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THE DEMAND AND SUPPLY OF SECURITIES AND ECONOMIC GROWTH AND ITS IMPLICATIONS FOR THE KALDOR-PASINETTI VERSUS SAMUELSON-MODIGLIANI CONTROVERSY*

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The Keynesian revolution is usually thought to have begun with the *General Theory of Employment, Interest, and Money* [16, p. ix] [7, p. 462]. According to Keynes's biographer, however, the *General Theory* emerges from Keynes's attempt to simplify the intricate analysis of his *Treatise on Money* [7, p. 437]. It is the *Treatise* (hereafter referred to as TM) rather than the *General Theory* (hereafter GT) which is Keynes's "most mature work," "the work of a lifetime," and the one where the student will "get the best picture of his [Keynes's] total contribution to economics" [7, p. 403].

Admittedly, Keynes's fundamental "law" on effective demand is developed extensively only in the GT, and one can readily agree with Klein that "the revolution was solely the development of the theory of effective demand" [16, p. 56]. Nevertheless, it may be argued that the liquidity preference theory of 1936 represents a retrogressive movement from the monetary analysis of the TM, where, in the latter, Keynes's "views about all the details of the complex subject of money are . . . to be found" [7, p. 403]. As Sir Roy has lamented, "it is a paradox that the man whose world-wide fame during most of his lifetime arose from his specific contributions to monetary theory, which were rich and varied, should be studied mainly in one of his books which contains little about money as such" [8, p. 442].

It is also a sorry fact that in the post-Keynesian literature the role of money in the growth models has too often been ignored. Moreover, the relationship between money and growth is likely to continue to be misunderstood so long as modern Keynesian monetary analysis is based solely on Keynes's 1936 work. The essence of growth is dynamic change, and Harrod has pointed out that "the *Treatise* is more dynamic than the latter volume" [7, p. 433]. In the TM, we only "get an analysis of the economy when it is out of equilibrium and in a state of movement . . . ." [7, p. 457]. Robinson [22, p. 56] and Klein also note that the TM emphasis is on movement and dynamics [16, p. 28]. It is my belief, therefore, that a more solid advance in understanding of the

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money-securities-economic growth nexus can be made by judiciously mixing elements of Keynes's 1930 monetary analysis with his 1936 classic approach to the principles of effective demand.

Some of the confusion which hitherto has prevented the combining of the analysis of the TM with the concepts of the GT can be eliminated by some recourse to microeconomic concepts. For example, the Marshallian stability conditions, at any given output level, can be identified with the earlier work, while the Walrasian stability conditions, at any given supply price, can be the interpretative key to the later volume. If, in the TM, one substitutes the Marshallian concept of demand price for the term "investment," and supply price for "savings," the terminological turmoil arising from Keynes's discussion of the inequality of savings and investment is readily resolved. Thus, to recall the argument of the TM, when investment exceeds (is less than) savings—i.e., the demand price, D_p, exceeds (is less than) the supply price, S_p, which includes normal profits at a given level of output, Q_1, as in Figure 1a—then, in the market period, transactions occur at the demand price of p_1. This results in windfall profits (losses) as revenues exceed (fall short of) normal supply requirements. The invisible hand of the marketplace, operating via these windfall profits (losses) encourages entrepreneurs to expand (contract) output and employment. It is the analysis of the factors which lead to a discrepancy between D_p and S_p which bring about the dynamic change in prices and subsequently output in the TM.

In the GT, on the other hand, Walrasian stability conditions are implicitly utilized. If *ex ante* investment exceeds (is less than) *ex ante* savings, then the demand quantity, D_q, exceeds (is less than) the supply

