NEAD

SOME BASIC PROBLEMS OF RESEARCH INTO COMPETITION IN AGRICULTURAL MARKETS

BY

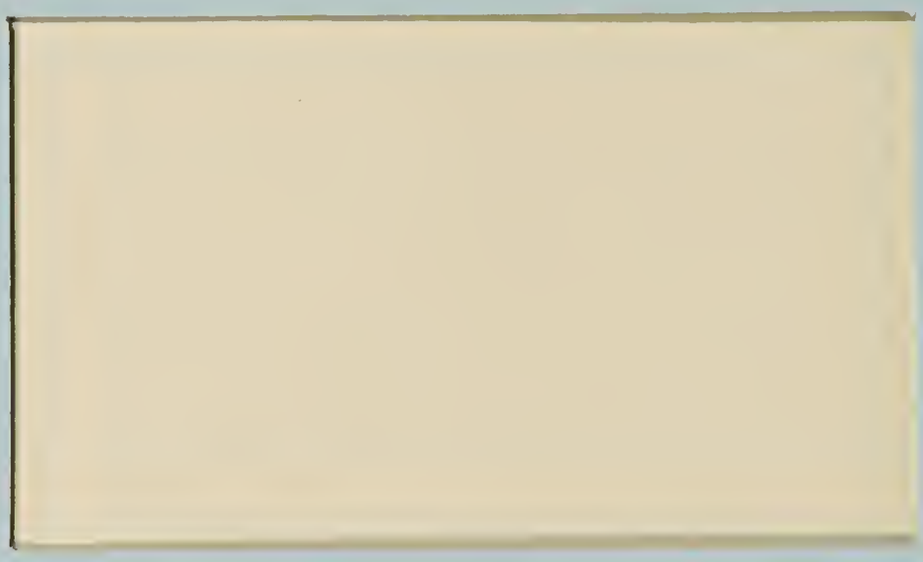
Allen B. Paul

NEAD WORKING PAPER

NATIONAL ECONOMIC ANALYSIS DIVISION

ECONOMICS, STATISTICS, AND COOPERATIVES SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE



SOME BASIC PROBLEMS OF RESEARCH INTO COMPETITION IN AGRICULTURAL MARKETS

BY

Allen B. Paul

SOME BASIC PROBLEMS OF RESEARCH INTO COMPETITION IN AGRICULTURAL MARKETS*

BY

ALLEN B. Paul

Equilibrium theory has come under heavy attack for its lack of realism (e.g. Kaldor, Morgenstern, Robinson 1976, 1977). Yet, economists continue to use it on the grounds that it is the best theory available, implying that it yields testable implications (e.g. Furubotn and Pejovich).

I propose to make a modest contribution to this 'debate' by lending support to both sides. Looking at primary agricultural markets, I will argue through most of this paper that the usefulness of partial equilibrium theory can be improved by incorporating 'time' in a more fruitful way. But later, I will argue that for some big problems of society, we must search for a theory of disequilibrium to guide inquiry. I hasten to add that there is nothing new in this stance, although I will try to shed some fresh light on the matter.

The following discussion is divided into six topics entitled price structure and time; price discovery and market tatonnement; market form and price competition; market boundaries; dynamics of the firm and the market; and concluding remarks.

Price Structure and Time

The point to be emphasized here is that exchange involving contracts for deferred delivery introduces time as an explicit dimension. Such exchange

*Presented at the annual meetings of the Allied Social Sciences in Chicago, August 30, 1978.

results in three price dimensions for a commodity—one for variations in form, a second for variations in place and a third for variation in time of delivery. The latter constitutes the time-structure of price, comparable to the more familiar form and place structures of price.

This point is not well-recognized but it is important. What is confusing is that the prices observable in each of the three dimensions, including time, tend to change over time. The observed changes tend to pervade one's thinking and dominate economic analysis. But current anticipations of how prices may differ at successive forward dates result in a current structure of prices for the forward dates.

Forward contracts, or markets in future goods as some would put it, are very clever instruments. Some theorists, notably Arrow and Debreu, have reasoned that complete use of forward contracts would result in a competitive equilibrium (see Radner). They see widespread failure to use forward contracts for all forward dates and all goods as a puzzle requiring explanation (Arrow 1978, 1974). What is not examined in such literature is the significance of such contracts, wherever they exist or can exist, for efficient organization of production in the face of market uncertainty.

