COMENIUS UNIVERSITY IN BRATISLAVA
FACULTY OF MATHEMATICS, PHYSICS AND INFORMATICS

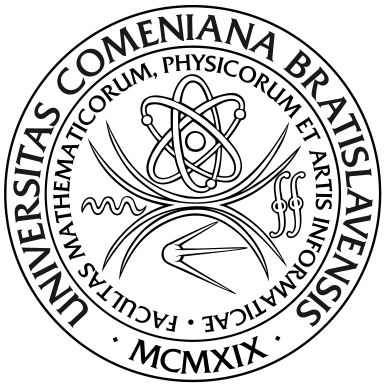
DEVELOPMENT OF THE SLOVAK ECONOMY BASED ON STRUCTURAL DECOMPOSITION

MASTER'S THESIS

Adam Řehůřek 2011

COMENIUS UNIVERSITY IN BRATISLAVA
FACULTY OF MATHEMATICS, PHYSICS AND INFORMATICS

DEPARTMENT OF APPLIED MATHEMATICS AND STATISTICS



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MASTER'S THESIS

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Mathematics of Economics and Finance

Supervisor:
Univ. Prof. Dipl.-Ing. Dr. Mikuláš Luptáčik

Bratislava 2011

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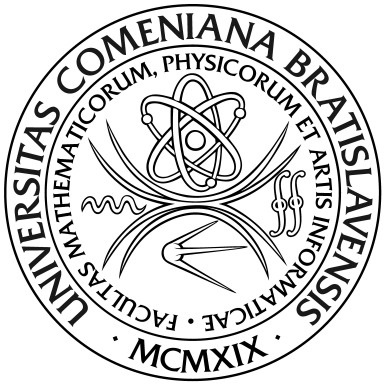

Analýza vývoja slovenskej ekonomiky založená na metóde štrukturálnej dekompozície

DIPLOMOVÁ PRÁCA

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Ekonomická a Finančná Matematika

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Cieľ : By applying the method of structural decomposition to analyse effects of particular factors on development of relevant economic indicators of the Slovak economy (gross output, employment, value added, import intensity, productivity) between years 2000 and 2005.

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Declaration

I declare that all parts of this thesis have been written by myself and that I have only used references explicitely referred to in the text.

Bratislava, August 2011 .....

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Abstract

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The thesis concerns with the assessment of development of the Slovak economy by means of the input-output analysis. In order to undertake this study, commodity-by-commodity symetric input-output tables for years 2000 and 2005 were provided by the Statistical Office of the Slovak Republic. Especially crucial role was played by the property, that both datasets were quantified in basic prices of the year 2000. Hence, besides the classical multiplier analysis we were allowed to employ also non-standard input-output techniques such as structural decomposition and measuring the rate of growth in economic productivity. Eventually, this led to quite remarkable grasp of the subject, i.e. much deeper insight into changes in relevant economic indicators and recognition of interdependencies among various sectors within the economy.

Keywords: input-output analysis, multipliers, structural decomposition, economic productivity

Abstrakt

Řehůřek, Adam: Analýza vývoja slovenskej ekonomiky založená na metóde štrukturálnej dekompozície [Diplomová práca]. Univerzita Komenského v Bratislave. Fakulta matematiky, fyziky a informatiky. Katedra aplikovanej matematiky a štatistiky. Vedúci diplomovej práce: Univ. Prof. Dipl.-Ing. Dr. Mikuláš Luptáčik. Bratislava: Fakulta matematiky, fyziky a informatiky, 2011. 89 s.

Práca sa prostredníctvom metód input-output analýzy venuje zhodnoteniu vývoja slovenskej ekonomiky. Za účelom vykonania tejto štúdie boli Štatistickým úradom Slovenskej republiky poskytnuté symetrické input-output tabuľky za roky 2000 a 2005 v komoditno-komoditnom členení. Nesmierne dôležitú úlohu pritom zohrala skutočnosť, že obe spomínané sady dát boli kvantifikované v bežných cenách roku 2000. Z toho dôvodu mohli byť okrem štandardne vykonávanej analýzy input-output multiplikátorov aplikované taktiež nie celkom bežne používané nástroje input-output analýzy akými sú metóda štrukturálnej dekompozície a výpočet miery rastu ekonomickej produktivity. Všetky vyššie uvedené metódy nám napokon poskytli pomerne komplexný obraz o ekonomickom vývoji našej krajiny, t.j. umožnili hlbšie porozumenie štruktúry zmien, ktoré nastali v dôležitých ekonomických ukazovateľoch a taktiež poskytli bližšiu identifikáciu miery prepojenosti a súvislostí medzi jednotlivými oblasťami danej ekonomiky.

Kľúčové slová: input-output analýza, multiplikátory, štrukturálna dekompozícia, ekonomická produktivita

" If there is a God, he's a great mathematician. "

Paul Dirac

Contents

Introduction

Nowadays, input-output framework is a well known concept frequently applied while analyzing direct and indirect interdependencies among sectors within an economy. The goal of this thesis is to apply this analytical scheme on data representing volumes of production and consumption flows inside the Slovak economy. Based on the real data outcomes we later try to assess the economic development of this country.

In order to undertake this research, we were provided with the input-output datasets for two different time periods, in particular one for the year 2000 and one for the year 2005, which can be by means of the input-output analysis examined and compared. Within this framework, one may then try to interpret economically the changes and development of characteristic economic indicators.

Let us point out one important feature. The data which describe the Slovak economy flows throughout 2005 were quantified in basic prices of the year 2000. This was both very unique and very crucial property, since the influence of price changes was hence removed and so the relevance and credibility of the observed economic progress of Slovak economy was qualitatively maximized. The thesis is divided into following four parts.

The first part is devoted to general introduction into the input-output framework. The fundamental structure of widely used tables is depicted here as well as the generally understood notation of its components. The derivation of main input-output formulas is illustrated, some interesting input-output issues are discussed and a very short overview of real data is presented.

In the next chapter, the concept of the input-output multipliers is introduced. Since, through the reasonable interpratation of these indicators, one may very efficiently characterize features of the economy and relations which hold across the sectors. We focus on four types of these multipliers, derive their formulas and later present their figures for the Slovak economy. Notice, that this topic has already been addressed in Slovak economic literature (see [3]) and even in at least one master's thesis (see [8]) before and so is not much pioneering.

With the much more inovative and hence the main issue of this thesis concerns the third chapter, where the method of structural decomposition is introduced and discussed. This particular method is very useful while analyzing changes in some complex economic indicator, since the observed total change in this variable can be through this scheme decomposed into changes in its various components. Therefore, the analysis of changes in relevant economic indicators of the Slovak economy, i.e. gross

output, employment, value added and imports can be done more in detail (e.g. the contribution made by the change in technology or the change in the overall level of final demands can be recognized) and hence much better explained. At the end of this section, results based on the real-data analysis are presented.

Last part of the thesis is then devoted to one of many frontier areas in the input-output framework - measuring economic productivity. As far as we are concerned, this concept has not been explored yet in terms of the Slovak economy. Hence, we hope that both theoretical and practical results from this section will enrich our understanding of economic processes inside our country and provide even more detailed insight into the way how this economy works and evolves.

1 Fundamentals of Input-Output Analysis

This introductory chapter of the thesis is devoted to a brief explanation of common structure and some basic principles of the input-output models. Throughout this text, the open static Leontief input-output model is considered. However, we are not about to go much into depth in this area, just as much so that the reader could understand key ideas and relations and so could clearly comprehend subsequent parts of this text. Proper step-by-step derivation can be found for example in [6].

The most fundamental element of the input-output analysis is the so-called input-output table (matrix), denoted by X, which represents interindustry flows of goods and services. In order to detect and quantify these flows, one must first divide the economy into several categories. This procedure can be done in two ways. The first is to employ the "industry" classification, where each figure represents the magnitude of all flows of goods in/out of the respective industry. The second is to introduce the "commodity" classification, where each figure represents the flows of only one specific commodity (product). To understand the difference between these two approaches is truly important, since one industry may produce not just one (primary) product, but also (secondary) products which are the main goal of production process in some different industry and therefore, particular tables (values) obtained via either first or second classification often differ.

Currently across the EU, both depicted approaches are from 2008 classified according to the Statistical Classification of Economic Activities in the European Community - NACE Rev. 2. More precisely, the commodities are recognized according to the Statistical Classification of Products by Activity - CPA, but this is very closely related to the NACE. Since we are about to analyze data for the years 2000 and 2005, we follow the previously accepted classification according to NACE Rev. 1 [7] and CPA 2002.

To define the input-output table X, which will play important role in our next input-output discussion, one must first introduce the concept of the so-called "Make-Use" system, i.e. to introduce the "make" and the "use" matrices. The make matrix, denoted by $V = [v_{ij}]$, is the $n \times m$ matrix, while each out of its n rows represents an industry and its particular production of commodities and each out of its m columns represents a commodity and its production all across the industries (generally m does not have to be equal to n). Hence, v_{ij} represents the amount of commodity j produced by industry i. The $m \times n$ use matrix, denoted by $U = [u_{ij}]$, is constructed the other way around. The rows represent the commodities, while the columns represent the industries. Here, instead of the outputs

(production), each element stands for the input (supply) of particular commodity delivered into particular industry, i.e. u_{ij} represents the amount of commodity i used by industry j.

Now, by specially treating these matrices and some additionally defined vectors, two basic forms of the symetric input-output table (SIOT) can be derived (this topic is very extensive and has already been discussed recently in the thesis written by Daniela Šuhajová [8], so we decided not to include it into the thesis - for proper derivation see [5]). The first one is the form, when one obtains the $n \times n$ table completely in terms of industries. Both rows and columns are understood to represent the industries, while rows represent their outputs and columns represent their inputs. Then, each element x_{ij} characterizes the amount of goods which were delivered from industry i to industry j (and vice versa, the amount of goods purchased by industry j from industry i). The second form is the one, when the $m \times m$ table entirely in terms of commodities is obtained. Both rows and columns represent here the commodity categories and description of each element x_{ij} could be done analogically to the previous case.

According to the European System of Accounts (ESA 1995), the commodity-by-commodity tables are preferred. However, a few countries in the EU still rather compile industry-by-industry tables. As for the Slovak Republic, the make and use matrices and provided by the Statistical Office of the Slovak Republic each year, while the SIOTs only once in five years (stated by Eurostat directive). In this thesis, we analyze the 57×57 SIOTs presented in terms of commodities ($com \times com$) at basic prices of the year 2000 based on the commodity technology assumption.

In the theoretical parts of the thesis we frequently use words "sector" and "product" to cover the general idea of either industry or commodity classification. However, be aware that in the empirical parts, we almost exclusively address commodities and their classification (unless otherwise stated). Moreover, because the classifications CPA and NACE provide the same number of categories for both commodities and industries, we generally use n to indicate the number of categories into which the economy is divided into.

One additional feature is left to say about SIOTs at this stage. SIOTs provided by statistical offices generally represent the flows of goods both imported and domestically produced. Hence, these primary forms of input-output tables (referred to as version A) should be always accompanied by at least two other tables: a symmetric input-output table showing only the use of domestically produced goods (referred to as version B) and a symmetric table showing only the use of imports. In the following theoretical discussion, we mostly consider the general case of input-output

tables. However, in the empirical part we focus rather on the version B, since the effects mainly on domestic figures are about to be assessed.

So far, we have introduced the basic form of input-output table X. However, let's proceed further so that we can get to its so-called expanded form. In each economy there are purchasers whose demand for goods from other sectors is not much related to amount of their own production and more related to some external factors. Therefore, such sectors are known as "external units". These are for example government, households or foreign sales. Their purchases are often motivated by products as such and not considered as the input for their further production. These units are often referred to as the final-demand categories and their consumtion is known as the final demand.

If one denotes final demand for sector i's product as y_i and its total production as x_i, following equations clearly hold.

$$\begin{aligned} x_1 &= x_{11} + x_{12} + \ldots + x_{1i} + \ldots + x_{1n} + y_1, \\ x_2 &= x_{21} + x_{22} + \ldots + x_{2i} + \ldots + x_{2n} + y_2, \\ &\vdots \\ x_i &= x_{i1} + x_{i2} + \ldots + x_{ii} + \ldots + x_{in} + y_i, \\ &\vdots \\ x_n &= x_{n1} + x_{n2} + \ldots + x_{ni} + \ldots + x_{nn} + y_n. \end{aligned} \tag{1}$$

So, the particular distribution of sector i's production (output) across the economy is expressed in i's row of the matrix X and in the term y_i. As we already stated, value y_i is a complex variable and may be specified more in detail. In this text, we will consider decomposition of this variable into five (later four) elements with the following terminology: final consumption expenditure by households/consumers C, final consumption expenditure by non-profit organisations NZI, government purchases G, gross fixed capital formation (gross investments) THK and sales abroad (exports) EX. Therefore, following relation holds.

$$y_i = c_i + nzi_i + g_i + thk_i + ex_i. \tag{2}$$

If one speaks about consumption (input) of the sector i, this is expressed in the i's column of the matrix X. However, it is quite easy to see, that not only goods produced in sectors $1, 2, ..., n$ are actually inputs for the production process in the sector i. There are also some inputs from the so-called payments sector, such as label payments P or other value-added payments (interest payments, rental payments) N. By adding these together, one may introduce the variable which represents total value-added

payments $W = P + N$. Moreover, into the payments sector also belongs the volume of all inputs which were imported from foreign countries, denoted by M.

Since we already described all components of the expanded input-output table which are going to be discussed and used throughout this text, we may now on the Figure 1 illustrate its graphical form (for simplification we consider decomposition of the economy only into two processing sectors).

Input- Output Table		Processing Sectors 1	Processing Sectors 2	Final Demand					Total Output
Processing	1	x_{11}	x_{12}	c_1	nzi_1	g_1	thk_1	ex_1	x_1
Sectors	2	x_{21}	x_{22}	c_2	nzi_2	g_2	thk_2	ex_2	x_2
Payments Sector		p_1	p_2						$\mathbf{p}_\Sigma$
		n_1	n_2						$\mathbf{n}_\Sigma$
		m_1	m_2						$\mathbf{m}_\Sigma$
Total Outlays		x_1	x_2	$\mathbf{c}_\Sigma$	$\mathbf{nzi}_\Sigma$	$\mathbf{g}_\Sigma$	$\mathbf{thk}_\Sigma$	$\mathbf{ex}_\Sigma$	$\mathbf{x}_\Sigma$

Figure 1: Expanded input-output table for two-sector economy

If one sums down the last column of the table, the total gross output $\mathbf{x}_\Sigma$ throughout the economy is obtained.

$$\mathbf{x}_\Sigma = x_1 + x_2 + \mathbf{p}_\Sigma + \mathbf{n}_\Sigma + \mathbf{m}_\Sigma.$$

The same value is obtained, if one sums all the terms which appear in the last row of the table.

$$\mathbf{x}_\Sigma = x_1 + x_2 + \mathbf{c}_\Sigma + \mathbf{nzi}_\Sigma + \mathbf{g}_\Sigma + \mathbf{thk}_\Sigma + \mathbf{ex}_\Sigma$$

Since obviously both expression above are equal to each other, putting them together and rearranging the terms provides following expression.

$$\mathbf{p}_\Sigma + \mathbf{n}_\Sigma = \mathbf{c}_\Sigma + \mathbf{nzi}_\Sigma + \mathbf{g}_\Sigma + \mathbf{thk}_\Sigma + (\mathbf{ex}_\Sigma - \mathbf{m}_\Sigma).$$

The left-hand side of the depicted expression can be characterized as the gross national income (the total factor payments in the economy), while the right-hand side represents the gross national product (total purchases in the economy plus total value of net exports). Therefore, as long as we know values for all terms, it is possible to express their percentage contribution to either gross national income or gross national product.

Short Real Data Overview: With respect to the real data describing the Slovak economy, let us note at this point, that throughout this thesis we are going to use the currency SKK (Slovak koruna) instead of the current Slovak currency €, since the data we are about to discuss are owing to their time of origin quantified in SKK.

In the year 2000 the gross national product reached the level of 865 billion SKK. As for its components, household consumption stood for 54 percent, non-profit organization expenditures stood for 1 percent, government purchases stood for 21 percent, gross fixed capital formation stood for 27 percent and net export was negative with the contribution of minus 3 percent.

In the year 2005, the situation was not that much different. The gross national product grew with 28 percent and was quantified with the value of 1,1 trillion SKK. Its individual components were as follows: household consumption stood for 52 percent, non-profit organization expenditures stood again for 1 percent, government purchases stood for a bit less then 20 percent, gross fixed capital formation stood for 31 percent and the magnitude of net exports was negative again with the contribution of minus 4 percent.

To comment on these values, clearly non such a big change in the proportions occured over these studied five years. The biggest contribution in both years was done by the household consumption, somewhere over 50 percent in both cases. Second biggest share was added by the formation of gross capital, in year 2000 with one quarter of gross national product and five years later with almost one third of gross national product. The last element referred to as relatively big contributor were the government spendings, with the value throughout the observed period around 20 percent. Non-profit organisations as expected played very insignificant role in this calculations, reaching only 1 percent all over the time. As for the values of net exports, these were in both studied years negative, which means, that Slovak Republic imported from abroad goods of higher monetary value than goods which were exported. This fact is understood to be rather unpleasant and in order to increase the wealth situated in our country it shall be positively changed.

One interesting observation is still left to say. The amount of net exports did not change much compared to value of gross national product. However, if one looks closer on the single values of exports and imports, it turns out, that these both values increased over these five years by more that 50 percent, which implies, that Slovak Republic was truly over these five years becoming more and more widely opened economy.

But, let us get back to the theory and discuss the intersectoral flows of products once again. It is very crucial to notice one of the fundamental assumptions of the input-output analysis, that the amount of product i sold/delivered to sector j, or in other words the value x_{ij}, is entirely determined by the value x_j - the total output of sector j. For instance, the more pieces of wooden furniture are produced during the year, the higher level of logging is needed. Hence, it is quite reasonable to define the ratio of these two values as

$$a_{ij} = \frac{x_{ij}}{x_j}. \tag{3}$$

Terms a_{ij} for $i, j = 1, 2, ..., n$ are referred to as technical coefficients or input-output coefficients. The value a_{ij} is understood to be constant over the time (in the short run) and might be interpreted as the monetary worth of inputs from sector i needed for the production of one single output of the sector j. Apparently, all $a_{ij} \geq 0$.

Terms a_{ij} are components of the matrix A, which is referred to as the matrix of technical coefficients and which reflects direct requitements of production. Calculation of this matrix can be done via the formula

$$A = X\hat{X}^{-1}, \tag{4}$$

where $\hat{X}^{-1}$ is a diagonal matrix and on its diagonal lie inverted values of the output vector $x = [x_j]$. If we now rearrange the relation (3), the term x_{ij} can be expressed as $x_{ij} = a_{ij}x_j$. By substituting this into system of linear equations (1), we obtain the following system.

$$\begin{aligned}
x_1 &= a_{11}x_1 + a_{12}x_2 + \ldots + a_{1i}x_i + \ldots + a_{1n}x_n + y_1,\\
x_2 &= a_{21}x_1 + a_{22}x_2 + \ldots + a_{2i}x_i + \ldots + a_{2n}x_n + y_2,\\
&\vdots\\
x_i &= a_{i1}x_1 + a_{i2}x_2 + \ldots + a_{ii}x_i + \ldots + a_{in}x_n + y_i,\\
&\vdots\\
x_n &= a_{n1}x_1 + a_{n2}x_2 + \ldots + a_{ni}x_i + \ldots + a_{nn}x_n + y_n.
\end{aligned} \tag{5}$$

By this adjusted system of linear equations we are given the chance to explicitly derive the relation between demand for the goods and the level of their gross production. If we put all terms which represent the production

on the right side and all demand terms on the left, we obtain

$$\begin{aligned}
(1-a_{11})x_1 - a_{12}x_2 - \ldots - a_{1i}x_i - \ldots - a_{1n}x_n &= y_1,\\
-a_{21}x_1 + (1-a_{22})x_2 - \ldots - a_{2i}x_i - \ldots - a_{2n}x_n &= y_2,\\
&\vdots\\
-a_{i1}x_1 - a_{i2}x_2 - \ldots + (1-a_{ii})x_i - \ldots - a_{in}x_n &= y_i,\\
&\vdots\\
-a_{n1}x_1 - a_{n2}x_2 - \ldots - a_{ni}x_i - \ldots + (1-a_{nn})x_n &= y_n.
\end{aligned} \tag{6}$$

If we denote by I the $n \times n$ identity matrix and by $y = [y_j]$ the vector of final demand, the system (6) can be rewritten into the following matrix form.

$$(I - A)x = y \tag{7}$$

Right now, we may ask the very basic question of the input-output analysis: If one is able to forecast the upcoming final demands of all final-demand categories and the matrix of technical coefficients is known (since this matrix is fixed at least in the short run), what amount of production (output) would be necessary to cover all implied flows of goods?