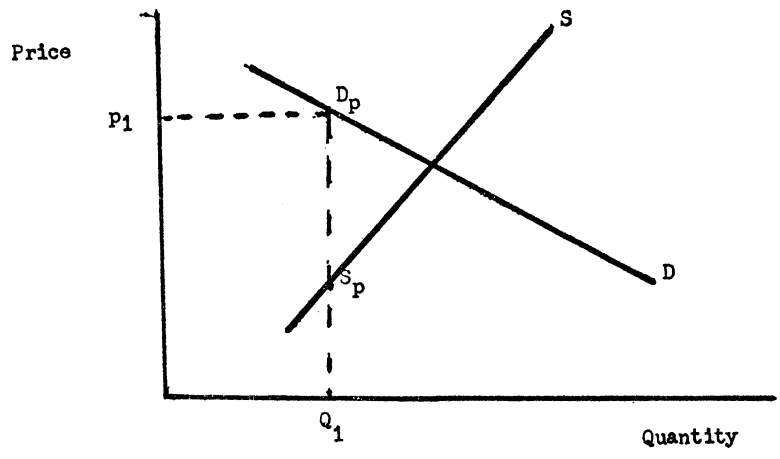

FIGURE 1a

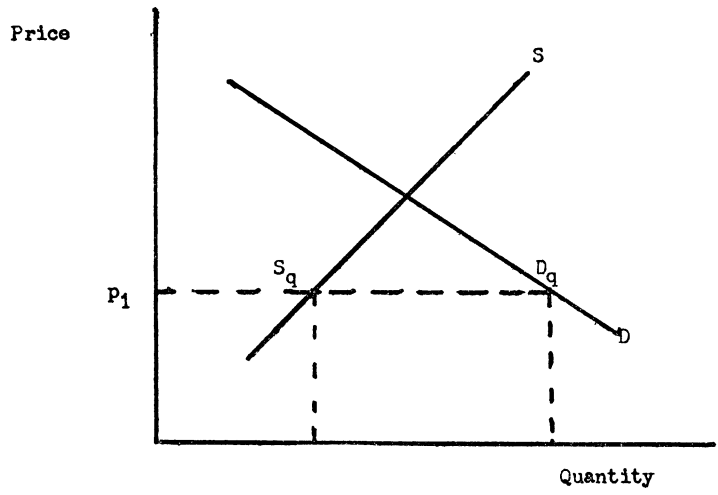

FIGURE 1b

quantity, S_q, at the given supply price of p_1, as in Figure 1b. Market transactions occur at the price of p_1, and the demand quantity of D_q is sold, while production is equal to the supply quantity, S_q, as inventories are drawn down. Entrepreneurs, reacting to the involuntary reduction (increase) in inventories caused by the invisible hand, are induced to expand (contract) output (cf. [23, pp. 223–24] [7, p. 456]). Since in this latter case, the market price is equal to the supply price—which is easily translated into wage units—for the given level of output and employment, these can be no windfall profit or loss on current production. Consequently, actual savings must always equal actual investment as unplanned inventory changes play the role which windfall profits did in the TM.[1]

With the GT, however, a more subtle change in view is imparted through the adoption of the Walrasian conditions than merely the simple transfer in concept from demand and supply prices to demand and supply quantities.[2] Perhaps due to the persuasion of the friendly

[1] Keynes attempted to justify the change in emphasis from windfall profits to unintended inventory changes as being more realistic [15, p. 51, n. 1].

[2] Modern neo-Keynesians, despite similarities in their growth models, are deriving their analysis from different Keynesian sources. Kaldor [9] and Pasinetti [18] are utilizing Marshallian D_p and S_p conditions with market transactions occurring at D_p (at full employment). Since Kaldor essentially utilizes demand prices as the market-clearing mechanism in his growth model, he can say "I am not sure where 'marginal productivity' comes into all this" [9, p. 100]. Productivity is relevant for the supply price and not the demand price. Joan Robinson, on the other hand, is emphasizing the supply price aspect of Walrasian conditions in her analysis of the rate of profit in economic growth [21, pp. 10ff.]. Thus, despite many similarities in the Kaldor-Pasinetti and Robinsonian Cambridge varients of growth models, there remains important differences. For example, the Robinson analysis is much more involved with the relationship of technology, the money wage, and profit margins (the degree of monopoly) to "normal" (i.e., supply) price [e.g., 21, pp. 7, 10, 17, 29, 36–37, 41, 45, 47, 70–74, 77–78, 120–21]. These items are virtually ignored in Kaldor-Pasinetti type growth models.

coterie surrounding Keynes at Cambridge, the 1936 volume is geared primarily to the establishment of a stable equilibrium with less concern for the forces promoting dynamic movement [7, p. 457] [22, p. 56]. Subsequent mathematical formulation of the Keynesian model has accentuated the tendency to suppress the earlier features of dynamism in their concentration on the simultaneous solution of the equations of the system. The equilibrium position rather than the mechanism of change has become the characteristic post-Keynesian analysis.

If Harrod is correct in arguing that Keynes had concluded that his critics "simply failed to grasp" [7, p. 435] the complexities of the 1930 analysis, then it is reasonable to believe that the GT was the result of a search for a "simplification" [7, p. 437]. If the main breakdown in communication between Keynes and others was on the principle of effective demand, then it is not surprising that although "money enters into the economic scheme in an essential and peculiar manner, [Keynes purposely fitted] technical monetary detail . . . into the background"[3] [15, p. vii].

If Keynes's real contribution was "to show that if savings are not offset by legitimate investment outlets, failure to generate a high level of employment will follow" [13, p. 81], then in winning the battle of Say's law in his 1936 volume, Keynes may have underplayed the complexities of monetary market phenomena through an oversimplified monetary analysis.

Actually, Ohlin, with D. H. Robertson always (for company) in pursuit, was quick to seize upon the deficiencies of the truncated monetary analysis of the GT [17] [20]. Under their hammering, Keynes was forced to retreat and confess the incompleteness of his work in a series of exchanges in the *Economic Journal* [13] [14]. As Keynes had already developed a more powerful and complete monetary analysis in his TM, however, he was immediately able to moderate his liquidity preference argument to encompass the needs of finance, and thereby enjoin his critics with what he characterized as the "coping-stone of the liquidity theory" [14, p. 667]. In essence, Keynes was merely restoring the theory of bearishness and the demand for capital goods as elaborated in the TM into consistency and orderliness with his liquidity preference apparatus.[4]

Rather than a coping stone, Keynes's 1937 finance motive discussion is the Rosetta stone which makes possible the deciphering of the ancient

[3] This evaluation of the relationship between the TM and GT finds support in Klein's remark that the liquidity preference theory was not an essential element of the GT: "It merely rounds out the theory and makes it complete . . . Keynes . . . remarked that, as it actually happened, he first conceived of the savings-investment equation [i.e., the excess demand equation] as the determinant of the level of output. This left him without a theory of interest; so he then developed the liquidity preference theory" [16, p. 43].

[4] Cf. Harrod's comments on Keynes's "remarkable" consistency in the development of his theories [7, pp. 467ff.].

