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Keynes' Finance Motive and Economic Growth

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ABSTRACT

This study rediscusses the Keynesian finance motive to show the appropriate workings of this motive in the case of several additional increases in autonomous investment assumed to flow out at an even rate over n turns. To do so, two multipliers are developed, where both account for the required growth in the supply of money to accommodate that increase in investment spending, and the consequent economic growth.

Moreover, this work questions the results offered by Paul Wells (1981) concerning the same subject. Although the used approach seems to be rather a new one, for it leads to measurable results, yet the way it has been applied by Wells appears to be inconsistent with the assumptions.

INTRODUCTION

Although the title may suggest a full discussion of Keynes' finance motive properly speaking, it is not primarily the main concern of this paper. In fact, this subject has been discussed rather extensively in various other works. The pioneer work of Davidson (1965, 1972), Weintraub (1980), Wells (1981, 1983), Erturk (1990) are among these works.

The major purpose here, however, is to question the result obtained by Wells (1981). While discussing the workings of the Keynesian finance motive, Wells intends to calculate "the quantity of additional money needed to underwrite a $\Delta 1$ dollar increase in investment spending and the resultant multiplier expansion of the economy". This seems rather a new approach to the workings of the finance motive that leads to obtain measurable results. Wells' work, however, seems to have missed the point.

This paper takes issue with Wells' study on one, yet major, account. Wells assumes, among other assumptions, that "the additional investment spending flows out at an even rate of $(\Delta I/n)$ dollars per period, period after period" (Wells, 1981). However, the results offered by Wells show that he has not been consistent with this assumption.

Following Wells' analysis, one should say that it is true that the required first-period growth in the supply of money will be $(\Delta I/n)$ dollars, and that this growth in the money supply will initiate a Keynesian multiplier expansion. However, Wells' shortcoming arises when he notes that the second period's level of spending exceeding the income earned in the first period will only be $[b\ (\Delta I/n)]$, consequently the second round increase in the quantity of money called for will also be equal to $[b(\Delta I/n)]$.

This is not accurate. To be consistent with his assumption, Wells should have noticed that the second period's level of spending, hence, the second round increase in the quantity of money called for will be $[(\Delta I/n) + b(\Delta I/n)]$. Moreover, the release of another $[\Delta I/n)]$ dollars in the second period, as assumed, will also initiate a new Keynesian multiplier expansion in addition to the one already initiated in the first period. This very same reasoning applies for all subsequent periods.

As a result of the mentioned shortcoming, Wells' calculation of the total growth in the quantity of money (ΔMs), given by the following equation, shows clearly that the assumed release of additional amount of investment of $[(\Delta I/n)]$ dollars in every subsequent period has not been accounted for as intended.

$$\Delta Ms = (\Delta I/n)\ [1+b+b2+...] = (\Delta I/n)\ [1/(1-b)] = \Delta Y/n$$

This amounts to saying that Wells' results as can easily be seen account for only one, instead of n, Keynesian multiplier expansions. In other words, additional investments were not flown out at an even rate, as assumed; thus, the effects of that on the quantity of money and economic growth were not accounted for as it has been intended. That is why Wells' results turned out to be inconsistent with his assumption.

This paper intends to restudy the workings of Keynes' finance motive assuming, as Wells does: that the increase in autonomous investment flows out at an even rate over n income-expenditure turns

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(defined later). To do so, a new multiplier, called the augmented multiplier, is developed to show the workings of the finance motive and help us determine the additional amount of funds, change in the supply of money, necessary to undertake the additional amount of autonomous investment. Moreover, it is intended to show the aggregate effect of such additional investment on national income, i.e., the consequent economic growth.

Initially, a word or two about Keynes' finance motive seems to be in order, then, the attention will be entirely devoted to its workings and to the development of the mentioned multiplier. A special case of this multiplier where the amount of finance needed to be released by the banking system is constrained by the required reserve ratio will be considered. Consequently, an augmented modified multiplier will also be developed.

