

## ORIGINAL ARTICLE

# The language of pluralism from the history of the theory of price determination: Natural price, equilibrium price and administered price

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## Abstract

This paper seeks to identify terminology to aid in distinguishing the approaches to the theory of price determination as presented in classical political economy, neoclassical economics and post-Keynesian economics. Through a review of the respective literature, a dominant usage is identified for the theoretical price concept in each theory. Natural price is identified with classical theory, equilibrium price with neoclassical theory and administered price with post-Keynesian theory. Use of the differentiated terminology is advocated for improving clarity in pluralist discourse on the theory of price determination and the role of prices in modern market economies with their inherent complexity.

## KEYWORDS

administered price, equilibrium price, natural price, pluralism, price theory

## 1 | INTRODUCTION

A pluralist approach to economics offers insights by applying multiple perspectives to the complexity of economic phenomena (Courvisanos et al., 2016; Dow, 2004; Harcourt, 1999). Yet, pluralism creates difficulties in terms of communication across multiple research programs. Gräbner and Strunk (2020, p. 324) suggest communication can be enhanced by ‘clarifying more explicitly what the terms used in an inquiry mean, how concepts are understood in the present framework’. In this

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paper I draw on the history of development of the theory of price determination to propose language for enhancing pluralist discourse.

Classical political economy, neoclassical economics and post-Keynesian economics are distinctive in how they deal with the theory of price determination and the role of prices in the economy.<sup>1</sup> Each approach to theory relates price to measures of cost, but the way cost is measured and the relationship between price and cost differs in ways that have implications for the analysis of capital accumulation, price stability, levels of output and employment, and the distribution of income. Importantly, there are also differences in the dominant terminology used by contributors to the development of each theory.

In this paper, distinctive differences in their theoretical conception of price are identified across classical political economy, neoclassical economics and post-Keynesian economics through in-depth discussion of the history of the theory of price determination. Also, a predominant terminology used for the concept in each approach is identified. Natural price is identified for the theoretical price concept in classical political economy. The force of free competition means natural price is equal to unit cost based on uniform wage and profit rates across products that reflect the social and technical conditions of the time and place. Equilibrium price is identified with neoclassical economics. Equilibrium price balances supply and demand in markets, with many qualifying adjectives, such as long-run, partial or oligopolistic, used to distinguish planning horizon, scope of analysis and competitive conditions. Finally, administered price is identified with post-Keynesian economics, with administered prices determined by the price-setting rules and routines used by large firms.

Adam Smith (1937 [1776]) distinguishes between market and natural prices. Only natural prices are deemed to be subject to objective (natural) economic laws, while market prices react to temporary and accidental influences. Other classical economists generally follow Smith's distinction between market and natural prices, although not necessarily his theory of how natural prices are determined. Natural prices are such that revenues are just sufficient to cover costs of production when wage rates and profit rates are uniform across all production activities and meet the social and technical conditions of that time and place. Sraffa (1960) formalises the approach of classical theory, albeit without using the terminology of natural price and not relating the wage and profit rates to social and technical conditions.

Marshall (1920) maintains a semblance of the distinction between market and natural prices with his categories of temporary, short-period and long-period equilibrium prices. Temporary equilibrium prices reflect influences from demand or supply of a product without any allowance for a production response to price changes. Production adapts over time to differences between prices and production costs, with plant and equipment relatively fixed in the short period. Over the long period, plant adjusts through capacity changes at individual firms as well as through the entry or exit of firms, such that price is equal to the expected average cost of production. Marshall argues the long-period equilibrium price is equivalent to the natural price in classical price theory.

Marshall's mixture of static and dynamic elements creates logical difficulties, especially when there are increasing returns to scale. Logical coherence has been restored by subsequent neoclassical theorists moving to ahistorical intertemporal general equilibrium analysis, with current equilibrium prices incorporating all relevant deterministic or stochastic information on future developments. The current equilibrium price is consistent with prices in organised future markets and the rational expectations of market participants regarding future economic conditions. The balancing of supply and

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<sup>1</sup> Classical, neoclassical and post-Keynesian theories of price determination are recognised as distinctive, at least by heterodox theorists (Kurz & Salvadori, 1995; Semmler, 1984). Bloch (2020) discusses the changes in the approach to the theory of price determination from Smith and Ricardo through to Marshall and modern neoclassicals.

demand in the equilibrium price thus extends to capturing all information about the future as evaluated by current market participants.<sup>2</sup>

Post-Keynesian price theory rejects the optimisation approach of neoclassical theory and the equalisation of profit rates across producers of classical political economy. Instead, the focus is on explicitly incorporating mechanisms used by market participants, especially large firms, for dealing with irreducible uncertainty as well as with imperfections in information and competition. Prices are treated as set administratively to achieve strategic objectives of the firm, which include survival, growth, and market dominance as well as profit. While a variety of administrative procedures have been proposed (Lee 1998) suggests there is a common framework for post-Keynesian pricing in which the price for each product is equal to the accounting cost per unit at expected output multiplied by one plus an administratively determined profit margin. There are varying specifications in terms of how unit costs are measured and how profit margins are determined. He adopts the terminology of administered prices in referring to the prices determined using the post-Keynesian framework.

While the terminology of administered prices is not universally applied by post-Keynesians, they all recognise prices are determined by firms as distinct from market determination through supply and demand. Many use the terminology of mark-up prices, with mark-ups treated as historically determined within relatively constant market conditions, but subject to management decisions when conditions are changing. Yet, mark-up price is also used by mainstream economists to refer to the gap between price and marginal cost (Basu, 2019; De Loecker et al., 2020). Thus, I follow Lee in adopting administered price as the term identifying the theoretical price concept for post-Keynesian theory, absent an obviously more inclusive, and yet distinctive alternative.<sup>3</sup>

The theory of price determination in classical political economy is reviewed in Section 2, followed by neoclassical economics in Section 3 and post-Keynesian economics in Section 4. Section 5 concludes.

## 2 | CLASSICAL THEORY OF NATURAL PRICES

In *The Wealth of Nations* (TWN), Adam Smith (1937 (1776)) seeks to explain growth in national income through expansion of the market that allows a greater division of labour.<sup>4</sup> Smith is thus led to focus on the determination of prices in the market, where he takes a scientific approach by distinguishing between market prices and natural prices. Natural prices are determined by the requirements for reproducing existing economic relationships.