Clearly, the mentioned statment stands for the fact, that both matrix A and the vector y are known and the unknown variable is the vector x. Whether there exists a unique solution for x from the expression (7) depends now on whether or not the matrix $(I - A)$ is singular. That is, whether or not the inverse matrix $(I - A)^{-1}$, referred to as the Leontief inverse, exists. As long as it exists, the vector x can be calculated via the equation

$$x = (I - A)^{-1}y. \tag{8}$$

Note, that this relation allows us to establish very interesting issue of the input-output calculus about values of the obtained vector of gross outputs. In particular, whether the logical assumption of non-negative final demands does or does not strictly imply non-negative production. Obviously, the answer depends on the values of $(I - A)^{-1}$. From (8), to guarantee that any $y \geq 0$ generates $x \geq 0$, all elements of the Leontief inverse must be clearly non-negative. While $A \geq 0$ and $N(A) < 1$ (where $N(A)$ denotes the norm of the matrix A, i.e. the largest sum of the absolut values of the elements in each column), which actually holds for the matrix of technical coefficients, the $x \geq 0$ is by non-negative y really assured.

This vague conclusion can be proven in several ways. Briefly, for example by means of the so-called Hawkins-Simon conditions. These two

men investigated the more general problem, when only $A \geq 0$ is assumed. Starting from the general definition of inversed matrix, which reads

$$(I - A)^{-1} = \left(\frac{1}{|I - A|} \right) [adj(I - A)], \tag{9}$$

where $|I - A|$ is determinant of the matrix and $[adj(I - A)]$ is the respective adjugate matrix, they derived the sufficient conditions to assure that system (8) implies $x \geq 0$. If we state, that by the principal minor of matrix $(I - A)$ is understood a determinant of the square matrix, which remains after removing one or more rows and the same columns from $(I - A)$, these conditions simply read, that all principal minors of matrix $(I - A)$ must be strictly positive (and they are indeed). For more detailed insight, see [5].

The non-negativity of vector x may also be recognized quite easily from the illustration done in the following section - Approximation of the Leontief Inverse. Nevertheless, notice at this point one important observation. The real-data figures y_i representing the overall final demand for sector i's product in fact take non-negative values and so the non-negative production across the economy is truly implied. However, as for the individual components of final demand, more precisely as for the element thk, negative values can be observed, too. This is caused by the fact, that gross investments also encompass changes in inventories, which can naturally take both positive and negative values. Though, in case of negative values, these must be logically compensated by the exact yet positive volumes spread across household consumption, non-profit organization expenditures, government spendings and exports.

If we denote elements of $(I - A)^{-1}$ by α_{ij}, the relation (8) can be rewritten as n linear equations of the following form.

$$\begin{aligned}
x_1 &= \alpha_{11}y_1 + \alpha_{12}y_2 + \ldots + \alpha_{1i}y_i + \ldots + \alpha_{1n}y_n, \\
x_2 &= \alpha_{21}y_1 + \alpha_{22}y_2 + \ldots + \alpha_{2i}y_i + \ldots + \alpha_{2n}y_n, \\
&\vdots \\
x_i &= \alpha_{i1}y_1 + \alpha_{i2}y_2 + \ldots + \alpha_{ii}y_i + \ldots + \alpha_{in}y_n, \\
&\vdots \\
x_n &= \alpha_{n1}y_1 + \alpha_{n2}y_2 + \ldots + \alpha_{ni}y_i + \ldots + \alpha_{nn}y_n.
\end{aligned} \tag{10}$$

This simple linear system provides us with the very obvious illustration, why the Leotief inverse is sometimes also referred to as the total requirements matrix. Apparently, it provides the explanation how the final production of all goods depends on each component of the final demand.

Furthermore, since we know from the expression (2) that the vector of final demands y can be decomposed into five elements c, nzi, g, thk and e, one may via following formulas calculate the output vectors generated separately by each of these elements (instead of notation c, nzi, ... we sometimes use y_C, y_{NZI}, ... or y^C, y^{NZI}, ...).

$$\begin{aligned} x_C &= (I-A)^{-1}y_C, \\ x_{NZI} &= (I-A)^{-1}y_{NZI}, \\ x_G &= (I-A)^{-1}y_G, \\ x_{THK} &= (I-A)^{-1}y_{THK}, \\ x_{EX} &= (I-A)^{-1}y_{EX}. \end{aligned} \tag{11}$$

Since the vector y_{THK} can take also negative values, be aware that this may result into "negative" production x_{THK}. Interpretation of this phenomenon is very clear, though - some parts of household consumption, non-profit organization expenditures, government spending or exports are going to be covered by warehouse stocks.

In addition, one may via similar formula calculate the value of the output that would be hypothetically generated by the vector of imported goods m, if this was to be produced exclusively inside the country.

$$x_M = (I-A)^{-1}m. \tag{12}$$

Approximation of the Leontief Inverse

One of the interesting problems, which are in these days already out of date but were very severe in input-output calculations carried out in the past was the issue of finding the Leontief inverse. It appeared to be true, that even if one knows all technical coefficients a_{ij}, it used to be quite hard to find the values of matrix $(I-A)^{-1}$, since gathered data were very often devided into fifty or sometimes even hundred processing sectors and hence one needed to invert quite a huge matrix. The answer to this issue was then simply by the power series approximation of the Leontief inverse, which provided satisfactory results while still performing relatively undemanding procedure.

Since today's computers are able to provide the inverse matrix almost immediatelly and with precise values α_{ij} for any reasonable number of sectors, there is no more need to consider any type of approximated matrices. Nevertheless, we would like to illustrate this method, since there lies very interesting economical interpretation behind this otherwise fully algebraic approach.

Let us consider the following matrix product

$$(I - A)(I + A + A^2 + A^3 + \cdots + A^n). \tag{13}$$

It is quite easy to see, that after premultiplication, this expression will be left only with the terms I and $(-A^{n+1})$.

$$(I - A)(I + A + A^2 + A^3 + \cdots + A^n) = (I - A^{n+1}). \tag{14}$$

Since $a_{ij} \geq 0$ for all i, j and also $\sum_{i=1}^{n} a_{ij} < 1$ for all j (i.e. $N(A) < 1$), as $n \to \infty$, the elements in A^{n+1} all become close to zero. This means, that for $n \to \infty$ the right-hand side of the expression (14) is left only with the identity matrix I. Therefore following expression holds.

$$(I - A)^{-1} = (I + A + A^2 + A^3 + \cdots). \tag{15}$$

Because the property $a_{ij} \geq 0$ implies that all terms on the righ-hand side are non-negative, the Leontief inverse in non-negative as well. Hence, the statement that the equation (8) for any $y \geq 0$ always generates $x \geq 0$ is proven. Moreover, the equation (8) after substitution from (15) takes the form

$$x = (I + A + A^2 + A^3 + \cdots)y,$$

or rather

$$x = y + Ay + A^2y + A^3y + \cdots . \tag{16}$$

If we now state, that in many applications done on this issue it has been shown that terms starting from A^8 are after multiplying the vector y almost zero and hence insignificant, one clearly sees that this method truly provides effective way of solving the established inverse problem in a fully algebraic manner.

As for the economical interpretation, notice that the terms on the right-hand side of the expression (16) actually represent the consecutive levels of production, which are necessary to supply the final demand y. First, to satisfy the final demand, the amount y (direct supply) must be produced. But, to produce the amount y, additional amount Ay (indirect supply) must be produced. Similarly, to produce the amount Ay, additional amount A^2y (next-level indirect supply) must be produced. One could follow now further with the explanation in the illustrated pattern.

2 Multipliers

2.1 Frequently Used Input-Output Multipliers

In case that the relevant input-output data are available for the economy, just as we are provided right now, these can be used to efficiently analyze various effects on the overall economic performance caused by specifically typed changes in the vector of final demand. One speaks then about a so-called impact analysis, which represents the occasion, when in the short run the action of one or maybe a few impacting subjects implies certain changes of the final demand. Typical example of this action might be the one, when the effect of changes in government spendings is to be assessed, e.g. the effect of investments in the form of building highways or buying new company cars for public administration.

The basis for this approach is the already proclaimed main formula of the input-output analysis

$$x = (I - A)^{-1}y.$$

More precisely, at this stage we are about to focus on the elements of Leontief inverse, since the theoretical impact on an economy caused by hypothetical changes can be revealed just through the special treatment of these values. In other words, via the illustrated formula and by intentionally designed vector of final demands y which corresponds to changes in question, one is able to calculate theoretical values implied by the expected y. For instance, when there is certain amount of money, lets say 30 million SKK, which is to be invested by the government into the automotive industry, there is a very simple calculation which leads to the number of generated output, either directly or indirectly. In particular, the calculation is done by creating a vector y full of zeros but the element which corresponds to the automotive industry sector, where appears the value 30 million SKK.

In general, there are more quite natural effects than just the one illustrated on the amount of production, which can be constructed from the above equation. From the elements of Leontief inverse $(I - A)^{-1}$ can be derived various summary indicators characteristic for the actual state of the studied economy. This indicators are referred to as the input-output multipliers. There are several types of multipliers, mentioned in the respective literature. In this text we focus on following four types: output multipliers, value-added multipliers, employment multipliers and import multipliers.

2.1.1 Output Multipliers

First type of multipliers we are about to present are the output multipliers. The output multiplier for sector j corresponds to the overall production across all sectors of the economy that is needed to supply one monetary unit of sector j's final demand. Thus, this measure indicates somehow the level of intersectoral linkage and dependences. As for the formula for its calculation, one obtains its value by summing the values in j's column of the Leontief inverse. Therefore,

$$O_j = \sum_{i=1}^{n} \alpha_{ij}. \tag{17}$$

To make clear the meaning behind this formula it is obiously good time to mention now explicitely the economical interpretation of values α_{ij}, although it was already indirectly explained in the above text. Since, the value α_{ij} can be understood as the output (direct requirement) of sector i that is necessary to deliver one monetary unit of sector j's product into the final demand. Hence, if the output multiplier is equal to sum of such values over the index i, it can be interpreted just as we claimed.

The greater value of the output multiplier, the greater output throughout the economy is needed and so the effect on the overall production is more intense. Thus, if there was for example an issue about whether the government should invest some money into one sector or another, the better choice would be implicitly to spend all this money in the sector with the greater output multiplier. However, this attitude can not be applied in all such cases, since it directly implies that all investments would end up in the one sector with the highest multiplier, which for many reasons is recognized as a rather unwise decision.

Starting from this presented concept, we may now introduce the multipliers of each final-demand category. In some sense, they give us the information about the effectiveness of the particular y's category or in other words, how the specific component of the final demand is transformed into the final output of the economy. Their values are indirectly based on the values of output mulpliers for sectors, into which the demand goes to and are calculated as the ratio between the overall output generated by the corresponding final-demand category and the summary value of the final-demand elements itself. Their formulas are as follows.

Multiplier of private consumption:

$$O_C = \frac{\sum_{j=1}^{n} x_j^C}{\sum_{j=1}^{n} y_j^C}, \tag{18}$$

Multiplier of government consumption:

$$O_G = \frac{\sum_{j=1}^{n} x_j^G}{\sum_{j=1}^{n} y_j^G}, \tag{19}$$

Multiplier of investments:

$$O_{THK} = \frac{\sum_{j=1}^{n} x_j^{THK}}{\sum_{j=1}^{n} y_j^{THK}}, \tag{20}$$

Multiplier of exports:

$$O_{EX} = \frac{\sum_{j=1}^{n} x_j^{EX}}{\sum_{j=1}^{n} y_j^{EX}}, \tag{21}$$

while ever since now, G indicates the joint values of government spendings and non-profit organisations consumption (because NZI alone is relatively small and insignificant) and all corresponding vectors x^p and y^p are related through respective expressions depicted in (11). Note, that since $x_j^p \geq y_j^p$ for all $j = 1, 2, ..., n$ and all p categories of the final demand, all presented multipliers are greater than (or hypothetically equal to) one.

2.1.2 Value-Added Multipliers

As we already mentioned in the first chapter, the extended input-output table includes among many other figures also the information about the value-added payments, denoted by W, that were generated inside the economy throughout the observed time period. This particular values can be used to calculate the next multiplier we would like to present, the value-added multiplier, which provides us with the information about the relation between the final demand and the resulting value added. In particular, the sector j's value-added multiplier represents the value added that was implied by increasing the final demand for sector j's product by one monetary unit.

In order to calculate this multiplier, the values of Leontief inverse are used again. Besides, one apparently needs to incorporate in some way the value-added vector $w = [w_j]$ as well, which is done as follows. The $n \times n$ diagonal matrix $\hat{A^W}$ is introduced, while on its diagonal appear the ratios between the value added observed in the sector and its overall output. Formally,

$$\begin{aligned} a_j^{\hat{W}} = a_{ij}^{\hat{W}} &= \frac{w_j}{x_j} \qquad \text{if} \quad i = j, \\ a_{ij}^{\hat{W}} &= 0 \qquad \text{otherwise.} \end{aligned} \tag{22}$$

The terms $a_j^{\hat{W}}$ are referred to as the value-added coefficients.

Now, the matrix of cumulative value-added coefficients R^W can be constructed using the following formula.

$$R^W = A^{\hat{W}}(I - A)^{-1}. \tag{23}$$

Components of the matrix R^W characterize direct and indirect effects on magnitudes of value added caused by the change in vector of the final demand. Eventually, by summing these elements down the columns, the certain value-added multipliers for each sector can be quantified.

$$\psi_j^W = \sum_{i=1}^{n} r_{ij}^W, \tag{24}$$

2.1.3 Employment Multipliers

Very similar to the previously illustrated concept is the idea of the so-called employment multipliers. These provide us with the information about the employment which is via the production process generated by the final demand. More precisely, the sector j's employment multiplier represents the level of employment, i.e. number of employees that is needed to deliver one monetary unit of sector j's product into the final use.

The formula for this multiplier has the very same structure as in the case of the value-added multiplier, but instead of the vector of value added taken from the input-output table the vector $l = [l_j]$ of employees' counts across the sectors is considered. Notice, that this vector is generally not a component of the extended input-output table and so one needs to look for its values elsewhere (e.g., tables for the Austrian economy include this vector, but the Slovak don't). Once this vector is accessible, the $n \times n$ diagonal matrix $\hat{L}$ can be constructed, where on its diagonal lie the employment coefficients. Formally,

$$\begin{aligned} \hat{l_j} = \hat{l_{ij}} = \frac{l_j}{x_j} \qquad & \text{if} \quad i = j, \\ \hat{l_{ij}} = 0 \qquad & \text{otherwise} \end{aligned} \tag{25}$$

where terms l_j represent the absolut values of employment in respective sectors. The matrix of cumulative employment coefficients then reads

$$R^l = \hat{L}(I - A)^{-1} \tag{26}$$

and its elements express direct and indirect employment requirements necessary to satisfy any potential demand. Finally, the employment multipliers can be calculated from this matrix via summation of its elements down the columns,

$$\psi_j^l = \sum_{i=1}^{n} r_{ij}^l. \tag{27}$$

2.1.4 Import Multipliers

The last but certainly not the least important group of sectoral multipiers we are about to present are the import multipliers. These as well as all previously described measures can very specifically, though precisely characterize certain economic features of the country.

The import multipliers generally give us the information about the amount of imported goods that is based on the observed data needed to supply the potential changes in final demand. In particular, import multiplier of sector j represents the overall level of imported goods necessary to be delivered and used in the production process so that exactly one monetary unit of sector j's final use is going to be covered.

The explicit formula for import multipliers is alike formulas depicted in the previous sections. However, for its derivation one must take into consideration the appropriate vector of values, in this case the vector $m = [m_j]$ of figures which stand for the monetary values of goods imported into each sector. To recall, this vector can be found in the extended input-output table. The diagonal matrix, denoted by $\hat{A^m}$, is then constructed again while its values read

$$\begin{aligned} a_j^{\hat{m}} = a_{ij}^{\hat{m}} = \frac{m_j}{x_j} \qquad & \text{if} \quad i = j, \\ a_{ij}^{\hat{m}} = 0 \qquad & \text{otherwise.} \end{aligned} \tag{28}$$

The terms $a_j^{\hat{m}}$ are well known as the direct import coefficient.

By multiplying the matrix $\hat{A^m}$ from the right by the Leontief inverse, the matrix R^m of cumulative import coefficients is obtained.

$$R^m = \hat{A^m}(I - A)^{-1}. \tag{29}$$

Ultimately, the import multipliers for all individual sectors can be quantified just the same way as before, by summing values of matrix R^m down the columns,

$$\psi_j^M = \sum_{i=1}^{n} r_{ij}^m. \tag{30}$$

2.2 Digging Deeper into the Final Demand

This last theoretical part of Chapter 2 is devoted to the closer look on the individual components of the final demand, i.e. private consumption, government purchases, gross fixed capital formation and exports and the levels of various economic quantities, for which they are either directly or indirectly responsible. In particular, we are about to focus on levels of three relevant indicators: employment, value added and imports. Additionally, this section also forms the groundwork for the next chapter, where the method of structural decomposition is discussed.

In fact, every single formula in this part is going to be based again on the main relation of the input-output theory

$$x = (I - A)^{-1}y,$$

derived earlier in Chapter 1. However, in order to calculate for instance the level of employment generated by the total final demand y, the right-hand side of the above formula must be clearly extended with some specific term, that would accomplish the transformation of the calculated values of output into terms of desired quantity - employment. For each economic indicator in question, this is done in a slightly different way, so let us discuss each case separately.

2.2.1 Generating of Employment

Undoubtedly, the rate of unemployment is a very crucial figure that characterizes the actual condition and vitality of the country. The higher the unemployment rate rises, the higher dissatisfaction spreads among the population and the higher government expenditures are to be spent on the unemployment benefits (disregarding all other social consequences). Therefore, the final demand's efficiency in generating the employment is for this survey quite important to assess.

As long as one speaks about the employment, the transformation from certain values of output to magnitudes of the employment generated across the sectors is done by incorporating the matrix $\hat{L}$ introduced and discussed in Section 2.1.3. In particular, the formula which provides the vector of employment generated in each sector of the economy by the total final demand reads

$$l = \hat{L}(I - A)^{-1}y. \tag{31}$$

If required, by reminding the relation (26) one may rewrite this expression as

$$l = R^l y. \tag{32}$$

Both depicted forms are acceptable.

As illustrated in (11), further specification for each element of the final demand can be similarly introduced at this point. Thus, it is possible to decompose the vector l into respective components

$$l = l_C + l_G + l_{THK} + l_{EX}, \tag{33}$$

while following relations hold and provide us with vectors of employment generated in the economy by each considered individual category of the final demand.

$$\begin{aligned} l_C &= R^l y_C, \\ l_G &= R^l y_G, \\ l_{THK} &= R^l y_{THK}, \\ l_{EX} &= R^l y_{EX}. \end{aligned} \tag{34}$$

2.2.2 Generating of Value Added

The value added, which enters the input-output calculus as a component of the payments sector, is another significant factor of the country's economic performance. Clearly, the higher the value added the better the economy's ability to increase the values of crucial economic parameters such as employee earnings or taxes. Hence, as in the previous case the relation between the final demand and the value added is important to be identified.

As expected, while speaking of the value added vector, both matrices $\hat{A^W}$ and R^W discussed briefly in Section 2.1.2 are considered and incorporated into the calculation the same way as in the case of the employment. Hence, the transformation from the values of output to levels of the value added generated throughout the sectors is done via the formula

$$w = \hat{A^W}(I - A)^{-1} y = R^W y. \tag{35}$$

Since the vector w is decomposable again into respective minor elements, the expression

$$w = w_C + w_G + w_{THK} + w_{EX} \tag{36}$$

holds, while single formulas for each final-demand category can be derived from the relation (35) and read

$$\begin{aligned} w_C &= R^W y_C, \\ w_G &= R^W y_G, \\ w_{THK} &= R^W y_{THK}, \\ w_{EX} &= R^W y_{EX}. \end{aligned} \tag{37}$$

2.2.3 Generating of Import

The magnitude of imported goods needed to be delivered into the country in order to support, supply or simply allow the production belongs to the group of very important figures of the input-output analysis too, since it provides the information about the dependence of country's production on foreign purchases and so in some sense gives the knowledge about the economical independence of the studied economy. Hence, the issue of focusing on the amount of imports is reasonable to establish in this section as well.

