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Keynes after Sraffa and Kaldor: Effective demand, accumulation and productivity growth

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**Keynes after Sraffa and Kaldor:
Effective demand, accumulation and productivity growth**

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Working Paper No: 2010-07

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Abstract

This paper analyzes to what extent John Maynard Keynes was successful in showing that the economic system tends to fluctuate around a position of equilibrium below full employment in the long run. It is argued that a successful extension of Keynes's principle of effective demand to the long run requires the understanding of the contributions by Piero Sraffa and Nicholas Kaldor. Sraffa provides the basis for the proper dismissal of the natural rate of interest, while the incorporation by Kaldor of the supermultiplier and Verdoorn's Law allows for a theory of the rate of change of the capacity limit of the economy.

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Introduction

One of the most controversial propositions in macroeconomics is that the economy is driven by demand. In *The General Theory*, Keynes clearly argued that the system would fluctuate in the long run around a position considerably below full employment. In other words, he believed that the economy would settle below full employment, and that lack of demand, rather than a supply constraint, was the main cause for underemployment equilibrium. Some orthodox authors would deny that in all circumstances, but the conventional wisdom seems to accept that, whereas the proposition is correct in the short run, it cannot be taken seriously in the long run. In the long run, the supply constraint is inexorable.

It is particularly problematic that the conventional reading of Keynes assumes that unemployment can only result from some type of imperfection, typically some sort of price rigidity be that in the market for goods or in the so-called factor markets. Keynes correctly noted that only by abandoning the presupposition of a natural rate of interest it would be possible to establish his unemployment equilibrium in the long run. Piero Sraffa's critique of the marginalist theory of capital proved an essential piece of the argument against the natural rate of interest.

Yet, even after dealing with the question of unemployment equilibrium in the long run, Keynes theory of effective demand did not contemplate the process of accumulation. Nicholas Kaldor was the central author extending the principle of effective demand to the long run. Kaldor's models developed from the mid-1960s onwards suggest that the Keynesian proposition is valid, not only the short run, but also in the long run. Most authors suggest that the thrust of the Kaldorian model lies in the

supermultiplier (Dixon and Thirlwall, 1975, p. 203). This paper argues that without the so-called Kaldor-Verdoorn's Law (hereafter KVL) it is not possible to fully extending the Keynesian proposition to the long term, and, as a result, that Law should be seen as central as the supermultiplier in the Kaldorian model. The KVL explains the rate of change of labor productivity, and, as a result, makes endogenous the change in the capacity limit of the economy.

The remainder of the paper is divided in three sections. The following section discusses in what sense Keynes's principle of effective demand in *The General Theory* may be seen as a short run proposition, and to what extent it is amenable to be extended to the long run. Sraffa's work is shown to be central for an understanding of Keynes's long run theory of unemployment. The subsequent section analyzes the relevance of the KVL, together with the supermultiplier, in providing the theoretical foundation for the principle of effective demand in the long run. The last session provides a brief discussion of policy implications Sraffa's and Kaldor's extensions of Keynes's analysis.

The Capital Critique and the Keynesian Revolution

The conventional interpretation of the Keynesian Revolution, as it consolidated in academia and in policy-making circles, implied that fiscal policy, in particular budget deficits, should be used in recessionary periods.¹ The ultimate cause of unemployment

¹ It must be noted that Keynes does not directly talk about budget deficits in *The General Theory*, preferring to emphasize what he calls the socialization of investment (Keynes, 1936, p. 378). In the discussions regarding budgetary policy during World-War II, Keynes (Keynes, CW, vol. XXVII, pp. 405-13), he emphasized the importance of separating the current budget from the capital budget, and the importance of maintaining the former balanced over the cycle, while the latter should be used for the long run objective of full employment.

was to be seen in some sort of market imperfection, be that a rigidity of the rate of interest (as in the Liquidity Trap case) or the nominal wage.²

Careful reading of *The General Theory* should cast serious doubts regarding the conventional interpretation that emphasizes wage rigidities, since in chapter 2 of his book Keynes tells us that ‘the complete results of a change in money-wages are more complex, as we shall see in chapter 19,’ and those changes in wages are fully considered in that chapter (Keynes, 1936, p. 12, n. 1). As a result, Keynes arguments in chapter 19 are not based on any type of price rigidity. Also, in chapter 15 Keynes tells us ‘after the rate of interest has fallen to a certain level, liquidity preference may become virtually absolute ... [b]ut ... I know of no example of it hitherto’ (Keynes, 1936, p. 207). In other words, a downward rigidity of the rate of interest, while possible in theory, was not in practice the cause of unemployment either. The rigidity or imperfectionist argument that came to be associated to Keynes name, hence, has no basis in *The General Theory*.

Keynes recognized that ‘it is on the effect of a falling wage and price level on the demand for money that those who believe in the self-adjusting quality of the economic system must rest the weight of their argument,’ in a mechanism that became known as the Keynes effect (Keynes, 1936, p. 266). According to Keynes ‘...the reduction in the wages-bill ... will diminish the need for cash for income and business purposes ... reduce *pro tanto* the schedule of liquidity-preference ... reduce the rate of interest and thus prove favorable to investment’ (Keynes, 1936, p. 263) Hence, Keynes clearly understood that price and wage flexibility might lead to full employment equilibrium.