TM hieroglyphics into modern post-Keynesian teminology. In attempting to analyze the role of money in the real, non-golden age, world of economic growth, I have become even more aware of the defects of the truncated monetary approach of the GT as against the perspicacity and elaboration of the TM's analysis of the interrelations of commodity and security markets, and the roles played by the various financial institutions which Keynes tends to dismiss as mere "technical detail" in the GT. Since the TM is an analysis of "an economy on the move," while the latter volume emphasizes static equilibrium,[5] much insight can be derived by restructuring the bearishness concepts of the TM with the more widely used classificatory scheme of the GT.

Given the deliberate ensconcement of detailed monetary analysis in the GT, it is not surprising that, thirty years after the Great Depression, the efficacy of monetary policy in promoting economic growth has been viewed, as Professor Samuelson points out, with skepticism by a significant portion of the academic "Keynesian" majority of the economics establishment [see 24, pp. 341–42]. Elsewhere I have already made some attempt at providing a simple model of capital accumulation [2] which blends the stock and flow elements in the demand and supply of (1) real capital, (2) money, and (3) securities (which are essential features of the analytical structure of the TM) with the more familiar principles and concepts of effective demand developed in the GT. Within such a framework it is possible to provide more perspective on the interplay among the organized security exchanges, corporate financing policy, investment bankers, and the banking system in channeling the financial funds necessary for capital accumulation. Regrettably this is an analysis which is virtually ignored in most "analytical" post-Keynesian models. That Keynes did not wish to ignore the financial market institutions is evident from the inclusion of Chapter 12 in GT. Nevertheless, he considered these aspects a "digression" which was "on a different level of abstraction from most of this book" [15, p. 149]. While the literary content of this chapter gets high marks for brillance, and the reader is struck by many telling phrases, the analytic portion is slim. No wonder discussions of financial institutions and their impact on

[5] This is especially true when comparing the money market analysis of the two books. The stock approach to money of the GT makes the securities market appear to be in continuous static equilibrium. Observed security prices, on the other hand, are normally disequilibrium ones. The reader might engage in an interesting exercise if he tried to unravel the meaning of the four possible bull and bear markets which Keynes analyzes on pp. 252–54 of Volume I of the TM. (Hint: Disequilibrium is the essence in understanding the analysis of these bull and bear markets.) Moreover, if it was recognized by "Keynesians" that the money market may not always clear (as the *General Theory* leads one to believe), i.e., that there is a "fringe of unsatisfied borrowers" [12, Vol. 11, p. 365], then some of the controversy over whether the monetary authority should control solely the rate of interest (which does not necessarily clear the market) or whether they should control primarily the money supply itself could be clarified. If the object is to affect aggregate demand, and if the interest rate does not clear the market, the money supply is the more strategic policy variable for the monetary authorities.

the economy have flowed primarily from the pens of non-Keynesian scholars.

Now that over three decades have past, it is due time that Keynesian economists were weaned from the mollycoddling liquid of liquidity preference and imbided in the stronger distillations of the TM, including its real "non-golden" age disequilibrium approach to dynamic change.

The Two Cambridges Debate

In the time remaining, I should like to suggest a few of the general elements of a theory of security markets and apply it to a controversy which has recently engaged the scholars of Cambridge, England, and Cambridge, Massachusetts. In any complete macro-model, the real capital market can be developed in terms of stock and flow relationships which show that the growth in the stock of real capital depends primarily on entrepreneurial expectations of profits from the future flow of capital services, the rate of discount, the ability of entrepreneurs to obtain finance, the rate of capital depreciation, and the supply elasticity of the capital goods producing industries [see 2]. Because of space limitations in this paper, however, real investment will be taken as exogenously determined.

In our model, an analysis of household portfolio decision making based on the bearishness concepts of the TM and its relationship to corporate financing policies can be introduced to indicate that at least one aspect of the two-Cambridges debate—the Samuelson-Modigliani Anti-Pasinetti Theorem versus Kaldor's Neo-Pasinetti Theorem—is really a tempest in a teapot. This aspect of the altercation could have been avoided had both parties followed the TM approach which insists that the savings decision of households is not only independent of the investment decision of firms, but household savings decisions are, as a first approximation, independent of portfolio balance (or bearishness) decisions. As Keynes emphasized: "Although these [savings and bearishness] factors react on one another . . . [they] are independent in the sense that any degree, positive or negative, of the one is compatible in appropriate attendant circumstances with any degree, positive or negative, of the other" [12, Vol. 1, p. 145, also see pp. 141, 147].

The particular point in the two-Cambridge controversy which I will discuss involves the fact that Pasinetti developed a growth model which demonstrates "the irrelevance of workers' propensity to save . . . [while uncovering] the absolutely strategic importance for the whole system of the decisions to save of just one group of individuals: the capitalists" [18, p. 274]. Samuelson and Modigliani demonstrate, however, that if the savings propensity of worker households ($s\hat{w}$) is high enough, the workers end up doing all the accumulation, as the capitalists' house-

holds share of total wealth approaches zero [25, pp. 275–77]. Accordingly, the Samuelson and Modigliani proof, which they call the "Duality Theorem" but which Kaldor labels the "Anti-Pasinetti Theorem," appears to severely restrict the generality of the Cambridge, England, growth analysis. Consequently, Kaldor found it necessary to offer in rebuttal, a "Neo-Pasinetti Theorem," which presents some seminal ideas about the demand for securities in the context of economic growth.[6]

Essentially, Kaldor attempts to associate the net acquisition of financial assets by the personal (household) sector with net personal savings and the availability of finance for business investment. In Kaldor's words: "net savings out of income sets up a demand for securities, [and] net dis-savings out of income (=net consumption out of capital or capital gains) sets up a supply of securities. There is also a net supply of new securities issued by the corporate sector. Since, in the securities' market, prices will tend to a level at which the total (non-speculative) supply and demand for securities are equal, there must be some mechanism to ensure that the [consumption] spending out of capital (or capital gains) just balances the savings out of income *less* any new securities issued by corporations"[7] [10, p. 316].

