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# REPRODUCTION OF SHORTAGE ON THE HUNGARIAN CAR MARKET

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## I. *Introduction*

THE basic question of this article is: what *shortage phenomena* appear on the car market and which factors account for the perpetuance of shortage on this market? Using the general theoretical ideas and analytical apparatus developed by one of the authors,[1] we try to find out whether there are any *regularities* which are theoretically important in the development of demand and supply, in the behaviour of buyer and seller and in the changing of the market situation.[2]

Our subject is delimited:

—Only the *Hungarian* car market is investigated, and a few references are made to the practice of other countries.

—Only *private cars* bought by *private persons* are considered.

In the following, the expression 'car market' is to be understood with the preceding restrictions.

Although the main subject of this article is the investigation of the car market, it is our endeavour that it should have a significance beyond the problems of just one sector and should contribute to the *general* theory of consumer demand and purchase, that is, of the consumer goods market.

## II. *Forms of distribution*

People acquire a car through various forms of distribution, through various channels. The percentage shares of the forms of distribution are summed up in *Table 1*.[3] Let us consider each form in turn.

(1) The predominant form of distribution of new cars is the *queuing up* for the cars sold by the Merkur Company. This is the form which is going to be investigated primarily in this article.

(2) Some of the new cars are sold by *rationing,* by jumping the queue. The main form of this is that ministries and a few other institutions are granted a 'special quota' which they distribute among their staff and the employees of the sector under their authority. There is no clear and public regulation to determine the share of this 'special quota', nor which buyers should benefit from it.

We do not consider it to be our task to pass a judgement from the ethical point of view on the form of distribution through rationing by jumping the queue. We have not enough information at hand to evaluate the criteria of this rationing. As economists and observers of real socio-economic systems we can realise that *where there is a queue, there must be also people jumping the queue.*

(3) Another form of distribution is to draw a prize (car prize for savings, lottery).

TABLE 1

THE SHARE OF THE VARIOUS FORMS OF DISTRIBUTION

| | *Qualification according to the theoretical forms of distribution* | *Share (%) in total purchase 1976* | *Share (%) in the purchase of new cars 1976* | *Share (%) in the purchase of new cars 1979* |
|---|---|---|---|---|
| *New cars* | | | | |
| 1. Merkur sales following the queue | queuing | 21·6 | 84·5 | 82·4 |
| 2. Merkur sales according to 'special quotas' | rationing | 3·1 | 8·2 | 9·6 |
| 3. Merkur sales as lottery prizes | random distribution | 1·0 | 4·0 | 3·3 |
| 4. Konsumex sales against hard currency | constrained market transaction or present | 0·3 | 1·4 | 2·0 |
| 5. Private person's import | market transaction or present | 0·5 | 1·9 | 2·7 |
| *Second-hand cars* | | | | |
| 6. Merkur purchase sold to private persons | constrained market transaction, combined with queuing, rationing or random distribution | 6·3 | — | — |
| 7. Private person's sale to private person | constrained market transaction | 67·2 | — | — |

*Source:* Merkur, Konsumex and OTP Reports, study of the Hungarian Market Research Institute, see note 3.
*Methodological notes*: Row 1 consists of those who bought their car against a cheque issued by OTP. The data in row 2 are our own calculations. From the quantity sold by Merkur we deducted the figures in rows 1 and 3 and considered the difference as approximation of the 'special quota'.

(4) At the state-owned foreign trade enterprise Konsumex cars can be bought for *hard currency* without or with only a short queuing up.

(5) The car imported by a private person from abroad: this is, in the final analysis, a market form, since either the car owner himself or the individual presenting him with a car effected the purchase under market conditions abroad, as a rule, against hard currency.

(6) Some second-hand cars are sold through the state enterprise Merkur. This is done seemingly in a market form, yet due to the artificially low prices the buyers of second-hand cars form a queue; the seller gives his preference to one (rationing); or the decision is made by lot.

(7) The overwhelming part of second-hand cars go from private sellers to private buyers via a *market form.* There prices are formed and transactions concluded through bargaining. However certain regulations constrain the trade in second-hand cars.[4]

Summing up, we can state that the basic form of acquiring a car is queuing up for it. Although there is no unregulated free market, the larger part of the trade in second-hand cars does take place—with some administrative constraints—under conditions that can be called a market form.

## III. *Shortage indicators*

According to everyday experience, there is no *'absolute' shortage of cars* in Hungary. If one wants to buy a car, one can do so, at most one has to wait or to accept forced substitution. There is, however, a *'relative' shortage of cars:* supply deviates from the initial demand of the buyers—in quantity; and in composition according to type, quality, age, and delivery date. We try to measure this deviation in numerical terms, with the aid of *shortage indicators.*

Data collection has proved difficult. Several indicators exist which are appropriate to describe the market situation and are observable without any great difficulty, yet no regular observation has been arranged.

(1) The most important shortage indicator on the market for new cars is the *queuing time.* The actual queuing time of buyers could be observed, but such data have not been collected. Therefore, we have to be content with two kinds of indirect approach to the queuing time. One is the *promised* queuing time; the expectable waiting time which Merkur and the National Savings Bank (OTP) make known to the buyer when joining the queue. The other approach is the *calculated* queuing time: the quotient of the backlog of orders at the beginning of the year, and of the sales transacted in the course of the year. It shows in how many years the turn will come for the last buyer who joined the queue in the previous year, if sales were to stabilise at the present year's level.

In *Table 2* the time series of the calculated queuing time are given for the average of all models and for a few specially considered models. The queuing time is long even on average, and it is especially so for the popular models.

(2) Forced substitution is one form in which the shortage is manifest. In an investigation carried out by the Hungarian Market Research Institute a large number of buyers were asked the following question: 'If you could obtain it immediately, which model would you

TABLE 2

COMPUTED QUEUING TIME (YEARS)

| | *Average* | *For Trabant* | *For Wartburg* | *For Skoda* | *For Lada* |
|---|---|---|---|---|---|
| 1966 | 2·1 | 2·9 | 2·6 | 0·7 | — |
| 1967 | 0·5 | 1·0 | 0·6 | 0·0 | — |
| 1968 | 0·9 | 1·6 | 1·4 | 0·1 | — |
| 1969 | 1·7 | 4·6 | 3·1 | 0·6 | — |
| 1970 | 2·0 | 4·3 | 3·3 | 1·6 | — |
| 1971 | 2·5 | 4·9 | 5·6 | 3·0 | — |
| 1972 | 2·4 | 4·2 | 7·6 | 3·1 | 1·0 |
| 1973 | 1·6 | 2·4 | 4·0 | 1·6 | 1·0 |
| 1974 | 1·1 | 1·1 | 2·8 | 1·6 | 0·8 |
| 1975 | 0·5 | 0·3 | 0·8 | 1·0 | 0·4 |
| 1976 | 2·3 | 4·7 | 4·9 | 0·4 | 0·8 |
| 1977 | 2·5 | 3·7 | 3·7 | 0·5 | 1·8 |
| 1978 | 3·6 | 5·8 | 4·8 | 1·2 | 3·6 |
| 1979 | 5·3 | 7·2 | 5·8 | 2·3 | 6·0 |
| 1980 | 3·1 | 4·0 | 2·3 | 1·4 | 3·4 |

*Source:* See note 3; also letter from Merkur about 1980 and 1981.

