An analysis of consistency
of the three-year plan (1983--85)
of the productive sphere of the Polish economy*

by

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Consistency of various paths of growth, presented in the national socio-economic three-year plan 1983–1985 is examined with the help of a simple model. The presented model reflects, in a way, the method of construction of the plan. It concerns the productive sphere of the economy: final demand, personal income and expenditures. The financial relations are neglected. The quantitative investigation reveals the "weak" points of the plan.

1. Introductory remarks

The paper is aimed at examination of feasibility of the Three-Year (1983–85) National Socio-Economic Plan (NSEP)[1].

Generally, national economic plan is a composition of projected economic activities, which are expected or to be undertaken by government. Levels of these activities are expressed by values of variables mentioned in the plan. These values correspond to consecutive years, whose numbers compose a set, called here the time horizon of the plan, briefly: the **plan horizon.** Sequences of the values will be called **paths of growth** (despite their discontinuity). The NSEP is understood as a composition of projected three-year paths of growth.

This composition should be consistent. Otherwise some targets of the plan are unattainable, i.e. it is impossible to execute such a plan.

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[1] The National Socio-Economic Three-Year Plan was voted by the Polish Parliament (Seym) in 1983.04.28. See Diariusz Sejmowy (Seym's Daily), 3/1983.

Consistency of the composition of paths of growth presented in the NSEP is examined by means of a simple model. The model includes a number of assumptions concerning production, elements of final demand, private incomes and expenditures, etc. The model assumptions, which will be presented further on, are controversial but neither planner's knowledge nor any "external" knowledge used for examining the consistency of any economic plan is perfect. The best one can do is to construct the plan consistent with this imperfect knowledge.

Consistency or inconsistency of the NSEP is conditional upon the model employed. If the composition of the planned paths of growth is **consistent** (from the point of view of the model) the plan will be called **feasible.** If not, the feasibility of the plan will be considered doubtful, and the plan will be called **infeasible.**

Methods of construction of the plan are not presented in the NSEP document. It is neither possible nor sensible. The NSEP document must not be too voluminous and should be understandable to general public. However, another document presenting the method of construction of the plan is much desired. Such a document would make the experts sure that the plan is consistent with the best planner's knowledge of the economy. There are countries — eg. Japan, Holland — where, along with a document presenting governmental forecasts and intentions of the government other documents, including forecasts based on models providing the feasibility of the plan, are published by governmental or independent agencies[2]. Our examination of the feasibility of the NSEP is intended to be a substitute of such a document. Since this substitute has been constructed ex post, it cannot contribute now to the correction the NSEP. It only can eventually reveal the points where the plan is consistent and its feasibility — doubtful.

Variables of the NSEP are aggregates at various aggregation levels. It is therefore difficult to verify the consistency of paths of growth of all the variables mentioned in the NSEP. Besides, our examination has been boiled down to the variables describing the productive sphere of the economy. Other spheres, e.g. financial sphere and its relationships with the productive one have been omitted.

2. Model assumptions

The general idea of examination of realizability of the NSEP is the following. Two different sets of paths of growth are explicitly or implicitly assumed in the NSEP: the paths of growth of outputs of the productive sectors of the economy, and those of other variables: household consumption, collective consumption, investment, import, export, etc. The problem is, whether expected outputs and imports (both expressed in constant prices) meet final demand, created by consum-

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[2] Cf. New Economic and Social Seven-Year Plan and Econometric Model for the New Economic and Social Seven-Year Plan. Both documents were published by Economic Planning Agency, Government of Japan, August 1979. See also Control Economisch Plan, Netherlands Central Planning Bureau, Haga 1972.

ption, investment, export, etc. or not. If so, the NSEP is feasible, if not, the deficit occurs in at least one sector of the economy.

All the vectors used in the model are n-dimensional, and the matrices are square, (n, n), where n stands for the number of production sectors[3]. Vectors and matrices are denoted by capital letters, aggregates are denoted by lowercase letters. The NSEP covers the following years: 1983, 1984, 1985 (time index $t = 1983, 1984, 1985$). The plan horizon is designated by $T = \{1983, 1984, 1985\}$.