Since Kaldor is discussing long-run golden age equilibrium, the balancing mechanism to which he alludes cannot be the level of output (Y) which by hypothesis is growing at the full employment rate over time. Instead, given the savings propensities, Kaldor suggests that—for any given volume of new issues by corporations—it is the level of security prices which equilibrates not only the demand and supply of securities but also the sum of net personal savings of households plus corporate retained profits with net investment in the system [10, p. 318].

The essence of Kaldor's position is given in the statement that "the net savings of the personal sector (available for investment by the business sector) will depend, not only on the savings propensities of individuals, but on the policies of the corporations towards new issues. In the absence of new issues the level of security prices will be established

[6] As footnote 2 suggests, Kaldor is deriving his analysis primarily from concepts of the TM. Consequently, it should not be surprising that Kaldor ultimately attempts to analyze the demand and supply of securities—an analysis which is specifically developed in the TM, but which is only implicit in the GT emphasis in the demand and supply of money. For some unexplained reason Samuelson and Modigliani ignore Kaldor's analysis in their reply [25]. It should be apparent that Kaldor-Pasinetti are presenting a model based solely on the demand price approach of the TM (at full employment), while Samuelson-Modigliani are offering a neoclassical productivity model based solely on supply price at full employment. Since productivity is not a determinant of demand price, once one recognizes Kaldor's demand price orientation, it is easy to understand why he exclaims, "I am not sure where 'marginal productivity' comes in on all this" [9, p. 100]. Samuelson-Modigliani, on the other hand, make productivity the essence of their system by emphasizing supply price.

[7] This must be regarded as an extension of views expressed over 28 years ago in Kaldor's analysis of "Speculation and Economic Stability." In that article, Kaldor argued that the price of bonds and shares are "largely determined" by speculative influences [11, pp. 42–44].

at the point at which the purchases of securities by the savers will be just balanced by the sale of securities by the dis-savers, making the net savings of the personal sector zero" [10, p. 318].

If accepted at face value, Kaldor's statement is truly a surprising *volte-face* Keynesian theory, especially since it is a Keynesian of Kaldor's stature who appears to be implying that given the distribution of income, given the level of net investment (I), and given the corporate new issue policy, the level of security prices (i.e., the rate of interest) will cause aggregate personal consumption to just fill the gap between the full employment level of output and investment spending. After all these years of verbal duels, acrimony, and clarification, Kaldor's analysis suggests that the rate of interest is the mechanism which ensures that effective demand is always maintained at the full employment level.[8] Kaldor, in his attempt to defend Pasinetti's neo-Keynesian analysis from the American neoclassical assault, has unwittingly reinstated the *deux ex machina* of the neoclassical system—the rate of interest—as the balancing mechanism, not only for maintaining equilibrium in the securities market, but also for ensuring a level of effective demand always ample to secure full employment.[9]

Fortunately for Keynesian economics, Kaldor's own analysis does not require this neoclassical mechanism once it is recalled that Keynes recognized—insisted really—that the household savings decision is distinct from the household portfolio balance or bearishness decision [12, Vol. 1, p. 141]. In fact if the terms portfolio, portfolio balance, and change in portfolios, respectively, are substituted for the words net savings, savings, and net savings when they appear in that order in the preceding quotation from Kaldor, then Kaldor's revised statement is simply a perceptive elaboration on Keynes, with some incisive implications on how traditional Keynesian mechanisms will restore equilibrium, with or without full employment as a precondition.

The Basic Relationships

The public's demand for securities (or placements) can be conceptualized as a stock demand for a store of value [12, Vol. 1, pp. 141–43, 248–51] and this can be written as

$$D_p = f_1(\rho, \lambda, \beta, \gamma, e, V) \tag{1}$$

[8] Samuelson has, in a more jocular moment, referred to Jean Baptiste Kaldor [24, p. 345]. While I think this is scarcely appropriate, in the light of Kaldor's constant emphasis on full employment policy, there would be some point to the indictment if Kaldor really believed that the rate of interest induces consumption to fill the deflationary gap.

[9] This unintended result—if Kaldor's argument were valid—would do much to justify a witticism uttered some years ago by D. H. Robertson when he wrote: "Now as I have often pointed out to my students, some of whom have been brought up in sporting circles, high-brow opinion is like a hunted hare; if you stand in the same place, or nearly the same place, it can be relied upon to come round to you in a circle" [19, p. 81].

