution between present and future consumption. Then we usually present the effects of an increase in current income as in Figure 2 below, where the assumption that $Y_{t+1} = 0$ lets us show the increase as a horizontal shift of the budget line, leading to a new tangency between the new budget line and a new intertemporal indifference curve. Then unless we have a very unusual indifference map, part of the increase in income will be spent today and part saved in order that consumption may be increased tomorrow, giving a short run marginal propensity to consume of less than 1. This is Keynes' fundamental psychological law, and the fact that it would take an indifference map which we would regard as pathological to yield any different behavior suggests that even what we now regard as neoclassical models make the same assumption; they simply embody it in the intertemporal utility function.

Although we cannot show it on a two-period indifference curve diagram, we could in principle include considerations about whether an increase in income is temporary or permanent under heading (6) in Chapter 8, "Changes in expectations of the relation between the present and the future level of income". In including this heading, Keynes seems to have been thinking about the typical age-pattern of income over the life cycle, since he says that "whilst it may affect considerably a particular individual's propensity to consume, it is likely to average out for the community as a whole." That would be the case for a stable population with an unchanging age distribution, where an individual's income might rise and then fall as time passed but the entry and exit of individuals from the population over time would mean that the average level of income would (in the absence of income growth resulting from technological change) remain unchanged.

Thus the conclusion that consumption rises with income but by less than the increase in income (and note that the mpc is in terms of the level of income and consumption, not the proportion of income consumed) is present in the neoclassical model of the utility maximizing individual, but expressed in different terms.   The other primary determinant of the intertemporal allocation of consumption in the standard micro model is the interest rate, and Keynes considers this as well, in Chapter 8. As he puts it:

> For the classical theory of the rate of interest, which was based on the idea that the rate of interest was the factor which brought the supply and demand for savings into equilibrium, it was convenient to suppose that expenditure on consumption is *cet. par.* negatively sensitive to changes in the rate of interest, so that any rise in the rate of interest would appreciably diminish consumption. It has long been recognised, however, that the total effect of changes in the rate of interest on the readiness to spend on present consumption is complex and uncertain, being dependent on conflicting tendencies, since some of the subjective motives towards saving will be more easily satisfied if the rate of interest rises, whilst others will be weakened.

So when we consider the effect of an increase in the interest rate in terms of income and substitution effects – on the one hand causing us to substitute away from present consumption towards greater future consumption, but on the other hand not requiring us to sacrifice quite as much present consumption as before, for any given target level of future consumption - an increase in the interest rate, while it will tend to increase future consumption, cannot be guaranteed to lead to a reduction in current consumption (see Figure 3 below). In any event, as Keynes saw it:

> Over a long period substantial changes in the rate of interest probably tend to modify social habits considerably, thus affecting the subjective propensity to spend — though in which direction it would be hard to say, except in the light of actual experience. The usual type of short-period fluctuation in the rate of interest is not likely, however, to have much *direct* influence on spending either way. There are not many people who will alter their way of living because the rate of interest has fallen from 5 to 4 per cent, if their aggregate income is the same as before.

In other words, when we are looking at factors which determine consumption in the aggregate, variations in the rate of interest which are within what we might regard as the usual range are not, given typical curvature of the intertemporal indifference curve, likely to have that much of

an impact, although Keynes does note that things might well be different when the change in the interest rate is unusually large[6].

All in all, Keynes concludes that while consumption is likely to be influenced to some degree or other by all of the factors which enter into the individual's intertemporal utility maximization problem as we usually set it up today, under normal conditions most of those factors are likely to have a relatively minor impact. Normal conditions here means within their usual range of fluctuation –we have already mentioned Keynes' observation that unusually large changes in the rate of interest may well have a noticeable effect, and he also considers the effect of unexpected large changes in wealth (what he terms "windfall changes in capital-income):

> These are of much more importance in modifying the propensity to consume, since they will bear no stable or regular relationship to the amount of income. The consumption of the wealth-owning class may be extremely susceptible to unforeseen changes in the money-value of its wealth. This should be classified amongst the major factors capable of causing short-period changes in the propensity to consume.

Today, of course, the wealth-owning class encompasses the entire population, so unexpected asset shocks can be expected to have a significant impact on the propensity to consume, defined as the average propensity – the proportion of current income which is allocated to current consumption[7].

So the bottom line is that Keynes has not rejected the Ramsey's model of the consumer as an intertemporal optimizer, but that as a general empirical rule:

> We are left therefore, with the conclusion that in a given situation the propensity to consume may be considered a fairly stable function, provided that we have eliminated changes in the wage-unit in terms of money. Windfall changes in capital-values will be capable of changing the propensity to consume, and substantial changes in the rate of interest and in fiscal policy may make some difference; but the other objective factors which might affect it, whilst they must not be overlooked, are not likely to be important in ordinary circumstances.
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> The fact that, given the general economic situation, the expenditure on consumption in terms of the wage-unit depends in the main, on the volume of output and employment is the justification for summing up the other factors in the portmanteau function "propensity to consume". For whilst the other factors are capable of varying (and this

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[6] Figures 4 – 6 below sketch out some cases of effects of interest rate changes and of relative changes in the interest rate and working-period income.
[7] Here we are again getting into factors which aren't easily sketched on two-period indifference curve maps.

> must not be forgotten), the aggregate income measured in terms of the wage-unit is, as a rule, the principal variable upon which the consumption-constituent of the aggregate demand function will depend.

And again, in Chapter 9:

> Since, therefore, the main background of subjective and social incentives changes slowly, whilst the short-period influence of changes in the rate of interest and the other objective factors is often of secondary importance, we are left with the conclusion that short-period changes in consumption largely depend on changes in the rate at which income (measured in wage-units) is being earned and not on changes in the propensity to consume out of a given income.

Digressions:

Both Chapters 8 and 9 contain sections which are slight diversions from the initial themes of the chapters. In Chapter 9 we get a bit more discussion of the relation between the interest rate and current saving:

> We must, however, guard against a misunderstanding. The above means that the influence of moderate changes in the rate of interest on the *propensity* to consume is usually small. It does not mean that changes in the rate of interest have only a small influence on the amounts *actually* saved and consumed. Quite the contrary. The influence of changes in the rate of interest on the amount actually saved is of paramount importance, but is *in the opposite direction* to that usually supposed.

We are getting back here to one of the core themes of the *General Theory*, that the macro effects of certain explanatory variables are not necessarily the same as the micro effects, even though the macro effects result from micro responses. We are not dealing with a representative agent model here; aggregation effects are fundamental to the story which Keynes is telling in the *General Theory*.

In Section II of Chapter 9, the focus is on what we will see if we plot actual interest rates and actual, aggregate savings, even given the assumption that the effect of an increase in the interest rate is to induce every individual in the economy to try to save more out of their current income. As a result of everyone increasing their rate of saving in response to an increase in the rate of interest (i.e. reducing their average propensity to consume) aggregate consumption can be expected to fall but so too can aggregate savings. The increase in the interest rate will cause

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investment to fall, which will in turn cause income to fall, and the fall in aggregate income will pull aggregate saving down until it matches the reduced level of investment. As Keynes puts it, even it is true that an increase in the interest rate would prompt us to save more out of an unchanged individual income, income in the aggregate cannot remain unchanged as the interest rate rises – it has to fall. The more virtuous we are (i.e. the more inclined to thrift we are) the more income will have to fall in response to an increase in the interest rate in order to maintain the savings-investment equality.

Chapter 8 has a couple of digressions. In Section III, after having set out the basic model of the consumer, Keynes first expands on his view of intertemporal consumer optimization by arguing that it can be expected that a higher proportion of income will be saved as income increases. If we accept this argument, we would draw the Keynesian consumption function as concave rather than linear, with the mpc declining as income increases. While Keynes raises this possibility in a couple of places in the *General Theory* it is not fundamental to his argument. What is fundamental is that even with a constant mpc, as income increases a greater absolute amount will be saved. In terms of Figure 7 below, as income rises and consumption rises with it, the gap between the consumption function and the 45° line, along which consumption equals income, increases (looking at the part of the diagram to the right of Y*, although the same effect is in operation to the left of that point). Keynes notes (on page 97) that having an mpc less than one is essential for the dynamic stability of the macroeconomy. He also notes that when income falls it may be the case (as at points to the left of Y* in Figure 7) that consumption will come to exceed income, partly because individuals will be drawing on their accumulated savings but also (this comes back into play in Chapter 10) because during downturns, governments will be running deficits (willingly or unwillingly, as he puts it) and will be borrowing to finance unemployment relief. Then he makes an observation which harks back to his earlier discussion of Say's Law, to the effect that because the mpc is less than one, when aggregate income rises because employment has increased, "the increased employment will prove unprofitable unless there is an increase in investment to fill the gap". The issue of the use of increased investment to fill that gap comes back towards the end of Chapter 8, but before that happens Keynes goes off into what he admits is a digression on the role of business saving in his model of the macroeconomy.

Keynes, Kuznets and Business Saving:

Section IV of Chapter 8 is perhaps best known for the fact that, while Keynes makes extensive use of Simon Kuznets'[8] estimates of gross and net capital formation for the USA, he misinterprets Kuznets' figures. The *Collected Writings* edition of the *General Theory* includes, as Appendix 2, the September 1936 Economic Journal article in which Keynes discusses Kuznets' figures in some detail and corrects his earlier errors of interpretation. The fundamental issue in this section of the *General Theory* is the role of business and government saving in the macroeconomy – business saving also comes into Chapter 9, where he talks about the subjective motives for business saving. These he lists as:

> (i) The motive of enterprise — to secure resources to carry out further capital investment without incurring debt or raising further capital on the market;
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> (ii) The motive of liquidity — to secure liquid resources to meet emergencies, difficulties and depressions;
>
> (iii) The motive of improvement — to secure a gradually increasing income, which, incidentally, will protect the management from criticism, since increasing income due to accumulation is seldom distinguished from increasing income due to efficiency;
>
> (iv) The motive of financial prudence and the anxiety to be "on the right side" by making a financial provision in excess of user and supplementary cost, so as to discharge debt and write off the cost of assets ahead of, rather than behind, the actual rate of wastage and obsolescence, the strength of this motive mainly depending on the quantity and character of the capital equipment and the rate of technical change.

In Chapter 8 his argument rests on the position that in the aggregate, when we factor the entrepreneur's behavior in his capacity as a consumer into the model, the bigger the gap between gross and net income and, in particular, "the larger the financial provision which it is thought necessary to make before reckoning net income, the less favourable to consumption, and therefore to employment, will a given level of investment prove to be.".