² Hicks (1937) and Modigliani (1944) are the key contributions in the ascent of the so-called neoclassical synthesis. In policy circles, there are at least two turning points accepted as marking the rise of Keynesian policies in the United States: first, after Roosevelt’s recession of 1937-38, when fiscal deficits became the central policy tool, and, second, the Kennedy-Johnson tax cut of 1964. By the 1970s, even Nixon would claim to be a Keynesian.

Further, Pigou (1943) argued that wealth effects implied that deflation would lead to an expansion of consumption, and also push the economy towards full employment, usually referred as the Pigou effect (Patinkin 1987). Keynes, however, emphasized that forces that moved the economic system away from full employment countered the self-adjusting forces created by deflation. In particular, a reduction in wages involved redistribution of income from workers to capitalists and would put pressure on ‘those entrepreneurs who are heavily indebted ... with severely adverse effects on investment’ (Keynes, 1936, pp. 262 and 264).³ It is important to note that Keynes’s arguments against the so-called Keynes effect can also be extended to the Pigou effect.

The upshot of Keynes’s discussion of the effects of price and wage flexibility in chapter 19 of *The General Theory* is that there is no guarantee that the system would move towards full employment. Fundamentally, one would have to assume that the positive wealth effects would be systematically larger than the negative effects imposed by the burden of debt. Since there is no reason to believe that this is the only theoretically reasonable assumption, let alone whether that would be empirically relevant, Keynes concludes that:

[We] oscillate, avoiding the gravest extremes of fluctuation in employment and prices in both directions, round an intermediate position appreciably below full employment and appreciably above the minimum employment a decline below which would endanger life. But we must not

³ The Keynes effect depends on the negative relationship between investment and the rate of interest, and, as a result, is open to the capital debate critique. That is not the case with the Pigou effect. Kalecki (1944), in a direct response to Pigou, showed, similarly to Keynes, that in the case of a price decline the real value of currency and demand deposits increased, but that was offset partially or completely by the increase in the real burden of those that had borrowed from the banks. In other words, in a deflationary situation the burden of debt increased. Irving Fisher (1933) had also pointed out the negative effects of debt-deflation.

conclude that the mean position thus determined by ... those tendencies which are likely to persist, failing measures expressly designed to correct them, is, therefore, established by laws of necessity (Keynes, 1936, p. 254).

In other words, full employment is a mere possibility, but the system has no necessary tendency towards it, and there is no reason to believe that under normal circumstances, and without government intervention, it would be achieved. Several different positions of equilibrium in the long run, determined by the persistent forces of the capitalist system, could be established, and *persistent* unemployment would be the norm.

Uncertainty would make things worse, but even if expectations were always fulfilled there would be no reason to believe that deflationary forces would make the system move towards full employment. Keynes emphasized that ‘...the extreme precariousness of the basis of knowledge in which our estimates of the prospective yield have to be made,’ implied that the system was unstable; but only under particular circumstances, when ‘...the capital development of the country becomes a by-product of the activities of a casino...’ would instability be extremely harmful (Keynes, 1936, pp. 149 and 159).

In this sense, it is difficult to agree with Minsky’s interpretation that Keynesian economics should be seen as the “economics of permanent disequilibrium” (Minsky, 1975, p. 68). In this context it is important to remember the often quoted passage of *The General Theory* where Keynes tells us that “...it is an outstanding characteristic of the economic system in which we live that, whilst it is subject to severe fluctuations in respect of output and employment, it is not violently unstable (Keynes, 1936, p. 249).⁴

⁴ Interestingly enough, in this respect Minsky’s position resembles Patinkin (1956), who insists that the Keynesian idea of unemployment equilibrium is incorrect and it should be correctly

This indicates that a great degree of steadiness, despite the existence of fundamental uncertainty, results from the existence of conventions and institutional arrangements that allow the system to be relatively stable.

In this sense, it seems clear that Keynes was able to show in *The General Theory* that the system has a tendency in the long run to get stuck at a position of equilibrium that is suboptimal. It also seems clear that the conventional view which assumes that Keynes moved from an interpretation of the system with flexible prices and fixed quantities in the *Treatise* to one of fixed prices and flexible quantities in *The General Theory*, as interpreted by Leijonhufvud (1968), is incompatible with a careful reading of chapter 19 of the latter book (Amadeo, 1989, p. 4).

However, even though *The General Theory* unemployment equilibrium is not a short run result in the sense that prices and wages are flexible, it is short run in the sense that the capital stock is fixed. In other words, the long run level of employment is determined for a given level of investment, but the effects of investment on productive capacity are not taken into the consideration. Further, Keynes (1936, p. 161) argued that investment was governed by *animal spirits*, ‘...a spontaneous urge to action rather than inaction’ (Keynes 1936, p. 161). This implies that investment is seen as exogenous to the system and determined by individual initiative of entrepreneurs.⁵

Yet, in a somewhat contradicting view Keynes argues that there is no ‘...material difference ... between [his] schedule of the marginal efficiency of capital ... and the

termed unemployment disequilibrium. For a discussion of Patinkin’s views and his rejection of the neoclassical synthesis emphasis on wage rigidity see Rubin (2002).