<sup>2</sup> Practical application has required recognising the possibility of disturbances to equilibrium, so that market price is assumed equal to the equilibrium price plus a random disturbance term that usually is assumed to have zero mean and finite variance.

<sup>3</sup> An earlier version of this paper used normal price as terminology for the post-Keynesian price concept. However, an anonymous reviewer pointed to the extensive use of normal price by classical and neoclassical economists as well as post-Keynesians. I am now convinced usage of normal price is so widespread across the different theories as to disqualify it as useful for identifying any particular theory of price determination.

<sup>4</sup> Smith's fame as the founder of scientific economics is disputed by some and supported by others. Schumpeter (1954, p. 184, italics in the original) suggests, 'the fact is that the *Wealth of Nations* does not contain a single *analytic* idea, principle, or method that was entirely new in 1776.' In contrast, Bharadwaj (1986, p. 348) claims, 'Adam Smith's *Wealth of Nations* broke new ground. It was the first systematic and comprehensive work to lay down the analytical categories in political economy pertaining to the capitalist mode of production.' In the introduction to *Precursors of Adam Smith: 1750–1775*, Meek (1973) suggests Smith's analysis may satisfy Kuhn's (1962) requirements for a scientific paradigm. However, the same criteria would also qualify the prior analysis of the Physiocrats, although the Physiocrats focussed on agricultural rather than industrialised economies.

'When the price of any commodity is neither more nor less than what is sufficient to pay the rent of land, the wages of labour, and the profits of the stock employed in raising, preparing and bringing it to market, according to their natural rates, the commodity is then sold for what may be called its natural price' [*op cit.*, p.55].

Prices are natural in the sense of obeying objective economic laws, even though they are derived from the character of civil society rather than being determined by forces of the natural world. The natural wage provides the worker with sufficient income to sustain himself and his family at the level appropriate to local conditions. The natural rate of profit gives the capitalist sufficient income to sustain his economic role, which is providing the stock of goods for both maintaining production and providing any increment to that stock to enable expansion of the economy. The natural rent of land is sufficient to sustain the landlord's economic role, which is productive only in terms of maintaining the fertility of the soil and ensuring land is put to its most remunerative use.

Smith [*op. cit.* p. 54] recognises, 'The actual price at which a commodity is commonly sold is called its market price. It may be above, or below, or exactly the same with its natural price.' Importantly, free competition means differences between the natural and market price of a commodity normally lead to reallocation of resources, such that 'The quantity brought thither will soon be sufficient to supply the effectual demand.' [*op. cit.* p. 58] Thus, 'The natural price, therefore, is, as it were, the central price to which the prices of all commodities are continually gravitating.' [*ibid.*]

The objective economic laws that determine natural prices are reliable and enduring in contrast to the temporary and accidental influences that cause market prices to deviate from their natural levels. Much of Chapter VII of Book I of *TWN* is devoted to providing examples where market prices of commodities deviate from natural prices. Deviations may even occur indefinitely where there are obstacles that, 'hinder the effectual demand from ever being fully supplied' [*op. cit.* p. 61], including monopoly and regulated restrictions on competition. Also, deviations are asymmetric, 'The market price of any commodity, though it may continue long above, can seldom continue long below, its natural price.' [*ibid.*] Discussion of permanence and asymmetry in the deviations of market prices from corresponding natural prices argue against interpreting Smith's natural prices as expected values of market prices.<sup>5</sup>

The distinct influences operating on natural prices versus market prices are well illustrated in Smith's discussion of the prices of various commodities in Chapter X of Book I of *TWN*, particularly the price of corn. Smith recognises that the natural rent of agricultural land rises with the opulence of a country, as opulence means a sustained greater demand for food. With the rising natural rate for rent, the cost of producing corn rises as does its natural price. However, opulence also increases the size of the market, which increases the division of labour and raises the productivity of labour, thereby reducing the wage component of the cost of producing many commodities.<sup>6</sup>

Smith suggests the effects of rising rent and rising productivity of labour are generally so finely balanced as to keep the natural price of corn constant and make corn a candidate for an invariable standard of value. Data provided by Smith (*op. cit.*, pp. 251–258) indicate no clear trend for the market

<sup>5</sup> Groenewegen (1982) points to the asymmetry in the relation between market and natural prices as evidence against the interpretation of Smith as providing an equilibrium analysis in his price theory. In Groenewegen's (*op. cit.*, p. 9) view, 'Smith's superb appreciation of the real frictions in economic life as revealed by historical experience led him to place no faith in the mechanical analogies which his contemporaries, especially Turgot, had introduced into the subject.'

<sup>6</sup> Smith (*op. cit.*, p. 86) comments on the competing impacts of rising money wage of labour and the rising productivity of labour, 'There are many commodities, therefore, which, in consequence of these improvements, come to be produced by so much less labour than before, that the increase in its price is more than compensated by the diminution of its quantity.'

price of corn from 1202 to 1764 based on sporadic observations up to the late 1500s and annual observations thereafter, but there are substantial fluctuations from year to year and also over longer periods.<sup>7</sup> The fluctuations are attributed to accidental and temporary factors (good and bad harvests, war, civil unrest and the like), meaning the market price of corn at any point in time is not a reliable indicator of its natural price. Thus, corn is ruled out as providing an invariable standard of value even if its natural price is constant.

In *The Principles of Political Economy and Taxation (PPET)*, Ricardo (1973 (1821), p.51) follows Smith in viewing market prices as deviating from natural prices due to accidental causes, stating, 'we are treating the laws which regulate natural price, natural wages and natural profits, effects totally independent of these accidental causes.' However, Ricardo's price theory differs from that of Smith in important aspects.<sup>8</sup> First, Ricardo notes land just fertile enough to be in production receives no rent. The natural price of product from this land is equal to the cost of only labour and capital, each paid at their natural rate. All corn has the same natural price, so the amount of rent does not enter into the determination of the natural price of corn. Rather, the natural price of corn determines the pattern of rent of land with rent varying across parcels according their productivity.