In terms of digging deeper into the vector of final demand, to assess the linkage among its individual components and the supply of imported goods, the matrices $\hat{A^m}$ and R^m introduced earlier in Section 2.1.4 are employed. Consequently, the transformation from certain level of output to magnitudes of the imports needed across the sectors is accomplished via the formula

$$m = \hat{A^m}(I - A)^{-1}y = R^m y. \tag{38}$$

Decomposition of the vector m into components generated by each category of the final demand reads

$$m = m_C + m_G + m_{THK} + m_{EX}, \tag{39}$$

while further specification of the relation (38) with respect to the categories in question apparently leads to the following form of the individual equations.

$$\begin{aligned} m_C &= R^m y_C, \\ m_G &= R^m y_G, \\ m_{THK} &= R^m y_{THK}, \\ m_{EX} &= R^m y_{EX}. \end{aligned} \tag{40}$$

Now, since we are able to decompose the vectors of employment, value added and imports, we may substitute the output figures in (18) - (21) for these values and so derive particular employment, value-added and import multipliers of each respective final demand's category.

2.3 Multipliers of the Slovak Economy

As we have mentioned already at the very beginning, the main goal of this thesis is certainly not only to present our theoretical knowledge of the input-output methodology. On the contrary, the most important parts of this text are devoted to the real-data analysis, done on the input-output figures of the Slovak economy. This is one such a part, which concerns with the empirical values of multipliers.

2.3.1 Data Analyzed Throughout This Thesis

In all sections of the thesis, where the outcomes of the real-data analysis are presented, the same datasets are studied. Although we have revealed some of their characteristics in the earlier parts, it is reasonable here to address this issue again. Therefore, the text continues with their proper and compact description.

Thanks to the Statistical Office of the Slovak Republic, we were given the chance to access the commodity-by-commodity symetric input-output tables (SIOTs) for the years 2000 and 2005 at basic prices based on the commodity technology assumption. This occasion would not be that much rare, if the SIOT for the year 2005 wasn't in basic prices of the year 2000. This unique feature allowed us to employ input-output methods and techniques, that are considered to be rather non-standard and hence we may at this point honestly note, that this was the very fact that implied the original idea of writing thesis on such a subject.

The mentioned SIOTs were provided in all of their respective forms, i.e. the version A which aggregates the economic flows of both domestically produced and imported goods, the version B which represents only the flows of domestic production and also the version, where only imports are quantified. In order to obtain the measures that would help us properly assess development of the Slovak economy, disregarding the effects on economic indicators placed in foreign countries, in all our calculations we used figures from version B. There was only one or two exceptions to the rule, which will be pointed out.

In both SIOTs the commodity classification according to the Statistical Classification of Products by Activity - CPA 2002 was applied (this classification is already out of date, because it was substituted by the CPA 2008). More precisely, in the analyzed SIOTs the economy was divided into 59 commodity categories. However, since the values for the categories mining of uranium and thorium ores (CPA 12) and private households with employed persons (CPA 95) were lacking, we omitted these two.

Unfortunately, one unpleasant fact must be admitted here as well. There were vectors of employment for both years 2000 and 2005 incorporated in many calculations done throughout the real-data analysis. However, these vectors are in Slovak terms not part of the SIOTs and so we had to look for them elsewhere. Eventually, we have found them only in the industry classification, which is very similar but still different from the commodity classification needed. Since the transformation matrices (not discussed in this thesis, see [6]) from one classification to another were not available at the time, we decided to use the vectors presented in terms of industries. Hence, all results in this work associated with the employment might be a bit misleading and must be interpreted carefully with respect to this imperfection. We are completely aware of this drawback. Though, because we focus on the general tendencies and development of the relevant economic indicators rather than on particular values, the outcomes can be still accepted as reasonable and correct.

2.3.2 Multipliers Per Commodity

As derived in the theoretical part of this chapter, the output, value-added, employment and import multipliers for each commodity can be calculated via the formulas (17), (24), (27) and (30), respectively. Since all these measures put together create a full-page table, we decided to place them in the appendix part. In particular, all the multipliers for 2000 are illustrated in Appendix 1, while the multipliers for 2005 in Appendix 2. Nevertheless, we are about to mention here at least some important figures for the year 2005. The year 2000 is not much addressed, since the analysis of these figures was already done in [3].

Let us note first some general remarks. We calculated here for each commodity two types of output multipliers. The first is based on the version A and thus reflects the effects on both domestic and foreign production, while the second is based on the version B and represents only the effects on outputs observed purely inside the country. Very logical and acceptable is the fact, that the first multiplier has always greater value than the second one.

Also a very crucial relation lies between the values of value-added and import multipliers. Since, as one can clearly see from the presented figures, summation of these two measures gives for each commodity always one. This result is very natural, because any value delivered into the final use is composed of the part imported into the country (foreign value added) and the part which was created inside the economy (domestic value added). Hence, the resulting one is truly a reasonable value.

As for the particular figures, the output multiplier for the version A reached the highest values in radio, television and communication equipment and apparatus (4.54); office machinery and computers (4.48) and motor vehicles, trailers and semi-trailers (4.32). The smallest values were obtained in education services (1.35); other services (1.42) and financial intermediation services (1.52).

Speaking about the output multipliers of the version B, here the figures are quite different. Actually, one can see very interesting feature, also apparent in 2000, that the smallest values for this multiplier were calculated just for the commodities with the highest multipliers in terms of version A. In particular, radio, television and communication equipment and apparatus (1.16); motor vehicles, trailers and semi-trailers (1.17); office machinery and computers (1.21). For these three commodities, comparison of the multipliers A and B obviously implies their high import intensity, which should be also later seen on particular values of their import multipliers. However, to continue addressing the output multipliers B, small values were observed also in coke, refined petroleum products and nuclear fuel (1.15) and education services (1.20). Well, education is apparently at the bottom in both versions. On the contrary, the highest output multiplier B was reached by metal ores (2.19), which were the only commodity with the value greater than 2. Follow supporting and auxiliary transport services, travel agency services (1.81); construction work (1.79) and electrical energy, gas, steam and hot water (1.78).

Since the value-added and import multipliers are complementary values, when one is large the other one is small and vice versa. Hence, we may address them both at the same time. As we have already pointed out, the high values for import multipliers can be expected at least in CPA 30, 32 and 34. Truly, the figures for these commodities are all around (0.80), thus only one fifth of their multiplier effect was value added generated domestically and the rest transferred abroad. Among other highly import-intensive commodities belonged coke, refined petroleum products and nuclear fuel (0.72); electrical machinery and apparatus n.e.c. (0.67) and air transport services (0.67). On the other hand, the commodities with proportionally large values for value-added multipliers were other services (0.94); real estate services (0.93) and products of forestry, logging and related services (0.91). Also education services (0.93) and public administration and defence services (0.90), as representatives of the Slovak government services proved very low levels of import intensity.

The last multiplier illustrated in the tables yet not discussed in this section is the employment multiplier. The values of this measure per commodity provide us with the information about the number of employees

which were directly and indirectly engaged in delivering one unit (in this case 1 million SKK) of respective commodity into the final use (recall, that to obtain these figures, the industry-classified vectors were used). Most remarkable value of this multiplier was obtained for metal ores (7.13). Apparently, in order to supply 1 billion SKK of this commodity's final demand, 7 130 employees were needed throughout the economy. Also notice, that compared to the year 2000, this multiplier increased by 60 percent whereas also then its value (4.43) was the second highest all across the commodity categories. Other commodities with the relatively high employment multipliers in 2005 were hotel and restaurant services (4.01); education services (3.87); other services (3.82) and water transport services (3.61). Among the commodities with very low employment multiplier can be naturally classified those with the high import intensity, i.e. coke, refined petroleum products and nuclear fuel (0.17); motor vehicles, trailers and semi-trailers (0.29) and office machinery and computers (0.37). Also real estate services (0.34) can be placed in this group.

To identify some broadly recognized relation, we may present following statement. The greater difference between output multipliers A and B, the smaller employment multiplier and the greater import multiplier (i.e. smaller vallue-added multiplier) and vice versa. However, it does not always must be true.

Generally can be stated, that very similar characteristics hold for both 2000 and 2005 (see either values in Appendix 1 or the outcomes from analysis done in [3]). However, to comment on the multipliers' development between the studied years, we shall mention here at least some overall characteristic figures and selected considerable changes. Drop of the output multipliers was observed in 46 out of 57 commodities for the version A and in 48 commodities for the version B, while the biggest fall occured for membership organization services n.e.c. and services auxiliary to financial intermediation. Conversely, the highest increase was assessed for version A in radio, television and communication equipment and apparatus and for version B in tobacco products. The employment multiplier decreased in 45 commodities. The most severe fall appeared in sewage and refuse disposal services and services auxiliary to financial intermediation. The increase in this multiplier was present clearly in metal ores. In 55 percent of commodities occured the increase in value-added multiplier, in the rest logically increased the import multiplier. Import intensity grew mostly in air transport services, whereas tobacco products recorded the most distinguished decrease in this parameter.

In the rest of this multipliers' analysis, we are now about to focus on multipliers assosiated to particular categories of the final demand. For

each type of these multipliers, we present two tables, one for each year in question. The values depicted in the tables are briefly discussed and compared. After we go through all considered multipliers, we provide one summarizing table which encompasses all of them.

Remember, that the analyzed input-output data for the year 2005 are quantified in basic prices of the year 2000. Thus, the credibility of the comparison between the 2000 and the 2005 values is maximized, though the 2005 numbers might not correspond to publicly available real-economy figures quantified in common prices.

2.3.3 Output and Output Multipliers

The first economic indicator we address is the gross output. The following two summary tables consist of four columns. In the far left column, the final-demand categories are classified so that further identification of values in each row is clear. Then, the column of values of the gross output generated by each category is placed. Follows the column of percentage values, which represent each generated output as a part of total gross output of the country. The last column depicts the values of the output multiplier per each final-demand category for the version B. To recall, the resulting multipliers were obtained via the formulas (18)-(21).

Table 1: Output and Output Multipliers in 2000

Final-Demand Categories	Output (in billion SKK)	Output (%)	Output Multiplier (version B)
Households	660.96	29	1.840
Government	295.96	13	1.529
Investments	294.62	13	1.862
Exports	1 008.80	45	1.526
TOTAL	2 260.40	100	1.648

Table 2: Output and Output Multipliers in 2005

Final-Demand Categories	Output (in billion SKK)	Output (%)	Output Multiplier (version B)
Households	613.97	24	1.535
Government	277.68	11	1.341
Investments	323.93	13	1.685
Exports	1 371.39	53	1.371
TOTAL	2 586.97	100	1.437

In the year 2000, the overall level of production reached 2 260 billion SKK. Out of this value, 29 percent was generated by the households and 13 percent was generated by the government expenditures as well as by the gross investments. The rest, i.e. 45 percent was generated by the exports.

Five years later, the overall level of output increased by 326 billion SKK and was totally evaluated at 2 586 billion SKK. The particular proportions contributed by each final-demand category slighly differed. The household consumption generated 24 percent (5 percent drop), the government spendings contributed next 11 percent (2 percent drop), the gross capital formation contributed the same percentage as in 2000 i.e. 13 percent and since the exports grew compared to the year 2000 with 362 billion SKK, this led to contribution of the remaining 53 percent.

To comment on the output multipliers, their exact values are not much in our interest. Important fact is to note, that all across the final-demand categories their values decreased over the time while even their order persisted. Only the multipliers of government and exports switched.

We decided to depict here only several selected changes in the output-related figures, the rest is left to be recognized by the reader (if nedeed). However, be aware of the fact, that we are absolutely not done yet with these values. Since, after we present such tables for all important economic indicators, all the observed changes are about to be very deeply and carefully studied later in the following chapter.

2.3.4 Employment and Employment Multipliers

We proceed with the tables associated to another relevant indicator - employment. Here, the figures of the very same structure as previously are depicted. Recall, that the vectors of employment in terms of industries were used in the respective calculations, therefore the presented results must be understood rather as the estimates than the accurate values. As for the multipliers, these were obtained via the formulas (18)-(21), where the outputs were replaced by the respective employment components.

Table 3: Employment and Employment Multipliers in 2000

Final Demand Categories	Employment (in thousand)	Employment (%)	Employment Multiplier (version B)
Households	590.86	28	1.64
Government	523.75	25	2.71
Investments	241.82	12	1.53
Exports	744.77	35	1.13
TOTAL	2 101.20	100	1.53

Table 4: Employment and Employment Multipliers in 2005

Final Demand Categories	Employment (in thousand)	Employment (%)	Employment Multiplier (version B)
Households	494.21	22	1.24
Government	503.32	23	2.43
Investments	280.50	13	1.46
Exports	934.36	42	0.93
TOTAL	2 212.40	100	1.23

More than 2.1 million employees were recognized in the Slovak economy in the year 2000. Out of this number, one quarter was directly or indirectly generated by the government consumption, 28 percent worked in order to supply the private consumption, 12 percent was generated by the investments and the largest number, more than 744 thousand employees which stood for the remaining 35 percent, worked directly or indirectly for the exports.

In 2005, household expenditures noticeably lowered their contribution, in partucular by 6 percent of the overall level. The government generated 23 percent (2 percent drop), the gross capital was responsible for 13 percent (1 percent increase) and the exports, again taking the leading position, generated the rest - outstanding 42 percent (7 percent increase). In total, the employment increased by the 111 thousand people, while exceeding the overall level of 2.2 million employees.

All across the final-demand categories, the respective employment multipliers decreased over the time. The highest multiplier in both studied years was calculated for the government expenditures. This absolutely corresponds to the fact, that the vast majority of these expenditures were spent on the commodities with relatively high employment multipliers. In particular, on public administration and defence services; education services and health and social work services. On the contrary, the smallest multiplier was in both time periods observed for the exports, while in 2005 not even one thousand people were directly and indirectly employed in producing the exports worth one billion SKK. The largest drop of the value was associated to the private consumption, where one billion SKK in 2005 generated four hundred employees less than five years earlier.

Apparently, many other specific comments on these values could be placed here. However, both here and also in all later analyzed economic indicators, such comments are omitted and left to be identified by the reader with respect to the fact, that their further analysis is done in the following chapter.

2.3.5 Value Added and Value-Added Multipliers

The analysis continues with the concise overview of values characterizing the value-added aspect of the economy. Both particular levels of value added and their percentage contributions to the overall level are presented here as well as respective value-added multipliers per each final-demand category. The value-added multipliers were calculated again via the modified formulas (18)-(21), where substitution of the output values for the value added magnitudes was performed.

Table 5: Value Added and Value-Added Multipliers in 2000

Final Demand Categories	Value Added (in billion SKK)	Value Added (%)	Value-Added Multiplier (version B)
Households	272.230	31	0.76
Government	164.251	19	0.85
Investments	112.606	13	0.71
Exports	316.194	37	0.48
TOTAL	865.281	100	0.63

Table 6: Value Added and Value-Added Multipliers in 2005

Final Demand Categories	Value Added (in billion SKK)	Value Added (%)	Value-Added Multiplier (version B)
Households	313.599	28	0.78
Government	179.602	16	0.87
Investments	133.860	12	0.70
Exports	481.245	43	0.48
TOTAL	1 108.306	100	0.62

In 2000, the biggest contributor to the value added were the exports, providing 37 percent of its overall level. The second were the households with the contribution of 31 percent, followed by the government expenditures with 19 percent and the gross fixed capital formation with the remaining 13 percent. In total, the value added generated throughout the country was assessed at 865 billion SKK.

In the year 2005, the exports boosted the economy just as we observed in the previous indicators, elevating the value added generated by this final-demand category by 165 billion SKK. In percentage terms, the foreign sales totally contributed 43 percent of the overall level. The rest was contributed then by the private consumption, the government expenditures and the gross investments with 28, 16 and 12 percent, respectively. Notice, that all across the final-demand categories, the values had increased.

The only category, where the value-added multiplier did not exceed the 50 percent limit were the exports, reaching the 0.48 all over the time. Other categories altered their multipliers, yet not radically. The value-added multiplier of households increased by 0.02, leading eventually to the value 0.78. The multiplier of the government spendings increased similarly by 2 percent, resulting into 0.87 in 2005. As a matter of fact, the only category which lowered its value-added multiplier were the gross investments, in particular by 1 percent (from 0.71 to 0.70). Totally, the value added in 2005 was quantified at 1 108 billion SKK with the aggregate value-added multiplier 0.62 (1 percent decrease).

2.3.6 Import and Import Multipliers

The last but certainly not the least economic indicator we are interested in are the imports and their particular structure. Notice, that by summing the levels of the imports and the previously discussed levels of value added, one obtaines figures representing the overall levels of consumption recorded by each final-demand category. Hence the result, that putting together the import multipliers and the value-added multipliers calculated through the specifically modified formulas (18)-(21) always provides one is quite obvious (since the denominator in both is exactly their sum). We illustrate the figures using again the same form as previously.

Table 7: Import and Import Multipliers in 2000

Final Demand Categories	Import (in billion SKK)	Import (%)	Import Multiplier (version B)
Households	86.978	17	0.24
Government	29.366	6	0.15
Investments	45.654	9	0.29
Exports	344.737	68	0.52
TOTAL	506.736	100	0.37

Table 8: Import and Import Multipliers in 2005

Final Demand Categories	Import (in billion SKK)	Import (%)	Import Multiplier (version B)
Households	86.317	12	0.22
Government	27.425	4	0.13
Investments	58.391	8	0.30
Exports	519.306	75	0.52
TOTAL	691.439	100	0.38

From the figures representing the flows of imports in the year 2000 is clear, that the vast majority of imported goods ended up being in some form further exported. In fact, 68 percent of the overall imports had this feature, while only the remaining 32 percent were used purely inside the country. More in detail, imports generated by the household consumption stood for 17 percent, those generated by the capital formation stood for 9 percent and the rest, i.e. only 6 percent was generated by the government consumption.

In 2005, the exports increased the generated imports by almost 175 billion SKK, which eventually led to the outstanding 75 percent contribution to the overall level of all imported goods. The imports generated by the gross investments also increased in their absolut value, though the percentage contribution fell by 1 percent. The amount of goods imported into the country in order to supply the household consumption and the government consumption both decreased their absolut values, resulting in 12 and 4 percentage contribution to the overall magnitude, respectively. The whole number of imports between 2000 and 2005 increased by 184 billion SKK and was in the year 2005 assessed at 691 billion SKK.

To comment on the values of the import multipliers, there is actually not much to say. Since, the exact opposite characteristics holds as for the value-added multipliers, discussed earlier. Only one figure we would like to point out at this stage. It emerged that the import intensity of the exports was all over the observed time period 52 percent. The reformulation of this sentence could be the one, that not even one half of the value exported from the country was created inside the Slovak economy. This is understood to be a rather negative observation, because as we stated many times before, the exports are generally the most contributing category of the final demand. Hence, we can hope, that as the time goes by this multipier will at least gradually decrease its unpleasantly high value.

2.3.7 Summary Table

To summarize the outcomes of this part of our read-data analysis, we decided to present the summary table of all figures illustrated throughout this last several pages, i.e. absolut values, percentage contributions and multipliers. However, as you certainly noticed, only the overall values per each final-demand category were depicted and discussed. In order to obtain these figures, the vectors of all economic indicators generated by each final-demand category had to be clearly calculated first. This was done via the formulas (11),(34),(37) and (40) and the results we decided to place in the appendix part of the thesis. In particular, see Appendix 3-10.

