

## KEYNESIAN THEORIES OF GROWTH

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### 1. Introduction

This paper outlines the content of a Keynesian approach to the theory of growth. While for other established traditions it is possible to talk of a theory of growth described by some specified models and contributions<sup>2</sup>, for the Keynesian tradition it is only possible to identify a group of different theories, which share the view that the economic system does not tend necessarily to full employment and that the autonomous components of demand may affect the rate of growth of the economy.

As far as we know, there is no essay in the recent literature, which tries to reconstruct the content of a Keynesian approach to growth by describing the different lines of development, which have historically emerged. In what follows an attempt will be made to do so.

The paper is organised as follows. Section 2 attempts to outline a unifying framework for Keynesian theories of growth, trying to derive it from the analyses proposed by the founder of modern growth theory, Roy Harrod. Section 3, 4 and 5 deal with the analyses underlining the influence on growth of three autonomous components of effective demand, coming from the Government sector, the private sector, in the form of autonomous investment, and the foreign sector. Section 6 deals with a different group of Keynesian theories, underlining the relevance of increasing returns, cumulative causation and unbalanced movements in the process of growth. Section 7 draws some conclusions.

### 2. Harrod and the formation of a Keynesian framework for growth theory.

According to Varri (1990, p. 9), Harrod's contributions to growth have received less attention than they deserve. Recently, however, some works<sup>3</sup> have reconsidered his writings, taking advantage of the availability of his papers at the Chiba University of Commerce in Ichikawa (Japan) and clarifying the extent to which some of his writings have been misrepresented. They have denied, in particular, the view that Harrod's efforts to develop a theory of growth and dynamics were stimulated by his work on imperfect competition and his dissatisfaction with the

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<sup>2</sup> The model proposed by Solow (1956) describes the neoclassical theory of growth. For the classical tradition one can refer to the analyses proposed by Pasinetti (1960) and by Samuelson (1978). The analyses presented by Barro and Sala y Martin (1995) give the main elements of the New Growth Theories.

<sup>3</sup> See Young (1989) and Besomi (1999).

Austrian trade cycle theory put forward by Hayek.<sup>4</sup> Moreover, they have confirmed the limits of the widespread belief that Harrod developed his analysis of growth, by assuming absence of monetary influences and fixed technical coefficients and saving propensity, in order to establish the famous "knife-edge problem".<sup>5</sup>

In opposition to the first view, Young (1989, pp. 15-50) has clarified that Harrod's efforts to develop a theory of growth and dynamics were mainly stimulated by his contacts with Keynes. These began in 1922, when Keynes invited Harrod to study economics in Cambridge under his supervision.<sup>6</sup> One year later, having read *A Tract on Monetary Reform*,

Harrod took up Keynes's call for deeper research into the problems of the 'credit cycle', and over the next few years produced a number of essays on the subject. In these Harrod focused on the theoretical basis for - and policy options related to - issues raised by Keynes in the *Tract*. (Young, 1989, p. 16)

According to Young, in these essays, some of which were never published, Harrod dealt with a problem that was central in Keynes's and in other works of the time. This literature, moving from the idea that the economic system is stable and that negative influences on fluctuations only come from monetary and credit factors, tried to identify a "neutral" policy, i.e. a policy that can prevent monetary and credit disturbances from amplifying the fluctuations of the economy.

In those years Harrod also paid attention to Keynes's proposals for Government interventions.<sup>7</sup> According to Phelps Brown (1980, pp. 13 and 18), Harrod first heard Keynes's proposals at the Liberal Summer School of 1924. Since then, he closely followed Keynes's intellectual activity on this subject<sup>8</sup> and after the great depression he actively supported his proposals.<sup>9</sup> By that time, Harrod had come to recognise the need for deep political and theoretical changes.<sup>10</sup> As Young (1989, pp. 30-38) points out, in an unpublished paper, written in 1933, Harrod stated that the great depression had posed a new problem to economists and politicians. The previous recessions had not led the economy too far from full employment, nor had they cast doubts on the belief that the economy is able to return to it. The severity of the great depression had

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<sup>4</sup> This interpretation was proposed by Kregel (1980 p. 98; 1985, pp. 66-67)q

<sup>5</sup> The major reference for the "knife-edge" interpretation is Solow (1956; 1970). For the opposite interpretation, see Eisner (1958), Asimakopulos and Weldon (1965), Kregel (1980), Asimakopulos (1985).

<sup>6</sup> See Phelps Brown (1980, pp. 7-8).

<sup>7</sup> 'During the 'twenties many of us were deeply interested in Keynes's advocacy of measures to promote fuller employment'. (Harrod, 1967, p. 316)

<sup>8</sup> According to Phelps Brown, Harrod constantly followed Keynes's work for the Liberal Party, with his contributions to the Yellow Book of 1928 and the defense of Lloyd George's proposal for public works. At the same time, Phelps Brown says, he closely followed Keynes's academic work, as he did in summer 1926, when he spent a fortnight with Maynard and Lydia at Tilton, while Keynes was working on the galleys of the *Treatise*.

<sup>9</sup> Phelps Brown (1980, p. 19) points out that since 1932, Harrod wrote several letters to *The Times*, in favour of Keynes's proposals.

<sup>10</sup> Young (1989, p. 30) quotes Harrod (1971, p. 77) to claim that 1933 marked a turning point in the theoretical work of the Oxford economist on this subject.

changed this situation. It had put in danger political stability and raised the problem both of a new political approach and of a new economic theory able to clarify whether market forces can lead the economy towards full employment or Government intervention is required to restore it. As a first contribution to these problems Harrod published in 1933 *International Economics*. This book, as Young (1989, pp. 38-39) points out, sets the lines of analysis that Harrod developed in the following years. In *International Economics* and in his 1936 *The Trade Cycle*, he moved from Keynes's *Treatise*<sup>11</sup> to focus on the cyclical fluctuations of the economy around a line of steady growth. His aim was to point out that competitive market forces may widen the gap between actual and equilibrium growth, independently of the destabilising influences of monetary and credit factors, which had been underlined by the literature up to that time. In his 1939 essay on dynamics, again stimulated by the discussions with Keynes<sup>12</sup>, Harrod focused instead on the equilibrium paths of the economy and on the factors determining the "warranted" and the "natural" rates of growth. This study represented 'a preliminary attempt to give an outline of a "dynamic" theory' (Harrod, 1939, p. 254) and 'a necessary propaedeutic to trade-cycle study' (Harrod, 1939, p. 263).

It moved from the condition of equilibrium of the commodities' market. In the most simplified case, that of an economic system without Government intervention and close to non-residents, this condition is represented by the equality between saving and investment decisions. In the formal presentation of his analysis, the saving propensity was taken as given. Yet, Harrod (1939, p. 276) made some reference to the influence of the interest rate on the propensity to save and, in his following writings, he recalled the possibility of using Ramsey's intertemporal approach to fund this part of his analysis.<sup>13</sup> The equation relative to investment, which introduces, according to some authors<sup>14</sup>, the major difference with other traditions, assumes that investment decisions are taken independently of saving decisions and are not generated by them. They depend on the "acceleration principle" and on the degree of utilisation of capital equipment, along the following lines:

$$(2.1) \quad i = v g^* + f(g - g^*_{-1})$$

with  $f(0) = 0$  and  $f' > 0$

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<sup>11</sup> See Young (1989, pp. 48-50).

<sup>12</sup> See the discussion on *The Trade Cycle*, presented in volume XIV of *The Collected Writings of J.M. Keynes*.

<sup>13</sup> See Harrod (1948, p. 40; 1964, pp. 903 and 905-906). The similarity between Harrod's and Ramsey's analysis of saving is underlined by Asimakopulos and Weldon (1965, pp. 66). Harrod (1973, p. 20) also clarifies that 'what each person chooses in regard to saving is governed by various institutional arrangements, which differ from country to country and from time to time. There is the question of what the State will provide for future contingencies - old age, ill health, unemployment, etc. - by current transfer payments as and when they arise. The more ground that the State covers, the less will the individual feel it incumbent to provide for himself by saving. Personal saving will also be affected by the degree the education of one's children is subvented by the public authorities'.

<sup>14</sup> See Sen (1970, pp. 11 and 23) and Asimakopulos and Weldon (1965, p. 67)

where:

$i$  represents the ratio between investment and the net output of the economy;

$g^*$  the current period expected rate of growth of output;

$g^*_{-1}$  the previous period expected rate of growth;

$g$  the current period rate of growth;

$v$  the equilibrium capital/output ratio;

Harrod used his analysis to study the "warranted" rate of growth ( $g_w$ ), defined as that equilibrium rate which allows the normal utilisation of capital equipment.<sup>15</sup> He assumed that, along the warranted equilibrium path, expectations are realised ( $g^*_{-1}=g$ ) and the expected rates of growth are equal to the warranted rate ( $g^*=g^*_{-1}=g_w$ ). The following equations were thus used for the analysis of the warranted rate:

$$(2.2) \quad s = v g_w$$

$$(2.3) \quad v = v(r)$$

with  $v' < 0$

$$(2.4) \quad r = r_0$$

where:

$s$  represents the average propensity to save of the economy;

$r$  the rate of interest.

The introduction of equation (2.3) and (2.4) points out, in opposition to a widespread view, that Harrod did not develop his analysis of growth by assuming absence of monetary influences and fixed technical coefficients. Equation (2.4) assumes that the rate of interest depends on the conduct of monetary policy, which, according to Harrod, operates by stabilising this rate at some specified level.<sup>16</sup> Equation (2.3) recognises the possibility of substitution between factors of production. Harrod admitted the existence of decreasing marginal returns<sup>17</sup>, but considered that this kind of substitution was low, following the results reached by the Oxford Research Group, in which he actively participated.

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<sup>15</sup> According to Harrod (1939, p. 264), the warranted rate is that rate that, if it occurs, leaves producers satisfied, in the sense that for them 'stock in hand and equipment available will be exactly at the level they would wish to have them'.

<sup>16</sup> Harrod (1948, p. 83) points out that his analysis of the warranted rate assumes the rate of interest constant. He referred to the realism of Keynes's view on the behaviour of the interest rate (pp. 64-65), agreeing that this rate may be rigid (pp. 56-57) and unable to decrease in such a way as to lead to full employment (pp. 70-71; 83-84; 97; 99).

<sup>17</sup> See Harrod (1939, pp. 258, 259 and 276). On page 276, in particular, Harrod explicitly referred to an inverse relationship between  $v$  and  $r$ . In the Thirties the neoclassical assumption of decreasing marginal returns was generally accepted. Sraffa's critique of the neoclassical theory of capital had not yet been presented. Within Sraffa's papers, the first written evidence of this critique is dated 1942. (See Panico, 1998, p. 177, fn. 55; and Panico, 2001, pp. 300 and 308-309 fn. 59, 60 and 61). As is known, it was published in 1960 and discussed at length in the following decade.

