Accumulation and Growth in a Monetary Economy: James Tobin Revisited.

Gilberto Tadeu Lima

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** Ph D student in economics at the University of Notre Dame, USA, and formerly professor in economics at FGV/SP.
1. This short paper is intended to critically outline some Post Keynesian objections that were raised against that approach which is conceived as having laid down the basic foundations of the neoclassical monetary growth models, namely, the contributions to capital accumulation and growth in a monetary economy put forward by Tobin in the 1950s and 1960s. To put it precisely, this paper focuses on some criticisms addressed by Kregel (1971) and Davidson (1968) against Tobin's classic work on the subject (Tobin 1965) with a view to evaluate the extent to which those criticisms also apply to Tobin's first monetary growth model (1955).

Most economic growth models, whether they be of the Harrodian-Domar, Keynesian-Kaldor, Solow-Swan, or Kaleckian-Steindl type, ignore or at least minimize the role played by money supply in the process of capital accumulation and growth; in general, these models tend to emphasize real factors rather than monetary phenomena. Paradoxically, even though Keynes' *General Theory* was exclusively concerned with a monetary economy in which changing beliefs about the future influence the quantity of employment, money plays no more than a perfunctory role in the Cambridge theories of growth, capital, and distribution developed after Keynes (Kregel 1985, p. 133). Indeed, James Tobin's paper on 'Money and Economic Growth' (1965), its explicit purpose to blend a Keynesian and neoclassical growth system notwithstanding, can be considered the first attempt to systematically analyse the role of money in a model of capital accumulation and economic growth after the Keynesian revolution.

Put directly, Tobin attempts to monetise a standard neoclassical growth model by means of emphasising the Keynesian consumption-savings-money-holding decisions via his well-known concept of portfolio balance: the two-sided decision, to save or spend, and what form to hold savings, is the crux of the Keynesian format of the model. As it is detailed in what follows, these savings and portfolio decisions are, however, the only Keynesian features of a model that is neoclassical in all other aspects, in particular by assuming full employment and the applicability of Say's Law.\(^1\) I now turn to Kregel's three major criticisms of the way capital accumulation and growth are dealt with in Tobin's monetary approach.

2. Kregel's first objection to Tobin system regards the underlying assumption that savings govern the accumulation of capital stock. Though reference is made to the possible Keynesian difficulties that may occur if savers allow more capital to be created than investors would desire to employ, Tobin
declines the usual neoclassical assumption that savings determine the accumulation of capital stock. As a consequence, the equilibrium capital intensity, which is measured by the capital-labor ratio, occurs in the model when the marginal product of capital is just sufficient as a rate of return to induce savers to hold physical capital as concrete objects in their portfolios. Taking the concept of the required rate of profit as the key variable in Keynesian growth models, Tobin forges a place for portfolio balance in his analysis by introducing money to compete with that rate for a place in households’ portfolio holdings. The rationale behind such an introduction, Tobin argues, is that in a closed economy the important alternative stores of value are monetary assets, so that “[i]t is their yields which set limits on the acceptable rates of return on real capital and on the acceptable degree of capital intensity” (p. 676).

For Kregel, it is Tobin’s treatment of the comparison of rates of return on real capital with the yield on money as finance that results in some crucial confusions within the Tobin system. First, the rate of return on real capital that it is used is not the rate of profit on capital, but rather the marginal product of capital. In the real world, Kregel replies, “it is the existence of profitable investment opportunities and an expected rate of profit that generates a demand for finance and thus allows a positive rate of interest on money to exist and not vice versa as Tobin’s analysis assumes” (p. 67). Second, Tobin has no explicit treatment of the business sector, all accumulation being governed simply, in neoclassical fashion, by savings automatically invested in physical capital and the portfolio demands of savers; not surprisingly, the complete absence of placements from the model is crucial. For Kregel, “[n]either the portfolio decision of households nor the investment decisions of firms can be directly related to the marginal productivity of a particular piece of concrete capital. The two decisions may be related by the interest rate on finance, but this is necessarily a two-way causation between the two decisions” (p. 68).