While the material in Section IV of Chapter 8 is justly termed a digression, it is also of considerable interest because of the taste it gives of Keynesian business cycle theory. It focuses

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[8] Simon Kuznets (1901-1985) Harvard economist and winner of the Nobel Memorial Prize in Economic Sciences in 1971. In the 1930s he worked at the U.S. Department of commerce, where he constructed the first official estimates of US national income. See Simon Kuznets (1941) *National Income and its Composition 1919-1938* pub. National Bureau of Economic Research, New York.

on sinking funds – accumulations of business or government savings aimed either at building up enough savings to pay off debt when it comes due or to completely replace a segment of capital stock. Replacement here means more than just spending on upkeep and maintenance; it is aimed at allowing the firm, at some point in the future, to replace its existing capital stock completely with newer vintage capital. Funds which are being used for upkeep and maintenance are not a problem since they are continually being spent, and if the economy had reached a steady state with no net growth in the capital stock, the amount being built up in sinking funds would on the whole be matched by the amount being spent as older capital came up for replacement. Keynes' concern here is with firms setting aside large sums in anticipation of replacing their capital since, barring a steady state, there is no reason to assume that the business saving being done by one firm is being matched by investment being done by another. Suppose, then, that one group of firms is accumulating cash in advance of undertaking large capital replacement expenditures. That current saving being done by those firms represents a reduction in current aggregate demand, and if the level of equilibrium income is not to fall the increased saving being done by one group of firms has to be matched by an increase in investment by another group of firms: as Keynes puts it "It has, therefore, to be balanced by new investment, the demand for which has arisen quite independently of the current wastage of old equipment against which the financial provision is being made;". So if firms in one sector increase their cash accumulation, investment spending by other firms will have to increase by enough to absorb those increased savings: if that does not happen, and investment remains at its old level, less of that unchanged level of investment will be available to generate current income.

The key to understanding the point which Keynes is making here is the fact that investment is a flow, not a stock; that it must be undertaken by someone each period meaning that there has to be a motive for a different person to undertake investment spending in each period. When we teach introductory macroeconomics we tend to treat investment as exogenous, as though it were a stock which is always there, or at the most we treat it as a function of the interest rate, so that as long as the interest rate doesn't change, exactly the same amount of investment will be done in each period. In fact, of course, investment is a very volatile component of aggregate demand. Keynes gets into the motives for investment in Chapter 11, but in Chapter 8 we do get a reminder that someone has to make a deliberate decision to undertake investment spending, and that savers

and investors are not necessarily the same people. In the digression in Chapter 8 Keynes' primary focus is on savings and investment by firms, but the distinction between of savers and investors remains – when one group of firms is accumulating cash in a sinking fund, those firms are making a deliberate decision not to undertake investment spending in that period. If no other firms happen, for unconnected reasons, to increase their investment spending by enough to match the increased business saving, aggregate demand will fall.

This is what leads into the sketchy dynamic model to which we referred above. Suppose that the economy is not in steady state but rather that it has just gone through a boom in investment in fixed capital. In addition, assume that firms are financially prudent, meaning that knowing that at some point in the future they will have to replace that new fixed capital they decide to set aside not just enough to pay for current maintenance spending but in addition make a payment into a sinking fund against that future spending. This means that the investment boom will be followed by a period of high corporate saving, which will reduce aggregate demand until the time comes for the accumulated corporate saving to be spent on replacing the old capital, at which point there will be another investment boom. Thus investment booms, once set off, tend to spawn investment-savings cycles. As Keynes sees it, corporate financial prudence in the aftermath of the post-World War One investment boom could well explain the Depression, at least in the US[9]:

> In the United States, for example, by 1929 the rapid capital expansion of the previous five years had led cumulatively to the setting up of sinking funds and depreciation allowances, in respect of plant which did not need replacement, on so huge a scale that an enormous volume of entirely new investment was required merely to absorb these financial provisions; and it became almost hopeless to find still more new investment on a sufficient scale to provide for such new saving as a wealthy community in full employment would be disposed to set aside. This factor alone was probably sufficient to cause a slump. And, furthermore, since "financial prudence" of this kind continued to be exercised through the slump by those great corporations which were still in a position to afford it, it offered a serious obstacle to early recovery.

This is the point where Kuznets' calculations enter the *General Theory*. Having set out his theoretical case for the harmful effects of sinking funds, Keynes is trying to find empirical evidence on the point. He raises the issue of the public savings being done by local governments

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[9] One significant factor in the American investment boom of the 1920s was the booming growth of the automobile industry.

in Britain, and the saving being done by individual home buyers who aim to pay off their mortgage debt at a rate faster than that at which their house deteriorates, and then turns to Kuznets' figures on Gross and Net capital formation in the US, concluding that American net capital formation had collapsed after 1929, "falling in 1932 to a figure no less than 95% below the *average* of the quinquennium 1925-1929.".

Keynes, Malthus and Investment:

Following his digression into a discussion of such empirical evidence as was available on gross and net investment, Keynes returns to the theme of the second part of Chapter 8. The last couple of pages of the chapter are in some ways surprisingly classical (as we, rather than Keynes would use the term). He starts with an observation which echoes Adam Smith, to the effect that consumption is the sole object of all economic activity[10]. Keynes then makes a point which re-emphasizes the difference between the micro and macro perspectives:

> Aggregate demand can be derived only from present consumption or from present provision for future consumption. The consumption for which we can profitably provide in advance cannot be pushed indefinitely into the future. We cannot, as a community, provide for future consumption by financial expedients but only by current physical output. In so far as our social and business organisation separates financial provision for the future from physical provision for the future so that efforts to secure the former do not necessarily carry the latter with them, financial prudence will be liable to diminish aggregate demand and thus impair well-being, as there are many examples to testify.

As individuals we make provision for the future by saving, not in real terms – i.e. not by piling up stocks of goods in our basements, to be consumed in later years – but in financial terms. To the extent that we accumulate financial instruments we anticipate being able to increase our physical consumption in the future. But from the perspective of the community as a whole, the only actions which we can take today which will increase collective consumption in the future involve increasing real physical output, either of consumption goods through inventory investment or of capital goods, through fixed capital investment. If we all accumulate financial

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[10] In Chapter VIII of Book IV of the *Wealth of Nations*, Smith says "Consumption is the sole end and purpose of all production, and the interest of the producer ought to be attended to only so far as it may be necessary for promoting that of the consumer. This maxim is so perfectly self-evident, that it would be absurd to attempt to prove it."

instruments without adding to future availability of physical goods, all that happens is that the price of future goods rises (along, in most cases, with some redistribution of future consumption). The bit in the quote above about separation of financial from physical provision for the future is just another way of saying that in the presence of reasonably efficient and accessible markets in financial instruments, saving and investing are done by different people with different motives, and an increase in saving, in the form of increased demand for financial assets, will not necessarily increase the availability of physical consumption goods in the future. Then Keynes takes the argument a bit further:

> The greater, moreover, the consumption for which we have provided in advance, the more difficult it is to find something further to provide for in advance, and the greater our dependence on present consumption as a source of demand. Yet the larger our incomes, the greater, unfortunately, is the margin between our incomes and our consumption. So, failing some novel expedient, there is, as we shall see, no answer to the riddle, except that there must be sufficient unemployment to keep us so poor that our consumption falls short of our income by no more than the equivalent of the physical provision for future consumption which it pays to produce to-day.

His elaboration on this rather gloomy observation leads into the second classical echo in this part of Chapter 8, this time an echo of Malthus's general gluts theory.

It always jars slightly to see Keynes refer to Malthus as a precursor of the ideas set out in the *General Theory*, although putting things in the context of the post-Napoleonic War and post-First World War economic debates helps make the parallel clearer. Still, Malthus's general glut theory was not really a theory of insufficient demand, in the Keynesian sense, but of overproduction. For Malthus the problem was one of excessive investment increasing productive capacity to the point where there would be a glut of all commodities on the market and prices would be driven down below the shut-down point for virtually everything. We tend to think of increased investment as a remedy for Keynesian insufficiency of demand, whereas for Malthus it was the cause of the problem – Malthus's remedy was for an increase in consumption spending by unproductive workers: workers who would consume the output of other workers without themselves adding to the generalized excess supply. There is something of this in the knife-edge feature of the Harrod-Domar growth model, which is a Keynesian model, but it is not a theme of the *General Theory*. The last couple of pages of Chapter 8, however, are definitely Malthusian in the general glut model sense.

As Keynes expresses it:

> Consumption is satisfied partly by objects produced currently and partly by objects produced previously, *i.e.* by disinvestment. To the extent that consumption is satisfied by the latter, there is a contraction of current demand, since to that extent a part of current expenditure fails to find its way back as a part of net income. Contrariwise whenever an object is produced within the period with a view to satisfying consumption subsequently, an expansion of current demand is set up. Now all capital-investment is destined to result, sooner or later, in capital-disinvestment. Thus the problem of providing that new capital-investment shall always outrun capital-disinvestment sufficiently to fill the gap between net income and consumption, presents a problem which is increasingly difficult as capital increases. New capital-investment can only take place in excess of current capital-disinvestment if *future* expenditure on consumption is expected to increase. Each time we secure to-day's equilibrium by increased investment we are aggravating the difficulty of securing equilibrium to-morrow.

The story which Keynes is telling here works best if we think of investment as being inventory investment, so that we are talking about increases in actual stocks of consumption goods, but it also holds if we are talking about additions to fixed capital and hence to the capacity to produce consumption goods. Suppose the economy is in a slump and we respond with increased investment (again, think in terms of inventory investment). The increased income earned by the labour which has been employed by the investment spending will increase expenditure on consumption goods, but by less than the original increase in the value of output, and in our story that increase was an increase in the stock of consumables. So our remedy for insufficient demand results in an increase in the stock of available consumables. Assume that the original cause of the slump remains in effect, so we must hold investment spending high if we don't want to slip back into the slump. Again, at the end of the period our inventories will have built up further. Eventually the cost of carrying ever-accumulating inventories of consumption goods will lead to our choosing to consume those inventories rather than produce even more goods to stockpile, and investment spending will fall off. The more investment we did in the past, the larger the part of our current consumption demand we can satisfy out of past investment and the lower the level of investment and income we will have in the current period. So while the original increase in investment spending eased the original problem, eventually we will decide to dis-invest – to consume out of our piled-up consumption capacity, whether in the form of stocks of inventories or in the form of the capacity to produce consumption goods which follows along

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with investment in fixed capital – and at this point we will go into a Malthusian general glut style slump.

As Keynes sees it, new capital investment can only continue to exceed current capital dis-investment (i.e. our capacity to increase the production of consumption goods in the future can only increase without causing a general glut type of slump) if we expect consumption to continue to grow. If consumption doesn't continue to grow at a suitable rate we will eventually find that we have over-invested, and the excess capacity will lead to a downturn. Clearly, we get a taste of an accelerator model here[11].

Keynes' concern in the *General Theory* is with short run fluctuations: the long run, in general, enters through expectations and as a factor which conditions short run responses. The last section of Chapter 8 is one of the few places where the long run effects of short run decisions are discussed at all. Longer run and growth considerations do enter briefly again later in the book, also in connection with investment, and again there will be a surprisingly classical feel to the way they enter. Before that, however, in Chapter 10 Keynes introduces the mpc formally and explains the logic of the multiplier.