choose instead of the one you have ordered?' The answers are summed up in *Table 3*. The principal diagonal shows the proportion of those who voluntarily chose the model ordered, at least as far as the available selection is concerned. The elements of the Table outside the principal diagonal show the proportion of those who applied forced substitution even at the moment of ordering: the long queuing time for the preferred model compelled them to order another one. The proportion of those making their choice voluntarily is highest for the Trabant—every other buyer in the queue would in fact like to have a Trabant. For the remaining models this ratio is much lower and certain models are chosen exclusively as forced substitutes. The answers confirmed our assumption: *forced substitution is present in a high degree on the car market.*

TABLE 3

FORCED SUBSTITUTION RATIOS AMONG THOSE WANTING TO BUY A CAR
(the present number of those who have ordered a certain model = 100)

| *Model preferred in case of immediate delivery* / *Model Ordered* | *Trabant* | *Wartburg* | *Skoda* | *Zhiguli* | *Moskvich* | *PF 126* | *Dácia* | *Other models not available at present* | *Total* |
|---|---|---|---|---|---|---|---|---|---|
| Trabant | 47 | 21 | 1 | 19 | 0 | 5 | 1 | 6 | 100 |
| Wartburg | 16 | 7 | 7 | 53 | 0 | 1 | 6 | 10 | 100 |
| Skoda | 5 | 10 | 0 | 80 | 0 | 0 | 5 | 0 | 100 |
| Zhiguli | 5 | 30 | 7 | 30 | 1 | 3 | 2 | 22 | 100 |
| Moskvich | 25 | 25 | 0 | 25 | 0 | 0 | 0 | 25 | 100 |
| PF 126 | 25 | 11 | 11 | 39 | 0 | 0 | 0 | 14 | 100 |
| Dácia | 0 | 25 | 0 | 50 | 0 | 0 | 0 | 25 | 100 |

*Source:* Study of the Hungarian Market Research Institute, see note 3.
*Methodological note*: the investigation took place in 1977; 4120 persons were asked in total; 1406 sent evaluable answers.

(3) Some of the buyers choose, instead of (or *beside*) queuing up, the immediate purchase of a second-hand car. Therefore, *one of the indirect indicators* of shortage on the car market *is the ratio of the prices of new to second-hand cars.* In the first column of *Table 4* we give Danish data.[5] Denmark, like Hungary, does not manufacture cars; nevertheless, supply of new as well as of second-hand cars is ample. Under such conditions, the price ratio reflects the judgement of the market on the value of the two categories of cars.

On the Hungarian market *the constraints on the supply of new cars drive the prices of second-hand cars upwards.* Our statistics cover a period in which no rules prohibited the sale of second-hand cars under three years of age to private persons. The second column of Table 4 shows the relative prices of the Skoda, which is the easiest to buy, and the third column shows those of the Trabant, which is the most popular car; the price ratios for the other models fall between these two extremities. In this period buyers paid a considerable surcharge for a relatively new Trabant on the second-hand car market. Even in the 6th year of use, two-thirds of the new price was paid, while on the Danish car market, on average, the second-hand price falls below one-third of the new price after such long use.

TABLE 4

SECOND-HAND CAR PRICES IN PERCENTAGE OF NEW PRICES

| *Age of car* | *Danish average price* | *Hungarian price Skoda S100* | *Hungarian price Trabant 601* |
|---|---|---|---|
| | 1 | 2 | 3 |
| 0–1 | 70·3 | 87·8 | 112·2 |
| 1–2 | 61·5 | 81·1 | 104·4 |
| 2–3 | 50·3 | 73·0 | 92·8 |
| 3–4 | 40·9 | 62·2 | 85·1 |
| 4–5 | 37·1 | 54·1 | 75·4 |
| 5–6 | 31·5 | 43·2 | 65·8 |

*Source*: For column 1 we used the study by N. Kaergard, and for column 2 the article 'Mit ér . . .?', see note 5.
*Methodological notes*: the Danish data were based on advertisements in 1968. The Hungarian data were based on actual market transactions in the first half of 1977, by taking partial samples.

(4) Finally *credit terms are* one more indirect shortage indicator. Although in the Hungarian case, credit terms are not highly responsive to short-run changes in the market situation, they do signal lasting changes and are characteristic of the different sales systems. The general rule is that if a credit transaction[6] is made at all, *on a buyers' market the seller will grant credit to the buyer, while on a sellers' market the buyer will grant credit to the seller.* In most capitalist countries a car can be bought on credit. Latterly, since the difficulties of selling cars have grown, Skoda cars can be bought on credit in Czechoslovakia. In Hungary, however, half of the purchase price, and in Romania the whole of it, has to be paid in advance, when the buyer joins the queue.[7] To sum up, the data confirm clearly that in the past fifteen years there has been a chronic and, to a changing degree, intensive shortage on the Hungarian car market.

## IV. *Behaviour of the buyer*

### *Demand*

In a chronic shortage situation we cannot apply a single specific concept of demand, since the buyer's buying intention is interpretable in several ways and evolves over time. Theoretically, in the case of the car market, the following phases can be discerned:

*Hypothetical demand, phase 1.* The buyer is asked the question, whether he would like to buy a car, and if so, which model he would choose if, at a valid Hungarian price, he could get any Eastern or Western type for immediate delivery,[8] with the guarantee of parts supply and full and complete service.

*Hypothetical demand, phase 2.* The foregoing question is asked, but narrowed down to the Eastern and Western models, or their present-day 'descendants', which have been on sale in Hungary during the last 15 years—against forints or hard currencies, or which have been imported privately in any considerable quantity.

*Hypothetical demand, phase 3.* The question is further narrowed down to the models which are currently sold by Merkur against forints, with queuing up. Yet the buyer is asked to assume that he does not have to queue up for any of the models. Thus the buyer will consider only the model and the price.

*Initial demand, phase 4.* It is not only the qualitative properties and the price of the

model but also the expected queuing time that influence the buyer's decision which queue to join. Contrary to the *hypothetical* demands of phases 1–3, this initial demand need not be found out by questioning but is *revealed* by the act of joining the queue. What is more, the buyer confirms the seriousness of his intention by depositing a 50% advance payment.

*Revised demand, phase 5.* Resulting from the effect of several factors, the buyer may modify his initial demand and leave the queue. Perhaps he joins another queue, either because he has changed his mind, or because the seller has persuaded him to buy another model.[9]

*Actual purchase, phase 6.* To our knowledge, no questioning has yet been done concerning phases 1 and 2 of the hypothetical demand, and as for phase 3, only the Hungarian Market Research Institute has made some initial steps. (Reference was made to this in respect of Table 3.) Data on the initial demand and on the actual purchase are available in the records of Merkur and of the OTP, or can be concluded from them, but so far they have not been systematically examined, or their trends methodically analysed. Information on revised demand is again sporadic.