Second, Ricardo recognises the means of production are products of labour in prior periods, so final output is the product of direct and indirect labour. Profit included in the natural price of a commodity depends on the ratio of direct and indirect labour. Ricardo states (*op. cit.*, p. 22–23), 'In estimating, then, the causes of the variations in the value of commodities, ... I shall consider all the great variations which take place in the relative value of commodities to be produced by the greater or less quantity of labour which may be required from time to time to produce them.' Thus, in Ricardo's version of classical price theory, profit is reduced to a complicating factor and rent has no explanatory role, only the amount of direct and indirect labour embodied in a commodity is important in determining its natural price as an exchange ratio.<sup>9</sup>

Third, Ricardo is much clearer than Smith in rejecting the supply and demand approach to price determination. Effects on price from variation in demand are only temporary until supply adjusts to meet demand. Ricardo's discussion of the influence of supply and demand on price in Chapter XXX of *PPET* concludes, 'the prices of commodities which are subject to competition, and whose quantity may be increased in any moderate degree, will ultimately depend, not on the state of demand and supply, but on the increased or diminished cost of their production.' [*op. cit.*, p. 262].

Both Smith and Ricardo use natural in natural price as a metaphor for indicating the determination of price is beyond direct human control. Free competition means the natural price of a commodity, expressed in terms of the amount of other commodities for which it can be exchanged, is determined by technical conditions of production and the division of income between labour and capital. In contrast, under conditions of monopoly or regulation, as Smith notes, the market price is kept indefinitely above the natural price by preventing supply from meeting the effectual demand.

A less metaphorical meaning to the term, natural, in the natural price is suggested by the impact of the fertility of the soil on technical conditions of production in agriculture. Smith recognises this influence through including the rent of land as part of cost that determines the natural price of agricultural

<sup>7</sup> Prices are given in terms of money, sterling silver, which is itself subject to variation, especially due to the influx of precious metals from the Americas from the Sixteenth Century onwards. Smith's discussion of the price of corn points to the separate influence of changes in the value of money (see the 'Digression concerning the Variations in the Value of Silver during the Course of the Four last Centuries', *op. cit.*, pp. 176–242).

<sup>8</sup> Ricardo's position on natural versus market prices and the differences between his analysis of natural prices and that of Smith are discussed at length by Signorino (2015).

<sup>9</sup> Stigler (1965) writes of Ricardo's 93 percent labour theory of value, although Coleman (1990) suggests an error in Ricardo's reasoning means he underestimates the impact of profits on the exchange value of commodities.

commodities. However, as Ricardo demonstrates, the fertility of particular patches of land affects the amount of rent they earn but doesn't affect the rent of land at the margin of cultivation, which is always zero. The influence of nature on the natural price of agricultural commodities through the fertility of the soil operates only indirectly through shifting the margin of cultivation.<sup>10</sup>

Classical economists after Ricardo maintain the distinction between market prices and the prices determined by the force of free competition. However, the terminology of Smith and Ricardo is discarded. For example, Karl Marx (1954 (1887)) in building on Ricardo's analysis explicitly recognises the difference between a commodity's value in terms of embodied labour and what he terms the price of production. Instead of following Ricardo and glossing over the difference, Marx puts it at the centre of his theory of exploitation through the expropriation of surplus value by capitalists. While Marx's argument that profits are due to the exploitation of labour differs from that of Smith or Ricardo, his concept of a price of production for a commodity equal to the cost of production with inputs priced at their prices of production is not fundamentally at odds with the concept of natural price used by his predecessors.<sup>11</sup>

Piero Sraffa (1960, p. v, quotation marks in original) adopts the standpoint of the classical economists in investigating, 'such properties of an economic system as do not depend on changes in the scale of production or in the proportions of 'factors'.'<sup>12</sup> His representation of the economic system with commodities as both means of production and outputs follows the classical treatment of production and consumption as a circular process (*op. cit.*, Appendix D). Commodity prices are determined such that each product price is equal to the cost of production based on a uniform wage rate and uniform rate of profit across all commodities. Unlike Smith or Ricardo, Sraffa does not suggest either the wage rate or the profit rate has a natural value. Rather, Sraffa's emphasis is on the trade-off between the wage rate and the profit rate, and thus, more akin to the treatment in Marx.

Sraffa's formalisation of classical price theory emphasises the reproduction property of prices, which is sometimes obscured in the disparate discussions of classical economists. Prices are determined in Sraffa's analysis without any reference to supply and demand equilibrium or to optimising behaviour on the part of economic agents. Whether market prices have any tendency to gravitate towards theoretically determined prices is not addressed. Rather, these prices constitute benchmarks for sustaining the circular process of production and consumption through monetary transactions. Such prices need not bear any particular relationship to prices that equate supply and demand.<sup>13</sup>

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<sup>10</sup> Thomas Malthus (1958 (1798)) suggests a different non-metaphorical influence of nature on the natural price through natural laws of population, with population expanding and contracting to keep the natural wage near the subsistence level. However, even Malthus acknowledges the influence of behavioural norms and institutions on the link between natural wages and population growth, a view emphasised by later classical economists, such as John Stuart Mill and Karl Marx.

<sup>11</sup> Roncaglia (2010, p. 177, quotation marks in original) in discussing the difference between Marx and the classical economists on the distinction between market prices and natural prices notes, 'With Marx, the main change from this dichotomy concerns terminology; the term "natural prices", which suggests the idea of "corresponding to the nature of things" for a phenomenon, which in fact presupposes the institutions of capitalism, is substituted by the term "prices of production".'

<sup>12</sup> Smith's (1937 (1776), p. 55) definition of a natural price as, 'neither more nor less than what is sufficient to pay the rent of land, the wages of labour, and the profits of the stock employed in raising, preparing and bringing it to market, according to their natural rates', makes no mention of the scale of production. A direct interpretation of this definition is that it applies to a particular, current or normal, level of output, making unnecessary the stronger interpretation that imposes an assumption of constant returns to scale.

<sup>13</sup> Harcourt (1982, p. 258, italics in the original) emphasises the independence of Sraffa's results from any concept of supply and demand equilibrium, 'The point is that while supply and demand *may* have the effect of driving the levels of actual prices towards those of natural prices, the latter *themselves* are not determined by the forces of supply and demand.'

