

# WORKING PAPERS IN ECONOMICS

**Towards an Observational Economics  
of Business Behaviour: The Horizontal  
Supply Curve, 'Fuzzy' Demand and Other  
Anomalies for Conventional Theory**

by

**Bruce W. Ross**

**No. 234**

**August 1996**

DEPARTMENT OF ECONOMICS



The University of Sydney  
Australia 2006

**Towards an Observational Economics  
of Business Behaviour: The Horizontal  
Supply Curve, 'Fuzzy' Demand and Other  
Anomalies for Conventional Theory**

by

**Bruce W. Ross**

**No. 234**

**August 1996**

**Abstract**

This paper proposes the development of an 'observational economics' whose domain would be restricted to what is observable in the real world. Observational economics should be regarded as a separate but complementary undertaking to mainstream economics. Adoption of such an approach would enhance the reestablishment and development of interaction between economists and the business community.

Phenomena such as price setting, unpredictable and variable demand, and inventories and order backlogs are argued to be anomalous from the viewpoint of conventional microeconomics, but fundamental to an observational perspective on business behaviour. A basic observational model of price and output determination for the price setting manufacturing firm is outlined.

**National Library of Australia Card Number and ISBN 1-86451-232-6.**

<b>CONTENTS</b>	<b>PAGE</b>
<b>1. Introduction</b>	<b>1</b>
<b>1.1 The Need for an Observational Economics</b>	<b>1</b>
<b>1.2 The Decline of an Observational Perspective in Economics</b>	<b>4</b>
<b>1.3 Observational Economics as a Separate but         Complementary Endeavour</b>	<b>7</b>
<b>2. Some Aspects of Real World Price and Output Determination</b>	<b>8</b>
<b>2.1 The Prevalence of Price Setting</b>	<b>8</b>
<b>2.2 The Horizontal Supply Curve</b>	<b>12</b>
<b>2.3 'Fuzzy' Demand</b>	<b>13</b>
<b>2.4 The Role of Inventories and Order Backlogs</b>	<b>16</b>
<b>3. A Rudimentary Model of Price and Output Determination</b>	<b>18</b>
<b>4. Conclusion</b>	<b>21</b>
<b>Acknowledgements</b>	<b>21</b>
<b>References</b>	<b>22</b>

**Towards an Observational Economics of Business Behaviour: The  
Horizontal Supply Curve, 'Fuzzy' Demand and Other Anomalies for  
Conventional Theory**

**1. Introduction**

The purpose of this paper is to advocate the development of an empirically-based approach to the study of business behaviour which I have termed 'observational economics'. The distinguishing feature of this branch of economics would be an insistence that its domain be restricted to what is observable in the real world. In place of the axioms of neoclassical economics the focus would be on observed phenomena.

In this introductory section it is contended that adoption of an observational perspective offers the prospect of fruitful interaction between economists and the business community, an interaction which was a feature of political economy until the present century. It is emphasised that progress in the reestablishment of the observational tradition is dependent on recognition and observance of a separate but complementary relationship with mainstream theory.

The second section emphasises this by considering a number of phenomena which have hitherto been largely ignored or neglected because of their anomalous status from the viewpoint of conventional microeconomics, but which are demonstrated to be fundamental to an observational perspective on price and output determination. A very basic observational model of price and output determination is sketched in the final section.

*1.1. The Need for an Observational Economics*

The discipline of economics, despite its venerable status, appears to contribute little to contemporary business decision making. By contrast, more recently developed intellectual areas such as management science, organisational theory,

marketing and human relations have generated a substantial literature which directly impacts on the practice of business and management.

The present gulf between the concerns of the economist and the world of business is attributable in large measure to the development of increasingly more abstract and mathematically sophisticated economic models. In this respect Dennis Mueller remarks that

we, the economics profession, are ill-equipped to answer ... important questions about what corporations are and do because we have come to rely too much on abstract simplification of what corporate actors do (or ought to do). To understand the corporation, and the important role it plays in the economy, we need to build our analysis on a richer behavioral foundation (Mueller, 1992:147-48).

He aligns himself with a significant number of economists who he asserts have, directly or indirectly, "recommended abandoning both profits maximization, indeed maximization modeling of any kind, and market equilibria as assumptions in economic modeling because of their lack of realism" (Mueller, 1992:164).

In arguing for an "economics without equilibrium", Nicholas Kaldor criticised economists who had developed, to a high degree of sophistication, the logical properties of economic equilibrium, but without investigating the correspondence of the theory's axioms with reality or whether the propositions derived from them deductively could be verified. He labelled the prevailing theory a "system of derived tautologies." He proposed instead the development of theories based on observation and induction, focussing on the discovery of empirical regularities of associations that could yield refutable hypotheses. Along these lines he argued for the use of "stylized facts" as the basis for theory building, such "facts" not being invariably true in all conceivable instances but true in the broad majority of cases. The objective should be to seek the most reasonable explanation capable of accounting for the facts (Kaldor, 1985:8-13).

One of the foremost defenders of neoclassical economics, Fritz Machlup, in his American Economic Association Presidential Address, acknowledged that the firm in traditional price theory was a "theoretical construct" which had no direct, observable, concrete meaning. "The model of the firm in that theory is not, as so many writers believe, designed to serve to explain and predict the behavior of real firms; instead, it is designed to explain and predict changes in observed prices ... as effects of particular changes in conditions" (Machlup, 1967:9). If we accept Machlup's position then there is an obvious need for an alternative approach which *is* expressly concerned "to explain and predict the behavior of real firms."

The present study is an attempt to develop an observational economics of business behaviour in the real world. "Observational" is employed here in the sense in which it pertains to science, where "observation" denotes "accurate watching and noting of phenomena as they occur in nature with regard to cause and effect or mutual relations" (*Concise Oxford Dictionary*). The observational approach would impose simple but logical restrictions on economic researchers. All of the elements which are to be incorporated into their models must be founded on or consistent with observed behaviour. As a consequence, the decision making embodied in such models can only be based on information which would actually be available to the decision makers.

Observational economics would offer a fresh perspective on theoretical and empirical work which has been forgotten or ignored. There is a mass of such material which has been neglected because of its inconsistency with and lack of relevance to axiomatic economics. Many of these empirical studies and observationally-based theories are worth re-examining for the insight they might bring to the world of practical business affairs. An observational agenda also provides encouragement for further research into actual corporate operations. In this respect it is interesting to note Robert Lanzillotti's statement almost forty years ago concerning his survey of the pricing objectives of large companies:

The principal purpose of this paper has been to contribute to our knowledge of the actual process by which prices are formed in

industry, with the expectation that the data will help in constructing a more realistic theory of the firm capable of yielding useful predictions of industrial price behaviour (Lanzillotti, 1958:938).

I believe that it is important to emphasise that we have become a profession that has been trained *not to observe*. The economist's characteristic device, "let us assume", serves to make observation redundant.