In talking about 'demand' in the present paper, we shall always mean the *initial* demand, even when this is not specified. Some problems still remain, which have to be solved in order to make our definitions unambiguous. One important distinction is whether we want to measure a 'stock' indicator or a 'flow' indicator. Several definitions of practical consideration can be given for both. In the first column of *Table 5* a 'stock' indicator is

TABLE 5

TIME SERIES OF THE DEMAND FOR CARS

| *Year* | *Demand 'stock': Backlog of unfilled orders at the beginning of the year* | | *Demand 'flow': Additional buying intention* | |
|---|---|---|---|---|
| | *Units* | *Chain index* | *Units* | *Chain index* |
| 1966 | 33302 | — | −2733 | |
| 1967 | 10800 | 32·4 | 33159 | ↑ |
| 1968 | 18501 | 171·3 | 40176 | 121·2 |
| 1969 | 34029 | 183·9 | 65413 | 162·8 |
| 1970 | 74619 | 219·3 | 76316 | 116·7 |
| 1971 | 108164 | 145·0 | 59692 | 78·2 |
| 1972 | 116837 | 108·0 | 49019 | 82·1 |
| 1973 | 106051 | 90·8 | 58368 | 119·1 |
| 1974 | 85912 | 81·0 | 47616 | 81·6 |
| 1975 | 44210 | 51·5 | 208836 | 438·6 |
| 1976 | 163532 | 369·9 | 124589 | 59·7 |
| 1977 | 206791 | 126·5 | 238687 | 191·6 |
| 1978 | 352586 | 170·5 | 285315 | 119·5 |
| 1979 | 530772 | 150·5 | −91880 | ↓ |
| 1980 | 323547 | 61·0 | 41605 | ↑ |
| 1981 | 259471 | 80·2 | | — |

*Source*: column 1 is based upon Merkur Adatgyüjtemény (see note 3), and letter from Merkur, column 2 on the former, as well as Közlekedési és Hirközlési Évkönyv (see note 3) and information from OTP and Konsumex. The chain indices in column 4 show the change compared with the previous year by an upward or downward arrow instead of an index, if the additional buying intention changed from a negative number into a positive one, or vice versa, that is, when a quotient cannot be computed.

[a] Data not available.

shown: the stock of accumulated and valid orders. The 'flow' indicator of the third column is called *additional buying intention.* [10] It can be stated upon the basis of the Table that the demand for cars fluctuates significantly.

*The decision variables of the buyer*

In his consideration of purchasing a car, the buyer can decide the following:

—Through which form of distribution can he and, in case of a choice, does he wish to acquire for himself a car? For most buyers, if they want a new car, there is only one form: that of queuing up.

—If he has chosen to queue up, he can decide for which model to queue. Within this range, he can have a few special wishes such as colour and certain accessories.

—When queuing up, he can decide to leave the queue and join another one—assuming that the seller agrees to this—or cancel his order.

—If, finally, his turn comes, he can decide whether to take delivery of the car immediately, or to postpone it, within the term allowed by the seller.

The buyer has no say in the price, which is determined by the seller. Our buyer is therefore a *price-taker.* The situation is different when he buys a second-hand car from a private person, when bargaining is possible.

*Factors explaining the buyer's behaviour*

In *Table 6* the variables explaining the buyer's behaviour are surveyed and classified. In the following parts of this article we shall try to cast some light upon their effects, in so far as this is possible by relying upon experience and deductive reasoning. [11] Some of the explanatory variables are also described numerically in the paper. These numerical descriptions are, however, not to be considered more than illustrations.

TABLE 6

THE EXPLANATORY VARIABLES OF THE BUYER'S BEHAVIOUR

| *Effect group* | *Serial number* | *Denomination* |
|---|---|---|
| *Standard effects* | | |
| The buyer's financial resources | 1 | The buyer's income |
| | 2 | The buyer's savings |
| | 3 | The expected selling price of the buyers car at the time of the exchange |
| Price effect | 4 | New car price<br>Second-hand car price |
| | 5 | Fuel price |
| | 6 | Other costs of running (spare parts, service) |
| Cross price effects | 7 | Public transport tariffs |
| | 8 | Housing costs |
| | 9 | Other costs of living |
| *Non-standard effects* | | |
| Supply effects | 10 | Limitation of the range of models to be ordered |
| | 11 | Expected queuing time |
| Administrative effects | 12 | Administrative constraint on the resale of cars |

In Table 6 *standard and non-standard* effects are discerned. First of all we must clarify this distinction. Standard consumption theory, elaborated by Gossen, Engel, Pareto, Hicks and Samuelson, has developed parallel with neo-classical economics and is intertwined with Walrasian equilibrium theory. The part of standard consumption theory that is concerned with demand functions is accepted by some Hungarian economists who otherwise reject its theoretical bases.[12] Standard consumption theory was inspired by the examination of a buyers' market, and of the behaviour of the buyer having a hard budget constraint and paying an effective price. On such a market the fundamental explanatory variables of demand are price and income—though other factors may also be important. On a buyers' market demand can be satisfied more or less without change; intention and realisation coincide. Therefore, the direct observation of demand can be replaced by the observation of actual purchases.

In this article the attribute 'standard' refers to interrelations which exist between demand on the one hand and price and the financial resources or income of the buyer on the other hand. On a sellers' market the standard explanatory variables also have significant influence, assuming that the buyer's budget constraint is hard and the price effective.[13] In the case of cars purchased by private persons both conditions are fulfilled, therefore, the standard factors exert their effect. Beside them, however, there are other, 'non-standard' factors with a considerable influence, characteristic specifically of a sellers' market; these are mainly supply and administrative constraints.

Let us first take in turn the 'standard' factors.

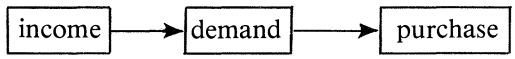
*(1) Income and (2) Saving.* In the estimation of demand functions the customary procedures consider the buyers' actual purchases as dependent variables.[14] This procedure is justified if the buyer is not constrained by short supply in realising his intention. In such a case it can be assumed that buying intention and actual purchase coincide. This assumption is unjustified, however, if there is chronic shortage on the market. This is because in the latter case the direct determinant of the actual purchase is supply. Therefore, what is determined in this case by the customary process is not a *demand* function but a *purchase* function.

On some markets the direct observation of demand is possible even in the case of shortage: this is so on the Hungarian car market, on which, as we have seen, initial demand is recorded. It is this indicator—more exactly, the additional buying intention—that we analysed.

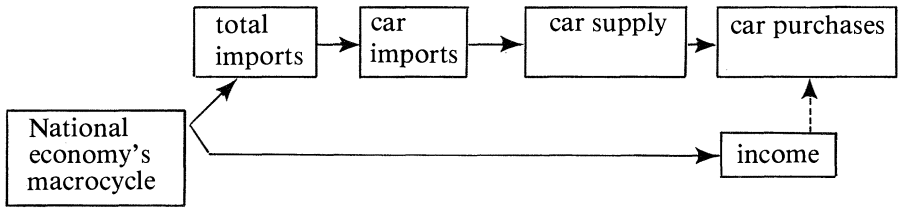
It is evident that even under conditions of chronic shortage the fundamental Engel relationship is effective; income strongly influences the long-term trend of demand. The actual purchase function, however, does not coincide with the demand function. Purchase runs closely parallel with income. There are two indirect effects to be observed. First, *in the long run neither the buyer's behaviour* manifest in buying, *nor the seller's behaviour* manifest in selling *diverge greatly from demand.* When the queuing time has elapsed the customer usually buys the car (only a few orders are cancelled). The supply directly determining the actual purchase cannot diverge far from the long-term trend of demand, either; supply follows demand more or less, apart from the shortage zone. Second, the parallel trends of incomes and car purchases can be further explained by the fact that both change because of the effect of identical factors. The macro-level fluctuations in the

tightness of restrictions simultaneously influence income on the buyer's side and car imports on the seller's side; actual purchases will be determined by the latter, that is, by supply.

On a buyers' market, the following chain of causation asserts itself:




As opposed to this, on a sellers' market the chain of causation is the following:




The vertical dotted arrow indicates that income and car purchases are moving closely together, because of a common cause, but it does not refer to any important direct *causal* link: close correlation, of course, does not necessarily represent causality.