⁵ For a modern interpretation along these lines that emphasizes the role of expectations, confidence and psychological factors in explaining the instability of the economic system see Akerlof and Shiller (2009). It is important to notice that Keynes seems to emphasize conventional rather than psychological forces in the determination of the long run rate of interest (Keynes, 1936, p. 203).

demand curve for capital contemplated by some of the classical [sic] authors' (Keynes, 1936, p. 179).⁶ This view of investment as inversely related with the rate of interest is problematic for at least three reasons, two related to inconsistencies with the notion of capital implicit in the marginalist theory and one associated to the empirical evidence.

The capital debates, sparked to a great extent by Sraffa's revival of the surplus approach, have shown that reswitching and reverse capital deepening are possible, and, as a result, the marginalist view of an inverse relation between capital intensity and its remuneration is not valid. The point is that when capital is defined, not as a quantity measured in value of an amorphous factor of production, but as a produced means of production, then it is generally not possible to determine a univocal relation between the demand for capital and its price.⁷ In that case, there is no guarantee that a reduction of the rate of interest would lead to higher investment and through the multiplier to the full employment level of savings.

It is important to note, in this context, that when confronted with the empirical evidence that there was no inverse relation between the remuneration of labor (real wages) and the quantity of labor demanded, Keynes was fast to get rid of the assumption

⁶ By classical authors Keynes is, as it is well known, referring fundamentally to marginalist authors. In fact, even though he usually uses the term classical, in the page right before the above-mentioned quote Keynes, refers, more appropriately, to the neoclassical school (Keynes, 1936, p. 177).

⁷ For example, if the price of a certain machine used in the production of a few consumption goods falls, one would expect that substitution effects would lead to increased demand for that machine. Depending on the elasticity of the demand for that machine, however, the income of the producer may fall, and if we assume that the producer demands consumer goods that are intensive in the use of that particular machine, then the fall in the price of the machine may ultimately lead to less demand for that machine. The income effect would be perverse and could more than compensate the substitution effect. The fact that the machine is a produced good used in the production of other goods generates an interdependence that invalidates the generality of the neoclassical views on scarcity and relative price. Davidson (1982, pp. 14-23) argues that post-Keynesians emphasize income effects over substitution effects. Petri (2003) provides an overview of the Sraffian critique of neoclassical theory.

of decreasing marginal returns.⁸ Keynes suggests that Kalecki's assumption of constant returns seems more appropriate (Keynes, CW, vol. XIII, p. 405). Keynes willingness to part with the marginalist labor demand schedule seems to indicate that, if similar problems were pointed out with respect to the demand schedule for capital, he would most likely feel inclined to abandon it.

Also, the critique of the marginalist theory of capital provides a theoretical basis for Keynes rejection of the concept of a natural rate of interest (Keynes, 1936, pp. 242-4). Keynes's acceptance of the notion of the marginal efficiency of capital implies that there is a sufficiently low interest rate that would be associated with an investment that would produce the full employment level of savings. Excluding imperfectionist arguments related to the downward rigidity of the interest rate, or the possibility that a negative interest rate would be required to increase investment to its full employment savings level, it would seem that the acceptance of the marginal efficiency of capital is in contradiction with the notion of a "highly conventional" rate of interest (ibid., p. 203).⁹

The critique of the marginalist notion of capital shows that there is no logical basis for a real rate of interest determined by the productivity of capital, and shows that the limitations of the so-called loanable theory of interest are deeper than Keynes suspected. In that sense, Sraffa's critique of the neoclassical notion of capital is essential for the position, according to which

⁸ Dunlop (1938) and Tarshis (1939) had shown that real wages were positively correlated with output.

⁹ Sraffa (1960, p. 32) also suggests that the rate of interest could be determined exogenously to the system by the institutional arrangements of society. For the affinity of Keynes's and Sraffa's conception of the long-term rate of interest see Vernengo (2001, p. 350).

There is no unique long-period position of equilibrium equally valid regardless of the character of the policy of the monetary authority. On the contrary there are a number of such positions corresponding to different policies (Keynes, CW, vol. XXVII, pp. 54-55).

In other words, the long run equilibrium rate of interest is fundamentally associated to the policy regime controlled by the monetary authority, and that was the main reason for Keynes' advocacy of capital controls and a policy of relative low interest rates to promote the so-called euthanasia of the rentier.