### 1.2. *The Decline of an Observational Perspective in Economics*

The separation of economic theory from the real world of business is essentially a twentieth century phenomenon. Earlier economists such as Adam Smith and Alfred Marshall attempted to identify general principles underlying real world economic behaviour, particularly in relation to business and industry. Their writings indicate a detailed familiarity with the actual conditions under which businesses of their time operated. For instance, Mueller (1994) emphasises the focus on observation of business behaviour in Adam Smith's *Wealth of Nations*:

When ... I read the *Wealth of Nations*, I am struck most of all by Smith's powers of observation. Here was a man who could walk through a pin factory and deduce general principles about the organization of industry. Here was a man who could observe the simple commerce of the butcher and the baker and deduce the fundamental principle of market organization. All of the propositions that Smith put forward are either a combination of observation and deduction, or an observation by itself [emphasis in original].

He notes that the famous passage describing the tendency of trades people to discuss conspiracies against the public "would appear to stem either from direct observation of the business community, or a combination of observation and introspection" (Mueller, 1994:28). His position is that "Smith's classic treatise is not a series of hypotheses about how individuals and markets will behave, but

rather a treasure chest of observations of how they do behave" (Mueller, 1992:149).

Mueller also observes that "[e]conomics remained a healthy mixture of induction and deduction" until the neoclassical revolution of the late 19th century, when there was a struggle between those who favoured the previously dominant inductive/historical methodology and the neoclassicalists who employed abstract models and deductive reasoning. Although the latter emerged triumphant, their victory was not immediate. For example, although Marshall was undeniably a neoclassical economist, "his work is thoroughly grounded on his observations of how businesses and markets work."

Similarly Mueller points out that Keynes's invention of macroeconomics was his response to the observation that markets in the real world did not seem to perform as described in the models of neoclassical economics. He also remarks: "The passages in the *General Theory* that are most often quoted ... are inevitably Keynes's insightful observations about human nature and economic institutions, rather than analytical deductions from his models" (Mueller, 1994:28-29).

At least since the formation of the Oxford Economists' Research Group in the 'Thirties, some economists have recognised the inapplicability of conventional theory to practical problems and have endeavoured to develop more realistic models. Interestingly the members of the Oxford Group began their investigations as committed marginalists, but soon found that their detailed questioning of businessmen yielded answers which were clearly at odds with accepted theory. This disenchantment is clearly evidenced in the Hall and Hitch report on full cost pricing and it also certainly motivated Philip Andrews's long crusade to develop and have accepted his normal cost theory. These works subsequently influenced more modern scholars such as Paolo Sylos-Labini, Alfred Eichner and other Post Keynesian macroeconomists who can be seen to have a strongly observational orientation in their work. Similarly, in the United States, there have been attempts to develop theories of behavioral and managerial economics which, as the names

suggest, propose the introduction of more realistic assumptions to the theory of the firm.

The reason why these attempts to reform the accepted theory have ultimately been unsuccessful is, I believe, that their originators have all been unwilling or unable to completely abandon the neoclassical tradition. To a greater or lesser extent, they have tried to reconcile observed phenomena with the dominant theory, so that they end up with an incompatible mix of empirical and axiomatic elements.

In the event, it has proved virtually impossible to incorporate observational elements undistorted within a neoclassical framework. Inevitably the anomalous findings are either ignored or reinterpreted in such a way that they can be reconciled with the dominant paradigm. Neoclassical methodology has proven to be a vortex from which it is almost impossible to break away.

For example, both behavioural and managerial models are essentially "revisionist approaches" to the neoclassical theory of the firm. The distinguishing feature of the behavioural approach is its use of empirical analyses of decision processes of individual firms which are then incorporated into neoclassical models. By contrast, the managerial approach modifies the neoclassical objective function to incorporate the results of empirical observations of individual firm behaviour. An important characteristic of both approaches is that they cease to be *a priori* because the firm's behaviour can no longer be deduced from the assumptions that describe their environment (Cyert and Hedrick, 1972:399). However, what needs to be emphasised is that both approaches basically represent revisions or modifications of neoclassical theory and thus retain most of the unrealistic behavioural assumptions that underpin that theory.

There are many potentially valuable contributions relating to the economics of the business enterprise which have been neglected and largely forgotten. The main cause of this has been the tendency to employ equilibrium analysis as a filter for new ideas. Those elements of any novel work which can be incorporated, even if

only by distortion, within the dominant paradigm are absorbed. Anything which does not fit that framework is ignored and discarded. It is precisely those ideas which can not be interpreted within the structure of comparative statics which are likely to shed light on the behaviour of firms in the real world. What has happened is not so much "throwing out the baby with the bathwater" as "throwing out the baby *instead of* the bathwater."

### 1.3. *Observational Economics as a Separate but Complementary Endeavour*

Machlup's stricture on the pretensions of behavioural economics as an alternative to marginalist theory has relevance to the appropriate role for an observational economics:

"A research programme designed to result in theories that explain and predict the actions of particular firms can never compete with the simplicity and generality of the marginalist theory, which, being based on the constructs of a fictitious profit-maximizer, cannot have the ambition to explain the behaviour of actual firms in the real world" (Machlup, 1978:525).

In considering the usefulness of value theory as a tool of analysis, Richard Ruggles contends that the concepts of the theory of the firm are not structured so as to be operable in empirical terms and thus cannot legitimately be used to analyse empirical situations. He also points out that, because the micro concepts used in value theory are basically different from the macro concepts of aggregative analysis, there is a wide gap between micro and macro theory. As a result aggregative theory cannot use micro behaviour theory to check the implicit propositions about producer and consumer behaviour inherent in the aggregate behaviour patterns posited or observed.

He goes on to suggest that "a separate conceptual framework must be erected for classifying empirical information about the individual firm." Such a framework should be of a very general nature and take into account the

requirements of macro theory as well as those of micro theory. The basic criterion for the classification scheme adopted should be “empirical operability”, with both functional and institutional characteristics being observed as much as possible. Finally, he suggests that “such a framework should be used in conjunction with orthodox value theory rather than substituted for it” (Ruggles, 1954:147-48).

I believe that it is important to acknowledge that an observational approach is unlikely to yield truly general theories. Therefore I would suggest that observational economics should set itself a modest agenda with limited objectives. In particular, it should present itself as a complementary endeavour to mainstream theorising rather than a competitor.

On the other hand, because it implies a repudiation of axiomatic reasoning it cannot be legitimately grafted onto conventional microeconomics and thus should always remain a separate activity, drawing where appropriate on the observationally valid findings of the senior section of the discipline and perhaps, in turn, yielding empirical insights which might usefully be incorporated into the more abstract models.

Labels such as ‘*ad hoc*’ and ‘empiricist’ should not be regarded as pejorative when applied to observational economics but accepted as reflecting its proper status, for as Mueller observes, “[a]lmost all models of complex behavior that try and account for observed patterns of data are *ad hoc*” (Mueller, 1992:166). However, I believe that there is a tendency to underestimate the degree of generality and regularity which will prove to be discernible in actual business behaviour.

