Modern growth theories, orthodox and heterodox

Table of contents (provisional)

1. The Keynesian and Sraffian revolutions Cesaratto (revised Pariboni)

2. Harrod: the father of all growth models (but one) Cesaratto (revised Pariboni)

3. Neoclassical growth theory (Solow) Cesaratto (revised Pariboni)

4. Endogenous growth theory Cesaratto (revised Pariboni)

5. Heterodox models I

5.1.The Cambridge equation Cesaratto (revised Pariboni)

5.2. The Neo-Kaleckian model Cesaratto (revised Pariboni)

5.3. Recent models and debates Pariboni (revised Cesaratto)

6. Heterodox models II: Marglin-Bhaduri Cesaratto (revised Pariboni)

7. The Supermultiplier model: the new paradigm?

5.1.Antecedents: Garegnani, Ackley, Kalecki, Kaldor on autonomous demand Cesaratto (revised Pariboni)

5.2.The model Pariboni (revised Cesaratto)

5.3. Recent developments and applications Pariboni (revised Cesaratto)

8. Endogenous money and demand-led growth Cesaratto (revised Pariboni)

Other topics (and chapters):

- 'harrodian' models a là peter skott (in cap. 4?) Pariboni
- Keynesian in the short, 'classical' in the long? dumenil e levy, D.Foley, Kurz & Salvadori, others? (in cap. 6?). Pariboni/Cesaratto
- Tradizionalmente parlando di crescita si trattava anche di teoria del capitale (in cap. 2?) Pariboni/Cesaratto
- Figure of heterodox growth theory: Harrod, Kalecki, Kaldor, Joan Robinson Cesaratto/Pariboni

Chapter 1

The Keynesian and Sraffian revolutions and conflicting modern growth theories

In this introductory chapter we will place the different theoretical approaches to growth considered in the next chapters in a stylized frame of the history of economic thought. We will refer in particular to the developments of the Keynesian revolution, characterized on the one hand by its reabsorption by traditional theory and, on the other, by the attempt of the most heterodox currents to defend and extend its most original contents.

1.1. Keynes's controversial legacy

A useful starting point for introducing the modern treatment of growth is Keynes' contribution, which defines the contours of modern macroeconomics.

It is generally acknowledged that Keynes' main contribution concerns the theory of effective demand which he contrasted with the belief of the dominant, neoclassical theory in Say's Law. According to this theory - which should more properly be called marginalist - the flexibility of the "natural" interest rate in the financial market ensures that on average (i.e. taking into account cyclical phenomena of a transitory nature, such as confidence crises, mistakes of monetary authorities) the level of investment adjusts to the supply of fully employment saving. (By full-employment saving we intend the saving supply out of fully utilized endowments of capital and labour.) On the other hand, full employment is ensured by the absence of barriers to real wage flexibility. In this way, marginalist economists believe that the so-called Say's Law is proven: aggregate demand is always adequate to the full-employment aggregate supply.[1]

In the theory of effective demand, on the other hand, it is the level of saving that adjusts to the level of investment decided by entrepreneurs by means of an income multiplier. There would be no reason why the level of investment decided by entrepreneurs is that adequate to full employment, so that the analysis of the multiplier (or, it is the same thing, of effective demand) indicates the possibility of underemployment balances.

---

[1] An introductory text on the foundations of marginalist theory, the natural interest rate and Say's Law is Cesaratto (2020, Chap. 2).

The Keynesian analysis is generally considered a short-term analysis as Keynesian equilibria determined are based on the assumption of a given production capacity. This raises the question of whether its conclusions can be extended to the long term. As is well known, the "neoclassical synthesis" (the IS/LM analysis), initially proposed by Hicks in 1937, thought it could confirm the Keynesian possibility of underemployment balances as a short-term case (e.g. concerning interest rate and wage rigidities, difficulties of coordination between economic agents, or pessimistic expectations), whereas in the longer term neoclassical trends towards full employment would have prevailed.

