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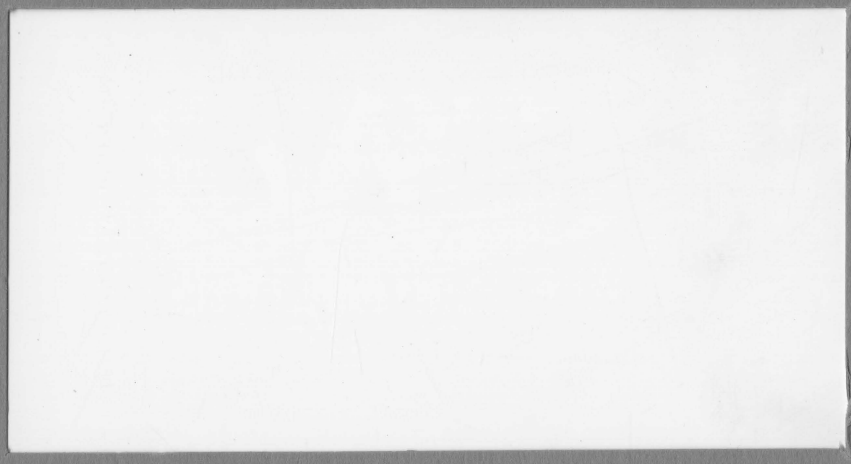

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# Competitive Structure of Agricultural Markets and Development of Smallholder Agriculture[1]

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# Competitive Structure of Agricultural Markets and Development of Smallholder Agriculture[1]

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## Summary and Conclusions

Evidence is widespread that policy strategies of less-developed agricultural countries are based on the assumption that general excess profit margins are taken by commodity dealers, farm input and consumer goods merchants and moneylenders. Explicit statements by many behavioral scientists and some economists support this view. Yet we have little systematic, direct evidence to either support or refute this assumption, and the indirect evidence rests on shaky empirical and theoretical foundations. Moreover, that classical exploitation (excess profits) or even total marketing margins are the performance dimensions of primary importance in development policy formulation is extremely questionable in many instances.

Because restricted entry of new firms is an assumption of all theoretical models which attempt to explain secular aggregate excess profits, entry conditions have been examined for selected areas and commodities. With the exception of legal monopolies, such as a municipal abattoir, the available evidence suggests that no serious barriers to entry exist. However, a

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*Professor of Agricultural Economics. The views expressed are those of the author and do not necessarily reflect those of the University of Kentucky or its officials. Helpful comments of several colleagues and members of the Agricultural Development Council Research and Training Network Marketing Group in developing these ideas are acknowledged.

[1]The investigation reported in this paper (No. 73-1-15) is in connection with a project of the University of Kentucky Agricultural Experiment Station and is published with the approval of the Director.

combination of undeveloped road networks, undeveloped information systems and related institutional infrastructure, plus factor lumpiness, appear to provide conditions of monopolistic and monopsonistic competition. These forms of competitive structure yield no long-run, industry-wide excess profits but may cause high marketing costs and excess capacity which have price effects similar to those of exploitation. Clearly, studies which measure the effects of existing competitive structures on prices and margins rate a high priority on the research agenda.

The distinction between these exploitative and non-exploitative competitive structures is extremely important. Policy tools appropriate to elimination or reduction of exploitation are ineffective in reducing costs and excess capacity under monopolistic and monopsonistic competition, a factor which may explain the widespread failures of agricultural cooperatives to achieve their goals in less-developed countries.

While general price incentives for capital formation and innovation are important, it has been noted in another paper [11] that developmentally limitational marketing malfunctions are not restricted to those which affect marketing margins and average farm prices. Effective articulation at the farm and processor level of differences in demand for products of varying quality may be equally important.

Evidence presented herein suggests that informational and related institutional inadequacies explain impurities of competition in primary markets for farm commodities (as well as poor articulation of consumer demands at the producing level). Implied is the possibility of underemphasis in research and action programs on the development of market-related institutions.