Bradley and Howard (1982, p. 31) point to the usefulness of Sraffa's work in the rehabilitation of classical economics, 'Sraffa's analysis indicates many of the propositions of Classical and Marxian political economy can be rigorously proved and generalised outside the confines in which they were initially formulated.' In particular, derivations are provided for the inverse relationship between the wage rate and the profit rate in the distribution of the surplus, the concept of an invariable standard of value, and the nature of the relationship between the price of a commodity and the composition of its means of production in terms of dated labour. Of course, Sraffa's technical analysis of prices abstracts from many aspects of the classical idealisation of natural prices, particularly from Smith's focus on the wealth of nations being driven by the division of labour and the size of the market and from Ricardo's focus on wages rates needing to provide for the reproduction of the labour force.

Sraffa (*op. cit.*, p.9) explains that in referring to prices, 'Such classical terms as 'necessary price', 'natural price', or 'price of production' would meet the case, but value and price have been preferred as being shorter and in the present context (which contains no reference to market prices) no more ambiguous.' Outside of Sraffa's special context, distinctive terminology when referring to the theoretical price concept is required to avoid ambiguity. Natural price is the dominant usage by Smith and Ricardo, while its relationship to the somewhat differentiated theoretical price concepts of Marx and Sraffa is clear. Importantly, the terminology of natural price captures the spirit of price being determined by forces beyond direct human control. Classical theory treats human actions as resulting in changes of quantities, particularly the accumulation of capital, but only indirectly impacting on theoretically determined prices through changes in technical coefficients of production.<sup>14</sup> Thus, natural price is the appropriate identifying term to use in discussing the theoretical price concept of classical political economy.

### 3 | NEOCLASSICAL THEORY OF EQUILIBRIUM PRICES

Differences exist between neoclassical economics and classical political economy in several dimensions. A few examples may illustrate. First, a focus on explaining growth and development in Smith or income distribution in Ricardo is replaced by a focus on explaining the efficient allocation of scarce resources (Robbins, 1935). Second, classical treatment of individuals as passive members of social classes is replaced by individuals as optimising agents in analysis characterised by Schumpeter (1954, p. 889) as methodological individualism. Third, emphasis on dynamic analysis in classical political economy is replaced by an emphasis on static analysis.

Differences between classical political economy and neoclassical economics extend to the approach to the theory of price determination. In classical political economy prices provide for the reproduction and expansion of economic activity, while in neoclassical economics prices equate supply and demand in markets. In classical theory price equals to the cost of reproduction when there is free competition, while in neoclassical economics competitive price always equals to marginal cost but equals average cost only in long-run equilibrium.

Identifying differences need not imply they are sufficiently fundamental to constitute a distinct paradigm or research programme. Alfred Marshall (1920, p. v) in the preface to the first edition of *Principles of Economics (PE)* claims no fundamental break from his classical predecessors, 'The new doctrines have supplemented the older, have extended, developed, and sometimes corrected them,

<sup>14</sup> As Kurz and Salvadori (1995, p. 14–15) put it, 'Thus, classical authors separated the determination of profit and prices from that of quantities... The latter were considered as determined in another part of the theory, that is, the analysis of accumulation and economic and social development.'

and often have given them a different tone by a new distribution of emphasis; but very seldom have subverted them.' Whether new doctrine subverts the old is a matter of judgement, a judgement best informed by a close examination of the differences.

In Marshall's (*op. cit.*, p. vii) new doctrine, 'the general theory of the equilibrium of demand and supply is a Fundamental Idea running through the frames of all the various parts of the central problem of Distribution and Exchange.' He interprets the natural price concept of Adam Smith and other classical economists in a manner meant to be consistent with this fundamental idea. According to Marshall (*op. cit.*, p. 289, italics and quotation marks in original), 'the normal, or "natural", value of a commodity is that which economic forces tend to bring about *in the long run*. It is the average value which economic forces would bring about if general conditions of life were stationary for a run of time long enough for them to work out their full effect.' The economic forces Marshall has in mind are supply and demand interacting to establish equilibrium.

Mainstream historians of economic thought often accept Marshall's claim for continuity of his normal price concept with the natural price of classical political economy and, indeed, see the continuity extending to modern neoclassical theory of price determination (Blaug, 1996). Some heterodox scholars accept continuity extending as far as correspondence between Marshall's notion of a normal price and the classical notion of a natural price, but not to other aspects of Marshall's theory and certainly not to subsequent developments in temporary and intertemporal general equilibrium (Garegnani, 1976; Kurz & Salvadori, 1995; Schefold, 2018). Andrews (2015, p. 265) rejects any correspondence, noting 'The classical natural price of a commodity functioned instead as a reproduction price, the price that is just sufficient to maintain an ongoing supply of the commodity to the market, a concept fundamentally different from a long-run outcome.'

Diverse views on the break between classical political economy and Marshallian analysis are at least partially attributable to focussing on different aspects of the theory of price determination. Garegnani (1976, p. 29) notes, 'The forces which Marshall and post-Ricardian theory introduced to determine the normal rates of wages and profits were fundamentally different from those envisaged by Ricardo for his natural rates.' Yet, Garegnani (*op. cit.*) then argues, 'what concerns us here is only to point out that the notion of 'long-period positions' as 'centre' of gravitation was fundamentally the same in the two cases and did not depend for its application on the hypothesis of a stationary (or steady-state) economy.' Garegnani thus identifies Marshall as breaking from classical theory of price determination in terms of the determination of rates for wages and profits, but not in terms of long-period positions as centres of gravity for prices.

Marshall distinguishes between temporary, short-period and long-period analysis. In the temporary analysis, price adjusts the quantity demanded of a commodity to the available supply without any allowance for the response of the level of production to price. Over longer periods, production adapts to differences between prices and production costs. Plant and equipment are fixed in the short period but, with stationary external conditions, adjust over the long period to just the right level required to bring cost into balance with revenue.

Marshall (*op. cit.*, p. 382) doesn't suggest the short-period, static analysis of equilibrium can be directly applied to the long period,

'The Statical theory of equilibrium is only an introduction to economic studies; and it is barely even an introduction to the study of the progress and development of industries which show a tendency to increasing return. Its limitations are so constantly overlooked, especially by those who approach it from an abstract point of view, that there is a danger in throwing it into a definite form at all.'