Demand is considerably influenced by the *savings flow*. Further investigation is required into how the savings flow itself depends on other factors, including income, supply on other markets, cross price effects, and so on.

Finally, one more remark on the role of income. The customary approach answers first of all the question, what is the effect of earlier and of simultaneous incomes on demand and purchases. It is common knowledge, however, that demand is also influenced by *expectations for the future*. This is to be revealed by some other methods, for example, by interviews. A halt in the rise in real wages and expectations of stagnation and recession may be expected to slow down the rise in demand for cars.

(3) *The value of the car already owned.* Those who possess a car already will get a new one through exchanging it; the selling price of the old car is an important financial resource for buying the new one. Their financial situation is dependent largely on the trend of prices on the second-hand car market, on the administrative rulings that constrain selling, and so on. Thus it would be appropriate to divide car buyers into two large groups: old car owners and new-comers. Their market behaviour is different (as is their driving).

(4), (5), (6) *Own price effects.* The price of new cars had been by and large stable until 1979. In that year a sudden rise occurred. This also meant a considerable increase in the obligatory advance, which has to be considered as a component of the rise in prices. The rise obviously depressed the demand for cars. It played a role in the sudden fall of 'stock' demand in 1979. We cannot find out, however, to what extent this factor was responsible for the fall and to what extent it was caused by other factors which exerted their effect more or less at the same time—the halt in the rise in real incomes, less optimistic expectations, the administrative constraints on the resale of cars, etc. Separation of the various effects in an

econometric way seems impossible now because most of them appeared in one single 'package' in 1979.

Demand for second-hand cars is obviously a diminishing function of the price of second-hand cars. It is also one of the standard relationships that the prices of new and of second-hand cars have a cross effect on demand: the relative rise in prices of the former will augment the demand for the latter and *vice versa*.

(7) The present level of *public transport tariffs* has been stable for years and, compared with the rising costs of motoring, is very low. This acts to reduce demand for cars, while occasional increases in tariffs would boost the demand for cars.

(8) *Housing costs.* There is no clear relationship between housing costs and the demand for cars. Common microeconomic considerations suggest the existence of a substitution relationship. A number of households can choose between spending their money on improving their housing conditions, or on buying a car. In Hungarian conditions, however, there are a great number of households for which the problem is present in another form. The two items of consumption, costs of housing and costs of a car, diverge substantially. This is confirmed by the studies of Lackó and Simon,[15] which say that fluctuations in housing costs are reflected in fluctuations in savings and not in changes in other items of consumption, including the purchase of cars.

(9) *Other costs of living.* There is no clear relationship here, either. We do not know, in which way more expensive consumption affects the demand for cars. Those who became accustomed to a car will hardly give it up, but will tend to use their car less.

The *non-standard effects* occur as a consequence of the sellers' market character of the economy—and of the car market within it—as well as of the administrative intervention into the market process.

(10) *Limitation on the assortment offered for sale.* This is an effect of fundamental importance, which draws a sharp line between a buyers' market and a sellers' market. Of course, the buyer can always choose only among the alternatives offered by the seller. The question is, to what extent the seller adjusts the set of supply alternatives to the revealed demand of the buyer. If, say, the buyer was offered products A, B, C, D, É, etc. in 1971 and products B and D were no longer supplied in 1972, this directly affected demand in 1972. For example, the Western cars imported and sold in the 1960s and early 1970s created a demand for these models. Later, however, Western car imports stopped. Another example is the supply of the Trabant and the Wartburg. Bookings for Wartburgs ceased between 1972 and 1974, and for Trabants between 1972 and 1975. The majority of buyers were not prepared to accept forced substitution, but preferred waiting. Thus, when booking started again, postponed demand came out in a burst. This instance shows clearly that the supply offered by the sellers, both foreign and Hungarian, is a major influence on buyers' demand.

(11) *Queuing time.* The effect of the expected queuing time on the buyer's demand is not unambiguous. On the one hand, the rising queuing time *repels* the buyer. Some buyers are impatient and prefer to combine forced substitution with a shorter queuing time, switching to less popular models if the queue for the model they prefer is too long.

There is also, however, a contrary effect: the rising queuing time *attracts* the buyer to the queue.[16] If the queue is very long, it is worth booking in advance for a second purchase. It is also worth joining the queue for the purpose of resale, since in this way a speculative

premium can be achieved. It is our impression that this accounted for the sudden rise in demand in the years 1977 and 1978, which was then put to an end by the 50% advance and the prohibition of early resale of second-hand cars.

(12) *Administrative constraints on resale. Where there is shortage and queuing, places in the queue will almost inevitably be offered for sale.* As in the case of jumping the queue, we do not seek to pass a moral judgement: as economists we have to establish that this is a concomitant of the phenomenon of queuing.

Administrative orders banned the sale of cars less than three years old among private persons. (Even before that the sale of cars under one year old between private persons had been specially taxed.) Since the ownership of a car has to be registered at the police, this order is enforceable. In the long run, the administrative constraint influences queuing intentions, that is, demand.

Now that we have come to the end of our list of explanatory variables, we wish to stress that a one-sided emphasis of either the standard or of the non-standard effects may lead to false conclusions. It is only by considering their *simultaneous* effects that we can understand the buyer's behaviour.

## V. *Behaviour of the seller*

*Supply*

In the preceding section the concept of the buyer did not need to be specified, since it is self-evident who the buyer is in the case of car purchases by the population. The situation is different with the seller. In talking about 'seller' in this article, we mean the personification of a *multi-level regulation process* and not only the person facing the buyer in the course of the selling transaction. Starting from the bottom, the decision levels are the following:

—Merkur personnel serving the buyer directly.

—Merkur apparatus, headed by the managers. On a level with them is Mogürt Foreign Trade Company attending, among other things, to the imports of private motor cars.

—Medium-level management organs: the Ministry of Domestic Trade, the Ministry of Foreign Trade, the Ministry of Transport and Communication.

—Top-level economic organs: the National Planning Board, the Ministry of Finance, and the Office of Supply and Price-Control.

—Top party and government organs making the most important decisions.

In our theoretical approach we sum up the *simultaneous* effects of the activities of all these levels in the abstract category of the 'seller'. Real decisions are formed, of course, through the complicated interactions of these levels.[17] In this article, however, we do not consider the division of roles within the decision-making process, but try to describe the *common resultant* of the interactions, first of all from the point of view of whether there is any *regularity* in it.

As for the concept of supply, it gives less trouble. Under the conditions of the shortage economy, supply is self-evident and easy to measure. What is at the seller's disposal as real physical supply can be sold almost immediately. Therefore, in what follows supply will be considered as identical with sales.

The time series of car sales to private persons is shown in *Table 7*. The long-run trend is of considerable increase but this is uneven and fluctuating.

TABLE 7

TIME SERIES OF SALES TO PRIVATE PERSONS

| *Year* | *(Units)* | *(Chain index)* |
|---|---|---|
| 1964 | 6857 | — |
| 1965 | 9957 | 145·2 |
| 1966 | 15706 | 157·7 |
| 1967 | 20785 | 132·3 |
| 1968 | 20474 | 98·5 |
| 1969 | 19879 | 97·1 |
| 1970 | 36665 | 184·4 |
| 1971 | 44033 | 120·1 |
| 1972 | 49182 | 111·7 |
| 1973 | 67307 | 136·9 |
| 1974 | 77942 | 115·8 |
| 1975 | 81692 | 104·8 |
| 1976 | 72661 | 88·9 |
| 1977 | 84388 | 116·1 |
| 1978 | 96833 | 114·7 |
| 1979 | 100270 | 103·5 |
| 1980 | 103632 | 103·4 |

*Source*: See note 3, also letter from Merkur.
*Methodological note*: the figures include not only sales through queuing, but also those through a 'special quota' and prizes.