## The Exploitation Hypothesis Examined

Wharton [13] was among the first to put the exploitation hypothesis to empirical test, albeit with somewhat inconclusive results. More recently, Ruttan has interpreted evidence from studies of the Philippine rice and corn markets as indicating relatively competitive markets, the evidence being that regression coefficients relating farm prices to those at higher levels in the marketing channel were not significantly different from 1.0, i.e., that margins were constant [8]. Although this evidence is somewhat suggestive of pure competition in trade channels, an earlier paper has attempted to show that this falls far short of rigorous proof [12]. In fact, the theoretical basis for questioning this interpretation was set forth by Nicholls [6; ch. 20] [7; p. 886] more than 30 years ago. He argued that margin inflexibility was consistent with tight oligopolistic control, and that, in the short run, margin flexibility (margins increasing as demand increased relative to supply) was consistent with rational maximizing behavior under pure competition. In short, this sampling of the very limited literature on the subject indicates that the direct evidence that we have regarding the magnitude of exploitation in markets for major farm commodities or in the distribution channels for inputs is extremely limited and inconclusive. Long's conclusion that interest rates in private farm credit transactions were exploitative[1] in only 15 to 20 percent of his sample is about the only quantitative estimate for any market that has come to the attention of the author

[1] As used by Long, the term "exploitative" apparently refers to returns in excess of opportunity costs for investments of comparable risk and is so used in this paper. Abnormal or excess profits will be treated as synonyms.

[5; p. 1006]. Even this is not necessarily indicative of aggregate excess profits, a point which will be developed later.

## Exploitation as an Exclusive Performance Criterion

Prices in whatever guise provide important incentives for productivity, savings, and investment. However, it is obvious that profits alone do not determine farm prices of inputs and farm commodities. All of the forms of impurely competitive, exploitative structures, e.g., monopsony or oligopsony are not only exploitative; they are also inefficient, i.e., the firms involved operate at non-minimum costs and misallocate resources. But are these the relevant structural models?

## Entry Conditions and Exploitation

As Wharton [13] pointed out, unless entry of new firms is restricted by some exclusionary device or by imperfect knowledge of profit opportunities, excess profits can be only temporary. They are eventually wiped out by entering competitors, just as the profits from new farm innovations go only to the early adopters. Therefore, evidence relating to entry conditions in agricultural markets may be suggestive of whether exploitative models represent tenable hypotheses.[1] Tables 1 and 2 indicate that the numbers of marketing firms licensed to do business in Khon Kaen Province, Thailand, have changed significantly over relatively short periods of time. Kenaf baling plants almost tripled in number in a four-year period, while cattle

[1]Data presented are not to be construed as necessarily representative of other commodities or countries. They are illustrative and suggestive only, pertaining to only one region of one country.

Table 1. Numbers of Marketing Facilities, In Khon Kaen Province Thailand, By Type and Year

| Type of Facility | Year 1968 | 1969 | 1970 |
|---|---|---|---|
| Small Rice Mills[1] | N.A. | 1,024 | N.A. |
| Large Rice Mills[2] | 28[3] | 32[4] | 33[4] |
| Kenaf Dealers[3] | 205 | N.A. | N.A. |
| Licensed Cattle and Buffalo Dealers[6] | 41 | 20 | 18 |
| Licensed Hog Dealers[6] | 11 | 8 | 8 |
| Total Number of Villages[7] | 1,484 | 1,493 | 1,518 |
| Total Number of Farms[8] | N.A. | N.A. | 115,039 |

Sources and Definitions: All data not otherwise designated was assembled and supplied by Mr. Chuang Maungkaew, Northeast Agricultural Center, Khon Kaen and sources noted are given by him.

[1]6-20 Horespower. (1971 Changwad (province) publication)

[2]20-100 Horespower.

[3]Survey Agricultural Economics Branch, Northeast Agricultural Center.

[4]Changwad (province) Publication 1971.

[5]Changwad Economic Officer.

[6]Changwad Veterinary Officer.

[7]Ministry of Interior, Bangkok.

[8]Changwad Agricultural Officer.

Table 2. Numbers of Kenaf Baling Plants in Khon Kaen Province, Thailand, by Years

| Year | Number of Plants |
|---|---|
| 1962 | 12 |
| 1963 | 14 |
| 1964 | 16 |
| 1965 | 30 |
| 1966 | 45 |
| 1967 | 45 |
| 1968 | 45 |
| 1969 | 45 |
| 1970 | 45 |

Source: Collected from Office of Economic Affairs, Khon Kaen province and reported by Sirirugsa (9; p. 44).

and buffalo dealers declined to fewer than half their original numbers in a three-year period. Rice mill numbers expanded slowly, roughly in proportion to recent national and regional production trends. Extensive cross-hauling of paddy rice between markets by trucker-dealers and large rice mill operators, which was reported in an informal survey conducted by the author, suggest easy entry conditions unless there are capital restrictions or licensing exclusions.