## 2. Some Aspects of Real World Price and Output Determination

### 2.1. The Prevalence of Price Setting

Price adjustment is the basic equilibrating mechanism in microeconomic theory, but as Tibor Scitovsky points out, “[t]rade at set prices is the most common form of market relation in our society” (Scitovsky, 1952:21). Economists have usually

ignored the evidence of price setting and the fact that once set, those prices are often intended to persist for a considerable period. In some instances price changes may occur frequently, as when the product or service is subject to the price competition of numerous other firms, but in many cases once set the price is intended to persist at least until some future review date such as the beginning of a new production season, unless extraordinary events have occurred in the interim.

Sixty years ago, Arthur Burns reported that a diverse range of U.S. industries made use of price setting. This involved sellers quoting an offer price intended to remain open for an extended period of time, during which production would be adjusted to the amount demanded at that price. Among those employing the method were the oil, gasoline, bread, sugar, drugs, canning, agricultural implements, anthracite, tin plate, woollen fabric, carpet and automobile industries. The most extreme examples of price stability in Burns's time came from the steel industry. He cited the fact that soon after the formation of the United Steel Corporation in 1901, the price of steel rails was set at \$28 a ton. This price was maintained for a full fifteen years. After a six year period in which price was altered twelve times, a new price of \$43 was established which lasted for over 10 years (Burns, 1936:197-206).

A year earlier than Burns's study, in a report to the U.S. Secretary of Agriculture, Gardiner Means had drawn attention to an increasing incidence of what he termed ‘administered prices’, which were defined as prices “set by administrative action and held constant for a period of time,” as distinct from market prices which were “made in the market as the result of the interaction of buyers and sellers” (Means, 1962:78). Means's claim of a shift from market determined to administered prices generated a number of articles contesting the view that administered prices were a new or novel phenomenon. Among the disputants was Rufus Tucker, who produced statistical evidence that “in this country ever since 1790 our price structure has included a large number of prices that remained unchanged for months or years at a time, side by side with prices that changed monthly, weekly, daily, or in recent years even hourly.” He insisted:

"Ever since manufacturers first began to sell elsewhere than at the factory, and to employ travelling salesmen, and to contract with wholesalers and jobbers, it has been necessary for them to announce prices and to stick by their announcements, or if they diverted from them to do so secretly" (Tucker, 1938:47, 53).

Scitovsky has pointed out that in markets characterised by mass production and large scale organisation, the cost to the producer or merchant of bargaining exceeds the gain from it. In such a situation suppliers can increase their profit by refusing to bargain and setting price on a "take it or leave it" basis. Buyers can buy as much as they want to, but only on set terms over which they have no control. Scitovsky contended that price setting applies in industrialised countries in all markets in which the consumer buys. Consumers face prices set by retailers, and smaller retailers face the set prices of producers and wholesalers (Scitovsky, 1952:19-22).

Peter Wiles has also highlighted the importance of fixed prices, particularly in relation to manufacturing and distribution. In determining price, the firm has to make a prediction as to the "general level of output", i.e., what is the expected demand at the price. The normal procedure then is to "fix a price for the 'season' and await customers," with the season being imprecisely defined but no more than a year in duration. Both sellers and buyers prefer 'take it or leave it'. Bargaining or 'higgling' is a nuisance, and a waste of time and energy. Sellers with a large number of products cannot be sufficiently expert to be continually reconsidering the price of each one. In any case, Wiles maintained that higgling is the privilege of the owner entrepreneur while most selling is carried out by employees, who must be told what to charge (Wiles, 1961:45-49).

It should be emphasised that firms which set their price are not necessarily price makers. Some firms, such as those operating as price leaders, may have discretion to determine the level of their price, but many other firms have little option other than to follow the price decided by others, although this does not mean that they will exactly match the price set by the dominant firms. But what

needs to be emphasised is that each, whether price maker or follower, sets or fixes their price with the intention of maintaining it for an extended period of time.

Calculation of the set price is typically achieved by the use of a cost-based rule of thumb, of which a number of variants have been reported by economists. The most well-known is the full-cost pricing method first described by Robert Hall and Charles Hitch (1939), who claimed that firms based their pricing on average direct costs (assumed constant over a wide range of output), plus average indirect or overhead costs, together with a margin for profit.

A feature of most of the cost-based pricing models is that costs are divided into direct and indirect rather than the economists' classification of variable and fixed. On the basis of empirical evidence, unit direct costs are assumed to be constant over the range of normal capacity utilisation.

Heflebower questions the path-breaking status accorded to the Hall and Hitch study and others which related price changes to cost changes, pointing out that such practices had been described in business school texts since at least the 1920s (Heflebower, 1955:361). In addition, General Motors had been employing a similar pricing technique since the 'Twenties. Its pricing objective was to achieve on average over time an after-tax return on capital of approximately 15 percent. Average unit costs were calculated on an assumed 'standard volume' equivalent to 80 percent of plant capacity, with a profit margin being added sufficient to yield the target rate of return. This 'standard price' would then be adjusted to take account of actual and potential competition, business conditions, and other factors (Scherer, 1980:185-86).

Heflebower points out that most versions of the full-cost principle hold that the firm sets its price having regard only to total unit costs at some assumed output rate, with no attention being given to demand. However he suggests that closer examination reveals that the cost rules employed themselves contain, or in application are modified for, demand influences. "[T]he gross margin used by the individual firm reflects not its own indirect costs but rather the margin it finds by

experience to be desirable in light of costs and market conduct of its rivals” (Heflebower, 1955:363, 366).

### 2.2. *The Horizontal Supply Curve*

An obvious implication of price setting is that, subject to output constraints, the firm is prepared to supply whatever quantities buyers demand at the set price. Any intersection of demand with the price line would represent a point on the firm's supply curve, since it indicates an amount that the firm is willing to supply at that price. Thus, in effect, the firm has a horizontal supply curve at the level of the set price.

To re-emphasise the point, at the set price the firm is willing to supply whatever quantity the market demands up to the limit determined by current output plus any inventories brought forward from the immediately previous period. Therefore, the price line is coincident with the firm's supply curve, on the same logic used to justify the horizontal demand curve in perfect competition.

Economists who have attempted to analyse price setting behaviour have generally failed to recognise the price line as a supply curve, probably because it coincides with the average revenue curve. For example, in Philip Andrews's theory of manufacturing business the firm is assumed to be “offering its product for sale at a fixed price which will remain unchanged despite the fluctuations in output,” which results in what he refers to an “average-revenue-price line” (Andrews, 1949b:253-56). Wiles asserted that setting and sticking to a price creates “an infinitely elastic sales curve” [emphasis in original], insisting that this sales curve was by no means a demand curve in that “it does not describe the effect of price changes on quantity bought, it merely describes the seller's intention not to alter his price whatever he sells” (Wiles, 1961:47). By contrast, Romney Robinson explicitly identified the price line in administered or “code established” pricing as the firm's short period supply curve (Robinson, 1961:207, 219).