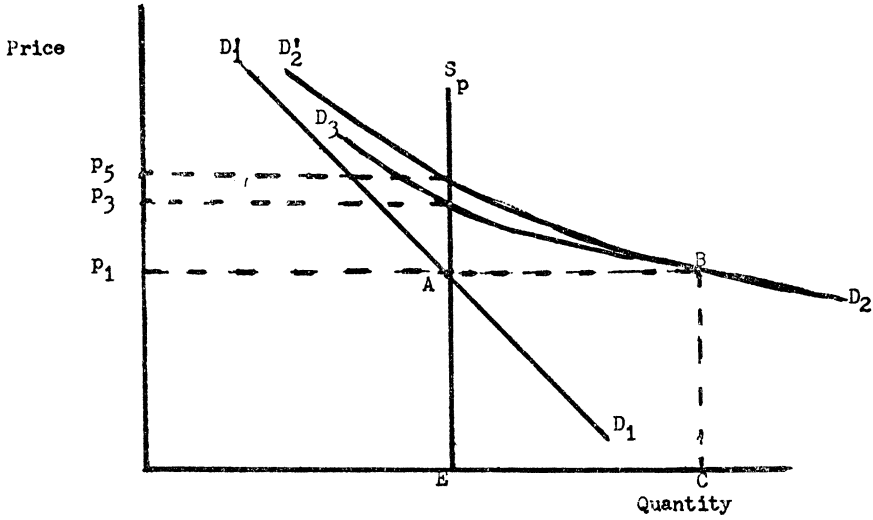

FIGURE 2

where D_p is the market demand for placements at any point in time, p denotes the market price of securities, λ is a set of expectations about the rate of change of future security prices, β and γ represent the public's aversion to income and capital risk, respectively, while e represents the number of wealth owners and the distribution of wealth among them, and V stands for the magnitude of the public's total store of value at any point of time. V is defined as the total of money balances held by savers as a store of value[10] (M_2) plus the total market value of placements held by the public at any point of time. This stock demand for placements, D_p, includes the Wicksteedian reservation demand for securities by the "bulls." Given λ, β, γ, e, and V, a demand curve for placements can be drawn as downward sloping D_1D_1' in Figure 2, i.e., $f_{1_p}' < 0$, since as the price declines, the expected capital gain from purchasing a security increases, while the (income) opportunity cost of holding money balances as a store of value increases. Hence the public will want to substitute placements for money holdings as the price of securities declines. Furthermore, every act of actual personal savings implies an increment in V and consequently an outward shift of the D_1D_1' curve (i.e., $f'_{1V} > 0$) in Figure 2. In line with his argument of a quarter century ago, Kaldor refers to this relationship between the demand for placements and changes in V as the nonspeculative demand

[10] In the TM, Keynes associates money held as a store of value with saving deposits. Even in the GT, money-time deposits are included by Keynes in his definition of money [15, p. 167, n. 1], a definition which places Keynes much closer in spirit to Professor Friedman than to most "Keynesian" monetary theorists.

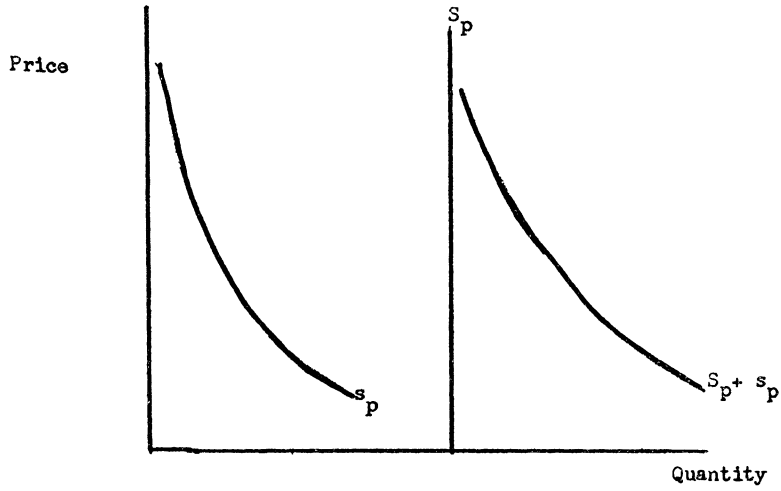

FIGURE 3

for securities (see [11, pp. 42, 48]). In the terminology of the TM, on the other hand, this shift in the demand curve for securities would be an increase in bullishness.

At any point in time, a given stock of outstanding securities exists as inherited from the past. Accordingly, the stock supply schedule of placements facing the public (S_p) is perfectly inelastic (in Figure 2 and 3) that is

$$S_p = \alpha \tag{2}$$

where α is a predetermined constant. If there are no new securities issued by corporations, then an equilibrium price of p_1 will be established.

The unit of measurement of the quantity of placements runs in terms of the income per period to which ownership of a placement constitutes an absolutely certain claim [cf. 26, p. 21]. The use of a "certainty-income-claim" unit of measure signifies that, for our immediate purposes, we may ignore the varieties in market types of placements. Accordingly, "the rate of interest" is inversely related to the price of securities.[11]

Increases in the quantity of placements supplied will functionally depend on the entrepreneurial demand for investment goods and their demand for external finance to underwrite the investment. The flow

[11] Of course, an increase in the probability of receiving an income claim would have the same effect as increases in "short sales" in the securities market. It may be viewed as an increase in effective supply. We shall ignore these problems in the following analysis since their introduction would make the analysis more complicated without altering the major conclusions.

supply schedule of placements can be specified

$$s_p = (igK)/p \tag{3}$$

where s_p designates the flow-supply of placements, and where, following Kaldor's symbols, i reveals the fraction of the firms' current investment (denoted by gK, where K = capital, g = growth rate) which corporations decide to externally finance via the issue of new securities to the public [cf. 10, p. 317]. Given i, g, and K, the flow supply schedule (s_p) with respect to the placement price, p, in any time period constitutes a rectangular hyperbola (see Figure 3).[12] The market supply schedule of placements in any period is obtained by summating equations (2) and (3); thus

$$S_p + s_p = \alpha + (igK)/p \tag{4}$$

The market supply curve, $S_p + s_p$, is the lateral summation of the stock- and flow-supply curves in Figure 3.

