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II. DISEQUILIBRIUM MODELS

Wojciech Charemza*, Mirosław Gronicki**, Richard E. Quandt***

MODELLING PARALLEL MARKET IN CENTRALLY PLANNED ECONOMIES THE CASE OF THE AUTOMOBILE MARKET IN POLAND

1. Introduction

Most empirical work dealing with socialist economies appears to be oriented towards macroeconomic problems or at least to the study of highly aggregated time series. Examples are provided by D. H. Howard (1976), M. Lacko (1975), L. Podkaminer (1982), R. Portes and D. Winter (1980), R. Portes, R. E. Quandt, D. Winter and S. Yeo (1983, 1984, 1985), W. Welfe (1983), and W. Charemza and M. Gronicki (forthcoming). Only relatively infrequently has a particular market been the target of detailed empirical investigation; a case in point is the study of the Hungarian car market by Z. Kapitany, J. Kornai and J. Szabo (1981).

In the present paper we examine the complicated structure of a consumers' durables market on which shortages occur and which generate parallel mechanisms of exchange. Such an undertaking differs markedly from analogous endeavors in the context of free-market economies. Some of the more salient differences are the following.

* Assoc. Prof., University of Birmingham, Great Britain, University of Gdańsk, Poland.

** Dr., University of Gdańsk, Poland.

*** Prof. Dr., Princeton University, Princeton, USA.

1. In the free-market context it is commonly assumed that either equilibrium is attained or if not, a continual approach to equilibrium occurs because of a partial adjustment to a discrepancy between desired and actual stocks. In socialist economies prices are controlled and change only infrequently and it is commonly argued that socialist economies invariably exhibit excess demand (J. K o r n a i (1980), J. P i c k e r s g i l l (1980), J. W i n i e c k i (1982), W. B a l i c k i (1983)), without any tendency to approach equilibrium. Although this proposition is debatable for aggregate demand and supply R. P o r t e s and D. W i n t e r (1980), R. P o r t e s, R. E. Q u a n d t, D. W i n t e r and S. Y e o (1983, 1984, 1985)), we consider the assumption of permanent excess demand to be reasonable for particular consumers´ durables.

2. The notions of parmanent income and rational expectations play a prominent role in free-market approaches to characterizing durables markets (B. S. B e r n a n k e (1983)). Whether the change desired stocks of durables such as cars is proportional to permanent income in socialist economies is certainly debatable. It is also not clear whether the rational expectations view is entirely reasonable in an environment in which central planners can abruptly alter both the lifetime prospects and the transitory component of income.

3. If it is true that there is permanent excess demand, we must ask what theory of consumer behavior is compatible with that state of affairs. If consumers expect to be rationed, then at least according to the Drèze concept, their effective demands ought not to exceed their allotted rations. It is also not clear whether consumers can be thought of as adjusting their labor supply between work and leisure (and between the ´normal´ economy and the ´underground´ economy (W. C h a r e m z a and M. G r o n i c k i (forthcoming)) in response to perceived rationing in commodity markets. We must therefore investigate, at least schematically, what kind of utility function is compatible with a reasonable definition of permanent excess demand.

4. In comparison with free market economies, the data problems are enormous. Even for the car market, for which data seem to be relatively abundant, no data are available on the stock of cars and so no aggregate equations such as those of G. C. C h o w

(1957) can be estimated. There are no panel data and so procedures such as those of B. S. B e r n a n k e (1983) are not possible. In certain submarkets one cannot even ascertain the quantity of cars transacted. Under these circumstances, model formulation and estimation are going to be difficult.

In Section 2 we introduce a simple model of the consumer that is compatible with the stylized facts of the market. In Section 3 we discuss the basic features of the automobile market and specify our model. Section 4 is devoted to problems of estimation and Section 5 contains a discussion of results*. Section 6 contains some brief conclusions.

2. A Model of the Consumer

It is a fact of life in socialist economies that certain consumers durables such as cars are, on the whole, not readily available. Consumers have to queue and this is said to be compatible with the normal state of the market (J. K o r n a i and J. W. W e i b u l l (1978), B. G. K a t z and J. O w e n (1984)). An important feature of such a situation is that, at any one moment or over any unit period, the number of consumers requiring service (demand) is greater than the number being serviced (supply); moreover, that this situation can represent an equilibrium in the sense that there are no forces tending to change the queue. We illustrate this with a very simple model, related to that of C. M. L i n d s a y and B. F e i g e n b a u m (1984), and lacking the elaborateness of B. G. K a t z and J. O w e n (1984).

We posit the simple utility function

$$V(x,y) = U(x) + \gamma e^{-\beta w} y \tag{2.1}$$

where x is a composite good with price normalized to unity, U(x) is concave, y = 1 if the consumer enters the queue for the dura-

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ble good at the present time and zero otherwise, w is the amount of time he has to wait for the delivery of the durable good and γ is a parameter that may assume different values for different consumers[1]. The waiting time acts as a kind of discount rate and converts future car services into present utility (for simplicity we assume that β is identical for all consumers). The additive separability of the two types of goods appears reasonable but otherwise the utility function is chosen to express the effect of queuing as conveniently as possible. Given an income M, the budget constraint is

$$x = M \quad \text{if the consumer does not enter the durable good queue} \tag{2.2}$$

$$x = M - p \quad \text{otherwise}$$

where p is the price of the durable good. The expected utility of the consumer is

$$U(M) \quad \text{if he does not enter the queue}$$

$$U(M - p) + \gamma E(e^{-\beta w}) \quad \text{otherwise.}$$

He will enter the queue if

$$U(M - p) + \gamma E(e^{-\beta w}) > U(M). \tag{2.3}$$

Assume that (2.1) we have a continuum of consumers, each characterized by a particular value of $\gamma > 0$, with density $h(\gamma)$, and (2.2) arrivals in the queue and service in the queue are independent with arrival and service rates λ and μ respectively ($\mu > \lambda$) and that the interarrival and interservice times are exponentially destributed (which preserves the Markov property of the process). In the present context the arrival rate is the rate at which customers arrive at the queue and the service rate is the rate at which customers in the queue obtain the durable good. Then the density function of waiting time w is

$$f(w) = (\mu - \lambda)e^{-(\mu - \lambda)w} \tag{2.4}$$

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[1] We would gain some generality at the cost of a substantial increase in complexity if we note the utility function as $U(x) + \gamma f(w)$, with $f' < 0$, $f'' > 0$.