Material balance is described as follows

$$R_t = X_t + M_t - (Z_t + C_t + C_t^c + I_t + E_t) \quad (t \in T).$$

In the formula, the following notation is used: X — gross outputs, M — imports, Z — current inputs, C — private consumption, C^c — collective consumption, I — investment, E — exports. The residual quantity, R_t, denotes surplus of gross output plus import over total (productive and final) demand. Negative value of an element of vector R_t means deficit of goods originated from the corresponding sector in year t[4].

To estimate the surplus, vector R_t, some additional assumptions have to be employed. The assumptions take the following form.

Gross output of the i-th sector of the economy grows at a constant rate w_i within the plan horizon

$$x_{i, 1982+\tau} = (1+w_i)^\tau x_{i, 1982} \quad (\tau = 1, 2, 3).$$

Symbol $x_{i,1982}$ denotes gross output originated from the i-th sector in 1982. ($x_{i,1982}$ stands for the i-th element of X_{1982}). Rates w_i have been derived from the NSEP.

Current input is proportional to gross output

$$Z_t = A_t X_t \quad (t \in T).$$

Two various matrices of flow coefficients, A_t, were estimated. In the first, matrix A has been assumed to be constant over the NSEP horizon, whereas in the second one the same matrix has been assumed to change, in accordance with governmental expectations concerning the reduction of material and energy current inputs. Both matrices were estimated on the basis of the matrix A_{1980}, which was the most up to date matrix of flow coefficients available.

The first version. Within 1980–82 significant changes in technology and prices took place in Poland. To capture these changes, the matrix A_{1980} was modified, at first with respect to prices and then with respect to technology changes. The matrix

$$A_{1982} = P_{80}^{82} A_{1980} (P_{80}^{82})^{-1},$$

where P_{80}^{82} stands for diagonal matrix of price indices of goods originated from particular sectors (1980 is the basic year for price indices). The matrix A_{1982} reflects price changes but it assumes the same technology that matrix A_{1980} does.

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[3] Number of the production sectors in calculation was $n = 17$. Their names are listed in table 1

[4] All the quantities are expressed in constant (1982) prices except for several cases, which will be carefully marked.

Changes in technology were estimated on the basis of observation of changes in material cost of production. Let k_j^r be the material cost of production in the j-th sector (in current prices), and k_j^h — the hypothetical cost which the j-th sector would bear if technology did not change within 1980–82. Hypothetical cost has been defined as

$$k_j^h = x_{j,1982} \sum_{i=1}^{n} a_{iJ,1982},$$

where $a_{iJ,1982}$ stands for the (i,j)-th element of the matrix A_{1982}. A quotient k_j^r/k_j^h has been accepted as a measure of technological changes in the j-th sector. A matrix

$$A = A_{1982} K,$$

where K stands for the diagonal matrix of quotients k_j^r/k_j^h, was further on accepted as the matrix of flow coefficients for 1983–85. Although the total material input by sectors suggested by A differs from that suggested by A_{1982}, the relations of inputs in every sector of the economy are the same.

The second version of matrix of flow coefficients reflects governmental expectations concerning reduction of material and energy inputs. These expectations have been expressed by the assumptions that

— inputs of products originated from all the sectors (except for "Fuel and Energy") diminish in industry at annual rate $1 - k^m$,

— inputs of products originated from sector "Fuel and Energy" diminish in the whole economy at annual rate $1 - k^e$.

Hence, the second version of flow coefficient matrix assumes the form

$$A_{1982+\tau} = (K^e)^\tau A (K^m)^\tau \quad (\tau = 1, 2, 3),$$

where K^e, K^m stand for diagonal matrices such that: all the diagonal elements of K^e are equal to 1 except for the element corresponding to sector "Fuel and Energy" which is equal to k^e ($k^e < 1$); all the diagonal elements of K^m are equal to 1 except for the elements corresponding to industry sectors which are equal to k^m ($k^m < 1$).