### *The seller's decision variables*

The seller—that is, the collectivity of organs and enterprises attending to car supply—may decide on the following:

—Import intention. Actual imports depend, of course, not only on the Hungarian import intention but also on the willingness of the exporting party.

—Distribution of actual imports among the various groups of buyers—firms, non-profit institutions and private individuals—and how much of the latter should be through queuing and how much through the special quotas or other forms of distribution.

—Granting the requests of those in the queue to alter their orders, or perhaps inviting them to switch to another model.

—Suspending the booking of orders.

—Determination of the financial terms of the sale. What should be the price of the new car? How much advance should be paid, or, should cars be sold on credit?

—Administrative constraint on resale among private persons.

—Regulation of the sale of second-hand cars by the state-owned trade company.

Apart from a little more or less important internal friction, the centrally directed multi-level regulation process exhibits a homogeneous behaviour, so that the tens of thousands of competing buyers are faced with one single, especially large, quasi-monopolistic 'seller'. The 'seller' is especially gigantic, because it not only controls the supply, and determines the price, as monopolistic sellers usually do, but it also controls the credit terms and the administrative constraints on the market process.[18]

*Factors explaining the seller's behaviour*

In Table 6 standard and non-standard effects explaining the buyer's behaviour were distinguished. The explanation of the seller's behaviour must begin with a negative statement: the most important standard factors: the price and the expected enterprise profit have no effect on the seller's supply. This statement cannot be clearly confirmed by past experience, since there was only one considerable price increase—in 1979. This price increase was certainly not followed by a standard *micro*-market reaction, namely an increase in supply. On the contrary, macro-effects predominated: as the price increase kept back demand, so also was supply kept back under the restriction that covered the whole economy. This is manifest not only in the short-term change in supply, but also in the medium-term targets. Our interviews have shown that the five-year supply targets were gradually lowered. The initial target figure in 1978 was—according to several agreeing opinions—to import 650,000 private cars. In the summer of 1981 the 6th Five-Year Plan envisaged imports of 520,000 cars, but at Merkur and at the Ministry of Domestic Trade several voiced the opinion that only 480,000 should be imported.

Both public opinion and a number of economists reacted by thinking: 'it has become more expensive, but at least there will be more . . .' It must be noted that this relationship does not assert itself automatically. In our circumstances, for example, on such a market as the one on which new cars are sold, it does not work.

Let us now turn our attention to the *non-standard effects*. All of these go back to the fact that the seller is *not* a genuinely independent, market-oriented firm. It is basically not led by profit considerations, and does not have to compete for the goodwill of the buyers. The 'seller' is a multi-level regulating organisation motivated by a number of other factors, and it is able to impose its will upon the buyer.

Without aiming at completeness, we shall consider five factors.

(1) *Transport policy*. With a certain amount of simplification, the usual train of thought runs as follows:

Let private motoring develop, but not too fast. It should not outrun its supplying facilities, the capacity of the road network, the service network, etc., nor should it displace public transport.

There are a number of rational elements in this train of thought. There is much to support the idea that in a planned economy it should not be solely the spontaneous demand of the population that decides the rate of increase of car ownership and that serious consideration should also be given to the indirect, external consequences of the growth of motoring, which then should be constrained accordingly. These are, however, *constant* factors, which would lead to a *smoothly rising upper limit*: they cannot account for the wide fluctuations in supply.

(2) *Effect of trade with the socialist countries*. As we have already mentioned, imports depend not only on the Hungarian import intention, but also on the export willingness of the partner countries. Here very definite constraints are encountered from time to time, which halt or reduce imports of one model or another.

Beside these irregular *constraints* on the exporters' side, there are some more regular relationships as well. If the trade balance between Hungary and a car-manufacturing socialist country becomes more favourable for Hungary, Hungarian car imports from the

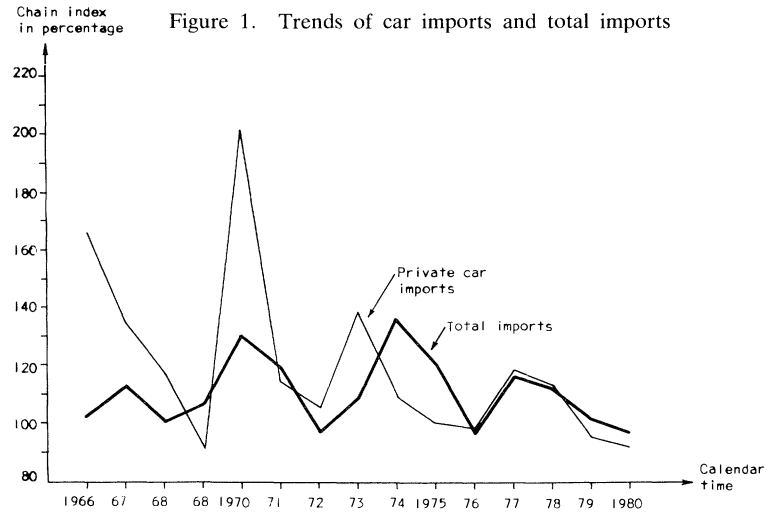
country in question will increase suddenly the next year. If the foreign trade balance changes for the worse, car imports will slow down or stop. This relationship does not prevail on every market in every year but it can be observed quite frequently. There is also a *general and rather close* correlation between car imports from the various socialist countries and total imports from the same countries. In these cases, therefore, car imports depend more or less linearly on total imports from the particular country.

(3) *Effect of trade with the capitalist countries.* Here the export willingness problem does not arise: the capitalist car industry is always ready to supply when Hungary is ready to pay in hard currencies.

An obvious relationship exists between the convertible balance of payments and the stock of debts on the one hand, and car imports from capitalist markets on the other hand. When the balance was not deteriorating to any great extent but, on the contrary, was improving, or an improvement was expected, imports from capitalist countries were stable or even growing. When, however, there was a significant deterioration, or prospects were poor, imports were stopped.

(4) *Effect of the national economy's macrocycle.* The continuous close relationship between private car imports and total imports holds not only for the absolute quantities, but more or less for the rates of growth too. *Figure 1* shows the chain indices of private car

Figure 1. Trends of car imports and total imports




*Source*: See note 19

imports and of total imports.[19] Accelerations and decelerations coincide in eleven cases out of fourteen. Therefore, the permanent relationship between economy-wide import decelerations and accelerations on the one hand and car import decelerations and accelerations on the other hand is demonstrable.

(5) *Reaction to shortage signals.* The factors listed so far put an upper limit on the 'zone' of supply currently possible, on the basis of the foreign trade and transport policy constraints. However, there is still quite extensive scope for manouevring by the seller. According to our observation, this manouevring takes place mostly in response to shortage signals.