It follows immediately that[2]

$$E(e^{-\beta w}) = \frac{\delta}{\delta + 1} \tag{2.5}$$

where $\delta = (\mu - \lambda)/\beta$. Then (2.3) becomes

$$\gamma > \frac{\delta + 1}{\delta} (U(M) - U(M - p)) \equiv \gamma_0 \tag{2.6}$$

and the fraction of consumers entering the queue is

$$P = \int_{\gamma_0}^{\infty} h(\gamma)d\gamma = 1 - H(\gamma_0) \tag{2.7}$$

where H is the cumulative distribution function of h. If N is the total number of consumers, the arrival rate λ is NP. The arrival rate depends on P and in turn determines P as the outcome of optimal decisions by consumers; an equilibrium exists if the mapping $p \to P$ possesses a fixed point. The key notion here is that one of the parameters of the queuing, the arrival rate, is endogenous. The arrival rate (as well as the service rate, and the parameters of the utility function) determines the expected waiting time and that influences the results of utility maximization, which in turn determines a new value of the arrival rate. Consumers are in equilibrium if no further adjustment is necessary; i.e. if the expected waiting time "assumed" in the utility maximization exercise yields anu arrival rate which implies that same expected waiting time. It is simple to show that

$$P = 1 - H\left[\frac{(\mu - NP)/\beta + 1}{(\mu - NP)/\beta} (U(M) - U(M - p))\right] \tag{2.8}$$

has a unique solution for P in the $0 < P < 1 - H(\gamma_0)$ interval.

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[2] We take the expectation unconditionally (i.e. not conditioned by queue-length) since we are more interested in the case in which this variable is not observed. For a more detailed but similar development see B. G. Katz and J. Owen (1985).

Then the expected waiting time and queue length corresponding to this solution value of P are themselves equilibrium values.

From (2.8) we immediately obtain several comparative statics results. Denote by P_M, P_p, P_δ the partial derivatives of P with respect to M, P and δ respectively, and let ΔU denote $U(M) - U(M - p)$. Differentiating (2.8), we obtain

$$P_M = H'\left[\frac{\mu - NP + 1}{\mu - NP}\ (U'(M - p) - U'(M))\right] / \left[1 + H'\frac{N\,\Delta U}{(\mu - NP)^2}\right]$$

$$P_p = -H'\left[\frac{\mu - NP + 1}{\mu - NP}\ U'(M - p)\right] / \left[1 + H'\frac{N\Delta U}{(\mu - NP)^2}\right]$$

$$P_\delta = H' \cdot \frac{\Delta U}{(\mu - NP)^2} / \left[1 + H'\ \frac{N\Delta U}{(\mu - NP)^2}\right]$$

H', ΔU and U' are positive and $U'(M - p) - U'(M)$ is negative (by virtue of the concavity of U). Hence $P_M > 0$, $P_p < 0$ and $P_\delta > 6$. From the latter it follows that an increase in the service rate increases the willingness to enter the queue, whereas an increase in β, i.e. the rate at which utility decays with waiting time, reduces the willingness to enter the queue. But no matter how the parameters of the problem change, in equilibrium there will always be a queue, even though more unfavorable circumstances reduce the willingness of consumers to enter the queue.

In the light of the above it is convenient to interpret excess demand in the aggregate time series sense to consist of the difference between the quantity demanded by consumers in the queue on the average in a given time interval and the quantity made available in that time interval. Although in a flow sense there is no excess demand in the queuing model, since the arrival rate must be less than the service rate, the amount of goods consumers are willing to purchase at any one time interval may be much greater than the amount of goods delivered in that interval. The consumer optimizes on the basis of his income, prices and waiting time and an equilibrium emerges in which the waiting time is endogenous and is jointly determined by the consumer's decision to enter the queue. Although his expectation of long waits reduces his probability of entering, in equilibrium there is no reason for the queue to disappear. "Disequilibrium" is thus somewhat of a misnomer: the lack of equality between demand and supply is an equilibrium property of the system.

3. An Example: The Automobile Market

The markets for cars and dollars (and other Western currencies) are the best known examples of 'parallel' markets in centrally planned economies, especially in Poland. These markets are large and exert a strong influence on smaller legal and illegal fields of private activity. They are also relatively well-organized and statistical data about them, however incomplete, are more plentiful than about other markets. The Polish car market is described in detail by Z. K r a s i n s k i et. al. (1980) and by K. S t a r z e c (1983).

The complicated structure of the car market is derived from the fact that various systems exist for conveying new cars from the seller (the state) to consumers. The institutional arrangements provide for different prices and methods of payment in each of the resulting submarkets.

A major distinction is between cars that are on the market for the first time and second-hand cars (though note that this distinction is not the same as that between new and used cars, since some new cars are purchased for speculative reasons and are immediately resold). The supply of cars sold for the first time is predominantly from the state. In the period under investigation (1973-IV to 1983-IV) the private importation of new and used cars was negligible and amounted to 4.6% of deliveries in 1974 and 3.6% in 1979 (Z. K r a s i n s k i et. al. (1980)). The rest of the supply came from the state and consists of cars manufactured in Poland, as well as imported[3]. The cars sold by the State are actually sold by state enterprises: primarily by POLMOZBYT, which sells cars for Polish currency (zlotys) and by PEWEX, which sells cars (and other consumption goods) for U.S. dollars and other hard currencies[4]. In the 1974-1979 period the percentage of total state deliveries accounted for by dollar sales ranged from 16 to 23% (Z. K r a s i n s k i et. al. (1980)).

The official zloty price paid by consumers to POLMOZBYT results in delivery of a car after a long period in the queue, which anecdotal evidence reports as measured in years. The price is extremely stable: for the Fiat 125p, for example, it was changed only three times in the 1974-1982 period. This zloty price is invariably the lowest price at which a car can be purchased[5].

The cars sold by PEWEX were usually available without appreciable queuing and often of higher quality. Although it is convenient here to pretend that all these sales were against dollars, they were in fact against dollars and some other hard currencies as well as against 'dollar vouchers'. (For a similar practice in Hungary: see Zs. K a p i t a n y, J. K o r n a i, J. S z a b o (1984)). The legal aspect of these transactions is not straightforward. Polish citizens were allowed to import and possess Western currencies but could legally sell them only at official banks at an official price. Dollar vouchers, on the other hand could be obtained at banks for dollars at par and

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[3] In 1974-82 the cars produced domestically were mainly fiat 125p, fiat 126p, syrena and polonez (since 1978). The import of new cars accounted for 10-30 percent of total deliveries and consisted mainly of skoda (from Czechoslovakia), trabant (from the GDR), and zaporożec (from the USSR).

