New Developments in the Methodology of Supply

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1. Introduction

The subject of this paper is the methodology of analysis behind the notion of the supply curve, motivated by the fact that at present it is precisely defined only under the hypothesis of perfect competition, on the microeconomic level and in the short run. This seems to be a sufficient reason why “the aggregate supply side remains the outstanding challenge” (Fischer, 1988, page 332). However, despite the lack of explicit attention to the notion of a supply curve, “the practical importance of understanding the supply side of the economy is certainly not diminishing” (Schmalensee, 1988, page 677).

It is important to note that there are at least two basic variables to be explained by economic theory: the price, and the quantity produced and bought. Hence, it is necessary to build a model with at least two equations in order to provide a solution. Considering that the demand curve is always present, one other relation, which plays the role of the supply curve, is lacking in the literature of economics. Accordingly, the objective of this paper is to demonstrate that existing methodologies may lead to a generalized notion of the supply curve, stressing then its role in the methodology of economic analysis.

In the neoclassical approach the behavior of producers is dominated by the objective of maximizing profits, and the methodology of differential calculus assures that this objective is attained. Traditionally, this method has been applied case by case, from perfect competition to monopoly, calling for a careful description of the prevailing pattern of mutual reactions of all producers in the branch, or the intensity of competition and the degree of cooperation between them. Given the rules of the game, the first-order condition for maximizing profit always brings about an equation that links price and production. This equation plays the role of a supply curve whose slope is a partial function of the intensity of competition between sellers.

As the intensity of competition varies widely from case to case, at present there is no general neoclassical theory of supply. However, this deficiency is not a consequence of the methodology; it may be overcome through the generalization of the restriction given by competition, which is in turn afforded by a conjectural variation parameter. Hence, this procedure may lead to a “general-slope” supply curve, allowing thus for a synthetic methodology of economic analysis: the comparative statics of a supply and demand model. Additionally, this methodology has been developed towards greater realism by the inclusion of a rational expectations schedule.

This paper demonstrates that there is a still more general methodological approach to the analysis of the supply side, which is inspired by three principles of the classical theory: mobility of capital, gravitation, and the notion that the short run price is a resultant of the general relation between supply and demand forces. As a consequence of this price formation process, producers always retain some inventory, which plays then a central role, since it is said to be the memory of decision-makers’ past experience. The stock is thus supposed to indicate to each company the new short run levels of price and production that it must set, and the decision-making process is such that convergence to equilibrium is assured. A special relation between price and production will thus be seen: ex post, this relation is defined as the long run supply curve.

Both the classical-inspired and the neoclassical approaches bring about the same long run supply curve. Therefore, the classical-inspired approach may provide a more general methodology of economic analysis because, after abstracting the long run equilibrium status from its detailed short run decision-making process, it allows for the same synthetic analytical tool: the long run supply curve, both at the microeconomic level and at the aggregate macroeconomic level.

2. The Neoclassical Methodology of Supply

The neoclassical methodological approach to supply is based on the assumption of a
dominant objective of producers, the maximization of profits, which is assured by differential calculus. The first solution has been given by Cournot (1838), where the hypothesis that the decisions of companies are mutually independent is proposed. This solution has been criticized on the grounds that independency is an insufficient definition of competition; in fact, it corresponds to a situation where each producer acts as if he were a monopolist, because he is actually not influenced by the others.

The question of competition or cooperation between sellers remains without a general approach; hence, a consensus on a general solution for the maximization problem is still lacking. The latest accredited opinion says that it is necessary to provide "encouragement to those who look to game theory as a potential source of enhanced explanatory power in this area" (Sutton, 1990, page 512). However, it must be observed that, independently of the particular model proposed to describe the interaction between producers, some solution in terms of equilibrium price and equilibrium amount must be provided.

Of course different models will give different solutions, but this is less important. What really matters is that each model brings about one unique solution at a time. It is expected that all microeconomic models are based on decision-making processes that are consistent, in the sense that if exogenous variables take the same values then the outcome will be the same. This is to say that, apart from physical constant characteristics, producers' decisions must be explained by some sets of exogenous variables; no model supposes that decisions could be subject to randomly distributed desires of producers.