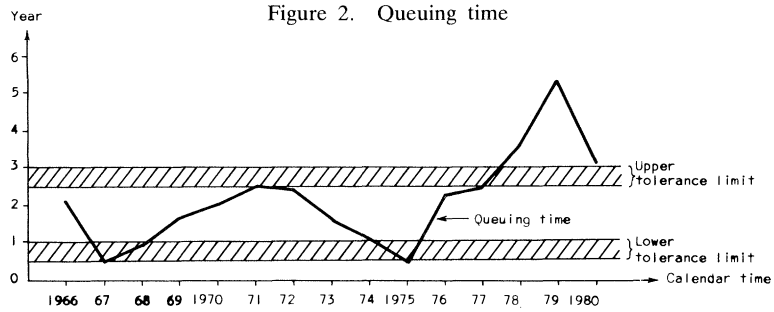
(5a) *Effect of the queuing time.* Figure 2 presents the interrelations graphically and also shows the actual queuing time series previously given. The seller observes *an upper tolerance limit. Shortage should not be too big.* This limit seems to be an average queuing time of two and a half to three years. The motive for observing an upper tolerance limit is to be sought in the political sphere. Economic policymakers aim to avoid a queuing time which buyers regard as intolerably long. If queuing time exceeds this limit, the 'attraction effect of the queue' will grow and, consequently, the queue will become even longer.

When around 1978–79, the upper tolerance limit was greatly exceeded, the seller intervened drastically in order to cut back shortage to the tolerable limit. *This was achieved, however, not through increased supply, but by suddenly curtailing demand* via price increases, raising of the advance payment, and additional constraints on resale.

The seller also observes *a lower tolerance limit*: shortage should not be unduly low. He is especially intent that the sellers' market should not turn into a buyers' market. It seems that this lowest critical value is about six months to one year of waiting. The seller has several motives for acting in this way. The most obvious one is that if the queue were to be too short or, worse still, cease altogether, it would be inconvenient for the seller. Buyers would become more fastidious, and it would be hard or perhaps even impossible to satisfy their wishes because of the suppliers' rigidity. Certain foreign trade considerations of a general character also preclude too short a queue.[20] There is not even enough capacity for storing unsold cars.

The car market hit the lower tolerance limit of shortage twice: in 1967 and in 1974. Contrary to the procedure adopted when the upper tolerance limit was exceeded, the price was not changed now, but—for three years on both occasions—supply was held back. This is demonstrated in *Figure 2* and *Table 8.* These were the two cases in which the supply available to the population did not just grow more slowly, but an absolute reduction took place.[21] As a result of holding back the supply, the average waiting time again rose above the lower tolerance limit.

Figure 2. Queuing time




*Source*: See Table 2

The sharp turns that follow the surpassing of the tolerance limits largely account for the great fluctuation of supply. The time series also show that a connection between shortage signal and supply (or other decision variables of the seller) exists not only in the proximity of the tolerance limits. It can be demonstrated with the most popular models, Trabant, Wartburg and Lada, that a growing queuing time acts toward increasing supply[22] while a declining queuing time acts towards reducing supply.[23]

TABLE 8

THE LOWER TOLERANCE LIMIT OF SHORTAGE AND SUPPLY REACTION

| *Year* | *Queuing time* | *Supply chain index* |
|---|---|---|
| 1966 | 2·12 | 157·7 |
| 1967 | 0·52 | 132·3 |
| 1968 | 0·90 | 98·5 |
| 1969 | 1·70 | 97·1 |
| 1970 | 2·04 | 184·4 |
| 1973 | 1·58 | 136·9 |
| 1974 | 1·10 | 115·8 |
| 1975 | 0·54 | 104·8 |
| 1976 | 2·25 | 88·9 |
| 1977 | 2·50 | 116·1 |

*Source*: See Tables 2 and 7.

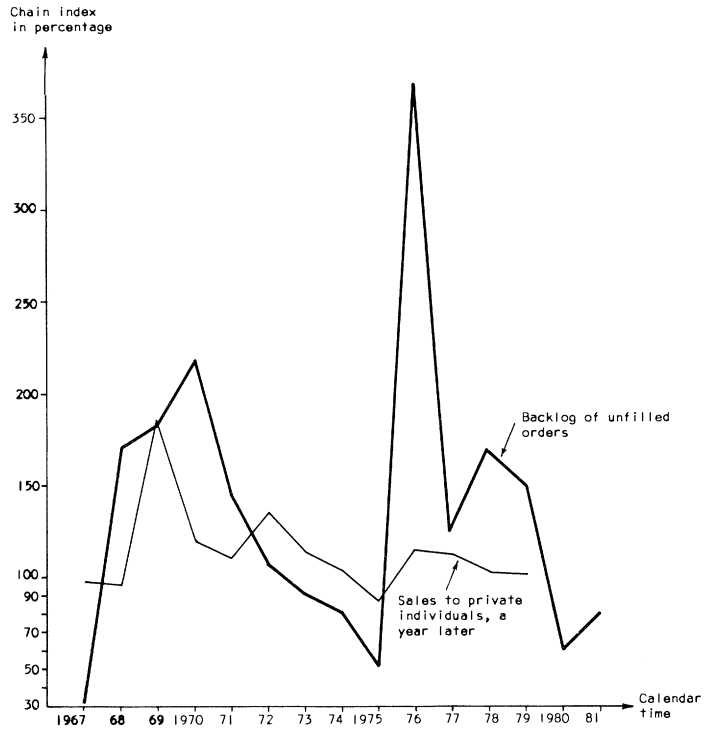
The first part of the relationship is almost self-evident: the seller does not want shortage to become too severe. The other part is somewhat perplexing: *the seller is opposed to too little shortage.*

*(5b) Effect of the backlog of unfilled orders.* According to our observation, if the growth of the backlog of unfilled orders speeds up, this will be followed in the next year by a speed-up in sales. This observation is illustrated in *Figure 3*. As opposed to the queuing time signal, this relationship does not account for the turning-points in sales to private persons, but is effective rather in the quieter years. The frequency of its effect amounts to two-thirds of the cases (in the years 1969–80). It is thus not particularly strong and is weaker than the effect of the macrocycle and of the foreign trade factors.

Here we want to add a remark on the *long-term* effects of shortage on car production and supply. In the capitalist car industry there is sharp competition between producers, first of all by offering more up-to-date models with much lower fuel consumption than before. Yet the car industry of the socialist countries has hardly moved in that direction. The East German, Soviet, Czechoslovak and Polish car industries still produce the models of the 1960s—in the case of Trabant the 1950s—with only minor variations. Nor have there been any real signs of a change in this situation since 1973. This causes and will go on causing very serious losses in the socialist countries' energy balance, in which petrol consumption by cars is an ever increasing item. Besides, with these models the socialist car exporters cannot really break into the Western markets, their low prices notwithstanding.

The citizens of the socialist countries who wish to buy a car would also prefer models with lower fuel consumption, because the price of petrol has increased.[24] On a sellers' market, however, the buyer may have wishes, but he cannot force them upon the seller. Those who control the manufacture of the Trabant and the Lada know well that these ten-to-twenty year old, mass-produced, routine models are sold to a queue stretching 6–10 years ahead, both in their own country and in other socialist countries. Thus they feel no economic pressure toward technical progress, and manufacture of models with much lower fuel consumption.

Figure 3. Trends of sales to private individuals and backlog of unfilled orders




*Source*: See Tables 5 and 7

## VI. *Theoretical propositions and car market experience*

Summing up our analysis, we can say that the explanatory factors considered 'twitch' the supply, by lengthening or shortening the queue. This is reflected in the buyer's reactions. The level of supply, the length of the queue, changes in prices and other related measures cause demand to fluctuate, which in turn affects the length of the queue and the supply.