Kaldor's Neo-Pasinetti Theme

Returning to Kaldor's argument, maintenance of equilibrium in the securities market requires that any increase in the demand for placements must equal the quantity of new issues supplied by corporations plus the liquidation of securities by shareholders wanting to obtain active money balances to finance consumption out of capital gains. Thus Kaldor writes the equilibrium condition as

$$s_w W = cG + igK \tag{5}$$

where s_w is the wage earners' marginal propensity to save, W is the wage bill, and c is the fraction of capital gains (G) which stockholders wish to consume [10, p. 317].

At this stage, Kaldor is effectively assuming no savings out of profit distributions [10, p. 316] so that all capitalist savings is done by the firm. Most importantly, Kaldor states that "as far as my own ideas are concerned, I have always regarded the high savings propensity out of profits as something which attaches to the nature of business income, and not the wealth (or other peculiarities) of the individuals who own propery [sic]. It is the enterprise, not the particular body of individuals owning it at any one time, which finds it necessary in a dynamic world of increasing returns, to plough back a proportion of the profits as a kind of prior charge on earnings. . . . This is because (i) continued expansion cannot be ensured . . . unless *some proportion* of the finance required for expansion comes from internal sources. . . . Hence the high savings propensity attaches to profits as such, not to capitalists

[12] Kaldor would associate the non-speculative supply of securities [10, p. 317] with our flow-supply schedule (see [11, p. 42]).

as such" [10, p. 310]. No wonder Kaldor and Pasinetti believe in the "absolute strategic" importance of the capitalists' propensity to save in the process of growth. This so-called "capitalists' propensity to save" is primarily a measure of corporate investment policy and the availability of finance rather than the savings behavior of particular households. Even the Cambridge, Massachusetts, neoclassicists cannot deny the "strategic" importance of actual investment expenditures on economic growth. Kaldor and Pasinetti are merely reminding us of the essentiality of finance in carrying out investment plans (cf. [3] [4]).

Despite this evidence which suggests that the two-Cambridges controversy may simply be a result of a semantic confusion involving savings and investment propensities and the finance motive, let us continue to examine the Neo-Pasinetti Theorem for its implications on the demand and supply of securities in the context of economic growth by utilizing the stock demand and stock-flow supply schedules developed above. Considerations of these in some detail will clarify the Neo-Pasinetti Theorem and free Kaldor from the necessity of restoring the rate of interest to its neoclassical role.

The equilibrium condition expressed in equation (5) tacitly posits that all savings out of wages will be utilized to increase the demand for placements in personal portfolios; and further, that there will be no increase in the demand for speculative money holdings as a store of wealth. Substantially the argument entails that there is a marginal propensity to purchase placements (k) out of personal savings which is assumed to equal unity.[13] If k does equal one, the marginal propensity to hold speculative balances as wealth increases is zero[14] (cf. [1, pp. 195–96] [2]).

1. *When No New Securities Are Issued.* Given the level of investment, and the distribution of income between wages and profits, and the household savings propensities assumed by Kaldor in his Neo-Pasinetti Theorem, then if $k=1$, the demand curve for placements will shift from point A to point B at the initial price of p_1 in Figure 2. This shift from A to B is indicative of an increase in demand which is just sufficient to absorb (at a price of p_1 per unit) a value of additional placements equal to the personal savings out of wages; that is in Figure 2, $ABCE$ must equal s_wW, if $k=1$.

Since k is assumed equal to unity, the area of the rectangle obtained by taking the horizontal difference between the initial D_1D_1' and the

[13] This is the same assumption Kaldor employed 28 years ago [11, p. 45, no. 1].

[14] Although Kaldor's analysis makes no specific mention of the money supply, it is implicit that the money supply increases by an amount equal to s_wW. Initially therefore workers' savings accrue to them entirely as idle balances. Since Kaldor assumes the marginal propensity to hold speculative balances is zero, the demand for placements curve shifts outwards as described below. It should be noted that Keynes believed that $0<k<1$, since "the inactive demand for liquidity partly depends on the aggregate of wealth" [14, p. 668].

new D_2D_2' curve and multiplying it by the ordinate height of the price level, for any price, will always equal total savings out of wages.[15] Thus, the D_2D_2' curve will have a hyperbolic relationship with respect to D_1D_1'; if consumption out of capital gains are precluded (that is, if $c=0$ in equation (5)). If no new securities are issued, then the price of placements would rise until p_5 in Figure 2. This higher price level would induce the public to hold the same quantity of securities in their portfolio as initially even though the state of bullishness had risen (i.e., the demand for placements has increased) because of savings out of wages (or in Kaldor's terminology because of an increase in nonspeculative demand).

Actually, Kaldor has assumed that $c\neq 0$ and consequently, that shareholders may be eager to liquidate some of their securities to finance consumption out of capital gains equal to cG. A value of $c>0$ presumes a sort of "real-placement-balance" effect analogous to the Pigou-Patinkin "real balance" effect. This implies that at any price above the initial p_1 price, the "reservation" demand for securities is contracted somewhat which, in turn means that there is a marginal propensity to demand placements (j), whenever there is a change in the price of placements, which is negative[16] (i.e., $j<0$). If $j<0$, then the portion of the D_2D_2' curve above p_1 does not wholly convey the magnitude of the aggregate demand for placements since the reduction in reservation demand will mean that the quantity demanded at any price will fall short of that shown on the D_2D_2' curve (for the latter is drawn on the hypothesis that $j=0$).