Eichner contends that there is no empirical support, at least outside of agriculture and mining, for a positively sloped supply curve. He finds no evidence that industrial firms encounter higher unit costs with expanded output, with the result that constant or increasing returns appear to be the rule. “To the extent that the concept of a supply curve is at all applicable to the industrial sector, the curve would appear to be perfectly elastic, at least over the observable range, rather than being positively sloped” (Eichner, 1983:211, 213). It is interesting to note that Eichner had not always clearly identified the price line as a supply curve. Seven years earlier, he had depicted a “revenue function” which was “a line parallel to the horizontal axis at a height equal to the price ... . This gives the revenue curve the appearance of an infinitely elastic demand curve” (Eichner, 1976:44).

### 2.3. *'Fuzzy' Demand*

R.A. Gordon observes that “[t]he pictures of continuous, negatively inclined demand curves that the theorist draws are figments of the theorist's ... imagination - at least so far as imperfectly competitive, industrial markets are concerned.” He suggests that the business man knows very little about the nature of the demand curve for his various products and, in particular, does not ordinarily know how his sales would vary at different selling prices. “His great concern, on the demand side, is with the probability of a constantly changing volume of sales at a given price” (Gordon, 1948:277).

Some other economists have highlighted the unpredictability of demand. For example, Heflebower notes that oligopolistic industries experience wide variability of short run demand “cyclically or even more unsystematically” (Heflebower, 1961:86), while Zarnowitz reports that many products of manufacturing industries face “extremely unstable, sporadic, or individualized customer demand” (Zarnowitz, 1962:391).

While a number of more recent studies have drawn attention to situations of uncertain or stochastic demand, such works typically simply note or assume the

stochastic nature of demand which is then incorporated into a variant of a conventional economic model. The uncertainty of demand is not in itself considered deserving of extended comment. An exception is Dennis Carlton (1978; 1984), who observes that “firms often do not know how much of their product will be demanded each day.” He attributes the randomness of demand to the fact that “the number of customers that frequent the firm will generally vary from day to day” (Carlton, 1978:571).

The basically axiomatic model which he has developed does take account of “three essential features of market operation” which can be seen as observationally based. These are “price inflexibility, demand uncertainty, and timing considerations.” He notes that one reason for price inflexibility is that changing prices frequently is time consuming and costly, but he regards as of more importance the fact that prices may have to be maintained for some time if their “signal” is to be received. Demand is uncertain over the period during which prices are inflexible, and “at the beginning of any market period after prices have been set, firms do not know for sure what their demand will be, although they do know what the random distribution of demand looks like.” By timing considerations he means “the need to have produced or to have made some prior commitment to production ... before the unknown customer demand is observed” (Carlton, 1978:571; 1984:11).

Because of the randomness of demand firms are not confident that they can sell all they desire at the going price and are concerned with overproducing and being left with unsold goods, thus incurring extra holding costs. They are also concerned with underproducing and therefore maintain inventories to protect against the loss of potential sales. A key feature of his analysis is that “as an outcome of the market process ... occasionally some customers will be unable to purchase the good.” In Carlton’s model firms set price and decide on output at the beginning of the market period, then observe their random demand. An equilibrium is derived where, in general, supply will not equal demand. However

his notion of equilibrium is somewhat unique as its two elements are price and the probability of obtaining the good (Carlton, 1984:11-15).

Notwithstanding the work of Carlton and some others, the general position is that, while the most casual inspection of almost any business’s operating data would confirm that their product demand is both uncertain and variable, most economists have ignored or failed to perceive the fact that there is a substantial degree of uncertainty as to the quantity demanded from a particular seller in any time period. The amounts demanded will almost always fluctuate from period to period, often in a quite unpredictable manner. Some of this fluctuation can be anticipated, e.g., when it is due to seasonal or cyclical factors, etc., but there is almost invariably a residual element of uncertainty. In a word, the demand for a particular product is almost always perceived by its producer to be ‘fuzzy’.

An important reason for the fuzziness of demand is the firm’s own continuing endeavours to shift outwards its demand by way of advertising, the activities of its sales representatives or other marketing efforts. The firm can be expected to continually seek to expand its sales to take advantage of its unutilised capacity. The use of advertising and other selling activities is not only to expand demand but also to protect established demand which may be slipping either absolutely or in terms of market share - further testimony to the dynamic and fluctuating nature of demand.

The level of demand expected at the time of setting price may be very different to what the firm comes to expect in the light of actual market conditions. But this only reinforces the central point that the firm has at best only a fuzzy idea of the actual amount that will be demanded from it in any period.

As a consequence of demand variability and unpredictability, we observe that real world markets typically do not clear. In any time period the quantity demanded will not equal the quantity supplied in the sense in which that term is usually used. What economists normally mean when they talk about quantity supplied is that quantity which is both produced and offered for sale in the current

period. If demand is uncertain there is no reason to suppose that what is produced will exactly match what is demanded.

#### 2.4. *The Role of Inventories and Order Backlogs*

Wilford Eiteman (1949) was one of the first economists to draw attention to the role of inventories in situations of uncertain and varying demand. In his model price is determined on the basis of a mark-up on costs calculated for that level of output representing "the minimum reasonable use of the plant available." With price fixed, output is increased until inventories begin to rise at abnormal rates, then adjusted until they become stable.

A more sophisticated analysis is that of F.M. Scherer who observes that because demand functions are constantly shifting, mistakes in setting output levels are inevitable. If too much is produced relative to the current flow of orders, the first reaction is a buildup of inventories or a reduction of order backlogs, while if too little is produced, inventories will be drawn down or delivery times extended. Inventories and order backlogs serve both as buffers for production imbalances and as feedback signals to guide the coordination of future production with demand. He finds it hard to understand why this system, which he judges to be "supremely operational", has been overlooked so often by students of inventory behaviour.

Inventory and order backlog movements provide the first level of response to demand shifts because of natural lags in the production process. Not only does it take time to reschedule production but it is also costly. Setup, hiring and retraining costs increase with frequent production rate changes and there may be adverse effects on productivity and workforce morale. Further, given that "the flow of orders is inherently erratic," firms do not react to faint demand change signals but wait to confirm a more persistent demand change before adjusting the level of production (Scherer, 1980:193-94).

As suggested by Scherer, the lack of coincidence in the real world between demand and supply means that firms either maintain inventories of their final products or have order backlogs for those products. If goods can be stored, then any imbalance is accommodated principally by changes in inventory levels. Because there are significant costs involved with frequent changes of price we can envisage a hierarchy of responses to mismatching of supply and demand. Initially, if output exceeds demand, the firm will simply allow inventories to rise, waiting to see if the imbalance persists or worsens. If it does, then the next step is to reduce output. The third level of response would involve a reduction in price, but this would never be undertaken without taking into account the anticipated responses of rival firms. In fact there is substantial evidence of firms' extreme reluctance to change price to accommodate demand shifts. A similar hierarchy of inventory depletion, increased output and the possibility of increased price would apply when demand continues to exceed supply.

Firms in industries such as job printing and heavy engineering and most construction firms of necessity produce-to-order. In such situations, imbalances between supply and demand may lead to the accumulation of back orders. Backlogs of orders can be viewed as negative inventories and lend themselves to a mirror-image hierarchy of firm responses.