We shall now examine some theoretical propositions developed previously by one of us,[25] in the light of our observation of the car market. The propositions were the result of generalisation of practical experience and deductive logical reasoning, without reference to statistical data. That is why they were called 'hypotheses' which needed to be tested. Now we can refer to statistics, but only in respect of a single partial market. Although no theory of a wide validity can be *proved* on this basis, it can be said in any case that the investigation of this field *does not disprove* but rather *supports* the theory.

All the propositions refer only to the resource-constrained shortage economy of the socialist system, with both the traditional and the post-reform[26] economic management; therefore, this limitation will not be added to the formulation.

The first three propositions are concerned with *shortage.*

*1st proposition.* Chronic shortage is present on the market in general, and especially on the market of several household consumer goods.

*2nd proposition.* The backlog of unfilled orders (that is, the 'queue') is permanently larger than is justified by organisational factors.

*3rd proposition.* A departure from the usual intensity of shortage serves as a feedback signal[27] at all levels of control and planning. In response to this signal the market returns to its usual intensity of shortage.

Our observation of the car market fully confirms these propositions. Particular attention is drawn to the finding which we hold to be decisive in the empirical test of the propositions: the control prevailing on the car market does not allow the queue to *shrink too much.* As long as *this* regularity prevails, shortage will subsist.

The indicators of the chronic shortage situation have no internationally valid tolerance limits; the numerical values of the limits may differ from time to time and country to country. In the course of the last fifteen years in Hungary a queuing time of 1 to 3 years has become habitual and accepted on the car market. This is what the seller has become accustomed to; he adjusts his acquisition routine and sales organisation to it. On the other hand, the buyer too has become accustomed to it; it is on this basis that, for the great majority of buyers, the customary forced substitution and queuing propensity rates, the usual scheduling of covering the purchase price, etc. have developed. The habitual intensity of shortage is a self-perpetuating phenomenon: habit, conformism and conservatism are partly a consequence but also a cause of the continuous reproduction of shortage.

In other socialist countries economic management as well as the buyers are accustomed to different degrees of shortage intensity. For example, in the GDR queuing time is 8 to 10 years and there is nothing to indicate that it is likely to change in the future. It depends on a large number of factors, not least on how far the population is willing to accept the established shortage situation and on the degree of consumer dissatisfaction with which the political and economic management can and will 'coexist'. In this respect there are considerable differences between the various countries.

The following three propositions are concerned with the relationship between prices and shortage.

*4th proposition.* Chronic shortage can subsist on the market for a consumer product group, whether the relative price of the latter is low or high.

The price of private cars is relatively high in Hungary. Kravis and his co-authors demonstrate in their book[28] that the relative price of cars in Hungary (compared with the average consumer price level) is about double that in the advanced capitalist countries. In spite of the high price, chronic shortage prevails. Thus the experience gained on the car market supports the 4th proposition. But from this point of view price *trends* may be even more important.

*5th proposition.* Neither the central planning of consumption, nor the behaviour of firms shows any general automatic tendency to react to the raising of the selling price by increasing supply.

*6th proposition.* A rise in prices does not automatically eliminate shortage of any consumer article.

Our observation of the car market supports these two propositions. The rise in prices has undoubtedly curtailed household demand, but has not led to increased supply. The growth of demand and supply both slow down, so that the usual intensity of shortage persists.

The confirmation of the 5th and 6th propositions is highly illuminating from the point of view of practical economic policy. *No rise in prices will eliminate shortage unless supply reactions change.* This leads us to the last question which we wish to discuss here.

Will the state of the car market change from a sellers' market to a buyers' market? We are trying to answer the question not in the normative, but in the predictive sense. It would not be impossible for shortage on the car market to cease.[29] There are some sections of the Hungarian market where there is no shortage, or at most sporadic frictional shortages: for example, energy supply, including fuel to the population, and most foods, etc. And yet we are of the opinion that it is improbable, though not impossible, that the car market will change into a buyers' market under the existing institutional conditions.

A transition of this kind would absorb substantial resources at the actual time of the transition. A car would have to be imported without delay from either the socialist or the capitalist market for every member of the queue who maintained his order in spite of the much shorter delivery time.[30] It is true, of course, that this would be only an *advance* use of resources to be used anyway, since, after elimination of the queue, only new additional demand would have to be satisfied continuously. And now, when a stagnation of incomes is expected, the elimination of the queue would not absorb too many resources, even temporarily. Probably, however, the planners and managers in charge of car imports and sales would not be pleased to see such a change, for the reasons explained earlier. But even if they came out in favour of effecting the change, the central allocators of resources could not be expected to bring themselves to take such a step. There is chronic shortage in other sectors too, some of them regarded as more important than private car transport. In certain fields shortage is a lot more intensive and, in its social effect, more depressing, too. Why should queuing be eliminated just for private cars? Directly or indirectly, the tendency of the *even distribution of shortage* would come to prevail. Of course, the arguments which refer to foreign trade considerations and the difficulties of the international balance of payments would be emphasised. Finally, however, the question would not be decided exclusively, perhaps not even primarily, by arguments. Very heavy pressure would be put on the decision-makers to concentrate their efforts on other tasks rather than on transforming one specific partial field from a sellers' to a buyers' market. The final result will be the continuous restoration of shortage on the car market for the forseeable future.[31] Our prediction is, of course, conditional on there being no essential change in the institutional framework of the economy.

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[1] János Kornai, *Economics of Shortage.* Amsterdam—New York—Oxford: North-Holland Publishing Co., 1980.

[2] We express our thanks to the directors and officers of the car trading company Merkur, of the Ministry of Domestic Trade, of the Hungarian Market Research Institute and of the National Savings Bank (OTP) who helped us by revealing problems and supplying data. However, this article reflects our own opinion exclusively.

We are grateful to the editors of the journal for improving the English of the paper.

[3] This table is compiled from the following sources: *A lakossági személygépkocsi piac egyes időszerü problémái.* (Some of the present-day problems on the private car market) (manuscript) Budapest: Hungarian Market Research Institute, 1978; *Közlekedési és Hirközlési Évkönyv, 1979* (Transport and News Communication Yearbook 1979) Budapest: Central Statistical Office, 1980; *Merkur Adatgyüjtemény, 1979.* (Merkur Data Collection, 1979) Budapest: Merkur Car Trading Co., (manuscript), 1980.

[4] For example, it has been ruled recently that within three years from the delivery of a new car it can be sold only to Merkur, or to some other specially indicated enterprise or co-operative.

[5] This table is compiled from data in the following: Keargard, Niels, *Eftersporgsel og varighed for varige goder*. Kobenhavn: Kobenhavns Universitets Okonomiske Institut, 1975; 'Mit ér ma a kocsim?' ('What is my car worth today?') *Autó-Motor*. 30, 19: 21, 1977; *Vejtransporten, 1980, Automobil—importorerness Sammenslutning*. Denmark, 1980.

[6] In the Soviet Union and in the GDR no advance payment has to be made when joining the queue. It may be that this adds to the length of the queue in these countries.

[7] Our source of information on the Soviet Union, Czechoslovakia and Romania is the article; 'Autóvásárlási körkép a szocialista országokból'. ('Panorama of car purchases of the socialist countries'), *Heti Világgazdaság*, 18 July 1981.

[8] Each important Western model has a valid forint price, if only for the purpose of imposing customs duty on privately imported cars. For interpretation of the stipulation of 'immediate delivery' it is assumed that the buyer has no special (so-called optional) wish, but is willing to buy the model available from stock.

[9] For example, in December 1978 the queue for the Lada 1600 was opened. Over 14,000 of those waiting for a Lada 1500 went to join the new queue, since in this way their turn came sooner. (See 'Mennyit kell autóra várni?') ('How long to wait for a car?') *Magyar Nemzet,* 24 December 1978.