Given a demand curve with a certain level, drawn in the traditional diagram price versus quantity, there will be an equilibrium solution, a particular point on the line of demand. If there is a shift in demand, all other things kept constant, then a new solution point of price and quantity will be obtained. If the previous level of demand is restored, then the same previous solution must be brought about, because the decision-making process must be consistent. In general, up and down shifts in the demand curve will induce a series of successive points of solution.

Connecting these points a special line will be traced, a line which contains all loci of equilibrium solutions resulting exclusively from decisions of producers. This line plays the role of a long run equilibrium supply curve because it shows all the equilibrium solutions desired by producers. It becomes therefore "natural to view the cyclical correlation between real output and prices as arising from a volatile aggregate demand schedule that traces out a relatively stable, upward-sloping supply curve" (Lucas, 1970, page 51).

In the same line a quotation from Robinson (1933) states that "We can imagine that we move along the supply curve by means of successive increases of demand" (page 85). Notwithstanding, Mrs. Robinson could not define a supply curve because she assumed that demand could also rotate, and this argument is still present in the literature of economics. However, the slope of demand reflects consumer preferences, which must be supposed to be stable. If consumers change preferences, then what actually happens is that a new product is being offered, de facto or through convincing advertisement.

As a corollary, decisions of one particular producer cannot actually change the slope of demand, either total or individual, except if the product is no longer the same. The strategic actions of one producer are expected to modify the level of the demand of his competitors, not necessarily its slope. Rotation of demand may be observed during a process of strong differentiation, after which consumers will have new different products whose mutual influence will again be transmitted through the levels of demand equations.

Given these introductory remarks, the conjectural variation approach seems to be the most general solution in accordance with the neoclassical methodology. The first-order condition for profit maximization is given by one equation which states that marginal cost is equal to marginal revenue, which is in turn equal to the sum of two components: the price and the product of individual production by the slope of the inverted demand and by the conjectural variation parameter, which has been added ad hoc to the result of the differential calculus. Mathematically:

$$\frac{\partial t}{\partial q_i} + z_i Q_{it} = c'(Q_{it})$$

Where $z_i$ is the individual conjectural variation, $a$ is the slope of the inverted demand function which is supposed to be constant, and $c'$ is the marginal cost which depends upon individual production $Q_i$. This equation describes a
relation between price and production, and may be defined as the individual short run supply curve. This definition, which may moreover be found in Bresnahan (1982), Porter (1983), and Schmalensee (1988), may be seen as a comprehensive general outcome of the neoclassical methodology on supply behavior.

Apart from physical objective features, this supply curve is a resultant of the behavior of producers. Part of the behavior of producers is represented by $z_i$ which "are conjectural variations that are best interpreted as reduced form parameters that summarize the intensity of rivalry that emerges from what may be a complex pattern of behavior" (Schmalensee, 1988, page 650). These characteristics are expressed by the slope of the supply curve, which is given by the reciprocal of the sum of the coefficient of the individual production $Q_i$ above, and the derivative of the marginal cost, $c$". In mathematical symbols:

$$\frac{dQ_t}{dP_t} = b_i = 1 / (z_i a + c') > 0$$

Therefore, this methodological approach can provide a general supply curve, but a conjectural variation $z$, considered a "natural way to parameterize various oligopoly solution concepts" (Geroski, Philips & Ulph, 1985, page 378), has been added a posteriori. Moreover, unless marginal cost curve is given, it is not possible to disentangle ex post, as demonstrated in Lau (1982), what is competition and what is profit maximization; normally all that can be estimated is the composed parameter $b_i$.

The next step is the aggregation of individual supply curves in order to obtain the industry supply curve, which would call for additional hypotheses about individual values for the conjectural variations and marginal costs. However, in order to arrive at a general solution, some concessions to simplicity must be given. Accordingly, if the possibility of identifying each element of the slope is discarded, then aggregation could be done in a simple way: the slope of the industry supply curve will be a function of the same elements of the slope of the individual curve, plus the number $n$ of competitors: greater $n$, smaller slope.