But the fact that the rate of interest has little or no relation with investment does not mean that changes in the interest rate do not have any impact on the level of activity.¹⁰ Pivetti observe s that ‘...if money plays an important role in determining income distribution, it will also play an important role in the determination of the level and composition of output’ (Pivetti, 1985, p. 100). Keynes was perfectly aware of the effects of income distribution on the level of output. Referring to the effects of a fall in real wages Keynes argues that:

The transfer from wage-earners to other owners of other factors is likely to diminish the propensity to consume. The effect of the transfer from entrepreneurs to rentiers is more open to doubt. But if rentiers represent on the whole

¹⁰ It cannot also be suggested that Keynes was primarily concerned with monetary policy and disregarded fiscal policy to a secondary plane (e.g. Tily, 2006). Not only was Keynes committed to the so-called socialization of investment, which is clearly connected to some form of government fiscal action regarding investment, which seems to be the driving force behind his war efforts to separate the current from the capital budget, but also he seemed to be on board with Abba Lerner's functional finance (Colander, 1984). In a letter to James Meade in April 1943 Keynes says that he “...read an interesting article by Lerner on deficit budgeting, in which he shows that, in fact, this does not mean an infinite increase in the national debt, since in course of time the interest on the previous debt takes the place of the new debt which would otherwise be required ... His argument is impeccable.” This leaves little margin of doubt of where Keynes stood on the validity of functional finance. (Keynes, CW, vol. XXVII, p. 320)

the richer section of the community and those whose standard of living is least flexible, then the effect of this [real wage reduction on output] also will be unfavorable (Keynes, 1936, p. 262).

Also, a reduction in interest rates allows increasing debt private and public debt accumulation at sustainable levels, and, as a result, it provides a strong encouragement for demand expansion.¹¹ In other words, even though investment is not inversely related to the rate of interest, it is very likely that other components of aggregate demand are. However, in contrast to the marginalist theory of capital that suggests that a natural rate of interest that generates the amount of investment that corresponds to full employment savings, the alternative based on Keynes implies that only under certain institutional conditions the rate of interest would be sufficiently low to stimulate aggregate demand and produce full employment.

Finally, if the theoretical reasons for rejecting the inverse relationship between capital intensity and the interest rate were not sufficient, it is relevant to note there is almost no empirical evidence for that proposition. Chirinko argues that ‘...the response of investment to price variables tends to be small and unimportant relative to quantity variables...’ that is, interest rates have little effect, and the level of activity is central (Chirinko, 1993, p. 1906). Also, Blomström *et al.* (1996) show that in the correlation between investment and output growth causality seems to run from the former to the

¹¹ It is well known that the last three booms and busts of the North American economy have been associated to consumption-based expansions fuelled by private debt accumulation. For a discussion of some of the characteristics of the unsustainable patterns of the American expansion see Pollin (2003), and Barba and Pivetti (2009).

latter. This implies that the weight of the evidence favors the accelerator as an explanation of investment behavior.¹²

It should be noted that the favorable evidence regarding the accelerator, and the absence of any evidence for a negative relation between investment and the interest rate, seems to indicate that the capital critique is empirically relevant. As noted by Petri (2000, p. 27) the inelasticity of investment with respect to the rate of interest not only suggests that reswitching and reverse capital deepening are sufficiently strong as to make the marginalist relation between abundance and remuneration inoperative. Be that as it may, the lack of responsiveness of investment to the interest rate implies that the former cannot adjust to full employment savings, and that it must be explained exogenously by other variables (e.g. output change). In that sense, it seems reasonable to conclude that the extension of Keynes's theory of effective demand to the long run must involve the incorporation of the acceleration principle.

Extending the *General Theory* to the Long Run

Nicholas Kaldor work on growth incorporated the multiplier and the accelerator, and in many respects represents the main extension of the principle of effective demand to the long run (Vernengo and Rochon, 2001). However, Kaldor's only incorporated the idea of the supermultiplier, which is central in his extension of Keynes's theory, in the second half of the 1960s.

¹² Keynes was not convinced by the accelerator principle, in his correspondence with Harrod, and tended to reject it (Keynes, CW, vol. XIV, pp. 321-50). However, it must be noted that from a theoretical point of view it does not affect the logic of effective demand whether investment is autonomous or derived demand. Also, the accelerator is perfectly compatible with the rejection of the marginalist notion of capital, which is central for the rejection of the notion of a natural rate of interest. From that point of view, it seems that is perfectly compatible with Keynes's own theoretical framework.

Kaldor work on growth can be analytically separated into two distinctive phases (Targetti, 1991). The young Kaldor, so to speak, was interested in distribution, and his models assumed, as a reasonable *stylized fact* of the post-war period, that full employment was the norm.¹³ Kaldor's distribution models solved Harrod's knife-edge instability problem, which implied that an actual growth rate beyond the warranted rate of growth (and the natural or full employment growth) would lead to a persistent divergence and ever-higher prices. In the Kaldorian model, an increase of the rate of growth above the level compatible with the full employment of resources would lead to a rise in prices, and a reduction in real wages. Given that the propensity to save out of profits is higher than the propensity to save out of wages, the reduction in real wages would have a negative effect on effective demand, reducing the rate of growth to the level compatible with a stable distribution of income (Kaldor, 1955-6, p. 84).