[4] Besides PEWEX there exist some other enterprises authorized to sell cars for dollars but are of minor importance.

[5] The basic price was subject to some other types of variation. Sometimes it was combined with a lottery for a place in the queue. At other times (1979-80) an 'express price' was introduced which was substantially higher than the basic price but in effect eliminated queuing. There also existed a combined dollar--zloty price as well as a system of coupons to avoid queuing that was available to privileged groups of consumers. (Z. K r a s i n s k i et. al. (1980)).

could also be freely traded at presumably market clearing prices and also used to purchase cars at PEWEX. The free market for dollar vouchers and the black market for dollars are closely related and in this paper they are regarded as a single market. The prices of dollar vouchers and black market prices for dollars were nearly identical and from the point of view of the potential car buyer it made no difference whether be paid PEWEX in dollars or dollar vouchers. If not imported from abroad, either of these instruments had to be purchased privately. In general, hard currencies played a significant role in private Polish economic activity. It is estimated that U.S. dollars in circulation in Poland ranged from 1.5 to 6 billion dollars (J. M o j k o w s k i (1984)) and various estimates put the monthly volume of black market hard-currency transactions alone at 2.5-4.2 million dollars[6].

A third market for cars is the second hand market in which cars are sold by private firms specializing in the sale of second hand cars, by advertising and principally through 'car exchanges' organized in large cities as open-air markets[7]. There is reason to believe that prices in the second hand market (in zlotys, dollars or dollar vouchers) were market clearing.

To summarize: there are in effect three markets for cars in Poland. The first is the official zloty market for new cars that does not have a market clearing price. The second is the official dollar market for new cars (PEWEX) that involves shorter queues and higher prices. Finally, there is the second hand market in which queues are negligible. In the latter two, the price presumably does clear the market.

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[6] K. S t a r z e c (1983) suggests that dollars are brought to Poland by diplomats, Polish citizens temporarily abroad (Seaman, etc.); to this we may add undetermined amounts of remittances from relatives in Western countries. It should be noted that there is some disagreement about what the facts are: C. S i m o n (1982) estimates private hoards of U.S. dollars in 1980 as no greater than 300 million. However, all sources seem to stress that hard currencies represent a substantial part of the entire stock of money in private hands.

[7] As indicated earlier, second hand cars are not necessarily used cars in that a new car purchased from the state could be immediately resold at a profit in the second hand market.

4. The Basic Model

An ideal model would specify demand and supply functions for all three submarkets and the stock of cars would play an important role in this specification at various points. Unfortunately, such a model would not be practical because key data required by it are not available. For the period investigated, 1973-IV to 1982-IV, we have found no quarterly data on the stock of cars, nor on the quantities of cars traded in the PEWEX market and in the second hand market. In general, one would have to consider this lack a serious disadvantage in attempting to estimate a car model. However, in Poland it appears reasonable to argue that, because of permanent shortage, the stock of cars has never reached a level at which it would exert an appreciable effect on the demand. We therefore content ourselves with an inferior specification in which some of the structural equations are already partially reduced; i.e. they stand between the original structural equations that would emerge from agents' optimizing behavior and the reduced form equations.

Notation. For simplicity of the subsequent derivations we denote the jointly dependent variables by y_1, y_2, y_3. By z_1, z_2, z_3 we denote functions of predetermined variables and parameters. We first define the symbols as follows:

y_1 = demand for new cars in zloty market

y_2 = BM\$/RP

y_3 = PF/RP

$$z_1 = \alpha_0 + \alpha_1(INC/RP) + \alpha_2 E(BM\$_{+1}/RP) + \alpha_3 DUM - \alpha_4 PO/RP$$

$$z_2 = \beta_0 - \beta_1 CAR + \beta_2 PO/RP$$

$$z_3 = \varepsilon_0 + \varepsilon_1 (PF/RP)_{-1} - \varepsilon_2 (BM\$/RP)_{-1} + \varepsilon_3 PO/RP$$

where[8]

[8] For a more detailed definition of variables see Appendix A.

BM$ = black market price of U.S. dollars;

RP = retail price index;

PF = zloty price of second hand cars;

INC = nominal personal income;

DUM = the "success illusion" dummy equals 1 for 1978 - 1 to 1979 - 1 and 0 otherwise;

PO = the official zloty price in the new car market;

PCD = the official dollar price of new cars in the PEWEX market;

CAR = quantity of cars (supply) made available to the zloty-denominated new car market;

E( ) = expectation of ( );

ξ_1, ξ_2, ξ_3 = normally distributed error terms, independent of one another.

The first equation of the model is the demand function for new cars in the zloty market and is a proper structural equation. We specify it as

$$y_1 + \alpha_2 y_2 - \alpha_4 y_3 = z_1 + \xi_1 \tag{3.1}$$

In view of the previous discussion, it is the demand (per unit period) of all those who receive cars from the state and who are willing to pay zlotys for them, plus those who are still in the queue. A priori we expect $\alpha_1 > 0$ (an increase in real personal income increases car demand), $\alpha_4 > 0$ (the relative price effect; the greater is the free market price relative to the official new car price, the greater the demand for new cars) and $\alpha_3 > 0$. This latter is attached to a dummy variable which takes values of 1 during certain quarters (1978-I to 1970-I) of the Gierek Government when the illusion of success for the Polish economy appeared to be widespread[9]. The coefficient α_2 is expected to be negative. Combining the appropriate terms on the left and right hand side of equation (3.1) shows that α_2 is

[9] The substantial investments made by the Gierek government in the first half of the 1970's had backfired for a variety of reasons, including bad harvests, and led to increasing foreign

really the coefficient of $E(BM\$_{+1}/RP)$ - $BM\$/RP$; it measures the effect of an expected real increase in the price of dollars. We posit a negative sign here on the grounds of the substitution effect: the expectation of more expensive dollars in the future, will tend to increase the current demand for dollars and, ceteris paribus, reduce the current demand for new cars[10].