This leaves open the question how prices can be in equilibrium if not in static equilibrium.

Marshall (*op. cit.*, p. 664) addresses this question in Appendix H of *PE*, 'The central point is that the term "margin of production" has no significance for long periods in relation to commodities the cost of production of which diminishes with a gradual increase in the output'. He goes on to suggest that in for industries subject to increasing returns, 'we have to consider the conditions of the representative firm rather than a given individual firm: and above all we have to consider the cost of a whole process of production, without any attempt to isolate that of a single commodity, such as a single rifle or yard of cloth.' (*ibid*).

The representative firm and the process of production as a whole are both crucial in Marshall's reconciliation of equilibrium and increasing returns in the long period, with each firm having its own history and future trajectory. Some firms are growing, others are in decline. Marshall (*op. cit.*, p. 263–4) uses the analogy between a population of firms and trees in the forest. The representative firm stands for the whole population of firms, benefitting from those increasing returns internal to a firm of average size and from external increasing returns available to all firms that arise from the whole process of production. No individual firm need be in long-period equilibrium, yet the population of firms in the industry is in equilibrium by collectively producing a quantity of output equal to the quantity demanded at a price equal to the average cost of production over the population of firms. Otherwise, the population adjusts, which impacts on the characteristics of the representative firm.<sup>15</sup>

Marshall's challenge to develop a dynamic analysis of the adjustment between the short period and the long period has been largely ignored, as has his warning against applying static analysis to the long period. Leading the charge was Alfred Cecil Pigou, Marshall's successor in the Chair of Political Economy at Cambridge. Pigou (1928, p. 239) replaces the representative firm by an equilibrium firm, with the dubious assertion, 'When the conditions of demand change, the output and the supply price of the industry as a whole must change in exactly the same way as they would do if, both in the original and in the new state of demand, all the firms contained in it were individually in equilibrium.'

Aggregate industry output is included in Pigou's cost function for the equilibrium firm, so external economies shift the firm's average and marginal cost curves. The industry supply curve is then constructed by having the supply price for any aggregate output determined by the minimum average cost from the equilibrium firm's cost function at that aggregate industry output. The number and size of other firms in the industry adjusts to whatever is necessary to produce the aggregate quantity demanded at the supply price. Thus, the shape and position of the industry supply curve is given by tracing long-run equilibrium positions for different levels of aggregate output from the shifting cost function of the equilibrium firm.<sup>16</sup>

Pigou's solution to dealing with increasing returns in competitive industries has been widely adopted.<sup>17</sup> Supply and demand equilibrium is taken to require profit-maximising equilibrium for every firm at all time horizons. Perfectly competitive firms have perfect information and face a uniform market price over which they individually have no control, which implies in the long run all firms in operation

<sup>15</sup> Metcalfe (2007) develops a Marshallian analysis of the changing characteristics over time of the representative firm driven by differential firm growth linked to heterogeneity in costs.

<sup>16</sup> Newman (1960) attacks Pigou's attempt to rescue Marshall's analysis through use of the cost curve of an equilibrium firm. He argues industry equilibrium along the long-period supply curve for Marshall doesn't require equilibrium for any individual firm, only that price equal the average cost for the representative firm.

<sup>17</sup> As early as 1942 a theory textbook by George Stigler (1942, p. 147, italics in original) states, 'Every supply curve is a cost curve – although of course not vice versa'. Stigler then posits that for the individual firm, 'Decreasing long-run average costs and competition are incompatible.' (*op. cit.*, p. 159–60) and suggests 'The situation of decreasing costs must be rare in competitive industries' (*op. cit.*, p. 165) The history of falling supply prices in agriculture and many standardised manufacturing industries seems to have escaped Stigler's attention.

have the same cost function and the same profit-maximising output level. Thus, Marshall's analysis of dynamic competition based on a representative firm standing for an industry of heterogeneous firms is replaced by analysis of identical firms in perfectly competitive equilibrium.<sup>18</sup> In the process, the link to Smith's world of increasing returns arising from the division of labour within producers is essentially abandoned.

Piero Sraffa (1926, p. 542) suggests an approach different from Pigou for dealing with increasing returns to scale, 'It is necessary, therefore, to abandon the path of free competition and turn in the opposite direction, namely, towards monopoly.' Many authors have followed this advice, with major works by Joan Robinson (1933) and Edward Chamberlin (1933) appearing soon afterward. In both works, firms face downward sloping demand curves for their products and maximise profit by equating marginal revenue and marginal cost. They also both consider the effects of free competition in terms of unimpeded entry and exit, which leads to firms operating at the tangency between their demand and average cost curves.

Robinson and Chamberlin both have firms supplying the quantity of product demanded by buyers at their profit-maximising price, so that their prices are equilibrium prices. With long-run adjustment to zero profits in the tangency solution, these prices also fit with Marshall's notion of normal prices in the long run. However, as Robinson clearly demonstrates in an analysis of the supply curve with this full equilibrium, the effect of a change in demand on the full equilibrium (or normal) price depends on what happens to the price elasticity of demand facing an individual firm. This feature is not consistent with the natural price concept of classical political economy, in which price depends solely on economic and social conditions of production.

Neoclassical price theory for oligopoly as a form of imperfect competition also emphasises equilibrium prices. Frederik Zeuthen (1930) builds on earlier analyses in presenting equilibrium conditions for profit-maximising firms under a range of assumptions concerning the shape of demand curves, cost curves and the expected reactions of rivals. Equilibrium is taken to require prices that simultaneously maximise profits for all interacting firms given their conjectures about reactions from rivals. Models of equilibrium pricing in oligopoly with various conjectures about rival reactions, including those associated with Cournot, Bertrand and Stackelberg, remain common in modern neoclassical texts and as frameworks for applied work by neoclassical economists.

Some models of oligopoly pricing, challenge the neoclassical concept of rational behaviour as they yield profit-maximising reactions from rivals inconsistent with the assumed reactions. More generally, the assumed reactions are viewed as *ad hoc*. Game theory following on from the seminal work of John von Neumann and Oskar Morgenstern (1944) offers a prospect of generating equilibrium prices in oligopoly with a firmer basis in rational behaviour. However, there remain multiple models and some models fail to yield equilibrium solutions under at least some plausible assumptions regarding technology, preferences and endowments.

