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Does modern endogenous growth theory adequately represent Allyn Young?

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Endogenous growth theory is now fashionable. It seeks to explain why per capita income growth in capital abundant countries is often faster than in capital poor countries and defies the operation of diminishing returns. This theory, which took off with Romer and Lucas, often makes Allyn Young's concept of increasing returns and Marshall's distinction between internal and external economies its starting point but considers their treatment of the subject as not sufficiently rigorous. The modern endogenous growth theorists then claim to explain what they had in mind with greater clarity, rigour and depth. This paper argues that this is not the case as these theorists actually misrepresent Young in important ways.

Key words: Endogenous growth, Increasing returns, Cumulative causation, Classical growth theory, Allyn Young
JEL classifications: B12, B 22, O11, O40

1. Introduction

Endogenous growth theory is now fashionable. It seeks to explain why per capita income growth in capital abundant countries is often faster than in capital poor countries and defies the operation of diminishing returns.[1] It also claims to explain the phenomenon of 'increasing returns' which appears to underlie the continuing high per capita income growth in rich countries. Romer (1989, p. 51) poses the problem thus: 'How can one reconcile extraordinary, continuing increases in average per capita income with the notion of diminishing returns?'

Early development economists such as Rosenstein-Rodan (1943, 1961), Nurkse (1953) and Lewis (1954) emphasised the role of capital accumulation in growth. Given a constant capital–output ratio, the Harrod–Domar model predicted that the higher the savings rate, the higher would be the rate of growth.[2] However, since

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[1] One of Kaldor's (1961) six stylised facts is that output per worker shows continuing growth with no tendency for a falling rate of growth of productivity.

[2] This would, however, be true if growth is not labour constrained. In line with Lewis (1954), one has to assume unlimited supplies of labour.

capital accumulation was regarded as central to growth, the assumption of a constant capital–output ratio was considered unrealistic (see Solow, 1956), in that the phenomenon of diminishing returns could soon be expected to reduce and finally eliminate all per capita income growth. Based on such models, which emphasise capital accumulation, it is difficult to foresee how growth can continue beyond a few decades given the assumption of diminishing returns. In fact Krugman (1994) in a celebrated article in *Foreign Affairs* claimed that the East-Asian miracle, like the earlier communist miracle, was largely based on input growth. It would therefore not be sustainable: 'Popular enthusiasm about Asia's boom deserves to have some cold water thrown on it. Rapid Asian growth is less of a model for the West than many writers claim, and the future prospects for that growth are more limited than almost anyone now imagines' (p. 64).

Neoclassical growth theory (e.g., Abramovitz, 1956; Solow, 1956, 1957) regards growth largely as the outcome of exogenous technical progress, which effectively offsets the law of diminishing returns to which inputs are subject. From the policy perspective this theory has little to offer since technical change is unexplained and therefore not amenable to policy. The theory predicts a convergence of living standards of different economies to a common level, but the evidence suggests no such convergence.[1] Romer (1989), on the basis of data from Summers and Heston (1984), presents evidence in the form of a scatter plot to suggest that growth rates across 115 market economies show no systematic variation with the level of per capita income. 'The absence of any negative slope in this scatter plot is evidence against the assertion that low-income countries tend to grow more rapidly than high income countries and that convergence in per capita income is taking place' (Romer, 1989, p. 64). Thus modern endogenous growth theory has partly emerged to explain this lack of convergence and partly to evolve a theory which has something interesting to say on policy.[2]

Modern endogenous growth literature, which took off with Romer (1986, 1987) and Lucas (1988), shows no signs of subsiding. Other important contributions in this area are Romer (1989, 1990), Krugman (1990, 1993), Murphy *et al.* (1989A, 1989B), Shaw (1992), and Aghion and Howitt (1998). This literature often makes Allyn Young's (1928) concept of increasing returns and Alfred Marshall's (1890) distinction between internal and external economies its starting point. Since the treatment of the subject by Marshall and Young is considered to be verbal and therefore insufficiently rigorous, the modern endogenous growth theorists then claim to explain what they had in mind with greater clarity, rigour and depth.

The objective of this paper is to examine whether modern endogenous growth theory adequately represents Young's concept of increasing returns. In the next section we shall present Young's view of growth in which the division of labour, limited by and determining the size of the market, plays a crucial role. In Section 3 we explain the ways in which modern endogenous growth theory is inconsistent with Young's ideas. In Section 4 we present our conclusions.