From equation (2.2) one can derive

$$(2.5) \quad g_w = s/v.$$

The study of the "warranted" rate was for Harrod a preliminary part of the analysis of the dynamic behaviour of the economy, which in 1939 was presented through the following steps.

The first step dealt with the forces that start to operate as soon as the economy gets out of equilibrium and expectations are not realised. According to Harrod (1939, pp. 263-267), when the rate of growth differs from the equilibrium warranted rate, some centrifugal forces operate. If the former exceeds the latter, capital equipment is utilised above its normal level, inducing entrepreneurs to increase their investment decisions, as pointed out by equation (2.1). In the opposite case, capital equipment is utilised below its normal level, inducing entrepreneurs to reduce investment decisions. In both situations, the rate of growth will be pushed further away from the warranted level. This description was considered by Harrod (1939, pp. 263-264) equivalent to that developed by static theory when it is assumed that the market price exceeds (is lower than) the equilibrium price and the appearance in that market of an excess supply (an excess demand) tends to restore equilibrium. These descriptions, unlike the "cobweb" analysis in the traditional supply and demand theory, do not represent a dynamic analysis of disequilibrium. They just point out in an informal way that some centrifugal or centripetal forces come into operation as soon as disequilibrium occurs.

Most literature has interpreted this part of Harrod's work as the outcome of a dynamic analysis of stability. Sen (1979, p. 14), for instance, after pointing out that Harrod's analysis only deals with the initial elements of this problem and can be compatible with different analytical developments, criticised his conclusions.

There are many other ways in which Harrod's somewhat incomplete model can be completed. Some confirm instability, while others either eliminate it or make it conditional on certain actual circumstances. In general, it will be fair to say that Harrod's instability analysis over-stresses a local problem near the equilibrium without carrying the story far enough, and extensions of his model with realistic assumptions about the other factors involved tend to soften the blow. (Sen, 1970, p. 14)

Already in 1939, however, Harrod had stated that his analysis did not give a complete account of the problem, suggesting some lines along which a dynamic analysis of the behaviour of the system can be developed.

Space forbids an application of this method of analysis to the successive phases of the trade cycle. In the course of it the values expressed by the symbols on the right-hand side of the equation undergo considerable change. As the actual growth departs upwards or downwards from the warranted level, the warranted rate itself moves and may chase the actual rate in either direction. The maximum rates of advance or recession may be expected to occur at the moment when the chase is successful. (Harrod, 1939, pp. 271-272)

Moreover, in the subsequent years, Harrod (1948, p. 99) first claimed that he was reluctant to enter the field of the dynamic analysis of disequilibrium without developing the analysis of the equilibrium warranted path, which, according to him, had a higher degree of generality.<sup>18</sup> Then, he rejected the view that his aim had been to raise a "knife-edge problem"<sup>19</sup> confirming that he had only tried to underline the existence of some centrifugal forces coming in operation as soon as the economy gets out of equilibrium. The reference to these forces did not exclude the existence of others forces, producing stabilising effects, which have to be analysed by considering, according to Harrod, that the "natural" rate of growth represents the "ceiling" limiting the expansion of the economy.

The second step of the analysis proposed by Harrod (1939) to study the dynamic behaviour of the economy considered the existence of forces pushing the "warranted" rate of growth towards the "natural" rate. This part of Harrod's work was based on his assumptions on substitution between factors of production and on the determination of the interest rate. As said above, introducing equations (2.3) and (2.4), Harrod did not deny the existence of substitution between factors of production, but considered that it occurred in a low degree. After 1939, this idea was often restated: he claimed, with increasing emphasis, that he was skeptical on the possibility of reaching full employment through reduction of the interest rate.<sup>20</sup> Moreover, he confirmed that the rate of interest tends to show some rigidity, since it depends on the conduct of monetary policy, which, according to Harrod, operates by stabilising this rate at some specified level.<sup>21</sup> This view of the interest rate, which also took into account the attempts of the monetary authorities to maintain the equilibrium of the balance of payments<sup>22</sup>, raises the problem of the links between the theory of growth and that of distribution, since it was associated in Harrod's writings with the idea that a persistent change in this rate leads to a similar variation in the rate of profit.<sup>23</sup> The analysis of this problem, however, was little developed by the Oxford

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<sup>18</sup> Dealing with his analysis of the equilibrium warranted path, Harrod claimed: 'I know of no alternative formulation, in the world of modern economic theory, of any dynamic principle of comparable generality. We must start with some generality however imperfect. We shall never go ahead if we remain in a world of trivialities or fine points. It is useless to refine and refine when there are no basic ideas present at all' (Harrod, 1948, pp. 80-81).

<sup>19</sup> As to the "knife-edge problem" Harrod stated: 'Nothing that I have ever written (or said) justifies this description of my view'. Harrod (1973, p. 31; but see also pp. 31-45).

<sup>20</sup> See Harrod (1948, pp. 132-133, 137-138 and 144; **1960, pp. 227-228; 234 and 237 Italian edition;** 1964, pp. 910-913; 1973, pp. 68, 78, 80, 102). It should be noticed too that, after 1960, Harrod thought that the major influence of the interest rate on investment is through the availability of finance, owing to the fact that the credit markets are imperfect (information are asymmetrically distributed) and tend to react to the shortage or availability of credit (see Harrod, **1960, pp. 227-228 and 249 Italian edition;** 1964, pp. 912-913; 1973, pp. 44, 61, 179).

<sup>21</sup> See Harrod (1948, pp. 99-100; 1973, p. 67).

<sup>22</sup> See Harrod (1969, pp. 178 and 191; 1973, p. 75)

<sup>23</sup> 'Sustained low interest will presumably in the long run reduce the normal profit rate' (Harrod, 1973, p. 111). And again: 'If the market rate of interest rises considerably and stays up for a substantial period, ... that may cause firms to increase the mark-up' (Harrod, 1973, p. 44, but see also, p. 78).

economist, who focused instead on the conclusion that one cannot rely on the belief that the spontaneous operation of market forces always leads the economic system towards full employment.

This conclusion led to the third step of analysis relative to the role of effective demand and Government policy on growth. Harrod (1939) pointed out that the warranted rate could be influenced by three different components of effective demand coming from the Government sector, the private sector, in the form of autonomous investment, and the foreign sector. In 1939 he gave some initial formal account of how these three sources of demand can affect the equilibrium path of the economy.<sup>24</sup> Then, he focused on the Government sector and considered how policy can be used to stabilise the economy and to achieve higher growth and employment. To sum up, the recent studies on Harrod's papers clarify that his seminal work on growth theory and dynamics was conceived as an extension of Keynes's analysis to a long-period context.<sup>25</sup> It developed the view that the economic system does not tend necessarily to full employment and that the autonomous components of demand may affect the rate of growth of the economy. His theory can thus be considered a prototype of a Keynesian approach to this problem, which outlines a framework that much literature within this tradition has subsequently adopted.

### **3. The influence of the government component of aggregate demand**

The need to take into account the influence of Government activity on growth was pointed out by Harrod since 1939, where he also gave some initial formal account of how this source of demand can affect the equilibrium growth path of the economy.<sup>26</sup> For him, Government policies have to be used both to stabilise the economy and to achieve higher growth.

Policy in this field is usually appraised by reference to its power to combat tendencies to oscillations. Our demonstration of the inherent instability of the dynamic equilibrium confirms the importance of this. But ... in addition to dealing with the tendency to oscillation when it occurs, it may be desirable to have a long-range policy designed to influence the relation between the proper warranted rate of growth and the natural rate. (Harrod, 1939, p. 275).

In 1939 Harrod claimed that both fiscal policy and variations in the long-term interest rate have to be used to pursue this long-range objective, adding that the latter are more appropriate than the former to this aim. The bank rate policy can be used instead to combat the runaway forces of the economy.

If permanent public works activity and a low long-term rate availed to bring the proper warranted rate into line with the natural rate, variations in the short-term

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<sup>24</sup> See Harrod (1939, pp. 269-274).

<sup>25</sup> The studies recently made on Harrod's papers thus also clarify why he claimed that the time will prove that Keynes's greatest contribution to economics is that of generating the dynamic theory of growth which the Oxford economist had proposed since 1939.

<sup>26</sup> See Harrod (1939, pp. 269-270 and 275).

rate of interest might come into their own again as an ancillary method of dealing with oscillations (Harrod, 1939, p. 276).<sup>27</sup>

This position was maintained in Harrod (1948, pp. 74-75 and 117-122), where he again identified fiscal policy with "public works". In the subsequent writings these ideas were revised, claiming that it was advisable to rely on fiscal, rather than on monetary policy, to affect the equilibrium warranted path of the economy, so as to bring it close to the natural path, and to conduct fiscal policy by changing the tax rates while keeping Government expenditure constant.

This new position was clearly presented in Harrod (1964 and 1973), where he also recalled that the conduct of policy is difficult owing to the complexity of the objectives to be achieved (Harrod, 1964, pp. 913-915) and to the fact that

even if the authorities had succeeded in maintaining a steady growth rate ... for a substantial period of time - a state of affairs not yet realised - and there was general confidence that their success would continue, this would not relieve the entrepreneur of his major uncertainties ... Entrepreneurs usually have to cast their bread upon the water. (Harrod, 1964, p. 907)

He proposed to use the equilibrium condition of the commodity market to study how Government policy has to be applied and suggested to deal with this equation by taking the natural rate of growth as given, i.e. as the objective that the long-term policy has to pursue. Harrod considered Government intervention necessary<sup>28</sup>, arguing that this view was becoming increasingly popular.

In the spectrum of countries ranging from individualism to socialism, the U.S.A. may be regarded as being at or near the individualist end. But even in that country 'monetary' and 'fiscal' policies are regarded as legitimate weapons of government, including the central bank. These policies serve to doctor the saving ratio and to provide enough, neither more nor less, to maintain reasonably full employment and growth in accordance with the growth potential of the economy. (Harrod, 1973, pp. 28-29; see also 1964, p. 906)

He also underlined that the traditional position, which confines the use of these policies only 'to ironing out the business cycle', 'implies too narrow a view of the duties of the authorities' (Harrod, 1973, p. 29).

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<sup>27</sup> Harrod (1964, p. 908) gave a somewhat different account of this point: 'In the concluding pages of my first "Essay" I did recognise that there were two distinct problems of policy, namely: (i) the short-term one of preventing deviations from a steady growth rate, and (ii) the long-term one of bringing the warranted rate into line with the natural growth rate. I recognised that, if the warranted rate was not equal to the natural rate - and there is no reason why it should be - difficulties would inevitably arise. Thus, policy was required to bring them together. My remarks on this subject were admittedly very sketchy. I suggested that the long-term interest rate might be used to make the warranted rate adhere more closely to the natural rate, while "public works" (nowadays "fiscal policy") and the short-term rate of interest should be used to deal with short-term deviations. All this was very loose. The existence of the double problem was, however, recognised'.

<sup>28</sup> See Harrod (1973, p. 45).