The multiplicity of models and the absence of equilibrium solutions in some circumstances present obstacles to extending imperfect competition to the general equilibrium theory of prices. John Hicks (1946, p. 7) acknowledges the limitation in the Introduction to his seminal contribution of temporary general equilibrium, *Value and Capital*,

'One limitation to our analysis will soon become very obvious, and I had better own up to it at once. We shall proceed throughout under the assumption of perfect competition; that is to say, we shall almost always neglect the influence on supply which may arise

<sup>18</sup> For an extended discussion of the subsequent perversions of Marshall's attempt to mix the theory of value and the theory of growth see Hart (2011).

from calculations made by sellers about the influence on prices of the sales they make themselves (Similarly for demand.) In fact many supplies and demands are probably influenced to some extent by such calculations; it may be they are influenced to a very important extent. However, it is very difficult to make much allowance for this influence in any other than the simplest problems; so that, although the analysis of this book would certainly be improved if more attention were paid to imperfect competition, I have thought it best to leave this over for the present.'

Further development of general equilibrium price theory continues to rely on the assumption of perfect competition. Gerard Debreu (1959, p. 35, italics in original) in formalising intertemporal general equilibrium price theory simply states, '*The value of an action a relative to a price system p is the inner product  $p \cdot a$ .*' There is no discussion of competition, perfect or otherwise. The statement that actions in the form of buying or selling quantities of commodities lead to expenditure or revenue equal to price times quantity implies that prices are constant with respect to quantities from the perspective of the decision maker. Why prices can be taken as independent of quantities and what would happen otherwise are not discussed.

The focus on equilibrium prices in neoclassical theory is related to the particular method favoured for deriving economically meaningful theorems. In his seminal contribution to the formalisation of neoclassical price theory, Paul Samuelson (1965 (1947), p.8, italics in original) proposes using theorems derived from, 'the method of *comparative statics*, meaning by this the investigation of changes in a system from one position of equilibrium to another without regard to the transitional process involved in the adjustment.'<sup>19</sup> Samuelson (*op. cit.*, p.19) then states, 'For theoretical purposes an economic system consists of a designated set of unknowns which are constrained as a condition of equilibrium to satisfy an equal number of consistent and independent equations'. Not only is what happens outside of equilibrium ignored in neoclassical theory of price determination, but the economic system is defined to exclude any variables that can't be constrained to be in equilibrium.

Neoclassical theory of price determination continues to follow the path of what Samuelson labels the correspondence principle, deriving theorems concerning comparative statics from the stability conditions required for equilibrium. Attempts to incorporate analysis of prices away from equilibrium, such as those treating competition as a process outlined in the works of Friedrich Hayek (1978) or Joseph Schumpeter (1939), have been generally ignored. Neoclassical theory of price determination has become exclusively a theory for determining equilibrium prices, albeit with adjectives denoting time frame, market structure or scope, including temporary, short-run, long-run, intertemporal, competitive, monopolistic, oligopolistic, partial and general.<sup>20</sup>

#### 4 | POST-KEYNESIAN THEORY OF ADMINISTERED PRICES

Post-Keynesian criticism of the neoclassical theory of price determination points to the lack of realism in its underlying assumptions and to its dubious ontological foundations. Intertemporal general equilibrium theory treats the economy as a closed system in which current and future prices are

<sup>19</sup> Samuelson's dismissal of the relevance of what happens between equilibria continues a tradition from Walras' assumed process of *tâtonnement*, where equilibrium prices are achieved without any transactions occurring away from equilibrium.

<sup>20</sup> Short-run and long-run are mentioned here rather than Marshall's short-period and long-period, respectively. The current practice in neoclassical price theory uses short-run and long-run as adjectives to indicate abstract concepts of the time horizon for adjustment, while for Marshall short-period and long-period refer to processes of adjustment in historical time.

determined by individual optimising behaviour with full information, or at least rational expectations, and operating in perfectly competitive markets. No account is taken of complexity in the form of distributed specialised knowledge nor is account taken of innovative human behaviour that continually changes the structure of the economy, making the future unknowable and inconsistent with forming rational expectations.

Post-Keynesian theory of price determination is based on an open-system ontology focussing on prices strategically determined by the large industrial, technological and commercial firms that dominate modern capitalist economies. These firms are inherently heterogeneous given the complexity of modern economies, with specialised knowledge of individual employees connected through incomplete internal networks specific to the individual enterprise and drawing on idiosyncratic external networks of suppliers, customers and competitors. Each firm has a unique collection of specialised capital equipment and operating systems, reflecting a pattern of historical development that differs across firms.

Lee (1998, p. 5) points to the lack of a cohesive theoretical core for post-Keynesian price theory, but states, 'The theoretical milieu of Post Keynesian price theory consists of ideas, arguments, statements and explanations which make up the three price doctrines associated with Post Keynesian economics – the administered, the normal cost, and the mark up price doctrines.' Lee goes on to trace the origins of each of these three doctrines to the flurry of theorising about imperfect competition in 1930s, associating administered prices with the work of Gardiner Means, normal-cost (or, more specifically, full-cost) prices with the work of the Oxford Research Group, and mark-up prices with the microanalysis of Michał Kalecki.

According to Lee, administered prices are set using standard pricing procedures that start with the firm's measure of normal operating cost and add amounts to cover overhead cost and profit. Full-cost prices are equal to the firm's adopted measure of normal operating cost per unit multiplied by one plus a measure of the average ratio of overhead cost to operating cost, with the resulting measure of normal unit total cost then multiplied by one plus a standard net profit margin. Finally, mark-up prices are equal to normal operating cost per unit multiplied by one plus a firm-determined gross profit margin.

Each of the post-Keynesian pricing doctrines combines accounting measures of operating cost per unit with rules or routines for determining an addition for overhead cost and profit. Increased use of standardised pricing procedures and associated cost accounting is explained by the changing institutional structure of markets from the 19<sup>th</sup> century onwards, particularly the rise of the modern corporation. Adolf Berle and Gardiner Means (1997, (1932)) note the increasing dominance of American industry by huge corporations with widely dispersed shareholdings and professional managers in control, often as a result of consolidation of smaller companies directly managed by individual or family owners. They argue, 'The divorce of ownership from control consequent on that process almost necessarily involves a new form of economic organization of society.' (*op. cit.*, p. liii).