[1] Another of Kaldor's stylised facts is that there are wide differences in the rate of growth of productivity across countries.

[2] Whilst it is true that lack of evidence on absolute convergence stimulated the development of endogenous growth theory, it was subsequently emphasised that Solow's model only predicts *conditional* convergence (see, for example, Mankiw *et al.*, 1992).

2. Young's view of growth

The starting point of our analysis is Adam Smith (1776) who argued that the division of labour was constrained by the size of the market.[1] When Smith talked of the division of labour what he had in mind was job specialisation either within a firm or the development of specialised arts and crafts. He gave the example of pin manufacture in this context. If one man were to carry out all the operations of pin making—drawing of wire, cutting, head-fitting and sharpening etc.—his output would be minimal. If, however, the market size were sufficient, then each worker could specialise in a single operation only, with dramatic effects on total output and output per worker.

The larger the division of labour the larger is productivity. Smith in his *Wealth of Nations* listed three gains flowing from the division of labour:

> This great increase in the quantity of work which, in consequence of division of labour, the same number of people are capable of performing, is owing to three different circumstances; first to the increase of dexterity in every particular workman; secondly, to the saving of the time which is commonly lost in passing from one species of work to another; and lastly, to the invention of a great number of machines which facilitate and abridge labour, and enable one man to do the work of many. (Smith, 1776, Vol. I, p. 11)

Young elaborated on Smith's notion of the division of labour to include not only job specialisation but also specialisation among firms and industries.[2] According to him, specialisation at these levels was the main source of increasing returns. A growing market would permit a wider range of specialist firms and industries and this would lead to all-round cost reductions and hence to further increase in the size of the market. In Young, increasing returns take the form of pecuniary external economies that are passed on to other firms through the price system. Thus a competitive market system is crucial for the transmission mechanism to take place.

Young's concept of increasing returns is different from the equilibrium notion of economies of scale. In an economy the forces of disequilibrium are continuously defeating those which make for equilibrium, and hence he advocated a disequilibrium approach to the phenomenon of growth. Thus increasing returns must also be interpreted from a disequilibrium perspective.[3] Young pointed out that if we look for increasing returns under large-scale production or under production by large firms, we are likely to miss them. Increasing returns, more often, took the form of external economies that are passed on to other firms in the form of reduced prices. Thus increasing returns did not necessarily lead to monopoly or the breakdown of competition. What Young had in mind was 'large production' rather than 'large-scale production' in response to expansion of the market as a whole (Young, 1928, p. 531), so that increasing returns result from *economies of specialisation* rather than *economies of scale* as conventionally understood. In his LSE lectures, as recorded by his student Nicholas Kaldor, Young remarked: 'Most of the advantages of increasing returns can be had in an industry not consolidated ... Rather

[1] For a discussion of pre-Smithian theory regarding the role of consumption in development, see Perrotta (1997).

[2] See Chandra (2004) for a comparative discussion of their contributions on the division of labour. While Smith's main emphasis was the development of appropriate institutions and conditions for growth, Young explained the *mechanics* of endogenous growth more fully. Also see Chandra (2003).

[3] In contrast, some authors (e.g., Buchanan and Yoon, 1999, 2000) argue that increasing returns are quite compatible with an equilibrium perspective. See also Romer (1986).

they are those of increased specialisation, those of reorganisation, not mere increase of size in the operating units' (Young, 1990, pp. 53–4).

Young subscribed to a macroeconomic concept of increasing returns rather than microeconomic increasing returns arising out of economies of scale. He emphasised the importance of treating industrial operations as a whole, rather than looking for increasing returns under individual firms or industries even if they be large.[1]

Since the size of the market is determined not by population or geographical area but by the volume of total production, Young suggested that the capacity to buy depended on the capacity to produce. From this he concluded that Adam Smith's dictum regarding the division of labour amounted to the theorem that the division of labour to a large extent depends on the division of labour. Although Young did not use the term 'cumulative causation', which was earlier used by Veblen (1898) and later popularised by Myrdal (1957), his explanation of growth is very much in this spirit. In Young's words: 'The economic system grows and evolves, like a living organism, by means of successive adjustments and adaptations. But change breeds change, and every new adjustment paves the way for another' (Young, 1929; quoted from Mehrling and Sandilands, 1999, p. 411).