Finally there are goods such as daily newspapers and breakfast croissants which are inherently non-storable. Here a certain quantity is produced in each period, based on an estimate of likely demand. If demand is in excess of output, it will remain unsatisfied or be diverted to another supplier or another product. If output exceeds demand, the unsold stock will have to be discarded. It is a matter of commercial judgement by the producer whether to aim for a degree of excess demand with the inevitable loss of sales revenue and the risk of loss of customer goodwill, or to err on the side of over-supply, which is likely to be preferred where the ratio of price to direct cost is relatively high. With these products we often observe out-of-stock situations or piles of unsold goods at the end of the day, providing obvious confirmation of suppliers' inability to forecast demand.

### 3. A Rudimentary Model of Price and Output Determination

Figure 1 depicts a very basic model of price and output determination by a manufacturing firm which takes account of the phenomena discussed in the previous section. The curve ADC represents average direct cost which consists of raw materials and labour directly attributable to production of the particular good. ATC, or average total cost, is derived by *superimposing average indirect or overhead cost on direct costs*. The demand curve D is shown as disconnected and *thick and grey* to reflect its uncertain and fluctuating nature at the present level of price and the firm's lack of knowledge of its location at other prices.

At the beginning of the pricing period the firm will set its price on the basis of a markup on estimated unit direct costs at some assumed normal level of output, which will usually be somewhat less than the sustainable capacity indicated in Figure 1. The dominant group of firms within the industry usually have some degree of discretion as to the amount of the markup. Often one firm will fill the role of price leader and try to set price so as to cover indirect costs together with a satisfactory level of profit. However, the markup will usually take into account margins conventionally applying in the industry, the *state of competition*, and the danger of attracting entry both from new and established firms. In particular the *markup may have* to be modified in the light of prices already announced by other strong competitors.

Firms not in a position to determine their own price will probably follow those set by the price making firms. They will not necessarily exactly match such prices if, for instance, there are quality differentials or differing degrees of consumer acceptance between producers, but fringe or subordinate firms will almost certainly set their price so that it has a close correspondence with that chosen by members of the dominant group.

At the prevailing price the firm will be prepared to sell any quantity up to the limit of its present output together with any inventories brought forward from the

previous sales period. Thus the horizontal supply curve S is drawn so as to indicate that, due to the existence of inventories, for short periods supply can exceed sustainable output.

Once price is set it will normally be maintained by the various firms throughout the pricing period. Gordon argues that "the business man will assume that his sales estimates will be wrong to some extent, but he is almost certain to be prepared, within a considerable margin of error on both sides of his sales estimate, to maintain his price during the period for which plans are being made." Gordon insists that price will only be altered as a result of changes in conditions greater than envisaged as probable at the time the estimates were made. Even in this situation, before price is changed, strong efforts will be made to respond to the new situation through varying output, selling expense, product specifications, production techniques, and the like. "In any event, no change in price is likely to be made unless the business man is confident that the new situation will prevail for some considerable period" (Gordon, 1948:283).

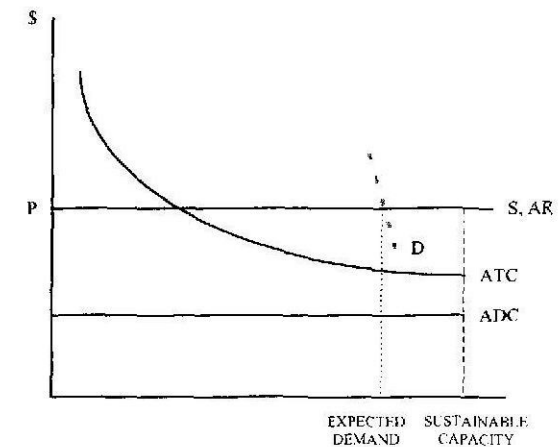


Figure 1. A basic model of the price setting manufacturing firm.

Sylos-Labini points out that changes in the price of variable factors usually affect firms of all sizes and therefore have a very rapid effect on costs and eventually result in a change in price. A rise in the price of variable factors raises the costs of all firms, although not necessarily by the same proportion. In such a situation the price leaders can raise the price of their products without fearing the reaction of rivals or the entry of new firms. But he is insistent that in general the prices of goods produced under oligopolistic conditions are completely rigid with respect to demand variations. Changes in quantity demanded cause immediate adjustments in supply. "Supply is 'administered' in order to administer prices" (Sylos-Labini, 1969:66-68, 114). Similarly Eichner's position is that price is unaffected by a shift of the demand curve, which involves a movement along the supply curve. A change in price is produced only by a change in costs which causes a shift of the supply curve itself (Eichner, 1983:222).

There are suggestions by some authors, however, that the observed rigidity of price with respect to demand changes may be subject to some qualification. For instance, Heflebower notes that both general observation and the literature of the rigid-price controversy of the 1930s indicates that quoted prices are non-responsive to demand shifts unless the demand change is sizeable and prolonged. But he argues that this is less true of actual transaction prices. Demand variations tend to be associated with price concessions, reclassification of customers and adjustments in freight charges and services rendered. He found "few exceptions to the rule that transactions prices vary to some degree relative to quoted prices when the latter do not move in response to demand" (Heflebower, 1955:389)

Okun also suggests that there may be some demand-induced price changes which are masked as cost-induced. He points out that in many industries, when firms raise their prices they routinely issue announcements to their customers that higher costs have compelled the increase. He makes the obvious point that no firm has ever explained to customers that it had raised price "to capture a larger share of the surplus in the relation as a result of a stronger market." Cost-based price

increases are regarded as 'fair', while those based on increased demand are often viewed as unfair (Okun, 1981:153).

#### 4. Conclusion

This paper has focussed on aspects of business behaviour and its environment which are observed to be prevalent but which have been virtually ignored by neoclassical economists. These include the practice of setting price and maintaining it for extended periods, the unpredictability and variability of demand, and the maintenance of inventories and order backlogs. Each of these are difficult to account for within traditional theories but are seen to be readily incorporable within an observational framework.

The model presented represents a modest initial step but provides a framework for further development and empirical testing and investigation. Much work needs to be done in extending the analysis, including consideration of such questions as the stability of the behavioural relationships outlined, the effect of entry, and pricing practices such as price leadership and limit pricing. There is also the need to appraise the observational validity of the equilibrium concept and optimisation assumptions in relation to the firm in the real world.

#### Acknowledgements

I am grateful to Warren Hogan, Evan Jones and John Nightingale for their comments on an earlier draft.