At the farm level, a survey of 170 kenaf producers in 1968-69 indicated that 91 had actually patronized more than two dealers in the previous three years [9; p. 54]. The small rice mills which serve mainly local consumption needs serve as a potential escape valve in the event that local assemblers or large mills take abnormal profit margins.

This and other evidence suggests that mobility is significant in many allegedly exploitative markets, leading one to doubt that entry conditions are highly exclusionary and that structural conditions required to support large, long-run aggregate exploitative margins are present. However, this does not deny the possibility that exploitation of particular immobile, poorly-informed or remotely located farmers occurs! Neither does it deny that particular shrewd tradesmen reap high rates of pure profit. It only means that profits are likely to be offset by losses by other dealers and/or on other transactions.

## An Alternative Non-Exploitative Structural Model

If exploitation does not occur as an important general problem does this dispose of the contention that markets are inefficient and non-competitive? On the contrary, consideration of monopsonistic and monopo-

listic competition models suggest the possibility of serious structural deficiencies, indeed, ones that in some ways are more difficult to correct than the truly exploitative ones, the ones in which abnormal profits persist.

In most less-developed countries the secondary road systems are largely undeveloped. Hence, costs of transportation are likely to be high. On that account alone, the commodity supply (average factor cost)[1] function facing the commodity dealer with a spatially dispersed producing sector may be less than perfectly elastic, and the demand (average revenue) function facing farm input and consumer goods merchants may be significantly downward-sloping. These conditions, in combination with scale economies and easy entry, define monopsonistic and monopolistic competition, respectively, both of which are profitless, high-cost equilibria of less-than optimum scale. Scale economies depend, in turn, upon input indivisibilities.[2]

In addition to the high cost of transportation, in an undeveloped marketing system information is not a free good. Typically markets in less-developed countries operate without the advantages of functional official grades, without market news services which report prices by grade, without uniformly employed weights and measures and without effective machinery for avoiding fraud through adulteration, mislabelling, short weight and other "sharp trading" practices.

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[1] See Nicholls [6] for definition of terms. Equilibrium is established when output is such that derived marginal revenue and marginal factor cost are equal. In monopsonistic competition, the derived average revenue and average factor cost are also equal in the long run at the same output.

[2] See Chamberlain [2; ch. V] and Nicholls [6; ch. 13] for further explanation. In monopsonistic competition equilibrium, downward-sloping demand, and long-run average cost functions are tangent.

In their absence, peasant farmers bear both the tangible cost of attempts to acquire additional information and/or added uncertainty. This will be illustrated in the interest of simplicity by reference to commodity sales, neglecting the closely parallel situation in credit and input or consumer goods markets.

Consider the farmer who delivers his paddy or kenaf to a dealer's establishment. If he lacks knowledge of the quality of his product and/or supply and demand conditions, he has the options of going from one dealer to another and obtaining bids, which involves costs, or risking the possibility that the offering price of the initial dealer is lower than he could obtain from another dealer in another village or market town. Itinerant assemblers who come to the village are few and unpredictable in number and, when selling to them, his problem is even more complex.

Whichever the system, the salient point is that in a situation of highly imperfect knowledge of market alternatives, the risk of foregoing a superior alternative by selling to one, or the probability of gaining by absorbing the added costs required to collect additional bids is an inverse function of the offering price of the dealer. Thus, if farmers act rationally, the slope of the commodity supply function facing the individual dealer is directly related to the uncertainties and costs confronting farmers which result from poor information and related institutional infrastructure. These uncertainties are the opposite sides of the product and service differentiation "coins" which Chamberlain and Nicholls treat in elaborate detail and apply in generally parallel fashion to the markets for inputs, and consumer goods.[1]

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[1]As Brewster [1] has implied, the credit market if further complicated by traditional village social structures in which the primary social obligations are to the members of the village, a fact which may complicate collections for loans made to persons outside the village.