Household consumption. Two approaches to projection of household consumption (by sectors) have been employed. Both of them are, strictly speaking, projections of consumers' expenditures. In the first approach, the sectoral structure of expenditures has been projected. In the second, the projected expenditures are first divided by groups of products and services (consumption categories), and then converted into expenditures divided by sectors. The first approach assumes that aggregated household expenditures c_t increase within the plan horizon in accordance with the NSEP expectations. Sectoral structure of expenditures, S^c, has been assumed to be the same as that of the year 1980 in terms of 1982 prices. Hence,

$$C_t = c_t S^c \quad (t \in T).$$

In the second approach, first the expenditures by consumption categories, $\overline{C_t^g}$, have been projected, and then they have been converted into expenditures by sectors. For this purpose a matrix V, called the conversion matrix, has been used. The (i, l)-th element of matrix V determines the share of products and services originated from the i-th sector in the l-th consumption category. (Of course, $1_n V = 1_g$. Symbols 1_n, 1_g stand for n- and g-dimensional vectors of ones, and g — for number of categories). According to this approach it has been assumed that

$$C_t = VC_t^g.$$

The conversion matrix was estimated on the basis of the statistical data for 1977[5]. Projections of the household expenditures divided by consumption categories were elaborated in 8 versions. Two of them are described below.

The first version encompasses the categorial structure of the household expenditures which corresponds to the NSEP projections of market supplies of products and services of consumption categories. The second version considers the expenditures by categories projected by means of expenditure functions, relating the shares of expenditures for particular consumption categories to household income. Variables of all the functions have been expressed in per capita terms, and their parameters have been estimated on the basis of statistical data covering the period 1970–77. The estimated functions were used to project the expenditures for 1982 and 1983–85. The projections for 1982 differ from statistically observed expenditures in this year. The differences between both quantities were used for revision of the projections (proportionally to the differences) of the expenditures for 1983–85 As the result of the last procedure, the projected structure of consumption is a combination of the structure of expenditures observed in the seventies (which is supposedly a desired one), and of the structure observed in 1982.

Unfortunetely, because of a long-lasting disequilibrium on the consumer market in Poland, both approaches to disaggregation of household expenditures (by sectors and by categories) do not answer the question, what the structure of expenditures would have been if the demanded products and services had been available on the consumer market (taking income and prices for granted). Also, it is impossible to estimate to what extend the variants of household expednitures assumed, reflect the future consumers' demand.

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[5] The conversion matrix used in calculations was rectangular (17,29) — dimensional.

To estimate such a matrix detailed data are needed. Among other things an information as to sectoral composition of every consumption category is needed. Moreover, the data have to be expressed in terms of
— prices paid to producers,
— prices paid by consumers.
The difference between the values of expenditures for products of a given consumption category expressed in prices of both types is the margin of profit, value added of a sector "Whole and Retail Trade", assigned to products and services of that category. The most up to date, sufficiently detailed data suitable for estimation of the conversion matrix come from the year 1977.

Collective consumption, C_t^c, was projected in the following way

$$C_t^c = c_t^c S_t^{cc} \quad (t \in T).$$

Aggregated collective consumption, c_t^c, has been taken from the NSEP, and vector S^{cc} reflecting sectoral structure of collective consumption has been assumed to be identical to that of the year 1980 (in terms of prices of 1982). It is a primitive approach to determination of the paths of growth of collective consumption, but there is no evidence in the NSEP that the government intends to change the sectoral structure of collective consumption.

Foreign trade (E — exports, M — imports). Because the methods of projection of exports and imports are the same, we will describe only the way in which two alternative paths of growth of exports were determined. In the first one it has been assumed that sectoral structure of export within the plan horizon will be approximately identical to that observed in 1980. The latter structure has been modified in order to take into account the NSEP expectations concerning export of products originated from the sector "Machinery". Vector of such modified structure coefficients will be denoted by S^e.