## References

- Andrews, P.W.S., "A Reconsideration of the Theory of the Individual Business," *Oxford Economic Papers*, 1 (New Series), 1949a, 54-89.
- Andrews, P.W.S., *Manufacturing Business*, London: Macmillan, 1949b.
- Andrews, P.W.S., *On Competition in Economic Theory*, London: Macmillan, 1964.
- Burns, Arthur R., *The Decline of Competition: A Study of the Evolution of American Industry*, New York: McGraw-Hill, 1936, 197-206.
- Carlton, Dennis W., "Market Behavior with Demand Uncertainty and Price Inflexibility," *American Economic Review*, 1978, 68, 571-88.
- Carlton, Dennis W., *Market Behavior under Uncertainty*, New York: Garland Press, 1984.
- Cyert, R.M. and Hedrick, C.L., "Theory of the Firm: Past, Present and Future; An Interpretation," *Journal of Economic Literature*, 1972, 10, 398-412.
- Eichner, Alfred S., *The Megacorp and Oligopoly: Micro Foundations of Macro Dynamics*, New York: Cambridge U.P., 1976.
- Eichner, Alfred S., "Why Economics is not yet a Science," ch. 9 in A. S. Eichner ed., *Why Economics is not yet a Science*, London: Macmillan, 1983.
- Eichner, A.S. and Kregel, J.A., "An Essay on Post-Keynesian Theory: A New Paradigm in Economics," *Journal of Economic Literature*, 1975, 13, 1293-1314.
- Eiteman, Wilford J., *Price Determination: Business Practice versus Economic Theory*, Research Report No. 16, Ann Arbor, Mich.: Bureau of Business Research, University of Michigan, 1949.
- Gordon, R.A., "Short-period Price Determination in Theory and Practice," *American Economic Review*, 1948, 38, 265-88.

- Hall, R.L. and Hitch, C.J., "Price Theory and Business Behaviour," *Oxford Economic Papers*, 1939, 2, 12-45.
- Heflebower, Richard B., "Full Costs, Cost Changes, and Prices," in National Bureau of Economic Research, *Business Concentration and Price Policy: A Conference of the Universities-National Bureau Committee for Economic Research*, Princeton: Princeton U.P., 1955.
- Heflebower, Richard B., "Stability in Oligopoly," *The Manchester School*, 1961, 29, 79-93.
- Kaldor, Nicholas, *Economics without Equilibrium*, Armonk, N.Y: M.E. Sharpe, 1985.
- Lanzillotti, R.F., "Pricing Objectives of Large Companies," *American Economic Review*, 1958, 48, 921-40.
- Machlup, Fritz, "Equilibrium and Disequilibrium: Misplaced Concreteness and Disguised Politics," *Economic Journal*, 1958, 68, 1-24.
- Machlup, Fritz, "Theories of the Firm: Marginalist, Behavioral, Managerial," *American Economic Review*, 1967, 57, 1-33.
- Machlup, Fritz, *Methodology of Economics and Other Social Sciences*, New York: Academic Press, 1978.
- Means, Gardiner C., "Industrial Prices and Their Relative Inflexibility," in *The Corporate Revolution in America*, New York: Crowell-Collier, 1962.
- Mills, Edwin, "Uncertainty and Price Theory," *Quarterly Journal of Economics*, 1959, 73, 116-30.
- Mueller, Dennis C., "The Corporation and the Economist," *International Journal of Industrial Organization*, 1992, 10, 147-70.
- Mueller, Dennis C., "Business and Industrial Organization Research: Synergy or Shotgun Marriage," *Journal of the Economics of Business*, 1994, 1, 27-30.

- Okun, Arthur M., *Prices and Quantities: A Macroeconomic Analysis*, Washington, D.C.: Brookings Institution, 1981.
- Robinson, Romney, "The Economics of Disequilibrium Price," *Quarterly Journal of Economics*, 1961, 75, 199-233.
- Ruggles, Richard, "The Value of Value Theory," *American Economic Association, Papers and Proceedings*, 1954, 44, 140-51.
- Scherer, Frederick M., *Industrial Market Structure and Economic Performance*, Chicago: Rand McNally, 1980.
- Scitovsky, Tibor, *Welfare and Competition: The Economics of a Fully Employed Economy*, London: Unwin University Books, 1952.
- Sylos-Labini, Paolo, *Oligopoly and Technical Progress*, translated by Elizabeth Henderson, Cambridge, Mass.: Harvard U.P., Revised Edition, 1969.
- Tucker, Rufus S., "The Reasons for Price Rigidity," *American Economic Review*, 1938, 28, 41-54.
- Wiles, P.J.D., *Price, Cost and Output*, Oxford: Basil Blackwell, 1961.
- Zarnowitz, Victor, "Unfilled Orders, Price Changes, and Business Fluctuations," *Review of Economics and Statistics*, November 1962, 44:4, 367-92.

**Working Papers  
in Economics**

- 191 W.P. Hogan Market Value Accounting in the Financial Sector; November 1993
- 192 Y. Varoufakis & W. Kafourous The Transferability of Property Rights and the Scope of Industrial Relations' Legislation: Some Lessons from the NSW Road Transport Industry; November 1993
- 193 P.D. Groenewegen Jacob Viner and the History of Economic Thought; January 1994
- 194 D. Dutta & A. Hussain A Model of Share-Cropping with Interlinked Markets in a Dual Agrarian Economy; March 1994
- 195 P.E. Korsvold Hedging Efficiency of Forward and Option Currency Contracts; March 1994
- 196 J. Yates Housing and Taxation: An Overview; March 1994
- 197 P.D. Groenewegen Keynes and Marshall: Methodology, Society and Politics; March 1994
- 198 D.J. Wright Strategic Trade Policy and Signalling with Unobservable Costs; April 1994
- 199 J. Yates Private Finance for Social Housing in Australia; April 1994
- 200 L. Haddad The Disjunction Between Decision-Making and Information Flows: The Case of the Former Planned Economies; April 1994
- 201 P.D. Groenewegen & S. King Women as Producers of Economic Articles: A Statistical Assessment of the Nature and the Extent of Female Participation in Five British and North American Journals 1900-39; June 1994
- 202 P.D. Groenewegen The French Connection: Some Case Studies of French Influences on British Economics in the Eighteenth Century; June 1994
- 203 F. Gill Inequality and the Wheel of Fortune: Systemic Causes of Economic Deprivation; July 1994
- 204 M. Smith The Monetary Thought of Thomas Tooke; July 1994
- 205 A. Aspromourgos Keynes on the Australian Wages System; July 1994
- 206 W. Kafourous & Y. Varoufakis Bargaining and Strikes: From an Equilibrium to an Evolutionary Framework; July 1994
- 207 A. Oswald & I. Walker Rethinking Labor Supply: Contract Theory and Unions; July 1994
- 208 J.B. Towe & D.J. Wright The Research Output of Australian Econometrics and Economics Department: 1988-93; July 1994
- 209 F. Gill & C. Rose Discontinuous Payoff Functions under Incomplete Information; August 1994
- 210 S-J Kim Inflation News in Australia: Its Effects on Exchange Rates and Interest Rates; October 1994
- 211 Y. Varoufakis Moral Rhetoric in the Face of Strategic Weakness: Modern Clues for an Ancient Puzzle; November 1994
- 212 E. Jones Bureaucratic Politics and Economic Policy: The Evolution of Trade Policy in the 1970s and 1980s; December 1994
- 213 R. Hataiseree & A.J. Phipps The Relationship Between Money and Income in Thailand: Some Evidence for the 1980s Using a Cointegration Approach; January 1995
- 214 G. White Classical Competition, Keynesian Adjustment and Composite Dynamics: A Critical Perspective; February 1995