Absolut Values in 2000

Final Demand Categories	Output (in billion SKK)	Employment (in thousand)	Value Added (in billion SKK)	Import (in billion SKK)
Households	660.96 (29)	590.86 (28)	272.230 (31)	86.978 (17)
Government	295.96 (13)	523.75 (25)	164.251 (19)	29.366 (6)
Investments	294.62 (13)	241.82 (12)	112.606 (13)	45.654 (9)
Exports	1 008.80 (45)	744.77 (35)	316.194 (37)	344.737 (68)
TOTAL	2 260.40 (100)	2 101.20 (100)	865.281 (100)	505.736 (100)

Absolut Values in 2005

Final Demand Categories	Output (in billion SKK)	Employment (in thousand)	Value Added (in billion SKK)	Import (in billion SKK)
Households	613.97 (24)	494.21 (22)	313.599 (28)	86.317 (12)
Government	277.68 (11)	503.32 (23)	179.602 (16)	27.425 (4)
Investments	323.93 (13)	280.50 (13)	133.860 (12)	58.391 (8)
Exports	1 271.39 (53)	934.3 (42)	481.245 (43)	519.306 (75)
TOTAL	2 586.97 (100)	2 212.40 (100)	1 108.306 (100)	691.439 (100)

Multipliers in 2000 (version B)

F-D Categories	Output	Employment	Value Added	Import
Households	1.84	1.64	0.76	0.24
Government	1.53	2.71	0.85	0.15
Investments	1.86	1.53	0.71	0.29
Exports	1.53	1.13	0.48	0.52
TOTAL	1.65	1.53	0.63	0.37

Multipliers in 2005 (version B)

F-D Categories	Output	Employment	Value Added	Import
Households	1.54	1.24	0.78	0.22
Government	1.34	2.43	0.87	0.13
Investments	1.68	1.46	0.70	0.30
Exports	1.37	0.93	0.48	0.52
TOTAL	1.44	1.23	0.62	0.38

3 Structural Decomposition

3.1 Structural Decomposition Analysis

Besides classical techniques and outcomes of the input-output analysis, it is often a very interesting issue to ask ourselves the question, whether it is possible to understand and explain more precisely the structure of changes which occured over the time. In fact, this question exclusively comes up in the case when two or more input-output datasets for different time periods are available. Then, as we shall illustrate, several calculations might be performed which provide the decomposition of the observed changes in some studied economic indicator into several minor changes contributed by various factors.

For instance, the change in the vector of gross production between two different periods could be split into a part which represents the changes in the final demand and a part which stands for the changes in the Leontief inverse, i.e. changes in technology. Moreover, the change in the final demand could be further decomposed into a part associated to changes in the total level of final demand and that part related to changes in the composition of the vector y. Similarly, one could further disaggregate the changes in the Leontief inverse, too. There exist many other aspects of the economy apart from the gross output, on which this attitude can be apllied to, such as employment or value added. However, the calculation might then become slightly more complicated since one could deal with more than just two factors that affected the observed changes.

3.1.1 Illustrative Decomposition

To make the explanation of the structural decomposition analysis (SDA) as clear as possible, first we are about to illustrate this method simply on the level of gross output, which has only two contributing factors.

Lets consider that we are provided with the input-output datasets for two different years. Notice, that both datasets are expected to be expressed in prices for a common year, so that any possible effect of changes in prices is excluded. Each variable considered is then specified by either index 0 or 1 (where 0 is understood to be the index that characterizes the earlier time period). If we denote the vector of gross output by x^t, the Leontief inverse by $L^t = (I - A^t)^{-1}$ and the vector of final demand by y^t, $(t = 0, 1)$ following relations hold.

$$\begin{aligned} x^0 &= L^0 y^0, \\ x^1 &= L^1 y^1. \end{aligned} \tag{41}$$

In the input-output framework, the crucial values on which the method of structural decomposition is focused on are the differences. In this particular case, the difference between the vectors of gross outputs x^0 and x^1, since this is the very parameter which quantifies the change that happend over the time. The difference in gross outputs clearly reads

$$\Delta x = x^1 - x^0 = L^1 y^1 - L^0 y^0. \tag{42}$$

Now, in order to disaggregate the total change in production Δx into its components, the changes in individual factors must be introduced.

$$\begin{aligned} \Delta L &= L^1 - L^0, \\ \Delta y &= y^1 - y^0. \end{aligned} \tag{43}$$

It is very important to point out, that the way in which the terms from (43) are supposed to be incorporated into the formula (42) is not clear. As a matter of fact, there exist many various attitudes to this rather questionable step, while all of them still persist to be valid.

For example, if we decide to use only the values L^1 and y^0, which from (43) implies following substitutions

$$\begin{aligned} L^0 &= L^1 - \Delta L, \\ y^1 &= y^0 + \Delta y, \end{aligned} \tag{44}$$

the equation (42) takes the form

$$\begin{aligned} \Delta x &= L^1(y^0 + \Delta y) - (L^1 - \Delta L)y^0 = \\ &= (\Delta L)y^0 + L^1(\Delta y). \end{aligned} \tag{45}$$

As we can see, what we obtained is the desired decomposition of the vector Δx, while the first component apparently represents the changes in technology and the second represents the changes of the final demands. Notice, that at these particular settings the changes in technology ΔL are weighted by values of the final demand y^0 and vice versa, the changes in the final demand Δy are weighted by values of the Leontief inverse L^1.

To mention some economical background, there appears to be one quite intuitive right in the last presented formula. For instance, consider the right-hand side term

$$L^1(\Delta y) = L^1 y^1 - L^1 y^0. \tag{46}$$

The first part obviously stands for the production that is needed to cover the new final demand while using the new technology, the second part represents the output that would be needed to cover the old final demand

while using new technology, too. Thus, their difference can be truly understood as a reasonable parameter of changes in the vector of final demand. The term $(\Delta L)y^0$ can be explained just alike.

Alternatively, if only the values L^0 and y^1 are considered, the substitutions

$$\begin{aligned} L^1 &= L^0 + \Delta L, \\ y^0 &= y^1 - \Delta y \end{aligned} \tag{47}$$

are implied and the expression (42) transforms into

$$\begin{aligned} \Delta x &= (L^0 + \Delta L)y^1 - L^0(y^1 - \Delta y) = \\ &= (\Delta L)y^1 + L^0(\Delta y). \end{aligned} \tag{48}$$

Apparently, the very simular decomposition as in the previous case is obtained. However, the weighting of the individual terms has altered. The term which stands for the change in technology is now weighted by values of the final demand y^1 and the term which stands for the changes in the final demands is weighted by the values of the Leontief inverse L^0.

There exist also another way, how to easily get expressions (45) and (48). Starting from the formula (42), if one adds and subtracts L^1y^0 on the right-hand side and then does the rearrangement, the result (45) is obtained.

$$\begin{aligned} \Delta x &= L^1y^1 - L^0y^0 + L^1y^0 - L^1y^0 = \\ &= L^1y^0 - L^0y^0 + L^1y^1 - L^1y^0 = \\ &= (L^1 - L^0)y^0 + L^1(y^1 - y^0) = \\ &= (\Delta L)y^0 + L^1(\Delta y). \end{aligned}$$

Conversely, starting from the formula (42), by adding and subtracting L^0y^1 on the right-hand side, the expression (48) is derived.

$$\begin{aligned} \Delta x &= L^1y^1 - L^0y^0 + L^0y^1 - L^0y^1 = \\ &= L^1y^1 - L^0y^1 + L^0y^1 - L^0y^0 = \\ &= (L^1 - L^0)y^1 + L^0(y^1 - y^0) = \\ &= (\Delta L)y^1 + L^0(\Delta y). \end{aligned}$$

As we clearly see, both expressions (45) and (48) are from mathematical point of view correct without any dispute. But at the same time, because of the reversed time weighting, each surely provides quite different result (disregarding the trivial and uninteresting case, when no change of technology and final demands occured over the time, i.e. $L^1 = L^0$ and $y^1 = y^0$).

In addition, these two presented formulas are by far not the only possibilities. Since, for instance there is still the option left to consider only

the values of technology and final demand, which were observed for the same time period.

If one uses just the values for the year 0, i.e. L^0 and y^0, the substitution of the values L^1 and y^1 must be introduced

$$\begin{aligned} L^1 &= L^0 + \Delta L, \\ y^1 &= y^0 + \Delta y. \end{aligned} \tag{49}$$

After considering these expression to replace the terms in (42), the equation

$$\begin{aligned} \Delta x &= (L^0 + \Delta L)(y^0 + \Delta y) - L^0 y^0 = \\ &= (\Delta L)y^0 + L^0(\Delta y) + (\Delta L)(\Delta y) \end{aligned} \tag{50}$$

is derived. The terms which represent the changes in technology and final demands are now both weighted by the values measured in the year 0. Though, a new interaction term $(\Delta L)(\Delta y)$, that doesn't have any comprehensible economical interpretation, has emerged.

In case we use the values for the year 1 exclusively, the expressions

$$\begin{aligned} L^0 &= L^1 - \Delta L, \\ y^0 &= y^1 - \Delta y \end{aligned} \tag{51}$$

are derived from (43) to replace the terms L^0 and y^0 and the equation

$$\begin{aligned} \Delta x &= L^1 y^1 - (L^1 - \Delta L)(y^1 - \Delta y) = \\ &= (\Delta L)y^1 + L^1(\Delta y) - (\Delta L)(\Delta y), \end{aligned} \tag{52}$$

which specifies the difference in the vector of total output is obtained. Notice, that the interaction term $(\Delta L)(\Delta y)$ appears again, but on the contrary with the minus sign in front.

All four previously presented alternative formulas for the calculation of changes in the gross outputs have been already considered and analyzed by many researchers. However, mostly used and widely accepted approach is the averaged formula, derived as follows.

One may either take into consideration the first two illustrated equations, i.e. (45) and (48) or the second, i.e. (50) and (52). By adding the first two, one obtaines

$$2\Delta x = (\Delta L)y^0 + L^1(\Delta y) + (\Delta L)y^1 + L^0(\Delta y), \tag{53}$$

which can be further adjusted, so that it finally reads

$$\Delta x = \left(\frac{1}{2}\right) \underbrace{(\Delta L)(y^0 + y^1)}_{\text{Technology change}} + \left(\frac{1}{2}\right) \underbrace{(L^0 + L^1)(\Delta y)}_{\text{Final demand change}}. \tag{54}$$

The same result is obtained while considering the second pair of equations, since by adding (50) and (52) together, we get

$$\begin{aligned} 2\Delta x = (\Delta L)y^0 + L^0(\Delta y) + (\Delta L)(\Delta y) + \\ + (\Delta L)y^1 + L^1(\Delta y) - (\Delta L)(\Delta y), \end{aligned} \tag{55}$$

which can be divided by 2 and so the averaged form (54) is derived again.

Numerical Example: To make clear the issue that various attitudes may truly lead to at least slightly different results, we present a small example taken from [6]. Lets consider following figures

$$X^0 = \begin{pmatrix} 10 & 20 & 25 \\ 15 & 5 & 30 \\ 30 & 40 & 5 \end{pmatrix}, \; y^0 = \begin{pmatrix} 45 \\ 30 \\ 25 \end{pmatrix}, \; X^1 = \begin{pmatrix} 12 & 15 & 35 \\ 24 & 11 & 30 \\ 36 & 50 & 8 \end{pmatrix}, \; y^1 = \begin{pmatrix} 50 \\ 35 \\ 26 \end{pmatrix}.$$

Since the relation $x^t = X^t i + y^t$ for $t = 0, 1$ holds, the values of Leontief inverse L^0 and L^1 can be calculated. The relusting changes then read

$$\Delta L = \begin{pmatrix} 0.0649 & -0.0941 & 0.0320 \\ 0.1447 & 0.0607 & 0.0116 \\ 0.1448 & 0.0342 & 0.0586 \end{pmatrix}, \Delta y = \begin{pmatrix} 5 \\ 5 \\ 1 \end{pmatrix} \text{ and } \Delta x = \begin{pmatrix} 12 \\ 20 \\ 20 \end{pmatrix}.$$

If all presiously presented decomposition methods are applied, we obtain results illustrated in Table 9, which clearly prove our point. Also notice the feature of both first two terms as they absorb the interaction term. Or in other words, how total change observed is in equations (50) and (52) distributed also into the interaction terms.

From the general point of view it is important to emphasize, that the input-output method of structural decomposition always provides results in terms of sectors. Therefore, if there is an economy with n sectors considered, each element in the studied vector of changes, e.g. in gross outputs Δx is going to be decomposed into several contributing elements. As a result, one is dealing with an essential problem, how to define the measures that would properly represent the overall figures for the entire economy.

One possible approach is to consider the concept of economy-wide figures. This we shall illustrate on the decomposition technique (54). The equation for change in the vector of gross production takes then the form

$$i^T(\Delta x) = \underbrace{i^T\left[\left(\frac{1}{2}\right)(\Delta L)(y^0 + y^1)\right]}_{\text{Economy-wide technology change}} + \underbrace{i^T\left[\left(\frac{1}{2}\right)(L^0 + L^1)(\Delta y)\right]}_{\text{Economy-wide final demand change}}, \tag{56}$$

where by i^T is denoted the n-dimensional row vector of all ones. To get the average value per sector, one further needs to divide both sides by n.

Table 9: Results for Alternative Decompositions

	Sector	Technology Change Contribution	Final Demand Change Contribution	Interaction Term
Equation (45)	1	0.90	11.10	0
	2	8.62	11.38	0
	3	9.01	10.99	0
Equation (48)	1	0.78	11.22	0
	2	9.66	10.34	0
	3	9.96	10.04	0
Equation (50)	1	0.90	11.22	+ (-0.12)
	2	8.62	10.34	+ (1.04)
	3	9.01	10.04	+ (0.95)
Equation (52)	1	0.78	11.10	- (-0.12)
	2	9.66	11.38	- (1.04)
	3	9.96	10.99	- (0.95)
Equation (54)	1	0.84	11.16	0
	2	9.14	10.86	0
	3	9.49	10.51	0

Another way might be simply to divide the sectors into several groups. The averages would be then calculated only over the elements inside the particular category. This grouping could be for instance done in the following way. The first group, called the primary sectors, would be industries related to natural resources. The second group, referred to as the secondary sectors, would be manufacturing and processing industries and the last group, titled the tertiary sectors, would consist naturally of all others sectors left. Or, the grouping into fastest growing sectors - slowest growing sectors - other sectors could be introduced.

Regardless of the particular averaging involved, it is important to state, that summary measures usually neglect a great deal of detail. To prove this point, consider again the previously discussed numerical example. In Table 10, the comparison between figures per individual sector and the economy-wide figures is illustrated for the equation (54). Note, that since the problem is just artificially made up to demonstrate the addressed property of summary measures, the absolut values of contributing factors are not that important. Thus, we focus rather on the values in parentheses which stand for the percentage of total change observed in each row.

As for the economy-wide figures, the contribution of the change in

Table 10: Results for Sector-Specific and Economy-Wite Decompositions

	Output Change	Technology Change Contribution	Final Demand Change Contribution
Sector 1	12	0.84 (7)	11.16 (93)
Sector 2	20	9.14 (46)	10.86 (54)
Sector 3	20	9.49 (47)	10.51 (53)
Economy-wide	50	19.47 (37)	32.53 (63)

technology is assessed at 37 percent, while the change in final demand contributed the rest, i.e. 63 percent. In terms of indivual sectors, quite a wide range of values is observed. In particular, the change in technology takes values from 7 to 47 percent. Hence, the change in final demand contributed to total change of gross outputs per sector with values from 53 to 93 percent.

3.1.2 SDA Approach Applied to Products of more than Two Terms

In general, the economic quantity we would like to analyze through the method of structural factorization does not have to be always decomposable into only two components, such as in case of the gross output. Therefore, in order to provide reasonable and comprehensive overview of the SDA approach, all the formulas we have presented in terms of two contributing factors should be at this stage definitely generalized.

Lets start with the reformulation of the expressions (41). For $t = 0, 1$ we can write

$$x^t = L^t y^t. \tag{57}$$

If we denote by v the addressed complex variable and by f_1^t and f_2^t its contributing factors, the above relation implies the general form

$$v^t = f_1^t f_2^t. \tag{58}$$

The expression (42) which characterizes the vector v's change can be then rewritten as

$$\Delta v = f_1^1 f_2^1 - f_1^0 f_2^0. \tag{59}$$

and possibly further specified in the way of (45) and (48), i.e.

$$\Delta v = (\Delta f_1) f_2^0 + f_1^1 (\Delta f_2) \tag{60}$$

and

$$\Delta v = (\Delta f_1) f_2^1 + f_1^0 (\Delta f_2), \tag{61}$$

respectively. Now, we extend simply the very idea behind these equations on the case of three and later on n contributing factors.

If we consider the variable v being composed of three factors, so that we may formally write

$$v^t = f_1^t f_2^t f_3^t, \tag{62}$$

the formula for the change Δv reads

$$\Delta v = f_1^1 f_2^1 f_3^1 - f_1^0 f_2^0 f_3^0. \tag{63}$$

Reminding now the relation for individual changes in factors, i.e.

$$\Delta f_i = f_i^1 - f_i^0 \tag{64}$$

for $i = 1, 2, 3$, the substitutions for either f_i^1 or f_i^0 are implied. Then, just like in two-factor case, by taking into consideration some of these substitution and inserting them into the expression (63), various equations can be derived. The one with the same character as (60) reads

$$\Delta v = (\Delta f_1) f_2^0 f_3^0 + f_1^1 (\Delta f_2) f_3^0 + f_1^1 f_2^1 (\Delta f_3), \tag{65}$$

the one like (61) reads

$$\Delta v = (\Delta f_1) f_2^1 f_3^1 + f_1^0 (\Delta f_2) f_3^1 + f_1^0 f_2^0 (\Delta f_3). \tag{66}$$

Apparently, there is a pattern involved in each equation. Either on the right appear only terms for the year 0 and on the left terms for the year 1 or the other way around. Furthermore, if we introduce the concept of averaging again, following equation is obtained.

$$\begin{aligned} \Delta v = &\left(\frac{1}{2}\right)(\Delta f_1)(f_2^0 f_3^0 + f_2^1 f_3^1) \\ &+ \left(\frac{1}{2}\right)[f_1^0 (\Delta f_2) f_3^1 + f_1^1 (\Delta f_2) f_3^0] + \\ &+ \left(\frac{1}{2}\right)(f_1^0 f_2^0 + f_1^1 f_2^1)(\Delta f_3). \end{aligned} \tag{67}$$

Let's point out, that the terms $(1/2)$ are clearly not related to the number of contributing factor, but are implied by the fact that we are averaging two formulas (in this case (65) and (66)). This statement is true for any number of factors.

Finally, we picture the formulas for the general n-factorized variable. The equation analogous to (65) reads

$$\begin{aligned} \Delta v = &(\Delta f_1)(f_2^0 \ldots f_n^0) + f_1^1 (\Delta f_2)(f_3^0 \ldots f_n^0) + \\ &+ \cdots + (f_1^1 \ldots f_{n-2}^1)(\Delta f_{n-1}) f_n^0 + (f_1^1 \ldots f_{n-1}^1)(\Delta f_n), \end{aligned} \tag{68}$$

the one parallel to (66) reads

$$\begin{aligned}\Delta v = (\Delta f_1)(f_2^1 ... f_n^1) + f_1^0(\Delta f_2)(f_3^1 ... f_n^1) + \\ + \cdots + (f_1^0 ... f_{n-2}^0)(\Delta f_{n-1})f_n^1 + (f_1^0 ... f_{n-1}^0)(\Delta f_n)\end{aligned} \tag{69}$$

and the straightforward averaging of these two provides the equation

$$\begin{aligned}\Delta v = &\left(\frac{1}{2}\right)(\Delta f_1)[(f_2^0 ... f_n^0) + (f_2^1 ... f_n^1)] + \\ &+ \left(\frac{1}{2}\right)[f_1^0(\Delta f_2)(f_3^1 ... f_n^1) + f_1^1(\Delta f_2)(f_3^0 ... f_n^0)] \\ &+ \cdots + \left(\frac{1}{2}\right)[(f_1^0 ... f_{n-2}^0)(\Delta f_{n-1})f_n^1 + (f_1^1 ... f_{n-2}^1)(\Delta f_{n-1})f_n^0] + \\ &+ \left(\frac{1}{2}\right)[(f_1^0 ... f_{n-1}^0) + (f_1^1 ... f_{n-1}^1)](\Delta f_n).\end{aligned} \tag{70}$$

3.1.3 Next-Level Decomposition of Changes in Final Demand

As we have already mentioned in the beginning of the SDA discussion, to get even deeper insight into the structure of the observed changes in some complex economical variable, the factor Δy which represents the change in the final demand can be further decomposed. As we will show, its values can be understood to be aggregated by following three elements. The first is the change in the overall level of final demand between the studied periods, the next is the change in the way, how the values are distributed into each final-demand category, i.e. into private consumption, government spendings, investments and exports and the last is the change in the so-called product mix within each category, i.e. the change in certain proportions of final demand associated to each sector.

