PRICE, QUALITY AND TURNOVER TAX
OF CONSUMER DURABLE GOODS
IN SOCIALIST ECONOMIES *

A Case Study of Polish Refrigerators in 1970's

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I. Introduction

It is well known that the Polish government fixed the prices of fundamental foodstuffs, such as meat, at a very low level from a social point of view. At the end of 1970's the producer's price of meat exceeded the retail price and the difference of these two prices imposed a heavy burden on the state budget of Poland. Revenue and expenditure, however, should be balanced and therefore the deficit of subsidies for agricultural products must be compensated by some revenue. Of course, it is meaningless to ask by what this deficit is compensated, since in state budget a certain expenditure does not correspond to a particular revenue. But many Polish people believe that the turnover tax (podatek obrotowy) on consumer durable goods, such as refrigerator or television set, is the reverse of the medal of subsidies for agricultural products. The Western specialists possess the same understanding of

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this problem and this recognition was endorsed by the words of J. Pajestka¹, an ex-vice chairman of Planning Commission of Poland.

In 1980 the turnover tax (i.e. indirect consumption tax) in the whole economy was 381 billion zloty,² whereas the whole revenue of the state budget was 1215 billion zloty.³ But we may suppose that half of the whole turnover tax was collected from the alcohol sale and the cigarette sale, since the alcohol sale in 1980 was 165 billion zloty,⁴ the cigarette sale was 41 billion zloty,⁵ and it is widely believed that more than 90% of the price of vodka is the turnover tax. So we may estimate the turnover tax except from the alcohol sale and the cigarette sale, approximately, at 200 billion zloty. On the other hand the subsidies for foodstuffs in 1980 was 164 billion zloty.⁶ Therefore from the official statistical data we can confirm the fact that at a macro-economic level the turnover tax except from the alcohol sale and the cigarette sale corresponds to the subsidies for foodstuffs.

In Polish literatures we can observe institutional explanations of turnover tax, but we can hardly find out quantitative analysis of turnover tax especially from a micro-economic viewpoint. Besides hitherto the Western specialists, as well as the Eastern economists, examined mainly macro-economic problems, such as economic planning, economic growth and so on. In this article the author would like to make a quantitative analysis of turnover tax in the case of Polish refrigerators from a micro-economic viewpoint.

Many Polish people believe that about half of the price of consumer durable goods is drawn up to the state budget as turnover tax. The first aim of this article is to substantiate this view in a case study of Polish refrigerators. In this article the author will show statistically the fact that nearly 50% of the retail price of Polish refrigerators corresponds to the production cost and the fact that more than 40% of the retail price is drawn up to the state budget in

¹. J. Pajestka says that (the high prices for new products and luxurious goods) is intended to prevent the increase of the price level of fundamental consumer goods.
². Rocznik Statystyczny [14], p.584.
³. Rocznik Statystyczny [14], p.584.
⁴. Rocznik Statystyczny [14], p.431.
⁵. Rocznik Statystyczny [14], p.433.
⁶. Rocznik Statystyczny [14], p.585.
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a wide sense.7

This article examines the price policy of consumer durable goods in 1970's, but the 1970's of Poland should be divided into three periods; the first is to 1973, the second is from 1973 to 1977 and the third is the catastrophic period after 1977. These three periods possess completely different characteristics to each other. This article discusses the second period, that is, the period when the economic reform was introduced and next reached a deadlock.

The economic reform in 1973 covered a wide area and necessarily referred to the price policy of consumer durable goods and to the system of turnover tax. As will be mentioned in the following section, the Polish literatures in 1970's say that the system of turnover tax is now changing from the old style to the new. The result of our analysis, however, shows the fact that, against the above statement, the turnover tax on Polish refrigerators was determined in the old style even after the economic reform.

After the crisis in 1980 many criticism of the economic policy in 1970's became openly published and they argue that the economic reform was insufficient or mistaken. The second aim of this article is to show the fact that the economic reform of the turnover tax on Polish refrigerators was insufficient and that the turnover tax was determined in the old manner, that is, the turnover tax was determined ad hoc in the form of lump sum tax.

This article makes an analysis using the so-called hedonic approach, which has developed in order to explain the retail price of consumer durable goods from the characteristics of the good. In the section III the method of the hedonic approach will be briefly explained. In the section IV the author will present some conclusions after analysing the data of polish refrigerators.