In many respects, it might be argued that the Kaldorian distribution models remained within the confines of Say's Law, since they assumed full employment. However, Kaldor was a pragmatic theorist whose main methodological contribution to the critique of mainstream economics was the idea of *stylized facts*, broad regularities that models should incorporate and/or explain (Toner, 1999, p. 120). Thus, by the mid-sixties his concerns had turned to "the relatively slow rate of economic growth of Britain" (Kaldor, 1966, p. 282).

¹³ Targetti (1991, p. 411) suggests that Kaldor's works from 1957 to 1962 should be seen as substantially different from those developed in the late 1960s and the 1970s. The early models also assume free competition, and a one-sector economy, which would be abandoned in later models. The distinction between Kaldor's early and mature work on growth are also discussed in Vernengo and Rochon (2001).

The epistemological break occurred in 1966 with his famous inaugural lecture at the University of Cambridge on the causes of British economic decline (Kaldor, 1966).¹⁴ The mature Kaldor emphasizes the balance of payments constraint and its effects on labor productivity. The assumption of full employment is completely abandoned. The precise reasons for Kaldor's change of perspective are beyond the scope of our paper, but one can speculate that the loss of the international reserve position by the pound, and the ensuing problems associated with the balance of payments were central for the development of his demand-led models.¹⁵ Kaldor was mainly concerned that in Britain '...the maintenance of full employment might prove incompatible with a continued equilibrium in the balance of payments under a regime of fixed exchange rates' (Kaldor, 1971, pp. 497-8).

In this context, an essential element of the Kaldor mark II models is the adoption of the Hicksian supermultiplier.¹⁶ Kaldor (1971, p. 505) argued that investment was not an exogenous element of demand, following the acceleration principle, and that:

If we consider the problem in terms of the *growth rates* of demand, and not just in terms of the *levels* of demand, we can no longer treat the level of domestic investment as being autonomously determined; industrial investment will be all the greater the faster the demand for the products of industry is growing and the more fully its existing capacity is utilized (Kaldor, 1971, p. 505).

¹⁴ In the lecture, Kaldor suggested that labor shortage was the main cause of British sluggish growth, but as noticed by Thirlwall (1987, p. p. 85) he soon retracted that position arguing that the lack of export dynamism was behind the poor economic performance.

¹⁵ Also, one should not dismiss the influences of his teacher at the London School of Economics, Allyn Young, and his preoccupation with increasing returns, and his experience working with Gunnar Myrdal and Petrus Johannes Verdoorn at the Economic Commission for Europe (ECE), where he was introduced to the idea of cumulative causation and Verdoorn's econometric study. See Thirlwall (1987) for a discussion of these intellectual influences.

¹⁶ See Hicks (1950, p. 62).

The solution involves the multiplier and the accelerator principles ‘...lumped together, in the notion of a supermultiplier to gauge the true effect of an increase in exogenous demand’ (Kaldor, 1983, p. 195).¹⁷ The supermultiplier expresses the effect of autonomous spending on the level of output, taking into consideration the fact that productive capacity adjusts to demand.

In the sense that productive capacity is not fixed, the supermultiplier provides an apt extension of Keynes’s principle of effective demand to the long run. The supermultiplier implies that the *level* of output, when productive capacity is fully adjusted to demand, is determined by the autonomous components of demand. However, the *rate of growth* of the productive capacity limit remains exogenous to the model. In other words, if the Kaldorian model ended there, productivity would be exogenous, and one would fall on ‘...the usual hypothesis ... that the growth of productivity is mainly to be explained by the progress of knowledge in science and technology’ (Kaldor, 1966, p. 290).

The fundamental role of the KVL is to endogenize the rate of growth of labor productivity. The KVL suggests that there is a strong correlation between the growth of labor productivity and the rate of growth of economic activity.¹⁸ It is only with the KVL that the *rate of growth* rather than the *level* of the productive capacity limit is determined by autonomous demand. In that sense, the inflationary barrier, the capacity limit that if

¹⁷ For a more recent discussion of the supermultiplier see Bortis (1997) and Serrano (1995).

¹⁸ Verdoorn (1949, p. 59) argues that “in the long run a change in the volume of production, say about 10 per cent, tends to be associated with an average increase in labor productivity of 4.5 per cent.” The Verdoorn coefficient close to 0.5 is also found in Kaldor’s estimation of the law. Kaldor (1966, p. 289) reports a 0.484 coefficient.

exceeded would lead to inflation, is endogenously determined by demand. As autonomous demand expands, the capacity limit moves further away.¹⁹

This should not be interpreted as suggesting that demand-pull inflation cannot take place. If the rate of growth of demand outpaces the rate of growth of productivity the economy may very well hit the proverbial inflation barrier. In other words, the question of whether there will be a correlation between inflation and unemployment will depend on the size of coefficients, which might vary from period to period. It must be noted, also, that under certain conditions expansionary demand may be perfectly compatible with price stability, and with an inflation barrier that recedes as the economy grows.²⁰

Kaldor was interested in the relative decline of the UK and, as a result, measured the Verdoorn's Law in a cross-section of countries.²¹ He averaged out the rate of labor productivity and output growth between 1953-4 and 1963-4, and that was sufficient to deal with the cyclical fluctuation of both variables. This set the standards for the