- 215 C. Karfakis & A.J. Phipps *Treasury Note and Bank Bill Rates, the Risk Premium and Australian Monetary Policy*; February 1995
- 216 P.D. Groenewegen *The Post 1945 Internationalization of Economics The Australian Experience*; April 1995
- 217 S-J Kim *Modeling Changes in Daily \$A Exchange Rates: An Application of GARCH*; June 1995
- 218 R. Hataiseree & A. Phipps *The Degree of Capital Mobility in Thailand: Some Estimates Using a Cointegration Approach*; June 1995
- 219 I.J. Irvine & W.A. Sims *Measuring Consumer Surplus with Unknown Hicksian Demands*; June 1995
- 220 I.J. Irvine & S. Wang *Saving Behavior in a Pure Life-Cycle Model with Income Uncertainty*; June 1995
- 221 J. Logan *The Self-Destruction of Private Health Insurance*; October 1995
- 222 A. Aspromourgos *Cantillon on Real Wages and Employment: a rational reconstruction of the significance of land utilization*; November 1995
- 223 M. Smith *A Monetary Explanation of Distribution in a Gold Money Economy*; December 1995
- 224 J.B. Towe *The Ranking of University Accounting and Finance Departments in Australia, 1990-94*; January 1996
- 225 W.P. Hogan *Foreign Debt: Perceptions, Experiences and Issues*; January 1996
- 226 N. Barkatullah *OLS and Instrumental Variable Price Elasticity Estimates for Water in Mixed-Effects Model Under Multipart Tariff Structure*; January 1996
- 227 C. Simkin *Three Essays on Problems of Market Economies*; January 1996
- 228 L. Haddad *On the Transition from a Supply to a Demand-Constrained Economic System: The East European Experience*; February 1996
- 229 F. Gill *The Road to Full Employment: Co-ordination in a World of Interdependent Decisions*; February 1996
- 230 S-J Kim *Testing the Rationality of Exchange Rate and Interest Rate Expectations: An Empirical Study of Australian Survey Based Expectations*; March 1996
- 231 R. Bryan & M. Rafferty *Still Calling Australia Home? Conceptions of International Capital in Recent Official Reports*; May 1996
- 232 H. Sun *Macroeconomic Impact of Direct Foreign Investment in China 1979-93*; June 1996
- 233 D.K. Dutta *A General Model of Derived Demand Linkages in a Dual Economy: Some Structural Implications*; July 1996
- 234 B.W. Ross *Towards an Observational Economics of Business Behaviour: The Horizontal Supply Curve, 'Fuzzy' Demand and Other Anomalies for Conventional Theory*; August 1996

Copies are available upon request from:

Department of Economics  
The University of Sydney  
N.S.W. 2006, Australia

### Working Papers in Economics Published Elsewhere

- 2 I.G. Sharpe & R.G. Walker *Journal of Accounting Research*, 13(2), Autumn 1975
- 3 N.V. Lam *Journal of the Developing Economies*, 17(1), March 1979
- 4 V.B. Hall & M.L. King *New Zealand Economic Papers*, 10, 1976
- 5 A.J. Phipps *Economic Record*, 53(143), September 1977
- 6 N.V. Lam *Journal of Development Studies*, 14(1), October 1977
- 7 I.G. Sharpe *Australian Journal of Management*, April 1976
- 9 W.P. Hogan *Economic Papers*, 55, The Economic Society of Australia and New Zealand, October 1977
- 12 I.G. Sharpe & P.A. Volker *Economics Letters*, 2, 1979
- 13 I.G. Sharpe & P.A. Volker *Kredit und Kapital*, 12(1), 1979
- 14 W.P. Hogan *Some Calculations in Stability and Inflation*, A.R. Bergström et al (eds.), J. Wiley & Sons, 1978
- 15 F. Gill *Australian Economic Papers*, 19(35), December 1980
- 18 I.G. Sharpe *Journal of Banking and Finance*, 3(1), April 1978
- 21 R.L. Brown *Australian Journal of Management*, 3(1), April 1978
- 23 I.G. Sharpe & P.A. Volker *The Australian Monetary System in the 1970s*, M. Porter (ed.), Supplement to Economic Board 1978
- 24 V.B. Hall *Economic Record*, 56(152), March 1980
- 25 I.G. Sharpe & P.A. Volker *Australian Journal of Management*, October 1979
- 27 W.P. Hogan *Malayan Economic Review*, 24(1), April 1979
- 28 P. Saunders *Australian Economic Papers*, 19(34), June 1980
- 29 W.P. Hogan *Economics Letters*, 6 (1980), 7 (1981)
- I.G. Sharpe & P.A. Volker *Australian Economic Papers*, 18(33), December 1979
- 30 W.P. Hogan *Keynesian Theory, Planning Models, and Quantitative Economics*, G. Gandolfo and F. Marzano (eds.), 1987
- 32 R.W. Bailey, V.B. Hall & P.C.B. Phillips
- 38 U.R. Kohli *Australian Economic Papers*, 21(39), December 1982
- 39 G. Mills *Journal of the Operational Research Society* (33) 1982
- 41 U.R. Kohli *Canadian Journal of Economics*, 15(2), May 1982
- 42 W.J. Merrilees *Applied Economics*, 15, February 1983
- 43 P. Saunders *Australian Economic Papers*, 20(37), December 1981
- 45 W.J. Merrilees *Canadian Journal of Economics*, 15(3), August 1982
- 46 W.J. Merrilees *Journal of Industrial Economics*, 31, March 1983
- 49 U.R. Kohli *Review of Economic Studies*, 50(160), January 1983
- 50 P. Saunders *Economic Record*, 57(159), December 1981
- 53 J. Yates *AFSI, Commissioned Studies and Selected Papers*, AGPS, IV 1982
- 54 J. Yates *Economic Record*, 58(161), June 1982
- 55 G. Mills *Seventh Australian Transport Research Forum-Papers*, Hobart 1982