Drawing on some suggestions in Hicks' Value and Capital and in Working' seminal article on "The Theory of the Price of Storage," I had made a start in this direction. I investigated in three cases, the proposition that the purchase of a commodity for forward delivery is equivalent to the purchase of (a) a commodity for spot delivery and (b) a set of services to make the spot commodity into the forward commodity. The outcome was the identification of explicit,

though indirect, markets in specialized services used to transfer a commodity in form, place and time.

Thus, for example, the market price for a spot bushel of soybeans plus the interest cost on the soybean investment over the processing interval, when subtracted from the concurrent price for the bushel-equivalent of soybean oil and soybean meal deliverable at the end of the processing interval, is the market price for soybean milling services per bushel (Paul 1966; Paul and Wesson 1966). Similarly, the price for a spot feeder-steer plus a spot bundle of feed sufficient to turn the feeder into a fed steer at the end of the feeding period, plus interest on the investment in feed and feeder over the period, when subtracted from the concurrent price for a fed steer deliverable at the end of the feeding period, is a market price for the feedlot services per animal (Paul and Wesson 1967). Similarly, the price for a bushel of spot grain plus the interest cost on the grain investment over the storage period, when subtracted from the concurrent price for a bushel of grain deliverable at the end of the storage period, is (when adjusted for convenience yield) a market price for warehousing services per bushel (Paul 1970). If one were to search, I suspect many other markets in specialized services could be identified.

Such price differences appear to respond to their own supply and demand forces in a classically predictable way. For example, a large crop represents an increased demand for storage, processing and transport services and tends to raise their prices (i.e. widen margins). The amount of the increase depends on the elasticity of supply of services which, in turn, depends on alternative uses for a fixed stock of more or less specialized equipment. It is a rival

explanation to the old complaint that when crops are large, farm prices decline excessively because buyers do not have to compete as strongly for supplies as before.

The further significance of explicit, though indirect, markets for services will be suggested soon.

Price Discovery and Market Tatonnement

The translation of traders' price ideas into market prices need not imply that successive prices will converge toward an equilibrium. There could be continuous oscillations of price. But it is useful to start with the assumption of a tendency toward equilibrium (Machlup pp. 43-72). It could lead us, for example, to inquire how market-clearing prices are formed; whether different mechanisms for establishing price are efficient in the light of the potentials of modern electronic technology; whether the rules of trading might hinder reaching equilibrium; and whether the particular path of prices established under one set of procedures would result in a different equilibrium than under another set of procedures.

Perishable products once produced are good subjects for initial observation. They preclude significant speculation for the rise or fall of price. As commodities become storable, or as forward trading develops, speculation becomes possible and this can interfere with the tendency for the market to reach equilibrium. The main problem is that people in the market—growers, processors, merchants, and others—may not arrive at their price anticipations with sufficient rationality and independence. This is an especially rich field for investigation and it is attracting wide attention. 1/

To show that trading behavior normally would lead to an equilibrium price, Walras visualized a process of tatonnement--the 'trial' prices and quantities that are entered and revised by buyers and sellers until a price is reached that would match the amount offered with the amount taken. (Patinkin, pp. 531-540).

While it is hard to find real world examples of this 'feeling-out' process that would result in a single market-clearing price during a market session, there appear to be elements of the tatonnement process in most competitive markets, e.g., the "shopping-around" that occurs in early morning hours at big public livestock markets or at big public wholesale fresh vegetable markets, before substantial sales are concluded. Also, the persistence of the daily or weekly "call" throughout the history of commodity markets might be interpreted as a form of tatonnement. The "call" which usually lasts but 15 to 30 minutes once or twice a day or week, and on whose final price many unpriced contracts are settled, has been severely criticized for being unrepresentative because it usually has few actual transactions. But if its main role is to make price ideas for the day consistent with quantities demanded and supplied, by bringing all interested parties together where they can talk and bid, then the appropriate criterion for its evaluation is how well it fills this role in comparison with other methods. One of the anomalies of our times is the use of the "call" in some fairly concentrated markets.