II. Retail price of consumer goods and turnover tax in 1970's

When we discuss the consumption problem in socialist economies it is important to distinguish between the price for consumers and the price for pro-

7. The word of "in a wide sense" will be explained in sections II and IV of this article.
producers. The former is used as a parameter in decision making of consumer and the latter is used in decision making of producer. The main role of the latter is to induce the producer to fit its production plan for the national economic planning. The former is, according to the words by an orthodox economist, set in order to fit the demand of consumers to the consumption pattern which is determined in advance by the central planning board. As J. Lipiński says, if these two prices are completely separated, then the preference of consumers can not exert any influence on the production planning and "the lack of consumers' sovereignty" comes into existence. The economic reform of the retail price and the turnover tax was intended to modify this lack of consumers' sovereignty.

First, we present the formula of retail price under the traditional system of turnover tax. Since the main theme of this article is not institutional consideration of tax system in socialist economies, we examine the following simplified formula:

\[ C + \pi + M + T = P \]  \hspace{1cm} (1)

where
- \( C \): production cost
- \( \pi \): profit
- \( M \): commercial margin
- \( T \): turnover tax
- \( P \): retail price

We may consider that the production cost and the commercial margin are not influenced by the change of turnover tax. As for the profit, a certain percentages of the production cost are counted as profit and therefore in socialist economies a certain amount of profit is \textit{a priori} guaranteed. In the case of capitalist economies the four variables except the profit in the above identical equation (1) are firstly determined and next the profit becomes determined as the difference between the revenue (P) and the expenditure (C + M + T). In the case of socialist economies, however, the profit is determined in a completely different manner. That is, in socialist economies the central planning board first calculates a reasonable production cost, which is called

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8. Minc [8], pp.180–181.
9. Lipiński [6], p.219.
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usually the norm cost or the standard cost, secondly divides the norm cost into labour cost and non-labour cost and thirdly guarantees the 20% of the labour cost and the 8% of the non-labour cost as profit.\textsuperscript{10} In this manner the profit of socialist enterprises is calculated. Therefore the profit (π) is not influenced by the change of the turnover tax. Here we should take account of the fact that even the retail price does not exert any influence on the level of profit.

From the above-mentioned consideration the problem is now concentrated in the relation between the retail price (P) and the turnover tax (T). In capitalism we usually understand the turnover tax as a proportional tax system on the production cost. In socialism, especially in the traditional system, this understanding is not appropriate. In socialist economies the traditional method of turnover tax is the differentiated system of turnover tax (system różnicowany podatku obrotowego). In this system the government levies the turnover tax \textit{ad hoc} on particular commodities and therefore there is no relation between the amount of the turnover tax and the production cost. In this system, as we mentioned in section I, a high level of the turnover tax is levied on luxurious goods or new products. In this manner the government can stabilize the price of fundamental goods and equilibrate the demand for the luxurious goods with the supply of these goods.\textsuperscript{11}

Reconsidering the experience that the differentiated system of turnover tax separates the production plan from the consumers’ preference, in 1973 the proportional system of turnover tax (system procentowych stawek podatku obrotowego) was introduced. In this new system the government was to levy the turnover tax as a certain percentages of the difference between the retail price and the commercial margin, that is, a certain percentages of the supply price (cena zbytu). In this system the rate of tax is differentiated with respect to the kind of goods. So if one enterprise produces several kinds of goods, for instance, television set, refrigerator and bicycle, then a different rate of tax is levied on each group of goods. In an extreme case, according to W. Pruss,\textsuperscript{12} even 30 kinds of tax rate were applied in one enterprise. But the

\textsuperscript{10} Pruss [11], p.49.
\textsuperscript{11} Miastkowski [7], pp.108–109.
\textsuperscript{12} Pruss [11], p.93.
same rate of tax is applied for the goods within the same group, for instance, the refrigerator group.

In this new system the retail price is related to the production cost. But as J. Lipiński pointed out, in order to relate the production plan to the consumers' preference the possibility of elastic change of production plan should exist. That is, when there exists excess demand in the market, the enterprise should elastically increase its production. In the Polish economy in 1970's, however, for enterprises there was small possibility to increase the production of goods with large demand, such as colour television set, automobile, refrigerator, electric washer and so on, since the fundamental investments of every industry were arbitrarily determined by the Politburo. In this point, we consider, exists the cause of failure of the economic reform in the field of tax system. In fact a Polish literature which was published at the end of 1970's says that the proportional system of turnover tax is usually applied not independently but as auxiliary means. The retail price was determined also taking into account the balance of the market and the comparison with other consumption goods.