Growth, once started, has an underlying tendency to be self-perpetuating rather than self-exhausting. Although different industries grow at different rates depending on their elasticities of demand and supply, the endogenous process of overall growth is such that 'even with a stationary population and in the absence of new discoveries in pure and applied science there are no limits to the process of expansion except the limits beyond which demand is not elastic and returns do not increase' (Young, 1928, p. 534).

If the market is the main source of increasing returns, what exactly is the role of capital? Capital, by enhancing roundaboutness in production, greatly facilitates the division of labour. So increasing returns are basically the economies of capitalistic and indirect methods of production, but they are constrained by the size of the market: 'The first point is that the principal economies which manifest themselves in increasing returns are the economies of capitalistic or roundabout methods of production. These economies . . . are largely identical with the economies of the division of labour in its most important modern forms . . . The second point is that the economies of roundabout methods, even more than the economies of other forms of the division of labour, depend upon the extent of the market – and that, of course, is why we discuss them under the head of increasing returns' (*ibid.*, p. 531). Thus the important point is that the economies of roundabout or capitalistic methods of production are constrained by the size of the market, so capital accumulation by itself is not an independent engine of growth.

In this demand-based view of growth, inputs of labour, capital and technology are seen more as the outcome of the growth process than its cause. Considerable evidence exists to suggest that growth is indeed not caused by inputs of labour or capital. Currie (1997) gives a useful review of this evidence for the USA. Regarding the relationship between real GDP and non-residential business investment, he finds that GDP precedes non-residential business investment fairly consistently from 1960 to 1992. He also cites supporting evidence from Montenegro (1989) who, on the basis of Granger-causality, finds that GDP causes non-residential business investment in the

[1] '[T]he mechanism of increasing returns is not to be discerned adequately by observing the effects of variations in the size of an individual firm or of a particular industry, for the progressive division and specialisation of industries is an essential part of the process by which increasing returns are realised. What is required is that industrial operations be seen as an interrelated whole.' (Young, 1928, p. 539)

US and not vice versa. As for the role of labour Currie finds that there is a negative correlation between per capita income growth and population growth for a sample of 100 countries.[1] Thus in Currie's view there is little evidence to suggest that growth is mainly the outcome of inputs of labour or capital.

Blomström *et al.* (1996) express a similar view. On the basis of their Granger analysis as applied to panel data, they find that economic growth precedes capital formation and not vice versa. In a recent study, Chandra and Sandilands (2003) show that although GDP and real investment are cointegrated for India during 1950–96, the direction of causality runs from economic growth to capital accumulation and not vice versa. So investment emerges as a following rather than an initiating factor in India's growth.[2]

3. Modern endogenous growth theory and Young

Recently, considerable literature (e.g., Fine, 2000; Sandilands, 2000; Thirlwall, 2003) has emerged offering critical assessment of modern endogenous growth theory. For example, Fine (2000), in assessing this theory from the perspective of recent developments within the economics discipline, has suggested that there is little new in it as it heavily draws upon and strengthens the traditional microeconomic foundations of neoclassical economics. 'The originality lies more in bringing these ideas to the fore and packaging them in the most advanced form of mathematical models. At a more mundane level, the claim to newness resides, at least terminologically, in substituting endogenous for exogenous. What was previously taken as given is now explained' (p. 248). Thus, like much of recent macroeconomics, endogenous growth theory 'can be thought of as microeconomics parading as macroeconomics' (p. 252). Similarly, Thirlwall (2003) finds nothing essentially new in modern endogenous growth theory's stress on externalities arising out of human capital formation or R&D expenditures as these factors had already been emphasised by scholars such as Schultz (1961), Denison (1967) and Griliches (1957). Sandilands (2000) questions the stress on 'new' knowledge in endogenous growth literature as opposed to the greater diffusion of 'existing' knowledge as the size of the market expands.

Modern endogenous growth literature similarly misinterprets Young in several important ways. First, this literature seems to suggest that Young was talking about some kind of competitive equilibrium in the presence of increasing returns. For example, Romer (1986, p. 1004) writes:

> The idea that increasing returns are central to the explanation of long-run growth is at least as old as Adam Smith's story of the pin factory. With the introduction by Alfred Marshall of the distinction between internal and external economies, it appeared that this explanation could be given a consistent, *competitive equilibrium* interpretation. The most prominent such attempt was made by Allyn Young in his 1928 presidential address. (Italics added)[3]

[1] Studies by Mankiw *et al.* (1992) and Knight *et al.* (1993) suggest that population growth has a negative and statistically significant impact on both per capita income level and per capita income growth. See also Thirlwall (1999, p. 119) for a summary of six recent studies on the macrodeterminants of growth.