Finally, he claimed that fiscal policy was appropriate to achieve this long-term objective.<sup>29</sup> It should be used by varying the tax rates while keeping government expenditure constant.<sup>30</sup> Monetary policy was suitable instead to deal with what he defined the short-term policy objective of correcting the divergence of the actual rate from the warranted rate and stabilising the fluctuations of the economy. Temporary variations in the short-term rate of interest, he said, operate through their effects on the availability of credit in the markets (i.e. credit rationing).<sup>31</sup> On the other hand, permanent variations in the interest rate tend to be more effective in causing similar variations in the rate of profit than in changing the capital-output ratio.<sup>32</sup>

The formal analysis used by Harrod to deal with these views was limited. It can be developed as done in equation (3.1) below, which follows his proposal to study how to apply Government policy by using the equilibrium condition of the commodities' market, which in this case takes the form "saving plus taxation is equal to investment plus Government expenditures".

$$(3.1) \quad s(1 - t + rb) + t = vg + e + rb$$

where:

- s is the propensity to save of the private sector ( $0 < s < 1$ );
- t is the average tax rate, defined in terms of the net output of the economy ( $0 < t < 1$ );
- r is the interest rate on Government bonds;
- b is the amount of Government bonds in circulation, measured in terms of the net output of the economy ( $b \geq 0$ );
- v is the capital-output ratio ( $v > 0$ );
- g is the rate of growth of the economy;
- e is the amount of Government's expenditure on goods and services, measured in terms of the net output of the economy ( $e \geq 0$ ).

As Harrod suggests, this equation can be used either to study the factors affecting the warranted rate of growth (in this case, g is taken as unknown, while r and the policy parameters t and e are taken as given) or to analyse how fiscal policy has to be applied to maintain reasonable full employment or growth in accordance with the potential of the economy (in this case, g is taken as given at its natural level, while one policy parameter, say t, is considered unknown).

From equation (3.1) one can derive

$$(3.2) \quad g = [s(1 - t + rb) + t - e - rb]/v$$

where  $dg/dt > 0$

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<sup>29</sup> See Harrod (1964, p. 906; 1973, pp. 102-103, 173 and 177)

<sup>30</sup> See Harrod, (1973, p. 107)

<sup>31</sup> See Harrod (1964, pp. 912-913; 1973, pp. 178-179).

<sup>32</sup> See Harrod (1973, pp. 44, 78 and 111).

It can be noticed that variations in the tax rate keep affecting growth even in the simplified case of a balanced Government budget and absence of Government bonds ( $t=e>0$  and  $b=0$ ), when equation (3.2) becomes

$$(3.3) \quad g = s(1-t)/v$$

where  $dg/dt < 0$ .

This effect does not depend on the influence of variations in  $t$  on the propensity to save and on the capital-output ratio.<sup>33</sup>

The presence of Government debt and the interest rate in equation (3.2) raises the problem of the relationships between growth and distribution and between monetary and fiscal policy. Only the former problem, as is known, occupies a central place in the original development of the post Keynesian theory of growth and distribution.<sup>34</sup> Kaldor's 1958 Memorandum to the Radcliffe Committee, however, considers both problems simultaneously.

The Memorandum describes how Government policy can affect stability and growth. It argues that monetary policy has to stabilise the short-term interest rates in order to avoid some 'undesirable consequences'. The instability of the interest rates enhances financial speculation and reduces the ability of the markets to convey financial resources towards productive enterprises. Moreover, it raises the risk premium to be paid on loans of longer maturity and leads to higher long-term interest rates. Higher long-term interest rates, in turn, make the management of Government debt difficult. Moreover, they increase the probability that firms may not be able to pay back their loans, making lending institutions and financial markets more fragile. Finally, they tend to cause economic stagnation.

To justify the tendency to stagnation Kaldor made explicit reference to his theory of growth and distribution and to what is known as the "Cambridge equation".

In a steadily growing economy the average rate of profit on investment can, in the first approximation, be taken as being equal to the rate of growth in the money value of the gross national product divided by the proportion of profit saved ... To keep the process of investment going, the rate of profit must exceed the (long-term) interest rates by some considerable margin. (Kaldor, 1958, pp. 137-138)

A monetary policy causing unstable interest rates raises the long-term rates to a level considered by investors too high to keep accumulation going. Under these circumstances, stagnation prevails, unless the rate of profit is raised too. According to Kaldor, this can be done through fiscal policy.

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<sup>33</sup> Some recent contributions to the New Growth Theories consider, instead, the influence of Government intervention on growth, be it a change in taxation or in expenditure, through its effect on the propensity to save and on the capital-output ratio. See Barro (1990).

<sup>34</sup> In his seminal contribution Kaldor (1955-56, p. 98) explicitly recognised the need to deal with the State in the analysis of steady growth conditions. Yet, like other authors, he failed to do so in most of his later work.

If the rate of interest were higher than [the level that keeps investment going], the process of accumulation would be interrupted, and the economy would relapse into a slump. To get it out of the slump it would be necessary to stimulate the propensity to consume - by tax cuts, for example - which would raise the rate of profit and thus restore the incentive to invest. (Kaldor, 1958, p. 138)<sup>35</sup>

The post Keynesian theory of growth and distribution, to which Kaldor greatly contributed, differs from Harrod's growth theory for the introduction of the saving propensities of different income groups and for the role attributed to distributive shares in restoring equilibrium conditions. According to some literature, this part of Kaldor's work departs from the Keynesian tradition, since it does not reject the idea that market economies tend to full employment.

Kaldor's Memorandum to the Radcliffe Commission does not confirm this allegation. It shows many similarities with the views proposed by Harrod and the rest of Keynesian tradition on the role of Government policy. First of all, Kaldor considered Government policies necessary to pursue stability and growth. Secondly, he thought that Government policies have to deal with a complex set of objectives, which are interrelated - and often incompatible - among them.<sup>36</sup> Thirdly, for Kaldor, monetary policy is the appropriate tool against the fluctuations of the economy, while it is advisable to use fiscal policy to pursue the long-range objective of sustained growth.<sup>37</sup> Fourthly, when he advocated fiscal policy Kaldor referred to variations in the tax rate, rather than to variations in the level of Government expenditure. Finally, like Harrod, Kaldor proposed to use the equilibrium condition of the commodities' market to deal with these problems and referred to it either to determine the growth path of the economy (considering the rate of growth as unknown and the interest rate, the tax rate and Government expenditure as given) or to determine the intensity of fiscal policy appropriate to the achievement of a specific rate of growth (considering one policy parameter - the tax rate - as unknown and the rate of growth as given).

Kaldor did not present his positions on the role of Government policy in a formalised way. Nor can such a treatment be found in other literature of that time. His reference to the Cambridge equation must then be considered, as he himself stated, a first approximation rather than the result of a thorough treatment of this problem. The first formal presentation of the post Keynesian theory of growth and distribution, which explicitly introduced the Government sector, was provided by Steedman (1972). This article proved that in an analysis that assumes a balanced Government budget and no outstanding bonds, the Cambridge equation holds in a larger number of cases than the "dual theorem" of Modigliani and Samuelson. Some years later,

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<sup>35</sup> According to Kaldor (1958, pp. 136-137), the drawback of this solution is that in time of inadequate demand the Government gradually transforms the economy into one of high consumption and low investment, with the undesirable consequences on long-run growth, which will be described in Section 6 below.

<sup>36</sup> See Kaldor, 1958, pp. 135-137.

<sup>37</sup> See Kaldor, 1958, pp. 141-142.

Fleck and Domenghino (1987), who challenged the validity of the Cambridge equation when the Government budget is not balanced stimulated an intense debate on this subject. The debate has examined a large number of cases, showing when the Cambridge equation holds and confirming the conclusion that Steedman had previously reached.<sup>38</sup>

The results of the debate can point out how the views on the role of Government policy that Kaldor presented in the Memorandum to the Radcliffe Commission can be formally developed and clarify some features of his proposals. Let's consider the case examined by Denicolò and Matteuzzi (1990), in which the Cambridge equation holds. It refers to a closed economy with two classes (workers and capitalists)<sup>39</sup>, where the Government sector finances its budget through the issue of bonds and the private sector finances its productive activity through the sale of shares to other components of the private sector. Capitalists do not work: they earn their income through the returns of their wealth. Moreover, the two classes have different saving propensities, can invest their wealth in shares representing real capital and in Government bonds, and have the same portfolio structure.<sup>40</sup> To study what are the conditions allowing steady growth, we must specify the equilibrium condition in the commodities' market, the dynamic equilibrium conditions between the savings of the two classes and the growth of their wealth, and the dynamic equilibrium condition between the Government budget and its debt. These conditions can be written as follows:

$$(3.4) \quad s_c (1-t) \alpha (r_b b + r_k v) + s_w (1-t) [1 + r_b b - \alpha (r_b b + r_k v)] + t = g v + e + r_b b$$

$$(3.5) \quad s_c (1-t) \alpha (r_b b + r_k v) = g \alpha (b+v)$$

$$(3.6) \quad g b = e + r_b b - t$$

where:

$s_c$  is the propensity to save of the capitalist class ( $0 < s_c < 1$ );

$t$  the tax rate ( $0 < t < 1$ ), which is assumed to be the same on all forms of income;

$\alpha$  the quota of wealth own by the capitalist class ( $0 < \alpha < 1$ );

$s_w$  the propensity to save of the working class ( $0 < s_w < s_c$ );

$r_b$  the rate of interest on bonds;

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<sup>38</sup> In this debate, Pasinetti (1989a; 1989b) and Dalziel (1989; 1991a,b; 1991-92) examine the validity of the Cambridge equation by introducing into the analysis the Ricardian debt/taxation equivalence. Denicolò and Matteuzzi (1990) and Panico (1992; 1993; 1997; 1999) consider the same topic by introducing into the analysis the existence of financial assets issued by the Government. Commendatore (1994; 1999a), instead, compares the limits of validity of the dual and the Pasinetti theorem.

<sup>39</sup> Denicolò and Matteuzzi (1990) deal with the so-called "personal" version of the post Keynesian theory of growth and distribution. It can be noticed, however, that the debate has considered different versions of the post Keynesian theory of growth and distribution: the personal version, in terms of classes, the functional version, in terms of income groups, and the institutional version, in terms of sectors of the economy. See Panico (1997) and Commendatore (1999a, b).

<sup>40</sup> The case of different portfolio structures is examined by Panico (1993).

- b the stock of Government bonds measured in terms of the net output of the economy ( $b > 0$ );
- g the rate of growth;
- v the capital/output ratio ( $v > 0$ );
- e the Government expenditure on goods and services, measured in terms of net output ( $0 < e < 1$ );
- $r_k$  the rate of return on real capital.

If we assume  $r_b = r_k = r$ , we get from equation (3.5):

$$(3.7) \quad s_c(1-t)r = g$$

where  $dg/dt < 0$  and  $dt/dr > 0$ .

This confirms the validity of the Cambridge equation, taking into account the role of  $t$ , and allows one to calculate the value of  $t$  compatible with steady growth at the rate of interest fixed by the monetary authorities.