In 1970's, when the investment in the field of consumer durable goods was insufficient, it is apparent that the turnover tax on consumer durable goods, such as refrigerator, was determined at a such level that the balance of the market and the revenue of the state budget are ensured.

As already mentioned, the economic reform in 1973 reached a deadlock. In 1977, as one of remedies for this situation, aiming to activate innovation and incentive to explore new products, "the system of new products" was introduced. This system enables the enterprise to acquire an additional profit, if new products are produced by this enterprise. If a product receives recognition of new products (this recognition is called Q-mark), then the retail price of this product is determined by one of the following two manners:

\[
(C + \pi) + M + D \equiv P \quad \text{(2)}
\]
\[
(C + \pi + T) + M + D \equiv P \quad \text{(3)}
\]

13. Lipiński [6], p.219.
14. Pruss [11], p.96.
15. As for the system of new products, see, Kincel [4]. As an English literature Cholewicka-Gożdzik [3] makes a brief introduction.
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In the identical equation (2), where the ordinal turnover tax does not appear, we first calculate the remaining value (D) by deducting the production cost (C), the profit (π) and the commercial margin (M) from the retail price (P) which is determined at a high level in order to balance the market. 70% of the remaining value (D) is drawn up to the state budget as tax. The commercial department of the economy can also receive the additional payment which can not exceed 10% of the value (D). The enterprise, therefore, can receive from 20% to 30% of the remaining value (D) as an additional profit.

In the identical equation (3), where the turnover tax is levied, we also calculate the remaining value (D) by deducting the value (C + π + T + M) from the retail price (P). The remaining value (D) is distributed in the same manner as in the identical equation (2).

In both cases the enterprise can receive an additional profit, amount of which is 20% or 30% of the remaining value (D), after receiving the normalized profit which consists of the 20% of the labour cost and the 8% of the non-labour cost. This additional profit is now spent for the premium allowance or the investment by self-financing. Since before the economic reform these expenditures were paid by the state, we can consider that the additional profit is once drawn up to the state budget from the enterprise and next transferred from the state budget to the same enterprise. Thus the additional profit becomes the revenue of the enterprise’s budget. That is, we can understand the additional profit (20% or 30% of D) and the additional payment for the commercial department (10% or less of D) as special present from the state budget. From the above-mentioned considerations we can assert that the whole amount of the remaining value (D) is drawn up to the state budget in a wide sense, though only 70% of the remaining value (D) is transferred to the state budget in a strict sense.

Under the system of new products the remaining value (D) has no proportional relation with the production cost. Especially in the case of the equation (2) the revenue of the state budget in a strict sense (70% of D), as well as the revenue of the state budget in a wide sense (the whole D), has no proportional relation with the production cost and therefore the proportional system of turnover tax in 1973 became denied in 1977 by the introduction of the system of new products. Moreover the introduction of the system of new products.
products suggests the fact that the price of consumer durable goods with high quality must be set at a such level that brings the balance of the market and therefore the fact that the proportional system of turnover tax could not function in the mid of 1970's.

On the other hand we may admit an active intention of "the system of new products" to relate the profit of enterprise with the retail price and to connect the production plan with the consumers' preference.

In section IV of this article we infer statistically the fact that in the case of Polish refrigerators even before the introduction of the system of new products, that is, even in the mid of 1970's, the proportional system of turnover tax was not put into practice. Since we examine the period before the introduction of the system of new products, we adopt the identical equation (1) as the fundamental equation for inference of our model.

III. Hedonic approach

In this article we adopt the hedonic approach (characteristics approach) as our analytical tool. Since the hedonic approach is not so popular for economists, in particular for specialists of socialist economies, in this section we present a brief survey of this approach.