Evidence of the Effects of Undeveloped Institutional Infrastructure

Studies of kenaf pricing of Sirirugsa under guidance of the author provide evidence that, despite easy entry conditions, the market institutions in Northeast Thailand are poorly-developed and supply and demand conditions badly articulated at the farm level. This exists in an industry where there are close correlations (R = 0.9) between aggregate movements of farm prices and those at higher levels in the marketing channel [9; p. 68] [10; pp. 21-22]. The regression shown in Table 3 indicates that farmers with inability to calculate from price and weight information the total sales proceeds due them appear to receive somewhat lower prices than those who have such skills. Indebtedness to the dealer appears to reduce average prices somewhat, presumably through reduced mobility. Size of lot marketed, which would determine the cost per kilogram of obtaining information on market alternatives, was positively related to price. The number of buyers which were known to be available was correlated positively with price but fell below a 10 percent significance level. The non-significance of ability to grade kenaf which was tested in a larger model is probably a result of generally low quality, small differences in quality and a small differential in price between adjacent grades. "Wholesale prices were realtively stable and average wholesale price on the week of sale was non-significant in the larger model as well." Moreover the entire regression model explains less than one-third of the price

Table 3. Regression Analysis of 1968-69 Farm Kenaf Prices In Three Provinces of Northeast Thailand

| | Variable[1] | Regression Coefficient | S.E. of Reg. Coefficient | + Value |
|---|---|---|---|---|
| Y | Price per Kilogram (BAHT) Nov. 1968 - Feb. 1969 | | | |
| $X_1$ | Quantity Sold (KG.) | 0.000076 | 0.00034 | 2.23** |
| $X_2$ | Use of Dealer Credit (Dummy Variable) | -0.1368 | 0.0459 | -2.76*** |
| $X_3$ | Farmer's Ability to Calculate Proceeds of Sale from Price and Weight | 0.061 | 0.0373 | -1.65* |
| $X_4$ | Number of Dealers Known to be Available | 0.0126 | 0.0083 | $1.50^{NS}$ |
| $X_5$ | Average Grade of Kenaf Sold (A = 400; B = 300; C = 200; Cuttings = 100) | 0.247 | 0.043 | 5.59*** |

Constant = 1.97, R = 0.29, Total F = 13.34, N = 170

NS = Not Significant at P = 0.10 but Significant at P = 0.20

* = Significant at P = 0.10

** = Significant at P = 0.05

*** = Significant at P = 0.01

[1]Variables excluded because not significant in prior model! Bangkok wholesale price during week of sale, farmers ability to grade, distance from farm to nearest baling plant, use or non-use of price information in bargaining.

Source: Sirirugsa Chumnarn, "Factors Affecting Prices of Kenaf in Khon Kaen, Roi Et, and Kalasin, 1968-69," Proceedings Agricultural Economics Section, Annual Agricultural Conference, Kasetsart University, February 1971 (Forthcoming).

variance, indicating a somewhat unsystematic pricing process.[1]

It is important to re-iterate that this evidence of disorganization and exploitation of those individuals with limited knowledge, limited mobility, and limited available alternatives is not under conditions of easy entry evidence of large aggregate excess profits. It is, instead, evidence of imperfect response to price alternatives and, given the cost of market knowledge, evidence of an upward-sloping supply function facing commodity dealers.

Factor Lumpiness -- Economies of Scale

The high costs associated with monopsonistic or monopolistic competition depend in addition on factor lumpiness such that numbers of competitors sufficiency to result in highly elastic slopes of the supply (average factor cost) and demand (average revenue) functions, respectively, is inconsistent with operation at minimum average costs. Lumpy capital in the form of large rice milling machinery and kenaf baling presses is obvious. The cost of a new large rice mill in Thailand is about U.S. $150,000.[2] The less-efficient small mill costs

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[1] It is recognized that a low $R^2$ can sometimes be explained by poor specification of the model and measurement error. The extremely careful procedures employed in gathering the grade and price information and a rather exhaustive regression analysis of it both suggest that any measurement errors or specification error account for a small part of the unexplained variance. In any event, the data presented here and elsewhere in this paper are regarded as suggestive and illustrative in nature, not definitive tests of the hypothesis.

[2] Capacity 5-6 tons per hour. (Source: A rice miller in Khon Kaen, Thailand.

about U.S. $10,000.[1] Yet for the small commodity assemblers and merchants their main capital assets may be a small, cheap structure to provide shelter and security, and perhaps a truck which can be used for hire as well as transportation of purchased goods. For these the main lumpy factor is family labor and management; and their market conduct suggests an implicit recognition of these indivisibilities and economies of scale. While facilities are usually small, most commodity assemblers handle several commodities, usually several items of household merchandise and/or several farm input items. It seems apparent that this diversification is in large part an attempt to combine from diverse sources a sufficient volume of business to provide a reasonable return to the family for its labor and investment, i.e., economies of scale. The social cost is foregone economies of specialization.