In the second export path two vectors S^{ec}, S^{es} of coefficients characterizing the sectoral structure of export to two groups of countries (capitalist and socialist) have been distinguished. Both vectors have been determined on the basis of foreign trade data of the year 1982 and modified as to take into account the planned increase of export of products originated from the sector "Machinery". In the first variant, the paths of growth of export have been defined by the following equation

$$E_t = e_t S^e \quad (t \in T),$$

whereas in the second variant — by the equation

$$E_t = e_t^c S^{ec} + e_t^s S^{es} \quad (t \in T),$$

where e_t^c, e_t^s stand for aggregated export to capitalist and socialist countries, $e_t = e_t^c + e_t^s$. In the second version the sectoral structure of projected export in consecutive years is a sort of compromise between structures S^{ec} and S^{es}.

Investment. The NSEP is a short-term (1983–85) plan rather than a long-term one. The horizon of this plan seems to be too short in order to observe a new capital stock (generated by investment activity within the horizon) coming into use. We have assumed therefore that investment activity within the NSEP horizon does not exert any influence on the growth of output. (The paths of growth of output have been assumed given). Nevertheless the paths of growth of investment must be taken into account, because investment activity creates a demand for products and services within the plan horizon.

Two various paths of growth of investment have been taken into account. They differ from each other with respect to the sectoral structure of investment, S^i. In the first variant, the structure observed in 1980 was assumed whereas in the se-

cond — the structure observed in 1982. The growth of aggregated investment, i_t, corresponds to that mentioned in the NSEP. Finally, the paths of growth have been derived from the following equation

$$I_t = i_t \, S^t \qquad (t \in T).$$

3. Computations

While analyzing the feasibility of the NSEP we have considered
— 2 various matrices of flow coefficients,
— 9 paths of household consumption (one, projecting the sectoral structure of consumption of the year 1980; two in which the categorial structure of consumers' expenditures correspond to the expectations of the NSEP concerning consumption and market supplies of products and services of particular categories; 6 alternative projected structures of consumers' expenditures formed in various periods in the past),
— 2 paths of exports and imports,
— 2 paths of investment.
Combining the above we have derived 72 paths of surplusses and deficits. In the enclosed tables, 2 paths of household consumption, 2 paths of investment, and 6 paths of surpluses and deficits are presented.

4. Results of experimental computations

Paths of growth of particular variables, and as a consequence, paths of growth of surpluses and deficits depend upon three groups of assumptions concerning
— the structure of the economy, which is supposed to be unchanging within the NSEP horizon,
— consumers' behaviour,
— some quantities, the values of which have been taken from the plan.
The assumptions of the third group reflect intentions of the government (or planners acting on its behalf). The first two groups contain hypotheses, some of them very arbitrary. Since the hypotheses are controversial, so are the results. Aware of that fact, we will present some results of experimental computations.

In Table 1 the paths of growth of household consumption are presented: $C1$ — characterized by the sectoral structure of consumers' expenditures of the year 1982 (upper rows), and $C2$ — characterized by the categorial structure of consumers' expenditures of the seventies (lower rows).

In Table 2 the paths of growth of investment are given: characterized by the sectoral structure of the year 1980 (upper rows) and of the year 1982 (lower rows).

In Tables 3–5 six various paths of growth of deficits and surpluses of outputs (and imports) over final demand by sectors are given. Presented in Table 3 ver.

1980 is characterized by sectoral structure of particular components of final demand observed in the year 1980. Tables 4 and 5 contain ver. 1982 and ver. P of the paths of growth of deficits and surpluses. Both of them are characterized by sectoral structure of components of final demand (except for the household consumption) observed in 1982. In ver. 1982 the categorial structure of consumers' expenditures is equal to that of the seventies whereas in ver. P it reflects the NSEP assumptions concerning market supplies of goods. Every table of the last three contains two paths of growth of surpluses and deficits: corresponding to the matrix of flow coefficients constant over time (upper rows), and — to the matrix changing over time in accordance with the NSEP expectations conecrning reduction of material and energy inputs (lower rows).