Garegnani (1962; 1978-79 [1983]; 2015) showed how the results of the critique to the marginalist capital theory that Sraffa (1960) and himself (Garegnani, 1960) had just published were functional to free Keynes from the various ties that still bound his theory to marginalism, which allowed its rapid reabsorption within the traditional alveus as an approach limited to special periods of investment depression. More specifically, those outcomes proved the non-generality of the marginal demand function of investment as negatively elastic to the interest rate. The interest rate could therefore no longer be regarded as the price that brings (capacity) saving and investment decisions into equilibrium. Once the invalidity of this marginalist legacy is proven, the most innovative proposition of the *General Theory* is ring-fenced: within the limits of existing capacity it is the level of saving that adjusts to the investment decisions through variations of output (or, in other words, of the degree of capacity utilisation).

Garegnani's reconsideration of the innovative and traditional aspects of Keynes is also useful for rejecting mainstream Keynesianism – represented today, inter alia, by Stiglitz and Krugman –, which confines the Keynesian case to periods of deeply depressed animal spirits, when investment appears inelastic even to lowering the interest rate, or 'liquidity traps', when monetary policy fails to adjust the real long term interest rates to the level (possibly negative) necessary to bring investment to full employment level (Garegnani, 1962, pp. 56-64, 1978-79 [1983], p.56). As we shall see, a natural victim of criticism of capital theory will be precisely the marginalist theory of growth. The criticism of the marginal capital theory naturally leads us to deny the automatic adjustment of investment to capacity saving, both over the short and long term.

In our opinion, this is the most convincing reconsideration of Keynes' contribution to heterodox theory. This view clashes with other popular interpretations, largely influenced by Joan Robinson, which underline other aspects of Keynes' thought, such as uncertainty, expectations and animal spirits as determining factors for investment decisions. These are seen by Garegnani as elements

that are too subjective and nebulous to serve as the basis for a solid accumulation theory (1979, p. 114-116). The two Pieros were also fully concordant on this issue.

It is the analyses of Roy Harrod and Evsey Domar (an English economist the first, an American the second) who tried to extend Keynesian analysis in the direction of a theory of growth. From Harrod-Domar's analysis the modern neoclassical theory of growth and various "post-Keynesian"[2] strands both depart. In the 1960s, the former theory was the long-term counterpart of the IS/LM model: the latter was assigned the task of analysing the short-term difficulties of the economy and proposing the most appropriate policies to lead it back to the long-term path studied by the neoclassical theory of growth. In this way Keynesian and marginalist elements would have found a synthesis.

For post-Keynesian economists who have less sympathy (and many theoretical doubts) towards the marginalist theory, the problem is, today as yesterday, how to extend to the long term what Kaldor has defined the "Keynesian premise", that is, the idea that the level of investment is independent from the saving supply (defined, as we shall see, in relation to a production capacity "normally" used).

1.2. Harrod and Domar legacy

Modern growth theory can be seen as a long and largely unsuccessful attempt to overcome the problems left behind by Harrod-Domar's growth model (**Chap. 2**). In this book we will not attempt any exegesis, in particular, of Harrod's interpretation of his own result. In our view Harrod's warranted growth equation can be interpreted either as a dynamic expression of Say's Law: assuming that all saving is invested, the economy will grow at an equilibrium (or warranted growth rate); or as a stylized description of the potential instability of capitalism (this is likely the way Harrod himself looked at his model). That is, if we assume that investment is decided independently from capacity saving (Kaldor's Keynesian Hypothesis), then unless capitalists expect the economy to grow at the warranted rate and invest accordingly, the actual rate of growth will diverge more and more from the warranted rate. Neoclassical economists are also unhappy that the warranted rate does not coincide with a full-employment path. However, this does not concern non-conventional economists which are not committed to defend the goodness of laissez-faire.

[2] We shall use the term "post-Keynesian" in a loose way as synonymous of heterodox. There is a little heterodox literature that tries to classify the different heterodox approaches. See for example Lavoie (2011).