The second equation of the model can be thought of as resulting from equating demand and supply of cars in the PEWEX market. Let demand be given by $D = D(PCD(BM\$/RP), PO/RP, y_1 - CAR, INC/RP)$, expressing that demand depends on own price (recalculated in zlotys through the black market dollar price), the competing product's price, on excess of unsatisfied demand in the competing market and on income. It is much harder to describe the supply function. Zs. K a p i t a n y, J. K o r n a i and J. S z a b o (1984) argue that supply is not affected by price and profitability but by the planners' general social goals, some macrovariables such as trade balance, and by excess demand for the cars. We therefore take supply to be a linear function of excess demand in the zloty new-car market plus a random error. Equating demand and supply yields an equation that explains the dollar price of PEWEX cars. Income already affects D through y_1 - CAR and we delete it from D in the main runs to reduce the number of parameters to be estimated. (In one run, however, we retain INC//RP in the equation.) The second equation of the model can then be written as

$$- \beta_1 y_1 + PCDy_2 = z_2 + \varepsilon_2 \tag{3.2}$$

The "dependent" variable explained by (3.2) is $PCDy_2$, i.e. the implicit zloty price of PEWEX cars (in this, however, PCD is exogenous and fixed by the authorities and only y_2 is jointly

trade deficits and attempts by the government to raise food prices. In 1978, a significant propaganda effort was undertaken to justify past policies by pointing to the increase in consumer goods. See J. M. M o n t i a s (1982).

[10] Although a similar relationship would hold for any other substitute good, we single out the dollar for inclusion on the basis of its importance. See also Section 3.

determined). A priori $\beta_1 > 0$ and $\beta_2 > 0$, since the latter measures the substitution effect of higher prices in the official zloty market, whereas the former measures the spillover effect from that market (i.e., the effect of the excess demand in that market) as can be seen by combining the $-\beta_1 y_1$ term with the $-\beta_1 CAR$ term in z_2.

The third equation of the model is

$$-\varepsilon_2 y_2 + y_3 = z_3 + \xi_3 \tag{3.3}$$

and is a partially reduced structural equation that explains y_3, the market-clearing price in the second hand car market. The equation may again be thought of as resulting from equating demand and supply in that market. Supply in this market is likely to depend on recent past prices and we include $(PF/RP)_{-1}$ as an explanatory variable. If supply responds positively to lagged price and also to current price and if demand has an inverse relation to current price, the autoregressive coefficient ε_1 will be positive. The coefficient ε_3 is also expected to be positive. The case of ε_2 is more difficult. Combining the term $-\varepsilon_2 y_2$ with the term $-\varepsilon_2(BM\$/RP)_{-1}$ in z_3 shows that ε_2 measures the effect of a recent increase in the real price of blackmarket dollars. This effect is not fully unambiguous. On the one hand, to the extent that dollars are an important liquid asset, an increase in the value of dollars generates a positive real balance effect. On the other hand, if the demand for dollars is inelastic, an increase in its value generates a negative income effect. A further consideration also suggests a negative effect: in critical times of uncertainty, dollars are a particularly good store of value (easily and safely stored, etc.) whereas cars are a particularly unsuitable asset (bulky, subject to damage, and potentially unusable because of gasoline restrictions and other reasons). Hence general increases in the value of dollars may be related to lower free market prices. On balance we posit a negative relationship here.

There are a number of alternatives one could consider. Specifically, the level of personal income could reasonably be included in each equation, since the demand for each type of car is likely to depend on it. One might well include in the equations the quantities of other durable good in short supply (e.g., housing) in order to measure the spillovers due to rationing in these markets. The excess demand in the zloty new-car market may spill over into the market for second hand cars (for a similar suggestion see Zs. Kapitany, J. Kornai, J. Szabo (1984)). Some of these other possibilities are briefly discussed in Section 5. However, we are already estimating 15 parameters (12 α's, β's, ε's an 3 error variances) in the basic model with 35 effective data points. Any substantial increase in the number of parameters is likely to create difficulties an we have attempted to stick to as parsimonious a formulation as possible, even if not entirely correct from the theoretical point of view.

The model is a disequilibrium model in that demand for new cars is not assumed to be equal to supply. In fact, we assume that we observe the supply (CAR) and that in every period

$$D \geqq CAR \tag{3.4}$$

and that, as usual, the demand D is not observed by the econometrician. This makes for a disequilibrium model that is slightly different from the usual ones. We now turn to the problems of estimation.

5. Methods of Estimation

Maximum Likelihood: The generally preferred method of estimation for desequilibrium models is maximum likelihood. The joint density (for observable and unobservable variables) is obtained from the structural equations and the unobservable variable is integrated out over the regions corresponding to the excess demand and excess supply regimes. If no a priori sample separation is given, the density is the sum of the two integrals. Simplifying for the moment by restricting attention to the standard simple disequilibrium model in which there exists only a demand function, supply function and min condition, the density of the transacted quantity can be written as

$$h(Q) = g_1(Q)(1 - G_2(Q)) + g_2(Q)(1 - G_1(Q)) \tag{4.1}$$

where g_1 and g_2 are densities and G_1 and G_2 are the cumulative distributions of demand (supply) conditional on supply (demand) and evaluated at Q (M. H a r t l e y (1974)). In the present case we make the a priori assumption that only excess demand occurs. (For the derivation, see Appendix B.) This is equivalent to the assumption that the term in (4.1) corresponding to excess supply (say $g_2 \cdot (1 - G_1)$) is zero which is identical to the assumption that the conditional probability $Pr\{S > D|Q\} = 0$. The likelihood function is then the product over the observations of terms such as (4.1).

Estimation of the Condensed Model. An alternative approach is to condense the model by solving equation (3.1) for y_1 and substituting this in (3.2). The resulting pair of simultaneous equations

$$\begin{aligned} &(PCD + \beta_1 \alpha_2)y_2 - \beta_1 \alpha_4 y_3 - \beta z_1 - z_2 = \xi_2 + \beta_1 \xi_1 - \\ &- \varepsilon_2 y_2 + y_3 - z_3 = \xi_3 \end{aligned} \tag{4.2}$$

is an ordinary nonlinear simultaneous equations system and may be estimated by FIML. It can be shown (R. E. Q u a n d t (1985), R. P o r t e s, R. E. Q u a n d t, S. Y e o (1985)) that the density function of y_2, y_3 from (4.2) is identical with that part of the density function derived in Appendix B that corresponds to the density term in (B.4)[11]. Hence the condensed method is based on the stronger a priori assumption that the probability that demand exceeds CAR, conditional on supply, equals unity.

11 The reader may note for example that the Jacobians of the respective transformations are equal and that in both cases and denominator of the density functions contains $\sigma_3(\sigma_2^2 + \beta_1 \sigma_1^2)^{\frac{1}{2}}$.