There will thus be an aggregate conjectural variation $z$ which will somehow be composed of the individual $z_i$ and may be said to range from zero, when rivalry between partners would be maximum (corresponding to the perfect competition hypothesis), to unity, when cooperation would be maximum (a cartel organization), thus allowing for any possible combination of cooperation and rivalry between producers in the same branch. It must be stressed that even in the most favorable situation, when all $z_i$ and all marginal costs are identical, the possibility of separating maximization from competition, as noticed above, depends on the knowledge of the marginal cost curve -- in this case a special marginal cost curve which could be seen as representative of the whole industry. Additionally, it is expected that the composed slope cannot a posteriori allow for identification of any individual behavior.

Hence, a general short run supply curve at the industry level may be represented by an equation connecting price and production with general parameters, like for example:

$$Q_t = b_0 + b_1 P_t - b_2 W_t$$

(1)

where $b_1$ is a composition of $n$ parameters $b_i$ of individual companies and $W$ represents cost-related variables which may shift the supply curve sideways. In order to be more realistic, it has been assumed, following mainly Muth (1961), that companies consider not only the actual price but also a rationally expected price $P^{e}$ which would be formed in accordance with a learning process based upon past experience. The supply curve may thus be defined by the following equation:

$$Q_t = b_0 + b_{11} P_t + b_{12} P^{e}_t - b_2 W_t$$

Considering, as stated by Muth (1961, page 316), that "expectations, since they are informed predictions of the future events, are essentially the same as the predictions of the relevant economic theory", in equilibrium $P_t$ and $P^{e}_t$ will be the same and the econometric work can only bring about the composed parameter $b_1$, which is the sum of $b_{11}$ and $b_{12}$. Unless relevant expectation data were available, it is not possible to distinguish $b_{11}$ from $b_{12}$ (Muth, 1960, page 3 24). Finally, the long run equilibrium supply curve at the industry level will be identical to (1), but provided that price $P$ and production $Q$ refers to equilibrium values and not to actual ones:

$$Q^*_t = b_0 + b_1 P^*_t - b_2 W_t$$

(2)

where asterisks refer to equilibrium values of the endogenous variables production and price.
3. Concluding Remarks on the Neoclassical Methodology

The dynamic component of the methodological approach based on the principle of profit maximization has received little attention. Despite the development of sophisticated econometric models, the dynamic trend towards equilibrium has been introduced a posteriori, through the notion of rational expectations; it is not a natural feature of the methodology. However, if it is assumed that fluctuations around equilibrium values may be seen as randomly distributed, then the exact short run pattern of the trajectory towards equilibrium becomes meaningless, because economic analysis is dedicated only to equilibrium relations between variables. Hence, the lack of explicit ex ante attention to dynamics may be seen as a negligible restriction.

Accordingly, short run means that variables are taken by their actual values and consequently a direct estimation of the supply curve defined by equation (1) becomes unfeasible: due to the fact that adjustment cannot be obtained instantly, actual values may contain a purely random component which could be eliminated before econometric treatment. In order to do that it is necessary to introduce expectations, which may lead to the estimation of equilibrium values, and hence to the estimation of equation (2).

The question of how prices are formed in practice, and the extension of the methodology to general equilibrium analysis, require an additional hypothesis, because the method cannot explain how producers and consumers interact directly. The solution proposed is the Walrasian auctioneer, who plays the role of calculating and communicating to economic agents the equilibrium price under which exchanges are allowed to be made, but cannot assure profit maximization. It is also remarkable that the deduction of the supply curve at the macroeconomic level has seldom been conducted by the abstraction and synthesis of all possible alternatives, but exclusively under the hypothesis of perfect competition, which brings about a vertical aggregate supply curve traced out at full employment level.

The most important conclusion on the neoclassical methodology on supply behavior is that, following the profit-maximizing principle, it is possible to estimate the combined parameter of the slope of the long run supply curve, and this seems to be sufficient information for economic analyses based upon supply and demand. Some concessions have been made in order to develop a general notion of supply curve, a notion that has been considered necessary under the grounds that, no matter what decision process is adopted, there will always be an ex post relation between price and production. The existence of this relation may be taken for granted; economic theory has as one objective to explain the relation between price and production.