The hedonic approach has developed in 1960's and 1970's as one of the new consumption theories. In the traditional consumption theory consumer feels his utility for units of goods, for instance, one apple or two automobiles. By contrast in the hedonic approach consumer feels utility for characteristics of goods, for instance, speed of automobile, wideness of automobile, net capacity of refrigerator or freezer capacity of refrigerator. From the idea that consumer will pay a high price for a good with high quality, first in 1960's, the following equation was presented without any theoretical inquiry:

$$\log P = a_0 + \sum a_i z_i$$

or

$$P = a_0 + \sum a_i z_i$$

16. The originator of the hedonic approach is Z. Griliches [2]. Also see, Dhrymes [1], Triplett and MacDonald [12] and Ohta [9].
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where \( P \) : retail price of good
\( a_0, a_i \) : constant
\( z_i \) : characteristics of good

This approach started first as empirical studies without theory, but later Lancaster [5], Ohta [9] and others gave theoretical foundations for this approach.

Here we must be careful of the fact that the hedonic approach as a consumer theory presumes competitive market in capitalist economies. In capitalism if a good with low quality is accompanied with a high price, then this good must retire from the market. In socialism, however, there exists no competitive market. There a high quality good with a low price is usually accompanied with queue and a low quality good with high price makes a tall pile of stocks. Therefore we can not apply the hedonic approach as a consumer theory in socialist economies.

In this article we adopt the hedonic approach as a producer theory, the theoretical foundation of which was given by M. Ohta [9], and Ohta called it cost function approach.

The cost function approach, in essence, is nothing but the idea that in order to produce a product with high quality a high production cost is necessary. But it is important to take care of the fact that a product with high quality is not directly connected with a high level of the retail price, since the retail price is influenced not only by the characteristics of the product but also by the price level of raw material, technical progress, inflation, the level of profit and so on. In this article, however, we examine the retail price of refrigerators at one point, that is, in 1976 and at that time in Poland refrigerators were produced by only two enterprises.\(^{17}\) Therefore in our analysis we can exclude change of raw material price, change of general price level and change of technology. Furthermore, as mentioned in section II, profit is determined as a certain percentages of the normalized production cost, that is, determined by the mark up method. Taking into account these matters we can simplify the hedonic equation, which explains the retail price from the characteristics of the good. In order to present the hedonic equation the cost

\(^{17}\) They are the Predom Polar and the Sillesia.
function should be first considered. The production cost is inferred as follows:

\[ C = a_0 + \sum a_i z_i + \epsilon \quad \ldots \quad (5) \]

where \( a_0, a_i : \) constant

\( z_i : \) characteristics of refrigerator

Here the characteristics of refrigerator indicate the net capacity, the freezer capacity and so on. As apparent from the equation (5), we assume a linear cost function. The supposition that the production of 300 litres refrigerator needs three times more of steel than that of 100 litres refrigerator is apparently the first approximation. Statistical inference places a limit upon the number of characteristics, since in Poland not so many refrigerators are produced. Moreover in some characteristics we cannot get the data. Therefore we restrict the number of characteristics in the analysis of our model. So it is very plausible that the production cost is influenced by other factors which are not examined in our analysis as characteristics. These remaining factors appear as the disturbance (\( \epsilon \)) in the equation (5).

In the production of refrigerator there exists a certain constant cost regardless of the characteristics of the refrigerator. We call it fixed cost and we will discuss this fixed cost at length in section IV. The fixed cost appears as the constant term (\( a_0 \)) in the equation (5).

As for the profit we can treat it very easily, since the profit is calculated as sum of the 20% of the labour cost and the 8% of the non-labour cost. So, as well as the production cost, the sum of the production cost and the profit is also proportional to the characteristics of refrigerator. Therefore we can establish the following equation:

\[ C + \pi = b_0 + \sum b_i z_i + \epsilon \quad \ldots \quad (6) \]

where \( b_0, b_i : \) constant

In an extreme case where the production of refrigerator does not need any non-labour factors, we can establish the relation that \( b_i = 1.2 a_i \). Of course, we cannot suppose such an extreme case. But if we assume that the capital-labour ratio is common in all production processes of refrigerator, we can justify the equation (6).

From the equations (1) and (6) we obtain the following equation:
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\[ P - M = \sum b_i z_i + (b_0 + T) + \epsilon \] .......................... (7)

Using the above equation (7) we infer the retail price of refrigerator in the following section.