Equations (3.4-3.7) thus point out how to develop in a formal way the views proposed by Kaldor in his Memorandum to the Radcliffe Commission, where the lack of a formal analysis of how Government intervention can affect growth and distribution led this author to refer to a version of the Cambridge which, unlike equation (3.7), does not include the tax rate. As a consequence, Kaldor conceived the influence of tax variations on growth in terms of their effect on the propensities to save. The analysis presented above, instead, clarifies how Government intervention can affect demand and growth independently of changes in the propensities to save and in the capital-out ratio. It thus makes it possible to elaborate further Kaldor's attempt to describe how fiscal policy can be used to maintain steady growth conditions.

Finally, the results of the recent debate on the role of the Government sector in the post Keynesian theory of growth and distribution clarify some other common elements of the classical and the Keynesian traditions. They allow one to reconcile two approaches to distribution, which have always been considered alternative.<sup>41</sup> These are the approach proposed by Kaldor and Pasinetti in their theory of growth and distribution and that implied by Sraffa's hint in *Production of Commodities* to take the rate of profit, rather than the wage rate, as the independent variable in the classical theory of prices and distribution.<sup>42</sup>

#### 4. The influence of autonomous investment

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<sup>41</sup> See Moss (1978, p. 306), Vianello (1986, p. 86), Nell (1988), Pasinetti (1988), Pivetti (1988), Wray (1988), Abraham-Frois (1991, pp. 197 and 202).

<sup>42</sup> For an analysis of this point, see Panico (1997; 1999).

The introduction of an autonomous investment function is often considered what differentiates a Keynesian theory of growth from other approaches.<sup>43</sup> There is, however, no agreement in the literature on what characterises a Keynesian investment function and several models of investment-driven growth have been proposed by post Keynesians. The first generation of models (labeled neo-Keynesian) was proposed by Joan Robinson (1956, 1962) and Kaldor (1957 and 1961). They are characterised by full (or normal) capacity utilisation of plants and flexible income shares and envisage a functional relationship between the rate of capital accumulation and the rate of profits.<sup>44</sup> A second wave of models (labeled Kaleckian) was inspired by the works of Kalecki (1971) and Steindl (1952). Important innovations of these models are the assumptions that firms under-utilise the productive capacity of their plants and apply mark-up procedures in determining prices. In Kaleckian models, capital accumulation is driven by profitability (through the rate of profits) and by effective demand (through the degree of capital utilisation). In what follows, a model is presented to describe the main differences between alternative approaches to growth within the post Keynesian tradition.

Let's assume (i) a closed economy with no government intervention; (ii) two factors of production, labour and capital with a fixed coefficient technology; (iii) flexible labour supply; (iv) absence of technological progress and of capital depreciation; (v) identical physical composition of capital and product; (vi) homogeneous firms. The following equations can then be written

$$y = w + rk \quad (4.1)$$

$$y = \min(a, uk) \quad (4.2)$$

$$u \leq b \quad (4.3)$$

$$\min(w_p, w_w) \leq w \leq \max(w_p, w_w) \quad (4.4)$$

$$g^s = s_c r \quad (4.5)$$

$$g^i = \mathbf{g}(r, u) \quad (4.6)$$

$$g^s = g^i \quad (4.7)$$

where:

- $y$  is the output/labour ratio;
- $a$  is the labour coefficient of production;
- $b$  is the capital coefficient of production;

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<sup>43</sup> See above section 2.

<sup>44</sup> In Kaldor (1955-56) and Pasinetti (1962), instead, investment is assumed to be entirely exogenous. Kaldor and Pasinetti's models are characterised also by full employment. According to many authors this assumption cannot be considered Keynesian. See on this point Marglin (1984a, p. 533-534) and Kurz (1991, p. 422). As discussed above, for Kaldor, full employment growth could be achieved through suitable policy interventions. Therefore, the economy, in the absence of government interventions, does not necessarily grow at the full employment rate. Pasinetti, on the other hand, explicitly investigates the conditions of steady growth at full employment.

- $k$  is the capital/labour ratio;  
 $w$  is the real wage rate;  
 $w_p$  is the wage firms are prepared to pay;  
 $w_w$  is the wage workers are prepared to accept;  
 $r$  is the rate of profit;  
 $u$  is the degree of capacity utilisation, with  $y = uk$ ;  
 $g^i$  is the growth rate of investments;  
 $g^s$  is the growth rate of savings;  
 $s_c$  is the capitalists' propensity to save, with  $0 < s_c \leq 1$ .

According to equation (4.1), output is distributed to wage recipients and profit recipients. Following expressions (4.2) and (4.3), output is not necessarily the maximum technologically possible. Expression (4.2) describes a technology of the fixed-coefficient (Leontief) type according to which capital is not necessarily fully utilised. Expression (4.3) leaves open the determination of the degree of capacity utilisation, defined as the reciprocal of the capital/output ratio. It is possible to envisage two cases. In the neo-Keynesian case, the equality  $u = b$  holds. In the Kaleckian case, the degree of capacity utilisation is endogenously determined at the level  $u < b$ . Analogously, expression (4.4) leaves the wage rate open to two possible determinations. In the neo-Keynesian case, workers' and firms' claims over the shares of income (in real terms) are not inconsistent,  $w_w \leq w_p$ . It follows that distribution and growth are simultaneously determined. In the Kaleckian case, workers and firms lay conflicting claims over income shares,  $w_w > w_p$ . Here Kaleckian analyses are similar to Marxian ones in considering that distribution between profits and wages depends on the relative power of workers and firms. Equation (4.5), in line with XIX century classical tradition, clarifies that total saving only originates from profits. According to expression (4.6), the rate of accumulation depends on the rate of profits and on the degree of capacity utilisation. Finally, equation (4.7) represents the equilibrium condition saving equal to investment. The model (4.1)-(4.7) is determined when  $u = b$  and  $w_w \leq w \leq w_p$  as in the neo-Keynesian case or when  $u < b$  and  $w_p \leq w \leq w_w$  (and  $w_w \neq w_p$ ) as in the Kaleckian case.

The neo-Keynesian position is represented by the following equations derived from expressions (4.1)-(4.7) by assuming  $u = b$  and  $w_w \leq w \leq w_p$ :

$$y = w + rk \quad (4.8)$$

$$y = \min(a, bk) \quad (4.9)$$

$$w_w \leq w \leq w_p \quad (4.10)$$

$$g^s = s_c r \quad (4.11)$$

$$g^i = g_0 + g_1 r \quad (4.12)$$

$$g^s = g^i \quad (4.13)$$

Following Joan Robinson (1962), capital accumulation is prompted by expected profitability and favoured by the availability of internal finance. This explains the relationship between desired investment and the rate of profits of equation (4.12), which is a linear version of equation (4.6).

The model (4.8)-(4.13) is similar to the one proposed by Marglin (1984a, 1985b). It can be used to expound the contributions of Joan Robinson, Kaldor and Pasinetti to growth theory.

The solutions are univocally determined:

$$\bar{r} = \frac{\mathbf{g}_0}{s_c - \mathbf{g}_1} \quad (4.14)$$

$$\bar{g} = \frac{s_c \mathbf{g}_0}{s_c - \mathbf{g}_1} \quad (4.15)$$

$$\bar{w} = \frac{a[b(s_c - \mathbf{g}_1) - \mathbf{g}_0 b^{-1}]}{s_c - \mathbf{g}_1} \quad (4.16)$$

The most important features of the neo-Keynesian model are three. The first is that distribution and growth are simultaneously determined. The second is the transposition to the long run of the so-called “paradox of thrift”, according to which an increase of the propensity to save induces a reduction in the rate of growth and in the equilibrium rate of profits. Indeed, differentiating expressions (4.14) and (4.15) with respect to  $s_c$  one obtains

$$\frac{d\bar{r}}{ds_c} = -\frac{\mathbf{g}_0}{(s_c - \mathbf{g}_1)^2} < 0 \quad (4.17)$$

$$\frac{d\bar{g}}{ds_c} = -\frac{\mathbf{g}_0 \mathbf{g}_1}{(s_c - \mathbf{g}_1)^2} < 0 \quad (4.18)$$

The third is the classical negative relationship between  $r$  and  $w$  and, consequently, between  $g$  and  $w$ . By differentiating (4.16) with respect to  $\mathbf{g}_0$ , one obtains

$$\frac{d\bar{w}}{d\mathbf{g}_0} = -\frac{ab^{-1}}{s_c - \mathbf{g}_1} < 0 \quad (4.19)$$

Lower levels of the wage rate correspond to higher levels of capital accumulation, induced by upward shifts in the investment function.

When  $w_w > w_p$  the neo-Keynesian model is inconsistent and no solution can be reached. The economy suffers inflationary pressures. Joan Robinson (1962) acknowledged this possibility by referring to an “inflationary barrier” (also named “real wage resistance”), which represents the minimum level of the real wage rate organised labour is prepared to accept without opposing rises in monetary wages. When the inflation barrier is binding, the neo-Keynesian model is overdetermined. Moreover, since  $w = w_w > \bar{w}$ , then  $r < \bar{r}$  and  $\bar{g} > g^i > g^s$ , that is, the rate of



growth of investment demand exceeds the rate of growth of savings.<sup>45</sup> Notice that the discrepancy between  $g^i$  and  $g^s$  can be reduced by either decreasing  $\mathbf{g}_0$  and  $\mathbf{g}_1$  or increasing  $s_c$ .<sup>46</sup> The main critique raised against the neo-Keynesian analysis relates to the persistence of a negative relationship between growth and real wages. Some authors, inspired by the works of Keynes, Kalecki and Steindl, show that this negative relationship does not necessarily hold when there is long-run under-utilisation of production plants.<sup>47</sup> They assume, moreover, oligopolistic markets and conflicting claims on income distribution,  $w_p > w_w$

The Kaleckian position is represented by the following equations derived from expressions (4.1)-(4.7) by assuming  $u = b$  and  $w_w \leq w \leq w_p$ :

$$y = w + rk \quad (4.20)$$

$$y = \min(a, uk) \quad (4.21)$$

$$u < b \quad (4.22)$$

$$w = w_p \quad (4.23)$$

$$g^s = s_c r \quad (4.24)$$

$$g^i = \mathbf{g}_0 + \mathbf{g}_1 r + \mathbf{g}_2 u \quad (4.25)$$

$$g^s = g^i \quad (4.26)$$

In expression (4.23), income distribution is determined outside the model according to the Kaleckian theory of distribution. When condition (4.23) holds firms are able to choose the profit margin on the basis of the Kaleckian ‘degree of monopoly’,  $\mathbf{p} = a^{-1}(a - w_p)$ , independently of workers’ wage resistance.<sup>48</sup> Equation (4.25), a linear form of (4.6), postulates a relationship between capital accumulation, the rate of profits and the degree of capital utilisation. In Kaleckian writings the current rate of profits is relevant for investment decisions for two main reasons. It represents a proxy for expected profitability and also a source of internal financing.<sup>49</sup> The level of capacity utilisation affects investment decisions both indirectly (acting through the rate of profits) and directly by reflecting the state of demand. According to

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<sup>45</sup> Marglin (1984a, 1984b) proposes a model, which blends Marxian and Keynesian features. Following this author, ‘equilibrium can be characterised in terms of investment, saving, and conventional wages, but to do so we must abandon the static characterisation of equilibrium in favour of a dynamic one. Using the disequilibrium dynamics of the two systems, we can synthesise Marxian and Keynesian insights into a just-determined model in which investment, saving, and the conventional wage jointly determine equilibrium.’ (Marglin, 1984b, pp. 129-30) Marglin solves the overdetermination problem introducing a new variable, the rate of inflation, depending on the discrepancy between  $g^i$  and  $g^s$ .