Paths of growth of components of final demand

1. Comparison of two versions of household consumption reveals that expenditures for products and services originated from the following sectors: "Fuel and Energy", "Machinery", "Chemicals", "Glass, Stone and Clay Products" are significantly greater in ver. $C1$ than in ver. $C2$, whereas consumers' expenditures for products and services originated from: "Light Industry" and "Agriculture" ("Field Grops") are significantly lower in ver. $C1$ than in ver. $C2$. The consumption in ver. $C1$ requires the development of technologically more advanced sectors than that projected in ver. $C2$.

2. We will not go in depth into this case of household consumption in which categorial structure corresponds to the NSEP projections of market supplies of products and services. Except for "Light Industry", it is very close to $C2$. The expenditures for products of the abovementioned sector are significantly greater than in ver. $C2$[6].

3. The sectoral structure of export in 1980 differed from that in 1982. It is worth noticing that the share of "Fuel and Energy" products fell down in 1982 as compared with 1980 (because of coal export collapse).

4. Only 5 of 17 sectors into which the economy was divided were indentified as investment sectors (i.e. as producers of capital goods). They are as follows: "Machinery", "Wood and Paper Industry", "Construction", "Transportation and Communication", "Wholesale and Retail Trade". As a consequence of that fact, 5 positive elements of vector S (and vectors I_t) correspond to the investment sectors. The zero elements correspond to the non-investment sectors.

The sectoral structure of investment in 1982 differed significantly from that in 1980 The former structure was characterized by greater share of "Construction" services and smaller of "Machinery" products in the total value of investment.

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[6] This path of household expenditures can be reconed on the basis of tables: 1, 4, 5. The latter two tables contain paths of growth of surpluses and deficits differing from each other only with respect to household expenditures.

Paths of growth of surpluses and deficits

5. It is obvious that assuming reduction of material and energy inputs makes the obtained projected volume of final product greater, and as a consequence — greater is the projected surpluses of output (and import) over demand. (Compare figures in relevant rows of Tables 3–5). This additional surplus occurs with various intensity in various sectors, the relatively greatest one in sectors producing intermediate goods („Fuel and Energy", "Metallurgy", "Machinery", "Chemicals").

6. The following sectors: "Fuel and Energy", "Agriculture" ("Livestock") show deficits of output in every alternative path and every year of the NSEP horizon. Both sectors turned out, therefore, to be the "bottleneck" of the economy. Assuming diminishing material and energy inputs the deficits are shirinking whereas with constant input coefficients over time the deficits are getting larger.

7. Also, the computations reveal deficits of output of two following sectors: "Agriculture" ("Services"), "Wholesale and Retail Trade". It seems to us that the projected deficits in both sectors are the result of assumptions that the structure of the economy formed at the beginning of the eighties will not change in the mid eightees. Because of sharp price rising at the beginning of the eighties the demand for services in agriculture diminished. As a result, the demand for services projected by means of our model is overestimated. For similar reasons the projected deficit of "output" (margin of profit) of sector "Wholesale and Retail Trade" seems to be overestimated.

8. The deficits and surpluses of services originated from sector "Construction" need special attention. Generally, ver. 1980 is less construction services consuming than ver. 1982 and ver. P. In ver. 1980 a deficit has appeared for the year 1982, in ver. 1982 — for the years 1982–1983 (and for 1984 if constant technology has been assumed), and in ver. P — for the years 1982–1984. In the last two cases the sectoral structure of investment of the year 1982 has been assumed, whereas in ver. 1980 — the structure of the year 1980. Results derived by us may evidence that changes in the sectoral structure of investment give rise to the relative shortage of services provided by sector "Construction".

9. In ver. P, identifying the categorial structure of household consumption with the market supplies of products and services projected by the NSEP, a deficit of output of "Light Industry" has appeared for 1984–85. It may suggest the impossibility of achieving the level of market supply with goods originating from this sector assumed in the NSEP (taking for granted the planned rate of growth of output of this sector).

Projected surpluses and deficits versus actual development of the Polish economy in 1983–84

A comparison of the computed results and data describing development of the Polish economy in 1983–84 leads to the following conclusions.