[2] For similar evidence in the case of the UK, see Chandra and Sandilands (2002).

[3] See also Robbins (1932), who mistakenly suggested that Young (and Smith) were advocates of equilibrium economics: '[A]lthough Adam Smith's great work professed to deal with the causes of the wealth of nations, and did in fact make many remarks on the general question of the conditions of opulence which are of great importance in any history of applied Economics, the central achievement of his book was his demonstration of the mode in which the division of labour tended to be kept in equilibrium by the mechanism of relative prices – a demonstration which, as Allyn Young has shown, is in harmony with the most refined apparatus of the modern School of Lausanne. The theory of value and distribution was really the central core of the analysis of the Classics, try as they might to conceal their objects under other names' (pp. 68–9).

Young did stress the importance of a competitive market system in making increasing returns possible but his conception was not that of equilibrium. He regarded growth as a process in which 'the counter forces which are continually defeating the forces which make for economic equilibrium are more pervasive and more deeply rooted in the constitution of the economic system than we commonly realise' (Young, 1928, p. 533). Furthermore: 'Every important advance in the organisation of production, regardless of whether it is based upon anything which, in a narrow or technical sense, would be called a new "invention", or involves a fresh application of the fruits of scientific progress to industry, alters the conditions of industrial activity and initiates responses elsewhere in the industrial structure which in turn have a further unsettling effect. Thus change becomes progressive and propagates itself in a cumulative way' (*ibid.*, p. 533). Moreover: 'Seeking equilibrium conditions under increasing returns is as good as looking for a mare's nest' (Young, 1990, p. 45).

The modern endogenous growth literature seems to suggest that *economies of scale* are the chief source of Youngian *increasing returns*, and therefore that fixed costs and monopolistic competition are important ingredients of models trying to depict the phenomenon of increasing returns. For example, Romer (1987, 1989) considers that increasing returns are based on specialisation arising out of fixed costs and that therefore we need not rely on the beneficial external effects due to spillovers of knowledge.[1] Describing his Marshall–Young–Romer model of endogenous growth Romer (1989) writes:

> The degree of specialisation, or equivalently, the number of different firms that are available at any point in time or location, is limited by the presence of fixed costs. . .Although Marshall and Young choose to describe specialisation in terms of competitive equilibrium with externalities, it is now clear that a more rigorous way to capture the effects they had in mind is in a model with fixed costs. In an equilibrium with nonnegative profits, price must exceed marginal cost to be able to recover these fixed costs, so the model must therefore contemplate some form of market power. (p. 108)

As is implicit in Romer's statement above, Young himself never talked of fixed costs or economies of scale or monopoly power in the context of increasing returns.[2] In the Youngian notion, increasing returns are certainly based on specialisation (or the division of labour) which occurs among firms and industries, but these increasing returns are mostly external to a firm and transmitted to other firms through pecuniary external economies. By contrast, Romer suggests that for specialisation to arise, significant fixed costs and monopoly power are necessary. In the Youngian notion, specialisation does not arise due to fixed costs or monopoly power but due to the expansion of the size of the market. Since Youngian increasing returns are external rather than internal, macroeconomic rather than microeconomic, their presence does not necessarily lead to the emergence of monopoly or to the breakdown of competition.

[1] However, Romer (1990) also presents a model in which monopolistic competition and knowledge spillovers are both allowed in an equilibrium situation. This model emphasises the role of integration into world markets in increasing the growth rate through the way it promotes new research.

[2] For example, Young (1928) while dwelling on Alfred Marshall's distinction between internal and external economies warns that 'it is, or ought to be, a safeguard against the common error of assuming that whenever increasing returns operate there is necessarily an effective tendency towards monopoly' (p. 527). But this distinction, according to Young, is a partial view and may only be true as long as the representative firm is able to maintain its identity. Once one takes into account the changes taking place in the external environment, which are qualitative as well as quantitative, one has to depart from the equilibrium notion of increasing returns which Marshall had in mind. Youngian increasing returns are therefore based on continuous disequilibrium rather than equilibrium.