<sup>46</sup> According to Lavoie (1992), this casts serious doubts on the Keynesian properties of the steady growth equilibrium, since capital accumulation is crucially linked to the degree of thriftiness.

<sup>47</sup> See, in particular, Rowthorn (1981), Nell (1985), Dutt (1984, 1987, 1990) and Lavoie (1992, 1995).

<sup>48</sup> More general resolution mechanisms of conflicting claims between firms and workers are presented in Dutt (1984, 1987 and 1990).

<sup>49</sup> These are the same reasons invoked by Joan Robinson (1962). See above.

Steindl (1952), firms plan a reserve of excess capacity facing uncertainty. This is to avoid the permanent loss of market share owing to the temporary inability to fulfil unexpected demand.

The solutions of equations (4.20)-(4.26) are univocally determined:

$$\bar{u} = \frac{\mathbf{g}_0}{\mathbf{p}(s_c - \mathbf{g}_1) - \mathbf{g}_2} \quad (4.27)$$

$$\bar{r} = \frac{\mathbf{p}\mathbf{g}_0}{\mathbf{p}(s_c - \mathbf{g}_1) - \mathbf{g}_2} \quad (4.28)$$

$$\bar{g} = \frac{s_c \mathbf{p}\mathbf{g}_0}{\mathbf{p}(s_c - \mathbf{g}_1) - \mathbf{g}_2} \quad (4.29)$$

Notice that the paradox of thrift is preserved, as shown by differentiating expressions (4.28) and (4.29) with respect to  $s_c$ ,

$$\frac{d\bar{r}}{ds_c} = -\frac{\mathbf{g}_0 \mathbf{p}^2}{[\mathbf{p}(s_c - \mathbf{g}_1) - \mathbf{g}_2]^2} < 0 \quad (4.30)$$

$$\frac{d\bar{g}}{ds_c} = -\frac{\mathbf{g}_0 \mathbf{p}(\mathbf{p}\mathbf{g}_1 + \mathbf{g}_2)}{[\mathbf{p}(s_c - \mathbf{g}_1) - \mathbf{g}_2]^2} < 0 \quad (4.31)$$

The negative relationship between growth and the real wage rate, instead, disappears. Equations (4.20)-(4.26) generates the so-called “paradox of costs”, according to which an increase in the wage rate (a decrease in the profit margin) implies higher profits and growth rates.<sup>50</sup> By differentiating expressions (4.28) and (4.29) with respect to  $\mathbf{p}$  one obtains

$$\frac{d\bar{r}}{d\mathbf{p}} = -\frac{\mathbf{g}_0 \mathbf{g}_2}{[\mathbf{p}(s_c - \mathbf{g}_1) - \mathbf{g}_2]^2} < 0 \quad (4.32)$$

$$\frac{d\bar{g}}{d\mathbf{p}} = -\frac{s_c \mathbf{g}_0 \mathbf{g}_2}{[\mathbf{p}(s_c - \mathbf{g}_1) - \mathbf{g}_2]^2} < 0 \quad (4.33)$$

The paradox of costs is due to the fact that effective demand (reflected by the degree of capacity utilisation) is very sensitive to changes in the profit margin. Therefore, the cost increase deriving from higher wages is more than compensated by the rise in effective demand. This can be seen by considering that, given the linear form of the function (4.25), it necessarily follows

$$\frac{\mathbf{p}}{\bar{u}} \frac{d\bar{u}}{d\mathbf{p}} = -\frac{\mathbf{p}(s_c - \mathbf{g}_1)}{\mathbf{p}(s_c - \mathbf{g}_1) - \mathbf{g}_2} < -1.$$

As suggested by Lavoie (1995), two are the most relevant critiques raised against the Kaleckian analysis of growth and distribution. The first, raised by neo-Marxians, relates to the specification of the investment function. The second, raised by neo-Ricardians, concerns the long-run discrepancy between the effective and the “normal” degree of capacity utilisation. The

latter is defined as ‘the degree of utilisation of capacity desired by entrepreneurs, and on which, therefore, they base their investment decisions about the size of a new plant relative to the output they expect to produce.’ Garegnani (1992, p. 55)

Moving from the relationship between the rate of profits, the profit margin and the degree of capacity utilisation,  $r = \mathbf{p}u$ , Bhaduri and Marglin (1990, pp. 379-380) argue that the specification of expression (4.25) imposes “unwarranted restrictions” on the possible reaction of investment to changes in profitability.<sup>51</sup> In particular, the possibility of profit-led accumulation is excluded *a priori*. These authors consider that investors may not be indifferent, for a given rate of profit, between low profits margins and high capacity utilisation and high profit margins and low capacity utilisation. In fact, they may not be willing to expand further productive capacity when excess capacity is already extensive. Consequently, according to Bhaduri and Marglin (1990), expression (4.25) has to be replaced by the following

$$g^i = \mathbf{g}_0 + \mathbf{g}_1 \mathbf{p} + \mathbf{g}_2 u \quad (4.34)$$

With the investment function specified as in (4.34) two alternative growth regimes are possible. The first occurs when the sensitivity of investment to changes in demand is larger than to changes in costs. It follows that the overall effect of an increase in the profit margin on growth is negative (wage-led growth) as in the Kaleckian case. Conversely, the second occurs when the sensitivity of investment to changes in costs is larger than to changes in demand. It follows that the overall effect of an increase in the profit margin on growth is positive (profit-led growth) as in the neo-Keynesian model. Following the introduction of expression (4.34), the solutions of the model (4.20)-(4.26) become

$$\bar{u} = \frac{\mathbf{g}_0 + \mathbf{g}_1 \mathbf{p}}{s_c \mathbf{p} - \mathbf{g}_2} \quad (4.35)$$

$$\bar{r} = \frac{\mathbf{p}(\mathbf{g}_0 + \mathbf{g}_1 \mathbf{p})}{s_c \mathbf{p} - \mathbf{g}_2} \quad (4.36)$$

$$\bar{g} = \frac{s_c \mathbf{p}(\mathbf{g}_0 + \mathbf{g}_1 \mathbf{p})}{s_c \mathbf{p} - \mathbf{g}_2} \quad (4.37)$$

Then, differentiating expressions (4.36) and (4.37) with respect to  $\mathbf{p}$  one obtains

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<sup>50</sup> See Rowthorn (1981, p. 18) and Lavoie (1992, p. 307).

<sup>51</sup> According to Vianello (1985, 1989 and 1996) and Ciccone (1986 and 1987) the relevant variable to take into account when dealing with investors’ decisions is, the “normal” rate of profits, that is, the one corresponding to the normal degree of capacity utilisation. Lavoie (1995, p. 798) shows that, under particular conditions, Vianello and Ciccone’s critique is equivalent to the one put forwards by Bhaduri and Marglin (1990).

$$\frac{d\bar{r}}{d\mathbf{p}} = \frac{\mathbf{g}_1\mathbf{p} - \mathbf{g}_2\bar{u}}{s_c\mathbf{p} - \mathbf{g}_2} \quad (4.38)$$

$$\frac{d\bar{g}}{d\mathbf{p}} = \frac{s_c(\mathbf{g}_1\mathbf{p} - \mathbf{g}_2\bar{u})}{s_c\mathbf{p} - \mathbf{g}_2} \quad (4.39)$$

with  $d\bar{r}/d\mathbf{p} \leq (>) 0$  and  $d\bar{g}/d\mathbf{p} \leq (>) 0$  for  $\bar{u} \geq (>) \mathbf{p}\mathbf{g}_1\mathbf{g}_2^{-1}$ . It follows that wage-led (profit-led) growth prevails when effective demand (reflected by the degree of capacity utilisation) is very (moderately) sensitive to changes in distribution. Note that, given the linear form of expression (4.35), the inequality  $\bar{u} \geq (>) \mathbf{p}\mathbf{g}_1\mathbf{g}_2^{-1}$  implies  $(\mathbf{p}\bar{u})(d\bar{r}/d\mathbf{p}) \leq (>) -1$ .

Finally, the neo-Ricardian critique employs an alternative formulation of the investment function (4.25), which describes investment behaviour as the entrepreneurs attempt to adjust gradually productive capacity towards a desired (or “planned”) level, that is

$$g^i = \mathbf{g}_0 + \mathbf{g}_1(u - b) \quad (4.40)$$

where  $b$  is the normal degree of capacity utilisation as determined by the characteristics of the technology.<sup>52</sup> In a long-run equilibrium, producers are “content” with their choices and desired and actual variables are equal,  $u = b$ . From equation (4.40), the following result obtains:

$$b = \frac{\mathbf{g}_0}{s_c\mathbf{p}} \quad (4.41)$$

Note that condition (4.41) can hold only by fluke. This problem can be solved by introducing one of the following assumptions: (i) the technological coefficient  $b$  is variable; (ii) saving is determined by investment  $g^s = \mathbf{g}$ ; (iii) investment is determined by saving  $g^i = s_c r$ ; (iv)  $\mathbf{p}$  is endogenous. The latter assumption generates neo-Keynesian results, with the rate of profits depending on the autonomous component of the capital accumulation function and on the reciprocal of the capitalists’ propensity to save as in the Cambridge equation,  $r = \mathbf{g} / s_c$ . In the context of an ongoing debate, Kaleckian and neo-Ricardian authors are disputing over the possibility of a long-run discrepancy between the current and the ‘normal’ degree of capacity utilisation. This complex debate seems to have taken two directions. The first is theoretical and deals with the meaning of normal rates of capacity utilisation and the possibility of a non-

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<sup>52</sup> The investment function (4.40) has been firstly introduced by a Kaleckian, Amadeo (1986a, 1986b and 1987), in the attempt to formalise Steindl’s (1952) analysis. Dutt (1984, p. 28) argues, instead, that in the investment function (4.25), the term related to the (constant) desired degree of capacity utilisation is already accounted for by the coefficients  $\mathbf{g}_0$  and  $\mathbf{g}_1$ .

convergence of the actual to the normal rates of capacity utilisation in the context of a long-run analysis.<sup>53</sup> The second concerns the very nature of long-run analysis.<sup>54</sup>

### **5. The influence of the external component of aggregate demand**

The Keynesian analysis of the influence of the external components of aggregate demand on growth rates is mainly based on the contributions of Harrod and Thirlwall, which underline the idea that the speed of growth of an open economy may be severely constrained by a poor trade performance. Some insights on the role of external demand can however be found in Keynes's writings on the 1925 British return to the gold. In *The Economic Consequences of Mr. Churchill* (1925), Keynes claimed that the return to the pre-war parity would have had a negatively influence on the British trade, making a sharp reduction of money wages necessary to restore the competitiveness of the national industry on overseas markets. The wage adjustment, however, would have not been painless: in the absence of a fall of the cost of living, workers' resistance to wage reductions<sup>55</sup> had to be overcome 'by intensifying unemployment without limits' (Keynes, 1925, p. 218).