According to the NSEP, it was expected that within the plan horizon current material inputs in industry would be lowered annually by 1.9–2.2%, and energy input — 2.5–3%. It turned out, however, that material inputs were lowered in 1983 only by 1.4%, and energy input — only 2% (Cf. "Życie gospodarcze" ("Economic Life") nr 7, 12.02.1984). A similar tendency could be observed in 1984. The inputs were lowered less than we had assumed in computations, where $k^m = 0.98$, $k^e = 0.975$, what means 2% annual reduction of material inputs in industry and 2,5% annual reduction of energy inputs in the whole economy. As a result, the alternatives assuming matrices with diminishing flow coefficients proved to be too optimistic in comparison with the development of the economy, approximately by a quarter of differences between these alternatives and those assuming constant matrix of flow coefficients.

6° Import of products of sector "Fuel and Energy" increased by 18% in 1983 as compared with 1982 (Cf. Statistical Yearbook (SYB) 1984, pp. 212, 353) although only 9% growth of import was assumed in the NSEP. This rapid growth of import may evidence relative shortage of products originated from the sector mentioned above.

In 1983 the 0.4% increase of livestock and the 0.5% decrease of deliveries of livestock were noticed. Also, in the same year import of agricultural products slightly decreased and export — slightly increased (Cf. SYB 1984, pp. 282, 353, 354). The shortage of agricultural products did not significantly change in 1983.

7° In 1983 "Agriculture" purchased 12% less services as compared with the previous year, although output of this sector increased by 3.3% (Cf. SYB 1984, pp. 280, 283). It shows that demand of "Agriculture" for services dropped in 1983 as compared with the beginning of the eighties (mainly because of the price rise as mentioned before).

8° In 1983 output of sector "Construction" increased by 7.2% whereas in the same time total value of investment exceeded its planned value over 115 millions what makes 10% of the investment planned for 1983. It is worth noticing that an "improper" sectoral structure of investment formed at the beginning of the eighties remained in 1983 (and 1984). (The share of construction works in total investment outlays dropped only by 0.8% as compared with 1983). (Cf. SYB 1984, p. 174 and "Życie Gospodarcze" ("Economic Life") nr 7, 12.02.1984). Two facts: tendency to over-investing and "improper" sectoral investment structure lead to the conclusion that this sector will be the "bottleneck" of the economy in the future.

9° Generally, the increase in output of every branch of the industry was greater in 1983 than the increase projected by the NSEP (Cf. SYB 1984, p. 207). The only exception is "Light Industry", whose output increased less than it had been expected. It may be the first signal of difficulties in satisfying the final demands for "Light Industry" products at the planned level, foreseen by our computations in the form of deficits of products of this industry in ver. P.

Table 1. Household consumption ($\times 10^9$ zl)

Sectors	Years			
	1982	1983	1984	1985
1. Fuel and Energy	104.3	107.7	111.3	114.8
	84.2	86.7	89.1	91.4
2. Metallurgy	.2	.2	.2	.2
	.1	.1	.1	.1
3. Machinery	209.0	215.8	222.7	229.9
	179.5	190.1	200.9	211.9
4. Chemicals	90.1	93.0	96.0	99.1
	62.0	65.0	68.1	71.3
5. Glass Stone and Clay Products	30.3	31.3	32.4	33.4
	20.7	21.9	23.0	24.2
6. Wood and Paper	86.9	89.6	92.5	95.5
	89.6	94.2	98.8	103.5
7. Light Industry	276.2	285.2	294.4	303.8
	297.8	312.4	326.9	341.4
8. Processed Food	1 217.3	1 256.6	1 297.1	1 339.0
	1 211.0	1 263.8	1 316.7	1 369.6
9. Other Industries	22.0	22.8	23.5	24.2
	22.8	23.9	25.0	26.0
10. Construction	22.2	23.0	23.8	24.5
	18.3	19.1	19.8	20.5
11. Agriculture: Field Crops	152.0	156.9	161.9	167.1
	152.1	157.0	161.7	166.3
12. Livestock	164.1	169.4	174.8	180.6
	191.9	198.6	205.1	211.6
13. Services	.2	.2	.2	.2
	.4	.4	.4	.4
14. Forestry	2.0	2.1	2.2	2.2
	5.6	5.7	5.8	6.0
15. Transportation and Communication	84.4	87.1	90.0	92.9
	97.0	101.1	105.2	109.3
16. Wholesale and Retail Trade	463.0	477.9	493.2	509.2
	490.5	512.6	534.8	557.1
17. Other Goods and Productive Services	49.1	50.6	52.2	54.0
	51.3	53.1	54.8	56.6