While elements of the tatonnement process may be observed in many agricultural markets, actual trades often occur throughout the market session. Thus, the final price is conditioned by the nature and sequence of preceding prices (Patinkin p. 532). Then, does the final price better represent the

equilibrium price for the quantity that changed hands during the session, than (say) the weighted average price for the entire market session?

Marshall said yes and gave an ingenious explanation. (Hicks 1939 pp. 127-129). Transactions during the session that were entered at 'false' prices could be viewed as having taken place at the true equilibrium price with a payment made from buyer to seller, or vice versa, equal to the dif ference between the true and false prices, as appropriate. If this income transfer were quite small relative to each trader's total income, it could be ignored. The final price for the session would be the equilibrium price.

Net income transfers from mistaken prices might indeed be relatively small for most market participants when a succession of market days are taken into account and the overages and underages are balanced out. Yet, one is not comfortable with the argument as it stands, especially for perishable items. It begs the questions of how particular machinery pairs individual traders through the session.

Something more can be said about tatonnement if trading were for for- ward delivery as well as for spot delivery. Morgenstern in "Thirteen Critical Points in Economic Theory" (p. 1170) has prompted my thinking. The following statement is logically correct, but it can mislead one.

> ...Tatonnement is patently impossible if among the items traded there are services or instantly perishable goods. Their supply is irrever- sible: once made they are gone. Services can, therefore, not even be part of tatonnement unless this is taken to be a purely hypothetical procedure and not a description of a possible physical sequence of events.

While services, when produced, are instantly perishable, this does not preclude a bidding process that moves prices toward equilibrium before the services are produced. There could be a continuous process of bidding for services whose delivery would start in (say) 2 months time and run for a month, like the transport or warehousing of grain. As time passes, suppliers and demanders will have reevaluated their own positions in the light of the last price and, if the machinery permitted, they could liquidate existing positions or establish new ones. Note that conditions need not have changed, warranting a new equilibrium price. Rather, an iterative process would reflect the groping for the final price.

If the machinery worked well, the price established for delivery of services starting in two months could converge toward equilibrium in a short time and the price would not change much, thenceforward, unless new conditions arose to start the bidding or contracting all over again.

It is not hard to see why changes in the expected market price for services to be provided during one period, may be positively correlated with changes in the expected market price for an adjacent period. Any changes in capacity of specialized equipment, or in the alternative uses for it, occur slowly. Therefore, short-run increases or decreases in demand for such services, would be spread between adjacent periods, as prices for the services of one period got out of line with prices of another (allowing for the differences in utility of the commodity in the two periods). Thus, when a service is about to be produced, it has been subjected to pricing forces over a lengthy period, and presumably the price for its current production would be near its equilibrium value. 2/

Market Form and Price Competition

Perhaps no great theorist has had a greater change of mind about the assumption of competitive equilibrium than Hicks. His Value and Capital was built on that assumption. Now, nearly four decades later, he has abandoned it as being too unrealistic. Hicks (1977) observed, in his latest book that, in the twentieth century, flexprice markets have been

> ...largely replaced by what I have called fixprice markets, in which prices are set by producers themselves (or by some authority); so they are not determined by supply and demand. It is of course granted that cost conditions, and sometimes also demand conditions, affect the prices that are fixed; but when these change, prices do not change automatically... Organized markets, which are more competitive markets, so that they do work on the whole, in a recognizably supply-demand manner, remain in existence in some particular fields; but the unorganized flexprice market, the old type, is on the way out.
>
> That modern markets are predominantly of the fixprice type hardly needs to be verified. It is verified by the most common observation" (pp. x-xi).

Hicks then goes on to suggest that the principal model in Keynes General Theory could have been better

> ...represented as consisting of fixprice markets (for labour and for commodities) together with just one flexprice market, the market for bonds..." (p. xiii).

Understandably, model builders must simplify, but to an agricultural economist this is too strong a dose to swallow. Assuredly, many if not most

primary commodity markets are better described as flexprice markets than fixprice markets, although this in itself does not mean that they perform well. The principal exceptions, (and important and perhaps growing exceptions) are those in which public authority is used to control, or allocate supplies.