Keynes' Finance Motive

In short, Keynes' finance motive emanates from the need for obtaining additional funds, cash, in order to finance a previously planned autonomous increase in investment. As Davidson noted, it is a motive that is quite apart from, and in addition to, the other motives for demanding money that is, transactions, precautionary, and speculative motives (Davidson, 1965, 1972). Furthermore, this motive is mainly concerned with changes in the level of economic activity when this is being prepared to move from a lower level of activity to a higher one (Weintraub, 1980).

Wells (1981) emphasizes that the possibility of an aggregate shortage of liquid resources does arise, and indeed is ever present in practically every growing economy. Since

> "... as long as the aggregate demand is not rising, the economy automatically generates sufficient purchasing power to sustain its current equilibrium level of spending... The aggregate financial problem here is simply one of channeling an ongoing adequate flow of funds from the surplus to the deficit units of the economy" (Wells, 1981).

Therefore,the underlying reasons for such a shortage of finance seems to be derived from the willingness of the banking system to release or not additional finance. For, if the public's liquidity preference is unchanged, any additional funds required to finance an additional planned investment has to be accommodated by the banking system by newly created money at the prevailing rate of interest. Hence, if the banking system responds positively by creating the needed amount of funds at the same rate of interest, the additional investment spending will fully take place moving the economy, via the multiplier process, to a new but higher level of activity. Otherwise, if the banking system responds partially, or not at all, the rate of interest is expected to rise, and investment spending and real activity will not rise sufficiently, if any at all. Commenting on this point, Keynes says:

> "In general, the banks hold the key position in the transition from a lower to a higher scale of activity. If they refuse to relax (that is, to provide additional finance), the growing congestion of the short-term loan market or of the new issue market, as the case may be, will inhibit the improvement, no matter how thrifty the public purpose to be out of their future incomes" (Keynes, 1973).

The transition referred to by Keynes implies that, the need for additional funds to satisfy the increased demand for money would lead to a higher interest rate if this demand is to be satisfied. However, a rise in the rate of interest may not become a reality if either the banking system is ready and willing to lend more cash or the public to release more cash at the prevailing rate of interest (Keynes, 1973).

The Augmented Multiplier

To account for the workings of the finance motive, some assumptions are allowed for. Initially, it is assumed that entrepreneurs are planning on increasing their investments by a certain amount, m dinar per turn; and that the additional investment spending flows out by the same amount at the beginning of every turn. Evidently, this increase in spending can only take place if the required amount of funds is secured. Following the previous discussion, the required finance of this additional investment has to be accommodated by the banking system by newly created money at the same existing rate of interest under the assumption that the public's liquidity preference is unchanged. By all that one implies that the increase in investment is not an induced but rather an autonomous one.

Furthermore, it is technically assumed that there

are n income-expenditure turns per year (n is not necessarily a predetermined span of time); marginal propensity to consume, b, is greater than zero and smaller than one. In addition, it is assumed by this work that, the total change in investment originates from the banking system excess reserves rather than from the demand deposits, implying that the required reserve ratio has been previously applied.

Based on these assumptions, I will turn now to discuss the magnitude of change in the money supply that derives from m dinar increase in investment per turn, turn after turn, and the consequent economic expansion; that is, economic growth via the augmented multiplier.

Focusing initially on the change in investment, the whole process starts at the beginning of the first turn, that is, at the time when the first increase in investment, m_1, takes place. An equal amount of an additional increase in investment is assumed to flow out at the beginning of every subsequent turn up to and including the last one, as shown in figure 1. One should restress that, every expenditure to be made in any particular turn in excess of the earned income in the previous turn has to be financed by newly created money by the banking system.

As a consequence of the first planned increase in investment, m_1, the money supply is required to grow by the same amount. As we know, when this increase in investment spending takes place, a Keynesian multiplier expansion will also take place. Furthermore, a concomitant multiplier expansion will be triggered with every additional increase in investment in all subsequent turns.