One implication of the new form of economic organisation noted by Means is the use of administered prices by the modern corporation, replacing prices determined by the interaction of supply and demand in the market. Means (1935, p. 401) emphasises the inflexibility of administered prices in the face of fluctuating demand, 'For administered prices, the price is rigid, at least for a period of time, and sales fluctuate with the demand at the rigid price.' He later extends the analysis to changes in administered prices and, in Means (1972, p. 292) he notes, 'the thesis has also been employed to explain the differential behaviour of market and administered prices in a general demand inflation and to explain the development of inflation in the presence of a persistent excess in unemployment.' He concludes, 'Until economic theory can explain and take into account the implications of this nonclassical behaviour of administered prices, it provides a poor basis for public policy.' (*op. cit.*, p.304).

Overlapping the work of Means on the use of administered prices by large American corporations is the work of Robert Hall and Charles Hitch on the use of full-cost pricing procedures by large British companies. Based on the results of questionnaires completed by executives of 38 mostly manufacturing companies, Hall and Hitch (1939, pp. 32–33, parentheses in original) summarise the findings, ‘there is a strong tendency of businessmen to fix prices directly at a level which they regard as their ‘full cost’.’<sup>21</sup> As with administered prices, prices set using full-cost procedures reflect costs at the normal operating level of output and are inflexible relative to market-determined prices. Hall and Hitch (*op. cit.*, p.33) conclude, ‘Prices so fixed have a tendency to be stable. They will be changed if there is a significant change in wage or raw material costs, but not in response to moderate or temporary shifts in demand.’

Michał Kalecki (1971) develops the doctrine of mark-up pricing starting in the 1930s as part of an analysis of economic dynamics and income distribution in modern capitalism, returning to the theme emphasised by Ricardo. Kalecki's pricing doctrine emphasises underutilised capacity and imperfectly competitive conditions in the market rather than administrative rules or customary behaviour. Excess capacity in manufacturing means the operating cost of per unit of output doesn't change much as the level of output produced by a firm varies in the short run. Neither does the degree of competition usually change much in the short run. Thus, as with the doctrines of administered prices and full-cost prices, Kalecki argues prices are generally insensitive to changes in demand for a firm's output, but bases this position on a different analysis.

Kalecki's concern with macroeconomic dynamics leads him to consider the forces determining prices throughout the economy. He argues prices of industrial raw materials are determined by supply and demand forces in the market and fluctuate pro-cyclically with aggregate output in the economy, resulting in pro-cyclical movements in the unit operating cost of manufacturers and, with fixed mark-up factors, pro-cyclical movements the prices of manufactured goods. A dichotomy thus emerges in Kalecki's analysis, manufactured goods prices don't vary with the output of the individual producer but they do vary with the aggregate level of production in the economy. The rigidity of prices in the administered price and full-cost pricing doctrines is thus modified in the mark-up pricing doctrine to account for disturbance from macroeconomic influences while maintaining stability of industrial gross profit margins.<sup>22</sup>

Discretion in price setting is implicit in both the administered and full-cost price doctrines, but there is no explicit linking of price to market power. In contrast, Kalecki's mark-up pricing doctrine treats market power as the primary determinant of the extent to which prices exceed unit costs, which provides the basis for Kaleckian analysis of the effect of market power on the distribution of income.<sup>23</sup>

<sup>21</sup> Hall and Hitch (*op. cit.*, p.21) explain the acceptance of full-cost pricing in terms of industry norms, ‘A study of the replies confirms the existence of a strong tradition, already referred to, that price ‘ought’ to equal full cost.’ Adherence to prices based on full cost among the 38 sample firms is reported to occur almost always for 12 firms, in normal times for 15 firms, in principle for 3 firms, and not at all for 8 firms.

<sup>22</sup> Changes in output prices in response to changes in raw material prices in the administered price doctrine are delayed to the next price-setting period and moderated by perceptions of whether the changes are likely to continue, while in the full-cost doctrine perceptions of the permanence of the raw material price changes are critical in determining whether the price changes are incorporated into full cost. In contrast, the mark-up doctrine proposes full and quick flow-through from raw materials prices to finished goods prices.

<sup>23</sup> Kriesler (1987) argues Kalecki's struggle to incorporate his insights regarding the role of market power into the analysis of the distribution of income led him to changing the explanation of the role of market power in pricing, moving from an emphasis on the perceived elasticity of demand to a recognition of the importance of oligopolistic interdependence and the institutional forces impacting on wage bargaining.

Development of post-Keynesian theory of price determination beyond the middle of the twentieth century has generally focussed on the role of firm strategy in price setting. A particular emphasis has been to link pricing decisions to investment plans (Eichner, 1976; Harcourt & Kenyon, 1976; Wood, 1975). The mark-up of price over normal unit direct cost is set to achieve sufficient profits to enable the firm to carry out its investment plans, assuming usual leverage and dividend policies.

A common thread running through post-Keynesian theory of price determination is emphasis on planning and control.<sup>24</sup> Large firms adopt pricing procedures that enable central direction over the pricing of hundreds or thousands of individual products. These procedures promote stability in the firm's profits, which supports planning for investment in production capacity, design of marketing campaigns and development of new products and processes. The resulting prices aim to underpin survival and growth in challenging external environments.<sup>25</sup>

The lack of convergence in variants of post-Keynesian theory of price determination means there is no common terminology ideal for all. The three pricing doctrines identified by Lee (1998), administered, normal cost and mark up, all have some claim to providing a name for the price determined according to the approach of post-Keynesian theory. A single name is useful for purposes of distinguishing between the post-Keynesian approach and classical or neoclassical alternatives. Administered price stands out as least likely to cause confusion in these comparisons.