Monopsonistic Competition -- A Basis for Reconciling Opposing Views

The logical consequence of the conditions of easy entry, economies of scale and less-than-perfectly elastic supply facing the marketing firm is high average costs without long-run excess profits. Clearly it provides a possible partial explanation of high marketing margins. Moreover, it provides a possible basis for reconciling two apparently opposing views. The first is that almost universal view of farmers, bureaucrats, behavioral scientists and a fair number of economists, one which they share with doctrinaire socialists. This view is that high

[1]Source: Mr. Somboon Suton, a student whose family owns a small rice mill.

marketing margins are explained by unfair trading practices, exploitation of inferior knowledge and immobilities of farmers by commodity dealers, merchants and moneylenders. The second, the one held by Ruttan, Long, and many other economists is that the evidence that excess profits account for a significant part of large marketing and distribution margins is tenuous at best. The point is that under monopsonistic or monopolistic competition conditions resulting from under-developed market institutions and communications infrastructure, competition is impure, margins are high, some individuals are exploited, and individual merchants may get rich, but profits may be small or non-existent in the aggregate.[1]

Finally, monopsonistic and monopolistic competition may provide a more cogent explanation of the "excessive numbers attached to...petty trade" to which Lewis [4; p. 326] refers than his once-popular labor redundancy hypothesis.

## The Policy Significance of Monopolistic and Monopsonistic Competition

While the secular effects of these forms of competitive structure

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[1] As W.E. Hendrix has pointed out in personal correspondence, the zero profits hypothesis requires that an explanation be provided for the failure of those who experience losses to exit from the industry. In family operated businesses or family farms it is not difficult to explain negative returns to entrepreneurship when the primary input is family labor, negative profits being absorbed in reduced levels of living. But equality of profits and losses is not explainable a priori without adding several assumptions. One may even conjecture that the conspicuous profits of a few may lead to negative aggregate profits through excessive entry (imperfect knowledge). Here it suffices to say that with economies of scale and free entry the conditions for small or negative excess profits and high costs and excess capacity exist and that the strict condition of zero profits is merely expositionally convenient in making the point that an alternative model may be applicable.

on farmers and consumers are qualitatively similar to those of classical monopoly and oligopoly in most respects, the policy instruments with which to deal with them as problems are entirely different. In the developed countries the history of agricultural cooperatives traces back to European guilds. It shows that a host of legal, institutional, behavioral, financial and other innovations had to be worked out before they became successful. They were the result of several hundred years of experimentation and are still rapidly evolving in response to changing institutions and economic conditions. But even when conditions were favorable in these regards, cooperatives have rarely succeeded unless there have been large excess profits margins which could be converted to the account of members. Clearly, this profits element is either missing or transitory in situations of monopolistic and monopsonistic competition. In these situations a combination of well-adapted institutions, good management, and sufficient subsidization to drive excess capacity out of the market are required, all of which are difficult to achieve in less-developed countries. This may explain the generally unsuccessful history of cooperatives in Southeast Asia. In particular, the profits requisite may be missing!

In addition, if impure competition is rooted in market-generated uncertainties resulting from undeveloped grades, market news and related institutions, this is no less a problem for cooperatives than for other firms. Farmers are not likely to patronize cooperatives if they are unable to discern the potential economic rewards therefrom.

A second policy implication of monopolistic and monopsonistic competition is that the economic contributions of transportation and communications infrastructure will be under-valued if their effects on the demand and supply functions facing agri-business firms are not taken into account, because they affect, in turn, price and resource efficiencies.

Finally, it would appear that if these structures are prevalent, an emphasis on public investment in physical marketing facilities, e.g., state investments in terminal marketing, processing and storage facilities, is quite seriously misplaced. Under monopsonistic competition it is more likely that over-investment, rather than under-investment, is already taking place and that emphasis should be placed on development of information systems, related market institution and transportation networks, the lack of which provides the basis for the inefficiency of the present system.[1]

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[1]The need for added storage for supply management to avert famines is a recognized exception.

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