Moreover, Kregel considers the form of money introduced into Tobin’s model as tending to negate even this causal connection, for without uncertainty as to the yield of other assets (the marginal product of capital is the yield on capital and thus certain over useful life once installed) money can serve no function in terms of offsetting capital risk and thus must, in Tobin system, be made to carry an institutionally determined yield. Put directly, with this form of monetary asset and no uncertainty as to the future it does stand to reason that the yield on money will determine the amount of capital and thus its marginal
productivity, so that capital intensity can only be increased, by definition, to the point where the marginal product of that amount of capital is equal to the yield on money. Not surprisingly, savings for Tobin are not conceived as a residual after the consumption decision has been made, but rather as an ex ante savings-for-investment function. Whatever eventual problems of ex ante savings exceeding ex ante investment are solved, or rather assumed away, by a government in charge of introducing enough money with the proper positive rate of return to cause households to substitute money for their excess demand for (the non-existent) physical capital. At this point, one cannot fail to realize that Kregel’s conclusion is quite devastating: “This involves the necessity of assuming full-employment in the model, for if this were not the case one must inquire why the government would not find it feasible to increase the production of physical capital rather than raising the return on money and thus allow more capital to be held in household portfolios” (p. 69).

3. Kregel’s second objection to Tobin’s monetary approach to capital accumulation and growth is related to the manner it conceives the relationship between an equilibrium capital intensity and equilibrium growth paths. Claiming Harrod’s terminology, Tobin introduces a ‘warranted rate of growth’, which is then defined as the rate of increase of the capital stock that would satisfy the ex ante rate of savings in the system. For Kregel, such a definition is only superficially similar to Harrod’s one, for the latter defined it as “that addition to capital goods in any period which producers regard as ideally suited to the output that they are undertaking in that period” (Harrod 1952, p. 260), thus opening the possibility for it not to be a full employment rate. To the extent that Tobin, unlike Harrod, does not permit an independent investment function, his warranted rate necessarily implies full employment and full utilisation of the capital stock.

Put another way, if Tobin’s savings function is to set the warranted rate in the system, then full employment and full utilisation of the capital stock must be realised, and Harrod’s basic problem of the divergence of the warranted rate from the natural rate is solved ex hypothesi. Tobin, though, not only introduces a natural rate of growth into the system, but also proceeds to trace the possible effects of an inequality between the warranted rate and the natural rate. To the extent that in the absence of changes in technique this appears to be an inherent paradox in Tobin’s formulation, his argument deserves to be closely followed. When the rate warranted by the full employment level of savings is greater than the natural rate of growth of the labor force, capital deepening is assumed to
occur. As Kregel correctly noted, such a deepening, of course, should imply either some change in technique, in underlying conditions, or the possibility of the familiar movement along the production function with smooth factor substitution, though Tobin mentions none of these possible explanations. During these deepening movement, however, the productivity (yield) of physical capital assets is falling, thus causing reactions in portfolio balance.

For Kregel, it is at this stage that what one might call 'Yale money' come into play to help determine the correct capital intensity which will equate savers' required return on savings to the portfolio managers' asset yield at the point of equivalence between the warranted and the natural rate of growth. This is achieved through a government deficit creating 'Yale money' with a positive yield that will compete with physical assets in portfolios such that the yield with a given quantity of capital growing over time at the natural rate is ruled by the rate of return on money. The excess of ex ante demand for capital assets by savers is deflated to the actual natural rate by satisfying the demand with money of a sufficiently high positive yield. Thus Tobin arrives at his equilibrium stock of money growing over time at the same rate as the capital stock with both equal to the natural rate. Kregel argues that this approach does not guarantee that equilibrium will be reached in a real-world economy, for nonconsumption is nonconsumption whether it takes the form of owning punch presses or the debt of government. To put it another way, unless the government is either willing to consume or invest the portion offset by its deficit plus interest, Tobin's ex ante relations will not emerge ex post and deficient effective demand will cause changes in the rate of investment, profit, wages and employment. To the extent that Tobin avoids these possibilities positing full employment and complete capacity utilisation, any effective demand problems are solved ex hypothesi.