Normal price is ruled out as a distinctive term for the post-Keynesian theoretical price due its extensive use by classical and neoclassical economists. For example, Marshall uses the language of normal prices for prices that would obtain if conditions were stationary for a period of time, with the normal price in the long run claimed to be equivalent to the natural price of classical political economy. Mark-up price also leads to potential confusion as modern neoclassical economists regularly use mark-up price to refer to equilibrium prices with imperfect competition (Basu, 2019).<sup>26</sup>

All the post-Keynesian pricing doctrines recognise the crucial role of managerial discretion in price setting. Additionally, the terminology of administered price recognises the distinctive historical roots of post-Keynesian approaches in relating price determination to the standardisation of costing and pricing practices in large firms. Administered price also recognises the general post-Keynesian emphasis on the rules and routines used by firms to deal with uncertainty. Finally, administered price captures the control purpose of the procedures that firms use to guide price determination as part of strategic planning to maintain price and profit stability. Thus, administered price seems well suited as a term identifying the theoretical price concept in post-Keynesian theory of price determination.

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<sup>24</sup> As Gu and Lee (2012, p. 463) put it, 'Thus, the administered prices of a business enterprise are strategic prices whose common and overriding goals are reproduction and growth.' Reproduction and growth are also a focus in classical price theory, but post-Keynesian price theory makes no presumption of equalisation in the rate of profit across producers. Indeed, differential profitability is central to post-Keynesian analysis of economic stagnation in the tradition of Steindl (1976 (1952)) and Baran and Sweezy (1966).

<sup>25</sup> Bloch and Metcalfe (2015) argue large firms dominate the modern economy because they develop capabilities that can be combined and focussed to deal with the uncertainty generated by the impact of restless knowledge. Price setting with standardised routines is essential to maintenance of these capabilities.

<sup>26</sup> Confusion between the use of mark-up prices by post-Keynesian economists and the equilibrium prices for profit-maximising firms facing downward sloping demand curves is the subject of a 'Symposium on the marginalist controversy and price theory' in the Winter 1990-91 issue of the *Journal of Post Keynesian Economics* (Vol. 13, no. 2).

## 5 | SUMMARY AND CONCLUSIONS

Classical theory of price determination emphasises the force of competition in regulating prices to equalise the rate of profit and wage rate across economic activities. The objective is to understand the drivers of economic growth and the distribution of income. The analytical structure has prices determined by the cost of production, assuming wages and profits are uniform across production activities and are at levels that allow for reproduction of social and technical relations. The resulting prices are natural in the sense of being outside the direct control of market participants.

Neoclassical theory of price determination adopts methodological individualism and focusses on the impact of individual behaviour in regulating prices across markets through exchange activities. The objective is to understand the drivers of the allocation of scarce resources. The analytical structure has prices determined by interaction of optimising behaviour of all market participants subject to constraints on endowments, technology and preferences. The resulting prices are equilibrium prices in the sense of being at the level required to balance the quantity supplied and quantity demanded in each market separately in partial equilibrium and for all markets simultaneously in general equilibrium.

Post-Keynesian theory of price determination focusses on the influence of pricing rules and routines of large industrial firms, recognising heterogeneity across firms as well as consumers. The objective is to understand short-period adjustment processes in prices, outputs, employment and incomes. The analytical structure has prices determined by large industrial firms behaving according to strategically determined rules or routines. The resulting prices are administered in the sense of being the outcome of managerial rules and routines consistent with the firm's strategy.

Of course, use of language is far from consistent even by a single author, much less among authors within a particular school of thought. Different shades of meaning are sometimes intended and sometimes not. To be useful the name assigned to a theoretical price concept needs to be used widely enough to convey commonality in meaning without being used so widely as to lose distinctiveness in meaning.<sup>27</sup> Most importantly, the names assigned to theoretical price concepts need to identify distinctive aspects of the conceptual approach to theory of price determination in each school of thought.

Natural prices in classical theory are determined by the equalisation of profit and wage rates across industries through the influence of free competition along with meeting the requirements for reproduction of the agents of production. There is no presumption of balancing supply and demand. Instead, prices depend solely on what the cost of production would be under current technological conditions assuming equal profit and wage rates across production activities at levels consistent with economic and social reproduction. Further, the internal organisation or strategies of firms play no role in the determination of natural prices.

Equilibrium prices in neoclassical theory are determined by balancing supply and demand assuming optimising behaviours by all economic agents. Equilibrium prices come in many versions depending on time frame, scope and market conditions. Theoretical coherence is achieved for the limiting case of perfectly competitive intertemporal general equilibrium, but applied work still draws on an array of short-run, partial and imperfectly competitive market models. Technical and social conditions are taken as predetermined and any strategic behaviour of firms is constrained to balance supply and demand.

Administered prices in post-Keynesian theory reflect the heterogeneity of circumstances and strategies of firms and consumers, especially as embodied in pricing rules or routines of large firms. Profit

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<sup>27</sup> For example, the term, normal price, is extensively used by Marshall and his followers, by Sraffians and post Keynesians to indicate the price that would occur in the absence of disturbing influences, but the forces that determine the normal price in these three approaches are conceptually distinct. Thus, the term does not uniquely identify a single school of thought.

rates and wage rates vary across industries and the explanation of such differences is a key objective of the analysis. Firms generally supply what is demanded at the administered price, but this can be well below productive capacity. If demand outstrips productive capacity, backlogs and rationing rather than price increases are used to allocate available supply.

Theory is inherently a simplification of reality. Differences between the theoretical conceptions of natural price, equilibrium price and administered price provide alternative insights into the way prices are determined in market economies. By providing different insights into price determination, there are also different insights into the impact prices have on the allocation of scarce resources, distribution of income, growth and stability of employment and output, and other aspects of economic life. These insights are independent of the frequency of market price being equal to the theoretical price as determined by any of the theories.

A pluralist theoretical approach provides opportunity for greater understanding of the complexity of price determination in modern market economies. Yet, discourse about the distinctive conceptions of price in classical, neoclassical and post-Keynesian theories can easily become confused without a language that separates the particular conception associated with each theoretical approach.<sup>28</sup> The history of development of the theory of price determination reveals notable changes in the language used in discussing the theoretical concept of price. In particular, natural price, equilibrium price and administered price are the terms used distinctively within classical political economy, neoclassical economics and post-Keynesian economics, respectively.

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<sup>28</sup> As Dow (2016, p. 42) notes, 'Where meanings are very different the use of common language can impede communication. The confusion caused by different meanings of rationality is a case in point, just as here we are focussing on distinctions between different meanings of 'consistency'.'



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