One clear evidence of flexprice markets in agricultural commodities is the large number traded on organized commodity exchanges. Another evidence is the large number of people that the Government employs to report on a daily basis cash prices for most farm commodities. Fixprice markets for commodities tend to occur in their manufactured forms. Yet, one must be careful not to take 'list prices' as entirely trustworthy transaction prices.

Let us now turn to another observation on the nature of competition as recently given by Joan Robinson (1977, pp. 1324-1325).

> The conception is absurd that a firm when it is making more than normal profits sits around waiting for competition to invade its market and drive it back towards its optimum size. It would be the height of imprudence for a business to distribute the whole of its net profit to the family or to shareholders, and no business could borrow if prospective profits did not exceed its interest bill...
>
> Successful firms accumulate, finance and devour unsuccessful ones. Most joint-stock companies continue to grow, and many competitive industries tend toward a condition of dominance by one or a few firms. But the great corporations do not behave monopolistically in the sense of restricting output in order to raise prices. They continue to compete with each other, invading new markets, introducing new products, and evolving new techniques, while at the same time throwing up oppor-

tunities for new small businesses to make a start.

Do Hicks' and Robinsons' views conflict? Not necessarily. The large corporation may fix its price-line for a time, with a view of invading someone's else's territory. The latter would be forced to match prices or lose customers. Thus, one cannot tell from the similarity of going prices whether there was competition or collusion. In either case, to use Hicks' term, we would observe a 'fixprice' market. Other sorts of evidence would be needed to make up one's mind.

This is why, I believe, that Bressler and his associates did not trust any inferences about the price performance of agricultural industries from the numbers of firms in the market. They preferred the laborious process of comparing observed prices for a commodity (in form, place and time) with costs of physical transformation that would be incurred by any firm that would operate with a modern equipment of efficient scale. In this manner they hoped to identify excessive costs as well as excessive profits. I don't think Bressler was concerned with how frequently prices flexed within the day or week. It was the average level of price that concerned him.

The average level of price also concerns "industrial organization" economists. Their extensive empirical studies usually show positive correlations between concentrated industries and price levels or profit rates. In contrast to the "Bressler-school," they deal at a fairly aggregative level of observation, which procedure causes problems of interpretation. But both rely on partial equilibrium theory to determine the social cost of market imperfections. It may be the best theory we have, but it cannot tell us much about the relation between economic growth and industrial organization and therefore,

not much about the nature of market deficiencies when markets are in chronic disequilibrium.

A final point. There are some services, produced by a small number of firms, whose prices do fluctuate from day to day almost as if they were determined in an atomistically competitive market. For example, U.S. soybean processing services are produced by about 20 firms, yet the price for soybean crushing services fluctuates as if there were 200 firms. Either our definition of the industry is too narrow, or ologopolies may behave like atomistic competitors. How should one define an industry? We usually say that it is all firms that make a single product or a group of related products; but then we must define these terms.

Market Boundaries

A single product has some unique form, place and time specification in the eyes of buyers. They regard it as having a separate market. Marshall set forth in lucid style the principles by which we can set boundaries to a market in each of three dimensions, but his time dimension is of a different sort than the one I have emphasized. Quoting Cournot, Marshall said that a market is:

> ...not any particular market place in which things are bought and sold, but the whole of any region in which buyers and sellers are in in such free intercourse with one another that the prices of the same goods tend to equality easily and quickly (p. 324).

The 'same goods' are things that can be easily and exactly described so that they "can be brought and sold by persons at a distance from one another and at a distance also from the commodities" (p. 326). With respect to time, Marshall said that the:

> ...element of Time requires more careful attention just now than does that of Space. For the nature of the equilibrium itself, and that of the causes by which it is determined, depend on the length of the period over which the market is taken to extend. We shall find that if the period is short, the supply is limited to the stores which happen to be at hand; if the period is longer, the supply will be influenced, more or less, by the cost of producing the commodity in question; and if the period is very long, this cost will in its turn be influenced, more or less, by the cost of producing the labour and the material things required for producing the commodity. These three classes, or course, will merge into one another by imperceptable degrees (p. 330).

