ESTIMATES OF THE DISEQUILIBRIA IN POLAND'S CONSUMER MARKETS, 1965–1978

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FOREWORD

Understanding the nature and dimensions of the world food problem and the policies available to alleviate it has been the focal point of the IIASA Food and Agriculture Program since it began in 1977.

National food systems are highly interdependent, and yet the major policy options exist at the national level. Therefore, in order to explore these options, it is necessary both to develop policy models for national economies and to link them together by trade and capital transfers. For greater realism the models in this scheme are kept descriptive, rather than normative. It is eventually proposed to link models to 20 countries, which together account for nearly 80% of important agricultural attributes such as land area, production, population, exports, imports, and so on.

In the course of this work on the development of the Polish agricultural policy model, Leon Podkaminer has investigated the disequilibria in Poland's consumer markets. Since an understanding of consumer behavior is critically important in formulating plans and designing policies that facilitate the realization of plans, this is an important element in the Polish agricultural policy model.

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Leon Podkaminer*

> The question is sometimes asked: Why do we need a theory of choice; why can't we simply take the concepts of demand itself (prices, income measured in money, etc.) as the basic concepts and leave all theory of choice aside? The answer is simple. The theory of choice—and particularly the concept of a utility indicator—is assumed to be independent of the particular organizational form of the market. Even if the goods were distributed to consumers in an entirely different way, not through a market with a budget equation, etc., the utility indicator would in general exist and may, for instance, be used for estimating the behaviour of consumers under specific market forms that may be contemplated in a programming analysis. (Frisch, 1959)

I. Introduction

IT is clear to most observers that Poland is experiencing an acute shortage of marketable commodities. Although absolute levels of per capita consumption of particular food items (especially animal products) and the collections of durables owned by the average household had approximated Western European standards until 1980, the extent of lines, waiting lists and more or less formalized rationing would suggest an excess demand for virtually all commodities. Although Poland is not the only country affected by the "disequilibrium malady," the Polish case is definitely a severe and persistent one.

Some thinkers attribute this situation to purely political motives. "One could restore market equilibrium overnight"—the reasoning often goes—"just by introducing equilibrium prices. But this would"—it is stressed—"provoke popular resentment." This outcome seems to be well supported by historical events, with attempts at raising food prices failing because of widespread protests.

Before one can conclude that there is nothing to do about the present situation but increase supplies—at any cost (to be covered ultimately by external sources)—it may be worth asking whether the proposed changes in the price structure actually represent a move towards equilibrium or whether, on the contrary, they imply an even greater extent of disequilibria.

A rigorous analysis based on the orthodox theory of consumer behaviour does not reveal any "irregularity" in the Polish consumer response patterns. More specifically, the proposition of this paper is that over the period 1965–1978 the administered price of food has always been substantially *higher* than the equilibrium one—while the administered prices of durables and services have been much lower than the respective equilibrium ones. Under these circumstances, the apparent oddity of the Polish consumer behaviour (including political opposition against the government raising food prices) appears perfectly consistent with the consumption theory. Accordingly, the futility of a number of the government's decisions becomes evident. (These decisions stipulated for differently structured combinations of two basic measures: (a) increases—either creeping or abrupt—in the prices of food products combined with income compensations and/or compensatory decreases in the prices of non-food commodities; (b) increases in the supplies of food products achieved through reductions in the supplies of non-food commodities).

The proper testing of the proposition is provided in section IV. Section II presents a general model of consumer behaviour under partial rationing or shortage of some commodities and its consequences regarding the econometric identifiability of the resulting system of demand equations. Section III is concerned with the estab-

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lishment of the utility functions that are hypothesized to reflect the preferences of the average Polish consumer.

II. Household Behaviour under Rationing—Elementary Conclusions Derived from the Theory of Choice

The usual utility maximization assumption of the theory of household behaviour used as the basis for the explanation and prediction of consumer behaviour in the absence of market disequilibrium is a convincing and convenient construction in the context of a market where the shortages of commodities occur.

Let $(q_1^0, q_2^0, \ldots, q_n^0)$ be the vector of quantities of goods 1, 2, . . . , n demanded (consumed) under respective equilibrium prices p_1, p_2, . . . , p_n by the average consumer (household) whose total expenditure, measured in money, is equal to y. $(q_1^0, q_2^0, \ldots, q_n^0)$ is hypothesized to be the unique optimum solution to the following maximization problem:

$$\text{maximize } U(q_1, q_2, \ldots, q_n) \tag{1}$$

subject to

$$\sum_{i=1}^{n} p_i q_i \leq y \tag{2}$$

where U is the utility function reflecting the consumer's preferences. (For the somewhat restrictive purposes of this paper differentiability of the utility function is assumed. In effect its concavity (and not only quasi-concavity) is required.)