4. Kregel's third objection to Tobin system regards the manner in which it deals with changes in the price level. As Tobin discusses only the effect of price level change on the value of the money asset, there is nowhere in the analysis any mention of the pattern of prices ruling in the system or of the effect of capital intensity on price or any other occurrence that might disturb the system of relative prices; wages, for instance, are completely ignored in Tobin’s model. As Tobin follows the neoclassical pattern of determining factor shares by the marginal contribution of factors, no attempt is made to answer questions on the effect of changes in distribution of income on the pattern of prices or capital intensity. In other words, since there are no prices in the system and no rate of profit on the
finance committed to capital for the production process, capital is ultimately measured in terms of output and the return is also output. As Kregel correctly noted, this measure "can only be constant if there is no change in technique, composition of output, distribution and (if they existed) pattern of prices. These conditions, in the absence of prices, are difficult to determine" (p. 72). In other words, the Tobin system does not handle the question of the effect of distribution on growth, the essential question of the introduction of money, or any analysis of choice of techniques. Thus Tobin's model remains an analysis in real terms, devoid of any monetary effects except in the limited sense of money serving, in a world of perfect certainty, as a substitute asset to be held in portfolios in place of physical capital.

To put it another way, in a model where the rate of savings sets the rate of investment and full employment is always achieved, the assets are always held regardless of how balanced portfolios may be. As Kregel correctly concluded, in order for any of Tobin's so-called 'Keynesian difficulties' to occur, the investment sector must be treated independently and firms given the freedom to make their decisions on investment isolated from any limits as to how much savings the community will voluntarily provide (p. 73). As I outline in what follows, Davidson's critique of Tobin system is also centered upon such an inherent limitation of that system. For Davidson, Tobin's model omits the very essence of the static Keynesian system, i.e., a demand for capital schedule formulated independently of the savings propensity and portfolio decisions of households (p. 291).

5. Like Kregel, Davidson argues that Tobin clearly misunderstood Harrod's 'warranted rate of growth'. Recalling the manner in which the determination of capital intensity by savings is illustrated in Tobin's basic diagram (Figure 1), he argues that what Tobin considers the amount of savings and investment (the vertical distance between the abscissa and the S curve), only shows the amount of the average product of capital that is available for nonconsumption purposes, provided the household consumption demands are met and the existing capital stock is actually employed (p. 292). Tobin interprets such an amount as showing how fast the capital stock is growing, and then concludes that it is the Harrod's warranted rate of growth (1965, p. 674). Like Kregel, Davidson replies that for Harrod (1952, p. 260), though, the warranted rate of growth in the capital stock is closely related to Harrod's capital requirements concept, thus reflecting entrepreneurial ex ante investment desires rather than any ex ante savings propensity.
For Davidson, as Tobin's model does not have an independent investment demand function, Tobin's interpretation of the warranted rate of growth is valid only if (1) both the existing capital stock and the labor force are fully employed at each point of time, and if (2) net investment goods are the only alternative to consumption goods. Whether these conditions are met or not, Davidson concludes, "it should be clear that the vertical distance to the S curve merely indicates the amount of nonconsumption aggregate demand which must be forthcoming to make it profitable to fully utilize the existing stock of capital and labor force at the point of time. This may, or may not, be equivalent to the warranted rate of growth in the capital stock, since only under the highly restrictive assumptions of (a) full employment, and (b) no wearing out of capital in a two sector economy will this vertical gap depict the actual rate of capital accumulation" (p. 293). As Tobin's saving function merely reflects the level of nonconsumption demand that must be forthcoming to fully employ the existing stock of capital, rather than net investment demand directly, his model will not uniquely determine the actual rate of capital accumulation, unless it is assumed that Say's Law prevails, i.e., there is always full employment.

It should be noted that Tobin develops that diagram for a nonmonetary economy (where Say's Law applies). The problem arises when he utilizes the implications of that picture to analyse a monetary economy by introducing the concept of portfolio balance. In a nonmonetary economy possessing only a single reproducible capital asset, Tobin recognises that there can be neither a separation of the investment and savings act nor portfolio choices. In his view, it is the introduction of monetary assets which permits the separation of the
investment from the savings decision, as well as portfolio choices for individuals; it
is in a monetary economy that the households' decision to increase their wealth
holdings in the form of money does not automatically augment society's wealth.