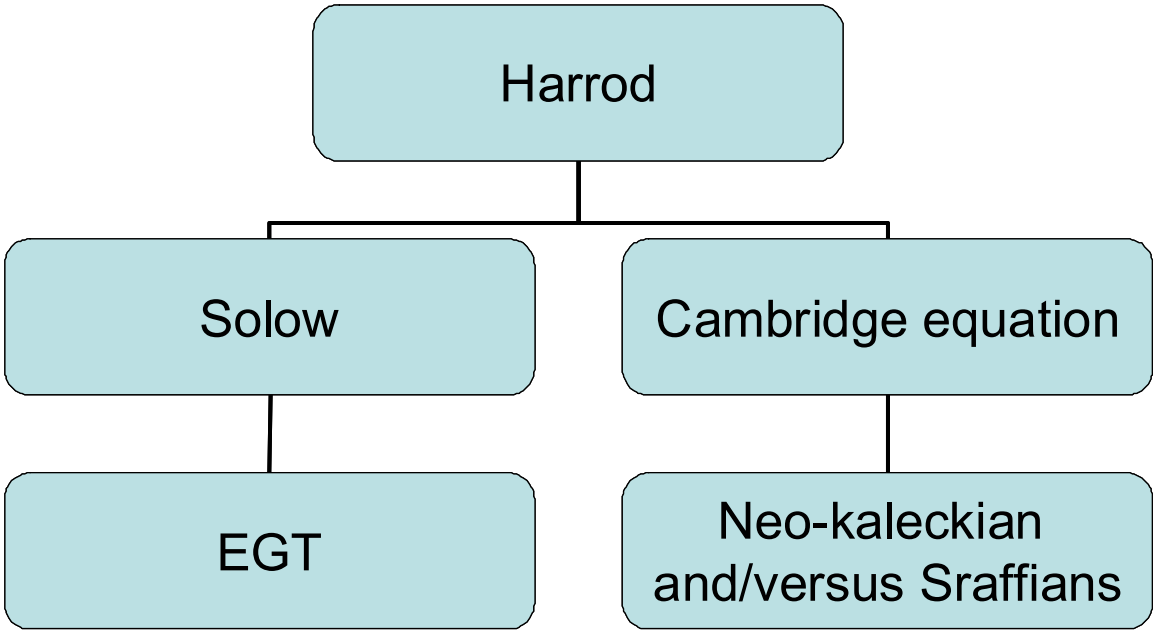
Moving from Harrod growth theory developed along two different lines. The first approach took capacity saving – the saving supply forthcoming from a normally utilized capacity – as the independent variable. The question becomes then how investment decisions adapt to capacity savings. The alternative approach took investment as the independent variable seeing in this a characteristic of capitalism both because it symbolizes the power of capitalists and because the evidence is of a marked instability of this variable. Indeed, Keynes regarded investment as the key variable in his theory of Effective Demand. The question is then to show how *capacity saving* – the saving supply forthcoming from a normally utilized capacity - adjusts to the independent investment decisions.

Solow's model represents the first approach (**Chap. 3**). It is, however, quite unsatisfactory from the point of view of capital theory. Shattered but not out powered by the capital theory controversy, neoclassical economists found some implications of Solow's model also unsatisfactory, what led to endogenous growth theory (EGT) – which actually begun in the early sixties actually, and not in the middle 1980s as usually supposed (**Chap. 4**). While EGT has not solved the problems with Solow, it appears unsatisfactory also from other perspectives.

A first "heterodox" or "post-Keynesian" approach, the so-called "Cambridge equation model" (or Cambridge model for short), was developed since the late 1950s by some Cambridge economists, heterodox followers of Keynes (**Chap. 5**). Some unsatisfactory aspects of their approach led since the early 1980s to further a formulation known as "neo-Kaleckian model" (**Chap. 5**). While in the Cambridge model income distribution changes in order to adjust capacity saving to investment decisions, in the neo-Kaleckian model the variability of the degree of capacity utilization plays the same role. According to Sraffian economists and to other heterodox economists, the abandonment of the notion of a long-run normal degree of capacity utilization is, however, an inacceptable step. In the late 1980s, two distinguished post-Keynesian economists, Amit Bhaduri and Stephen Marglin, extended the neo-Kaleckian approach proposing a taxonomy of growth regimes (e.g. wage-led or profit-led) which some post-Keynesian economist may still consider as *the* growth model (**Chap. 6**).

