The Elgar Companion to Classical Economics
A–K

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Decreasing Returns

Decreasing returns occur when increases in the quantity of resources utilized lead to a diminishing increase in output. Decreasing returns are caused by the limited availability of some input which prevents all inputs from varying in optimal proportion. In other words, if an input is limited in quantity, a rise in production levels brings about a less efficient proportion among inputs with a fall in productivity. According to classical economists, the typical case of this is the agricultural sector, which is the exclusive consumer of agricultural land. David Ricardo maintained that the expansion of the agricultural production of a country entails (extensive) diminishing returns because 'land is not unlimited in quantity and uniform in quality' (Ricardo, *Works*, I: 70). Decreasing returns in agriculture are the reason for rent being paid on the more productive lands. When 'in the progress of population, land inferior in quality, or less advantageously situated is called into cultivation', a rent is immediately paid for the use of the land of 'first quality' (ibid.). In short, the rent paid on lands of better quality derives from the difference in productivity between these lands and the marginal land characterized by inferior returns.

In Ricardo's times, it was commonly thought that technical change in agriculture would not be sufficient to balance diminishing returns. Adam Smith himself noticed that in agriculture it was impossible to increase the division of labour as in the manufacturing industry. This impossibility, writes Smith (*WN*, II, p. 16), 'is perhaps the reason why the improvement in the productive power of labour in this art, does not always keep pace with the improvement in manufactures'.

It should be stressed that the scarcity of land concerns agricultural production *as a whole*. Therefore, the law of decreasing returns operates only at an aggregate level and not in producing single agricultural or manufactured goods. For Ricardo, if all circumstances remain unchanged, the increased quantity produced of an *individual commodity* will involve constant returns. Free competition guarantees that inputs can vary in optimal proportion by moving resources from less profitable activities towards sectors where profit is higher. Ricardo notices that the commodities on which 'competition operates without restraint' are by far the greatest part of those goods daily exchanged in the market. These commodities, which are 'procurable by labour', 'may be multiplied ... almost without any assignable limit, if we are disposed to bestow the labour necessary to obtain them' (Ricardo, *Works*, I: 12).

As highlighted by Piero Sraffa (1925; 1926b), the law of decreasing returns has a very different origin from that of the law of increasing returns. Diminishing returns were associated mainly with the problem of rent within the theory of income distribution, while increasing returns were

treated in relation to technical change and the division of labour. Non-proportional returns were not considered by classical economists as a cause of the variation in the relative price of individual commodities produced because, on the one hand, diminishing returns increased, in the same measure, the cost of 'all agricultural produce in general' while, on the other hand, increasing returns were considered to be the 'result of the general economic progress' (Sraffa, 1926b: 537). Moreover, the classical concept of increasing returns was associated with the dynamic analysis of production conditions and is incompatible with the static theory of relative prices.

In the neoclassical theory of partial equilibrium price, the two laws of decreasing and increasing returns were merged in the single law of non-proportional returns. Sraffa observes that the idea of considering the law of non-proportional returns as a basis for the price theory arose, for analogy, only after studies of decreasing utility had drawn attention to the relationship between the price and the quantity consumed. The intersection of the supply and demand curves is linked to the non-proportionality of returns in relation to the quantity produced and to the symmetry of these opposing forces. With a horizontal long-period collective supply curve, cost determines price, while demand does not affect it but determines instead only the quantity produced (Sraffa, 1925: 56ff, 120; 1926b: 541).

Sraffa demonstrates that rising long-period curves do not satisfy the assumptions necessary to the partial equilibrium analysis of the price of single commodities produced under competitive conditions. He argues that in partial equilibrium analysis it is necessary to assume that (1) the supply curve is valid only for small changes in the quantity produced, and (2) the conditions of production and demand for an individual commodity are independent both in regard to each other and in relation to the supply and demand of all other commodities. As far as the first hypothesis on changes in quantities is concerned, it is clear that, if we move too far from the equilibrium points, we may have to construct a completely new curve, because a large variation would be incompatible with the *ceteris paribus* condition (Sraffa, 1925: 59–60).