¹⁹ It is interesting to note that at the same time that Kaldor was developing his model with a demand determined capacity limit the mainstream was reincorporating the idea of a very rigid supply constraint by incorporating Friedman's (1968) notion of a natural rate of unemployment, the analogous in the labor market to Wicksell's natural rate of interest that Keynes had dismissed. Most empirical models measure the natural rate of unemployment or the Non-Accelerating Inflation Rate of Unemployment (NAIRU) as dependent on the actual rate of unemployment, and as a result implicitly accept the notion that the demand policies that affect the current level of unemployment will affect the long-term unemployment level associated with stable inflation (e.g. Staiger, Stock and Watson, 2002). However, the theoretical justification for the inward shift of the Phillips Curve is often associated to changes in labor market behavior, i.e. the increasing use of temporary workers and greater labor market flexibility, which led to reduced labor force bargaining power (Katz and Krueger, 1999). In other words, the capacity limit is still seen as exogenous and dependent on the labor market dynamics.

²⁰ Also, inflation may arise from causes that are orthogonal to demand, for example cost-push pressures. In that sense, there is no reason to believe that there is a simple relation between the level of activity as reflected in by unemployment, for example, and inflation. There is, in the Kaldorian extension of the Keynesian model no reason for believing in a stable Phillips curve, or a vertical one, or even a horizontal one. But under different circumstances all of the above may occur even though there is no systematic force shaping the relation between quantities and prices.

²¹ This is the same procedure utilized by Verdoorn (1949).

discussion and analysis of the KVL. However, nothing indicates that the KVL is not operational over time in a given economy. The reason for using a cross section of countries and averaging out the data over relatively long periods seems to be related to the need of dealing with the trend effects of output on productivity. If one were to measure the KVL in time series one would have to separate cyclical and trend effects. In that case, one must deal with the cyclical properties of labor productivity and output.

It must be emphasized that the KVL when measured over time becomes intertwined with another well-known macroeconomic regularity, namely: Okun's Law. Okun argued that, in the United States, '...in the postwar period, on the average, each extra percentage point in the unemployment rate above four per cent has been associated with a three per cent decrement in real GNP' (Okun, 1962, p. 99).²² The relation implies that labor productivity, the ratio of output to employment is pro-cyclical. This suggests that the proper consideration of both regularities implies that Okun's Law deals with the cyclical characteristics of the relation between demand growth and labor productivity, while KVL is related to the trend or structural elements of the same relationship.

The incorporation of the KVL's effect into the long run supermultiplier model implies that not only employment and accumulation, meaning the level of full capacity output growth, but also the rate of change of the capacity limit, associated with productivity growth, is ultimately determined by demand forces. If the Sraffian critique of capital theory freed the Keynesian model of the notion of a natural rate of interest, and allowed a long run equilibrium with unemployment, the Kaldorian model incorporating

²² There is a second definition of the Okun's Law that relates unemployment to the gap between actual and potential output (Okun, 1962, p. 100). Jeon and Vernengo (2008) provide a simple empirical analysis of Okun and Verdoorn effects in the United States.

the supermultiplier and a theory of productivity growth provided a coherent alternative to the Ramsey-Solow-Lucas-Romer supply constrained approach to growth.

Concluding Remarks

Keynes believed that markets did not produce socially efficient outcomes, and that persistent unemployment could be a persistent characteristic of the economic system. The formal presentation of that idea was based on the principle of effective demand. Keynes emphasized that the novelty of his analysis, with respect to the marginalist model that preceded *The General Theory*, was that the level of income, rather than the rate of interest equilibrated investment and savings. For that reason he believed that the notion of a natural rate of interest should be abandoned.

The natural rate of interest is ultimately related to the marginalist theory of capital, and the notion of an inverse relation between investment and the rate of interest. For that reason, the understanding of the theoretical and empirical limitations of the neoclassical theory of capital, developed by Sraffa and his followers, is essential for providing support to Keynes's point about the possibility of unemployment equilibrium in the long run. The most successful adaptation of Keynes's ideas to the long run is based on the notion of a supermultiplier. Not only output is demand determined, but also capacity utilization adjusts to demand, according to supermultiplier models.

Yet, in these models the rate of change of the capacity limit is exogenous. Kaldor was instrumental in introducing the notion of Verdoorn's Law into supermultiplier models of economic growth. The central contribution associated to the interaction of demand-led growth models and the KVL is that they suggest that the capacity limit of the

economy is endogenous. In a sense, it can be suggested that the KVL provides the demand side explanation for a variable capacity limit. The lack of evidence for a stable natural rate of unemployment (e.g. Fair, 2000) suggests that, beyond the theoretical problems raised by the idea of the supply constraint, there is little empirical basis to use it as a guide for policy.