At the time, the theory of international trade was dominated by "classical" thinking, according to which the balance of payments automatically adjusts through gold flows and consequent relative price movements: countries experiencing a trade deficit would lose gold causing an internal price deflation which would induce a rise in exports and a fall in imports such as to restore equilibrium. According to Keynes, however, gold flows may fail to restore the balance of payments equilibrium if wages and prices react slowly to changes in the quantity of money:

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<sup>53</sup> As far as the meaning of normal capacity is concerned, following Kurz (1986, 1992 and 1994), the normal rate of capacity utilisation is the result of a cost minimisation choice. Caserta (1990) notices, however, that capacity utilisation has three different dimensions (i) the speed of operation during a given time period; (ii) the number and the length of shifts within a day; (iii) the number of units of reserve (idle) capacity. Consequently, 'planned' excess capacity is not necessarily linked to the choice of techniques. Kurz (1992) replies to this argumentation that 'the elasticity of the market economy does not seem, [...], to presuppose the existence of substantial planned reserves of plant and equipment. Even without such reserves there appear to exist considerable margins for an expansion of output in response to higher levels of demand. Additional output could be produced by above-normal degree of capital utilisation, provided it were profitable to do so' (Kurz, 1992, p. 80). On the absence of an adjusting mechanism between  $u$  and  $b$ , Committeri warns that 'we are faced with a drastic alternative: either (a) the economy happens to find itself in a steady state, where producers' expectations are being confirmed by actual experience [...] or (b) the 'equilibrium' utilisation degree does not coincide with its normal level, and hence producers' expectations are not being confirmed by experience. In this case, as the economy moves away from the steady path, the model has nothing to say about the long-run tendencies of capital accumulation.' (Committeri, 1986, p. 175)

<sup>54</sup> Neo-Ricardians consider steady growth analyses very restrictive and endeavour to study the relationship between effective demand and accumulation through comparisons of long-term theoretical positions. These may be considered as hypothetical states of rest prevailing after that the long-lasting tendencies of the economic system have exhausted their course. In contrast, for Kaleckians long-period should be intended as a sequence of short-term equilibria, consequently, they deny 'any analytical distinct existence for long-period analysis' (Halevi and Kriesler, 1991, p. 89).

<sup>55</sup> Keynes, 1925, p. 211.

in these cases, the “classical” mechanism wouldn't work, and interest rate adjustments have to come into play to ensure capital inflows sufficient to compensate for the trade deficit, with the inevitable adverse effect of discouraging capital accumulation and slackening economic activity.

In the following years, Keynes restated this view on various occasions. In the oral evidence addressed to the Macmillan Committee on Finance and Industry, he went so far as to advocate protectionism as a remedy against British economic recession<sup>56</sup>, a provocative suggestion in a *laissez-faire* oriented environment. The proposal testifies to the relevance Keynes attributed to the constraint that the balance of payment can set to domestic prosperity. In his view, as long as monetary policy was sacrificed to the achievement of external equilibrium, Britain was inevitably condemned to stagnation (Keynes, 1929, pp. 56-57), and the only means to “release” monetary policy from this task was to improve the British competitive performance in overseas markets. This view emerges in the *General Theory*:

in an economy subject to money contracts and customs more or less fixed over an appreciable period of time, where the quantity of domestic circulation and the domestic rate of interest are primarily determined by the balance of payments, as they were in Great Britain before the war, there is no orthodox means open to the authorities for countering unemployment at home except by struggling for an export surplus and an import of the monetary metal at the expense of their neighbours. (Keynes, 1936, p. 348)

The idea that the trade performance of a country may affect its level of economic activity was restated by Harrod in his 1933 book *International Economics*, where he introduced the so-called “foreign trade multiplier”, that is a causal relationship going from exports to domestic output. For Harrod (1933, pp. 119-23), in an economy with no Government sector and no saving and investment, income is generated by the production of domestic consumption goods (C) and exports (X):

$$[5.1] \quad Y = C + X$$

If all income is spent either on home consumption goods and imports (M):

$$[5.2] \quad Y = C + M$$

If the country spends on imported commodities a stable fraction  $m$  of its income,

$$[5.3] \quad M = m Y ,$$

we get:

$$[5.4] \quad Y = \frac{1}{m} X$$

Note that, under the assumptions of the model, the equilibrium of the commodity market and that of the balance of trade simultaneously hold. If saving, investment and the Government sector are instead introduced, the two previous equilibrium conditions may not be simultaneously

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<sup>56</sup> See Keynes, 1929, p. ...

satisfied. In this case, equation [5.4] only holds as balanced trade condition if one assumes that in a long-period analysis the trade balance must be preserved. Domestic income cannot then exceed the ratio between export and the import propensity: the country's trade performance sets an upper limits to domestic output, in accordance with Keynes' 1925 and 1929 treatment of the topic.

Other features of Harrod's treatment reveal the link with Keynes' work. First of all, the analysis of the dynamic adjustment of  $Y$ , following an external demand shock, reflects the line of reasoning pointed at by Keynes in both *The Economic Consequences of Mr. Churchill* and the oral evidence to the *Macmillan Committee*: in the case of a current account disequilibrium, the gold flows would cause pressures on interest rates, thus affecting investment in fixed and working capital and giving rise to changes in domestic output (Harrod, 1933, pp. 135-37). Moreover, Harrod follows Keynes in depicting the adjustment mechanism based on domestic output changes and that based on relative price changes as mutually alternative: with flexible wages and prices, the gold outflows caused by a trade deficit would change the domestic/foreign price ratio, so adjusting the balance of payments with no impact on the level of economic activity, according to the predictions of the "classical" theory (Harrod, 1933, pp. 124-25). But with sticky wages and prices, the gold outflows would cause "real" effects, and a poor trade performance may therefore become a constraint to domestic activity and employment (Harrod, 1933, pp. 118 and 125).

In the following years Harrod took up the task of extending the insights of the *General Theory* to a dynamic context, but he did not derive a dynamic version of his foreign trade multiplier. Nor was that developed by other Keynesian authors until the 1970's, although the external component of aggregate demand played an important role in Kaldor's view, as argued in Section 6 below.

In 1975 Dixon and Thirlwall elaborated a formal model of "export-led-growth" developing the notion of "cumulative causation" contained in a well-known contribution of Kaldor (1970). The model, estimated on United Kingdom data, gave rise to a quite unsatisfactory approximation between fitted and actual values over the period 1951-1966, predicting growth rates systematically and significantly higher than actual. According to Thirlwall (1998, p. 194) a plausible explanation of this discrepancy is the neglect of the balance-of-payments constraint. To make up for this failure, in 1979 Thirlwall worked out an analytical model incorporating the external equilibrium condition, described by the following equation:

$$[5.5] \quad P X + F = P^* M E$$

where  $P$  is the export price index,  $P^*$  the import price index,  $E$  the exchange rate and  $F$  the value of net capital flows measured in domestic currency. Expressing [5] in terms of rates of change, we get:

$$[5.6] \quad \theta (p + x) + (1 - \theta) f = p^* + m + e$$

where the lower case letters denote rates of change of the variables, while  $\theta$  and  $(1 - \theta)$  are respectively the value of exports and capital inflows as a percentage of imports.

Let us specify the demand for imports and exports through the conventional multiplicative functions with constant elasticities:

$$[5.7] \quad M = a \left[ \frac{P^* E}{P} \right]^y Y^p$$

$$[5.8] \quad X = b \left[ \frac{P}{P^* E} \right]^h Z^e$$

where  $a$  and  $b$  are constants,  $Z$  is the level of 'world' income,  $\psi$  and  $\eta$  are price elasticities,  $\pi$  and  $\varepsilon$  are income elasticities. Expressing [7] and [8] in terms of rates of change, substituting into [6] and rearranging, we get:

$$[5.9] \quad G_B = \frac{q\pi z + (1 - q)(f - p) + (1 + qh + y)(p - e - p^*)}{p}$$

where  $G_B$  is the rate of growth consistent with equilibrium in the balance of payments. In his work Thirlwall, basing himself on the extensive empirical evidence showing long-run stability in the terms of trade<sup>57</sup>, assumed that the contribution to economic growth of the price term in [9] is likely to be small. If for simplicity it is assumed to be zero, equation [9] reduces to:

$$[5.10] \quad G_B = \frac{q\pi z + (1 - q)(f - p)}{p}$$

If we also assume that a country cannot finance its trade deficit through capital inflows for a considerable length of time<sup>58</sup>, we have that long-run equilibrium requires  $q = 1$ . This transforms equation [10] into

$$[5.11] \quad G_B = \frac{e}{p} z$$

which represents the dynamic version of Harrod's foreign trade multiplier. The economic meaning of equation [11] is that a poor trade performance constrains a country to grow at a

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<sup>57</sup> See Wilson (1976), Ball, Burns and Laury (1977). Long-run stability in the terms of trade may alternatively rely either on arbitrage or on wage-resistance forcing domestic prices to move equiproportionately to exchange rate depreciations so that  $p - e - p^* = 0$  (Thirlwall, 1979, p. 283).

<sup>58</sup> On this topic, see McCombie (1998, pp. 229-32).



pace lower than allowed by the growth of internal demand and by resource availability. For instance, if  $G > G_B$ , imports would grow quicker than exports, thus deteriorating the country's trade account and forcing policy-makers to intervene. When for various reasons (*real wage-resistance* and subsequent transmission of exchange rate variations on domestic prices, product differentiation ensuing small price elasticity of demand for tradable goods, etc.) exchange rate devaluations prove ineffective, the balance of payments adjustment takes place through internal demand deflation, which slackens the pace of output growth (Thirlwall, 1979, pp. 279-80). According to Thirlwall, On the contrary, capital and labour availability does not constrain growth, being to a large extent "endogenous" to the economic system.<sup>59</sup>

Equation (11) also offers an explanation of why growth rates differ among countries. An increase in world income generates a rate of growth that depends on the value of the  $e/p$  ratio. Since there are significant international differences in this ratio (Houthakker and Magee, 1969), the same increase in the world income gives rise to different growth rates among countries.