Chapter 10: The Marginal Propensity to Consume and the Multiplier:

In Chapter 10 we finally get into a formal discussion of the marginal propensity to consume (mpc) and the multiplier, although the mpc has been foreshadowed at several points in earlier chapters. Keynes begins the discussion of the mpc by repeating that he is interested in the effects on real income on changes in the level of employment, holding the capital stock constant:

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[11] We tend today think of the accelerator as a Keynesian concept, as in Samuelson's multiplier-accelerator model (See Paul Samuelson (1939): "Interactions Between the Multiplier Analysis and the Principle of Acceleration" *Review of Economics and Statistics* 21(2), May, 75-78) but the idea of the accelerator long pre-dates the idea of the multiplier. J. Maurice Clark set it out in 1917 in "Business Acceleration and the Law of Demand: A Technical Factor in Economic Cycles" *Journal of Political Economy* 25(3), March 1917, and A. C. Pigou invoked it in 1927 in his book *Industrial Fluctuations*, where he argued that while in some cases it might look as if an economic downturn was being caused by a drop in Investment spending, the true cause of the downturn was actually a slowing of the rate of increase of consumption spending, and that a decline in the rate of increase in consumer spending could result in an absolute fall in the level of investment spending.

> The fluctuations in real income under consideration in this book are those which result from applying different quantities of employment (i.e. of labour-units) to a given capital equipment, so that real income increases and decreases with the number of labour-units employed. If, as we assume in general, there is a decreasing return at the margin as the number of labour-units employed on the given capital equipment is increased, income measured in terms of wage-units will increase more than in proportion to the amount of employment, which, in turn, will increase more than in proportion to the amount of real income measured (if that is possible) in terms of product. Real income measured in terms of product and income measured in terms of wage-units will, however, increase and decrease together (in the short period when capital equipment is virtually unchanged).

Here again we have one of those (to us) confusing statements about the effects of increased employment on income measured in wage units. The statement that employment will increase more than proportionately with real income[12] is simply a consequence of his assumption that the increase in employment involves adding more labour to a fixed quantity of physical capital, and that diminishing marginal productivity holds. The statement that income measured in wage units will rise by more than employment does reflects the assumption that, as output rises, even if the wage unit rises in money terms, prices will rise by more than the money wage rises, since the real wage has to fall. The rise in prices, of course, adds to the increase in income measured in money terms. The real purpose of this passage is to remind us of the reasons Keynes prefers to convert money-values to wage units, by dividing nominal values by the money wage: converting to command-over-labour equivalents is as close as he believes he can come to measuring income (and other nominal values) in real terms.

Having done that, he then introduces the mpc, defined as dC_W/dY_W where consumption and income are both measured in wage units. Then, defining $Y_W = C_W + I_W$, he writes

$$\Delta Y_W = \Delta C_W + \Delta I_W$$

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[12] Again, note that Keynes is not rejecting the concept of real income, nor is he denying that it will increase when employment increases, rather he simply doesn't believe that it is possible in practice to measure real income in any kind of meaningful way.

And the fact that C_W moves with Y_W lets him combine them into a single term and write $\Delta Y_W = k\Delta I_W$, where k is the multiplier[13] and the mpc is $1 - 1/k$, so $k = 1/(1-c)$ as we would normally write it these days.

The next couple of pages (in section II of Chapter 10) are devoted to comparing the multiplier of the *General Theory* with the employment multiplier set out by Richard Kahn in his 1931 paper[14]: Kahn had focused on the relation between an increase in the amount of labour employed in the investment sector and the amount of labour employed in the economy as a whole[15]. While Keynes is working with nominal values which have been converted to wage units, working in nominal terms has advantages over working in terms of employment since it will let Keynes talk about the impact of public works spending on the government's budget.

Much of what is in Chapter 10 is familiar – textbook stuff. There is, for example, the intro macro teaching example showing that if the mpc = 0.9, the (simple) multiplier is 10. There is also some back-of-the-envelope empiricism (all that was possible, in the absence of good macroeconomic data) with Keynes concluding, as far as the value of the mpc is concerned, that it lies closer to one than to zero:

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[13] For obvious reasons, Keynes refers to it here as the Investment Multiplier.

[14] Richard F. Kahn (1931): "The Relation of Home Investment to Unemployment" <u>Economic Journal</u> 41(162), June, 173-198.

[15] Kahn is generally credited with the first formal exposition of multiplier theory, and although there are other claimants to the title of first, they cannot be said to have had the same impact as Kahn. There are also some surprising near misses. Arthur Cecil Pigou, in a 1929 review of Ralph Hawtrey's book *Trade and Credit*, (A. C. Pigou, "The Monetary Theory of the Trade Cycle" *The Economic Journal* 39(154) June 1929) came up with a version of the multiplier based on the velocity of money: "Suppose that, instead of spending £100 in buying food and clothes for my personal consumption, I use the £100 to engage painters and plasterers, hitherto unemployed, to repair my house, these painters and plasterers using the money to buy the food and clothes that I forgo. In that event certain money units, that would otherwise have become income and outlay during a year n times, now become income and outlay (n+1) times. That is to say, V is increased, and, therefore, VM also." He goes on to say that "…aggregate money income (which is equal to outlay) is increased, in spite of the fact that M has remained unaltered and aggregate real income, along with the productive activity – employment – that gives rise to it, is also increased." He goes on to set out a more detailed multiplier story, but in essence, given that MV = PT, if V increases, holding M constant, P and/or T must increase, and in Pigou's story, since he started by hiring unemployed workers, T increases. Hawtrey, in his reply, convinced Pigou that his multiplier story was wrong, although Pigou returned to a velocity of money-based multiplier-type story in his 1949 book *The Veil of Money* (Macmillan, London, 1949). Hawtrey himself, in the draft of his 1932 book *The Art of Central Banking* came up with a detailed description of the multiplier process, which then did not appear in the published version of the book (Longmans, Green & Co. 1932). But in his 1931 book *Trade Depression and the Way Out* (Longmans, Green & Co., London) Hawtrey wrote (pg. 3): "So a vicious circle is set up. The fall in demand causes a fall in output and prices; the fall in output and prices causes a fall in income from profits and wages; and the fall in incomes causes a further fall in demand. Adversity in any industry or group of industries tends to spread to all the others."

> … with the result that we have, in a sense, the worst of both worlds, fluctuations in employment being considerable and, at the same time, the increment in investment required to produce full employment being too great to be easily handled. Unfortunately the fluctuations have been sufficient to prevent the nature of the malady from being obvious, whilst its severity is such that it cannot be remedied unless its nature is understood.

Beyond what we would today regard as introductory macro textbook material, there are also some remarks which show that, although he was setting out the bones of his model, Keynes was thinking in terms of his complete model. For example:

> When full employment is reached, any attempt to increase investment still further will set up a tendency in money-prices to rise without limit, irrespective of the marginal propensity to consume; i.e. we shall have reached a state of true inflation. Up to this point, however, rising prices will be associated with an increasing aggregate real income.

As we draw the AD/AS diagram today, with aggregate real output on the horizontal axis and the aggregate price level on the vertical, this would translate into a positively sloped, convex Aggregate Supply curve, with increases in aggregate demand translating into small price increases and large quantity increases when we are well below full employment, and with the price increases becoming larger and the increases in real income smaller as equilibrium income rises.

There are also a number of observations on factors which will tend to reduce the size of the multiplier. In one of the few explicitly open economy references in the *General Theory*, there is the observation that the more of any increase in investment spending which goes to imports, the smaller the domestic employment multiplier will be. There is also a return to his earlier suggestion that the mpc would decline as income increases, making the multiplier smaller at higher levels of income.

One of Keynes' more interesting suggestions about factors which might affect the size of the multiplier concerns the effect of increased economic activity on the demand for money:

> The method of financing the policy and the increased working cash, required by the increased employment and the associated rise of prices, may have the effect of increasing the rate of interest and so retarding investment in other directions, unless the monetary authority takes steps to the contrary; whilst, at the same time, the

increased cost of capital goods will reduce their marginal efficiency to the private investor, and this will require an actual *fall* in the rate of interest to offset it.

This would seem to anticipate a bit of ISLM analysis, in which an outward shift of the IS curve, will, if there is no increase in the money supply, because of the accompanying increase in the transactions demand for money, drive the interest rate up and crowd out private investment. Keynes is actually going beyond ISLM analysis, into AD/AS (again as we do them today) when he refers to the rise in prices associated with the increase in employment[16]. Another interesting passage suggests that:

> …unemployment is likely to be associated with negative saving in certain quarters, private or public, because the unemployed may be living either on the savings of themselves and their friends or on public relief which is partly financed out of loans; with the result that re-employment will gradually diminish these particular acts of negative saving and reduce, therefore, the marginal propensity to consume more rapidly than would have occurred from an equal increase in the community's real income accruing in different circumstances.

This passage seems particularly obscure until you remember that Keynes' consumer is a forward looking intertemporal optimizer. A period of unemployment has forced him to live off his accumulated savings (or borrow from family and friends), running his wealth below his long run target. This passage refers to the individual's attempts, after he has found new employment, to rebuild his assets, if not returning, or at least converging, to their original level, at least converging to a new long run savings path which is optimal given the income shock he has just experienced. Keynes refers elsewhere to saving as being a residual, but his consumer, like his firm, is a long run optimizer, and the parameters which determine a consumer's response to short run shocks come out of the solution to his long run problem. The effect, though, will be that the multiplier effect of a given increase in expenditure will be smaller when the economy is coming out of a recession than it would be if we were starting from the same initial level of income but our consumers had not just experienced a negative shock to their accumulated savings.

Keynes recognizes the limitations of this sort of speculation, but says:

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[16] As we derive the AD/AS diagram in most intermediate macroeconomics textbooks, the AD curve is derived from the ISLM diagram.

One can only say, for example, that a typical modern community would probably tend to consume not much less than 8o per cent. of any increment of real income, if it were a closed system with the consumption of the unemployed paid for by transfers from the consumption of other consumers, so that the multiplier after allowing for offsets would not be much less than 5. In a country, however, where foreign trade accounts for, say, 20 per cent. of consumption and where the unemployed receive out of loans or their equivalent up to, say, 50 per cent. of their normal consumption when in work, the multiplier may fall as low as 2 or 3 times the employment provided by a specific new investment. Thus a given fluctuation of investment will be associated with a much less violent fluctuation of employment in a country in which foreign trade plays a large part and unemployment relief is financed on a larger scale out of borrowing (as was the case, e.g., in Great Britain in 1931), than in a country in which these factors are less important (as in the United States in 1932).

Recovery From Recession and the Distribution of Income:

One other factor which Keynes discusses in Section III of Chapter 10 as affecting the size of the multiplier is worth looking at, not so much for the reason Keynes mentions it as for what it tells us about his formal analytical apparatus:

> For, in the first place, the increase of employment will tend, owing to the effect of diminishing-returns in the short period, to increase the proportion of aggregate income which accrues to the entrepreneurs, whose individual marginal propensity to consume is probably less than the average for the community as a whole.

As far as the multiplier is concerned, Keynes is saying that during a recovery there will be a shift in the distribution of income towards groups with lower marginal propensities to consume. What is interesting from our point of view is why he would think that, as the economy comes out of a slump with total income rising, and more people are hired, the share of national income going to profits ("the proportion of aggregate income which accrues to entrepreneurs") will tend to fall.

The explanation comes back to the Marshallian microfoundations of the model in the *General Theory*. Keynes assumes, remember, that the economy will always be operating on the value of the marginal product of labour (VMPL) curve. The short-period diminishing returns to which he refers, we would today refer to as diminishing marginal productivity of labour, remembering that as we move along the VMPL curve we are holding the capital stock fixed.