Despite Tobin's correct emphasis on the need to analyse such portfolio
balance decisions, Davidson recognises, one cannot fail to realize the existence
of three surprising aspects in his neo-Keynesian monetary growth model: (1) the
exclusion of uncertainty, expectational phenomena and private debt; (2) the
absence of an independent investment function; and (3) neglect of the
importance of the demand for money for transactions and finance purposes.
Davidson correctly points out that the absence of uncertainty and expectations
about the future yield of real capital and future prices, as well as the absence of
placements in the model, requires Tobin to posit a strange form of money - one
which pays interest if you hold on to it - in order to have a portfolio choice at all.
Since Tobin introduces portfolio decisions and an assumption of constant prices,
his 'Yale money', borrowing Kregel's felicitous phrasing, must have an
exogenously determined positive yield for the public hold it at all. What Tobin fails
to realize, though, is that once money is allowed to serve as a store of value, the
saving decisions on the part of households no longer determine the level of
investment. As Davidson correctly notes, "[i]t is at this point that Tobin requires,
and yet fails, to introduce into his model an explicit investment demand function
based on entrepreneurial expectations of profit" (p. 296).2

6. I now turn to the question of the extent to which these criticisms also
apply to Tobin's first monetary growth model (1955). Tobin's purpose in that
paper is to present a simple aggregative model that allows both for substitution
possibilities between factors and for monetary factors to have real effects. In this
sense, I would argue that Tobin's system can be conceived as an anticipation of
some ideas contained in Solow's classic contribution to the theory of economic
growth (1956). Tobin explicitly complains against two related characteristics of
"[c]ontemporary theoretical models of the business cycle and of economic
growth" that, in his view, lead "these models to present a rigid and angular picture
of the economic process: straight and narrow paths from which the slightest
deviation spells disaster, abrupt and sharp reversals, intractable ceilings and
floors" (p. 235). Unlike Solow, Tobin's 1955 paper attempted to remedy not only
the first supposed limitation of that theoretical models (neglect of substitution
possibilities); more in the spirit of Keynes' monetary thought, Tobin also tried to
remedy the second, and probably the really significant, limitation of that models,
namely, their neglect of monetary influences. It is in this sense that I would argue that Tobin should be credited for asking the right question. It is another story, however, whether he should also be credited for answering it correctly.

Furthermore, Tobin argues that his model does not restrict the economic process only to two possibilities, namely, steady growth or cycles. In Tobin’s 1955 model, an alternative line of development for the economic growth process is continuing underemployment - ‘stagnation’ during which positive investment increases the capital stock and possibly the level of real income. Applying the traditional ‘rigidity argument’ usually presented in the neoclassical-synthesis short run models, Tobin argues that this long run ‘stagnationist’ outcome, like the cycle, depends on some kind of price or monetary inflexibility.

A close examination of the first building block from which Tobin’s 1955 model is built allows one to conclude that the major criticism raised by Kregel and Davidson against Tobin’s 1965 model also applies to the former. In it, Tobin uses a savings function that explicitly attributes to savings the determinant role in the investment-saving relationship. After assuming that the savings function expresses how output is divided between consumption and net investment, Tobin argues that “any output not consumed is an addition to the capital stock” (p. 236); like in Tobin’s 1965 paper, any effective problems are apparently solved ex hypothesi. Moreover, in this paper Tobin also assumes that only two stores of value, physical capital and currency, are available to owners of wealth in the economy, the main difference being that currency is now supposed to bear a legally and permanently established own rate of interest equal to zero.