Therefore, the final change in the money supply, ΔMS, will be the sum of all sub-changes in the money supply place at all turns, that is:

$$\Delta MS = \sum_{t=1}^{n} MS_t \; ; \; t = 1, 2, ..., n \qquad (1)$$

where MS_t is a sub-final change, or the growth that occurred in the money supply at turn t.

Since the final change in the supply of money depends on the value of every MS_t, hence, the correspondent value of every MS_t must be determined. To do so, we need initially to understand the entire process, step by step. A-three-turn illustration is going to be used here, although the same reasoning applies to as many turns as there, that goes as follows:

At the same time of releasing the first amount of finance, m_1, to fund the first increase in investment, the money supply is expected to have an immediate increase by the full amount of m_1, which is the required growth in the money supply for the first period (notice that $MS_1 = m_1$). As already observed, this additional investment spending will initiate a Keynesian multiplier expansion, whose effect extends over all the subsequent turns, starting at the second turn, t = 2, and ending at the last turn, t=n.

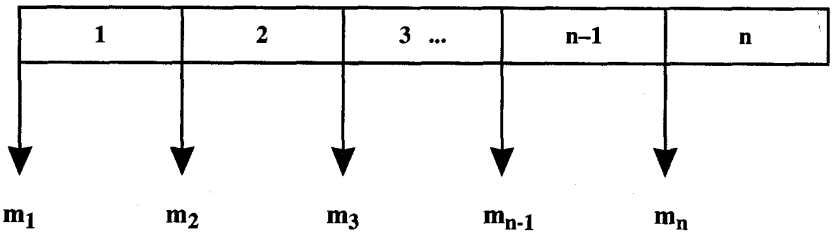
As a result, the level of spending in the second turn, that is MS_2, will have to exceed the earned income in the previous turn, the first turn, by bm_1 dinars. Thus, the total spending in the second turn will be bm_1 plus the new additional amount of finance, m_2, to be released by the banking system to fund the second increase in investment.

By the same talking, the level of spending in the third turn, m_3, will also exceed the earned income in turn two by b^2m_1 plus bm_2 dinars. Hence, the total spending in the third turn will be b^2m_1 plus bm_2 plus the other new additional amount of finance, m_3, (See Figure 2). This very same reasoning applies in the case of all other increases in investment that will flow out in the remaining turns up to the last turn.

However, it may also be helpful to sum up in detail the process of changing investment and the

Figure 1

Flows of Additional Investment



consequent change in the money supply in every turn of this illustrative example as follows:

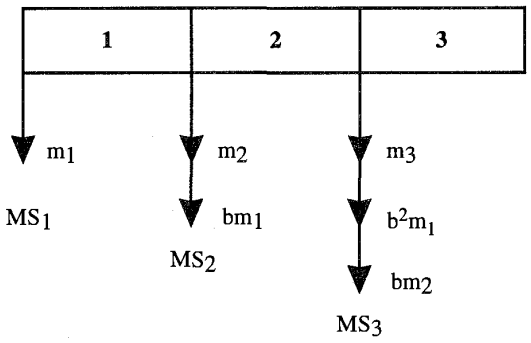
$MS_1 = m_1$

$MS_2 = m_2 + bm_1$

$MS_3 = m_3 + bm_2 + b^2m_1$

Figure 2

Flows of Investment with Keynes' Multiplier Exapansion



Thus, if we extend this process for n turns, the sum of all changes that satisfies equation (1) can be expressed as follows:

$$\Delta MS = MS_1 + MS_2 + MS_3 + ... + MS_{n-1} + MS_n \quad (2)$$

By substituting the equivalent value of each term in equation (2), this can be rewritten as follows:

$$\Delta MS = m_1 + (m_2 + bm_1) + (m_3 + b^2m_1 + bm_2) + ... + (m_n + b^{n-1}m_1 + b^{n-2}m_1 + ... + bm_n) \quad (3)$$