In Figure 8 below we show a VMPL curve with employment at L_0 which means that the wage is equal to $VMPL_0$. Since the VMPL curve is a marginal curve, equal (in a perfectly competitive economy, which was Keynes' default assumption) to the price multiplied by the Marginal Physical Product of Labour (MPPL), the value of total output in Figure 8 is equal to the area under the VMPL curve, above the horizontal and to the right of the vertical axes, up to the vertical line at L_0 on the horizontal axis. Since the wage per unit of labour is $VMPL_0$ and total employment is L_0, the rectangle defined by the origin, $VMPL_0$, L_0 and point E_0 on the VMPL curve represents total payments to labour[17] so the remainder of the value of total output, the triangle sitting atop this rectangle, represents profit and costs of fixed capital – payments to entrepreneurs. Labour's share, then, is the proportion of the total area which the lower rectangle accounts for.

Now assume that we have been in a slump and are coming out of it, with employment rising from L_0 to L_1 as in Figure 9 below. Since this is a Keynesian recovery the value of the capital stock has not changed so the MPPL curve will not have shifted, and we will assume that the price of output has not changed so the VMPL curve will not have shifted, meaning that the increase in employment represents a movement along the VMPL curve from E_0 to E_1, with employment rising from L_0 to L_1 and the value of the MPL falling from $VMPL_0$ to $VMPL_1$. Since the total level of labour has increased, the vertical line marking the rightmost edge of the area representing the total value of output has shifted to the right, which means that the area under the VMPL curve which shows the total value of output has increased, which in turn simply means that the value of total output has increased as we came out of the slump and increased employment. What happens to the labour share depends on what proportion of the new total output area which is accounted for by the new lower rectangle, described by the origin and point E_1. The shift to the right on the horizontal axis, to L_1, clearly tends to increase the area while the drop in the height as the VMPL falls tends to reduce it. Whether the new labour income rectangle is larger or smaller as a proportion of the new, larger, total output area depends on the relative magnitudes of these two effects, plus the area of the triangle which sits on top of the gross new labour income rectangle (the rectangle with base $L_1 – L_0$). The larger the drop in the VMPL due to the increase in L, the more likely it is that the relative area of the labour income rectangle will

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[17] If we are assuming that variable factors are employed in fixed proportions, we can think of the lower rectangle as payments to all variable factors combined.

fall. Formally, the matter comes down to the relative sizes of the elasticities of output and of the marginal product of labour with respect to labour, holding capital constant, and a large value of the elasticity of the marginal productivity of labour with respect to labour[18] will be a sufficient condition for labour's share to fall. To put the matter in a bit of context, in the case of a Cobb-Douglas production function, factor shares are constant, so an expansion of employment, while it would increase the magnitudes of total labour and capital income, would not reduce labour's share of total income. Keynes is thinking in terms of a production function for which the MPL falls fast enough as L increases for this particular result to appear, and the generality of his statement suggests that he took this as the representative situation in the economy. Clearly if this assumption about the technical properties of the production function does not hold up empirically, Keynes' observation about the distributional effects of a recovery[19] will not hold. In some ways this is a relatively minor point, but it emphasizes the point that Keynes' macro model rested on Marshallian microfoundations[20].

The Dynamics of the Multiplier Process:

Section IV of Chapter 10 contains an interesting discussion of a multiplier process working itself out over time. One question that was raised about Keynes model at the time was where the savings were to come from to finance an increase in investment, if in the initial unemployment

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[18] So we are looking at the second derivative of the production function with respect to labour, or the first derivative of the MPL with respect to L. Formally, let $\varepsilon_{VL} > 0$ be the elasticity of output with respect to labour and $\varepsilon_{VLL} < 0$ be the elasticity of the marginal product of labour with respect to L. An increase in L will necessarily increase aggregate income. Whether it will increase total labour income depends on the sign of $[1 + \varepsilon_{VLL}]$. If this term is negative, an increase in L will cause total labour income to fall when employment increases, which is obviously a sufficient condition for labour's income share to fall, given that aggregate income has increased. If $[1 + \varepsilon_{VLL}] > 0$, we have a necessary but not sufficient condition for labour's share to increase. Labour's share will increase if $[1 + \varepsilon_{VLL}] > \varepsilon_{VL}$ and fall if $[1 + \varepsilon_{VLL}] < \varepsilon_{VL}$, even if total labour income increases. Keynes seems to have had this latter case in mind in this passage of the *General Theory*.

[19] Again emphasizing that the capital stock is held constant in the analysis of the *General Theory*.

[20] As we have noted, Keynes typically worked with a perfectly competitive economy in mind. In the 1939 *Economic Journal* paper about the cyclicality of real wages he departed from that assumption in passing to talk briefly about the degree of monopoly in the economy, but he argued there that the degree of monopoly was more likely to rise in a slump, as some firms went out of business, and fall in a recovery as, new firms entered, than the other way around. His assumption that in a recovery there would be a tendency for labour's income share to fall comes out of his assumption about the technical properties of the production function – "the effect of diminishing returns in the short period" – and for him to take it as a common circumstance, as he seems to do in Chapter 10, suggests that he believed that the marginal productivity of labour fell off relatively rapidly as employment increased.

equilibrium, investment was low and savings had fallen to a level just equal to the reduced level of investment[21]. Joan Robinson was prone to giving an answer which tended to boil down to something like 'Haven't they ever heard of the multiplier?', but glibness was hardly convincing. Earlier in the *General Theory*, Keynes had essentially been doing comparative statics, looking at the change in the location of macro-economic equilibrium without talking about how the system actually got from the old equilibrium to the new. Thus he had talked about an increase in government investment spending increasing equilibrium income and about how it would be found, when the new equilibrium was compared with the old, that the increase in national income had led to an increase in aggregate saving which just matched the increase in investment, meaning that the increased investment would generate the increased investment needed to support it. To anyone concerned with transition dynamics, this was not likely to be a terribly satisfying story, and indeed, it was an odd story to come from the man who, in his *Tract on Monetary Reform*, had criticized the tendency to focus on steady states[22]:

> But this *long run* is a misleading guide to current affairs. *In the long run* we are all dead. Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us that when the storm is long past the ocean is flat again.

Section IV of Chapter 10 moves the argument ahead a bit, adding a bit of dynamics to the story. Suppose we are initially in an unemployment equilibrium. Now assume there is an increase in government investment spending, in the sector of the economy in which capital goods are produced. In the first period, aggregate income increases by the full amount of the increase in investment spending, consumption increases by the mpc times the increase in income and saving increases by the marginal propensity to save (one minus the mpc) times the increase in income. Clearly at this stage in the process the increase in saving must be less than the increase in investment spending since the increase in saving equals the mps times the increase in government investment spending. This raises the obvious question of how the I = S condition,

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[21] Some commentators thought that Keynes policy proposals depended on there being a pool of idle savings, probably sitting in the banks, waiting to be called on to finance new investment. Hawtrey seems to have made this mistake. Some of these commentators were prone to saying that there was no such pool, taking this to be a refutation of Keynes model, when Keynes would argue that they should have seen it as evidence supporting his argument about the way the saving-investment relation worked. This misunderstanding also relates to Keynes discussion in Chapter 7 of the view that investment could be financed by an expansion of bank credit without there being any accompanying increase in saving. Keynes himself at one point seems to have suggested that it would be possible for spending on public investment to be done before the funds were raised.
[22] J. M. Keynes (1923) *A Tract on Monetary Reform* pg. 80

which by definition is supposed to be satisfied at each point in time, can be satisfied at this stage in the dynamic process. If I = S were strictly an equilibrium condition and I could exceed S under circumstances such as we have just described there would be no problem, but Keynes is quite insistent that I = S by definition, so it must hold at all points in time.

The trick is that at this stage in the process, there has been no increase in output of consumption goods (nor in employment in the consumption goods sector). This means that the increased consumption demand which arises from people getting jobs in the capital goods sector has to be met by running down inventories of consumer goods – i.e. there will be negative inventory investment exactly equal to the increased consumption spending, which means that the increased saving will just equal that bit of the investment spending which has not been cancelled out by the negative inventory investment. In terms of the multiplier calculations, the increased income will just equal the multiplier times that bit of the original increase in investment spending.

This, however, is not an equilibrium position since inventories of consumer goods, which presumably previously were optimal for the level of consumption in the depressed state of the economy, are now too low. The consumer goods sector will respond to the unanticipated reduction in inventories (this, remember, is the Hawtrey story) by increasing production to restore inventory levels, and aggregate income will go up by that amount, which will be equal to the increase in consumption which occurred in the first stage of our story. This, of course, is the story we typically tell to teach the multiplier process. Even after this, though, because the people who have just been given jobs in the consumer goods sector will increase their own consumption spending by the mpc times the increase in their income, inventories won't be back to the original optimal level. They will basically go up by the mps times this second-round increase in income, so the net investment in inventories which occurs at this point will just equal the increase in saving which occurs at this point. So long as the original increase in investment remains in effect each period – i.e. so long as the government doesn't cut its spending and put people out of work – this process will continue until a new equilibrium has been reached at which saving will have risen to exactly equal the original increase in spending in the capital goods sector and the netting-out process in inventory investment has stopped. As Keynes expresses this:

> Thus an expansion in the capital-goods industries causes a series of increments in aggregate investment occurring in successive periods over an interval of time, and a series of values of the marginal propensity to consume in these successive periods which differ both from what the values would have been if the expansion had been foreseen and from what they will be when the community has settled down to a new steady level of aggregate investment. But in every interval of time the theory of the multiplier holds good in the sense that the increment of aggregate demand is equal to the product of the increment of aggregate investment and the multiplier as determined by the marginal propensity to consume.

Still, while this dynamic story helps us understand how it is that saving will always equal investment, even during the transition between equilibria, it doesn't resolve the problem which some of Keynes' critics had with the policy prescriptions of the *General Theory*. The key issue is, what happens at the very first stage of the multiplier process?

Suppose that, as Keynes argues, Saving always equals Investment with the adjustment coming through changes in the level of income, so that when investment falls, income also falls, pulling saving down until it equals the new, lower level of investment. Assume that the economy is in an unemployment equilibrium. If the government decides to increase its investment spending, how is that increase financed?

Hawtrey, Keynes, Financing Government Spending, and the Treasury View:

Hawtrey's argument, which was the basis of the Treasury View, was that when the government went to the financial markets to borrow to fund the initial increase in investment, bond dealers, who have a fixed budget constraint determined by how much the banks are prepared to lend them, would have to choose between buying the new government bonds or buying private bonds. If they choose to buy the government bonds, some private bonds will not be bought and some private investment projects will not be funded. This is the basis of Hawtrey's argument that any increase in government investment would completely crowd out an equal amount of private investment spending, with no net effect on aggregate demand. While Hawtrey set the argument up in terms of the behavior of bond dealers, the principle holds more broadly. If we accept that saving was just equal to the reduced level of investment associated with the unemployment equilibrium, and that there are therefore by Keynes' own definition no idle savings to be drawn

on to fund the new investment, the multiplier process can't get underway since the saving necessary to support the increased investment can't come into existence until after the investment had been done. Hawtrey, then, was not so much disputing the logic of the multiplier process once it got underway[23] as arguing that it would be strangled at birth by the lack of idle saving. The only effect of an increase in government investment spending would be to change the composition of total spending, not the amount.