[10] The additional buying intention is composed of two main items: 1. on a market where there is a queue, the number of those joining the queue, 2. the additional buying intention showing on the market where there is no queue. It can be assumed that the latter is realised within the given year. Therefore, it is approached by summing up the following data on purchase: purchase through rationing estimated by comparing the data of Merkur and of the OTP, sale through Konsumex, and private imports by the population.

[11] Some statements in the Table and in the adjoining analysis concern only the *total* demand for cars, or total purchases of cars, while others can be understood as concerning the demand and purchase variables for either the total of all models or for each model separately.

[12] See for example R. Hoch, I. Kovács and M. Ördög, *Fogyasztás és jövedelem* (Consumption and income). Budapest: Hungarian Academy of Sciences, Institute of Economics, (manuscript), 1980.

[13] For an explanation of the concepts of 'hard budget constraint' and 'effective price' see János Kornai, *The Economics of Shortage. op. cit.*

[14] This is the practice also followed by most Hungarian research on the econometric estimation of demand interrelations. See for example I. Baranyai, I. Csahók, A. Rácz, P. Salamin and L. Schnell, *Fogyasztási cikkek és szolgáltatások jövedelemrugalmassága* (Income elasticity of consumption articles and services). Budapest: Central Statistical Office, 1972. (Statisztikai Idöszaki Közlemények, Vo. 246); K. Hulyák, G. Muszély and Gy. Szakolczai, *A fogyasztás ökonometriai modellezésének eredményei* (Results of the econometric modelling of consumption). Budapest: Országo Anyag- és Árhivatal és Számitógépalkalmazási Kutató Intézet (manuscript), 1980. and see note 12, also discussing the car market.

[15] Mária Lackó, 'Consumer Savings and the Supply Situation'. *Acta Oeconomica 15,* 3–4: 365–383, 1975; András Simon: 'An Econometric Study of the Consumption and Savings of the Population'. *Matecon 15,* 4, 67–88. 1979.

[16] The relationship between shortage and buyer behaviour is examined more fully in J. Kornai, *Economics of Shortage, op cit.*

[17] In this connection, when defining the concept of the 'seller', we disregard private persons offering second-hand cars for sale.

[18] The attribute 'quasi' was added because some of the buyers can acquire a car through other channels: if they have foreign currency, or foreign relatives willing to present them with a car, if they have a share in the special quota, or are content to buy a second-hand car on the private market. Yet the overwhelming majority of buyers find themselves facing the monopolistic seller.

[19] *Statisztikai Évkönyvek* (Statistical Yearbook). Budapest: Central Statistical Office, 1960–69; *Külkereskedelmi Statisztikai Évkönyvek, 1970–1979* (Foreign Trade Statistical Yearbooks 1970–1979). Budapest: Central Statistical Office, 1971–1980.

[20] These arguments were heard, for example, in an interview with a leading member of the car trade. Question: 'In your view, how long should the queue be to be compatible with the Hungarian economic situation?' Answer: 'Two to three years.' Q: 'Is it not possible to strive for a shorter queue?' A: 'We could not work with a queue of less than one year. For that, the whole purchase structure would have to be changed'.

[21] The question arises, how far was the slow-down in car imports attributable to the general import restriction, that is, the effect of the macrocycle. We think that the macrocycle played no role in starting the change, since in both cases total imports started to slow down only a year later: in 1968 and in 1975 respectively. The fact, however, that the car market was restricted for three years in both cases and that in the last year of this period supply was reduced absolutely may well have been influenced by the general situation of the economy.

[22] This does not contradict our previous statements. If the queue has exceeded the upper tolerance limit for all models taken together, there will be a reaction not in supply, but in price and in administrative market restrictions. If, however, the queue for *certain* models has grown *within* the zone under the tolerance limit, supply will react.

[23] We have examined cases of marked growth or decline in the queuing time for all models of cars. The relationship stated above was found to prevail with the following frequency: Trabant—5 cases out of 7, Wartburg—5 cases out of 8, Lada—3 cases out of 4. Thus, whilst there is not a deterministic rule, there is a perceptible stochastic regularity.

[24] A few comparative data on fuel consumption (litres per kilometre). Lada 1500: 9–10, Lada 1200: 8–9, Trabant 601 7–9. Compared with this, the consumption of the Japanese Daihatsu Charade (993 cc) amounts to 6–1, that of the Daihatsu Coure (550 cc) to 7·5. Source: *Autóvásárlók Kézikönyve* (Car Buyers' Manual). Budapest: Idegenforgalmi és Propaganda Kiadó Vállalat, 1979.; 'Japán miniautók ('Japanese minicars'). *Heti Világgazdaság,* 13 June 1981.

[25] János Kornai, *The Economics of Shortage, op. cit.*

[26] We mean here the reform of the Hungarian economy put into effect in 1968.

[27] János Kornai, *The Economics of Shortage, op. cit.,* like a few similar studies, describes the control of the market in the state of chronic shortage in the form of control adjusted to the intertemporal average. We have found that another form of control prevails on the car market: control reacts mainly to cases of hitting the tolerance limits. The book discusses this form of control at several places too, but in another context. The relation between the two forms of control and, in this connection, a few theoretical and terminological problems of the 'normal state' and of 'control according to norm' will be discussed in an ensuing article. The 1st proposition is developed on pp. 47, 474 and 491–2, the 2nd proposition on p. 140, the 3rd on pp. 59 and 497–8, the 4th on p. 501, the 5th on pp. 338 and 497 and the 6th on pp. 497–8 and 556–7. The 3rd proposition has been formulated in such a way that we are not compelled here to touch upon these theoretical and terminological questions, which require a more detailed explanation.

[28] I. B. Kravis, Z. Kenessey, A. Heston and R. Summers, *A System of International Comparisons of Gross Product and Purchasing Power.* Baltimore—London: John Hopkins UP, 1975.

[29] It is worth looking again at the Czechoslovak car industry, in which deteriorating exportability and restricted home market demand have led to sales difficulties. In Czechoslovakia a Skoda can be bought without queuing and credits are even granted for car purchase (See note 7). Of course, there is a great difference between the Czechoslovak and the Hungarian problem. In Czechoslovakia car manufacturing capacity exists but demand has fallen. In Hungary, however, all cars are imported. It depends exclusively on imports, whether supply maintains or eliminates the queue, at a given volume of demand. Car imports are, in a certain sense, a question of 'free decision'. Therefore, in attempting a prediction we are trying to answer the question, how will the behavioural regularities and decision routines established by the existing mechanism affect this 'free decision'.

[30] A change to a buyers' market and a guarantee of continued good supply would cause many people to withdraw their order, the motive for which may have been over-insurance or speculation. The 'fictive' part of demand would be sure to fall.

[31] Collection of materials for this article ended in late 1981. The time that has elapsed since then has confirmed our prediction. The central party newspaper, *Népszabadság,* published an interview on 26 July, 1983 with the general manager of the Merkur automobile trading company. (The interview was done by Csaba Egerszegi.) It turned out from this—in the words of the general manager—that 'owing to the development of the balance of trade' in 1983 imports would be 16% less than the original quota. 'Because of our purchasing possibilities the average waiting time for a car has lengthened . . . And not only the quantity but also the composition of imports developed unfavourably'. According to the interview the two most popular models are the Skoda and the Lada. Skoda imports diminished by more than 40% and delivery of the Lada is not promised until 1988.