A relevant question, which this strand of literature has not yet given a conclusive answer, is what determines the  $e/p$  ratio. In some contributions, Thirlwall (1979, p. 286 and 1991, p. 26) explains the differences in this ratio as reflecting different patterns of sectoral specialization. This way of interpreting the dynamic foreign trade multiplier has striking implications for the theory of uneven development. Assume a simplified world where some countries produce manufactured goods and some produce primary goods only. As the income elasticity of demand for manufactured goods, due to Engels' Law, is higher than income elasticity of demand for primary goods, it would be  $e/p > 1$  for manufactured goods producing countries and  $e/p < 1$  for primary goods producing ones. Therefore, according to this view, the pattern of sectoral specialization is the source of a process of cumulative divergence in GDP levels: countries producing primary goods would be unable to grow at the same rate as those producing manufactured goods, owing to their tighter balance-of-payment constraint.

This view has been criticized by McCombie (1993, p. 481), who quotes extensive empirical evidence showing that income elasticities are not related to the differing product mixes of the exports of the various countries and maintains they should instead capture differences in non-price competitiveness. Yet he does not clarify what determines a country's non-price competitiveness. He only suggests that 'undoubtedly it is related to the poorly understood reasons why firms differ in X-inefficiency' (McCombie, 1993, p. 482).

It is worth noticing that the question of what factors affect the value of the dynamic foreign trade multiplier is of crucial relevance with reference to the "cumulative divergence" versus "catching up" controversy. Bairam (1993), for example, shows the existence of a statistically

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<sup>59</sup> Thirlwall (1986, pp. 48-49 and 1998, p. 185) clarify the meaning of this claim by saying that labour supply automatically responds to demand through labour mobility from agricultural to manufacturing sector, migration and increases in the female participation rate. Capital accumulation instead has a large induced element through the accelerator mechanism.

significant inverse relationship between the ratio  $e/p$  and the stage of economic development of the country, proxied by per-capita output. Such a relationship implies underdeveloped countries being less balance-of-payments constrained than developed countries, and therefore provides some support to the “catching-up” hypothesis against the “cumulative divergence” view rooted in the post-Keynesian tradition.

The idea that the balance of payment constraint approach is consistent with the evidence of cumulative divergence in GDP levels can instead be supported by recalling a recent essay written by Thirlwall (1998, p. 187), who relates the trade income elasticities of a country to a number of *supply-side factors* such as investment in new technology, R & D effort, education and training in skills. Market forces may not spontaneously generate these factors, due to their nature of public goods. Moreover, they are complementary in production to labour and capital, so that it is often impossible to obviate their scarcity through factor substitution.

A final problem considered by this line of research is the analysis of the role of international capital flows. Thirlwall and Hussain (1982) have used equation (10), instead of equation (11), to capture the experience of some developing countries, running persistent account deficits, financed by foreign investment. In a recent paper, Moreno Brid (1997) has questioned the use of equation (10) in a steady-state analysis without imposing any restriction on the evolution path of foreign capital inflows. According to him, the lack of this restriction may generate a pattern of foreign indebtedness not sustainable in the long run. He points out that international credit institutions impose to developing countries borrowing restrictions based on some index of their expected ability to repay the foreign loans, and therefore proposes a different specification for the balance-of-payments constrained growth rate based on the requirement of a constant ratio between the current account deficit and the GDP, a ratio interpreted as a measure of a country’s creditworthiness. He then shows that the dynamic foreign trade multiplier may assume a value higher or lower than the standard one, depending on the initial current account position of the country concerned. This revision has relevant implications for empirical analysis, clarifying that estimates of the  $e/p$  ratio may be significantly biased if they not take into account the countries’ initial export/import ratio.

To sum up, the balance-of-payments constraint approach addresses some relevant issues of growth theory in a genuine Keynesian fashion, clarifying the relevance of external demand and why policies based on internal demand injections may fail to accelerate the pace of growth of an open economy.

## **6. Growth, demand and cumulative causation**

There is in the literature a line of research which underlines that growth brings about technical progress and changes in the productive structure, in the forms of competition and in the economic institutions. These “qualitative” aspects of growth have been emphasised by classical

authors, like Smith and Marx, by several outstanding XX century economists (A. Young, Myrdal, Hirschman, to mention a few) and by the recent evolutionary approach proposed by Nelson and Winter (1974, 1977, 1982). According to this literature, growth implies structural change, which emerges as a disequilibrating phenomenon and which can be studied by analyses, less formal than those proposed above, describing the historical evolution of the economies.

Kaldor's work after 1966 is the major reference of this line of research within the Keynesian tradition.<sup>60</sup> He claimed that orthodox theory fails to explain divergence in growth among economies and that 'the differences in growth rates are largely accounted for by differences in the rates of growth of productivity' (Kaldor, 1966, p. 104). The latter, in turn, are mainly due to the economies of scale occurring within the industrial sector, whose rate of growth shows an 'extraordinarily close correlation' (Kaldor, 1978a, p. XVIII) with the rate of growth of GDP and productivity.

In order to describe the actual performance of the economies, Kaldor (1966; 1967; 1970; 1972) used the notion of "circular and cumulative causation", introduced by Myrdal (1957), considering the dynamics of the industrial sector as the "engine of growth". Following Young, Kaldor (1966 and 1967) described growth as a process generated by the inter-action between demand and supply: the rate of growth is positively related to the ability of supply to accommodate variations in demand and to the reaction of demand to changes in supply. Moreover, he clarified that the economies go across different stages of economic development. In an early stage, the demand for consumption goods plays the leading role in the growth process. In the later stages, the leading forces are, respectively, the exports of consumption goods, the demand for capital goods, and, finally, the exports of capital goods.<sup>61</sup> In the subsequent essays, Kaldor underlined other aspects of the growth process. In 1970 he examined how growth depends on the rate of change of exports, by applying Hicks' (1950) analysis of the "super-multiplier" to an open economy and considering exports as the autonomous component of demand and consumption and investment as induced components. The rate of growth of exports, in turn, was assumed to depend on an external cause, the world level of demand, and on a domestic cause, production costs. An increase in the world demand raises exports and domestic production through the super multiplier. The presence of increasing returns in the export sector increases productivity and reduces costs, unless a similar rise in wages occurs. The reduction in costs further increases exports, setting up a cumulative process, which tends to broaden the gaps with other regions. In 1972 Kaldor further integrated Young's analysis with

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<sup>60</sup> For a detailed analysis of Kaldor's, see Thirlwall (1987) and Ricoy (1987; 1998). The contributions describe several aspects of Kaldor's position. In what follows, we mainly focus on the role of demand in the growth process, paying less attention to the problems related to the evolution of technical progress and to his idea of growth as a path-dependent process.

<sup>61</sup> See Kaldor (1966, pp. 112-14).

the Keynesian principle of effective demand, examining the role played by the demand for investment and focusing on the conditions allowing self-sustained growth.<sup>62</sup>

For Kaldor, the demand coming from the foreign sector plays a primary role in setting in motion the growth process. The domestic sources of demand mainly influence, instead, the competitiveness of the economy and the intensity with which the external stimulus is transmitted to the rate of growth. Following Dixon and Thirlwall (1975), the views presented by Kaldor in 1970, can be so formalised:

$$y = \gamma x \quad (6.1)$$

$$x = \eta ( p_d - p_f - e ) + \varepsilon z \quad (6.2)$$

$$p_d = w - r + \tau \quad (6.3)$$

$$r = r_0 + \lambda y \quad (6.4)$$

Equation (6.1) specifies Kaldor's idea that the rate of growth of the economy,  $y$ , is directly related to the rate of growth of exports,  $x$ , through the parameter  $\mathbf{g}$ . In equation (6.2) the rate of growth of exports depends on the price-elasticity of exports,  $\mathbf{h}$ , on the rates of changes of domestic prices,  $p_d$ , of international prices,  $p_f$ , and of the exchange rate,  $e$ ; on the world income elasticity of demand for exports,  $\mathbf{e}$ , and on the rate of growth of the world income,  $z$ . Equation (6.3) specifies that the rate of growth of domestic prices depends on the rates of change of money wages,  $w$ , of productivity,  $r$ , and of the mark-up,  $\mathbf{t}$ . Equation (6.4) describes the relation between the rate of change of productivity and the rate of growth of the economy, with  $r_0$  representing the rate of change of the autonomous technical progress and  $\mathbf{I}$  what is known in the literature as the Verdoorn's coefficient.<sup>63</sup>

The equilibrium solution<sup>64</sup> of equations (6.1-6.4) is

$$y = \gamma [\eta ( w - r_0 + \tau - p_f - e ) + \varepsilon z ] / ( 1 + \gamma \eta \lambda ) \quad (6.5)$$

According to Dixon and Thirlwall (1975, p. 208) it is realistic to assume that  $|\gamma \eta \lambda| < 1$ . As a consequence, since  $\eta < 0$ , in equation (6.5)  $y$  is related positively to  $\mathbf{g}$ ,  $r_0$ ,  $p_f$ ,  $e$ ,  $\mathbf{e}$ ,  $z$  and  $\mathbf{I}$ , and negatively to  $w$  and  $\mathbf{t}$ . The effects of variations of  $\mathbf{h}$  are not determined.

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<sup>62</sup> Kaldor, (1972, p. 1252) argued that growth is a fragile process. In order to work it needs that several things simultaneously occur: investors must have confidence in the expansion of the markets; the credit and financial sectors have to accommodate the needs of trade; the distributive sector has to bring about price stability. According to Kaldor, after the 1930's, Government intervention has secured the smooth working of the process.

<sup>63</sup> Dixon and Thirlwall (1975, pp. 208-10) point out that  $r_0$  is determined by the autonomous rate of disembodied technical progress, by the autonomous rate of capital accumulation per worker and the extent to which technical progress is embodied in capital accumulation.  $\mathbf{I}$  is instead determined by the induced rate of disembodied technical progress, by the degree to which capital accumulation is induced by growth and the extent to which technical progress is embodied in capital accumulation.

<sup>64</sup> Dixon and Thirlwall (1975) also present the model in terms of finite difference equations, deriving equation (5) as the steady growth solution and the stability condition, which is:  $|\gamma \eta \lambda| < 1$ . Recently Setterfield (1997) has presented an analysis, similar to that of Dixon and Thirlwall (1975), in order to study the movements of the economy out of equilibrium.

Equation (6.5) can be used to describe the evolution of the rates of growth of different countries or of different regions within the same country. If one assumes a given mark-up in each region and given and equal values of  $p_f$ ,  $z$ , and  $w$  in all regions<sup>65</sup>, the differences in the rates of growth depend on the regional values of  $\mathbf{h}$ ,  $\mathbf{e}$ ,  $r_0$ ,  $\mathbf{I}$  and  $\mathbf{g}$

In Kaldor's writings it is possible to find some hints and analyses on the factors affecting these parameters. Kaldor (1971) considered price competition the most important factor stimulating the cumulative process. The ability of an economy to increase its exports was made to depend on this factor. In Kaldor (1978c) this position was abandoned, on account of the fact that the countries with the worst performance in terms of relative prices after the 2nd World War proved to be those with the best performance in terms of exports.<sup>66</sup> He then concluded that the rate of growth of exports depends on  $\mathbf{e}$  which in turn depends on the innovative capacity of a country<sup>67</sup>, meaning by that the capacity of a country to differentiate its products and give them a privileged position in foreign markets.