Quantities consumed under disequilibrium $(q^*_1, q^*_2, \ldots, q^*_n)$ are the unique optimum solution to the following maximization problem:

$$\text{maximize } U(q_1, q_2, \ldots, q_n) \tag{3}$$

subject to

$$\sum_{i=1}^{n} p_i q_i \leq y \tag{4}$$

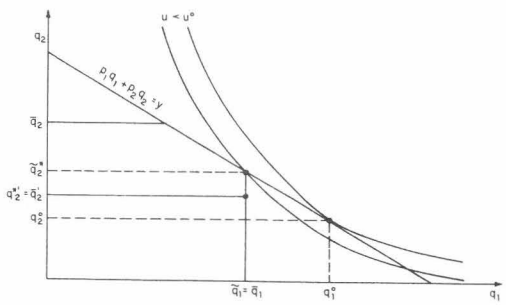
and

$$q_i \leq \bar{q}_i \qquad i = 1, 2, \ldots, m \tag{5}$$

where $p_1, p_2, \ldots, p_n$ are the administered (disequilibrium) prices and $\bar{q}_i$ is the quantity supplied of good i. The disequilibrium occurs whenever one (or more) $\bar{q}_i$ is smaller than the corresponding quantity demanded under equilibrium, q_i^0. It is obvious that the solutions to (1)–(2) and (3)–(5) differ unless $q_i^0 \leq \bar{q}_i$ for all i. The coordinates of the vector $(q_i^0 - q^*_i, q_2^0 - q^*_2, \ldots, q_n^0 - q^*_n)$ represent quantity-term measures of disequilibria for particular goods. It is important to note that when the "value" of the total supply $\left(\sum_{i=1}^{n} p_i \bar{q}_i\right)$ exceeds total expenditure, then the disequilibrium for some goods may be zero, some will be positive, while some will be negative. In other words, when there is no compulsory saving, the disequilibrium implies underconsumption of some goods combined with the overconsumption of some others (see figure 1, case 1). A negative disequilibrium for a good represents the *spillover*, i.e., an increase in consumption of the good caused by the impossibility of spending the money on more desirable goods whose supply is insufficient. (Whether the latter are substitutes, complements or unrelated to the good whose consumption is increased virtually does not matter.)

When the "value" of total supply $\left(\sum_{i=1}^{n} p_i \bar{q}_i\right)$ is smaller than the intended expenditure (y) then the consumption of every good will be actively constrained by respective supplies $(q^*_i = \bar{q}_i)$. Although in this case the consumer is willing to buy more than possible of every good, these

FIGURE 1.—DEMAND UNDER SHORTAGE IN 2 COMMODITY CASES



Note: *Case 1:* $(p_1\bar{q}_1 + p_2\bar{q}_2 > y)$
$\bar{q}^*_1 = \bar{q}_1 < q_1^0$, yet $q_2^0 < \bar{q}^*_2 < \bar{q}_2$.
Case 2: $(p_1\bar{q}_1 + p_2\bar{q}'_2 < y)$
$q^*_1 = \bar{q}_1 < q_1^0$, yet $q_2^0 < q^{*\prime}_2 = \bar{q}'_2$.

spillovers (i.e., overconsumption of some goods) may still appear (see figure 1, case 2).

The possibility of compulsory savings and spillovers under disequilibrium has grave consequences with regard to the econometric estimation of the parameters of the utility function. If the data on observed prices, expenditures and consumption (demand) correspond to the equilibrated market, then the estimation of the parameters of the utility function requires the statistical analysis of the following econometric model, resulting from equating the first-order derivatives of the Lagrangean function (1)–(2) to zero:

$$q_{it}^{0} = f_i(a, p_{1t}, p_{2t}, \ldots, p_{nt}, y_t) + \epsilon_{it} \qquad i = 1, 2, \ldots, n \tag{6}$$

where

t numbers yearly observations;
q_{it}^{0} represents observed demand (for good i);
p_{it} represents observed price of i^{th} good;
y_t is observed expenditure;
ϵ_{it} is the random factor affecting i—the equation in (6);
a is the vector of parameters to estimate.