- 56 V.B. Hall & P. Saunders *Economic Record*, 60(168), March 1984
- 57 P. Saunders *Economic Record*, 59(166), September 1983
- 58 F. Gill *Économie Appliquée*, 37(3-4), 1984
- 59 G. Mills & W. Coleman *Journal of Transport Economics and Policy*, 16(3), September 1982
- 60 J. Yates *Economic Papers*, Special Edition, April 1983
- 61 S.S. Joson *Australian Economic Papers*, 24(44), June 1985
- 62 R.T. Ross *Australian Quarterly*, 56(3), Spring 1984
- 63 W.J. Merrilees *Economic Record*, 59(166), September 1983
- 65 A.J. Phipps *Australian Economic Papers*, 22(41), December 1983
- 67 V.B. Hall *Economics Letters*, 12, 1983
- 69 V.B. Hall *Energy Economics*, 8(2), April 1986
- 70 F. Gill *Australian Quarterly*, 59(2), Winter 1987
- 71 W.J. Merrilees *Australian Economic Papers*, 23(43), December 1984
- 73 C.G.F. Simkin *Singapore Economic Review*, 29(1), April 1984
- 74 J. Yates *Australian Quarterly*, 56(2), Winter 1984
- 77 V.B. Hall *Economics Letters*, 20, 1986
- 78 S.S. Joson *Journal of Policy Modeling*, 8(2), Summer 1986
- 79 R.T. Ross *Economic Record*, 62(178), September 1986
- 81 R.T. Ross *Australian Bulletin of Labour*, 11(4), September 1985
- 82 P.D. Groenewegen *History of Political Economy*, 20(4), Winter 1988 and *Scottish Journal of Political Economy*, 37(1) 1990
- 84 E.M.A. Gross, W.P. Hogan & I.G. Sharpe *Australian Economic Papers*, 27(50), June 1988
- 85 F. Gill *Australian Bulletin of Labour*, 16(4), December 1990
- 94 W.P. Hogan *Company and Securities Law Journal*, 6(1), February 1988
- 95 J. Yates *Urban Studies*, 26, 1989
- 96 B.W. Ross *The Economic and Social Review*, 20(3), April 1989
- 97 F. Gill *Australia's Greatest Asset: Human Resources in the Nineteenth and Twentieth Centuries*, D. Pope (ed.), Federation Press, 1988
- 98 A.J. Phipps *Australian Economic Papers*, 31(58), June 1992
- 99 R.T. Ross *Australian Bulletin of Labour*, 15(1), December 1988
- 100 L. Haddad *Hetsa Bulletin*, (11), Winter 1989
- 101 J. Piggott *Public Sector Economics - A Reader*, P. Hare (ed.), Basil Blackwell, 1988
- 102 J. Carlson & D. Findlay *Journal of Macroeconomics*, 13(1), Winter 1991
- 102 J. Carlson & D. Findlay *Journal of Economics and Business*, 44(1), February 1992
- 104 P.D. Groenewegen *Decentralization, Local Government and Markets: Towards a Post-Welfare Agenda*, R.J. Bennet (ed.) Oxford University Press, 1990
- 107 B.W. Ross *Prometheus*, 6(2), December 1988
- 108 S.S. Joson *Rivista di diritto valutarario e di economia internazionale*, 35(2), June 1988
- 112 P. Groenewegen *NeoClassical Economic Theory 1870 to 1930*, K. Hennings and W. Samuels (eds.), Boston Kluwer-Nighoff, 1990

- 113 V.B. Hall *Energy Economics*, 12(4) October 1990
- T.P. Truong  
V.A. Nguyen
- 114 V.B. Hall *Australian Economic Review*, (87) 1989(3)
- T.P. Truong  
& V.A. Nguyen
- 115 F. Gill *Australian Journal of Social Issues*, 25(2), May 1990
- 116 G. Kingston *Economics Letters*, 15 (1989)
- 117 V.B. Hall & D.R. Mills *Pacific and Asian Journal of Energy*, 2(2), December 1988
- 118 W.P. Hogan *Abacus*, 25(2), September 1989
- 120 P. Groenewegen *Flattening the Tax Rate Scale: Alternative Scenarios & Methodologies*, (eds.) J.G. Head and R. Krever, 1990
- 122 W.P. Hogan & I.G. Sharpe *Economic Analysis and Policy*, 19(1), March 1989
- 123 G. Mills *Journal of Transport Economics and Policy*, 23, May 1989
- 126 F. Gill *The Australian Quarterly*, 61(4), 1989
- 128 S. Lahiri & J. Sheen *The Economic Journal*, 100(400), 1990
- 130 J. Sheen *Journal of Economic Dynamics and Control*, 16, 1992
- 135 Y. Varoufakis *Économie Appliquée*, 45(1), 1992
- 136 L. Ermimi *The Economic Record*, 69(204), March 1993
- 138 D. Wright *Journal of International Economics*, 35, (1/2) 1993
- 139 D. Wright *Australian Economic Papers*, 32, 1993
- 141 P. Groenewegen *Australian Economic Papers*, 31, 1992
- 143 C. Karfakis *Applied Economics*, 23, 1991
- 144 C. Karfakis & D. Moschos *Journal of Money, Credit and Banking*, 22,(3), 1990
- 147 J. Yates *Housing Studies*, 7, (2), April 1992
- 149 B. Rao *The Economic Journal*, 102(414), Sept. 1992
- 150 D. Wright *Bulletin of Economic Research*, 47(1), Jan. 1995
- 157 B. Rao *Applied Economics*, 24(6), June 1992
- 158 W.P. Hogan *Economic Papers*, 10(1), March 1991
- 159 P. Groenewegen *Local Government and Market Decentralisation: Experiences in Industrialised, Developing and Former Eastern Block Countries*, R. J. Bennett (ed.) UN University Press, 1994
- 160 C. Karfakis *Applied Financial Economics*, 1(3), September 1991
- 161 B. Rao *Southern Economic Journal*, 61(2), Oct. 1994
- 162 Y. Varoufakis *Erkenntnis*, 38, 1993
- 163 Y. Varoufakis *Science and Society*, 56(4), 1993
- 164 D. Wright *The Manchester School of Economics and Social Studies*, 63(4), December 1995
- 173 C. Rose *The Rand Journal of Economics*, 24(4), Winter 1993
- 174 D. Wright *Canadian Journal of Economics*, 28(4), November 1995
- 177 P. Groenewegen *European Journal of the History of Economic Thought*, 1(2) Spring 1994
- 178 D. J. Wright *Economic Record*, 70(211), December 1994
- 187 C. Karfakis & A. J. Phipps *Australian Economic Papers*, 33(62), June 1994
- 189 C. Karfakis & S-J Kim *Journal of International Money and Finance*, 14(4) August 1995

- 190 A.J. Phipps & J.R. Sheen *Labour Economics and Productivity*, 6(1), March 1994
- 193 P. Groenewegen *Contributions to Political Economy*, 13, 1994
- 194 D.Dutta & A. Hussain *Journal of Contemporary Asia*, 25(4), 1995
- 197 P. Groenewegen *New Perspectives on Keynes*, Supplementary History of Political Economy, 27, 1995, A.F. Cottrell & M.S. Lawlor  
Duke University Press, Durham
- 199 J. Yates *Housing Policy Debate*, 5(2), 1994
- 202 P. Groenewegen *Dix-Huitieme Siecle* (26), 1994
- 203 F. Gill *Australian Economic Papers*, 33(62), June 1994
- 208 J.B. Towe & D.J. Wright *Economic Record*, 71(212), March 1995
- 210 S-J Kim *Applied Financial Economics*, 6(2), 1996
- 218 R. Hataiseree & A. J. Phipps *Applied Economics Letters*, 3, 1996
- 225 W.P. Hogan *Economic Analysis and Policy*, 25(2), September 1995