Notwithstanding, it is difficult to identify the final result with the profit maximization principle. In fact, the econometric estimation of a long run equilibrium general supply curve, such as for example that described in (2), enables the analyst to distinguish the role of profit maximization only under restrictive additional hypotheses on the components of its slope, especially the exact pattern of individual conjectural variation, which results from the mutual simultaneous reactions of producers. However, in so doing the supply schedule would no longer be a general solution, but some possible particular case.

4. A Classical-Inspired Methodology of Supply

The term "classical" in economics always seems to be a subject for polemic, also at the microeconomic level. This could possibly stem from the fact that the development proposed by the neoclassical theory left certain viewpoints from the classics without precise destination. Some features have been adopted, such as the ceteris paribus clause, and the approach of partial analysis. Others have been considered unsatisfactory and substituted; for example the approach of the industry as a whole has been replaced by the profit maximization principle, which is an individual concern. Identically, the notion of competition has been reformulated and the law of supply and demand has been retained, but only if perfect competition prevails.

It is difficulty to establish formally what is a classical methodology of supply, especially if it is necessary to differentiate it from the modern neoclassical method. Hence, the term "classical-inspired" has been adopted to describe a certain approach which is based on some notions that are clearly classical, but the objective is far from the demonstration that the classics had the "right" answer. The purpose is, considering the theoretical weakness commented in the introduction to this paper, to
develop the notion of supply in order to improve economic analysis based upon the method of supply and demand.

The classical-inspired methodological approach of supply behavior is based on three classical notions whose neoclassical counterparts could also be improved: firstly, it is supposed that producers set short-run selling prices in accordance with their short-run need of cash money. Prices are not imposed by producers: the supply curve is not a horizontal line. Prices are also not "accepted" by producers: demand is not a horizontal line, nor is the supply curve a vertical line. Motivation of producers is twofold: their objective is assumed to be to increase profit and to compete; each producer is supposed to want to raise profit as much as allowed for by his competitors, who would simultaneously be trying to do the same.

Secondly, competition is supposed to be "free" but has no precise definition. The notion of competition is closely associated with capital mobility, which in turn requires that production be a function of profits. Thirdly, considering mainly that production takes time, actual short-run values gravitate around "natural rates" which are "centers of gravitation": if there were no new external shocks to the system then the endogenous variables would be attracted to the center, which is a long-run equilibrium position. Considering that shocks are continuously given, present values are always gravitating around the equilibrium, and gravitation is the link between actual and theoretical equilibrium values. Moreover, attention is directed to the industry rather than to individual producers.

Based on their principles, the classics proposed and would have adopted a methodology which would be rather empirical, if mathematical and statistical knowledge then available were sufficient. Given the principles the natural next step would be to collect information from the real world in order to verify if the theory adheres to reality, and what can be thereby anticipated. Therefore, the subsequent stage of the classical-inspired methodological approach is mathematical modelling and econometric application: and this is the first main purpose here.

In general terms, the core of the classical-inspired model is the decision-making process of producers, which may be separated into two components, marketing and production, connected by the inventory. Starting with price decision, it is supposed that each company proposes a short run price in the market, which is not the equilibrium price; this one will be brought about ex post by the interaction between supply and demand. The existence of a relation between price and inventories is well known, and may be found already in Smith (1776), where he says that the market price will differ from natural price (price of production) according to the seller's need "to get immediately rid of the commodity" (page 159).

Consequently, if the seller does not sell all the quantity available, there will be a rise in stocks, which will be considered in the next decision, when again it may be more or less important to "get rid" of the commodity. This relation has been formalized in the literature of economics since Samuelson (1948), and in the empirical field there are many contributions, such as for instance the research of Eckstein & Fromm (1968), and others collected by Wilkinson (1989) in a brief but comprehensive survey on the subject. Price in this model is also said to depend upon the cost of production: to greater cost, greater corresponding price. Therefore, the price proposition of companies may be alternatively seen as a mark-up pricing policy, where the margin varies in accordance with the demand pressure, which is indicated by the inventory status.