The policy implications of supermultiplier models that incorporate the KVL are pervasive, and they are the basis for the analysis of long-term Keynesian policies. For example, the current fears of fiscal expansionism and increasing budget deficits and public debt as a result of the so-called Great Recession are exaggerated, to say the least, according to this perspective. If excessive demand expansion had negative inflationary implications one would expect that a higher premium would be required for holding Treasury bonds. The fact, that this did not take place, or for example in the aftermath of the Great Depression and World War II when the debt-to-GDP ratio in the United States reached the level of approximately 120 percent, suggests that markets know better than mainstream economists.

In that sense, one might be tempted to believe that expanding demand is painless, and as some critics of long run Keynesian ideas would say, according to Keynesians we live in a world with no contradictions, in which full employment and better income distribution can be easily achieved. That is obviously far from the truth. However, the nature of the constraints faced by governments trying to expand demand is often misjudged. The two fundamental reasons for the inability to expand demand are, in the

case of most countries, in particular developing ones, the balance of payments, and the social conflict associated with changes in income distribution.²³

In the case of developing countries, that must import capital and intermediary goods in order to grow, demand cannot be expanded beyond its capacity to export, and obtain hard currency without incurring in external debt commitments. Even if international financial markets allow for growth beyond the current account limits in the short run, it must be noted that sooner or later exports would have to suffice not only to import the essentials for accumulation, but also to face the increasing demands of the debt burden. For no other reason debt crises are recurrent in developing countries.

Finally, in developed countries like the United States the balance of payments does not impose an overwhelming barrier to the expansion of demand. However, that does not imply that there are no limits to demand expansion. In fact, the recent financial crisis is a good example of the limitations that income distribution imposes on demand expansion. The ultimate causes of the crisis are associated to the significant changes over the last thirty years in income distribution, that have led to wage stagnation and increasing concentration of income and wealth at the top (Barba and Pivetti, 2009). In order to maintain their level of consumption most families have been forced to increase indebtedness in unsustainable levels, and as a result the American economy has been trapped in cycles of bubble driven booms with subsequent and increasingly deeper busts.

A more sustainable expansion of demand would require a significant change in income distribution patterns, but those, alas, are not easy to promote without significant political support. Before the economy reaches its supply constraint, several

²³ Kalecki (1943) warned about the use of unemployment as disciplining mechanism by the elites would lead to political business cycles.

contradictions impede the expansion of demand. Contrary to conventional wisdom demand management policies are fraught with conflict, and do not imply that we live in the best of all possible worlds.

References

- Akerloff, G.A. and R. Shiller (2009), *Animal Spirits*, Princeton, NJ: Princeton University Press.
- Amadeo, E. (1989), *Keynes's Principle of Effective Demand*, Aldershot: Edward Elgar.
- Barba, A. and M. Pivetti (2009), 'Rising Household Debt', *Cambridge Journal of Economics*, January, 33(1), pp. 113-37.
- Blomström, M., R. Lipsey, and M. Zejan (1996), 'Is Fixed Investment the Key to Economic Growth?', *Quarterly Journal of Economics*, 111(1), February, pp. 269-76.
- Bortis, H. (1997), *Institutions, Behavior and Economic Theory*, Cambridge: Cambridge University Press.
- Chirinko, R. (1993), 'Business Fixed Investment Spending', *Journal of Economic Literature*, 31(4), December, pp. 1875-1911.
- Colander, D. (1984), 'Was Keynes a Keynesian or a Lernerian?', *Journal of Economic Literature*, 22(4), December, pp. 1572-75.
- Davidson, P. (1982), *International Money and the Real World*, London: Macmillan.
- Dixon, R. J. and A. P. Thirlwall (1975), 'A model of regional growth rate differences on Kaldorian lines', *Oxford Economics Papers*, 27(2), July, 201-14.
- Dunlop, J. (1938), 'The movement of real and money wage rates', *Economic Journal*, 48(191), September, pp. 413-34.
- Fair, R. (2000), 'Testing the NAIRU Model for the United States', *The Review of Economics and Statistics*, 82(1), February, pp. 64-71.
- Fisher, I. (1933), 'The debt-deflation theory of great depressions', *Econometrica*, 1(4), October, pp. 337-57.
- Friedman, M. (1968), 'The Role of Monetary Policy', *American Economic Review*, 58(1), March, pp. 1-17.
- Hicks, J.R. (1937), 'Mr Keynes and the "Classics": A Suggested Interpretation', *Econometrica*, 5(2), April, pp. 147-59.
- Hicks, J.R. (1950), *A Contribution to the Theory of the Trade Cycle*, Oxford: Clarendon Press.
- Jeon, Y. and M. Vernengo (2008), 'Puzzles, Paradoxes and Regularities: Cyclical and Structural Productivity in the United States (1950-2005)', *Review of Radical Political Economics*, 40(3), Summer, pp. 237-43.
- Kaldor, N. (1955-6), 'Alternative theories of distribution', *Review of Economic Studies*, 23(2), pp. 83-100.