Considering the independence of production conditions, mentioned in the second assumption, we must distinguish between the effects of different orders of magnitude. If changes in returns are internal to the industry considered, variations in the quantity produced by this industry may influence the cost functions of other industries only as a consequence of a change in the equilibrium price of the industry under consideration. These feedback effects are negligible because they concern only second-order magnitudes. Therefore, the existence of these indirect effects can be considered compatible with the *ceteris paribus* assumption. However, if changes in returns of the industry examined lead to a similar variation in

the cost of other industries, these changes will be of the same order of magnitude and must be regarded as incompatible with the *ceteris paribus* assumption (Sraffa, 1925: 61; cf. Panico, 1991: 557ff; Kurz and Salvadori, 1995: 31). This is the case of the production of a commodity in which a considerable part of an input is employed, and in which the total amount of this input can be increased only at more than proportional cost. A more intense utilization of that input, as production increases affects the cost of the commodity in question just as it effects the cost of the other commodities into the production of which that input enters. In this instance, the conditions of the 'particular equilibrium', which one intends to isolate, are upset and the *ceteris paribus* assumption is not respected. The consequence is that the 'structure of diminishing returns is available only for the study of that minute class of commodities in the production of which the whole of a factor of production is employed' (Sraffa, 1926b: 538–9; cf. Panico, 1991: 563).

Sraffa notices that 'the same difficulties also arise, in almost identical form, in connection with increasing returns'. Therefore, in a static system of perfect competition, long-period industry supply curves, based on the law of non-proportional returns, must be considered incompatible with partial equilibrium hypotheses apart from two particular cases based on very restrictive assumptions: the presence of economies of scale external to the firm but internal to the industry, and the specific-factor case mentioned above. Sraffa's conclusion is that, in approaching the problem of competitive value, the old theory 'which makes it dependent on the cost of production alone appears to hold its ground as the best available' (1926b: 540–41). However, as Sraffa (1926a: 12) points out in a letter to John Maynard Keynes, this does not imply that 'in actual life' constant returns prevail. Even if Ricardo's hypothesis is the best available for a partial equilibrium theory of competition, 'in reality' the connection between returns and the quantity produced is 'obvious'. In Sraffa's opinion, 'business men would consider absurd the assertion that the limit to their production is to be found in the internal conditions of production in their firm' (Sraffa, 1926b: 543). For Sraffa, 'everyday experience shows' that the majority of individual manufacturing firms do *not* produce under conditions of diminishing returns. Neoclassical theory assumes that decreasing returns to scale are due to limited organizational capacity. But, following Michał Kalecki (1937: 105), in the long run there is no reason why this capacity might not be increased by adopting the Smithian division of labour for control systems, by allocating many administrative and organizational tasks to specialist employees. The difficulty in adapting the organizational capacity may affect the magnitude of the firm's growth rate at any moment, but it does not entail a limit on the expansion of its size beyond a certain point. If the limit to the firm's expansion does not arise from

diminishing returns, then it may arise from the difficulty in expanding the market share without changing any of these three aspects: improving the quality of the output, reducing its price or increasing marketing expenses. These themes have been analysed by the literature on imperfect competition and the firm's behaviour.

The critique of neoclassical price theory based on the coordination of non-proportional returns leads Sraffa to abandon the analysis of partial equilibrium. From the late 1920s, he begins to work on a price theory that takes up the classical concepts of reproducibility, surplus, circularity of production and freedom of entry. In his book, published in 1960, Sraffa focuses on the analysis of relative prices and income distribution, assuming 'no changes in output and ... no changes in the proportions in which different means of production are used ... so that no question arises as to the variation or constancy of returns' (Sraffa, 1960: v–vi; cf. Panico and Salvadori, 1994:324ff). As in classics, in Sraffa's theory, relative prices are determined by the conditions of production and not on the bases of the functional connection between returns and quantity produced.

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See also:

Increasing Returns; Land; Rent.

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