Concluding Comments. It is to be noted that in general it is not obvious that the parameters of the function representing the 'long' side of the market are identified. Sufficient conditions for identification are not known, although some necessary conditions for identifiability are derived in R. E. Quandt (1985). These conditions are satisfied for the parameters of the equations. Even then, the variance of the equation may not be identified; this can be seen most clearly by inspection from the condensed model (equation (4.2)). For this reason, in the condensed procedure we only estimate a combined variance for the first equation. In the disequilibrium maximum likelihood method we arbitrarily fix the value σ_1^2 at 2.0.

6. Empirical Results

The principal results are displayed in Table 1. Columns are designated by model number and estimation method. M designates the disequilibrium maximum likelihood procedure and C the condensed procedure. Model 1 is the basic one discussed in Section 3 with the proviso that the expectation variable $E(BM\$_{t+1})$ is replaced by $BM\$_{t+1}$, i.e., perfect foresight is assumed. In this model we obtain the real expected future price of dollars by deflating by RP_t. In a variant, we deflate by RP_{t+1}, which implies that the real value of dollars is foreseen perfectly. The results of this variant are extremely similar to those of Model 1 and are not reported explicitly. In Model 2, the variable INC/ /RP in the demand for new cars is replaced by DEP/RP, where DEP represents the end-of-quarter deposits of households in savings institutions. In Model 3 we modify Model 1 by including the spillover term $\varepsilon_4(y_1 - CAR)$ in the equation explaining the price of second hand cars. In Model 4 we include in this equation the term $\varepsilon_4(INC/RP)$.

The parameter values have the expected pattern of signs in Model 1/M. Personal income is not significant in equation (3.1), although the other coefficients in that equation and in equation (3.2) are significant. The only significant coefficient in the

Table 1

Results of estimation

Coefficients	Model[a] 1/M	2/M	3/M	4/M	1/C
α_0	23.117 (0.666)	37.651 (1.004)	31.297 (0.939)	23.393 (0.167)	-5.273 (-0.001)
α_1	4.415 (0.598)	-1.533 (-0.288)	1.112 (0.117)	4.711 (0.636)	4.453 (0.604)
α_2	-11.849 (-2.189)	-12.312 (-1.943)	-14.827 (-2.179)	-10.007 (-1.908)	-11.843 (-2.187)
α_3	18.047 (3.515)	19.484 (3.143)	18.515 (3.187)	17.731 (3.433)	18.040 (3.515)
α_4	164.245 (4.301)	189.116 (3.630)	187.319 (3.272)	160.821 (4.262)	164.200 (4.294)
β_0	-3.190 (-3.183)	-3.435 (-3.285)	-3.289 (-3.669)	-3.059 (-0.929)	-2.530 (-0.021)
β_1	0.023 (4.887)	0.021 (4.128)	0.021 (3.697)	0.023 (4.837)	0.023 (4.879)
β_2	4.086 (5.449)	4.319 (5.514)	4.174 (5.401)	3.931 (5.369)	4.085 (5.448)
ε_0	-0.330 (-0.451)	-0.354 (-0.463)	-1.434 (-0.589)	-0.757 (-1.305)	-0.330 (0.451)
ε_1	0.962 (2.986)	0.969 (2.898)	2.178 (1.011)	0.825 (4.012)	0.962 (2.984)
ε_2	-0.504 (-1.291)	-0.527 (-1.260)	-0.796 (-0.753)	-0.318 (-1.692)	-0.504 (-1.289)
ε_3	0.480 (0.833)	0.501 (0.830)	0.323 (0.329)	0.435 (1.180)	0.481 (0.832)
ε_4	- -	- -	0.006 (0.673)	0.262 (2.349)	- -
log L	41.157	41.055	42.679	44.998	41.157

Source: Author's calculations.

[a] t-ratios are given in parentheses below the estimates.

second-hand car price equation is that of the lagged price although all coefficients at least have the expected sign. In particular we note that the spillover from the normal (zloty) new--car market to the PEWEX car market (β_1) is positive and significant, that the effect of an expected dollar appreciation (α_2) has a significant negative effect on the demand for new zloty cars, and that a recent past appreciation of the dollar (ε_2) has a nonsignificant negative effect on the free market price. The insignificance of this coefficient may well reflect the conflicting influences that the right-hand-side variable was expected to have on the free market price.

In Model 3 we also include the spillover from the new zloty market in equation (3.3). The effect is a nonsignificant increase in the loglikelihood and a numerically very small measured positive spillover effect; we thus have no reason for preferring model 3/M.

Model 1/M and 1/C are directly comparable. The likelihood function values are essentially identical and all coefficients except two of the constant terms are essentially identical. This underscores the similarity of the respective likelihood functions and is compatible with the fact that the estimates in 1/M imply a value near 1 for $1-\Phi(\ )$ in the density function (B.3). Model 1/C does a worse job, however, of estimating the constant terms and the resulting excess demand predictions are less plausible.

We also estimated some variants of Models 2/M. Since they use different variables, they are not nested in 1/M and likelihood value comparisons are not particularly meaningful. Their coefficient estimates are broadly similar to those of 1/M without any particular reason for preferring them to 1/M.

We estimated a model similar to Model 3/M from which, however, ε_3 was excluded; it did not differ from Model 3/M materially. We also estimated a model in which the perfect foresight of $BM\$_{t+1}$ was replaced by an ARMA (4, 4) prediction: this left the estimates of equations (3.2) and (3.3) largely unchanged but made the coefficients of the new car demand completely insignificant.

We finally examined whether it is a serious misspecification not to include INC/PR in equations (3.2) and (3.3). Its inclusion in (3.2) yielded a t-value of 0.08 and an increase in the likelihood only in the 5th place. However, its inclusion in equation (3.3) (Model 4/M) with coefficient ε_4 yielded a significant coefficient and the likelihood ratio comparison with Model 1/M is also significant at the 0.01 level. We conclude that Model 4/M appears to be the most reasonable one. Our further discussion is based on this model and its comparison to Model 1/M.