Since, by assumption, $m_1 = m_2 = ... = m_n = m$, equation (3) can be rewritten as:

$$\Delta MS = [1 + (1+b) + (1 + b + b^2) + ...+ (1 + b + b^2 + ... + b^n)]\, m \quad (4)$$

Consequently, by summing up all terms between brackets, one obtains the augmented multiplier, μ, that takes the following form:

$$\mu = \frac{ø - b(ø + 1 - b^{ø})}{(1 - b)^3} \quad (5)$$

where, $ø = n + 1$; n: number of turns, and; b: marginal propensity to consume.

Hence, by applying the augmented multiplier, equation (4) becomes:

$$\Delta MS = \frac{m}{(1 - b)^3}\,[ø - b(ø + 1 - b^{ø})] \quad (6)$$

or, the same equation can be rewritten in the following short form:

$$\Delta MS = \mu\, m \quad (7)$$

When the augmented multiplier expansion comes to an end, the economy reaches its new and final equilibrium point. After reaching the new equilibrium position, the economy needs no further new bank money, for it has already the needed finance to sustain the new level of activity. For, as we know, the production of a dinar worth of final product will generate an equal amount of income payment. In addition, as noted by Wells (1981), all money created by the banking system to satisfy the demand for finance will be absorbed into the economy's transactions balances. Hence, Keynes' demand for finance, not having further increase in investment, will be nil.

The Modified Augmented Multiplier

On the other hand, if one is to consider the required reserve ratio, β, imposed by central banks on the demand deposits of the banking system as a way of controlling the supply of money, the augmented multiplier cannot be applied, since the amount of liquid resources required to finance the additional investment is assumed to originate from the banking system excess reserves. As a result, a different augmented multiplier ought to be developed to allow for the effect of the required reserve ratio. The amount of finance to be created released by banks, in this case, is assumed to be the same as the one used earlier, m, except that it is now subject to β.

The development of the modified augmented multiplier follows practically the same reasoning as in the case of the augmented multiplier. Therefore, the final change in the money supply as represented in equations (1) and (2) applies here. However, equation (4) becomes

$$\Delta MS = \{1 + (1+åb) + [1 + åb + (åb)^2] + ...+ [1 + åb + (åb)^2 + ...+ (åb)^n]\}m \quad (8)$$

By summing up all terms multiplying m, the modified augmented multiplier, Ω, is obtained. This takes the following form:

$$\Omega = \frac{ø - \infty(ø + 1 - \infty^{ø})}{(1 - b)(1 - \infty)^2} \quad (9)$$

where: $ø = n+1$; $\infty = åb$; $å = 1-\beta$; n: number of turns; b: marginal propensity to consume; β: the

required reserve ratio.

Hence, equation (8) becomes:

$$\Delta MS = \frac{m}{(1 - b)\,(1 - \infty)^2\,[\,\phi - \infty\,(\phi + 1 - \infty^{\phi})\,]} \qquad (10)$$

or, this equation can be rewritten in the following short form:

$$\Delta MS = \Omega\, m \qquad (11)$$

Economic Growth

As commonly known, whenever there is an increase in autonomous investment, a larger change in national income is expected due to the multiplier effect, that is economic growth takes place in the economy. The economic growth, that is usually accounted for by the Keynesian multiplier, is also accounted for by the augmented multipliers considering each multiplier's peculiarity.

We have seen that the required change in the money supply to finance the desired autonomous change in investment is the same amount of liquid resources needed from an increase in investment. Hence, the expected change in national income resulting from an increase in investment, that is, the expected economic growth, is also obtained by equation (7). Notice that the final change in national income, economic growth, is nothing but the change in investment times the multiplier, where the change in investment is equal to the change in the supply of money.