IV. A case study of Polish refrigerator

In 1976, as in the table 1, 13 kinds of refrigerator were sold in Poland. Among these refrigerators the Minsk was imported from the U.S.S.R., the Lehel from Hungary and the Szron from East Germany. As for the domestic products the enterprise “Predom Polar” produced 7 refrigerators and the “Silesia” produced 2 refrigerators. These all refrigerators are single-door type and in 1976 two-doors type refrigerator was not yet produced. These all refrigerators are operated by the compressor, though Poland produced another type of refrigerator, that is, the absorbing type. Since we assume the same technology, as mentioned in section III, we omit the absorbing type refrigerators. On the other hand we include the imported refrigerators, since we consider that the technology, the relative price level of goods and the capital-labour ratio are almost common in the Comecon bloc.

First we draw inference in the case that the commercial margin (M) does not exist. The commercial margin will be contained later in our analysis without difficulty.

Model I

In this model we infer the retail price by the following equation:

\[ P = b_1 z_1 + b_2 z_2 + b_3 z_3 + b_4 z_4 + b_5 z_5 + B_0 + \epsilon \] .......................... (8)

where \( b_i (i = 1, 2, ..., 5) \) : constant

\( B_0 \) : constant. \( B_0 \) corresponds to the \((b_0 + T)\) of the equation (7).
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Table 1

| Model      | $z_1$ | $z_2$ | $z_3$ | $z_4$ | $z_5$ | P  |
|------------|-------|-------|-------|-------|-------|----|
| Silesia SC 220 | 220   | 0.470 | 0.091 | 183.33| 1     | 7800|
| Silesia SC 280 | 280   | 0.569 | 0.096 | 233.33| 1     | 9350|
| Polar TS 135  | 135   | 0.525 | 0.074 | 180.00| 1     | 6800|
| Polar TS 175  | 175   | 0.563 | 0.057 | 145.83| 1     | 7000|
| Polar TS 180  | 180   | 0.568 | 0.106 | 225.00| 1     | 7200|
| Polar TS 230  | 230   | 0.556 | 0.065 | 209.09| 1     | 8500|
| Polar TS 281  | 281   | 0.575 | 0.053 | 200.71| 1     | 7000|
| Lehel        | 150   | 0.505 | 0.107 | 214.29| 0     | 7000|
| Polar L28     | 125   | 0.387 | 0.096 | 156.25| 1     | 6100|
| Polar L14     | 160   | 0.363 | 0.131 | 177.78| 0     | 6700|
| Minsk M11     | 280   | 0.571 | 0.096 | 224.00| 0     | 9200|
| Minsk M10     | 220   | 0.564 | 0.123 | 183.33| 0     | 7800|
| Szton         | 125   | 0.402 | 0.088 | 130.21| 0     | 6100|

Source, Źycie Gospodarcze [13]

The first explanatory variable ($z_1$) is the net capacity (litre) of refrigerator. As our result will show, this variable exerts the greatest influence on the retail price. The second variable ($z_2$) is the ratio of net and gross capacities, that is, $z_2 = \frac{\text{net capacity}}{\text{gross capacity}}$. If a space-saving refrigerator uses expensive heat insulating materials, then the refrigerator with a high value of the second variable will be accompanied with a high production cost and then with a high retail price. The third variable ($z_3$) is the ratio of freezer capacity and gross capacity, that is, $z_3 = \frac{\text{freezer capacity}}{\text{gross capacity}}$. In this case the freezer means the freezing space in the one-door type refrigerator and remains the temperature at $-12^\circ$C. The fourth variable ($z_4$) is the coefficient of electricity saving, that is, $z_4 = \frac{\text{net capacity}}{\text{average consumption of electricity kWh per day}}$. A refrigerator with a high value of the fourth variable is expected to use an expensive compressor and expensive heat insulating materials and to be accompanied with a high price. Since we can consider that the electricity-saving refrigerator contains other new devices, the fourth variable may represent some other remaining characteristics of new technology which are not examined in our analysis. In other words we may roughly say that the first variable represents the quantitative characteristics and in contrast the fourth variable represents the qualitative charac-
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The fifth variable is the dummy variable which indicates the existence of half-automatic defroster. "1" means existence and "0" means non-existence. The retail price (P) is measured by the Polish money zloty. We obtained the following result:

\[ P = 15.599 z_1 - 132.92 z_2 - 7106.3 z_3 + 8.3167 z_4 - 144.52 z_5 + 3735.1 \]
\[ (12.33)^* (-0.13) (-2.06) (3.15)^* (-1.10) (7.70)^* \]

......................... (9)

\[ R^2 = 0.98 \]

In parentheses are t-values. (*) indicates the clearance of 95% test.