Under disequilibrium the stochastic counterpart to (6) has to be additionally complemented by unobservable variables standing for shadow prices to the constraints (4) and (5). This destroys the identifiability of the resulting econometric model. More specifically, a disequilibrium counterpart to (6) may be put down in the following manner:

$$q_{it}^{0} = f_i(a, p_{1t}, p_{2t}, \ldots, p_{nt}, y_t) + \epsilon_{it} \qquad i = 1, 2, \ldots, n \tag{7}$$

and

$$p_{it}q^{*}_{it} = p_{it}q_{it}^{0} + \Sigma_j V_{ijt} + \mu_{it}$$

where

q^{*}_{it} is the observed consumption of good i;
V_{ijt} represents the "value" of the spillover (measured in money) from good j to i;
μ_{it} is a random factor.

Now in addition to ϵ_{it}, μ_{it}, also q_{it}^{0} and V_{ijt} are unobservable. Although the number of the variables V_{ijt} may be reduced by some asymmetry conditions (e.g., by requiring that $V_{ijt} = -V_{jit}$), still the system (7) is incapable of being econometrically estimated.

The moral of this story is that any nontrivial demand system ($n > 2$) estimated solely on the basis of the observed disequilibrium prices, quantities consumed and expenditures cannot be justifiably presented as even an approximate version of the actual system (6). Additionally, it may be noticed that even the trivial case poses considerable and hardly tractable—without some ad hoc conditions—econometric problems (Ito, 1980).

III. The Use of Extraneous Information in the Identification of the Utility Function for the Polish Consumer

It is obvious that without some extraneous information on the demand system (7) it is impossible to estimate its parameters. The information required cannot, however, be derived from the data on observed disequilibrium prices, expenditures and quantities, as this cannot generate any more knowledge than is present in there. Certainly the knowledge of black market prices might alleviate the specification of the system. However, since these prices are not reported by official statistics, in practice the advantage of following this approach is dubious.

A more promising method may be to resort to international comparisons. Existing demand studies for many countries that may be safely assumed to have enjoyed persistent equilibrium in consumers' markets suggest definite patterns of consumer behaviour. Why not identify some of the parameters that have proved to represent the average consumer demand response in a wide range of countries and attribute these to the system (1) for Poland, i.e., to the average Polish consumer's behaviour *under* equilibrium?

Upon acceptance of the premise (Houthakker, 1957) that "the discovery of widely applicable generalizations is the principal aim of science" and "that there are meaningful propositions which appear to be valid in nearly all the countries considered, without reference to their climatic or cultural conditions," it is possible, at least in principle, to proceed with the identification of the utility function of the Polish consumer.

Certainly, there is still a great need for caution. First of all, the research should be restricted to aggregate studies. Then, it should be noted that

the reported empirical demand studies do exhibit some differences. The estimated parameters vary somewhat from country to country. Also, they depend on the specific functional form of the equations adopted, the details of assumed stochastic structure and the estimation procedure applied. Needless to say, the statistical quality of the findings is not the same. In effect, the conclusions to be derived with respect to Poland cannot be expected to be independent of the particular foreign demand system accepted. However, if some of these conclusions demonstrate some degree of consistency, one may be justified in issuing fairly definite qualifications and recommendations with respect to the Polish situation.

The sample of cross-country comparative studies of consumer demand patterns, from which the final reference demand systems for Poland have been selected, is made up of Goldberger and Gamaletsos (1970), Gamaletsos (1973) and Lluch, Powell and Williams (1977).

The statistical significance of the reported estimates and their theoretical plausibility support the use of the Extended Linear Expenditure Systems (ELES) presented in Lluch et al. (1977). Another advantage in using the ELES system is in its ability to explain the size of voluntary savings and the structure of demand simultaneously. (The application of the results of any other available cross-country demand study would have required additional estimation of the aggregate consumption functions.)

The utility maximization (1)–(2) underlying the ELES has the following form:

$$\text{maximize} \sum_{i=1}^{n} m\beta_i \ln(q_i - c_i) + (1 - m)\ln(s)$$

subject to

$$\sum_{i=1}^{n} p_i q_i + s \leq y$$

where

$\beta_i c_i$ are commodity-specific parameters (c_i being interpreted as "committed" or "subsistence" consumption of good i),

s is the size of voluntary savings,

m is marginal propensity to consume out of total disposable monetary endowment,

y is total disposable monetary endowment (not to be confused with total expenditure).