In spite of their differences, both the approaches, neoclassical and heterodox aim to show that the economy converges to an Harrod-Domar warranted growth rate and, in this capacity, can be all defined as neo-Harrodian models. The only model that departs from the Harrodian framework is, as far as I can see, the Sraffian-Kaleckian supermultiplier that I regard as the most promising approach (**Chap. 7**).

Figure 1.1 sums up the main trends of modern growth theory.


Harrod
Solow
Cambridge equation
EGT
Neo-kaleckian
and/versus Sraffians

1.3. The indissoluble link between distribution and growth: Sraffa's legacy

Mainstream economists are obsessed with the "micro foundations" of macro models. By this they mean that macro models must be consistent with the rational decisions of individual agents. We believe that more than in methodological individualism, macro models must be well implanted in value and distribution theory, which, as David Ricardo argued, is the core of economic analysis.

In this regard, Sraffa not only completes the Keynesian revolution through criticism of the theoretical foundations of the marginalist theory of capital, but also recovers the classical theory of distribution, which can thus act as an alternative prop to the heterodox developments of Keynesian theory. Classical economics suggest that we should not begin social analysis from the single individual, the naïve idea that society can be interpreted by analysing the representative individual.

More specifically, Sraffa recovered the surplus approach to the theory of value and distribution developed by the Classical economists and Marx and later obscured by the emergence of marginalist economics in the second half of the 19th century. Central to the Classical theory is the concept of social surplus encapsulated by the equation:

$$S = P\text{-}N \qquad (1.1)$$

where S is that part of the physical net social product P (net of the reproduction of the means of production) which is left once workers' "necessities" (or wage goods), N, are paid.

The social surplus can be defined as the part of the social product that remains once society has put aside what is necessary to reproduce the social output at least at the same level, and that can thus safely used to any other purpose.

As seen, "Say's Law", named after the French economist Jean-Baptiste Say that formulated it in the early nineteenth century conveyed the idea that production generates income that in turn is spent in its entirety. The classical economists did not have unanimous opinions on the Say's Law. For instance, Ricardo believed in Say's Law, but Marx was much more skeptical about it. Ricardo believed that saving would not be an obstacle to the closure of the income-expenditure circuit, since decisions to save were identified with decisions to invest (note, however, that Say's Law does not by itself demonstrate that the economy tends to full employment, but only that it does not suffer from problems of aggregate demand).

Referring to equation (1), we may think of social output as composed of necessities (N) that are demanded by workers, and investment goods and luxuries (both contained in S) that are purchased

by “capitalists”. Suppose then that *S* is so large that capitalists (and the ancillary social classes) d not demand and consume all of it. Part of the output is unsold and this generates a problem of aggregate demand. One solution would be, of course, to increase *N*, but each capitalist would like to see the *other* capitalists pay higher wages while paying the lowest wages possible to its own employees, as Marx pointed out. Another solution is that capitalists decide to invest systematically the whole surplus they do not consume themselves. Productive capacity would constantly increase, but as long as capitalists continue to invest all what they save (and the availability of labour or land does not create problems), the problems with aggregate demand are overcome. Science fiction? No, this is the solution envisaged by Tugan-Baranowski, a Russian economist of the beginning of last century. As we shall see, Michal Kalecki - a great Polish economist with a Marxist background who, in the early 1930s, reached autonomously the same result later published by Keynes - appreciated Tugan’s idea that the satisfaction of human needs is not the purpose of capitalism: production of means of production through of means of production would be fine as long as this leads to the absorption of the social surplus (Kalecki 1967). The problem, as Kalecki sees it, is that a systematic investment of all saving would require some economic planning, but “Now capitalists do many things as a class but they certainly do not invest as a class” (ibid, p. 152), he explained in one of his most famous aphorism. Following Rosa Luxemburg, Kalecki envisaged in the “external markets” the solution: endogenous money creation (see below) would finance public spending, autonomous consumption and demand from foreign markets that will absorb the part of the social surplus that capitalists do not consume themselves. Our favourite growth model (**Chap. 7**) is inspired by these Luxembourg-Kaleckian ideas.