But in Tobin’s 1965 model, as I detailed above, the correct capital intensity is achieved through a government deficit creating ‘Yale money’ with a positive yield that will compete with physical assets in portfolios such that the yield with a given quantity of capital growing over time at the natural rate is ruled by the rate of return on money. Any excess of ex ante demand for capital assets by savers is deflated to the actual natural rate by satisfying the demand with money of a sufficiently high positive yield. A question that arises here is the extent to which Kregel’s critique of what I would call ‘Yale’ portfolio adjustment, which is based on a positive rate of return on money, also applies to the kind of portfolio adjustment contained in Tobin’s 1955 model, which is rather based on a zero rate of return on money. More importantly, though, what seems to deserve close scrutiny is the rationale behind Tobin’s monetary theory of stagnation.
For Tobin, the stock of currency, \( M \), is exogenously determined and can be varied only by budget deficits and surpluses. If \( p \) is the price of goods in terms of currency, the community's total real wealth at any moment of time is given by

\[
W = K + M/p
\]

(1)

Given \( K, M \) and \( p \), the community may be satisfied to split its wealth so that it holds as capital an amount equal to the available stock, \( K \), and as currency an amount equal to the existing real supply, \( M/p \). Tobin then refers to such a situation as portfolio balance, which is assumed to be the necessary and sufficient condition for price stability. Portfolio balance is assumed in the model to be defined by the following functional relationship:

\[
M/p = L(K,r,Y)
\]

\[L_k \geq 0, \ L_r < 0, \ L_y > 0.\]

(2)

In other words, Tobin's portfolio balance is an essentially exchange equation-type notion. Requirements for transactions balances of currency are assumed, as is customary, to depend on income. Given their real wealth, owners of wealth will wish to hold a larger amount of capital, and a smaller amount of currency, the higher the rent on capital, \( r \). Given the rent on capital, owners of wealth will desire to put some part of any increment of their wealth into capital and some part into currency.\(^3\)

The theory of portfolio balance implicit in Tobin's aggregative economic theory of investment implies that rates of return on all assets must be equal. In this model, the rate at which a unit of wealth is expected to grow is \( \hat{p}_e/p \), if it is held in the form of currency, or \( r_e \), if it is held as physical capital. Since portfolio balance requires that the real expected rates of return on the assets be equal, if \( r_e = r \) and \( \hat{p}_e = 0 \), equilibrium requires that \( r = 0 \). Each owner of wealth entertains as possibilities numerous values of both \( r_e \) and \( \hat{p}_e/p \), and to each possible pair of values he attaches a probability. While the expected value of \( r_e \) is assumed to be \( r \), the expected value of \( \hat{p}_e/p \) is expected to be zero. In other words, the owner of wealth expects on balance neither the rent of capital nor the price level to change. But since he is not sure, the dispersions of possible rents and price changes above and below their expected values constitute the risks of the two assets. Tobin then uses the principle of 'not putting all your eggs in one basket' to explain
relative attractiveness of currency as a store of value and thus force an even faster rate of price decline. For Tobin, an alternative to price deflation is the expansion of the supply of currency. As monetary expansion must be the result of deficit financing, Tobin assumes that $M$ takes the form of transfer payments. Algebraically:

$$\dot{K} + \frac{\dot{M}}{p} = S(Y + \frac{\dot{M}}{p})$$ \hspace{1cm} (3)$$

For Tobin, the normal result is that consumption will be a larger and investment a smaller share of a given level of real income. Thus the greater is $\dot{M}$, the slower will be the rate of capital expansion. At the same time the growth of the currency supply meets growing transactions requirements and satisfies the desire of wealth owners to balance increased holdings of capital, possibly yielding lower rents, with enlarged holdings of liquid wealth. As Tobin correctly admits, however, that there is a time path of $\dot{M}$ compatible with price stability may be seen by considering the inflationary consequences of large values of $\dot{M}$. But if the currency supply grows too slowly, the necessity that price deflation - probably an ever-faster price deflation - accompany growth casts considerable doubt on the viability of the growth processes described above. For Tobin, "[t]his doubt arises from the institutional limits on downward flexibility of prices, in particular money wage rates, characteristic of actual economies" (p. 244). To analyse the behaviour of the system when money wage rates are inflexible, Tobin works with two relationships between the price level, $p$, and employment of labour, $N$, being that both assume a constant capital stock, $K$.