It is assumed that $\sum_{i=1}^{n} \beta_i = 1$ so that voluntary saving is equal to $(1 - m)\left(y - \sum_{i=1}^{n} p_i c_i\right)$. The demand equations are given by the following expressions:

$$q_i^0 = c_i + \frac{m\beta_i}{p_i}\left(y - \sum_{i=1}^{n} p_i c_i\right) \qquad i = 1, 2, \ldots, m. \tag{8}$$

By solving (8) with respect to prices it is possible to express the equilibrium prices as explicit functions of monetary endowment (y) and available supplies. These are given by the following formulae:

$$p_i^0 = my \frac{\beta_i}{\bar{q}_i - c_i} \Big/ \left(1 + \sum_{j=1}^{n} \frac{\beta_j c_j}{\bar{q}_j - c_j} m\right) \qquad i = 1, 2, \ldots, m. \tag{9}$$

To ensure the comparability with average Polish data, the systems estimated by Lluch et al. were aggregated to the four-commodity ones containing "food" (including alcohol and tobacco), "clothing" (including footwear), "rent" (including heating and durables, but without automobiles) and "rest" (health, education, leisure, culture, etc.). This aggregation allows us to form a general picture of the Polish consumer market—which need not be consistent with subjective feelings about price levels and availability of particular subcommodities. Thus, for instance, the fact that within "food" goods there are those which have been considered both in short supply and too highly priced (better cuts of meat) or abundant yet underpriced (cereals, milk, potatoes), or, abundant and overpriced (alcohol), has to be disregarded. (The same applies to other commodity groups.)

There is one problem connected with the use of a demand system presupposing the existence of subsistence level c_i. Since an economist has to work with aggregate commodities, sometimes as nebulous as "food" or "services," c_i can seldom be measured in physical quantities. Instead, one has to work with an "abstract" c_i representing the monetary values of the subsistence consumption in the prices of some given year. While this problem does not affect the usage of any demand system for the country to which it refers, it certainly creates problems in cross-country com-

parisons since there is a need for the use of currency conversion rates. While this may be more or less safely done with respect to the comparable *equilibrium* economies, one might wonder how to convert c_i's expressed in, say, 1970 lira and Irish pounds into subsistence quantities of the basic commodities expressed in Polish zlotys of some given year.

To overcome this difficulty, two additional assumptions have been adopted:

1. Besides the "average" consumer, in each of the countries under consideration there is a "marginal subsistence" consumer whose income approximates the total subsistence level.
2. The volumes of consumption q_i's (in Poland) are always bigger than the corresponding subsistence levels, c_i's. In effect, neither prices nor supplies nor budget interfere with the attainment of all of the c_i's. In particular, no *spillover* between the subsistence consumptions could have occurred.

Now, if one defined the subsistence consumers in all countries (retired hippies?) and their average yearly allowances as $w^1, w^2, \ldots, w^k$, one would postulate the conversion rates for total committed expenditures to follow the identities:

$$\frac{w^{\text{Poland}}}{\sum_i c_i^{\text{Poland}}} = \frac{w^j}{\sum_i c_i^j} \qquad j = 1, 2, \ldots, k. \tag{10}$$

This line of reasoning has not been rigorously followed in that the author has chosen the average wage in the lowest-paid sector of the economy instead. (Agriculture appears to be the most deprived sector in all the countries.) Since at these defined levels of income the ratios (10) are not the same, separate sets of $\bar{c}_i$'s for Poland have been calculated according to the formula:

$$\bar{c}_i^j = \frac{w^{\text{Poland}}}{w^j} c_i^j \quad j = 1, 2, \ldots, k.$$

Admitting finally that there is some amount of possible bias in the method adopted, alternative conversion rates have also been used in separate runs to test the sensitivity of the estimates. In sensitivity run 1 one has

$$\bar{c}_i^{j,1} = 1.5\bar{c}_i^j,$$

while in sensitivity run 2 one has

$$\bar{c}_i^{j,2} = 0.5\bar{c}_i^j.$$

The parameters of the Extended Linear Expenditure System for Poland derived in the way presented above appear to be sensitive to the choice of country. However, the equilibrium supplies, computed according to formula (8), and the equilibrium prices, computed according to formula (9), for the period 1965–1978 fully corroborate the hypothesis of the paper. The application of any ELES, irrespective of the country of origin, to the historical data on Poland yields equilibrium prices for food much lower than actually observed. To economize on space, detailed estimates for only two countries, Ireland and Italy, are reproduced below. (There are two reasons for presenting the results for these two countries only. First, the testing statistics for the parameters of the ELES for both countries are by far the best of all the countries studied. Second, both countries represent an overall level of economic development comparable to that of Poland. In particular, the collections of durables and the kinds of housing facilities owned by the average household in all three countries are not dissimilar. Additionally, there are many cultural and historical analogies all three countries share.)[1]

IV. Estimated Actual Disequilibria for Historical Data 1965–1978

The estimates of the disequilibria in Poland's consumer markets are determined on a yearly basis. Two types of characteristics are computed:

1. The supplies of goods that would have equilibrated the markets while leaving all prices and monetary endowments unchanged. (See equation (9).)
2. The prices of goods that would have equilibrated the markets while leaving consumption (supplies) and monetary endowments unchanged. (See equation (8).)