In a disquilibrium situation where new packagings, new substitutes, new products, new processes and new combinations of factors are continuously emerging in response to a growing market, a representative firm is likely to lose its identity sooner or later. To take an extreme example to illustrate the point, a firm which initially manufactures a final product X may ultimately end up manufacturing some component of X. Or, instead of manufacturing all components of X itself, the firm may concentrate on assembling the final product and buy components from a number of small intermediate producers. The concept of 'economies of scale' is therefore slippery and problematic because first, the firm may not be able to maintain its identity for long and second, even if it does it does not often stay on the same cost schedule.[1]

This process of industrial fragmentation or disintegration is a key feature of the growth process. When the external environment is changing fast, not only is it difficult for a firm to maintain its identity but also the distinction between internal and external economies becomes blurred: 'With the extension of the division of labour among industries the representative firm, like the industry of which it is a part, loses its identity. Its internal economies dissolve into the internal and external economies of the more highly specialised undertakings which are its successors, and are supplemented by new economies' (Young, 1928, p. 538).

The importance of internal economies of scale is also highlighted by Krugman (1993). He suggests that economies of scale at the individual plant level are necessary to generate strategic complementarity (or pecuniary external economies) at the level of the economy. In his streamlined presentation of the big push model of Murphy *et al.* (1989B), he mentions that two conditions are necessary to generate external economies in the model, i.e., economies of scale in production and elastic labour supply in the traditional sector. 'It is thus the interaction between internal economies of scale and elastic factor supplies that gives rise to de facto external economies' (Krugman, 1993, p. 20). Furthermore, 'As long as there are unexhausted economies of scale in the modern sector, which are crucial to the whole argument, one must face up to the necessity of modelling the modern sector as imperfectly competitive' (*ibid.*, p. 20).[2]

[1] The term 'economies of scale' usually conjures up the comparative statics idea that by moving along a given cost schedule, unit costs can fall. By contrast, the Youngian conception, in the rare event of a firm being able to maintain its identity, is of 'dynamic economies of scale' in which the cost schedule itself shifts down as the overall market size, in which a firm operates, expands over time.

[2] Krugman (2002) also reviews Bertil Ohlin's seminal work *Interregional and International Trade* (1933) and asks, à propos his own recent contributions to 'new' trade theory based on increasing returns (notably in Helpman and Krugman, 1985), 'Was it All in Ohlin?' He concludes that Ohlin did anticipate many but not all of the modern insights. For he understood that not only factor endowments but also increasing returns are the sources of trade, insights absent from the Heckscher–Ohlin model as famously formalised by Paul Samuelson. However, while Krugman provides insights into the role of increasing returns as a source of trade, the Youngian perspective suggests that increasing returns are just as much (or more) the result as the cause of trade. By expanding the size of the market, trade acts as a powerful instrument for the realisation of increasing returns as a pervasive, continuing growth phenomenon rather than something that merely generates once-for-all gains. As Young (1924, p. 151) put it, before he had fully elaborated his ideas on increasing returns and economic progress: 'in the growth of our economic civilisation it has been commerce, rather than agriculture or industry, that has led the way. Production is limited by markets. It can advance only as markets are increased. Commerce creates markets. The industrial revolution... cannot be ascribed merely to the great inventions of Watt, Kay, Hargreave, Arkwright and Crompton. These mechanical improvements were... really called into being by the fact that growth of English commerce... had, for the first time, made the factory system and large-scale production possible.'

However, as already stressed, neither economies of scale nor imperfect competition is necessary for Youngian increasing returns to take place because 'large production, not large scale production, permits increasing returns' (Young, 1990, p. 54). In fact these increasing returns are most fully realised in a well-functioning competitive market system.[1]

By contrast, the endogenous growth and trade literatures stress anti-market policies, such as patents, copyrights and 'strategic trade policy' or protectionism; and monopoly power is justified on the grounds that competition, by driving down the returns, would not provide enough incentive to recoup the costs of R&D and innovation. In Youngian theory, increasing returns are achieved through more rather than less competition. The positive effects of competition through diffusion are thought to outweigh its negative impact. While Young was favourably inclined towards copyright laws, as 'otherwise it would not be possible for publishers to give adequate royalties to authors', he did not favour patents. But in any case the most important improvements in methods of production are not patentable. Young gives the example of the steam engine 'which, at first was empirical [i.e., involved trial and observation]; then Joule determined heat expansions [laws of thermodynamics] and engines developed. But Joule's work was not patentable... With the complications of industry, one patent is valueless unless it is used with another (e.g. wireless). The system is hopelessly intricate. We can probably do away with patents and not much retard development' (Young, 1990, p. 52).