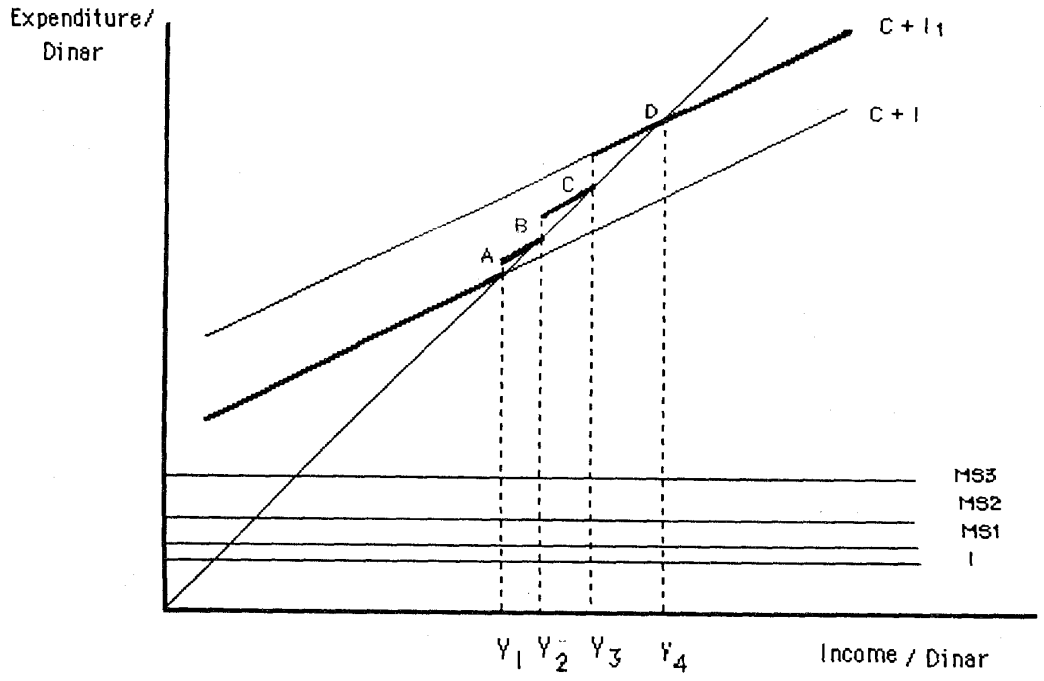
Therefore, by knowing the amount of additional investment flown out evenly at the rate of m dinar per turn, the number of turns during which m is supposed to flow out, and the marginal propensity to consume; the amount of economic expected to take place in the economy, can be easily measured by invoking the augmented multiplier, μ, as follows:

$$\Delta MS = \mu\, m = \Delta Y \qquad (12)$$

Similarly, by knowing the amount of additional investment flown out evenly at the rate of m dinar per turn, the number of turns during which m is flown out, the required reserve ratio, and the marginal propensity to consume; the final change in national income, the change in the supply of money, that is, the expected economic growth, can easily by obtained by invoking the modified augmented multiplier, Ω, as follows:

$$\Delta MS = \Omega\, m = \Delta Y \qquad (13)$$

Figure 3
Economic Growth



On the other hand, the aggregate effect of the additional investment as assumed can also be graphically seen as in figure 3. Let us assume that the economy is in equilibrium at point A, that represents national income Y_1. Moreover, let us apply the same illustrative example as in figure 2, where the change in investment are: MS_1, MS_2, and MS_3.

Nonetheless, before turning to figure 3, it must be said that it is not as easy as it may appear to graphically show the working of the augmented multiplier due to the overlapping effect. While the effect of MS_1, that is smaller in amount than MS_2, extends over n turns; the effect of MS_2, that is larger in amount than MS_1, extends over n-1 turns. Therefore, (Figure 3) is an approximate graphical illustration.