The net capacity (\( z_1 \)) is very significant, though the ratio of net-gross capacities is meaningless. So we must consider that the space-saving refrigerator does not need any additional production cost. As for the freezer the variable (\( z_3 \)) is also not significant. The freezer space of the one-door type refrigerator, different from that of the two-doors type refrigerator, may not exert any influence on the production cost. As for the electricity saving, however, the variable (\( z_4 \)) is significant. Expensive electrical parts should be equipped in the electricity-saving refrigerator. Furthermore we may infer that the electricity-saving refrigerators are accompanied with technologically new equipments and devices. The half-automatic defroster (\( z_5 \)) is not significant. Lastly the intercept (\( B_0 \)) is very significant. As already mentioned, the intercept can be divided as in the following equation:

\[ B_0 = b_0 + T + M \] ................................. (10)

where
- \( B_0 \): intercept
- \( b_0 \): fixed cost
- \( T \): turnover tax
- \( M \): commercial margin

If there exist no fixed cost and no commercial margin, then the whole intercept can be interpreted as the turnover tax.

Model II

In the model I only two variables are significant. In this model we con-
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struct an inference equation by these two variables, that is, the net capacity and the coefficient of electricity saving. The regression equation becomes as follows:

\[ P = b_1 z_1 + b_4 z_4 + B_0 + e \]  \quad (11)

The result is as follows:

\[ P = 16.805 z_1 + 5.6843 z_4 + 3192.9 \]  \quad (12)

\[ R^2 = 0.97. \]

In this result the t-value of \( z_4 \) decreased nearly to the lowest limit of the 95% test and the value of the intercept decreased to 3192 from 3735 of the model I. Next we construct the following two models which bring a better result than the model II and contain smaller number of variables than the model I.

**Model III**

\[ P = 15.839 z_1 - 4695.2 z_3 + 7.3605 z_4 + 3493.1 \]  \quad (13)

\[ R^2 = 0.98. \]

**Model IV**

\[ P = 15.556 z_1 - 6897.4 z_3 + 8.1437 z_4 - 142.81 z_5 + 3687.7 \]

\[ R^2 = 0.98 \]

In the last model the freezer ratio \( (z_3) \) clears the 95% test though in the reverse direction. We present the following explanation for this result. Recent products of refrigerator possess a tendency to contain a larger freezer space. Owing to the technological progress the recent products are accompanied with a relatively lower price than the old products, if other characteristics of refrigerator do not change. Therefore we may interpret the freezer ratio \( (z_3) \) as a trend.

Now we want to estimate the turnover tax regarding the existence of the commercial margin. In the above four models the result was obtained under
the assumption that \( M = 0 \). In Poland the commercial margin is calculated as a certain percentages of the retail price, but the rate of the commercial margin is not published. Although different groups of commodity are accompanied with, by nature, different rates of the commercial margin, we may consider that an unique rate of the commercial margin is applied within the same group of commodity, for instance, the refrigerator group. From the numerical examples in the polish literatures we estimate it as from 10% to 15%. If the rate of the commercial margin is 10%, then the sale price of refrigerator, which is equal to the difference between the retail price and the commercial margin, that is, equal to the value of \((P-M)\), should be calculated as the 90% of the retail price. Therefore if the rate of the commercial margin is 10%, then in order to estimate the sale price of refrigerator we simply deduct 10% of each coefficient of the above four regression equations. For instance, if the rate of the commercial margin is 10%, then the regression equation for the sale price in the model IV becomes as follows:

\[
P - M = 14.000 z_1 - 6207.6 z_3 + 7.3293 z_4 - 128.52 z_5 + 3318.9
\]

\[\begin{array}{rccccc}
\text{Table 2} \\
\hline \\
\text{Rate of the commercial margin} & \text{Model I} & \text{Model II} & \text{Model III} & \text{Model IV} \\
\hline \\
\text{intercept} & (b_0 + T) & (b_0 + T) & (b_0 + T) & (b_0 + T) \\
\text{intercept} & \text{(average retail price)} & \text{(average retail price)} & \text{(average retail price)} & \text{(average retail price)} \\
10\% & 3361 & 44.3\% & 2872 & 37.8\% & 3143 & 41.4\% & 3318 & 43.7\% \\
12\% & 3286 & 43.3\% & 2808 & 37.0\% & 3073 & 40.5\% & 3244 & 42.8\% \\
15\% & 3174 & 41.8\% & 2713 & 35.7\% & 2969 & 39.1\% & 3133 & 41.3\% \\
\hline \\
\end{array}
\]