The first, called the 'labour market balance' (LMB) relation, gives for any level of employment, $N$, the price level, $p$, that equates the marginal productivity of labour to the real wage. As shown in Figure 2, the level of employment $N_f$ is the maximum labour supply that can be induced at the given money wage, money wage becoming flexible upward at that level of employment. The second relation, called the 'portfolio balance' (PB), gives for any level of employment the price level required for portfolio balance between the given stock of capital and the given supply of currency. The reason why its slope may be either positive or negative is that the marginal productivity of the given capital stock, and hence the rent of capital, is greater the higher the volume of employment; so as far as this effect is concerned, the price level must be higher at higher levels of employment to reduce the real supply of currency. The transactions relation of demand for
currency to the level of real income works, however, in the opposite direction. To the extent that it is not possible to establish a priori which curve has the greater slope, the two possibilities are shown below. In 2(a) the LMB curve has the greater slope; both curves are drawn with positive slopes, but the PB curve could equally well have a negative slope.

As shown by the arrows, the intersection \( (p_0, N_0) \) is a stable short-run equilibrium in 2(a) but an unstable one in 2(b), both results following from the assumption that \( \dot{p} \) will be positive, zero or negative, depending on whether wealth owners regard their currency holdings as too large, just right, or too small. In 2(b) \( (p_f, N_f) \) is a stable short-run equilibrium, and there may be another stable intersection \( (p_d, N_d) \). Here \( N_d \) would be a level of employment so low and, correspondingly, a real wage so high that the rigidity of the money wage breaks down. As capital expansion shifts both the LMB curve and the PB curve downward, I now turn to a brief summary of its impact on the point \( (p_0, N_0) \). When the intersection \( (p_0, N_0) \) is an unstable point, as in 2(b), capital expansion increases both \( p_0 \) and \( N_0 \). When the intersection \( (p_0, N_0) \) is a stable point, as in 2(a), capital expansion necessarily lowers \( p_0 \) but may either increase or decrease \( N_0 \); the intersection may move either south-east or south-west. In other words, it is not possible to say which curve shifts more as a consequence of a given change in the capital stock.

8. A question that arises here is whether growth with full employment of labour is compatible with a floor on the money-wage rate. Except in the case where labour supply grows as rapidly as capital or more rapidly, the growth process brings about an increase of the real wage, and a certain amount of price
deflation is therefore compatible with rigidity of the money wage. According to the results above, however, certainly in the unstable case and possibly in the stable case, too, the amount of price deflation needed to maintain portfolio balance is too much to enable employment to be maintained at a rigid money wage, the reason being that capital growth shifts the PB curve down more than the LMB curve. However, it is also possible in the stable case that the LMB curve shifts more than the PB curve, so that employment could be maintained and even increased while the money wage remains rigid and prices fall. But even this possibility, Tobin correctly noted, depends on the assumption that wealth owners balance their portfolios on the expectation that the price level will remain the same. But, in Tobin's words, "it is only realistic to expect that a process of deflation would itself teach owners of wealth to expect price deflation rather price stability. Such expectations would inevitably so enhance the relative attractiveness of currency as an asset that the process could not continue without a reduction of the money-wage rate" (p. 247). Tobin argues that it is the situation depicted in 2(b) that gives rise to the possibility of a cycle formally similar to those of Kaldor, Goodwin and Hicks. Putting it very briefly, suppose the economy is at \((p_f, N_f)\). Capital expansion will sooner or later cause it to coincide with \((p_0, N_0)\), this day being hastened by any inflation in the money-wage floor fostered by full employment; it may be that, once having enjoyed the money wage relative to \((p_f, N_f)\), labour will not accept any lower real wage. But once that point is reached, any further capital expansion will require a price decline that will push the real wage, given that the money wage cannot fall, above its marginal productivity. Employers will then contract employment, but this does not obviate the necessity of price deflation. Indeed, it aggravates it, for the reduction of employment lowers the marginal productivity of capital. Thus balance cannot be restored both in the labour market and in wealth holdings until a level of employment is reached at which the wage rate becomes flexible downward \((N_d\) in Fig. 2). The permanence of this 'floor' equilibrium depends upon the saving function. If positive saving occurs at the levels of income produced by labour supply \(N_d\), capital expansion will continue, and so will price and wage deflation. Increase of employment then depends on the willingness of labour to accept additional employment at the low level to which severe unemployment has driven the money wage, being that an enough lowering of the money wage would result in a situation like that represented by point S in Figure 3, and full employment could be restored. If, alternatively, that 'floor' corresponds to a level of income at which there is
negative savings, the gradual attrition of the capital stock will move the PB curve up relative to the LMB curve. As capital becomes scarcer, its marginal product rises, thus increasing its relative attractiveness. Whatever happens to the money wage terms on which labour will accept additional employment, the decumulation of capital will eventually lead to a position like S in Figure 3. Once S is reached, any further reduction in the money wage will lead to an expansion of employment. But increasing employment only enhances the relative attractiveness of the existing stock of capital, thus causing the price level to rise and employment to be still further increased; the only stopping point is \((p_f, N_f)\). Once \(N_f\) is reached, the money wage becomes flexible upward and follows the price level upward until portfolio balance is restored at the price level \(p_f\). The cycle then repeats itself.