It is characteristic of autonomous expenditure of not being financed out of income revenues, e.g. out of wages as in the case of workers’ induced consumption; it must therefore be financed by credit creation. This leads us to the theory of endogenous money. In short, according to conventional theory banks lend savings - this was labelled by D.H.Robertson “loanable fund theory”. This is not so, however, as an increasing number of respected economists are acknowledging. When banks receive a request for a loan from a trusty customer (households or firms), they will never refuse it and will consequently open a deposit in her favour. In other words, banks create money (bank deposits) on request. This capacity to lend does not depend on having received savings before, or even on having enough reserves to back the newly created deposit. Reserves are indeed created on request of the commercial bank by the central bank. The idea of textbook *deposit multiplier* that says that the amount of deposits the banking system can create depends on the *exogenous* liquidity supply by the central bank is deadly wrong. The central bank, given the demand for credit that the market advances at the prevailing interest rates, endogenously creates reserves. Are central banks

then only passive creators of reserves? Not at all. They fix the (short period) interest rate at which they provide reserves. This rate influences the longer period interest rates in the economy and, therefore, autonomous spending, for instance the demand for mortgages. What endogenous money theory contends is that at the interest rate of her choice, the central bank provides all the reserves requested by the market. The relations between endogenous money creation, autonomous demand and growth are studied in **Chap. 8**.

1.4. Grow with style.

Earlier and more recent presentations of growth theory, including those of Solow (1970) and Jones (2002), focused on explaining Kaldor's six famous 'stylized facts' of economic growth.

Let Y to be output, N the labour force, K the capital stock, P profits and W the wage bill. The six stylized facts' are:

1. Output per worker $y = Y / N$ grows at a roughly constant rate ($\hat{y} = \hat{Y} - \hat{N}$) that does not diminish over time.

2. Capital per worker $k = K / N$ grows over time ($\hat{k} = \hat{K} - \hat{N}$).

3. As the result of facts 1 and 2, the capital/output (or capital coefficient) $v = K/Y$ ratio is roughly constant ($v = \bar{v}$).

4. The rate of return to capital (or rate of profits) r is constant: $r = P / Y = \bar{r}$.

5. As a consequence of fact 4, the respective shares of capital π and labor ω in net income are nearly constant. This is easily proved. Given that: $Y = P + W$, dividing by Y we obtain: $1 = \frac{P}{Y}\frac{Y}{K} + \frac{W}{Y} = \bar{r}\bar{v} + \omega = \bar{\pi} + \bar{\omega}$

6. Facts 1 and 5 imply that real wage w grows over time: since $\omega = \frac{W}{Y} = \frac{wN}{Y}$ is constant, and Y grows faster than N, then w must be growing.

Two additional stylised facts that growth models may aim to explain can be added to this list, although they are more controversial: a positive correlation between the investment (saving) rate, that is the ratio between investment (saving) and output, and the rate of economic growth, either in aggregate (g_Y) or per-capita terms (g_y).

These Stylised facts describe a balanced growth path, or steady state growth path (or normal path as we shall sometimes indulge to call it).

Steady state analysis is not necessarily the best method. The present financial crisis shows that capitalism is far to be growing along balanced paths. So steady state analysis should be complemented by the analysis of the crises. We believe that economic analysis is concerned with the analysis of tendencies that we often study by assuming an artificial ceteris paribus clause. This does not exclude that a robust analysis can singe out prevailing real tendencies in given historical circumstances. In our opinion, non orthodox theories – in particular the Sraffian supermultiplier approach - are better prepared to do this compared to neoclassical theory.

References

Lavoie, M. (2011) 'Should Sraffian economics be dropped out of the Post-Keynesian school?', *Économies et Sociétés*, 44(7): 1027–59.