As to the parameters,  $\mathbf{I}$ , Kaldor (1971) argued that the rate of change of productivity mainly depends on the rate of growth of the economy, on the composition of demand and on weight of the capital goods sector in the productive structure. High investments and a large capital goods sector enhance productivity and the competitive performance of the economy in the world markets.<sup>68</sup> According to Kaldor (1966; 1967; 1971), the influence of the composition of demand on productivity is due to the presence of variable returns in the different sectors of the economy. The intensity of the effect on productivity thus crucially depends on the sectors towards which the demand for consumption and investment is directed, since increasing returns mainly occur in the capital goods sector. Moreover, the extent to which this sector is able to accommodate demand is also important. High quotas of investment to output and of the capital goods sector in the productive structure enhance productivity changes, which, in turn, improve the international performance of the economy setting up and intensifying cumulative processes.

Kaldor (1971) referred to the role of composition of demand on long-term growth in his policy analyses too. He distinguished between the concepts of "consumption-led" and "export-led" growth. The latter, he argued, is more desirable than the former. According to him, consumption-led growth tends to have negative long-run effects on productivity, since it tends to increase the weight of non-increasing return sectors in the productive structure of the economy.

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<sup>65</sup> See Dixon and Thirlwall (1975, p.209). Notice however that, unlike Dixon and Thirlwall, Kaldor (1966, p. 147) assumes that the differences in the rate of change of money wages of different regions do not counter-balance the reduction in costs due to the different rate of change of productivity.

<sup>66</sup> On this point see also McCombie and Thirlwall (1994, pp. 262-300).

<sup>67</sup> See Kaldor (1981). For a discussion of this point, see the previous section of this essay.

<sup>68</sup> To empirically estimate the influence of the composition of demand on productivity, Kaldor (1966) also used an expression, which differs from our equation (4) only for introducing, as an additional variable, the quota of investment to output. His analysis showed that this variable explained the divergence of the rate of change of productivity from the trend determined by the original equation (4). It explains the residual change in productivity, not explained by increasing returns.

This tends to worsen the international performance of the economy. For these reasons, as said in section 3 above, Kaldor claimed that Government intervention should avoid the use of fiscal policy to reduce the excess of saving over investment, increase the rate of growth and reduce unemployment. By making growth more dependent on the demand for consumption, this policy generates the undesired consequences previously recalled. In this case, Kaldor said, the authorities should intervene on the exchange rate, rather than through fiscal measures.<sup>69</sup>

In Kaldor's writings it is also possible to find some hints on the factors affecting the parameter  $g$  which depends on the quotas and elasticities of the domestic sources of demand to the net output of the economy. The elasticity of the demand for consumption is influenced by productivity growth through the introduction of new products of large consumption.<sup>70</sup> When this occurs a higher value of  $g$  and a more intense effect of a given rate of growth of exports come about. For Kaldor (1971) tax reduction too has a positive influence on  $g$  through its effect on consumption.<sup>71</sup> Yet, any stimulus to the latter variable has long-run negative consequences, as said above, since it makes the growth process consumption-led. Finally, the elasticity of imports depends on the degree of coincidence between the composition of demand and the productive structure of the economy. In 1966 Kaldor related the degree of coincidence of the productive structure to demand to the stage of development reached by a country. The more a country can rely on a large capital goods sector, the lower will be the elasticity of imports, the higher the value of  $g$  and the more stimulating the effect of a given rate of change of exports. A country that has reached a stage of development which allows it to be a net exporter of capital good can enjoy 'explosive growth', since 'a fast rate of growth of external demand for the products of the "heavy industries" is combined with the self-generated growth of demand caused by their own expansion'. (Kaldor, 1966, p. 114)

Other Keynesian authors examined several aspects of cumulative growth considered by Kaldor. Some of them further developed the view that the demand for export plays the most important role in stimulating the growth process. Thirlwall (1979) presented a dynamic version of Harrod's multiplier. Kaldor had used Harrod's original multiplier in 1972.<sup>72</sup> He appreciated Thirlwall's new analysis and its empirical application<sup>73</sup>, which proved the utility of working with a simplified formula relating the rates of growth of output and of export, rather than with

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<sup>69</sup> In the subsequent years, Kaldor changed this position too: 'In this respect I now feel I was mistaken. Events since 1971 have shown that the exchange rate is neither as easy to manipulate nor as rewarding in its effect on the rate of growth of net exports as I have thought.' (Kaldor, 1978a, p. XXV).

<sup>70</sup> See Kaldor (1966, p. 113; 1981, p. 603). A similar view is presented by Rowthorn (1975, p. 899).

<sup>71</sup> This view was already presented in Kaldor (1958), as said in Section 3 above.

<sup>72</sup> See Kaldor (1972, p. 164).

<sup>73</sup> See Kaldor (1981, p. 602). In the same essay, Kaldor assumed that the sum of the marginal propensities to consume and invest is equal to unity. This assumption transforms the previous equation (6.1) into Harrod's dynamic multiplier, if we also assume that  $\eta=0$ . Notice that in the approach followed by the Cambridge Economic Policy Group, the sum of the marginal propensities to consume and invest is equal to unity, so that the Government deficit and the current account deficit are identical. On this point see also Targetti (1991).

the complex analysis described by equations (1-4).<sup>74</sup> Moreover, Thirlwall (1983), McCombie (1985) and McCombie and Thirlwall (1994) discuss the relation between Harrod's dynamic multiplier and the content of the previous equation (6.1). They argue that the rate of growth determined by this equation tends to that determined by Harrod's multiplier, whenever the latter rate is greater than the former, since  $\gamma$  tends to  $1/\pi$ , where  $\pi$  represents the income elasticity of imports.<sup>75</sup> This conclusion clarifies another reason why export-led growth is to be preferred to consumption-led growth. What's more, it gives even more relevance to the role of the external component of demand, playing down that of the domestic components and of cumulative processes.

The overwhelming role attributed to exports by the previous contributions has led some Keynesian authors to present analyses of cumulative growth, which emphasise the role of the demand for investment, that in the Keynesian tradition has always occupied a crucial position. McCombie (1988) himself seems to move in this direction. In an attempt to apply the analysis of Dixon and Thirlwall (1975) to the growth of two regions within the same country, he noticed that the region with the highest rate of growth enjoys a higher quota of profit over income<sup>76</sup> and, consequently, a higher rate of capital accumulation. According to McCombie, the increased accumulation further stimulates the cumulative process, a conclusion that restores a significant role to the demand for investment.

Skott (1985) e Skott-Auerbach (1995), on the other hand, present a cumulative causation model based on the relationship between the rate of profit and capital accumulation. In their analyses, regional differences in the profit rates bring about divergence in the rates of accumulation. The consequent divergence in the rate of growth causes unequal productivity changes, which tends to amplify the differences in the rates of profit and to start a cumulative process.

Finally, Boyer (1988) and Boyer and Petit (1988; 1991) present the most elaborated attempt to restore a significant role to investment. They assume a demand function for investment, influenced by profitability and aggregate demand, and a wage rate depending on unemployment and productivity changes. The results of this analysis depend on the values of the parameters relating the previous variables. By examining them, these authors identify four demand-driven growth regimes to which the historical evolution of modern economies can be made to

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<sup>74</sup> As McCombie and Thirlwall (1994, p. 434) claimed, 'despite the effort of formulating a fairly sophisticated export-led growth model, incorporating the idea of a virtuous circle, it seems from the empirical evidence that a simpler model will suffice.'

<sup>75</sup> 'There are a number of possible mechanisms through which this may happen: the encouragement to invest which would augment the capital stock and bring with it technological progress; the supply of labour may increase by the entry of the workforce of people previously outside or from abroad; the movement of factors of production from low productivity to high productivity sectors, and the ability to import more may increase capacity by making domestic resources more productive' (McCombie and Thirlwall, 1994, p. 233). See also McCombie (1998, pp. 238-239).

<sup>76</sup> To reach this result McCombie (1988), unlike Dixon and Thirlwall (1975), assumes that the rate of change of prices in the two regions is the same.

correspond.<sup>77</sup> The first, named ‘pure classical regime’ (Boyer and Petit, 1991, p. 498), is characterised by a high influence of profitability on investment and of unemployment on wages.<sup>78</sup> In this case the demand for investment is the driving force of the cumulative process. The second, named ‘Fordist or pure Keynesian regime’, which according to Boyer and Petit, has prevailed after the 2nd World War up the 1960’s, is characterised by a high influence of demand on investment and of productivity on wages. In this case the demand for consumption is the driving force of the cumulative process. The third regime is characterised by a high influence of demand on investment and of unemployment on wages. An increase in productivity raises unemployment and has a negative effect on the growth of wages. As a consequence consumption grows at a lower rate affecting in a negative way the rate of capital accumulation. Finally, the fourth regime, which has prevailed in Western economies during the 1970’s, is characterised by a high influence of profitability on investment and of productivity on wages. An increase in productivity enhances the growth of wages. As a consequence, profits are squeezed while consumption grows at a higher rate. The low profitability negatively influences the demand for investment. The final effect on aggregate demand is, according to Boyer and Petit (1991, p. 498), the depressing effect on investment more than compensates the stimulating effect on consumption, producing a net restrictive result on aggregate demand.

## 7. Conclusions

Harrod’s seminal work on growth theory was conceived as an attempt to extend Keynes’s analysis. It moved from the Keynesian ideas that the economic system does not tend necessarily to full employment and that the autonomous components of demand may affect the rate of growth of the economy. In subsequent years, Keynesian authors have developed this approach along several lines. They have focused on the different components of aggregate demand and on their role in the growth process, by using several descriptive and analytical methods. This multiplicity of ideas and analyses shows, according to some authors, the richness of this line of thought.<sup>79</sup> Conversely, an external observer may judge the lack of a unified framework a weakness, considering the Keynesian literature a disorderly set.<sup>80</sup> By reconstructing the content of a Keynesian approach to growth and describing the lines of development that have historically emerged, this paper has tried to underline the richness of this tradition. At the same time, it has tried to outline the existence of some unifying elements, which, while preserving the

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<sup>77</sup> Similar results are reached by Bhaduri e Marglin (1990), already recalled in Section 4 above.

<sup>78</sup> This regime is also characterised by a low influence of demand on investment and of productivity on wages. In the following, a high influence of one factor on investment and wages implies a low influence of the other factor.

<sup>79</sup> On this point see Dow (1985), Hamouda and Harcourt (1989) and Chick (1995).

<sup>80</sup> See Solow (1979), Backhouse (1988), Walters and Young (1997).



diversity of ideas and analyses, reduces the risk of interpreting the Keynesian literature as a disorganised set.

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