Let us consider the general case, when there are p categories of final demand. Then, we are clearly not dealing with the final-demand vector y^t as usual, but with the $n \times p$ final-demand matrix Y^t. Formally,

$$Y^t = [y_1^t, ..., y_p^t], \quad \text{where} \quad y_k^t = \begin{pmatrix} y_{1k}^t \\ \vdots \\ y_{nk}^t \end{pmatrix}.$$

Each term y_{ik}^t represents for year t the value spent in the sector i by final-demand category k. One may notice, that the relation

$$Y^t i = y^t \tag{71}$$

holds. Also, if we denote by $\mathbf{y}_\Sigma$ the total level of final demand across the entire economy, the relation

$$\mathbf{y}_\Sigma^t = i^T Y^t i = i^T y^t \tag{72}$$

holds. Furthermore, let z_k^t stand for the total value spent in year t by final-demand category k. The vector of such terms is then denoted by z^t and reads

$$z^t = \begin{pmatrix} z_1^t \\ \vdots \\ z_p^t \end{pmatrix} = (i^T Y^t)^T. \tag{73}$$

As a next step, lets employ the p-dimensional vector d^t, while its individual elements d_k^t indicate the proportion of category k's final demand, i.e. introduce somehow into this calculus the distribution of $\mathbf{y}_\Sigma^t$.

$$d^t = [d_k^t] = (1/\mathbf{y}_\Sigma^t) z^t = \begin{pmatrix} z_1^t/\mathbf{y}_\Sigma^t \\ \vdots \\ z_p^t/\mathbf{y}_\Sigma^t \end{pmatrix}. \tag{74}$$

The last newly introduced variable we are about to consider is the $n \times p$ bridge (product mix) matrix B^t of the form

$$B^t = [b_{ik}^t] = (Y^t)(\hat{Z}^t)^{-1}. \tag{75}$$

Hence, for elements b_{ik}^t we claim $b_{ik}^t = y_{ik}^t / z_k^t$. They represent for final-demand category k the proportion that was in year t addressed to products of sector i.

Now, we may finally present the very crutial relation of this section, which provides the desired decomposition. It reads

$$y^t = \mathbf{y}_\Sigma^t B^t d^t. \tag{76}$$

It further implies

$$\Delta y = y^1 - y^0 = \mathbf{y}_\Sigma^1 B^1 d^1 - \mathbf{y}_\Sigma^0 B^0 d^0. \tag{77}$$

If we apply at this stage the formulas derived in the previus part, in particular (65) - (67), we obtain following expressions

$$\Delta y = (\Delta \mathbf{y}_\Sigma) B^0 d^0 + \mathbf{y}_\Sigma^1 (\Delta B) d^0 + \mathbf{y}_\Sigma^1 B^1 (\Delta d), \tag{78}$$

$$\Delta y = (\Delta \mathbf{y}_\Sigma) B^1 d^1 + \mathbf{y}_\Sigma^0 (\Delta B) d^1 + \mathbf{y}_\Sigma^0 B^0 (\Delta d) \tag{79}$$

and

$$\Delta y = \underbrace{\left(\frac{1}{2}\right)(\Delta \mathbf{y}_\Sigma)(B^0 d^0 + B^1 d^1)}_{\text{Final-demand level component}} + \underbrace{\left(\frac{1}{2}\right)[\mathbf{y}^0_\Sigma(\Delta B)d^1 + \mathbf{y}^1_\Sigma(\Delta B)d^0]}_{\text{Final-demand product mix component}} + \\ + \underbrace{\left(\frac{1}{2}\right)(\mathbf{y}^0_\Sigma B^0 + \mathbf{y}^1_\Sigma B^1)(\Delta d)}_{\text{Final-demand distribution component}} . \tag{80}$$

If it is the case, that either we don't know the distribution of the final demand across its categories or simply we are not interested in acknowledging this distribution effect, we can suppose that $p = 1$. Then, $d^0 = d^1 = 1$, $\Delta d = 0$ and the relation (80) is modified into the form

$$\Delta y = \left(\frac{1}{2}\right)(\Delta \mathbf{y}_\Sigma)(B^0 + B^1) + \left(\frac{1}{2}\right)(\mathbf{y}^0_\Sigma + \mathbf{y}^1_\Sigma)(\Delta B). \tag{81}$$

3.2 Slovak SDA Empirical Study

At the end of Chapter 2, we illustrated several outcomes of the real-data analysis done on input-output figures representing the Slovak economy. In this section we continue in this analysis. More precisely, we study in depth the structure of the changes in all relevant economic indicators which occured between 2000 and 2005, i.e. we take the vectors presented in Appendix 3-10, calculate the respective differences and apply the previously derived decomposition formulas.

So, in the folowing text we are discussing the changes in output, employment, value added and imports. Though, the numerical values are not much of interest to us, since as we have presented, various attitudes may provide various results. Hence, we focus rather on identification of the general tendencies.

As for the particular method of decomposition, we decided to use the averaged decomposition formulas, since these are considered to be mostly accepted. In addition, we also employ the next-level decomposition of changes in final demand, but only into two contributing factors as illustrated in (81).

Since the SDA provided us with a huge amount of resulting figures, we placed the majority in the appendix part of the thesis. In Appendix 11-30, the structural decomposition of all considered vectors is illustrated, so if one is interested in any particular values, they can be very easily found. Here, we present and discuss only the economy-wide figures.

3.2.1 Decomposition of Changes in Output

To follow the earlier used order, we address first the decomposition of changes in the gross output. Three factors can be identified and quantified through this decomposition: the change in technology (ΔL), the change in final-demand level ($\Delta \mathbf{y}_{\Sigma}$) and the change in final-demand distribution (ΔB). Via the formulas (56) and (81), we obtained following figures. Notice, that in parenthesis we show the percentage contribution of each figure to the overall output change recorded by each final-demand category.

Table 11: Decomposition of Changes in Output (in million SKK)

Final-Demand Categories	Output Change	Technology Change Contribution (%)	Final-Demand Level Cont. (%)	Final-Demand Distrib. Cont. (%)
Households	-46 992	-105 780 (225)	68 690 (-146)	-9 899 (21)
Government	-18 280	-38 040 (208)	19 291 (-106)	469 (-3)
Investments	29 305	-34 097 (-116)	60 570 (207)	2 831 (10)
Exports	362 590	-119 490 (-33)	492 690 (136)	-10 610 (-3)
TOTAL	326 620	-297 410 (-91)	660 080 (202)	-36 045 (-11)

The level of gross output generated by the households decreased over the time by almost 47 billion SKK. Obviously, the positive effect of increase in the overall level of private consumption was beated by the negative effect of the economic progress. The exact same feature can be stated for the government expenditures, which generated in 2005 by 18 billion SKK less than in 2000. On the contrary, the gross capital and the exports generated more, in particular by 29 billion SKK and 363 billion SKK, respectively. The increase of the gross output generated by the gross capital was driven mainly by the increase in the overall level of investments. This effect was almost twice bigger than negative effect of the changes in technology. As for the exports, this characteristic was true as well, while the effect of increase in the overall level of exported goods was about quadruple to the effect of technology change.

Generally, in all final-demand categories the economic progress had negative impact on the resulting output, while the final-demand level had positive. The particular distribution of final demand all across the commodities had only minor effects, both positive and negative.

In total, the gross output increased by 326 billion SKK, while most of this number was contributed by the exports. According to the outcomes, the final-demand level contribution was twice the amount of the contribution done by the technology change. The distribution of final demand across the CPA categories had negative, though relatively insignificant effect.

Notice one interesting property, which holds throughout all the SDA results. If one sums the values across the final-demand categories, it does not always provide the number which stands in the "total" row. In particular, this curiosity appears exclusively in the last two columns. However, if one first adds these columns together and then performs the summation across the final-demand categories, the total number is obtained. As far as we are concerned, this feature is caused by the fact, that these last two columns represent the "next-level" decomposition. Hence, this summmation does not work for each next-level factor separately. This way can be treated only the aggregated column, which accounts for the effect of general final-demand change.

3.2.2 Decomposition of Changes in Employment

Next we discuss the outcomes which were obtained after apllying the SDA on figures associated to the employment. Here, based on the formulas (31) and (34), four factors are about to be identified and assessed: the change in labour productivity ($\Delta\hat{L}$), the change in technology (ΔL), the change in final-demand level ($\Delta\mathbf{y}_{\Sigma}$) and the change in final-demand distribution (ΔB). Recall, that all figures in the following table must be interpreted extra carefully, since we used not the proper vectors of employment per commodity but the ones quantified in terms of industries.

Table 12: Decomposition of Changes in Employment

Final-Demand Categories	Employment Change	Labour Prod. Cont. (%)	Technology Cont.(%)	F-D Level Cont. (%)	F-D Distrib. Cont. (%)
Households	-96 645	-28 629 (30)	-69 979 (72)	58 922 (-61)	-57 029 (59)
Government	-20 431	-51 916 (254)	-35 887 (176)	34 598 (-169)	32 775 (-160)
Investments	38 687	-1 452 (-4)	-25 645 (-66)	51 030 (132)	14 753 (38)
Exports	189 590	-60 049 (-32)	-83 931 (-44)	352 830 (186)	-19 260 (-10)
TOTAL	111 200	-142 050 (-128)	-215 440 (-194)	593 160 (533)	-124 470 (-112)

Starting now from the figures for the entire economy, compared to the year 2000 over 110 thousand more people were employed in 2005. The only factor which positively affected this number was increase in the overall level of final demand, which hypothetically created almost 600 thousand more new job positions. All other factors contributed to the overall number of employment in the negative way. In particular, 60 percent of the positive effect made by the final-demand level was cancelled by the effects of changes in the labour productivity and technology and next 20 percent was erased by the changes in the final-demand distribution.

The reason why the contributions made by labour productivity and technology changes are negative is clear. Since, quite logically, economic

progress and increase in labour productivity always results in people being made redundant. This is hence observed all across the final-demand categories. However, the negative effect of the factor (ΔB) must be explained differently. The negative value of this figure represents the fact, that final demand was reallocated into such commodity categories, which are less capable of generating the employment, i.e. are characterized with higher labour productivity.

While addressing the single final-demand categories, the private consumption appeared to have the same structure of positive and negative effect as the whole economy. Though the factor ($\Delta \mathbf{y}_{\Sigma}$) did not increase that much over the time as in total and so the overall contribution to employment change was done by minus 96 thousand. The government also contributed a negative value, in particular by minus 20 thousand employees. However, very profitable reallocation of expenditures was done in this category, which hypothetically resulted in over 30 thousand new job position (the same contribution as was accounted for by increase in their overall level).

The positive effect of reallocation was also assessed for the gross investments. In this category, a suspiciously minor negative effect was contributed by the change in labour productivity. This must have been the result of focusing on commodities, were almost no increase in productivity was observed as the time went by.

Apparently, almost all the largest numbers across the final-demand categories were associated to the foreign sales. Here, amazing 350 thousand job position were hypothetically generated thanks to increase in their overall level. Although all other factors accomplished negative contributions, they cancelled not even one half of effect accounted for by overall-level increase, which eventually led to the outstanding 190 thousand new job position in summary.

3.2.3 Decomposition of Changes in Value Added

Follows the analysis of changes in the value added. The method of structural decomposition is in this case applied to the formulas (35) and (37). Therefore, four different factors can be acknowledged again, while three of them are the same as for the employment: the change in technology (ΔL), the change in final-demand level ($\Delta \mathbf{y}_{\Sigma}$) and the change in final-demand distribution (ΔB).

The one that is changed is naturally the contributor representing the changes in labour productivity, which is now replaced by the changes in matrix $\hat{A^W}$, the matrix of value-added coefficient. This factor is hence re-

ferred to as the changes of value-added coefficients ($\Delta\hat{A^W}$). The positive value of this factor can be interpreted as the property, that the ratio between the value added created domestically and the value added situated abroad has increased.

Table 13: Decomposition of Changes in Value Added (in million SKK)

Final-Demand Categories	Value-Added Change	Value-Added Coeff. Cont. (%)	Technology Cont.(%)	F-D Level Cont. (%)	F-D Distrib. Cont. (%)
Households	41 369	46 277 (112)	-48 365 (-117)	31 408 (76)	12 049 (29)
Government	15 350	15 973 (104)	-17 106 (-111)	11 498 (75)	4 986 (32)
Investments	21 255	13 957 (66)	-17 187 (-81)	24 046 (113)	439 (2)
Exports	165 050	67 723 (41)	-51 085 (-31)	164 060 (99)	-15 648 (-9)
TOTAL	243 030	143 930 (59)	-133 740 (-55)	267 300 (110)	-34 460 (-14)

About all the figures depicted in the above table can be generally stated, that they mostly take positive values. The negative values appear almost exclusively in the column associated to the technology change contribution. There are only two exceptions to the rule, both placed in the last column, which indicates the negative effect of reallocation. But let us discuss the results step-by-step.

As for the households, the negative impact caused by the technology progress was almost by 100 percent cancelled by the change in the value-added coefficients. Hence, the final contribution to the value-added change was more or less equal to the total effect contributed by the aggregated change in consumption of this final-demand category. So, around 40 billion SKK. In fact, the very same characteristics hold also for the decomposition of value added generated by the government expenditures, just all the figures are lowered by approximately 60 to 65 percent.

The gross investments recorded almost the same absolut contribution made by technology change as did the government. However in total, the value-added change generated by this category was greater, in particular 21 billion SKK. But the most interesting number in this row lies in the last column. Actually, only 439 million SKK was contributed by the reallocation of the investments, which can be interpreted in two ways. Either there was almost no reallocation or the positive and negative effects offset each other. To decide, which one of these options is the right one, the closer look at the difference between the vectors of investments is needed, which in this particular case eventually proves the second alternative.

Clearly the biggest contributor to the total value-added change which observed across the entire economy were the exports, which accounted for the outstanding 165 billion SKK. This was actually twice the number generated together by all other final-demand categories. Since the positive effect of changes in the value-added coefficients completely erased

the negative effects contributed by the technology change and by change in the structure of exported commodities, the resulting value added is the very amount contributed by the increase in the exports' overall level. Notice here, that the change in the structure of exported goods affected the domestic value added negatively. Hence we may state, that the country started to export commodities with the feature of having a higher import intensity.

To comment on the total economy-wide figures, the overall value added increased between 2000 and 2005 by 243 billion SKK, while this number was mainly driven by the increase in the overall level of exports. Though, the change in the product mix contributed negatively, which is certainly considered to be a rather bad observation.

3.2.4 Decomposition of Changes in Import

Import is the last economic indicator on which the SDA was applied to. As long as we are aware of the formulas (38) and (40), through which certain vectors of imported goods generated by each final-demand category are calculated, the four factors affecting the final values can be identified. Three of them are the already addressed common factors: the change in technology (ΔL), the change in final-demand level ($\Delta \mathbf{y}_{\Sigma}$) and thechange in final-demand distribution (ΔB). The last factor is the change in the matrix of direct import coefficients - ($\Delta \hat{A}^m$), which can be interpreted as the change in the import intensities.

Table 14: Decomposition of Changes in Import (in million SKK)

Final-Demand Categories	Import Change	Import Int. Cont. (%)	Technology Cont.(%)	F-D Level Cont. (%)	F-D Distrib. Cont. (%)
Households	-661	14 990 (-2 267)	-12 901 (1 951)	9 299 (-1 406)	-12 049 (1 822)
Government	-1 942	8 012 (-413)	-6 879 (354)	1 911 (-98)	-4 986 (257)
Investments	12 737	6 767 (53)	-3 537 (-28)	9 946 (78)	-439 (-3)
Exports	174 570	-2 227 (-1)	-14 411 (-8)	175 560 (101)	15 648 (9)
TOTAL	184 704	27 542 (15)	-37 728 (-20)	160 430 (87)	34 460 (19)

Both private and government consumption contributed to the overall level of imports negative values, recognizing identically oriented effects all across the contributing factors. In particular, the positive effects were accounted for by the change in the import intensities and the overall levels of consumption, while negative effects by the remaining two factors. The highest effect was driven in both categories by the changes in import intensities, while the smallest by the changes in the overall level of expenditures. In addition, separately for the households one may state, that

all the factors contributed exceptionally equal values, which eventually resulted into minor contribution of only minus 661 million SKK.

The gross investments on the other hand contributed to the overall change in imports positively. Here, the very same effect as in the previously addressed final-demand categories were identified, though the negative effects were noticeably minor compared to the positive ones. Hence, the overall result was positive contribution assessed at 13 billion SKK.

Just as one could expect, the most intense effect was accomplished by the exports. The change in the overall level of imported goods generated by this final-demand category reached the remarkable 174 billion SKK. This was a result mainly driven by the extremely positive effect of increase in the overall level of exports. All the other factors compared to this one recorded very insignificant numbers. Moreover, they totally offset each other. Also notice, that the exports were the only final-demand category negatively affected by the change in the import intensities and positively affected by the change in the final-demand distribution. Apparently, the foreign sales of the Slovak economy reallocated over the time into the goods with the relatively higher import intensities, although these were generally lowered.

In total figures, the only negative impact on the imports had the economic progress represented by the change in technology. All other contributing factors had positive impacts, which resulted into the final number of change in the imports being assessed at 184 billion SKK.

Before presenting some summary features recognized all throughout this structural analysis, we would like to point out one interesting property related to the imports. As you may have noticed, the last column in the imports' table takes just the same values as the last column in the value-added table. This clearly coincides with the theory depicted earlier by the relation between the value-added and import multipliers. Truly, the reallocation of the final demand has the exact, yet opposite effects on the domestically generated value added and the imports (value added generated abroad).

3.2.5 A Few Generally Valid Observations

Obviously, the biggest contributions to changes in all studied economic indicators were made by the exports. These contributions were in all cases positive and were mostly driven by the increase in the foreign sales' overall level. The investments generally followed the exports' lead, yet by much lower figures.

The private and government expenditures on the other had mostly

accounted for the negative contributions, only except for the case of the value added. The factors generally affected these two final-demand categories just in the same way, only the factor of reallocation in terms of output and employment took opposite directions.

As expected, the economic progress (i.e. change in technology) characterized by the change in the Leontief inverse naturally affected all the indicators negatively. The same feature can be stated for the progress observed in the labour productivity.

On the contrary, since all across the final-demand categories the increase of the overall level of expenditures (i.e. economic growth) was observed, this final-demand level contribution was exclusively responsible for positively oriented effects. The change in the value-added coefficients recorded strictly positive effects all throughout the economy as well. Also the changes in the import intensities resulted mostly into positive effects, only the level of imports generated by the exports was affected by this factor negatively.

To comment on the tendencies characteristic for the change in final-demand distribution across the commodity categories, both positive and negative effects were assessed, while the government expenditures and the investment recorded mostly beneficial and the exports unprofitable reallocations.

4 Measuring Economic Productivity

Ever since the input-output methodology first came up in the early 1950s, a great amount of research has been done and a large number of various improvements and extensions has been introduced. As a matter of fact, all this enormous progress achieved over the last half century truly assisted in building up a reasonable and solid fundemantals for many economic models and ideas, which are often considered while dealing with a wide range of policy issues.

In order to properly address the progress done in this field and so to include into this thesis at least one topic which is as much up to date as possible, in this last chapter we are about to concisely discuss one of today's many frontier areas of the input-output framework brought into the daylight quite recently. In particular, we address the concept of economic productivity and the way of its measuring.

4.1 Background to Total Factor Productivity

Economic productivity is generally defined as the amount of production (output) of a sector per unit of its supply (input). At present, the rate of growth in productivity all across the economy is widely accepted as important indicator of country's development, since it is recognized to be the main source of its growth and health.

Various measures of economic productivity have been introduced by several reseachers. We focus on one particular concept, the so-called total factor productivity (TFP), which is broadly defined as the growth in total production that is not attributable to growth in inputs.

Let us point out, that all throughout this chapter we consider the version B of the input-output tables, i.e. the version, where import contribution is neglected and only the domestic production is acknowledged.