The point is that curve D_2BD_3 depicts the stock demand for placements at any point of time when there is some positive consumption out of capital gains. Hence when $k=1$, and $j<0$, the increase in placement prices will only mount to p_3 as the net increase in bullishness of the public is somewhat repressed compared to when $k=1$ and $j=0$.

If we posit a less than full employment initial equilibrium state, then this additional consumption (out of capital gains) will lead, of course, to an uplift in economic activity and a multiple increase in output (as embodied in the traditional multiplier analysis). A new equilibrium output level will be established where the sum total of personal savings out of wages will be enlarged as employment and the wage bill expands, while capitalists spend in excess of their dividend income (as assumed by Kaldor) and thereby reduce savings out of profits. Money income, real output, and employment will be augmented.

[15] More generally, the area of the appropriate rectangle will always be equal to k times savings out of wages, no matter what the value of k.

[16] At prices below p_1, on the other hand, the oft-mentioned "locked-in" due to a security price fall implies that $j\approx 0$. Kaldor's association of changes in consumption of capitalists with capital gains rather than capital losses tends to suggest he tacitly believes that $j=0$ for prices below the initial price level.

If, on the other hand, we start with the neo-Keynesian assumption of an initial given full employment equilibrium, then the increase in security prices when $j<0$ induces an increase in aggregate consumption and consequently an increase in aggregate demand. The upshot is the familiar concept of an "inflationary gap" (or an "inflationary barrier" in Mrs. Robinson's terminology [21, p. 13]). This involves an initial disequilibrium between investment and savings (an essential element in the fundamental equations of TM) and with a free market, the Pasinetti model would require the market price to increase to the higher demand price which would yield increased profit margins, a result which is identical to the formation of (windfall) profits in the TM.[17] Under the inflationary gap approach of the post-1936 Keynesian revolution, the adjusting mechanism in a free market requires that money wages and therefore supply prices rise, forcing fixed income groups (particularly bond-holding savers) to cut their real consumption demand because of a reduction in real income. The consequent "forced savings" of rentiers will restore equilibrium in the commodity market by squeezing net capitalist personal savings to a level equal to net investment minus the sum of savings out of wages plus retained profits. (In the Pasinetti model, of course, the forced savings of rentiers will be augmented by the forced savings of workers as the real wage declines with an increase in demand price.)

Thus, the level of output will be the instrument (at less than full employment) for equating net personal and corporate savings with net investment, while the wage-price mechanism and the existence of fixed money income contracts will ensure the equilibrium of net savings and investment at full employment (cf. [5, Chap. 11] [6] [27, Chap. 6]).

On this argument it becomes apparent that even in a Kaldor-Pasinetti world, the price of placements (i.e., rate of interest) will not affect the total of personal savings directly (except for Kaldor's assumed real-placement-balance effect); rather it will have its impact directly on the portfolio balance decision. With $k=1$, $j=0$ and no new issues forthcoming then there will be no actual change in the portfolio holdings of the public; as the price of securities rises to p_5 households will be induced to hold the same quantity of securities when their bullishness has increased. Alternatively with $j<0$, when $k=1$, then the price of securities need rise only to p_3 to reflect the lesser intensity in bullishness on the part of the public as they continue to hold the same quantity of securities.

Of course, it might be argued that instead of assuming an initial equilibrium level of employment, the comparable case for the Neo-

[17] In fact, Pasinetti's stability analysis involves a differential equation [18, p. 275] which analyzes the same factor (i.e., I–S) which leads to dynamic changes in the fundamental equations of the TM [12, Vol. 1, pp. 135–37].

Pasinetti Theorem should begin by positing that corporate savings plus wage earner household savings exceed, at the initial employment level, the exogenously determined level of investment. In this latter case, especially if $c=0$, the demand price for goods will be less than the supply price. This will result in windfall losses (i.e., less than normal profits) in the TM or lower profit margins in the Kaldor-Pasinetti model (or involuntary inventory accumulations in the GT), which should induce profit maximizing entrepreneurs to contract output, thereby lowering the total wage bill until savings and investment are equal. Of course, if, following Kaldor, we assume $c>0$, then the magnitude of the contraction necessary to bring about equilibrium in the goods market would be somewhat less.

Without protracting this analysis further by handling other possible cases, we can state that it does not really matter whether equilibrium in the goods market is initially assumed or not, for it is the level of output and/or the wage-price mechanism and the existence of fixed money contracts which are the primary mechanisms for bringing aggregate supply and demand (i.e., savings and investment) into equilibrium in modern market-oriented economies.

2. *External Finance Via New Public Issues.* The analysis for the situation when corporations issue new securities to the public can be readily obtained by combining, in Figure 4, the combined stock-flow supply analysis of Figure 3 with the demand analysis of Figure 2. For simplicity assume a given level of savings out of wages. If $k=1$, then, as we have already demonstrated, the demand curve shifts from D_1D_1' to D_2D_2' if $j=0$ (or to D_2BD_3 if $j<0$ at prices above p_1) in Figure 4. If the amount of external finance required equals total savings out of wages, that is if $iI=s_wW$, then the increase in the demand for placements at the initial price of p_1 (diagrammatically, a shift from A to B in Figure 4) will be just sufficient to absorb all the newly issued securities. Accordingly, the market supply schedule of securities, S_p+s_{p1}, will be rectangular hyperbola which passes through point B and the increase in the quantity of securities supplied at p_1 will just counterbalance and neutralize the increase in bullishness as households add to the quantity of securities they possess in their portfolios.