Table 1 presents the parameters of the two basic reference ELESs for Poland. Table 2 contains

[1] It is well beyond the scope of this paper to provide a profound analysis of historical and cultural similarities of the three nations under consideration. A superficial one has to be confined to pointing out the fact that each of them had—until quite recently—developed under the close supervision of the Catholic Church without having a modern unified national state.

information on observed prices, per capita consumption, monetary endowments and bank deposits for the period 1965–1978.

To facilitate the presentation of the results, the estimates of the *disequilibria* actually occurring in particular years (measured as differences between estimated equilibrium supplies and volumes actually consumed) are reported. Table 3 reports on the estimates of shortages (positive) and surpluses (negative) for the basic demand systems described in table 1.

Table 4 reports on the estimates of the price-term disequilibria (together with the actual prices) for the basic demand systems described in table 1. Additionally, the "true" price indexes (Laspeyres, base year = 1971) corresponding to the estimated prices are given, and also the corresponding index implied by the official data.

Before the findings presented in tables 3 and 4 are commented on, a brief account of the results of sensitivity runs 1 and 2 will be given.

V. Sensitivity Runs

The results of the additional runs 1 and 2 justify the proposition that the estimates of the extent of the past market disequilibria in Poland do not virtually depend on the levels of the conversion rates for total subsistence expenditure. This is exemplified by the contents of table 5.

The "critical" commodity "food" appears—in view of the results contained in tables 3, 4 and 5—to be *overpriced* (*or oversupplied*) as compared with the two equilibrium situations considered. Since this conclusion may run counter to the conventional wisdom, it is worth performing yet another sensitivity analysis. This time the focus is on the possibility of the pure demand for "food" (free from possible spillovers) being greater than recorded supplies. The analysis assumes utterly implausible parameters for the supposed Polish ELES, by which the "pure" demand for food (not allowing for possible spillovers from other commodities) would be the greatest. Since this is given by the following expression:

$$q_1 = c_1 + \frac{\beta_1}{p_1}\, m\left(Y - \sum_{j=1}^{4} p_j c_j\right),$$

it is obvious that the lower c_2, c_3 and c_4, the greater q_1.

By setting $c_2 = c_3 = c_4 = 0$, it is supposed that the average Polish consumer does not have any positive minimum levels for consumption of any nonfood commodity. Then, since the greater m and β_1, the greater q_1, let us suppose that of the two pairs of the reported β_1's and m, s, the larger ones are taken. Thus, $m = 0.846$ (the Irish pro-

TABLE 1.—THE PARAMETERS OF THE BASIC REFERENCE DEMAND SYSTEMS FOR POLAND
(c's in thousands of 1971 zlotys)

	Ireland		Italy	
Commodity (i)	β	c	β	c
Food (1)	.315	2.925	.402	2.4
Clothing (2)	.134	0.436	.087	0.52
Rent (3)	.222	0.907	.24	0.56
Rest (4)	.329	0.931	.271	1.12
Propensity to consume m	.846		.790	

TABLE 2.—HISTORICAL DATA FOR POLAND

	Food		Clothing		Rent		Rest		Total	Observed	Monetary
Year	q	p	q	p	q	p	q	p	Expenditures	Savings	Endowment
1965	7.33	0.92	1.59	1.00	1.28	0.98	1.94	0.84	11.22	1.33	12.55
1966	7.80	0.92	1.85	1.00	1.22	1.01	3.08	0.93	13.12	1.64	14.76
1967	8.06	0.93	1.93	1.00	1.34	0.99	3.29	0.95	13.89	1.97	15.86
1968	8.26	0.97	2.08	1.00	1.54	0.98	3.47	0.96	14.90	2.27	17.17
1969	8.52	0.97	2.20	1.00	1.60	0.96	3.68	0.97	15.57	2.67	18.24
1970	8.91	0.97	2.32	1.00	1.69	0.99	3.85	1.00	16.49	2.99	19.47
1971	9.05	1.00	2.33	1.00	1.95	1.00	2.62	1.00	15.45	3.42	19.37
1972	9.43	1.01	2.54	1.00	2.21	1.00	2.98	0.98	17.19	4.20	21.39
1973	10.18	1.01	2.90	1.00	2.45	1.00	3.38	1.00	19.01	5.20	24.21
1974	10.48	1.01	3.21	1.01	2.85	1.01	3.65	1.04	20.50	6.39	26.89
1975	11.28	1.12	3.17	1.20	2.85	1.25	3.17	1.31	24.15	7.39	31.54
1976	12.18	1.20	3.27	1.26	3.02	1.29	3.56	1.35	27.44	8.03	35.47
1977	12.64	1.26	3.22	1.34	3.67	1.36	3.38	1.70	30.98	8.74	39.72
1978	12.63	1.43	3.01	1.46	3.42	1.43	3.48	1.77	33.51	9.52	43.03