In a pair of articles he wrote for the **Times of London** on April 17 and 18 of 1939, Keynes tried to counter this point by arguing that the investment spending would have to be done before the money was raised to finance it:

> Loans must be raised after the expenditure has been incurred and not before. The savings come into existence *pari passu* with the expenditure, and owing to various time lags and transferences are not likely to be available for subscription to a loan until some time later. If an attempt is made to borrow them before they exist, as the Treasury have done once or twice lately, a stringency in the money market must result, since, pending the expenditure, the liquid resources acquired by the Treasury, must be at the expense of the normal liquid resources of the banks and of the public.

The last part of this quote seems to be arguing Hawtrey's point for him, and as for the first part, in which Keynes has the government spending before it raises the funds, Hawtrey dismissed it as an absurdity[24]. Keynes returned to this point in a pair of articles published in the **Times** on July 24 and 25 of 1939, but again his argument seems to rest on the belief that somehow or other an increase in income has already occurred, presumably as a result of the increased government investment spending, and that the trick now is to ensure that the increased saving which would follow from the increased income would be placed in government bonds in order that it could be used to finance the spending which has already happened.

One possible interpretation of what Keynes had in mind would follow from the observation which he made in the July 1939 articles, that in uncertain times people wanted to keep their savings in highly liquid forms. They could be offered short term Treasury Bills which would satisfy their desire for liquidity almost as well as cash and bank deposits would, but which would pay a slightly higher rate of interest than bank deposits, leading them to shift their savings

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[23] And at various times, he actually endorsed the logic of the multiplier process.
[24] G. C. Peden (2004) *Keynes and his Critics: Treasury Responses to the Keynesian Revolution 1925-1946* pg. 184.

portfolios towards the Bills. Whether this would work would depend on how the banks would respond to the loss of deposits – in uncertain times banks also had an incentive to stay more liquid than they otherwise would, which in their case would translate into keeping excess reserves. If the banks responded by allowing their excess reserves to fall a bit, there would be no crowing out and the multiplier process would begin.

In Hawtrey's model of how the banking system worked, banks selected their reserve ratios on the basis of their assessment of the state of the economy now and, as they foresaw it, in the near future. In that model, they would tend to respond to losing deposits to Treasury Bills by reducing their loans in order to maintain their desired reserve ratios. That would probably involve their making less money available to bond market dealers, with the result that the increase in government borrowing would lead to complete crowding out of a matching amount of private investment. In this case, the difference between Keynes' policy argument and Hawtrey's boils down to a difference in how they see the banks behaving - Hawtrey agreed that if there were to be an increase in bank credit at this point in the process, the multiplier argument might well prove valid. Arguably, Hawtrey took the view that the banks desired reserve ratio was fixed in the short run, making the money supply essentially exogenous in the short run (assuming that the monetary authorities left the monetary base unchanged) while Keynes might have been thinking in terms of the banks taking a more flexible view of their reserve ratios and hence there being a degree of endogeneity in the money supply.

The other possibility is that even in the 1939 articles Keynes is simply not being clear about the admission he made in 1937, that to avoid crowding out the initial increase in government spending would have to be financed by money creation. After that initial phase, the multiplier process would ensure that sufficient increased saving would be generated to finance the investment. Then whether there would be crowding out would depend on how close to full employment the economy happened to be. In this case we are back to the argument that Keynes made in Chapter 7, about bank finance of investment spending, but now applying it to government investment spending.

In a June 1937 paper[25] in response to articles by Bertil Ohlin, Dennis Robertson and Ralph
Hawtrey, Keynes wrote:

> The above analysis is useful in exhibiting in what sense a heavy demand for investment
> can exhaust the market and be held up by lack of financial facilities on reasonable
> terms. It is, to an important extent, the 'financial' facilities which regulate the *pace* of
> new investment. Some people find it a paradox that, up to the point of full
> employment, no amount of actual investment, however great, can exhaust and exceed
> the supply of savings, which will always exactly keep pace. If this is found paradoxical, it
> is because it is confused with the fact that too great a press of uncompleted investment
> decisions is quite capable of exhausting the available finance, if the banking system is
> unwilling to increase the supply of money and the supply from existing holders is
> inelastic. It is the supply of available finance which, in practice, holds up from time to
> time the onrush of 'new issues'. But if the banking system chooses to make the finance
> available and the investment projected by the new issues actually takes place, the
> appropriate level of incomes will be generated out of which there will necessarily
> remain over an amount of saving exactly sufficient to take care of the new investment.

In other words, to avoid crowding out, the first stage of an expansionary government investment
policy must be supported by an expansion of bank credit[26].

Burying Bottles of Banknotes:

Section V of Chapter 10 is devoted to trying to clarify some implications of the multiplier theory,
and of the role of the marginal and average propensities to consume with numerical examples. It
contains a couple of observations worth noting. One is that:

> Thus public works even of doubtful utility may pay for themselves over and over again
> at a time of severe unemployment, if only from the diminished cost of relief
> expenditure, provided that we can assume that a smaller proportion of income is saved

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[25] J. M. Keynes (1937): "Alternative Theories of the Rate of Interest" *Economic Journal* 47(186), June, 241-252
[26] In acknowledging the need for an expansion of bank credit in the first stage of a fiscal expansion Keynes was
coming close to Hawtrey's views, but their models still differed in significant ways. Hawtrey took the position that
business cycles were monetary phenomena, driven by periods of monetary easing and tightening. As he saw it, to
come out of a slump, what was needed was simply an expansion of bank credit, which would allow private
investment spending to pick up, the private spending having been restrained by tight credit conditions. He argued
on several occasions that the public works spending which Keynes was advocating was basically just an excuse for
an easing of credit conditions. The stimulus would come from the expansion of credit, not from the public
spending, which meant that a monetary easing would be sufficient to spark a recovery, without any need for the
fiscal expansion. The only circumstances under which he saw public works spending as beneficial were those
associated with what came to be known as a liquidity trap, when monetary easing alone would not work.

when unemployment is greater; but they may become a more doubtful proposition as a state of full employment is approached. Furthermore, if our assumption is correct that the marginal propensity to consume falls off steadily as we approach full employment, it follows that it will become more and more troublesome to secure a further given increase of employment by further increasing investment.

The suggestion that public works may pay for themselves through reduced relief expenditure is a continuing theme through Keynes' *General Theory* related writings, although it needs to be noted that what is presumably happening is that the form in which the government is doing its spending is shifting from relief payments to the payment of wages for performing public works and the multiplier effects should be similar. We also have the following, rather optimistic observation on the possibilities for empirical analysis:

> It should not be difficult to compile a chart of the marginal propensity to consume at each stage of a trade cycle from the statistics (if they were available) of aggregate income and aggregate investment at successive dates.

followed by a discussion of the possible size of the multiplier for the US, based on Kuznets' figures[27].

Section VI of Chapter 10 is notable for the following Keynesism:

> If the Treasury were to fill old bottles with banknotes, bury them at suitable depths in disused coalmines which are then filled up to the surface with town rubbish, and leave it to private enterprise on well-tried principles of *laissez-faire* to dig the notes up again (the right to do so being obtained, of course, by tendering for leases of the note-bearing territory), there need be no more unemployment and, with the help of the repercussions, the real income of the community, and its capital wealth also, would probably become a good deal greater than it actually is. It would, indeed, be more sensible to build houses and the like; but if there are political and practical difficulties in the way of this, the above would be better than nothing.

The digging up buried bottles of banknotes policy is often ridiculed by Keynes' critics, but it is actually part of a discussion about what kinds of activities politicians regard as acceptable. Immediately before the bottles, we have this:

> It is curious how common sense, wriggling for an escape from absurd conclusions, has been apt to reach a preference for *wholly* "wasteful" forms of loan expenditure rather

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[27] Even when officials at the Treasury came around to Keynes' multiplier theory, they regarded him as being too optimistic about both the size of the multiplier and the ease with which expansionary policies could be implemented.

than for *partly* wasteful forms, which, because they are not wholly wasteful, tend to be judged on strict "business" principles. For example, unemployment relief financed by loans is more readily accepted than the financing of improvements at a charge below the current rate of interest; whilst the form of digging holes in the ground known as gold-mining, which not only adds nothing whatever to the real wealth of the world but involves the disutility of labour, is the most acceptable of all solutions[28].

The point with regards to the banknotes is simply that while there is no fundamental difference between digging holes in the ground to extract gold and digging holes in the ground to find bottles full of banknotes, gold mining is regarded as an acceptable job-creation activity while burying and digging up banknotes would not be:

> Just as wars have been the only form of large-scale loan expenditure which statesmen have thought justifiable, so gold-mining is the only pretext for digging holes in the ground which has recommended itself to bankers as sound finance; and each of these activities has played its part in progress-failing something better.

The real point here is to express Keynes opposition to the Treasury's belief that public works projects must be able to be shown to be commercially viable, on strict business principles[29]. He argues that even if the rate of return fell short of a target rate, the benefits of reduced unemployment, including reduced dole payments, are a valid part of the rate of return calculation for public works programs. To turn it around, he is arguing that it does not make sense to tolerate a high rate of unemployment simply because the potential public works projects cannot be shown to be expected to yield a normal commercial rate of return. The buried bottles of bank notes example is simply a typical Keynesian rhetorical flourish[30].

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[28] Among the wholly wasteful forms, Keynes seems to include pyramid-building and wars.

[29] The Treasury's criteria on what conditions public works projects should meet were driven not just by theoretical and business considerations but also by the need to impose limits on politicians. The fear, quite justified, was that once politicians got the idea that large scale deficit spending was acceptable, the government budget would quickly get out of control. Treasury support for the Gold Standard had a similar element to it – the need to stay on gold imposed discipline on monetary policy.