For Tobin, the situation shown in Fig. 1(a) can also generate a cyclical behaviour, provided the intersection move to the left as the capital stock increases. Growth of capital is then accompanied by reduction of employment, so long as the money wage is maintained. In Tobin's view, such process may end in a stationary equilibrium if it entails that reduction in output as to reduce saving to zero. But it is also possible, though, that a process with positive saving, growth of capital and increasing unemployment will continue indefinitely. Thus the system may 'stagnate' at less than full employment, quite conceivably with capital growth and reduction of employment occurring at the same time. Whether the system behaves in this manner or with cyclical fluctuations depends on the relation between the conditions of portfolio balance and the rate of return on capital. The greater the change in portfolios that owners of wealth want to make when the rate of return on capital changes, the more likely it is that the system will behave in a cyclical way.
9. Tobin’s stagnationist growth model is therefore essentially based on the assumption that savings govern the accumulation of capital, money playing no more than a very perfunctory role in it. Since Tobin does not have an independent investment function, any changes in capital intensity are determined by savings via a mechanism that is not radically different from the accelerator one. The stagnationist outcome obtained in the model relies on the assumption that downward stickiness of money wages prevents or limits deflation and substitutes underproduction and underemployment. Unlike the 1965 model, in which capital formation is shut off because savings are diverted into government deficits or into real capital gains on monetary assets, capital formation is now reduced because savings are curtailed by reduction of income and employment. In other words, a basically similar portfolio adjustment is supposed to operate in both cases, though in the 1955 model it is employment rather than prices that bears the brunt of adjustment. As we seen above, it is the traditional rigidity assumption that ultimately allowed Tobin to derive a stationary underemployment equilibrium, and not effective demand or monetary problems. In this sense, one cannot fail to conclude that Tobin’s is nothing but a real stagnationist model applicable only to nonmonetary Say’s Law economies.

Notes

1. Tobin’s paper gave rise to a huge neoclassical literature on money, accumulation and growth. In an attempt to resolve the objection to the non-optimizing nature of Tobin’s model, Sidrauski (1967), for instance, pioneered a formulation of a monetary growth model in an explicitly optimizing framework. For early surveys of the modifications introduced into Tobin’s original model, which led to different results about the influence of money on steady-state growth rates, see Stein (1971) and Dornbusch and Frenkel (1973). A more recent survey of the neoclassical contribution to the literature on money and growth can be found in Orphanides and Solow (1990).

2. Davidson then presents an analysis which allows the examination of the role of money within the context of a Keynesian system permitting independent savings, investment and liquidity preference functions. I should mention, though, that it goes beyond the scope of this paper an even brief outline of that constructive part of Davidson’s piece.

3. Tobin does not consider extreme values of \( r \) in this kind of portfolio balance, that is, neither too low ones (complete preference for currency) nor too high ones (complete preference for capital).

4. At this stage, a natural candidate to a Post Keynesian objection to Tobin’s probabilistic approach to liquidity preference is that liquidity preference should be
conceived as a behaviour towards uncertainty rather than towards risk. A survey of some Post Keynesian objections to Tobin’s risk-based approach to uncertainty can be found in Lima (1992).

References


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