The importance of distinguishing between short-run and long-run market behavior is now well-known. Arguments can be avoided over whether an industry is essentially competitive or monopolistic, by making explicit one's assumptions about length-of-run. Or, arguments might be moved onto grounds that allow for resolution e.g., is the difference over how long the long-run must be? Or, if not, is there a difference over possibilities of entry by outside firms?

If one can get agreement on the boundaries for the 'short-run' market (which may not be too difficult for most agricultural output), the setting of place and form boundaries require care. I recall Congressional testimony, some years ago, describing how one meat-packer that had averaged about 40 percent of the daily cattle purchases at the Denver stockyards, had manipulated

price by suddenly withdrawing in favor of cattle from its own feedyards when Denver cattle prices had risen, thereby percipitating a drop in price. But the actual price experience showed that after the firm had withdrawn from the Denver market, prices continued to climb for some weeks before turning down; when the firm had reentered the market after prices had weakened, prices continued to decline. These facts suggest that for purposes of measuring market shares the market was too-narrowly bounded. While fed cattle ordinarily do not move great distances, chilled beef carcasses do. Thus, prices for fed cattle in many local markets probably were closely tied by a regional or national meat market. Evidently, the Denver packer was a much smaller factor in the relevant market than 40 percent.

Having said this, one should point out that geographical isolation of markets for agricultural commodities are a common and perhaps growing condition in the U.S. It is aggravated by increased economies of scale in processing, transport, storage, buying and other operations under advancing technology, that result in fewer, larger units. These monopoloid conditions deserve careful study.

The idea that two stages of a commodity are closely interrelated through production, of course, has its counterpart in consumption. Unless one has reliable 'cross-commodity' demand elasticities for the relevant time period, he may have no good basis for counting firms.

Now we will go beyond Marshall's concept of time. What can one say about competition and market boundaries when a market for future goods exists? The key idea is that a time-structure of commodity prices implies the marketing of services. The dilemma of the existence a flexprice market for a fairly

concentrated U.S. soybean crushing industry may be explored in this light. But first we should correct the number of decision-makers. Some firms may have delegated buying and selling decisions to individual plant managers where the profitability of the plant is sensitive to local conditions. (The 20 companies of the 1972 Census operated 60 mills). Also, foreign demand for U.S. soybeans implies a demand for services of mills in Europe, Japan and elsewhere. And some U.S. cottonseed, flaxseed and other vegetable oil mills can crush soybeans to advantage when their own season is done.

But we must look beyond numbers of decision-makers and see what they see. A U.S. plant manager usually looks at the rate at which beans might become available in his territory, their likely condition, his expected costs of carrying beans to later months, and the expected change in the rate of oil extraction. Conditions affecting these prospects tend to change during the season, hence, it is in the interest of each firm to re-do its contracts in the light of new information.

An important point now emerges. Within the interval between entering into and fulfilling a contract, the processing, transport and storage services are, within limits, excellent substitutes. For example, a contract to deliver soybean oil and meal in Chicago in three months could be filled in various ways--e.g., if the beans could be processed either in Iowa or Chicago, and if beans or the bean products could be stored at either location, then there would be at least six combinations of (the locus of) the processing, transport and storage services that could be used to satisfy the same contract. Each combination is a near-perfect substitute for another. Thus, the market boundaries for commodities in which there is active trade for forward delivery may be very broad. 3/

Dynamics of the Firm and the Market

Partial equilibrium theory cannot explain the recurrent upsets of equilibrium states nor the changing structure of markets. If as Joan Robinson says successful firms "accumulate, finance and devour unsuccessful ones (and) ...continue to compete with each other, invading new markets, introducing new products, and new techniques, while at the same time throwing up opportunities for new small businesses to make a start," what sort of theory would this suggest? I think that technological change and economic growth would have to be at the center of such a theory; but so would institutional change.

To explain the changes in agricultural markets, I became attracted to Allyn Young's thesis that market growth begets specialization and, in turn, specialization begets market growth. But it lacks an important feature. It does not explain how the capital needed for new kinds of production can be mobilized in the face of economic hazards. This usually requires institutional adaptation. Allyn Young probably did not address this issue because it was not important for his purposes.