Setting the error terms equal to zero, the model can be used to predict demand y_1, and then $\hat{y}_1$ - CAR can be interpreted as the excess demand. Both CAR and this predicted excess demand are displayed in Table 2. Returning to our queueing interpretation of Section 2, we attempt to compute the mean waiting time for new cars. For this purpose we assume as an approximation that the total queue length is the sum of the excess demand and the number of customers actually serviced; i.e. CAR. Denote the sum of these by Q (queue) and further assume that in any quarter the queue length is the expected queue length. Now $E(Q) = \rho/(1-\rho)$ where $\rho = \lambda/\mu$ is defined as the "traffic intensity"; equating $\rho/(1-\rho)$ to Q allows us to compute ρ, and since we know the service rate (CAR), we can compute the arrival rate λ. Finally, we obtain the mean waiting time as Q/λ (D. T. Phillips, A. Ravindrau, J. J. Solberg (1976)). These estimated mean waiting times are displayed in the next to last column of Table 2. Models 1/M and 4/M tell rather similar stories. During the early period, i.e., from 1974 - 1 to sometime in 1979, excess demand as a percentage of car deliveries ranged from 50.1 to 124.0. At the same time, the mean waiting time was remarkably steady, ranging from $1\frac{1}{2}$ quarters to just over two quarters. This is substantially shorter than anecdotal evidence would have it. It is clear that this computation gives only a point estimate for the mean waiting time and it is of interest to compute an upper boundary of an interval estimate (see below). One also notes that in 1980-1982 there begins a sharp increase in the mean waiting time, relieved only temporarily in 1981 - 1, and reaches the $4\frac{1}{2}$ to 6 quarter range in the 1981 - 3 to 1982 - 2 period, followed in the last quarter for which we can make a forecast by a sharp drop in both excess demand and mean waiting time. This final

Table 2

Excess demands and waiting times

Years	Car	Excess demand		Mean waiting time		Mean waiting time upper 90% confidence limit for 4/M
		1/M	4/M	1/M	4/M	4/M
1	2	3	4	5	6	7
1974 - 1	21.3	16.7	12.5	1.83	1.63	10.01
- 2	21.8	17.0	9.5	1.83	1.48	9.45
- 3	19.7	19.9	15.2	2.06	1.83	10.68
- 4	20.2	14.9	15.3	1.79	1.80	10.56
1975 - 1	19.3	15.6	13.9	1.86	1.78	10.85
- 2	26.0	18.3	12.9	1.74	1.54	8.19
- 3	24.4	20.6	19.7	1.89	1.85	9.12
- 4	41.3	16.8	17.4	1.43	1.45	5.64
1976 - 1	33.3	29.6	29.5	1.92	1.91	7.28
- 2	37.4	32.5	28.1	1.90	1.78	6.51
- 3	34.2	31.0	33.0	1.94	1.99	7.38
- 4	41.1	33.2	37.2	1.83	1.92	6.46
1977 - 1	51.6	31.9	30.5	1.64	1.61	4.96
- 2	51.5	39.4	41.0	1.78	1.82	5.41
- 3	48.5	36.3	38.1	1.77	1.81	5.56
- 4	41.1	35.0	42.1	1.88	2.05	6.59
1978 - 1	65.6	31.5	30.1	1.50	1.47	4.08
- 2	52.5	43.1	44.8	1.80	1.87	5.36
- 3	47.1	52.7	55.5	2.14	2.20	6.09
- 4	58.3	40.4	48.2	1.71	1.84	5.03
1979 - 1	66.2	40.5	38.5	1.63	1.60	4.14
- 2	51.6	44.8	47.6	1.89	1.94	5.37
- 3	49.6	58.6	60.1	2.20	2.23	5.83
- 4	50.5	54.7	62.6	2.10	2.26	5.91
1980 - 1	49.8	53.7	57.4	2.10	2.17	5.75
- 2	40.1	72.0	73.8	2.82	2.87	7.42
- 3	29.0	83.4	84.1	3.91	3.94	10.38
- 4	45.7	85.6	92.3	2.90	3.04	6.82
1981 - 1	48.6	34.4	48.0	1.73	2.01	5.81
- 2	37.8	64.1	79.6	2.72	3.14	8.17
- 3	25.6	90.7	93.3	4.58	4.68	11.53
- 4	31.3	131.4	126.1	5.23	6.20	10.27

Table 2 (contd)

1	2	3	4	5	6	7
1982 - 1	28.2	112.6	102.9	5.03	4.68	11.09
- 2	35.1	138.1	115.9	4.96	4.33	9.17
- 3	34.4	63.0	48.1	2.86	2.43	7.36

S o u r c e: Author's calculations.

drop may well be due to the existence of gasoline rationing. In general, the sharp increase in waiting times in 1980-1982 appears to be correlated with the flagging performance of tha Polish economy in this critical period.

To obtain an upper "confidence limit" for the mean waiting time, we resorted to stochastic simulations of Model 4/M. The estimated coefficients of the equations were taken to be the mean value and the estimated asymptotic covariance matrix of the estimates was taken to be the covariance matrix of a normal distribution. Coefficients were generated by drawing from this distribution. Equation errors ξ_1, ξ_2, ξ_3, distributed normally with zero mean and variances equal to those estimated from the model, were then added and the mean waiting time for each time period was obtained from the solution of the model. This experiment was replicated 100 times. For each quarter we then determined the 90th percentile of the distribution of waiting times. These are displayed in the last column of Table 2. The interpretation of these figures is the same as that of conventional confidence intervals: for example, using a 0.1 level of significance, we cannot reject the claim that in 1982 - 1 the mean waiting time was 11 quarters. There are two particularly noteworthy things about this last column of Table 2. First, many of the mean waiting times are quite compatible with the anecdotal evidence of 2-3 years, and none is less than a year. Secondly, whereas the point estimates show relatively homogeneous behavior in the 1970's, the last column shows waiting times in 1974 and early 1975 about as high as in the critical 1981-1982 period.

We finally examine the implied price and income elasticities of the endogenous variables from 4/M. Evaluating the elasticities of demand for new cars with respect to (real) income from equation (3.1) yields income elasticities ranging from 0.28 at the beginning of the period to 0.06 near the end. The corresponding price elasticities range from -4.64 to -0.65[12]. Alternatively, one may obtain the elasticities from the reduced form multipliers. These are displayed in Table 3. Column 2 shows the income elasticities of y_1, y_2, y_3 and column 3 shows the official-price elasticities of y_1, y_2, y_3. These are qualitatively similar to those of equation (3.1) but smaller in absolute value. The key observation is that the income elasticity of demand for new cars is very small, whereas the price elasticity is quite substantial, in fact, greater than unity in absolute value for almost half the period[13]. With minor exceptions, the price elasticity is declining in absolute value over the period and particularly low values are encountered from the middle of 1980 on.