However, Young was not against the idea of product differentiation or imperfect competition (see Blitch, 1995, p. 119). In Young, some form of monopoly power could emerge in the normal market process itself. For example, an entrepreneur who was first to innovate could reap supernormal profits. As others enter the field these would disappear, but reappear in some other area. However, this does not imply that monopoly power should be policy-induced to achieve growth, as the modern endogenous growth literature suggests. Imperfect competition or some sort of monopoly power may emerge from the process of growth, but from this one cannot conclude that deliberately created market power is a sound basis for augmenting growth.

In fact policy-determined favours and privileges smack of mercantilism which Smith opposed. Young (1928) was too much steeped in the classical tradition to advocate favours, privileges or protection to the chosen sectors. Moreover, he did not view increasing returns as being confined to specific sectors (such as manufacturing) but had a generalised notion of increasing returns.[2] A policy of favours or protection to specific sectors would distort the reciprocal *trade* relationships of sectors, curb the size of the overall market and hence the realisation of macroeconomic increasing returns.

Finally, endogenous growth theory may be faulted for being too steeped in the neoclassical framework of the aggregate production function—a concept that essentially

[1] Note that the Youngian stress on competition is necessary if the fruits of increased specialisation are to be effectively transmitted in the form of reduced costs/prices and improvements in quality. But the view of competition in Young (and Smith) is essentially that of a 'process' rather than 'outcome'. While in the process view competition produces cumulative change, in the 'outcome' view competition produces some sort of equilibrium or Pareto-optimal configuration. Also see Reid (1989, p. 1) who argues that 'it is a mistake to confuse the *act* of competition (i.e. the competitive process) with its *consequence* (i.e. competitive structure).'

[2] See Currie (1981, p. 54) in whose opinion Young 'was reluctant to speak of an industry of increasing returns even as an hypothetical example (and made it clear that he did so only out of respect to the prevailing custom and purely to make his point that an increase in output is an increase in demand for other industries' products).'

retains all the properties of microeconomics. It assumes that the whole is simply the sum of its parts, with aggregate output a unidirectional function of factor inputs, albeit the earlier neoclassical exogenous growth theory excludes inputs of human capital and R&D. Thus it gives essentially a supply-side view only, whereas Youngian increasing returns are based on macroeconomic real demand in which the whole is much more than the sum of its parts and in which competition, mobility and free trade are the essential mechanics of growth. The Youngian view of growth as a process cannot be easily reconciled with production–function type models, whether of the neoclassical vintage or of the modern endogenous growth variety.

4. Conclusions

Models emphasising capital accumulation cannot deal with the observed phenomenon of increasing returns in rich countries where rates of per capita income growth have not only been maintained but are often higher than in capital-poor countries. The neoclassical theory tried to explain this in terms of exogenous technical progress, which effectively counters the law of diminishing returns to which factor inputs are subject. But the technical progress or the residual itself was left unexplained. Also, the neoclassical theory did not have anything interesting to say about policy, as whatever the governments may do is not expected to have any influence on the exogenous technical change. Nor could the neoclassical models explain the lack of convergence between capital-abundant and capital-poor countries.

Modern endogenous growth theory entered the scene partly to explain the residual that was left unexplained by the neoclassical theory and partly to garner a policy role. Within the production–function framework, it succeeded in introducing certain innovations designed to yield increasing returns to scale rather than the neoclassical constant returns to scale. Despite these achievements, this endogenous growth theory could not break free from the supply-side view of the growth process emanating from the neoclassical production–function approach. As we noted, although the modern endogenous growth theory claimed to explain Young with greater analytical clarity, rigour and depth, it actually missed his central message that the division of labour and the size of the market are dominant influences. To its credit, endogenous growth theory discusses integration with world markets but only because larger markets induce more research inputs, which in turn contribute to faster growth. Thus this theory suggests that growth arises primarily due to the application of new knowledge. But the role of larger markets in making more effective use of existing knowledge or technology is largely neglected. As we noted, even with no advances in pure or applied sciences there are no limits to increasing returns in Young. Also, endogenous growth literature suggests that the presence of fixed costs and some sort of market power are crucial to growth. In Young, neither fixed costs, market power nor economies of scale are necessary for the realisation of increasing returns. They are better realised with more, rather than less, competition. Therefore, the modern endogenous growth theory misrepresents Young in important ways.

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