The primary equation used here is

$$x_j = \sum_{i=1}^{n} a_{ij}x_j + v_j x_j = \left(\sum_{i=1}^{n} a_{ij} + v_j \right) x_j, \tag{82}$$

which is analogous to equation (5), but instead of summing the values in the rows, we apply now summation down the columns. Apparently, terms a_{ij} are the well known technical coefficients, terms v_j represent the value-added coefficients (discussed in Section 2.1.2 and denoted earlier by $a_j^{\hat{W}}$) and terms x_j stand for the total output of the respective sector j. For

differential $\mathrm{d}x_j$, which is by (82) the differential of a product, holds

$$\begin{aligned} \mathrm{d}x_j &= \mathrm{d}\left[\left(\sum_{i=1}^{n} a_{ij} + v_j\right) x_j\right] = \\ &= \left(\sum_{i=1}^{n} a_{ij} + v_j\right)\mathrm{d}x_j + \left(\sum_{i=1}^{n} \mathrm{d}a_{ij} + \mathrm{d}v_j\right) x_j. \end{aligned} \tag{83}$$

Based on this last formula, the rate of TFP growth may be defined as

$$\tau_j = -\left(\sum_{i=1}^{n} \mathrm{d}a_{ij} + \mathrm{d}v_j\right). \tag{84}$$

With respect to (84), the relation (83) takes then the form

$$\mathrm{d}x_j = \left(\sum_{i=1}^{n} a_{ij} - v_j\right)\mathrm{d}x_j + \tau_j x_j. \tag{85}$$

Since one is provided mostly with the input-output datasets for several discrete time points, the relations (83)-(85) shall be transformed definitely into the finite-difference form. Hence, we employ following approximations

$$\begin{aligned} \mathrm{d}x_j &\approx \Delta x_j = x_j^1 - x_j^0, \\ \mathrm{d}a_{ij} &\approx \Delta a_{ij} = a_{ij}^1 - a_{ij}^0, \\ \mathrm{d}v_j &\approx \Delta v_j = v_j^1 - v_j^0. \end{aligned}$$

The equation (83) in the finite-difference terms becomes

$$x_j^1 - x_j^0 = \Delta x_j = \left(\sum_{i=1}^{n} a_{ij}^0 + v_j^0\right)\Delta x_j + \left(\sum_{i=1}^{n} \Delta a_{ij} + \Delta v_j\right) x_j^0, \tag{86}$$

or alternatively

$$\begin{aligned} \Delta x_j = \quad & \underbrace{\left(\sum_{i=1}^{n} a_{ij}^0 + v_j^0\right) x_j^1 - \left(\sum_{i=1}^{n} a_{ij}^0 + v_j^0\right) x_j^0}_{\text{Part contributed by old technology covering new input needs}} \quad + \\ + \quad & \underbrace{\left(\sum_{i=1}^{n} a_{ij}^1 + v_j^1\right) x_j^0 - \left(\sum_{i=1}^{n} a_{ij}^0 + v_j^0\right) x_j^0}_{\text{Part contributed by new technology covering old input needs}} \quad . \end{aligned} \tag{87}$$

From this alternative notation we may clearly see a very close relation to approaches illustrated in Chapter 3. As for the rate of TFP growth, this in the finite-difference form reads

$$\tau_j = -\left(\sum_{i=1}^{n} \Delta a_{ij} + \Delta v_j \right), \tag{88}$$

while the equation (85) obviously becomes

$$\Delta x_j = \left(\sum_{i=1}^{n} a_{ij} + v_j \right) \Delta x_j + \tau_j x_j^0. \tag{89}$$

As the last theoretical expression, we present the matrix form of the formula for the TFP growth, which reads

$$\tau_j = -[(i^T \Delta A)^T + \Delta v], \tag{90}$$

where A is the matrix of technical coefficients and i is the $n \times 1$ vector of all ones. Notice, that sometimes in the TFP analysis, the value-added coefficients v_j are further decomposed into its labor contribution p_j and capital contribution n_j. However, this text is not engaged in this matter (for deeper insight into the entire topic of economic productivity, see [1] and [5]).

4.2 Slovak TFP Development

The following lines are devoted to the concept of TFP placed in terms of the Slovak Republic. Hence, the story of our real-data analysis continues. This section is the end part of the thesis, though.

Via the formula (90) derived in the theoretical part of this chapter, we are about to assess the rate of the TFP growth observed in the Slovak economy between 2000 and 2005. The figures illustrated on the next page characterize the percentage rate of TFP growth (or decline) per commodity, using the CPA classification. Notice, that for these calculations actually the industry classification would be more appropriate.

We decided to picture and discuss only the results per commodity and not to introduce any aggregate figures, since our main goal here is through the particular rate of TFP growth to verify the relations between various sectors (commodities) and identify further the rate of their interdependency. In fact, our decision about the aim of this section follows from the very important observation, that health and competitiveness of a country is mainly related to the structure and efficiency of economic processes within its economy.

Commodities (CPA)	*TFP (%)*	*Commodities (CPA)*	*TFP (%)*
01 Products of agriculture, hunting	2	37 Secondary raw materials	4
02 Products of forestry, logging	0	40 Electrical energy, gas, steam, hot water	16
05 Fish and other fishing products	16	41 Collected and purified water	0
10 Coal and lignite, peat	1	45 Construction work	6
11 Crude petroleum and natural gas	-9	50 Trade, main., repair services of m. v.	-8
13 Metal ores	-3	51 Wholesale trade, commission trade s.	-5
14 Other mining and quarrying products	1	52 Retail trade services	1
15 Food products and beverages	8	55 Hotel and restaurant services	0
16 Tobacco products	-24	60 Land transport, transp. via pipeline s.	-20
17 Textiles	16	61 Water transport services	0
18 Wearing apparel, furs	2	62 Air transport services	53
19 Leather and leather products	7	63 Supp., aux. transp. s., travel agency s.	0
20 Wood and products of wood and cork	8	64 Post and telecommunication services	-1
21 Pulp, paper and paper products	4	65 Financial intermediation services	6
22 Printed matter and recorded media	4	66 Insurance and pension funding serv.	12
23 Coke, ref. petroleum prod., nuclear fuel	-12	67 Services aux. to financial interm.	11
24 Chemicals, chemical products	4	70 Real estate services	2
25 Rubber and plastic products	-2	71 Renting services of machinery and eq.	2
26 Other non metallic mineral products	-7	72 Computer and related services	1
27 Basic metals	16	73 Research and development services	0
28 Fabricated metal products	4	74 Other business services	-7
29 Machinery and equipment n.e.c.	-1	75 Public administration and defence s.	3
30 Office machinery and computers	-3	80 Education services	2
31 Electrical machinery, apparatus n.e.c.	4	85 Health and social work services	5
32 Radio, tel. and comm. eq. and app.	21	90 Sewage and refuse disposal services	0
33 Med., prec., opt. instr.; watches, clocks	13	91 Membership org. services n.e.c.	5
34 Motor vehicles, trailers and s.-trailers	-11	92 Recreational, cultural and sporting s.	-5
35 Other transport equipment	-19	93 Other services	1
36 Furniture, other m. goods n.e.c.	-15		

Before addressing certain figures it is important to emphasize, that both positive and negative values of TFP development were obtained. Hence, one can speak about either tendencies, i.e. about the growth and the decline in productivity. To understand the meaning of the outcomes, the growth in TFP generally represents the fact that the respective services or production of commodities became cheaper, simpler, less time-consuming, less complicated, more sophisticated, etc. The decline in TFP is naturally associated to the very opposite features.

As for the growth, the highest rate was assessed by air transport services (53). The sharpest decline on the other hand was recognized by tobacco products (-24). Apparently, the range of obtained values is quite wide.

The following text comments on all commodities which are expected to be somehow related. We start our discussion with the most interdependent commodities (according to our results) and gradually relax this property.

Just the same rate of TFP growth was observed for the pulp, paper and paper products (4) and printed matter and recorded media (4).

Collected and purified water (0) and sewage and refuse disposal services (0) both recorded no growth or decline in productivity at all.

The very similar rate of TFP decline proven the close relation between crude petroleum and natural gas (-9) and coke, refined petroleum products and nuclear fuel (-12).

Another obvious relation was proven between motor vehicles, trailers and semi-trailers (-11) and trade, maintenance and repair services of motor vehicles and motorcycles (-8). However, other transport equipment (-19) appeared to be not that much closely related.

Relatively similar values were obtained also for the next group of closely related commodities: financial intermediation services (6); insurance and pension funding services (12) and services auxiliary to financial intermediation (11).

The slightly positive development was identified for the commodities mostly funded by the government: public administration and defence services (3); education services (2) and health and social work services (5). To this group could be also partly included the research and development services (0).

The close relation between commodities gained via the mining can be recognized from the table: coal and lignite, peat (1); metal ores (-3) and other mining and quarrying products (1). Though in terms of productivity, basic metals (16) and fabricated metal products (4) proven to have obviously not so close linkage to the process of mining as such.

Some interdependency can be also identified through the values representing the area of machinery production: machinery and equipment n.e.c. (-1); office machinery and computers (-3) and electrical machinery and apparatus n.e.c. (4). Only the radio, television and communication equipment and apparatus (21) somehow deviated from this group.

Products of agriculture, hunting and related services (2) and products of forestry, logging and related services (0), in the Slovak Republik generally related more to the countryside, recorded very similar productivity developments. However, the wood and products of wood and cork (8) appeared to have not that close linkage to the forestry.

A wider relation can be seen between chemicals, chemical products and man-made fibres (4); rubber and plastic products (-2) and other non metallic mineral products (-7).

Similarly linked appear to be wholesale trade and commission trade services (-5) and retail trade services (1).

Even wider relation than between the previously mentioned commodi-

ties suprisingly arose between textiles (16); wearing apparel, furs (2) and leather and leather products (7).

The most shocking result was probably related to the area of transportation, where in terms of TFP emerged absolutely no linkage between land transport and transport via pipeline services (-20); water transport services (0) and air transport services (53).

There are still eighteen commodities left in the table, which we have not addressed so far. Though, we cannot see any more clear or logical relations across the commodities that should be assessed. Hence, if we forgot by any change to acknowledge any other specific interdependence, this is left to be done by the reader.

To sum up, according to the results of our TFP study, the Slovak economy generally proven to have quite high level of interdependency among many naturally related industries (represented more or less well by the commodity categories). This is certainly understood to be a good sign. However, across many sectors a decline in productivity was observed. This does not have to be strictly identified as a negative observation, since many technological improvements may result into lowering the productivity. Therefore, in order to get even deeper insight into this issue, further analysis should be undertaken.

Conclusion

Besides reasonable illustration of necessary theoretical background, the main contribution made by our thesis is certainly the comprehensive input-output study of development of the Slovak economy between 2000 and 2005.

In the first part of the real-data analysis we were concerned with the input-output multipliers and their economic interpretation. Here, we pointed out several big differences between multipliers calculated with respect to the imports and those where this contribution was neglected. Also some general comments were stated, such as the fact that in about 80 percent of commodities the output and employment multipliers decreased their values over the time. The deeper structure of relations between final-demand categories and overall levels of relevant economic indicators was pictured and commented here as well.

Though, the particular changes in these figures were properly analyzed in the next part, where the method of structural decomposition was employed in order to factorize the observed complex changes into their relevant components. A few generally valid statements were claimed here, such as the fact that the technology change affected all the considered quantities negatively or on the other hand, that the changes in final-demand level recorded exclusively positive impacts.

In the last section addressing the real-data analysis we revealed through the TFP growth the rate of interdependency among various naturally related sectors. We stated eventually, that relatively high level of interdependency can be recognized across the commodities, which is for the competitiveness of our economy certainly a good feature.

To sum up, the development of the Slovak economy from many input-output points of view is provided in this text, supplemented with the huge amount of detailed figures depicted in both the main and the appendix part of the thesis. So that if anyone is interested in relations which hold for any particular area of the economy, either in order to do further theoretical research or to eventually consider these outcomes in the real policy issues, the relevant information can be found and interpreted very easily.

Resumé

Hlavným prínosom tejto diplomovej práce je popri samozrejmom odvodení všetkých teoretických formúl najmä empirická časť ilustrujúca výsledky rozsiahlej input-output analýzy vývoja slovenskej ekonomiky medzi rokmi 2000 a 2005.

Prvá časť analýzy bola pritom zameraná na výpočet input-output multiplikátorov a ich následnú ekonomickú interpretáciu. Súčasťou tejto sekcie bol aj hlbší rozbor súvislostí medzi jednotlivými kategóriami konečnej spotreby a objemami dôležitých ekonomických ukazovateľov, t.j. produkcie, zamestnanosti, pridanej hodnoty a dovozu generovanými týmito individuálnymi zložkami.

Podrobná analýza konkrétnych zmien daných veličín bola však vykonaná až v nasledovej kapitole, kde sme prostredníctvom metódy štrukturálnej dekompozície (faktorizácie) boli schopní rozložiť hodnoty celkovo pozorovaných zmien na jednotlivé zložky vyplývajúce zo zmien charakteru príslušných prispievajúcich faktorov.

V poslednej časti, ktorá bola venovaná analýze reálnych dát sme napokon prostredníctvom odhadnutia rastu či poklesu ekonomickej produktivity pre jednotlivé statky dokázali pomerne jasne identifikovat mieru prepojenosti medzi oblasťami, ktoré by podľa očakávaní mali mať navzájom akýsi súvis.

Celkove sme v tejto práci poskytli z pohľadu input-output analýzy na naše možnosti maximálne relevantnú štúdiu vývoja a charakteru slovenskej ekonomiky a procesov v nej, reprezentovanú veľkým množstvom výstupov uvedených či už v jadre alebo v prílohách tejto práce. Tieto môžu byť prirodzene kedykoľvek podrobené ďalšiemu štúdiu a to či už za účelom teoretických aplikácií alebo v snahe ich konečného použitia v reálnych rozhodovacích procesoch tohto štátu.

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Appendices

On the following pages, various figures for the Slovak economy are presented. Recall the notation: private consumption (C), government expenditures (G), gross fixed capital formation (THK) and exports (EX).

Here is the list of all appendices:

Appendix 1 - Multipliers per commodity in 2000

Commodities (CPA)	*Output Multiplier (version A)*	*Output Multiplier (version B)*	*Employment Multiplier*	*Value-Added Multiplier*	*Import Multiplier*
01 Prod. of agriculture, hunting	2.67	2.09	2.54	0.79	0.21
02 Prod. forestry, logging	2.06	1.79	2.82	0.90	0.10
05 Fish and other fishing products	3.09	2.42	3.70	0.76	0.24
10 Coal and lignite, peat	2.08	1.63	3.75	0.84	0.16
11 Crude petroleum, natural gas	2.08	1.53	1.10	0.75	0.25
13 Metal ores	2.88	2.26	4.43	0.78	0.22
14 Other mining and quarr. prod.	2.81	2.11	1.95	0.74	0.26
15 Food products and beverages	3.09	2.00	1.58	0.62	0.38
16 Tobacco products	2.70	1.44	0.70	0.52	0.48
17 Textiles	2.49	1.49	2.47	0.61	0.39
18 Wearing apparel, furs	2.29	1.29	3.33	0.60	0.40
19 Leather and leather products	2.41	1.26	2.05	0.53	0.47
20 Wood, prod. of wood and cork	2.61	1.97	2.83	0.76	0.24
21 Pulp, paper and paper prod.	2.96	1.59	0.90	0.51	0.49
22 Printed matter, recorded media	2.76	1.71	1.42	0.63	0.37
23 Coke, ref. petr. prod., nucl. fuel	2.92	1.13	0.19	0.17	0.83
24 Chemicals, chemical prod.	2.95	1.45	0.65	0.47	0.53
25 Rubber and plastic products	3.13	1.35	0.96	0.40	0.60
26 Other non metallic min. prod.	2.86	1.76	1.21	0.60	0.40
27 Basic metals	3.48	2.03	0.89	0.50	0.50
28 Fabricated metal products	2.94	1.63	1.99	0.57	0.43
29 Machinery and eq. n.e.c.	3.32	1.48	0.93	0.43	0.57
30 Office machinery, computers	4.15	1.21	0.55	0.18	0.82
31 Elect. machinery, app. n.e.c.	3.13	1.29	0.81	0.40	0.60
32 Radio, tel. and comm. eq., app.	3.23	1.26	1.16	0.37	0.63
33 Med., prec., opt. instr., watches	2.48	1.60	0.88	0.71	0.29
34 Motor vehicles, trailers, s.-tr.	4.08	1.12	0.32	0.17	0.83
35 Other transport equipment	3.44	1.43	1.20	0.38	0.62
36 Furniture, other m. goods n.e.c.	3.28	1.40	1.47	0.35	0.65
37 Secondary raw materials	2.35	1.92	1.69	0.83	0.17
40 Elect. energy, gas, steam, hot w.	3.21	2.62	0.95	0.77	0.23
41 Coll. and pur. water, distrib.	2.44	2.02	2.07	0.85	0.15
45 Construction work	2.70	2.01	1.76	0.76	0.24
50 Trade, maint., rep. s. of m. veh.	2.51	1.75	2.21	0.77	0.23
51 Wholesale, commission tr. s.	2.50	1.79	1.07	0.72	0.28
52 Retail trade services	2.23	1.76	2.65	0.82	0.18
55 Hotel and restaurant services	2.77	2.19	3.15	0.77	0.23
60 Land transport, t. via p. serv.	2.61	1.55	1.16	0.54	0.46
61 Water transport services	2.96	2.31	1.88	0.74	0.26
62 Air transport services	3.58	2.52	1.86	0.60	0.40
63 Supp. and aux. trans. s., TA s.	3.07	2.07	1.21	0.62	0.38
64 Post and telecomm. services	1.94	1.54	1.51	0.85	0.15
65 Financial interm. services	1.85	1.64	1.00	0.92	0.08
66 Insurance, pension fund. serv.	2.06	1.85	1.76	0.92	0.08
67 Services aux. to fin. interm.	3.12	2.72	2.24	0.85	0.15
70 Real estate services	1.50	1.41	0.30	0.96	0.04
71 Rent. services of machinery, eq.	2.30	1.85	0.63	0.83	0.17
72 Computer and related services	2.28	1.64	1.04	0.78	0.22
73 Research and develop. serv.	2.48	1.81	2.73	0.75	0.25
74 Other business services	2.53	1.85	1.39	0.75	0.25
75 Public adm. and defence serv.	1.84	1.56	2.17	0.90	0.10
80 Education services	1.39	1.26	4.67	0.95	0.05
85 Health, social work services	1.94	1.46	3.44	0.83	0.17
90 Sewage, ref. disposal services	2.45	2.01	4.30	0.84	0.16
91 Membership org. serv.	3.66	3.02	3.00	0.76	0.24
92 Rec., cult. and sport. s.	2.46	1.91	2.21	0.78	0.22
93 Other services	1.67	1.44	4.16	0.91	0.09