[30] As part of his comments on gold mining, Keynes says that, since the value of a house depends on its utility, an increase in the housing stock drives down the rent which could be earned from building even more houses and lessens the attraction of building more houses (i.e. the demand curve for housing, seen as a willingness-to-pay curve, is downward sloping) but the same does not apply to the fruits of gold-mining. There is an echo here of the argument made by Xenophon in about 300 BC in his *Ways and Means to Increase the Revenues of Athens* in which he argues that public monies would be better spent on encouraging exploitation of the silver mines at Laurion rather than encouraging agriculture, because the rapidly diminishing marginal utility of food (in an era long before refrigeration) meant that increases in supply would drive the price of food down significantly, but the fact that people never ran out of things to do with silver (including burying it in the backyard for future use, if necessary) meant that a rapidly increasing supply would have very little impact on the price of silver, and hence on the return

the city could get from investment in the mines. Keynes' comments about pyramid building, also in the last section of Chapter 10, recall the suggestion by Sir William Petty, in the 17th century, to the effect that if no better work could be found for them to do, the unemployed could be put to work moving Stonehenge from Salisbury Plain to London. Petty's primary concern had been that the long term unemployed not get out of the habit of work.
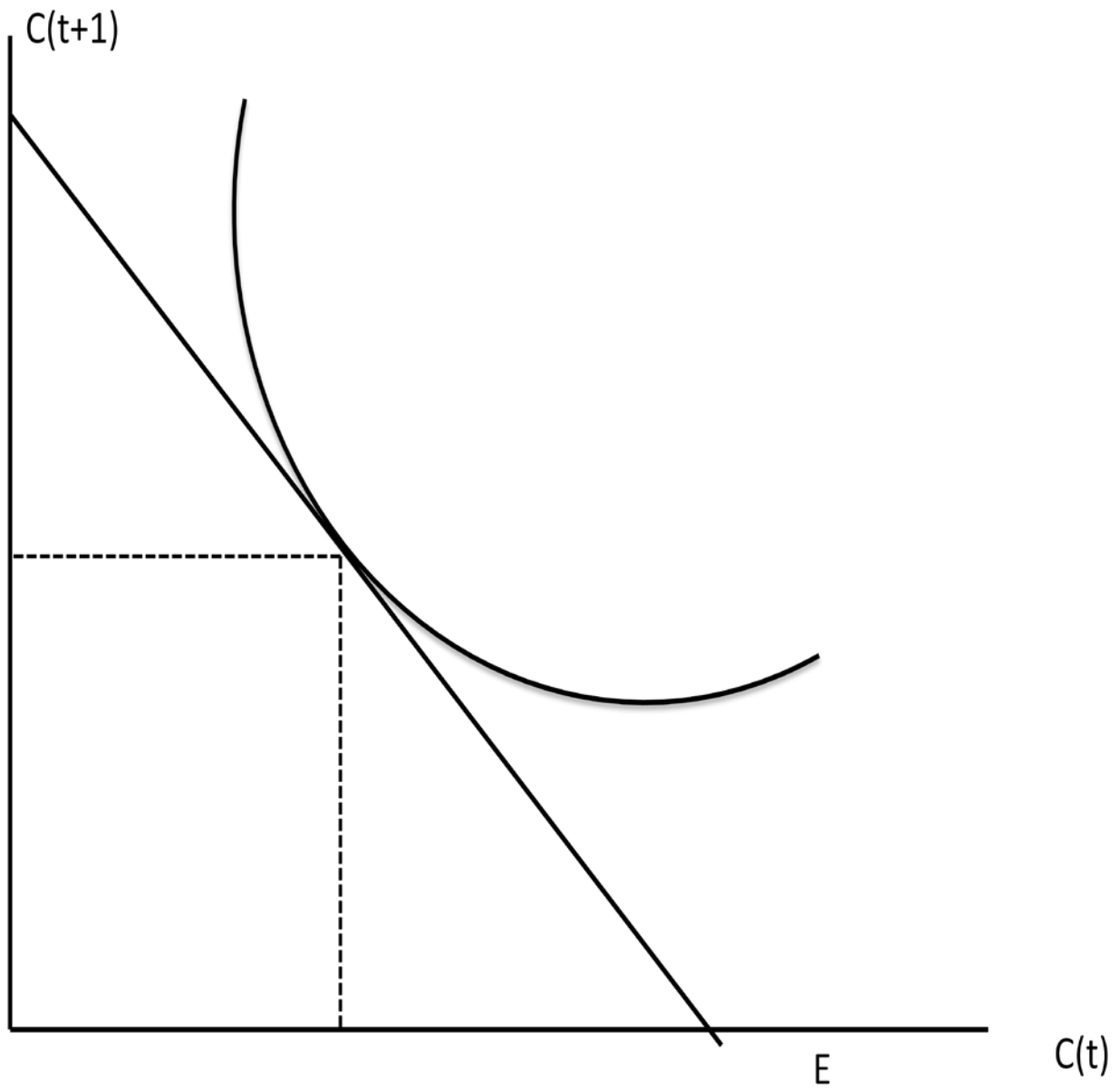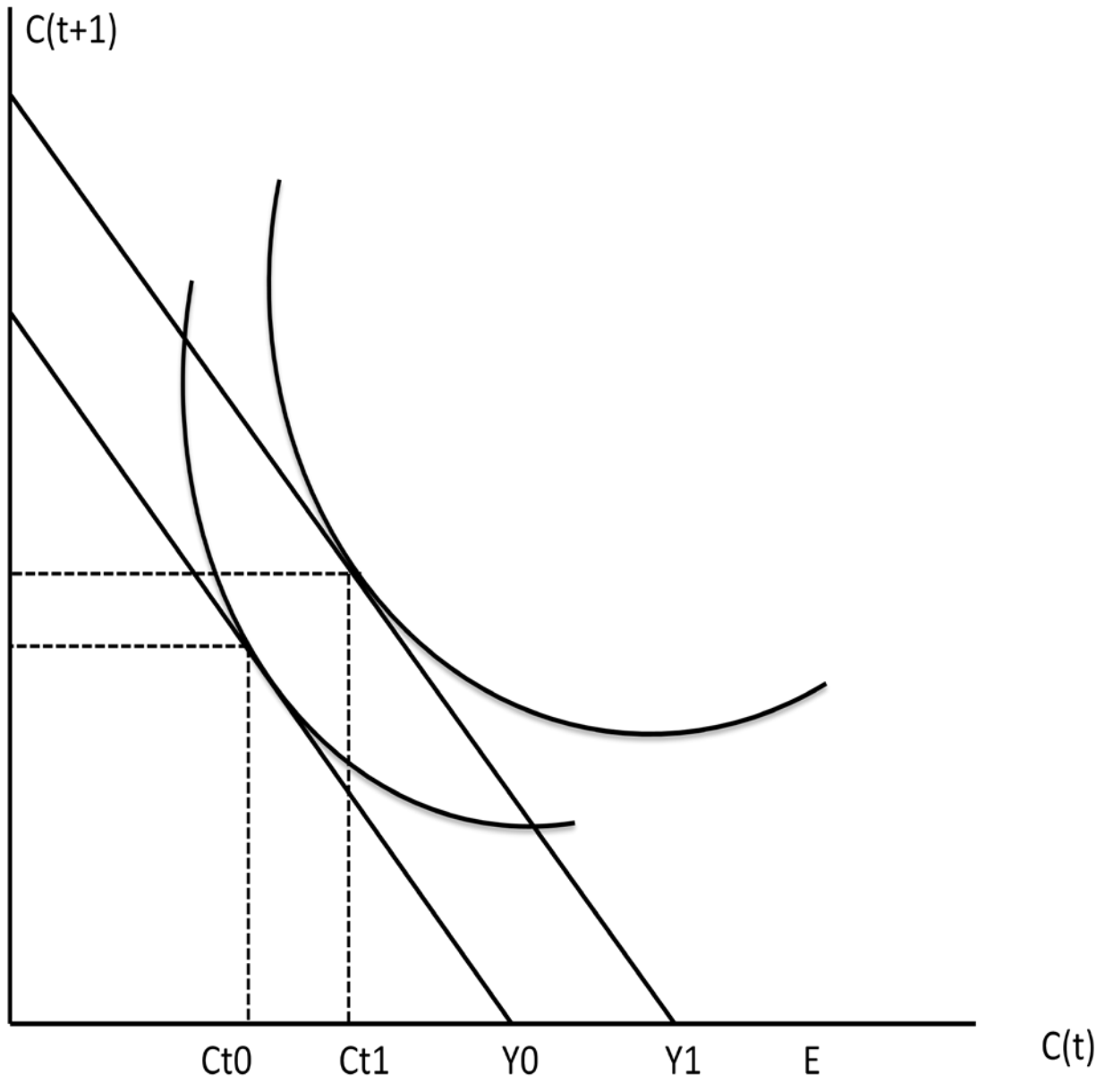
Figure 1: Two period optimization problem.