In the table 2 for each model and for each rate of the commercial margin the value of the intercept and the ratio of the intercept to the average retail price are presented. The average retail price of refrigerators in 1976 was 7580

18. These figures are cited from the numerical examples by Pruss [11], p.90, p.91, p.93 and by Kincel [4], p.21.
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zloty. If we remember the equation (10), it is apparent that this intercept is equal to the sum of the fixed cost and the turnover tax.

If there exists no fixed cost, about 40% of the retail price is drawn up to the state budget as the turnover tax. So the problem is now focused on how much the fixed cost is. Of course, we can not answer this question by the result of the regression equation, but nobody can believe that the whole intercept is occupied by the fixed cost. We must consider that a considerable part of the intercept is the turnover tax.

Next we examine the character of the fixed cost. The fixed cost consists of mainly the depreciation of construction cost of factory. The construction cost is usually borrowed from the state and the enterprise has to pay back it yearly to the state. Therefore if we approach the problem not from the enterprise’s viewpoint but from the national economy’s viewpoint, the borrowing of the construction cost is expenditure of the state budget and the repayment of it is the revenue of the state budget. In this way of thinking the fixed cost becomes revenue of the state budget and therefore the whole intercept can be interpreted as revenue of the state budget in a wide sense.

In conclusion we may consider that more than 40% of the retail price is drawn up to the state budget in a wide sense. If the fixed cost constitutes 10% of the whole production cost, we can say that nearly 40% of the retail price is occupied by the turnover tax. Even if we can know nothing about the fixed cost, we can say that only 50% or less of the retail price of refrigerator corresponds to the production cost and also we can say that more than 40% of the retail price should be interpreted as revenue of the state budget in a wide sense.

Lastly we consider the system of turnover tax in the mid of 1970’s. Remembering the fact that under the proportional system of turnover tax the tax is proportional to the production cost, if there exists no fixed cost, then the application of the proportional system should bring the hypothesis that $B_0 = 0$. This hypothesis is strongly rejected. Even if there exists such fixed cost as 10% or 20% of the retail price, we must deny the application of the proportional system in 1976, since the hypothesis that $B_0 = 758$ or $B_0 = 1516$ is also strongly rejected. Also we must reject the hypothesis that not a differentiated turnover tax as a lump sum tax but a differentiated turnover tax, which is proportional to the retail price, was applied in 1976, because the
differentiated turnover tax which is proportional to the retail price, is nothing but a proportional system of turnover tax.

Summing up we conclude that for the Polish refrigerators in 1976 not the proportional turnover tax but the differentiated turnover tax as a lump sum tax was applied. This statement endorses the institutional considerations in section II. This is the second aim of this article.

V. Concluding remarks

In this article we have shown two points. The first is the fact that the production cost of refrigerator constitutes only half of the retail price and more than 40% of the retail price is drawn up to the state budget in a wide sense. The second is the fact that the proportional system of turnover tax was not applied for the Polish refrigerators in the mid of 1970's.

At last we emphasize the limitations of our analysis. First the number of characteristics of refrigerator was limited. Secondly we assumed a linear cost function. Thirdly we assumed a certain rate of the commercial margin, since the rate of the commercial margin is not published. But we consider that the supposed rate of the commercial margin is not so far from the reality.

In spite of these limitations, the author hopes, this article may be considered as the first step to the micro-economic analysis of socialist economies.

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19. The proportional turnover tax is calculated as a certain percentages of the sale price. That is, \( \alpha (C + \pi + T) = T \). Then we obtain the following relation:

\[
T = \frac{\alpha}{1 - \alpha} (C + \pi)
\]

Since the profit is proportional to the production cost, that is, \( \pi = \beta C \), the following relation is established.

\[
T = \frac{\alpha}{1 - \alpha} (1 + \beta)C \quad \text{or} \quad T = \gamma C.
\]

Therefore the proportional turnover tax becomes proportional to the production cost.
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