The stochastic simulations can also be used to obtain "confidence limits" for these elasticities. Since the point estimates of the income elasticities are very low, we are interested in the upper 90 per cent confidence limit which ranges from a low of 0.109 to a high of 0.358 and generally increases during the period under consideration (e.g. the first 12 quarters' figures range from 0.109 to 0.167 and the last 12 quarters from 0.107 to 0.358). In the case of the price elasticities, the point estimates are increasing over the period and we are therefore interested in the lower 10% confidence limit. This varies from -1.464 to -3.455 but in no particular order. The stochastic simulations therefore are compatible with a small but non-negligible income elasticity and a sizeable but trendless price elasticity.

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[12] These elasticities are obtained for each year by using the actual values of the variables for that year and computing $[\partial y_1/\partial (INC/RP)]\ [(INC/RP)/Y_1]$, etc.

[13] If we consider the variant of the model in which income is included in the second equation, the income elasticity rises slightly but is still very low.

Table 3

Reduced Form elasticities of the demand for new (zloty) cars from model 4/M

Years	Income	Official price
1974 - 1	0.11870	-3.11514
1974 - 2	0.12121	-3.24658
1974 - 3	0.11656	-2.85575
1974 - 4	0,12894	-2.89359
1975 - 1	0.13264	-3.05073
1975 - 2	0.10691	-2.54092
1975 - 3	0.10273	-2.23667
1975 - 4	0.08354	-1.67813
1976 - 1	0.07567	-1.56256
1976 - 2	0.06610	-1.45741
1976 - 3	0.06148	-1,32960
1976 - 4	0.05625	-1.11993
1977 - 1	0.05933	-1.13996
1977 - 2	0.04558	-0.93771
1977 - 3	0.04941	-0.96630
1977 - 4	0.05657	-1.00526
1978 - 1	0.04310	-0.86377
1978 - 2	0.04832	-0.85985
1978 - 3	0.04691	-0.77385
1978 - 4	0.05058	-0.75400
1979 - 1	0.05381	-0.82861
1979 - 2	0.06138	-0.85707
1979 - 3	0.06668	-0.79184
1979 - 4	0.07076	-0.75670
1980 - 1	0.07043	-0.79332
1980 - 2	0.06246	-0.73886
1980 - 3	0.06099	-0.70581
1980 - 4	0.05927	-0.57090
1981 - 1	0.08897	-1.16522
1981 - 2	0.07382	-0.92982
1981 - 3	0.05859	-0.77174
1981 - 4	0.04115	-0.44795
1982 - 1	0.04301	-0.71025
1982 - 2	0,03318	-0.54731
1982 - 3	0.05767	-0.93291

S o u r c e: Author's calculations.

6. Concluding Remarks

It seems that parallel markets in centrally-planned economies can be subjected to econometric analysis in the future. However, the methods employed may be slightly different from the traditions of the applied econometrics. First of all, data are difficult to obtain and in many cases are subject to severe approximations. Consequently, the results have to be treated with additional caution. Secondly, estimation techniques are also different from those applied for models of markets in a more flexible economy. The 'all-excess-demand' hypothesis and permanent unobservability of some variables require non-trivial estimation algorithms. In practice almost every model requires its own specific method of estimation. Problems of specification and estimation are therefore closely related. Unlike the case of a genuine market, in a centrally-planned economy price is not sufficiently flexible to indicate the direction and the strength of the excess demand changes. The estimation problem becomes more complicated, since one cannot use prices as disequilibrium indicators. Finally, the specification of the model must be sufficiently complex as well as sufficiently flexible so as to (1) accommodate the problems of data availability, (2) cope with the problem of exhibiting the relation between the 'first' and 'second' (and in some cases 'third') markets.

Our results indicate that disequilibrium econometrics can provide insights into problems of this kind. The results on particular car markets are largely in agreement with a priori expectations as well as with some anecdotal evidence. In particular, the estimated fall in excess demand and waiting time at the end of 1982 seems to be a good forecaster of events in the out of sample years 1983-1985, in which the free market car price declined (mainly because of reduction in demand) and waiting time for the officially delivered cars was substantially reduced.

Appendix A

Sources and Construction of Data

The following are the principal sources of data:

BLS: Bulletin of Labour Statistics, International Labour Office, 1974-1982.
BS: Biuletyn statystyczny GUS, Warszawa 1974-1982.
CTPM: Official Catalogues of POLMOZBYT, 1974-1982.
CTPX: Official Catalogues of PEWEX, 1974-1982.
PCY: "Pick's Currency Yearbook" 1975-1979.
PT: "Przegląd Techniczny" 1983 (Warszawa).
QRP: Quarterly Review for Poland, Economist intelligence Unit, London 1982.
RS: Rocznik statystyczny GUS, Warszawa 1974-1982.
RSF: Rocznik statystyczny finansów, Warszawa 1978, 1982.
VE: "Veto" 1982-1983 (Warszawa).
ZG: "Życie Gospodarcze" 1974-1982 (Warszawa).

All the variables were constructed from raw data. The methods of construction required numerous adjustments to yield consistent data series, since in several cases the same source of raw data was not available for the entire period. We now list the principal methods of construction and difficulties with the various data series.

BMS: Black market price of dollars computed as a moving average from end of period figures in PCY for 1973 - 4 through 1979 - 4. For 1980 - 1 to the end the data came from several sources, principally from PT, No. 12, 1983, p. 26. The annual data in the latter were converted to quarterly by adjustments based on QRP and VE.

CAR: Deliveries of new cars to official zloty market. The sources are BS and RS. In case of disagreement we took the more recently published figures. In some cases of overlapping annual and quarterly data, we regarded the former more accurate and adjusted the quarterly data to agree with the annual totals.

INC: Households total personal income in billions of zlotys. The annual figures in RS were adjusted to yield quarterly figures on the basis of the montly figures in BS for the principal components.

PCD: Index of the official Fiat 125p, price from CTPX (1974 = 100.0).

PF: Index of free market price of cars (1974 = 100.9). This was obtained from the quarterly average prices for seven different types and ages of cars reported in ZG by computing their principal components. Only the first component accounting for 198.9% of total variance was used.

PO: Index of the official zloty price for the Fiat 125p, (1974 = = 100.0) from CTPM.

RP: Index of retail prices. Published quarterly in BS up to the end of 1975. After that the annual price index from RS was adjusted to provide quarterly interpolations. This relied on quarterly retail sales and on quarterly household expenditures.