Adam Smith's idea of "getting rid of the commodity" means that the supply curve is not a vertical line and that there is naturally some level of inventory. The same notion is contained in several other propositions such as for example the Kaldor's "convenience yield" (Kaldor, 1939), the Blinder's "shadow inventory" (Blinder, 1982), and the widespread, modern "demand of inventory" approach, which states that some stock exists because producers "desire" to have it and not necessarily because they "did not want" to sell it previously at a lower price. More importantly, the "getting rid of" is equivalent to the Marshall's "not spoil the market" (Marshall, 1890), and to the Keynes' "user cost" (Keynes, 1936). The Keynesian connection is convenient to stress that his notion of speculative demand for money has an implicit inventory behind it: the stock of money.

On the other hand, Marshall presents a more general idea, because he analysed also the production decision. In this classical-inspired approach production decision is supposed to be primarily based upon capital mobility: the higher the profit, the higher the total capital
available in the branch, increasing production in
the short term, and capacity in the long term.  
Additionally, production also depends upon
inventories: a rise in the stock is perceived as a
fall in demand, and thus each company, acting
alone or in accordance with its competitors,
diminishes production in order to avoid
excessive stockpiling and further pressure of
stocks on price.

On the contrary, if stocks fall producers
understand that demand has risen and then each
company plans to increase production, trying to
grant itself the largest possible share of the new
demand. The relation between inventories and
production decision has been studied under two
main theoretical approaches: the production
smoothing procedure, and the (S, s)
inventory-oriented policy. In a few words, the
mechanics of the classical-inspired decision-
making model is as follows: variations in
consumer income-related exogenous variables
lead to shifts in the demand curve, then in
consumption, and then in inventories. Variations in inventories induce producers to
change price and production, each one searching
for the best profit allowed for him by the
intensity of rivalry and the degree of
cooperation between them.

This double approach, that is, the analysis
of the simultaneous relations of inventories with
price and production, is a relatively new strand
of the methodology. Important theoretical
contributions are presented in Hay (1970),
Kirman & Sobel (1974), and Dumenil & Levy
(1987). Econometric works have also been
developed by Mills (1962) and by his critics
Steuer & Budd (1968). Based upon a statistical
methodology Kawasaki, McMillan &
Zimmermann (1982) stressed that firms do react
to the level of inventories, setting then new price
and production levels, which lead to an
equilibrium situation because convergence is
assured. A classical-inspired decision-making
model, in which the short run supply behavior
has been divided into two equations, the supply
price (marketing) and the production decision,
could for example be given by:

\[ P_t = f(W_t, E_{t-n}) \]

production decision: \[ Q_t = h(M_{t-r} E_{t-s}) \]

where \( M \) is the profit margin, \( E \) is the inventory
level, \( W \) is a cost-related exogenous variable,
and an indefinite lag structure is represented by
\( n, r, \) and \( s \). Considering additionally the demand
curve, a complete market model apt for
econometric estimation can be built.

Particularly at the econometric stage, it must be
observed that the inventory and the profit
margin are endogenous variables, in the sense
that their values of today are consequences of
yesterday's endogenous decisions on price and
production; they are not determined as if they
were independent variables. Hence, their
presence as lagged explanatory variables in both
short run supply equations leads to a reduced
model where all endogenous variables are
described by difference equations.

Consequently, all endogenous variables
have naturally a double behavior: the
equilibrium status and the trend towards
equilibrium. The equilibrium status is just a
theoretical consequence of the model; it would
only be observable if and when all exogenous
variables would have stopped varying; after
some time has elapsed, their effects over all
endogenous variables would have vanished. The
structural market model would then be in a
motionless position, which is defined as the
equilibrium status. On the other hand, the trend
component is the gravitational phenomenon
which may be eliminated because, after several
exogenous shocks, which are supposed to be
randomly distributed, it will lack any systematic
behavior.

Gravitation is the process through which
actual values of economic variables are kept
away from their equilibrium status. Moreover,
equilibrium and rationally expected values are
the same, because in the long run the only level
that may be expected to prevail is the
equilibrium one. Hence, when present decisions
depend on past experience there will always be
an equilibrium value which may be seen as a
latent rational expectation. Given sufficient
time, successive individual and collective trials
and errors will eventually bring about a
relatively satisfactory situation for all
consumers and companies: that is the
equilibrium status. Therefore, gravitation is the
link between long run equilibrium and short run
real values: the interface between theory and
reality.