Table 2. Investment ($\times 10^9$ zl)

Investment Sectors	Years			
	1982	1983	1984	1985
3. Machinery	290.9	360.6	366.5	372.5
		295.7	300.5	305.4
6. Wood and Paper	1.4	1.7	1.7	1.8
		1.4	1.4	1.5
10. Construction	810.4	754.2	766.6	779.1
		823.7	837.3	851.0
15. Transportation and communication	.9	1.1	1.1	1.1
		.9	.9	.9
16. Wholesale and Retail Trade	18.7	23.1	23.5	23.9
		19.0	19.0	19.6

Table 3. Surpluses of outputs ($\times 10^9$ zl)
Version 1980

Sectors	Years			
	1982	1983	1984	1985
1. Fuel and Energy	−159.2	−176.1	−190.0	−204.0
		−148.2	−133.0	−116.5
2. Metallurgy	34.2	33.9	33.3	32.6
		48.3	63.5	80.2
3. Machinery	232.4	213.3	260.0	309.0
		227.0	288,7	354.2
4. Chemicals	20.4	19.3	34.0	51.6
		26.9	50.0	75.7
5. Glass, Stone and Clay Products	23.1	22.3	20.8	19.0
		24.6	25.5	26.3
6. Wood and Paper	17.4	18.3	25.3	32.7
		21.2	31.4	42.3
7. Light Industry	40.1	44.3	47.5	51.2
		49.6	58.4	68.2
8. Processed Food	27.7	8.0	9.6	11.3
		16.7	27.4	38.7
9. Other Industries	9.8	11.3	14.5	17.9
		12.5	17.0	21.8
10. Construction	−36.7	63.4	81.4	100.4
		65.0	84.7	105.5
11. Agriculture: Field Crops	180.2	195.2	199.5	204.1
		200.7	210.7	221.4
12. Livestock	−66.6	−73.1	−76.6	−81.3
		−61.3	−52.5	−43.3
13. Services	−7.2	−7.3	−7.5	−7.6
		−7.3	−7.5	−7.5
14. Forestry	24.5	22.6	21.7	21.0
		23.5	23.6	24.0
15. Transportation and Communication	78.3	97.4	96.2	94.4
		101.1	103.9	107.9
16. Wholesale and Retail Trade	−46.4	−34.8	−20.7	−5.3
		−35.2	−26.4	−6.2
17. Other Goods and Productive Services	−24.5	−26.4	−28.4	−30.8
		−25.1	−25.8	−26.7

Table 4. Surpluses and deficits ($\times 10^9$ zl)
Version 1982

Sectors	Years			
	1982	1983	1984	1985
1. Fuel and Energy	−139.0	−150.8	−165.4	−180.5
		−122.9	−108.4	−93.0
2. Metallurgy	34.3	33.8	32.7	31.4
		48.2	62.9	78.9
3. Machinery	261.9	303.9	347.8	394.1
		317.6	376.5	439.3

Tab. 4 c.d.