DEP: Household's deposits in savings institutions. Sources are RSF, BS, RS.

Appendix B

Derivation of the Likelihood Function

Assume that the error terms ξ_1, ξ_2, ξ_3 in equations (3.1) to (3.3) are normally distributed with zero means and covariances and with variances σ_1^2, σ_2^2, σ_3^2. The joint density of the endogenous variables for period t then is

$$f(y_{1t}, y_{2t}, y_{3t}) = \frac{|PCD_t - \beta_1(\varepsilon_2 \alpha_4 - \alpha_2)|}{(2\pi)^{3/2}\sigma_1 \sigma_2 \sigma_3}$$

$$\exp\left\{-\frac{1}{2}\left[\frac{(y_{1t} + \alpha_2 y_{2t} - \alpha_4 y_{3t} - z_{1t})^2}{\sigma_1^2} + \frac{(-\beta_1 y_{1t} + PCD_t y_{2t} - z_{2t})^2}{\sigma_2^2} + \frac{(-\varepsilon_2 y_{2t} + y_{3t} - z_{3t})^2}{\sigma_1^2}\right]\right\} \qquad (B.1)$$

On the assumption that demand always exceeds supply (CAR), the pdf of the observable random variables is

$$h(y_{2t}, y_{3t}) = \int_{CAR_t}^{\infty} f(y_{1t}, y_{2t}, y_{3t})dy_{1t} \qquad (B.2)$$

Define

$$w_{1t} = \alpha_2 y_{2t} - \alpha_4 y_{3t} - z_{1t}$$

$$w_{2t} = PCD_t y_{2t} - z_{2t}$$

$$A_t = \frac{(-\varepsilon_2 y_{2t} + y_{3t} - z_{3t})^2}{\sigma_3^2}$$

$$B_{1t} = \frac{\sigma_2^2 w_{1t} - \sigma_1^2 \beta_1 w_{2t}}{\sigma_2^2 + \beta_1^2 \sigma_1^2}$$

$$B_{2t} = \frac{\sigma_2^2 w_{1t}^2 + \sigma_1^2 w_{2t}^2}{\sigma_2^2 + \beta_1^2 \sigma_1^2}$$

By completing the square on y_{1t} and integrating, we obtain

$$h(y_{2t}, y_{3t}) = \frac{|PCD_t - \beta_1(\varepsilon_2\alpha_4 - \alpha_2)|}{2\pi\sigma_3(\sigma_2^2 + \beta_1^2 \sigma_1^2)^{\frac{1}{2}}}$$

$$\exp\left\{ -\frac{1}{2}\left[\left(\frac{\sigma_2^2 + \beta_1^2 \sigma_1^2}{\sigma_1^2 \sigma_1^2}\right)(B_{2t} - B_{1t}^2) + A_t \right]\right\} \times \left[1 - \Phi\left(\frac{CAR_t + B_{1t}}{\sigma_1\sigma_2(\sigma_2^2 + \beta_1^2 \sigma_1^2)^{\frac{1}{2}}}\right)\right]$$

and the likelihood function is (B.3)

$$L = \prod_t h(y_{2t}, y_{3t}) \qquad (B.4)$$

It can be shown by the same technique that if the spillover term $\varepsilon_4(y_{1t} - CAR_t)$ is included in equation (3.3), the density function becomes

$$h(y_{2t}, y_{3t}) = \frac{|PCD_t(1 + \varepsilon_4 \alpha_4) - \beta_1(\varepsilon_2 \alpha_4 - \alpha_2)|}{2\pi(\sigma_2^2 \sigma_3^2 + \beta_1^2 \sigma_1^2 \sigma_3^2 + \varepsilon_4^2 \sigma_1^2 \sigma_2^2)^{\frac{1}{2}}} \times$$

$$\times \exp \left\{ -\frac{1}{2}\left[B_0(B_{2t} - B_{1t}^2)\right]\right\} \left[1 - \Phi\left(\frac{CAR_t + B_{1t}}{1/B_0^{\frac{1}{2}}}\right)\right]$$

where

$$B_0 = \frac{\sigma_2^2 \sigma_3^2 + \beta_1^2 \sigma_1^2 \sigma_3^2 + \varepsilon_4^2 \sigma_1^2 \sigma_2^2}{\sigma_1^2 \sigma_2^2 \sigma_3^2}$$

$$B_{1t} = \frac{\sigma_2^2 \sigma_3^2 w_{1t} - \sigma_1^2 \sigma_3^2 \beta_1 w_{2t} + \sigma_1^2 \sigma_2^2 \varepsilon_4 w_{3t}}{\sigma_2^2 \sigma_3^2 + \beta_1^2 \sigma_1^2 \sigma_3^2 + \varepsilon_4^2 \sigma_1^2 \sigma_2^2}$$

$$B_{2t} = \frac{\sigma_2^2 \sigma_3^2 w_{1t}^2 + \sigma_1^2 \sigma_3^2 w_{2t}^2 + \sigma_1^2 \sigma_3^2 w_{3t}^2}{\sigma_2^2 \sigma_3^2 + \beta_1^2 \sigma_1^2 \sigma_3^2 + \varepsilon_4^2 \sigma_1^2 \sigma_2^2}$$

where w_{1t} and w_{2t} are as before and

$$w_{3t} = \varepsilon_2 y_{2t} + y_{3t} - z_{3t}.$$

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W. Charemza, M. Gronicki, R. E. Quandt

MODELOWANIE RÓWNOLEGŁYCH RYNKÓW W GOSPODARCE CENTRALNIE PLANOWANEJ
PRZYPADEK RYNKU SAMOCHODOWEGO W POLSCE

W prezentowanym artykule został sformułowany model dla dóbr trwałego użytku, w którym przyjęto, że istnienie stałej nadwyżki popytu może reprezentować równowagę. Podejście to zastosowano do rynku samochodów w Polsce. Model ten jest ekonometrycznym modelem nierównowagi, ukazującym stałą nadwyżkę popytu w trzech oddzielnych dziedzinach:

1) rynek nowych samochodów sprzedawanych na "asygnaty",
2) rynek nowych samochodów sprzedawanych za dewizy,
3) rynek samochodów używanych.

Parametry równań oszacowano metodą największej wiarygodności. Oszacowane parametry posłużyły do wyprowadzenie średniego okresu oczekiwania na nowe samochody.