Source: *Polish Statistical Yearbooks* 1972, 1976, 1979. Quantities q in thousand 1971 zlotys, observed savings identified with bank deposits.

TABLE 3.—EXTENTS OF DISEQUILIBRIA QUANTITY TERMS
(1971 prices)

	Food		Clothing		Rent		Rest		Voluntary Savings		Observed
Year	Ireland	Italy	Ireland	Italy	Ireland	Italy	Ireland	Italy	Ireland	Italy	Savings
1965	−2.16	−2.05	−0.27	−0.50	1.11	0.89	1.56	1.30	1.19	1.74	1.33
1966	−2.02	−1.80	−0.30	−0.61	1.52	1.80	0.80	0.44	1.51	2.19	1.64
1967	−2.00	−1.74	−0.27	−0.62	1.63	1.41	0.84	0.42	1.68	2.41	1.97
1968	−2.00	−1.70	−0.27	−0.70	1.74	1.53	0.90	0.49	1.86	2.66	2.27
1969	−1.97	−1.61	−0.27	−0.73	1.89	1.68	1.04	0.48	2.08	2.89	2.67
1970	−2.04	−1.61	−0.26	−0.77	1.94	1.73	1.08	0.47	2.21	3.14	2.99
1971	−2.35	−1.96	−0.29	−0.79	1.62	1.41	2.25	1.66	2.18	3.10	3.42
1972	−2.23	−1.75	−0.27	−0.87	1.74	1.53	2.55	1.81	2.49	3.52	4.20
1973	−2.25	−1.62	−0.31	−1.03	2.02	1.82	2.83	1.93	2.92	4.12	5.20
1974	−1.85	−1.10	−0.35	−1.18	2.08	1.88	3.07	2.04	3.33	4.67	6.39
1975	−2.31	−1.49	−0.33	−1.16	1.87	1.66	3.15	2.21	3.91	5.47	7.39
1976	−2.82	−1.92	−0.23	−1.13	2.10	1.90	3.35	2.27	4.46	6.24	8.03
1977	−2.81	−1.84	−0.02	−0.99	1.74	1.54	2.89	1.94	5.03	7.00	8.74
1978	−3.15	−2.22	0.16	−0.79	2.19	1.92	3.00	2.00	5.43	7.57	9.52

pensity for total expenditure out of disposable income) and $\beta_1 = 0.4$ (the Italian marginal budget share of food) are assumed. Now, within the range of data for the period under study, the maximum "pure" demand for food would—in any given year t—be given by the following equation:

$$q_{1t} = c_1 + \frac{0.4}{p_{1t}} 0.846\,(Y_t - p_{1t}c_1). \qquad (11)$$

Let c_1 be as high as 3.6. This is measured in thousands of zlotys per capita (children included) per year in 1971 prices spent on food. (In physical terms this is equivalent to a diet consisting of 40 kg of meat, 25 kg of sugar, and practically unlimited amounts of milk, cereals, vegetables and, in addition, 2 litres of vodka.)

Now, having assumed the parameters of the equation for the "pure" demand for food that transform the average Polish consumer into an insatiable food devourer, it is possible to run equation (11) for any year studied.

Having done this, it is learned that *the "pure" demand for food, possible spillovers disregarded, has always been lower than the consumption reported.* (It is quite possible that actual prices for food have been higher than the reported ones. This would mean even greater surplus of food under respective equilibria. Thus, even if at the same time the actual consumption has been smaller than reported, the overall impact of the biased statistical data may be neglected.)