Figure 2: Increase in Period t income and consumption in both periods t and t+1.
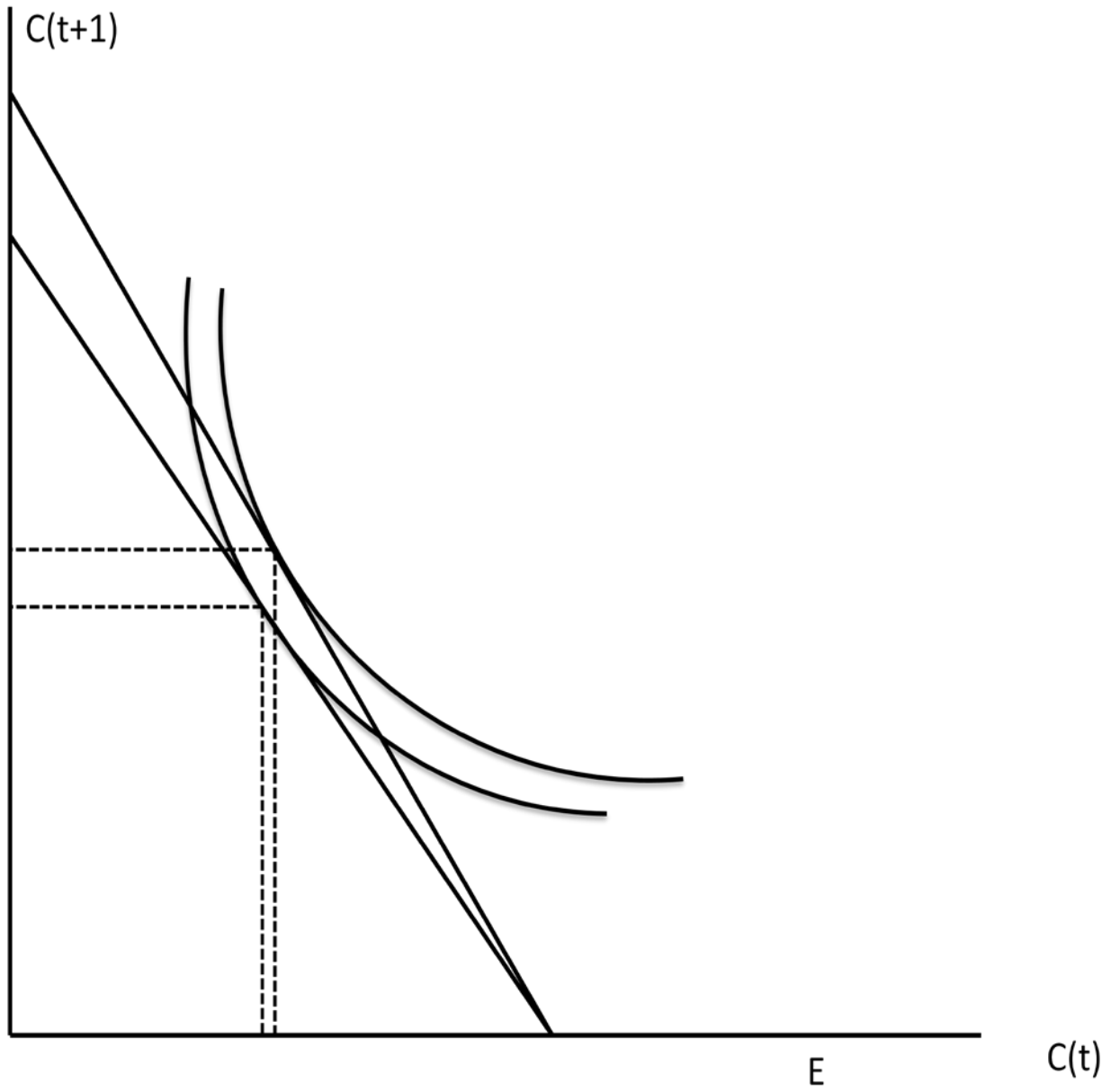
Figure 3: Increase in the rate of interest in a two period model with income received in the first period.
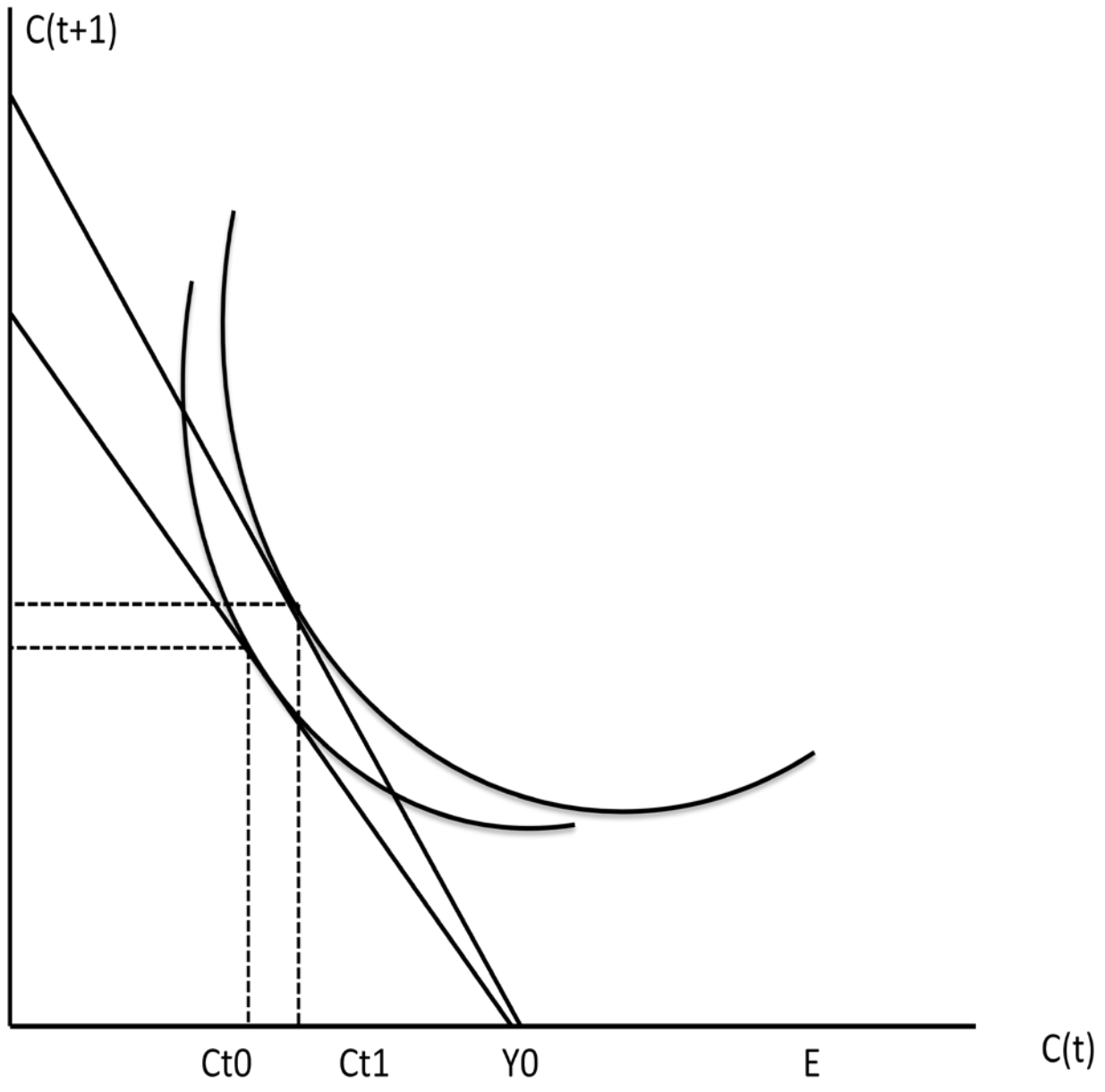
Figure 4
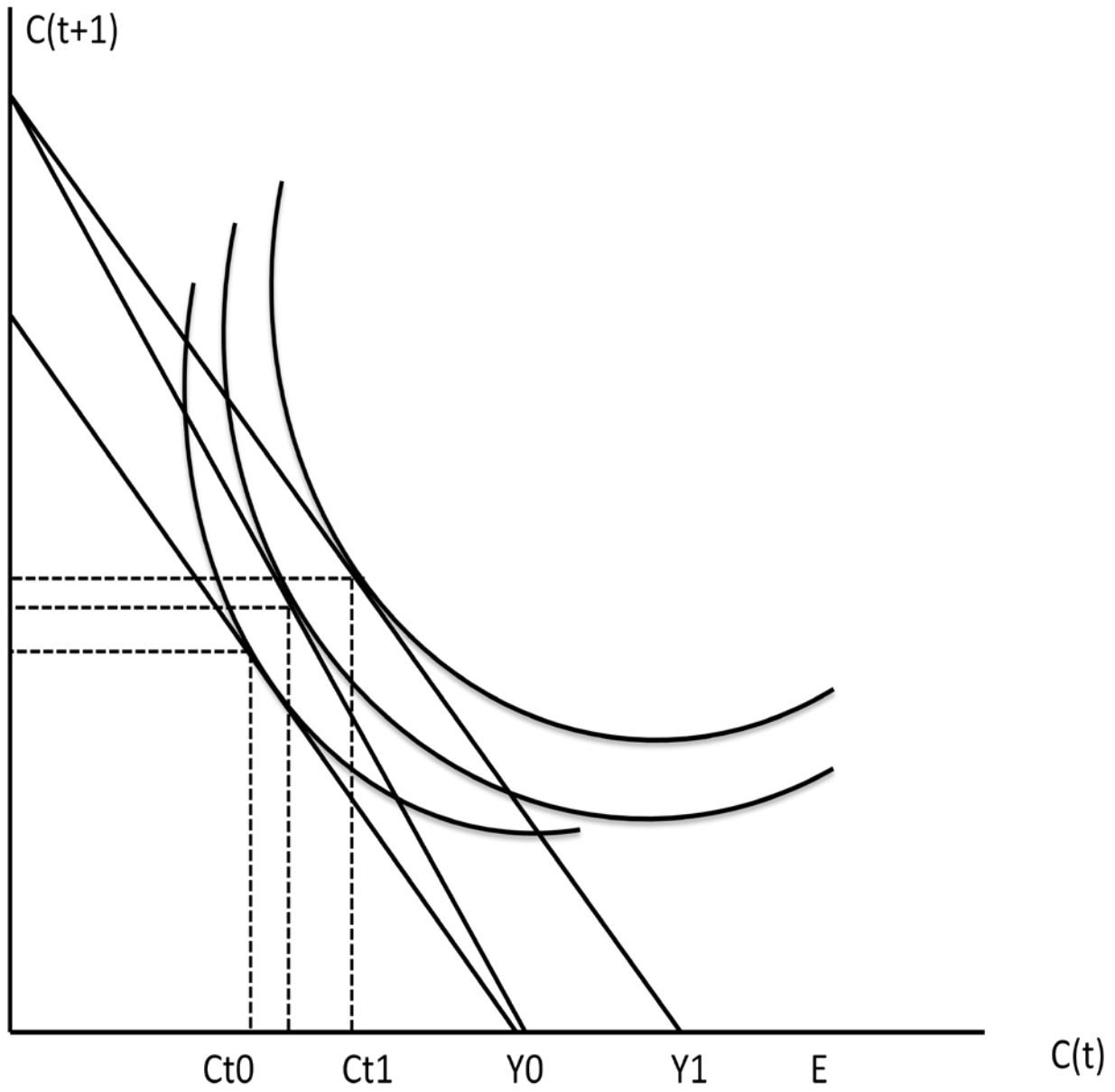
Figure 5: Increases in period t income, and in the rate of interest.
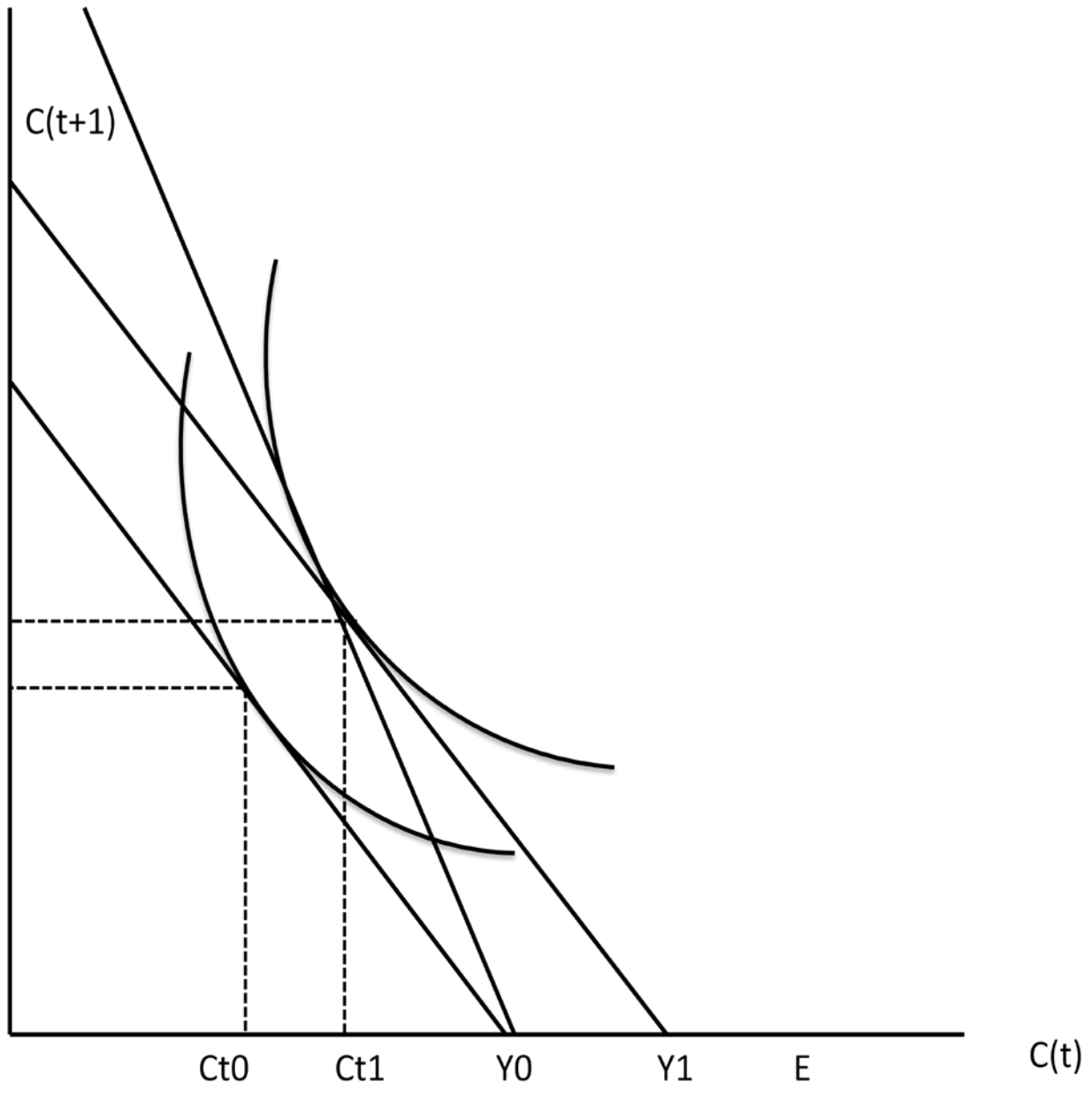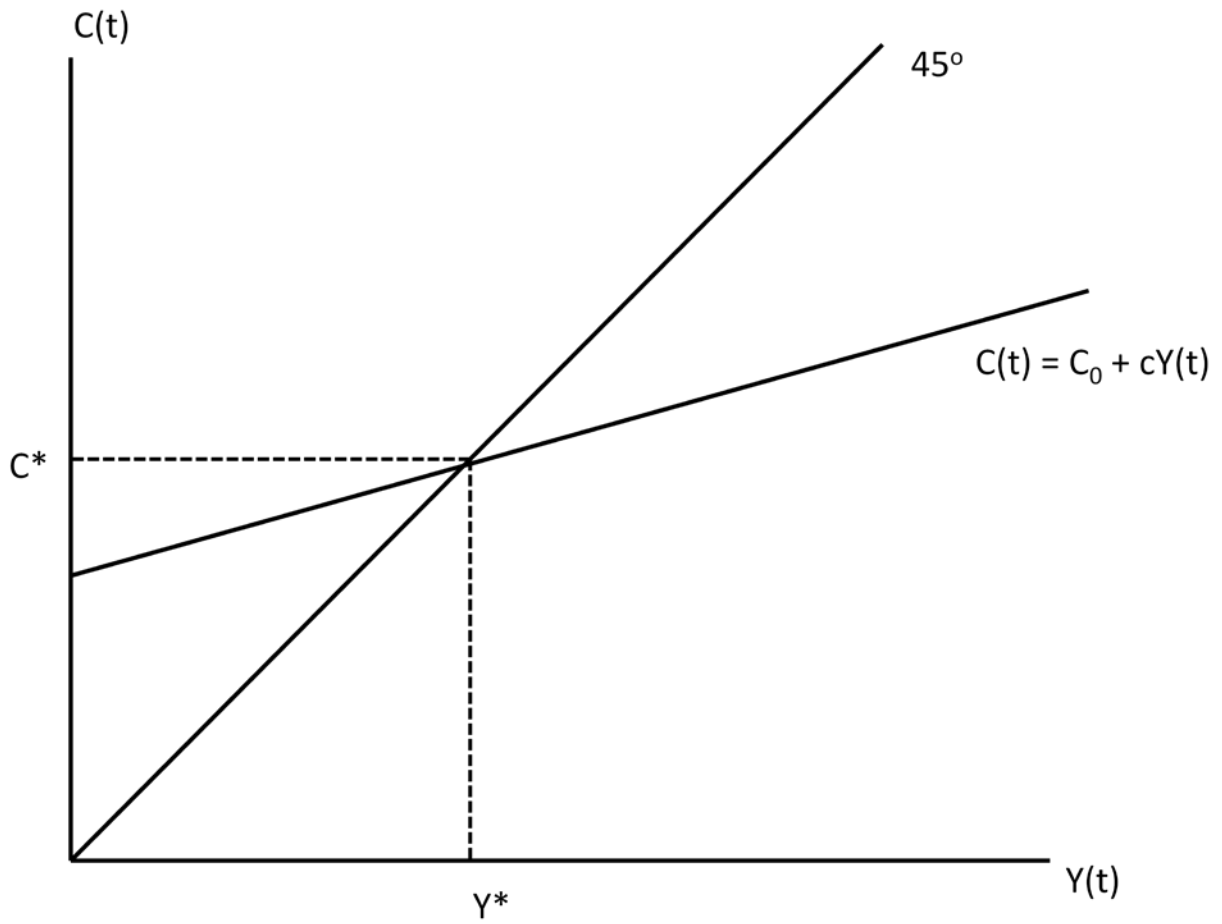
C(t+1)