If external finance requirements are less than savings out of wages, i.e., if $iI<s_wW$, and if $k=1$, then the rectangular hyperbola market supply curve, S_p+s_{p2}, will locate to the left of point B. Accordingly, if $j<0$, then the equilibrium price will rise to p_2 (or p_4 if $j=0$) as the augmentation in household bullishness is not blocked by a large enough increase in the offering of new issues to maintain the initial price of p_1. The market price rises only enough to entice the more bullish (wage-earning) households to increase the portfolio holdings of securities by

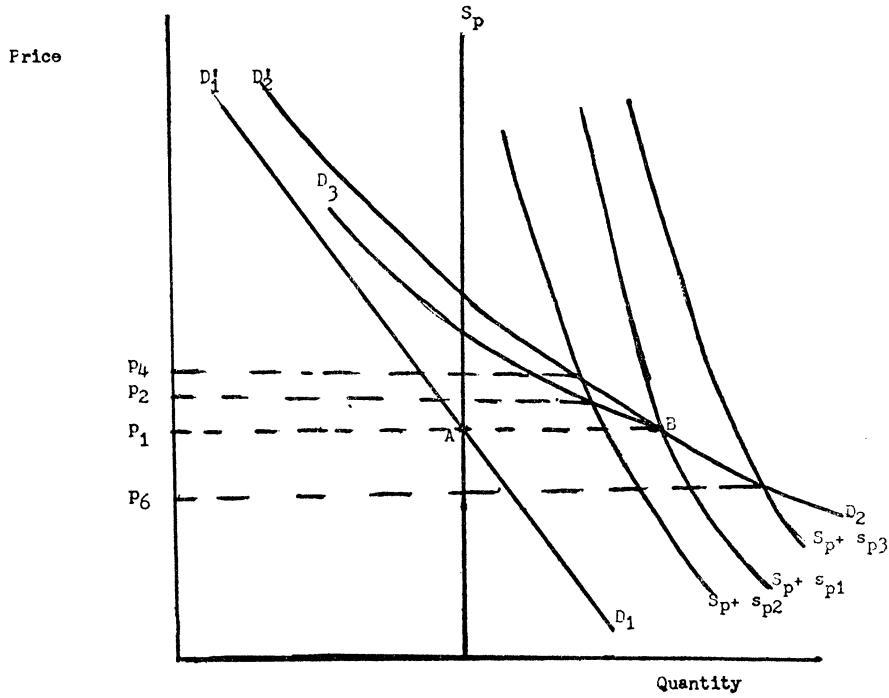

FIGURE 4

an amount equal to the quantity of new issues. Of course, with increased consumption out of capital gains, aggregate demand rises as before and therefore either changes in economic activity (at less than full employment) or alternatively wage-price inflation will carry total net personal savings into harmony with net investment less corporate retained profits.

If the amount of external finance demanded by firms exceeded savings out of wages, i.e., $iI > s_w W$, then the market supply schedule of placements, $S_p + s_{p3}$, would be a rectangular hyperbola lying to the right of point B. This means that firms attempt to float new issues in excess of the increase in bullishness at the initial p_1 price level. Accordingly, if $j = 0$ below p_1 then the placement price level declines to p_6 in order to stimulate households to add to their holdings of securities. In this last situation, one might not expect any change in aggregate consumption since $j = 0$ (by assumption). The lower price of placements, however, signifies a higher rate of interest which in turn could lower the attractiveness of investment by reducing present value estimates, which ultimately could result in a cut-back in output until the savings-investment equilibrium is achieved at a lower employment level with

lower investment and less savings out of wages. If $iI > s_w W$, therefore, full employment may not be able to be maintained as business firms find they can obtain the desired external finance only at higher interest costs. Of course, all this abstracts from monetary policy specifically designed to curtail interest rates to lower levels when employment declines (and an assumed exogenous I).

Summary

The analysis has shown that given the savings propensities of the various income classes and given $k \leq 1$, then the price of placements will alter until the household sector absorbs into its portfolio all the securities offered to it. The change in placement prices (and therefore in the rate of interest) does not in itself affect the total of personal savings or the distribution of savings between workers and capitalists. Given different degrees of bearishness between workers and capitalist households, the price of placements will alter the distribution of securities between them. It is only Kaldor's assumption of a real balance effect for placements when their price increases (that is, a posited negative j) which modifies the savings behavior of capitalists households.

Nevertheless, it is either changes in output (at less than full employment) or inflationary changes in wages and prices at full employment which constitutes the prime channels for working the appropriate changes in the level of personal savings to bring it into equilibrium with the exogenously determined level of investment. The flexibility of the market price of placements merely permits each household unit to hold as many placements as it desires, and to shift its portfolio holdings around as often as desired, while in the aggregate, the personal sector holds exactly the quantity of securities which is allocated to it. The rate of growth, on the other hand, is determined in a modern economy by the investment decisions (of business firms) which can be actually financed and carried out within the monetary and resource constraints of society.

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