5. Developing the Classical-Inspired
Methodology a Step Further

It is important to observe that changes in
the level of inventories induce changes in both
price and production, and in the same direction,
because coefficients have the same negative
signal in the supply price equation and in the production decision equation. Accordingly, these two equations may be combined: focusing on the production decision, first the stock \( E \) is replaced by its expression taken from the supply price equation. The inventory will thus be eliminated in the production decision equation, which will become a function of \( M \), \( P \) and \( W \). After that, the profit margin \( M \) is replaced by its definition, which must be a function of \( P \) and \( W \).

These substitutions lead eventually to one expression where \( Q \) is a function of \( P \) and \( W \). This is the line of simultaneous equilibrium of price and production, defined then as the long run supply curve. The slope of the long run supply curve will always be obtained from its two short run components: the supply price and the production equation, independently of the particular specification of equations in the classical-inspired model, because it depends upon the propensity to invest and on the simultaneous reactions of all companies in relation to individual and total stock shifts.

The slope of the supply curve is subject to some physical features, such as perishability, technology of production and distribution, management, financial strength, etc., but ultimately it depends upon competition between producers. Competition is conditioned by objective considerations such as for example the availability of funds, and the notion that it makes no sense to an individual producer to carry the stock of the whole industry; however, competition is based on choice, which is a human feature.

The slope of the classical-inspired supply curve reflects finally a purely psychological behavior of producers, while its position depends on the technology of production and distribution, and input prices. The slope may be said to be neither necessarily equal to zero, nor infinity, nor it is given by technology. It is a composition of parameters of the structural model and, like them, it cannot be determined ex ante; it is a resultant of a complex pattern of behavior, and must be identified by econometrics.

It is expected that economic growth leads to improvements in all physical features referred to above, in such a way that the slope of the supply curve may have a secular tendency to rotate clockwise, getting “more horizontal” positions. This means that a natural consequence of economic development may be that prices become more and more sticky. Frequently observed in the literature of economics, price stickiness is a phenomenon which may have some potentially important implications to macroeconomic analysis and to economic policy decisions.

After isolating gravitation, thus eliminating from the theory the random, short run actual fluctuations around equilibrium positions of producers and markets, the classical-inspired methodology of analysis becomes “comparative statics”. Furthermore, the behavior of producers, beyond the description given by the short run supply price and production decision equations, may synthetically be described by a long run supply curve. Hence, at this level of abstraction inventory is no more an explanatory variable; however, it remains an endogenous variable: an equilibrium status of price and production is brought about simultaneously with some equilibrium level of inventory. For an equilibrium status to exist it is not necessary that inventory vanishes.

It is important to observe additionally that, given the long run equilibrium supply curve, the model may be seen as if adjustment was obtained instantly. Therefore, the classical-inspired approach allows for a realistic model of price setting and production decision, but it may also be reduced to a synthetic form, making possible more comprehensible theoretical analysis, at both general equilibrium and macroeconomic levels.

Consider first the general equilibrium analysis, which is closely connected with the notion of capital mobility, which is in turn associated with profit margins in all sectors. Remembering that profit margin is an endogenous variable always defined in function of price and costs, it can vary only as a consequence of some exogenous variation, either from the cost side or from the demand side. For example, if there is a fall in demand then the short run inventory will grow, and profits will be smaller. Hence, in the next period production will be diminished and there will be some financial resources in excess which, considering that there is capital mobility, will be sent away, going to other new or already existent lines of business of the same companies, or simply to a speculative reserve fund.

However, if demand grows then profits will be larger, and capital will turn to this branch, coming from other relatively less attractive activities or from some speculative fund. As a corollary, it is worthwhile to observe that in the
short term capital mobility refers to financial capital, which is needed to hire more production factors, variable and fixed: new capital will allow for a greater short run level of production, and long run rising capacity. Consequently, the production decision equation may be seen as the decision of hiring factors, or the demand for factors, including financial capital.

Factor mobility, especially capital mobility, prevents production constraints in all industrial sectors. Moreover, the existence of a speculative fund indicates that there is some excess of supply of financial resources, and this means that all productive sectors have the financial capital they consider adequate for the running level of production. Capital mobility, which is a notion that has been used by all theoretical approaches, can prevent any constraint on the production decision of each sector, allowing for the realization of some profit margin. There will therefore be a general equilibrium of all sectors, despite the fact that this classical-inspired approach is unable to assure uniformity of profit rates.