Appendix 2 - Multipliers per commodity in 2005

Commodities (CPA)	*Output Multiplier (version A)*	*Output Multiplier (version B)*	*Employment Multiplier*	*Value-Added Multiplier*	*Import Multiplier*
01 Prod. of agriculture, hunting	2.28	1.76	1.74	0.79	0.21
02 Prod. forestry, logging	1.89	1.67	1.96	0.91	0.09
05 Fish and other fishing products	2.56	1.71	2.89	0.67	0.33
10 Coal and lignite, peat	1.68	1.37	2.56	0.86	0.14
11 Crude petroleum, natural gas	1.51	1.22	0.63	0.88	0.12
13 Metal ores	2.78	2.19	7.13	0.71	0.29
14 Other mining and quarr. prod.	2.21	1.71	1.21	0.78	0.22
15 Food products and beverages	2.85	1.74	1.30	0.58	0.42
16 Tobacco products	2.23	1.66	2.55	0.74	0.26
17 Textiles	2.62	1.26	1.44	0.47	0.53
18 Wearing apparel, furs	2.40	1.29	3.02	0.57	0.43
19 Leather and leather products	2.88	1.32	1.89	0.44	0.56
20 Wood, prod. of wood and cork	2.42	1.65	1.88	0.69	0.31
21 Pulp, paper and paper prod.	3.05	1.63	0.79	0.48	0.52
22 Printed matter, recorded media	2.70	1.56	1.22	0.60	0.40
23 Coke, ref. petr. prod., nucl. fuel	2.36	1.15	0.17	0.28	0.72
24 Chemicals, chemical prod.	2.80	1.40	0.67	0.43	0.57
25 Rubber and plastic products	3.13	1.38	0.78	0.39	0.61
26 Other non metallic min. prod.	2.52	1.71	1.16	0.65	0.35
27 Basic metals	2.58	1.37	0.55	0.49	0.51
28 Fabricated metal products	2.35	1.33	1.46	0.58	0.42
29 Machinery and eq. n.e.c.	2.86	1.37	0.80	0.46	0.54
30 Office machinery, computers	4.48	1.21	0.37	0.20	0.80
31 Elect. machinery, app. n.e.c.	3.39	1.23	0.81	0.33	0.67
32 Radio, tel. and comm. eq., app.	4.54	1.16	0.56	0.17	0.83
33 Med., prec., opt. instr., watches	2.63	1.40	0.55	0.57	0.43
34 Motor vehicles, trailers, s.-tr.	4.32	1.17	0.29	0.22	0.78
35 Other transport equipment	3.05	1.62	1.40	0.49	0.51
36 Furniture, other m. goods n.e.c.	2.92	1.45	1.23	0.46	0.54
37 Secondary raw materials	2.14	1.62	2.05	0.77	0.23
40 Elect. energy, gas, steam, hot w.	2.43	1.78	0.48	0.64	0.36
41 Coll. and pur. water, distrib.	2.07	1.74	2.20	0.86	0.14
45 Construction work	2.56	1.79	1.59	0.71	0.29
50 Trade, maint., rep. s. of m. veh.	2.42	1.65	1.93	0.77	0.23
51 Wholesale, commission tr. s.	1.93	1.54	0.93	0.85	0.15
52 Retail trade services	1.78	1.45	2.55	0.86	0.14
55 Hotel and restaurant services	1.88	1.57	4.01	0.88	0.12
60 Land transport, t. via p. serv.	2.07	1.49	1.20	0.75	0.25
61 Water transport services	2.02	1.61	3.61	0.80	0.20
62 Air transport services	3.26	1.41	0.83	0.33	0.67
63 Supp. and aux. trans. s., TA s.	2.55	1.81	0.83	0.70	0.30
64 Post and telecomm. services	1.78	1.43	0.86	0.87	0.13
65 Financial interm. services	1.52	1.31	0.78	0.91	0.09
66 Insurance, pension fund. serv.	1.76	1.38	1.20	0.82	0.18
67 Services aux. to fin. interm.	1.69	1.34	1.02	0.83	0.17
70 Real estate services	1.56	1.37	0.34	0.93	0.07
71 Rent. services of machinery, eq.	1.92	1.64	0.62	0.88	0.12
72 Computer and related services	2.03	1.45	1.07	0.78	0.22
73 Research and develop. serv.	1.98	1.43	2.60	0.79	0.21
74 Other business services	2.01	1.59	1.37	0.84	0.16
75 Public adm. and defence serv.	1.61	1.35	1.77	0.90	0.10
80 Education services	1.35	1.20	3.87	0.93	0.07
85 Health, social work services	1.89	1.31	3.16	0.78	0.22
90 Sewage, ref. disposal services	1.86	1.58	2.27	0.89	0.11
91 Membership org. serv.	1.92	1.59	1.93	0.87	0.13
92 Rec., cult. and sport. s.	2.02	1.70	1.88	0.87	0.13
93 Other services	1.42	1.29	3.82	0.94	0.06

Appendix 3 - Output components in 2000 (in million SKK)

Commodities (CPA)	*C-component*	*G-component*	*THK-component*	*EX-component*	*Total Output*
01 Prod. of agriculture, hunting	62 664	4 074	2 090	11 365	80 193
02 Prod. forestry, logging	2 482	732	1 214	8 433	12 861
05 Fish and other fishing products	19	1	2	59	81
10 Coal and lignite, peat	793	527	472	1 322	3 114
11 Crude petroleum, natural gas	518	169	3 358	1 108	5 153
13 Metal ores	71	45	11	728	855
14 Other mining and quarr. prod.	517	77	1 646	3 453	5 693
15 Food products and beverages	77 362	3 091	492	18 149	99 094
16 Tobacco products	1 190	12	691	1 962	3 855
17 Textiles	1 743	55	177	9 761	11 736
18 Wearing apparel, furs	3 250	143	-7 403	19 122	15 112
19 Leather and leather products	832	27	1 074	9 879	11 812
20 Wood, prod. of wood and cork	3 325	1 062	3 628	13 624	21 639
21 Pulp, paper and paper prod.	4 843	1 746	1 890	26 327	34 805
22 Printed matter, recorded media	5 056	2 564	869	8 155	16 644
23 Coke, ref. petr. prod., nucl. fuel	11 310	3 281	2 604	48 330	65 526
24 Chemicals, chemical prod.	4 185	14 253	1 255	47 055	66 747
25 Rubber and plastic products	2 861	336	6 315	20 187	29 699
26 Other non metallic min. prod.	2 891	605	13 117	19 948	36 561
27 Basic metals	4 111	1 338	-669	106 110	110 890
28 Fabricated metal products	4 093	866	3 399	27 817	36 176
29 Machinery and eq. n.e.c.	3 508	1 600	14 563	48 328	67 999
30 Office machinery, computers	202	82	-196	3 770	3 858
31 Elect. machinery, app. n.e.c.	187	41	6 944	31 495	38 667
32 Radio, tel. and comm. eq., app.	711	227	2 156	13 520	16 614
33 Med., prec., opt. instr., watches	940	1 138	2 384	5 144	9 606
34 Motor vehicles, trailers, s.-tr.	3 991	121	-4 209	99 278	99 181
35 Other transport equipment	892	46	1 341	7 963	10 242
36 Furniture, other m. goods n.e.c.	2 510	1 321	1 654	13 746	19 231
37 Secondary raw materials	459	299	842	745	2 345
40 Elect. energy, gas, steam, hot w.	96 730	14 418	3 350	50 194	164 690
41 Coll. and pur. water, distrib.	5 708	922	364	1 416	8 410
45 Construction work	14 930	3 763	141 820	15 266	175 780
50 Trade, maint., rep. s. of m. veh.	8 200	1 093	3 435	6 629	19 356
51 Wholesale, commission tr. s.	28 718	4 370	26 306	65 478	124 870
52 Retail trade services	50 458	2 662	5 033	20 680	78 833
55 Hotel and restaurant services	15 112	3 512	1 699	9 137	29 459
60 Land transport, t. via p. serv.	37 798	6 567	14 819	84 520	143 700
61 Water transport services	691	67	79	785	1 622
62 Air transport services	516	201	64	574	1 355
63 Supp. and aux. trans. s., TA s.	6 978	5 615	1 266	11 776	25 635
64 Post and telecomm. services	18 513	5 307	3 149	12 741	39 710
65 Financial interm. services	15 205	5 074	4 137	14 065	38 481
66 Insurance, pension fund. serv.	8 425	566	563	2 422	11 976
67 Services aux. to fin. interm.	1 802	364	409	1 266	3 841
70 Real estate services	80 070	7 365	7 668	13 969	109 070
71 Rent. services of machinery, eq.	5 431	1 454	3 386	8 900	19 170
72 Computer and related services	4 605	3 335	1 760	8 591	18 290
73 Research and develop. serv.	226	2 919	164	1 084	4 393
74 Other business services	23 197	8 530	11 103	37 496	80 325
75 Public adm. and defence serv.	1 427	91 808	263	1 609	95 106
80 Education services	4 736	30 821	131	757	36 444
85 Health, social work services	5 520	41 525	63	1 679	48 788
90 Sewage, ref. disposal services	4 965	1 399	301	1 024	7 689
91 Membership org. serv.	610	3 498	139	574	4 822
92 Rec., cult. and sport. s.	11 871	8 150	1 113	4 649	25 784
93 Other services	1 008	778	328	4 636	6 749

Appendix 4 - Output components in 2005 (in million SKK)

Commodities (CPA)	*C-component*	*G-component*	*THK-component*	*EX-component*	*Total Output*
01 Prod. of agriculture, hunting	46 617	3 048	4 042	18 521	72 228
02 Prod. forestry, logging	3 617	225	886	12 152	16 880
05 Fish and other fishing products	49	8	3	70	130
10 Coal and lignite, peat	437	189	626	1 445	2 697
11 Crude petroleum, natural gas	257	38	66	3 314	3 674
13 Metal ores	7	2	234	157	400
14 Other mining and quarr. prod.	461	136	305	3 995	4 898
15 Food products and beverages	52 376	2 228	1 268	31 836	87 708
16 Tobacco products	58	3	21	421	503
17 Textiles	600	79	196	11 527	12 401
18 Wearing apparel, furs	762	89	186	14 150	15 188
19 Leather and leather products	423	18	96	12 399	12 935
20 Wood, prod. of wood and cork	1 719	303	4 060	20 433	26 515
21 Pulp, paper and paper prod.	1 544	261	1 081	26 528	29 414
22 Printed matter, recorded media	7 707	917	1 458	8 599	18 680
23 Coke, ref. petr. prod., nucl. fuel	5 045	883	2 982	56 811	65 721
24 Chemicals, chemical prod.	2 799	2 417	1 941	44 010	51 166
25 Rubber and plastic products	1 486	431	1 254	42 271	45 443
26 Other non metallic min. prod.	2 369	456	8 910	25 705	37 439
27 Basic metals	1 525	419	4 580	102 010	108 530
28 Fabricated metal products	3 425	577	7 095	46 872	57 968
29 Machinery and eq. n.e.c.	3 316	501	5 392	74 433	83 642
30 Office machinery, computers	1 241	280	2 003	19 317	22 842
31 Elect. machinery, app. n.e.c.	2 814	360	4 466	63 880	71 520
32 Radio, tel. and comm. eq., app.	1 247	314	1 541	61 395	64 497
33 Med., prec., opt. instr., watches	993	3 047	2 034	7 647	13 721
34 Motor vehicles, trailers, s.-tr.	3 684	288	2 790	182 410	189 180
35 Other transport equipment	1 094	68	671	8 861	10 693
36 Furniture, other m. goods n.e.c.	6 290	707	1 418	23 094	31 508
37 Secondary raw materials	163	150	238	994	1 546
40 Elect. energy, gas, steam, hot w.	86 294	12 207	8 131	60 559	167 190
41 Coll. and pur. water, distrib.	3 711	814	270	1 518	6 313
45 Construction work	15 090	5 646	181 120	17 984	219 840
50 Trade, maint., rep. s. of m. veh.	8 773	635	4 049	10 319	23 776
51 Wholesale, commission tr. s.	20 197	3 111	17 559	73 512	114 380
52 Retail trade services	42 480	1 594	3 105	32 122	79 301
55 Hotel and restaurant services	7 520	2 241	824	14 736	25 321
60 Land transport, t. via p. serv.	30 163	2 624	5 933	73 194	111 910
61 Water transport services	108	24	60	597	788
62 Air transport services	139	263	47	4 145	4 594
63 Supp. and aux. trans. s., TA s.	11 245	4 537	1 519	18 019	35 320
64 Post and telecomm. services	30 183	4 709	2 356	14 501	51 749
65 Financial interm. services	29 576	1 858	2 285	14 761	48 480
66 Insurance, pension fund. serv.	17 025	164	340	1 746	19 275
67 Services aux. to fin. interm.	4 280	107	130	721	5 237
70 Real estate services	90 601	4 575	4 342	15 510	115 030
71 Rent. services of machinery, eq.	3 538	955	2 388	7 600	14 481
72 Computer and related services	2 789	2 441	16 106	6 441	27 778
73 Research and develop. serv.	307	2 208	140	1 152	3 807
74 Other business services	23 846	6 991	9 942	54 357	95 135
75 Public adm. and defence serv.	1 833	101 590	133	1 788	105 340
80 Education services	4 525	38 443	127	891	43 985
85 Health, social work services	4 204	44 981	37	2 261	51 483
90 Sewage, ref. disposal services	5 283	3 161	209	1 324	9 977
91 Membership org. serv.	295	4 542	104	366	5 307
92 Rec., cult. and sport. s.	12 702	8 388	638	10 461	32 189
93 Other services	3 145	437	195	5 543	9 321

Appendix 5 - Employment components in 2000

Commodities (CPA)	*C-component*	*G-component*	*THK-component*	*EX-component*	*Total Employment*
01 Prod. of agriculture, hunting	90 019	5 853	3 002	16 326	115 200
02 Prod. forestry, logging	4 690	1 383	2 295	15 933	24 300
05 Fish and other fishing products	46	3	4	147	200
10 Coal and lignite, peat	2 674	1 778	1 590	4 459	10 500
11 Crude petroleum, natural gas	392	128	2 541	839	3 900
13 Metal ores	273	175	41	2 811	3 300
14 Other mining and quarr. prod.	645	96	2 053	4 306	7 100
15 Food products and beverages	51 603	2 062	328	12 106	66 100
16 Tobacco products	432	4	251	713	1 400
17 Textiles	3 580	113	363	20 044	24 100
18 Wearing apparel, furs	9 893	435	-22 535	58 207	46 000
19 Leather and leather products	1 508	49	1 945	17 898	21 400
20 Wood, prod. of wood and cork	5 500	1 758	6 003	22 539	35 800
21 Pulp, paper and paper prod.	2 018	727	787	10 968	14 500
22 Printed matter, recorded media	4 375	2 218	752	7 056	14 400
23 Coke, ref. petr. prod., nucl. fuel	1 001	290	230	4 278	5 800
24 Chemicals, chemical prod.	1 599	5 445	479	17 977	25 500
25 Rubber and plastic products	2 023	238	4 465	14 274	21 000
26 Other non metallic min. prod.	2 080	435	9 436	14 350	26 300
27 Basic metals	1 401	456	-228	36 171	37 800
28 Fabricated metal products	6 551	1 387	5 440	44 522	57 900
29 Machinery and eq. n.e.c.	2 208	1 007	9 166	30 419	42 800
30 Office machinery, computers	73	30	-71	1 368	1 400
31 Elect. machinery, app. n.e.c.	114	25	4 238	19 223	23 600
32 Radio, tel. and comm. eq., app.	685	218	2 077	13 020	16 000
33 Med., prec., opt. instr., watches	342	415	869	1 874	3 500
34 Motor vehicles, trailers, s.-tr.	925	28	-976	23 023	23 000
35 Other transport equipment	810	42	1 217	7 231	9 300
36 Furniture, other m. goods n.e.c.	2 702	1 422	1 780	14 796	20 700
37 Secondary raw materials	372	242	682	603	1 900
40 Elect. energy, gas, steam, hot w.	23 259	3 467	805	12 069	39 600
41 Coll. and pur. water, distrib.	7 127	1 151	455	1 768	10 500
45 Construction work	14 243	3 590	135 300	14 564	167 700
50 Trade, maint., rep. s. of m. veh.	13 387	1 784	5 608	10 822	31 600
51 Wholesale, commission tr. s.	14 006	2 131	12 829	31 934	60 900
52 Retail trade services	107 020	5 645	10 675	43 861	167 200
55 Hotel and restaurant services	33 445	7 774	3 760	20 221	65 200
60 Land transport, t. via p. serv.	29 380	5 104	11 519	65 697	111 700
61 Water transport services	724	71	83	822	1 700
62 Air transport services	495	193	61	551	1 300
63 Supp. and aux. trans. s., TA s.	3 021	2 431	548	5 099	11 100
64 Post and telecomm. services	19 301	5 533	3 283	13 283	41 400
65 Financial interm. services	8 061	2 690	2 193	7 456	20 400
66 Insurance, pension fund. serv.	9 215	619	616	2 649	13 100
67 Services aux. to fin. interm.	1 689	341	383	1 187	3 600
70 Real estate services	8 589	790	823	1 498	11 700
71 Rent. services of machinery, eq.	28	8	18	46	100
72 Computer and related services	2 643	1 915	1 011	4 932	10 500
73 Research and develop. serv.	479	6 179	348	2 295	9 300
74 Other business services	17 068	6 276	8 169	27 588	59 100
75 Public adm. and defence serv.	2 375	152 810	437	2 677	158 300
80 Education services	21 001	136 660	579	3 356	161 600
85 Health, social work services	16 734	125 880	192	5 091	147 900
90 Sewage, ref. disposal services	16 399	4 623	995	3 383	25 400
91 Membership org. serv.	620	3 555	142	584	4 900
92 Rec., cult. and sport. s.	16 207	11 127	1 520	6 347	35 200
93 Other services	3 807	2 940	1 238	17 515	25 500

Appendix 6 - Employment components in 2005

Commodities (CPA)	*C-component*	*G-component*	*THK-component*	*EX-component*	*Total Employment*
01 Prod. of agriculture, hunting	52 601	3 439	4 561	20 899	81 500
02 Prod. forestry, logging	4 971	309	1 218	16 701	23 200
05 Fish and other fishing products	113	19	6	161	300
10 Coal and lignite, peat	1 036	448	1 486	3 430	6 400
11 Crude petroleum, natural gas	126	18	32	1 624	1 800
13 Metal ores	49	11	1 578	1 062	2 700
14 Other mining and quarr. prod.	358	106	236	3 100	3 800
15 Food products and beverages	35 472	1 509	859	21 561	59 400
16 Tobacco products	115	6	43	836	1 000
17 Textiles	730	96	239	14 035	15 100
18 Wearing apparel, furs	2 077	244	507	38 572	41 400
19 Leather and leather products	676	28	154	19 842	20 700
20 Wood, prod. of wood and cork	2 139	378	5 053	25 431	33 000
21 Pulp, paper and paper prod.	483	82	338	8 297	9 200
22 Printed matter, recorded media	6 188	736	1 170	6 905	15 000
23 Coke, ref. petr. prod., nucl. fuel	307	54	181	3 458	4 000
24 Chemicals, chemical prod.	1 264	1 091	876	19 869	23 100
25 Rubber and plastic products	804	234	679	22 883	24 600
26 Other non metallic min. prod.	1 689	325	6 354	18 332	26 700
27 Basic metals	488	134	1 464	32 614	34 700
28 Fabricated metal products	4 218	710	8 739	57 733	71 400
29 Machinery and eq. n.e.c.	1 844	279	2 998	41 380	46 500
30 Office machinery, computers	288	65	465	4 482	5 300
31 Elect. machinery, app. n.e.c.	1 869	239	2 966	42 426	47 500
32 Radio, tel. and comm. eq., app.	562	142	695	27 701	29 100
33 Med., prec., opt. instr., watches	289	888	593	2 229	4 000
34 Motor vehicles, trailers, s.-tr.	791	62	599	39 149	40 600
35 Other transport equipment	1 054	65	646	8 535	10 300
36 Furniture, other m. goods n.e.c.	5 310	597	1 197	19 496	26 600
37 Secondary raw materials	264	243	385	1 608	2 500
40 Elect. energy, gas, steam, hot w.	16 774	2 373	1 581	11 772	32 500
41 Coll. and pur. water, distrib.	5 937	1 303	431	2 429	10 100
45 Construction work	14 401	5 389	172 850	17 162	209 800
50 Trade, maint., rep. s. of m. veh.	13 320	964	6 148	15 668	36 100
51 Wholesale, commission tr. s.	11 213	1 727	9 749	40 812	63 500
52 Retail trade services	90 958	3 413	6 649	68 779	169 800
55 Hotel and restaurant services	26 816	7 992	2 940	52 552	90 300
60 Land transport, t. via p. serv.	27 410	2 384	5 392	66 514	101 700
61 Water transport services	343	77	189	1 892	2 500
62 Air transport services	79	149	27	2 346	2 600
63 Supp. and aux. trans. s., TA s.	3 311	1 336	447	5 306	10 400
64 Post and telecomm. services	17 498	2 730	1 366	8 407	30 000
65 Financial interm. services	16 167	1 016	1 249	8 069	26 500
66 Insurance, pension fund. serv.	15 545	149	311	1 594	17 600
67 Services aux. to fin. interm.	3 269	82	99	551	4 000
70 Real estate services	10 712	541	513	1 834	13 600
71 Rent. services of machinery, eq.	611	165	412	1 312	2 500
72 Computer and related services	2 079	1 819	12 002	4 800	20 700
73 Research and develop. serv.	677	4 873	308	2 542	8 400
74 Other business services	21 080	6 180	8 788	48 052	84 100
75 Public adm. and defence serv.	2 690	149 090	196	2 624	154 600
80 Education services	16 840	143 070	473	3 314	163 700
85 Health, social work services	12 249	131 060	108	6 588	150 000
90 Sewage, ref. disposal services	9 213	5 512	365	2 310	17 400
91 Membership org. serv.	373	5 734	131	462	6 700
92 Rec., cult. and sport. s.	15 272	10 084	767	12 577	38 700
93 Other services	11 202	1 558	696	19 743	33 200