TABLE 4.—THE EXTENTS OF DISEQUILIBRIA, PRICE TERMS
(1971 prices)

	Food			Clothing			Rent			Rest			Price Index		
													True		Reported
Year	Ireland	Italy	Actual	Ireland	Italy	Actual	Ireland	Italy	Actual	Ireland	Italy	Actual	Ireland	Italy	
1965	0.39	0.49	0.92	0.64	0.49	1.00	3.27	2.03	0.98	1.79	2.01	0.84	0.93	0.91	0.92
1966	0.43	0.60	0.92	0.64	0.53	1.00	4.76	2.92	1.01	1.03	1.11	0.93	1.00	0.93	0.94
1967	0.49	0.63	0.93	0.72	0.55	1.00	4.00	2.71	0.99	1.11	1.11	0.95	0.97	0.93	0.95
1968	0.55	0.68	0.97	0.76	0.55	1.00	3.29	2.44	0.96	1.22	1.15	0.96	0.95	0.93	0.97
1969	0.58	0.70	0.97	0.78	0.56	1.00	3.28	2.46	0.96	1.22	1.36	0.97	0.96	0.94	0.97
1970	0.59	0.72	0.97	0.80	0.56	1.00	3.19	2.48	0.99	1.27	1.16	1.00	0.97	0.96	0.98
1971	0.57	0.67	1.00	0.79	0.54	1.00	2.37	1.93	1.00	2.17	2.02	1.00	1.00	1.00	1.00
1972	0.63	0.73	1.01	0.82	0.55	1.00	2.20	1.86	1.00	2.07	1.87	0.98	1.00	1.00	1.00
1973	0.66	0.77	1.01	0.83	0.55	1.00	2.19	1.90	1.00	2.05	1.80	1.00	1.01	1.01	1.00
1974	0.73	0.85	1.01	0.84	0.55	1.01	1.99	1.76	1.01	2.11	1.82	1.04	1.04	1.04	1.01
1975	0.76	0.69	1.12	0.99	0.65	1.20	2.32	2.07	1.25	2.98	2.61	1.31	1.24	1.25	1.16
1976	0.80	0.93	1.20	1.11	0.72	1.26	2.46	2.22	1.29	2.93	2.52	1.35	1.28	1.28	1.24
1977	0.66	1.00	1.26	1.27	0.82	1.34	2.13	1.97	1.36	3.57	3.06	1.7	1.40	1.40	1.35
1978	0.93	1.09	1.43	1.49	0.96	1.46	2.53	2.32	1.43	3.70	3.18	1.77	1.53	1.52	1.49

TABLE 5.—ACTUAL AND EQUILIBRIUM PRICES FOR FOOD DEPENDING ON RUN (ASSUMPTION ABOUT CONVERSION RATE FOR TOTAL SUBSISTENCE LEVEL) AND THE REFERENCE SYSTEM

		Equilibrium					
		"Irish" System			"Italian" System		
Year	Actual	Run 0	Run 1	Run 2	Run 0	Run 1	Run 2
1965	0.92	0.39	−1.16[a]	0.45	0.49	0.34	0.53
1966	0.92	0.43	−6.29[a]	0.50	0.60	0.56	0.61
1967	0.93	0.49	−0.051[a]	0.53	0.63	0.61	0.63
1968	0.97	0.55	0.80	0.56	0.68	0.68	0.67
1969	0.97	0.58	0.46	0.58	0.70	0.71	0.69
1970	0.97	0.59	0.51	0.60	0.72	0.73	0.71
1971	1.00	0.57	0.54	0.47	0.67	0.64	0.68
1972	1.01	0.63	0.62	0.62	0.73	0.72	0.73
1973	1.01	0.66	0.67	0.65	0.77	0.77	0.77
1974	1.01	0.73	0.75	0.70	0.85	0.86	0.83
1975	1.12	0.76	0.77	0.76	0.89	0.87	0.89
1976	1.20	0.80	0.80	0.79	0.93	0.92	0.93
1977	1.26	0.86	0.87	0.85	1.00	0.98	1.00
1978	1.43	0.93	0.94	0.92	1.09	1.07	1.09

[a] It is "illegal" to execute run 1 for 1965, 1966 and 1967 with respect to the "Irish" system: its subsistence expenditure for "rent" (c_4) equals 1.35 while the actual expenditures $q_{3,1965}$, $q_{3,1966}$, and $q_{3,1967}$ are respectively 1.28, 1.22, and 1.34.