1	2	3	4	5
4. Chemicals	48.5	63.2	80.4	99.9
		70.8	96.4	125.0
5. Glass, Stone and Clay Products	32.7	31.2	29.6	27.5
		33.5	34.3	34.8
6. Wood and Paper	14.7	19.6	25.3	31.2
		22.5	31.4	40.8
7. Light Industry	18.5	16.4	14.8	14.0
		21.7	25.7	31.0
8. Processed Food	34.0	23.8	15.0	7.8
		32.5	32.8	35.2
9. Other Industries	9.0	11.7	14.5	17.8
		12.9	17.0	21.7
10. Construction	−32.8	−18.3	−3.0	13.0
		−16.7	.3	18.1
11. Agriculture: Field Crops	180.1	183.1	187.8	193.2
		188.6	199.0	210.5
12. Livestock	−94.4	−98.8	−103.3	−107.6
		−87.0	−79.2	−70.6
13. Services	−7.4	−7.5	−7.7	−7.8
		−7.5	−7.7	−7.7
14. Forestry	20.9	20.1	19.2	18.3
		21.0	21.1	21.3
15. Transportation and Communication	65.7	61.3	57.6	53.0
		65.0	65.3	66.5
16. Wholesale and Retail Trade	−73.9	−68.6	−61.5	52.4
		−69.0	−67.2	−53.3
17. Other Goods and Productive Services	−26.7	−28.9	−31.0	−33.3
		−27.6	−28.4	−29.2

Table 5. Surpluses of outputs ($\times 10^9$ zl)
Version P

Sectors	Years			
	1982	1983	1984	1985
1. Fuel and Energy	−139.0	−156.1	−176.1	−196.7
		−128.2	−119.1	−109.2
2. Metallurgy	34.4	33.8	32.7	31.4
		48.2	62.9	78.9
3. Machinery	262.0	297.8	336.1	376.6
		311.5	364.8	421.8
4. Chemicals	48.5	60.6	75.1	92.1
		68.2	91.1	117.2
5. Glass, Stone and Clay Products	32.7	30.5	28.0	25.2
		32.8	32.7	32.5
6. Wood and Paper	14.8	15.4	16.7	18.3
		18.3	22.8	27.9
7. Light Industry	19.0	3.8	−10.9	−24.9
		9.1	.0	−7.9

Tab. 5 c.d.

1	2	3	4	5
8. Processed Food	34.0	50.9	69.1	88.9
		59.6	86.9	116.3
9. Other Industries	9.0	10.8	12.6	14.8
		12.0	15.1	18.7
10. Construction	−32.8	−19.2	−4.9	10.1
		−17.6	−1.6	15.2
11. Agriculture: Field Crops	180.1	180.4	182.3	184.7
		185.9	193.5	202.0
12. Livestock	−94.4	−98.3	−102.5	−106.6
		−86.5	−78.4	−69.6
13. Services	−7.4	−7.5	−7.7	−7.9
		−7.5	−7.7	−7.8
14. Forestry	21.2	19.9	18.6	17.4
		20.8	20.5	20.4
15. Transportation and Communication	65.7	56.5	47.8	38.5
		60.2	55.5	52.0
16. Wholesale and Retail Trade	−73.8	−72.9	−70.0	−65.2
		−73.3	−75.7	−66.1
17. Other Goods and Productive Services	−26.5	−31.6	−36.7	−42.0
		−30.3	−34.1	−37.9

Analiza wewnętrznej zgodności planu trzyletniego (1983--85) dotyczącego sfery produkcyjnej gospodarki polskiej

W pracy zbadano, za pomocą prostego modelu, wewnętrzną zgodność różnych wariantów planu trzyletniego 1983—85. Zaprezentowany model jest substytutem pewnej metody budowy planu. Dotyczy on mianowicie sfery produkcyjnej gospodarki: popytu końcowego, dochodów i wydatków ludności oraz wydatków budżetowych. Powiązania finansowe zostały ominięte. Przeprowadzona analiza ilościowa ujawnia słabe punkty planu 3-letniego.

Анализ внутренней согласованности трехлетнего плана (1983--85), касающегося производственной сферы польской экономики

В работе исследуется, с помощью простой модели, внутренняя согласованность разных вариантов трехлетнего плана 1983—85. Представленная модель позволяет реконструировать метод разработки плана. Касается он производственной сферы экономики: конечного спроса, доходов и расходов населения, а также бюджетных расходов. Финансовые связи не учитывались. Проведенный количественный анализ выявляет слабые места трехлетнего плана.