The evolution of successful techniques to mobilize savings and channel it into investment in the modern age could not have happened without two basic discoveries, namely, that (a) debt could be sold to third parties by reducing prospects of default and (b) residual claims to income from business ventures could be made salable by limiting the claimant's liability for losses. It had taken several centuries to fashion the modern techniques and put them onto a secure legal footing. Moreover, practical applications are still evolving. For example, while the issuance and sale of corporate shares are generally

sanctioned, the issuance and sale of commodity options are not. Both are applications of the limited liability principle to residual claims.

The two great social inventions--salability of debt claims and equity claims--were just as important as the great physical inventions--steam, internal combustion and electric engines--in laying the foundations for modern economic growth. And like machines, institutions incorporate what has been learned: It is the almost endless elaboration of these basic social inventions into new and different arrangements to suit different purposes that a dynamic theory of markets should provide for.

To bring such institutions into a theory, I have suggested elsewhere (Paul 1974) a recursive system involving two quite different sets of forces--one 'real' and the other 'institutional'--interacting one on the other over time. Briefly stated, specialization of production (with attending enlargements of scale and further applications of technology) marches on in a growing economy, as both a cause and a consequence of growth, but at no faster pace than permitted by the reduction in investment hazards through public and private techniques, which techniques are themselves a cause and consequence of economic growth. Of course, for a time, someone may forge ahead with a specialized operation in a new area and assume big risks. But where many do so and fail, there will be a search for institutional accomodations to spread risks.

The private techniques are of two types. One type comprise enterprise-sharing arrangements under which capital from diverse sources is pooled and put under the command of a single agent--as manifested in syndicates, partnerships and corporations. The other type comprise enterprise-sharing arrangements that bind sufficient capital to a specified course of pro-

duction by voluntary agreements among sovereign economic units--as manifested in joint-account production, participation agreements, and deferred delivery contracts of various sorts.

The public methods of mitigating economic hazards include schemes to underwrite loans, insurance coverage, income and employment. These schemes tend to free-up private capital for investment in new and untried ventures which ventures in the aggregate further increase output, which increased output then favors more public schemes. And so this circular process continues.

The main thing to be said about private arrangements is that the two major types are interdependent. That is, the organization of more economic activity under the command of a firm is within limits, an alternative to the organization of such activity among firms through the market. Therefore, failures of markets to perform well make for more activity within the firm, whereas failures of the firm to perform well make for greater reliance on markets (Williamson). The market should provide as effectively and economically as possible, information, performance guarantees on contractual agreements, and settlement of disputes. The firm should play each of its roles effectively and economically--e.g., deciding on production techniques; hiring, training and rewarding personnel; gathering and using pertinent information; positioning assets to best advantage; complying with government regulations; and so on.

Some firms are bigger than required to achieve optimum performance in any of these roles, (although evidence that this is so or not so can be misleading). Command over large-scale equipment, or large efforts to develop advanced equipment, requires large firms. But what explains firms that are even larger?

Caves recently provided an explanation for the grain-exporting industry and advanced three reasons why firms must be large--i.e., they must minimize unused grain storage capacity in dispersed locations, they must reduce variance in returns from "basis" fluctuations, and they must be efficient at gathering timely information about grain markets throughout the world. While his inquiry is on the right track, by examining highly disaggregated enterprises, one still needs to ask: how large must a firm be in each area to compete successfully?

To satisfy such a query about any industry, one should examine whether the bigness of the firm compensates for deficiencies in market mechanisms for loans, enterprise-shares, insurance and foreign currency as well as for goods and services. If so, the question becomes whether deficiencies in any of these markets can be remedied, how, at what cost, and whether the large firm is itself a help or hinderance to improvement. Among other things, one also should study the culture and pathology of financial institutions including tax laws. This is a tall bill to present to economists. But it is a worthy one.

Concluding Remarks

My intent in this paper was to give a somewhat personal view of how to deepen our insights into basic market processes for the primary commodities. The two different paths that have been followed reflect a deep split among some of the best minds of the economic profession on how to proceed. I am not sure that the differences can or will be resolved because, as Joan Robinson has observed, there is a strong ideological underpinning to choice of method. But this is an old and staying problem of the profession. Perhaps more scientifically-based empiricism would help us through.

FOOTNOTES

_/ National Economic Analysis Division, ESCS, USDA.