- Kaldor, N. (1966), 'Causes of the Slow Growth in the United Kingdom', in F. Targetti and A. P. Thirlwall (eds.), *The Essential Kaldor*, London: Duckworth, pp. 282-310.
- Kaldor, N. (1970), 'The case for regional policies', in F. Targetti and A. P. Thirlwall (eds.), *The Essential Kaldor*, London: Duckworth, pp. 311-26.
- Kaldor, N. (1983), 'Keynesian Economics after Fifty Years', in F. Targetti, F. and A. P. Thirlwall (eds.), *The Essential Kaldor*, London: Duckworth, pp. 164-98.
- Kalecki, M. (1943), 'Political Aspects of Full Employment'. In M. Kalecki, *Selected Essays on the Dynamics of Capitalist Economies, 1933-1970*, Cambridge: Cambridge University Press.
- Kalecki, M. (1944), 'Prof. Pigou on the Classical Stationary State: A Comment', *Economic Journal*, 54(213), April, pp. 131-2.
- Katz, L.F., A. B. Krueger, G. Burtless, and W. T. Dickens (1999), 'The High-pressure U.S. Labor Market of the 1990s', *Brookings Papers on Economic Activity*, 30(1), pp. 1-87.
- Keynes, J. M. (1936), *The General Theory of Employment, Interest and Money*, London: Macmillan.
- Keynes, J. M. (1971-89), *The Collected Writings of John Maynard Keynes*, London: Macmillan/Cambridge University press for the Royal Economic Society.
 Vol. XIII: *The General Theory and After. Part I, Preparation*
 Vol. XIV: *The General Theory and After. Part II, Defense and Development*
 Vol. XXVII: *Activities 1940–1946: Shaping the Post-War World: Employment and Commodities*
- Modigliani, F. (1944), 'Liquidity Preference and the Theory of Interest and Money', *Econometrica*, 12(1), January, pp. 45-88.
- Leijonhufvud, A. (1968), *On Keynesian Economics and the Economics of Keynes*, New York: Oxford University Press.
- Minsky, H.P. (1975), *John Maynard Keynes*, New York: Columbia University Press.
- Okun, A.M. (1962), 'Potential GNP: Its Measurement and Significance', American Statistical Association, *Proceedings of the Business and Economics Statistics Section*, pp. 98–104.
- Patinkin, D. (1956), *Money, Interest and Prices*, Evanston, IL: Row, Peterson.
- Patinkin, D. (1987), 'Real Balances,' in J. Eatwell, M. Milgate, and P. Newman, (eds.) *The New Palgrave Dictionary of Economics*, London: Macmillan, pp. 98-101.
- Petri, F. (2003), 'A Sraffian Critique of General Equilibrium Theory, and the Classical-Keynesian Alternative,' in F. Petri and F. Hahn, F., (eds.) *General Equilibrium: Problems and Prospects*, New York: Routledge, pp. 387-421.
- Pigou, A. (1943), 'The Classical Stationary State', *Economic Journal*, 53(212), December, pp. 343–51.
- Pivetti, M. (1985), 'On the monetary explanation of distribution', *Political Economy*, 1, pp. 73–103.
- Pollin, R. (2003), *Contours of Descent: US Economic Fractures and the Landscape of Global Austerity*, London: Verso.
- Rubin, G. (2002), 'From equilibrium to disequilibrium: the genesis of Don Patinkin's interpretation of the Keynesian theory', *European Journal of History of Economic Thought*, 9(2), pp. 205-25.

- Serrano, F. (1995), 'Long Period Effective Demand and the Sraffian Supermultiplier', *Contributions to Political Economy*, 14 (1), January, pp. 67-90.
- Sraffa, P. (1960), *Production of Commodities by Means of Commodities*, Cambridge: Cambridge University Press.
- Staiger, D., J. Stock, and M. Watson (2002), 'Prices, Wages and the U.S. NAIRU in the 1990s', in A. Krueger A. and R. Solow (eds.), *The Roaring Nineties*, New York: Russell Sage Foundation, pp. 3-60.
- Targetti, F. (1991), 'Change and Continuity in Kaldor's Thought on Growth and Distribution,' in E. J. Nell, E.J. and W. Semmler (eds.), *Nicholas Kaldor and Mainstream Economics*. New York: St. Martin's Press, pp. 411-20.
- Tarshis, L. (1939), 'Changes in real and money wages', *Economic Journal*, 49(193), March, pp. 150-4.
- Tily, G. (2006), 'Keynes's theory of liquidity preference and his debt management and monetary policies', *Cambridge Journal of Economics*, 30(5), September, pp. 657-70.
- Thirlwall, A.P. (1987), *Nicholas Kaldor*, New York: NYU Press.
- Toner, P. (1999), *Main Currents in Cumulative Causation*, New York: St. Martin's Press.
- Verdoorn, P.J. (1949), 'Fattori che regolano lo sviluppo della produttività del lavoro', *L'industria*, 1, pp. 3-10.
- Vernengo, M. (2001), 'Sraffa, Keynes and "The Years of High Theory"', *Review of Political Economy*, 13(3), pp. 343-54.
- Vernengo, M. and L. P. Rochon (2001), 'Kaldor and Robinson on money and growth', *European Journal of the History of Economic Thought*, 8(1), pp. 75-103.