VI. First Conclusions, Policy and Research Recommendations

Has there been a *real* shortage of food in Poland? Were the government's attempts to raise food prices necessary?[2]

The contents of tables 3 and 4 may be summarized in just three statements:

1. Despite the fact that the parameters of the two demand systems are not very similar, the results yielded by them, although not identical, are amazingly consistent. All cultural and institutional differences between the "average" Italian and Irishman, do *not* lead to any substantial disagreement in diagnosing what is "wrong" with the Polish consumer.
2. At given prices the pure demand for food has always been *lower* than the quantity supplied by, at least, the equivalent of 1.5–2.5 thousand (1971) zlotys per capita per year. The actual consumption of food can therefore be explained as the result of spillovers from the undersupplied commodities "rent" and "rest."[3] Thus, it would have been possible to enjoy market equilibria with lower supplies of food at the reported prices. This, however, would have required definite increases in the supplies of the "rent" and "rest" commodities at the reported prices.
3. At given supplies, the price of food has been *too high* by at least 15%. Thus, it would have been possible to obtain market equilibria with the actual supplies of food being sold at much *lower* prices. This, however, would have required definite increases in the prices of the "rent" and "rest" commodities without reducing their supply.

The price reforms that were (unsuccessfully) introduced in 1970, 1976 and 1980 provided for substantial increases in the prices of food (with some compensatory decreases in the prices of nonfood products and/or some compensatory increases in incomes). In view of the analysis presented one has every reason to believe that these reforms—if aimed at restoring market equilibria—would have been counterproductive.[4] So too the policy of creeping increases in the price of food that has been followed since 1973 must be qualified.

A fair appraisal of the causes of such a counterproductive market policy should consider that

[2] The usual question asked about the Polish consumer market situation is whether there is a meat shortage. Because the diagnosis provided here is that there has not been any food shortage, the original question is not answered literally. However, there are good reasons to believe that the general qualification regarding food does apply to meat: per capita consumption of meat has not—until quite recently—been lower than in many evidently better-off, Western countries. At the same time, the average Polish income used to buy much less meat than elsewhere. Hence, it may be concluded that meat has tended to be oversupplied (overpriced) in just the same manner as "food." In actual fact, low level of supply and price of meat's obvious substitutes such as fish and cheese may justify the statement that meat has been oversupplied (overpriced) to a greater extent than other food products.

[3] Thus, at given supplies and prices one has had to observe the queues for food, although it is housing and various services which are *really* lacking. The lines appear, and there is every evidence of some consumers being unable to buy enough food because the first customers are induced to purchase more than they would if they had other possibilities of spending money. Hence the process of buying food is transformed into a sort of hunting. Those who do not get up early in the morning may face empty shelves. Those who face full shelves buy more than they really would if they had a guarantee of success next time. Hoarding (implying inevitable wastage) becomes the order of the day.

[4] Since the prices received by producers of agricultural products have had very little, if anything, to do with consumer prices—as the state used to be both the monopolistic buyer and seller of the bulk of all products, the motive for the changes in prices should not be believed to reside in the attempts at inducing bigger supplies of agricultural goods.

since Oscar Lange's (1961) frivolous and unjust "critique" of the concept of utility, economic research has had virtually nothing to do with any such "futility." "Econometric" estimates of average Polish consumer demand have been derived from studies that ignore the natural theoretical background contained in the theory of choice. Instead all sorts of ideas about the predominance of "institutional" factors in the shaping of consumer needs have played a role in providing a mix of commodities that has not suited the consumer at all.

The reluctance, which has been repeatedly signalled, of the "average Polish consumer" to accept the proposed price changes might suggest that he is really a more "rational man" than some tend to believe: the changes, if accepted, would have resulted in an even greater degree of disequilibrium.

The counterproposals formulated spontaneously by the population did *not* require increased supplies of food. What was asked for was the restoration of equilibrium in the market for food—and this could not have been done by raising food prices while compensating with rising incomes.[5] Instead, they were concerned with increasing the supplies of housing, education, health services, leisure and cultural goods! This natural experiment in revealing social preferences does, therefore, corroborate the analytical results presented.

To reach specific policy recommendations concerning the near future, one would have to use the data on the actual supplies of particular goods that the government intends to sell to the population. (Also, the analysis should allow for the possibly beneficial effects of some changes in the structure and size of foreign trade in specific consumer goods.) Additionally, research concerned with cross-country comparisons of the household expenditure patterns, distinguishing between various consumer groups, is still needed. This would enable the determination of the best price and—if need be—rationing policy, while taking into account possible distributional effects.

Certainly, the specification of the recommended policies concerning the aggregate commodities ("food," etc.) should be complemented by the specification of corresponding guidelines for more specific consumer goods. This, once again, necessitates additional studies. A step in this direction has already been made with a cross-country comparative study of the patterns for major food items (Podkaminer, 1981).

[5] Currently, with a catastrophic fall in agricultural production, which some attribute mainly to a series of unprecedented weather shocks (that have really happened), there may be a real shortage of food. However, since the supplies of most non-food goods and services have been diminishing even further, the structure of shortages may have remained much the same.

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