1/ One line of research is to identify and measure price oscillations in the light of conceptual and statistical difficulties. A second is to examine the causes, expecially the role of market information processes, including prices as information-bearers. A third is to assess the consequences of such market instability in terms of individual and social costs. A fourth is to examine the merits of the available remedies.

2/ A logical difficulty remains. Indirect pricing of services implies that current dispositions of commodities might be affected by changes in price for the futures commodity via changes in the spot-forward price spread. This is Morgenstern's point in another guise. No time exists for haggling over price, once services have been produced; i.e. service, being immediately perishable when produced, are immediately used-up in further production. But in practice, production in response to momentary price changes seldom occur.. The difference between the specific needs of the firm and standardized agreements, (which agreements must be standardized if they are to be widely used because they must provide leeway in what, where and when delivery are to be made) causes their prices to be somewhat independent.

3/ A common error is to draw boundaries around a particular set of trading arrangements. For example, boundaries are drawn around organized futures markets, as if so-called 'cash markets' had no trading for future delivery, nor 'futures markets' any trading for immediate delivery. Neither is true. Markets also need to be bounded in terms of what the commodity is exchanged for—i.e., dollars or other currency that can be readily converted into dollars. But if there are impediments to conversion of currencies, how far should one go in allowing all international forces within the framework of a single commodity market?

REFERENCES

ARROW, K. J. "Limited Knowledge and Economic Analysis." Am. Econ. Rev. 64 (1974): 1-10.

_____, "The Future and the Present of in Economic Life." Econ. Inquiry 16 (1978) 157-164.

BRESSLER, R. "Market Structure and Performance-The Conceptual Framework" Proceedings of Market Structure Workshop. North Central Regional Extension Marketing Committee. 1966.

CAVES, R. E. "Organization, Scale, and Performance in the Grain Trading Industry." Harvard Institute of Economic Discussion Paper No. 546 Cambridge. 1977.

FURUBOTN, E. and S. PEJOVICH. "Property Rights and Economic Theory: A Survey of Recent Literature." J. Econ. Lit. 10 (1972)

HICKS, J. R. Value and Capital. Oxford, 1939.

_____, Economic Perspectives. Oxford: Clarendon Press, 1977.

KALDOR, N. "What is Wrong with Economic Theory." Quar. J. Econ. 89 (1975) 347-357.

MACHLUP, F. Essays on Economic Semantics. Englewood Cliffs: Prentice Hall, Inc., 1963.

MARSHALL, A. Principles of Economics. Eight edition. London: MacMillan and Co.,m 1938.

MORGENSTERN, O. "Thirteen Critical Points in Economic Theory." J. Econ. Lit. 10 (1972): 1163-89.

PATINKIN, D. Money, Interest, and Prices. Second Edition. New York: Harper & Rowe, 1965

PAUL, A. B. "Pricing Below Cost in the Soybean Processing Industry." J. Farm Econ. 48 (1966): 1-22.

_____, "The Pricing of Binspace: A Contribution to the Theory of Storage." Am. J. Agr. Econ. 52 (1970): 1-12.

_____, "Role of Competitive Market Institutions." Agr. Econ. Res. 26 (1974): 41-48.

PAUL, A. B. and W. T. WESSON. "Short-Run Supply of Services-The Case of Soybean Processing. J. Farm Econ. 48 (1966): 935-951.

_____, "Pricing Feedlot Services Through Cattle Futures. Agr. Econ. Res. 19 (1967): 33-45.

RADNER, R. "Rational Expectations Equilibrium With Differential Information," Techn. Rept. OW-12. Center for Research in Management Sciences, University of California, Berkeley, 1978.

ROBINSON, J. Economic Heresies. New York: Basic Books, Inc., 1971

_____, "What are the Questions?" J. Econ. Lit. 15 (1977) 1318-1339.

WILLIAMSON, O. E. "The Vertical Integration of Production: Market Failure Considerations." Am. Econ. Rev. 61 (1971) 112-123.

WORKING, H. "The Theory of the Price of Storage" Am. Econ. Rev. 39 (1949) 1254-1262.

YOUNG, A. A. "Increasing Returns and Economic Progress," Econ. J., December 1928.