Another natural outcome of the classical-inspired approach is the notion of the supply curve at the macroeconomic level. This seems to be an important contribution because a comprehensive notion of aggregate macroeconomic supply curve is still lacking: there is no unique definition for it. Most of the alternative approaches to the supply curve at the macroeconomic level state that it has a special slope: either it is zero as in the neo-Keynesian approach, or infinity as in the neo-classical and the “new classical” ideals.

Alternatively, many macroeconomic models are based on the Phillips curve. However, it has always been recognized as a consequence of external shocks on the demand side of a supply-and-demand schedule, and this is the original proposition of Phillips (1958, page 283) himself: there is a Phillips curve if and only if there is a general-slope supply curve behind it. Notwithstanding, “the theory of aggregate supply underlying the Phillips curve remained underdeveloped” (Fischer, 1988, page 316).

Following the classical-inspired approach, the macroeconomic environment may be outlined by enlarging the notion of inventory with the introduction of unemployment, capital idleness, and the Keynesian speculative demand for money. Expanding the notion of capital mobility to the movement of financial resources between the real productive sector and the speculative fund, capital mobility will be seen as the link between the real and the monetary sectors of the economy, therefore allowing for the deduction of the long run aggregate macroeconomic supply curve. As a consequence, macroeconomic analysis may be based on the interplay of aggregate supply and demand curves.

6. Conclusions

The classical-inspired methodological approach to supply behavior is based on a microeconomic market model which allows producers to make decisions on price and production without redundancy of equations, thus dispensing with the Walrasian auctioneer. In this model variations in consumer income lead to shifts in the demand curve, then in consumption, and then in company inventories. Variations in inventories induce producers to set new levels of price and production, and the motivating force is twofold: each producer searches for the best profit allowed by the intensity of rivalry and the degree of cooperation between them. This is a composed behavior where profit maximization is neither emphasized nor denied; it is just implicit in the model.

As a consequence of the assumption that producer’s decisions depend upon previous values of profit and inventories, endogenous variables have an equilibrium value and a dynamic movement around the equilibrium positions: this is the gravitation phenomenon, which is explained by the fact that decisions take time to mature and in the meantime the exogenous variables levels are always changing, thus continuously disturbing the trajectory towards equilibrium. Therefore, the dynamics towards equilibrium is a natural feature in this classical-inspired methodological approach, thus demanding no additional hypotheses on the subject.

The classical-inspired decision-making process is such that convergence to a new equilibrium situation is assured: after some time, successive individual and collective trials and errors will eventually bring about a relatively satisfactory situation for all consumers and companies: that is the equilibrium status of the market. Connecting then the successive points of equilibrium of price and production a special relation is obtained: the long run supply curve. This curve is the same equation (2) obtained through the neo-classical methodological
approach
The identification and elimination of the gravitational component lead to a methodology of comparative statics, as if there were no inventories and adjustment were instantaneous. Consequently, the classical-inspired microeconomic approach may be seen as the foundation for a general equilibrium theory, mainly through its production decision equation. Furthermore, the notion of a long run equilibrium supply curve leads to a synthetic methodology of macroeconomic analysis, which may be based on aggregate supply and demand models.

In conclusion, it would seem that this methodological approach is more general than the existing ones: it allows for a realistic decision-making model at the microeconomic level, which is based on past profit and inventory, but the model may also be simplified leading to an orthodox general synthetic tool, the supply and demand analysis. At this level of abstraction and in macroeconomic terms the values for profit and employment are no longer important for determining the long run level of the equilibrium of the economy; given the external conditions the model has an equilibrium status where sectoral and aggregate profit and employment levels have not been anticipated because they can and must be estimated by econometrics. Therefore, the classical-inspired methodological approach leads to a general economic theory.

References

Notes
3. This stems from Marshall (1890), where he says that “production and marketing arc parts of the single process of adjustment of supply to demand” (page 181).
4. For a comprehensive survey on the matter, see Wilkinson (1989).