Ct0 Ct1 Y0 Y1 E C(t)

Figure 6

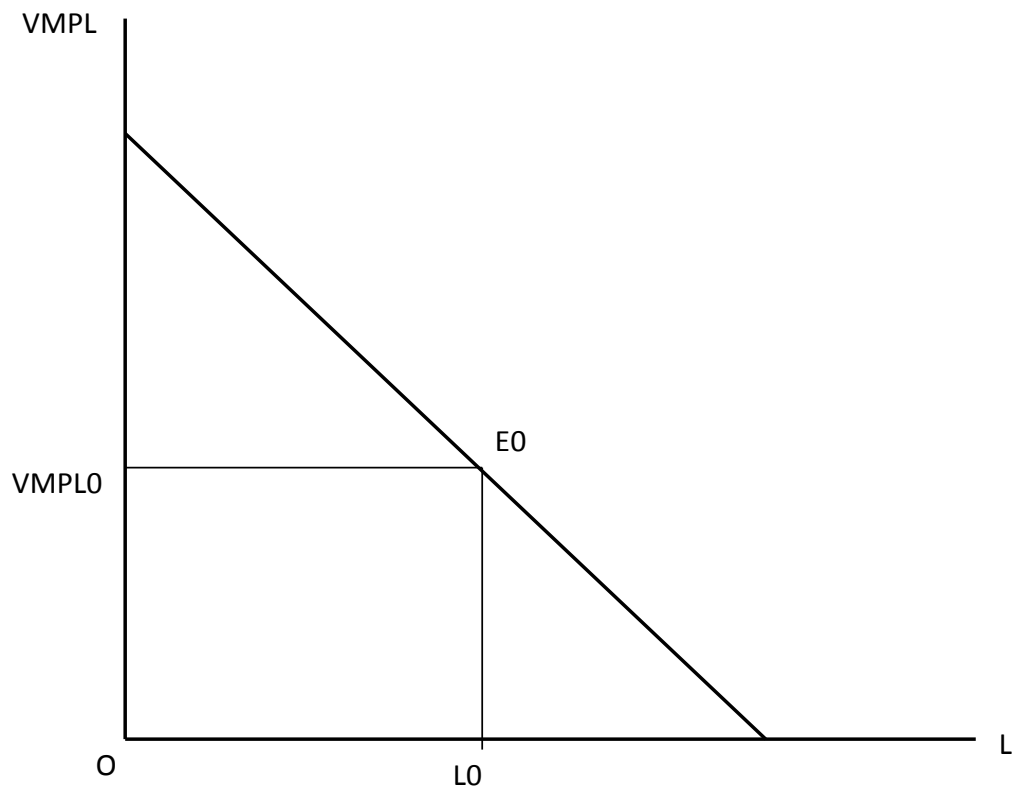Figure 7: Textbook Keynesian consumption function.
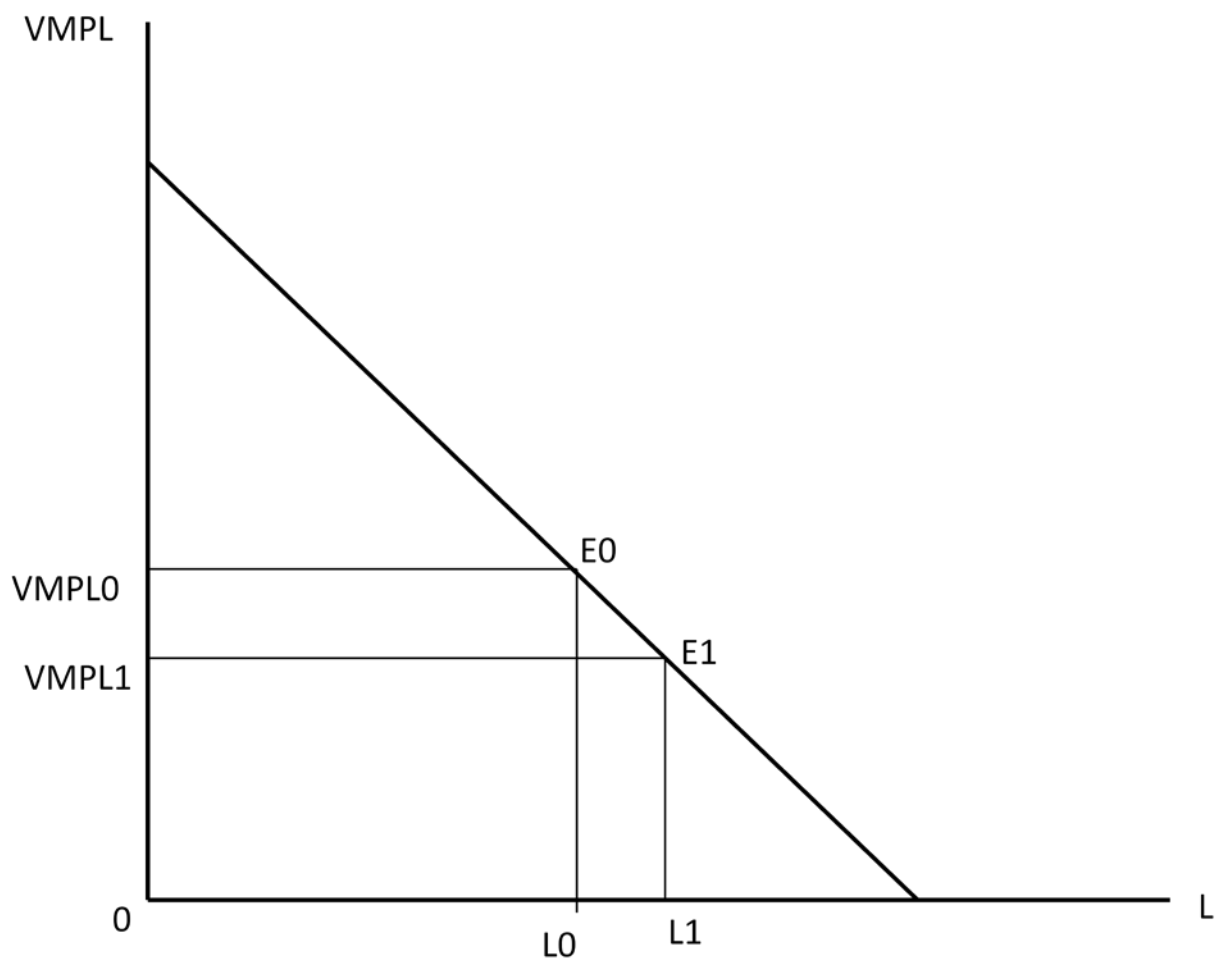
Figure 8: Labour and capital shares.

Figure 9: Effect of an increase in employment.