As shown in (Figure 3), when investment is increased by MS_1 dinars, the economy, the aggregate demand or C + 1, is expected to move from point A to a higher level of equilibrium, around point B. Consequently, national income is expected to move from Y_1 to a higher level, around Y_2; thus, the resulting economic growth will be $(Y_2\text{-}Y_1)$ dinars. By the same talking, an increase in investment by MS_2 dinars moves the economy to another higher point, around point C; thus, the resulting economic growth will be represented by $(Y_3 - Y_2)$ dinars. In general, this process goes on in a similar fashion until the economy, the aggregate demand or $C + l_1$, reaches its final equilibrium point, point D. It should be noticed that l_1 represents the initial level of investment, 1, plus all the additional increases in investment, ΔMS.

Generally speaking, if there are n additional changes in investment, the economy moves from its current equilibrium point to the final point of equilibrium, by passing through several "temporary" equilibrium points, as if the whole process is done by stages.

Concluding Remarks

The purpose of this paper is to study the workings of Keynes' finance motive to show the aggregate effect of an additional amount of autonomous investment on the supply of money and the consequent economic growth. Moreover, the paper questions the results offered by Wells (1981) on the same subject.

The discussion of Keynes' finance motive takes place under the assumption that, the additional increase in autonomous investment flows out at an even rate per turn, turn after turn; and that the needed finance to undertake this investment is secured by the banking system by newly created money at the same existing rate of interest.

To account for the aggregate effect of the additional amount of investment on the money supply and the consequent economic growth, a multiplier has been developed, the augmented multiplier, under the assumption that the amount of finance originates from the excess reserves, meaning that the required reserve ratio has already been applied. Another multiplier, that accounts for the same aggregate effect, called the modified augmented multiplier, has also been developed as a special case. Although both multipliers are developed considering the same set of assumptions, the modified one allows for the application of the required reserve ratio to the amount of finance to be created and released by the banking system.

Technically speaking, both multipliers take into consideration the Keynesian multiplier, [1/(1-b)]. In fact, when the number of turns over which the required amount of finance is supposed to be released equals zero, both multipliers reduce to the Keynesian one. The introduction of time into the Keynesian multiplier and the consequent development of the augmented multipliers seem to be a new approach to the workings of Keynes' finance motive and the Keynesian multiplier itself.

It is worthnoting that the two multipliers behave consistently when determining the final aggregate change in the money supply and the expected economic growth. Thus, it seems to be reasonable to expect that, such multipliers can be useful tools for policy makers when the size of the money supply and economic growth are under discussion.

As far as Wells' work is concerned, it has been shown that this work falls short of carrying the discussion of the workings of Keynes' finance motive properly. Although this work makes the same set of assumptions, the result is not consistent with the assumption that the additional amount of investment flows out at an even rate. Consequently, Wells' work seems to have been reduced to a simple application of the Keynesian multiplier contrary to what he has proposed to do.

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الدافع المالي الكنزي والنمو الاقتصادي

أحمد فراس العوران*

ملخص

استهدفت هذه الدراسة مناقشة الدافع المالي الكنزي لتبين الكيفية التي يعمل من خلالها في حالة زيادة الانفاق الاستثماري المستقل، على افتراض ان تلك الزيادة انما تقع بمقادير متساوية ومكررة في كل دورة من دورات الفترة الزمنية غير المحددة، ن.

ولتحقيق هذا الغرض، تم بناء مضاعفين اثنين يمكن كل منهما من حساب مقدار النمو الضروري في عرض النقود اللازم لتمويل تلك الزيادة في الانفاق الاستثماري وحساب ما ينجم عن ذلك من نمو اقتصادي.

وتتساءل الدراسة من ناحية أخرى عن النتائج المقدمة من بول ولز (١٩٨١) حول الموضوع نفسه، في الوقت الذي يبدو فيه ان النهج المستخدم امر جديد لأنه يساعد على الحصول على نتائج قابلة للقياس، الا انه لا يبدو ان ولز قام بتطبيق هذا النهج وفقاً للفرضيات التي تعامل معها.

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