Appendix 7 - Value-added components in 2000 (in million SKK)

Commodities (CPA)	*C-component*	*G-component*	*THK-component*	*EX-component*	*Total Value Added*
01 Prod. of agriculture, hunting	24 243	1 576	808	4 397	31 025
02 Prod. forestry, logging	1 390	410	680	4 723	7 203
05 Fish and other fishing products	4	0	0	13	18
10 Coal and lignite, peat	496	330	295	828	1 949
11 Crude petroleum, natural gas	269	88	1 746	576	2 679
13 Metal ores	28	18	4	287	337
14 Other mining and quarr. prod.	185	27	588	1 234	2 035
15 Food products and beverages	19 023	760	121	4 463	24 367
16 Tobacco products	424	4	246	699	1 373
17 Textiles	730	23	74	4 086	4 913
18 Wearing apparel, furs	1 553	68	-3 538	9 137	7 221
19 Leather and leather products	355	11	458	4 216	5 041
20 Wood, prod. of wood and cork	1 192	381	1 301	4 885	7 759
21 Pulp, paper and paper prod.	1 404	506	548	7 629	10 086
22 Printed matter, recorded media	1 768	897	304	2 852	5 821
23 Coke, ref. petr. prod., nucl. fuel	1 380	400	318	5 898	7 996
24 Chemicals, chemical prod.	1 370	4 666	411	15 405	21 851
25 Rubber and plastic products	741	87	1 635	5 227	7 690
26 Other non metallic min. prod.	1 004	210	4 557	6 930	12 702
27 Basic metals	813	265	-132	20 990	21 935
28 Fabricated metal products	1 491	316	1 238	10 131	13 175
29 Machinery and eq. n.e.c.	954	435	3 960	13 142	18 492
30 Office machinery, computers	21	8	-20	383	392
31 Elect. machinery, app. n.e.c.	56	12	2 069	9 385	11 522
32 Radio, tel. and comm. eq., app.	194	62	587	3 682	4 525
33 Med., prec., opt. instr., watches	436	528	1 106	2 386	4 455
34 Motor vehicles, trailers, s.-tr.	511	16	-539	12 721	12 708
35 Other transport equipment	196	10	295	1 751	2 252
36 Furniture, other m. goods n.e.c.	497	262	328	2 724	3 810
37 Secondary raw materials	204	133	375	332	1 044
40 Elect. energy, gas, steam, hot w.	25 648	3 823	888	13 309	43 668
41 Coll. and pur. water, distrib.	2 643	427	169	656	3 894
45 Construction work	5 519	1 391	52 432	5 644	64 986
50 Trade, maint., rep. s. of m. veh.	3 647	486	1 527	2 948	8 608
51 Wholesale, commission tr. s.	11 677	1 777	10 696	26 623	50 773
52 Retail trade services	25 407	1 340	2 534	10 413	39 695
55 Hotel and restaurant services	4 618	1 073	519	2 792	9 002
60 Land transport, t. via p. serv.	12 982	2 255	5 090	29 028	49 354
61 Water transport services	216	21	25	246	508
62 Air transport services	49	19	6	55	129
63 Supp. and aux. trans. s., TA s.	1 764	1 419	320	2 976	6 479
64 Post and telecomm. services	10 836	3 106	1 843	7 458	23 243
65 Financial interm. services	9 547	3 186	2 598	8 831	24 162
66 Insurance, pension fund. serv.	4 236	285	283	1 218	6 021
67 Services aux. to fin. interm.	233	47	53	163	496
70 Real estate services	59 779	5 499	5 725	10 429	81 431
71 Rent. services of machinery, eq.	2 583	691	1 611	4 234	9 119
72 Computer and related services	2 248	1 628	859	4 194	8 929
73 Research and develop. serv.	98	1 266	71	470	1 906
74 Other business services	9 119	3 353	4 365	14 740	31 576
75 Public adm. and defence serv.	947	60 944	174	1 068	63 133
80 Education services	4 030	26 225	111	644	31 010
85 Health, social work services	3 567	26 831	41	1 085	31 524
90 Sewage, ref. disposal services	2 293	646	139	473	3 552
91 Membership org. serv.	17	95	4	16	131
92 Rec., cult. and sport. s.	4 840	3 323	454	1 896	10 513
93 Other services	755	583	246	3 475	5 059

Appendix 8 - Value-added components in 2005 (in million SKK)

Commodities (CPA)	*C-component*	*G-component*	*THK-component*	*EX-component*	*Total Value Added*
01 Prod. of agriculture, hunting	21 612	1 413	1 874	8 587	33 486
02 Prod. forestry, logging	2 059	128	505	6 916	9 608
05 Fish and other fishing products	19	3	1	27	49
10 Coal and lignite, peat	313	135	449	1 037	1 935
11 Crude petroleum, natural gas	199	29	51	2 566	2 845
13 Metal ores	2	0	65	44	112
14 Other mining and quarr. prod.	222	66	147	1 924	2 359
15 Food products and beverages	12 741	542	308	7 744	21 336
16 Tobacco products	25	1	9	182	218
17 Textiles	211	28	69	4 063	4 371
18 Wearing apparel, furs	326	38	80	6 062	6 506
19 Leather and leather products	122	5	28	3 585	3 740
20 Wood, prod. of wood and cork	672	119	1 587	7 987	10 364
21 Pulp, paper and paper prod.	306	52	214	5 252	5 823
22 Printed matter, recorded media	2 752	328	520	3 071	6 670
23 Coke, ref. petr. prod., nucl. fuel	1 058	185	625	11 911	13 779
24 Chemicals, chemical prod.	759	655	526	11 931	13 871
25 Rubber and plastic products	335	97	282	9 522	10 236
26 Other non metallic min. prod.	850	164	3 199	9 229	13 441
27 Basic metals	506	139	1 521	33 869	36 035
28 Fabricated metal products	1 477	249	3 060	20 213	24 999
29 Machinery and eq. n.e.c.	976	148	1 587	21 912	24 623
30 Office machinery, computers	145	33	234	2 255	2 666
31 Elect. machinery, app. n.e.c.	686	88	1 088	15 566	17 427
32 Radio, tel. and comm. eq., app.	125	31	154	6 146	6 456
33 Med., prec., opt. instr., watches	393	1 205	805	3 024	5 427
34 Motor vehicles, trailers, s.-tr.	625	49	473	30 955	32 103
35 Other transport equipment	250	15	153	2 023	2 441
36 Furniture, other m. goods n.e.c.	1 678	189	378	6 162	8 407
37 Secondary raw materials	79	73	116	483	751
40 Elect. energy, gas, steam, hot w.	29 429	4 163	2 773	20 652	57 017
41 Coll. and pur. water, distrib.	1 989	436	144	814	3 383
45 Construction work	5 769	2 159	69 242	6 875	84 045
50 Trade, maint., rep. s. of m. veh.	4 468	323	2 062	5 256	12 109
51 Wholesale, commission tr. s.	11 624	1 790	10 106	42 308	65 828
52 Retail trade services	26 920	1 010	1 968	20 356	50 255
55 Hotel and restaurant services	4 670	1 392	512	9 153	15 727
60 Land transport, t. via p. serv.	16 036	1 395	3 154	38 913	59 498
61 Water transport services	60	13	33	332	438
62 Air transport services	20	38	7	600	665
63 Supp. and aux. trans. s., TA s.	3 841	1 550	519	6 156	12 066
64 Post and telecomm. services	19 106	2 981	1 491	9 179	32 757
65 Financial interm. services	21 607	1 357	1 669	10 784	35 418
66 Insurance, pension fund. serv.	10 241	98	205	1 050	11 595
67 Services aux. to fin. interm.	2 713	68	82	457	3 320
70 Real estate services	66 516	3 359	3 187	11 387	84 449
71 Rent. services of machinery, eq.	1 880	508	1 269	4 038	7 693
72 Computer and related services	1 528	1 338	8 824	3 528	15 217
73 Research and develop. serv.	178	1 284	81	670	2 214
74 Other business services	13 257	3 886	5 527	30 218	52 888
75 Public adm. and defence serv.	1 333	73 909	97	1 301	76 641
80 Education services	3 826	32 508	107	753	37 195
85 Health, social work services	2 685	28 723	24	1 444	32 875
90 Sewage, ref. disposal services	3 222	1 928	128	808	6 086
91 Membership org. serv.	166	2 548	58	205	2 977
92 Rec., cult. and sport. s.	6 483	4 281	325	5 339	16 428
93 Other services	2 510	349	156	4 424	7 440

Appendix 9 - Import components in 2000 (in million SKK)

Commodities (CPA)	*C-component*	*G-component*	*THK-component*	*EX-component*	*Total Import*
01 Prod. of agriculture, hunting	3 501	228	117	635	4 481
02 Prod. forestry, logging	7	2	3	23	34
05 Fish and other fishing products	1	0	0	2	3
10 Coal and lignite, peat	38	25	23	64	150
11 Crude petroleum, natural gas	84	27	545	180	837
13 Metal ores	4	3	1	41	48
14 Other mining and quarr. prod.	29	4	91	192	316
15 Food products and beverages	17 670	706	112	4 145	22 634
16 Tobacco products	463	5	269	764	1 501
17 Textiles	558	18	57	3 124	3 757
18 Wearing apparel, furs	1 184	52	-2 697	6 966	5 505
19 Leather and leather products	358	12	462	4 249	5 080
20 Wood, prod. of wood and cork	378	121	413	1 549	2 460
21 Pulp, paper and paper prod.	1 833	661	715	9 967	13 176
22 Printed matter, recorded media	1 202	610	207	1 939	3 958
23 Coke, ref. petr. prod., nucl. fuel	9 162	2 658	2 109	39 151	53 080
24 Chemicals, chemical prod.	1 854	6 315	556	20 847	29 572
25 Rubber and plastic products	1 567	184	3 459	11 058	16 269
26 Other non metallic min. prod.	784	164	3 555	5 407	9 909
27 Basic metals	1 103	359	-180	28 479	29 762
28 Fabricated metal products	1 245	263	1 034	8 458	10 999
29 Machinery and eq. n.e.c.	1 635	746	6 789	22 529	31 699
30 Office machinery, computers	155	63	-151	2 896	2 963
31 Elect. machinery, app. n.e.c.	102	23	3 810	17 282	21 217
32 Radio, tel. and comm. eq., app.	419	134	1 270	7 963	9 786
33 Med., prec., opt. instr., watches	191	231	484	1 045	1 952
34 Motor vehicles, trailers, s.-tr.	3 213	97	-3 389	79 931	79 852
35 Other transport equipment	485	25	728	4 327	5 565
36 Furniture, other m. goods n.e.c.	1 452	764	956	7 950	11 121
37 Secondary raw materials	21	14	39	35	109
40 Elect. energy, gas, steam, hot w.	5 156	769	179	2 676	8 779
41 Coll. and pur. water, distrib.	54	9	3	13	80
45 Construction work	1 327	335	12 610	1 357	15 629
50 Trade, maint., rep. s. of m. veh.	959	128	402	775	2 264
51 Wholesale, commission tr. s.	3 473	528	3 181	7 918	15 100
52 Retail trade services	2 983	157	298	1 223	4 660
55 Hotel and restaurant services	406	94	46	245	791
60 Land transport, t. via p. serv.	12 920	2 245	5 065	28 891	49 121
61 Water transport services	21	2	2	24	49
62 Air transport services	31	12	4	34	81
63 Supp. and aux. trans. s., TA s.	1 145	921	208	1 932	4 206
64 Post and telecomm. services	1 574	451	268	1 084	3 377
65 Financial interm. services	34	11	9	32	87
66 Insurance, pension fund. serv.	136	9	9	39	193
67 Services aux. to fin. interm.	30	6	7	21	64
70 Real estate services	186	17	18	32	253
71 Rent. services of machinery, eq.	144	39	90	236	508
72 Computer and related services	608	440	232	1 134	2 414
73 Research and develop. serv.	31	402	23	149	605
74 Other business services	3 092	1 137	1 480	4 998	10 707
75 Public adm. and defence serv.	22	1 418	4	25	1 469
80 Education services	49	317	1	8	375
85 Health, social work services	600	4 511	7	182	5 299
90 Sewage, ref. disposal services	67	19	4	14	103
91 Membership org. serv.	6	35	1	6	48
92 Rec., cult. and sport. s.	1 223	839	115	479	2 656
93 Other services	3	3	1	16	23

Appendix 10 - Import components in 2005 (in million SKK)

Commodities (CPA)	*C-component*	*G-component*	*THK-component*	*EX-component*	*Total Import*
01 Prod. of agriculture, hunting	3 359	220	291	1 335	5 204
02 Prod. forestry, logging	16	1	4	54	75
05 Fish and other fishing products	9	2	1	13	25
10 Coal and lignite, peat	24	10	34	79	148
11 Crude petroleum, natural gas	19	3	5	251	278
13 Metal ores	0	0	6	4	10
14 Other mining and quarr. prod.	28	8	18	242	297
15 Food products and beverages	16 139	686	391	9 810	27 026
16 Tobacco products	9	0	3	63	75
17 Textiles	288	38	94	5 535	5 955
18 Wearing apparel, furs	290	34	71	5 388	5 783
19 Leather and leather products	211	9	48	6 183	6 450
20 Wood, prod. of wood and cork	336	59	794	3 998	5 188
21 Pulp, paper and paper prod.	642	109	450	11 035	12 236
22 Printed matter, recorded media	2 162	257	409	2 412	5 240
23 Coke, ref. petr. prod., nucl. fuel	3 492	611	2 064	39 321	45 488
24 Chemicals, chemical prod.	1 343	1 160	931	21 119	24 553
25 Rubber and plastic products	780	227	658	22 192	23 857
26 Other non metallic min. prod.	479	92	1 802	5 200	7 573
27 Basic metals	652	179	1 959	43 629	46 419
28 Fabricated metal products	1 183	199	2 451	16 194	20 028
29 Machinery and eq. n.e.c.	1 512	229	2 459	33 943	38 143
30 Office machinery, computers	912	205	1 471	14 185	16 773
31 Elect. machinery, app. n.e.c.	1 669	213	2 648	37 882	42 412
32 Radio, tel. and comm. eq., app.	991	250	1 225	48 805	51 271
33 Med., prec., opt. instr., watches	330	1 013	677	2 543	4 563
34 Motor vehicles, trailers, s.-tr.	2 566	200	1 943	127 060	131 770
35 Other transport equipment	391	24	240	3 170	3 826
36 Furniture, other m. goods n.e.c.	2 717	305	613	9 977	13 612
37 Secondary raw materials	14	13	20	85	133
40 Elect. energy, gas, steam, hot w.	18 040	2 552	1 700	12 660	34 952
41 Coll. and pur. water, distrib.	39	9	3	16	67
45 Construction work	2 222	831	26 663	2 648	32 364
50 Trade, maint., rep. s. of m. veh.	324	23	150	381	879
51 Wholesale, commission tr. s.	1 412	217	1 228	5 140	7 997
52 Retail trade services	2 905	109	212	2 197	5 423
55 Hotel and restaurant services	202	60	22	396	681
60 Land transport, t. via p. serv.	4 214	367	829	10 226	15 636
61 Water transport services	3	1	2	19	25
62 Air transport services	82	156	28	2 459	2 725
63 Supp. and aux. trans. s., TA s.	1 853	748	250	2 970	5 821
64 Post and telecomm. services	2 257	352	176	1 084	3 869
65 Financial interm. services	1 737	109	134	867	2 848
66 Insurance, pension fund. serv.	2 368	23	47	243	2 681
67 Services aux. to fin. interm.	558	14	17	94	682
70 Real estate services	1 744	88	84	299	2 214
71 Rent. services of machinery, eq.	149	40	101	320	610
72 Computer and related services	393	344	2 267	907	3 910
73 Research and develop. serv.	42	303	19	158	522
74 Other business services	1 479	434	617	3 371	5 900
75 Public adm. and defence serv.	90	4 998	7	88	5 183
80 Education services	150	1 273	4	29	1 457
85 Health, social work services	678	7 256	6	365	8 305
90 Sewage, ref. disposal services	86	52	3	22	163
91 Membership org. serv.	17	265	6	21	310
92 Rec., cult. and sport. s.	663	438	33	546	1 679
93 Other services	43	6	3	76	128

Appendix 11 - Decomposition of changes in output - Total figures (in million SKK)

Commodities (CPA)	*Output Change*	*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	-7 965	-16 197	203	20 958	-263	-12 727	160
02 Prod. forestry, logging	4 020	-2 342	-58	4 048	101	2 314	58
05 Fish and other fishing products	49	40	82	29	58	-20	-40
10 Coal and lignite, peat	-417	-1 105	265	796	-191	-108	26
11 Crude petroleum, natural gas	-1 479	-1 885	127	1 241	-84	-835	56
13 Metal ores	-455	-727	160	175	-38	98	-21
14 Other mining and quarr. prod.	-795	-1 376	173	1 474	-185	-893	112
15 Food products and beverages	-11 386	-7 140	63	25 826	-227	-30 073	264
16 Tobacco products	-3 352	63	-2	668	-20	-4 082	122
17 Textiles	665	456	69	3 303	497	-3 093	-465
18 Wearing apparel, furs	76	-385	-505	4 157	5 452	-3 696	-4 847
19 Leather and leather products	1 123	291	26	3 382	301	-2 550	-227
20 Wood, prod. of wood and cork	4 876	-1 866	-38	6 509	134	232	5
21 Pulp, paper and paper prod.	-5 392	-6 424	119	8 870	-165	-7 838	145
22 Printed matter, recorded media	2 036	-7 139	-351	4 796	236	4 378	215
23 Coke, ref. petr. prod., nucl. fuel	196	-13 484	-6 896	18 003	9 207	-4 324	-2 211
24 Chemicals, chemical prod.	-15 581	748	-5	16 484	-106	-32 812	211
25 Rubber and plastic products	15 743	-111	-1	9 984	63	5 870	37
26 Other non metallic min. prod.	879	-3 657	-416	10 191	1 160	-5 656	-644
27 Basic metals	-2 360	-47 288	2 004	30 516	-1 293	14 412	-611
28 Fabricated metal products	21 793	-3 879	-18	12 582	58	13 089	60
29 Machinery and eq. n.e.c.	15 643	-1 673	-11	20 648	132	-3 333	-21
30 Office machinery, computers	18 984	2 580	14	3 297	17	13 107	69
31 Elect. machinery, app. n.e.c.	32 853	8 132	25	14 515	44	10 207	31
32 Radio, tel. and comm. eq., app.	47 883	2 272	5	10 194	21	35 418	74
33 Med., prec., opt. instr., watches	4 115	2 235	54	3 134	76	-1 253	-30
34 Motor vehicles, trailers, s.-tr.	89 994	18 394	20	37 730	42	33 870	38
35 Other transport equipment	451	1 020	226	2 880	638	-3 449	-764
36 Furniture, other m. goods n.e.c.	12 277	208	2	6 726	55	5 343	44
37 Secondary raw materials	-799	-686	86	535	-67	-648	81
40 Elect. energy, gas, steam, hot w.	2 499	-38 396	-1 537	45 718	1 829	-4 822	-193
41 Coll. and pur. water, distrib.	-2 096	-1 405	67	2 054	-98	-2 745	131
45 Construction work	44 055	83	0	53 609	122	-9 637	-22
50 Trade, maint., rep. s. of m. veh.	4 420	-4 072	-92	5 833	132	2 659	60
51 Wholesale, commission tr. s.	-10 492	-19 607	187	32 988	-314	-23 873	228
52 Retail trade services	468	411	88	21 785	4 653	-21 728	-4 641
55 Hotel and restaurant services	-4 138	-8 576	207	7 606	-184	-3 169	77
60 Land transport, t. via p. serv.	-31 789	-50 491	159	35 260	-111	-16 559	52
61 Water transport services	-833	-217	26	345	-41	-962	115
62 Air transport services	3 238	-213	-7	761	23	2 691	83
63 Supp. and aux. trans. s., TA s.	9 685	208	2	8 351	86	1 126	12
64 Post and telecomm. services	12 040	-11 632	-97	12 368	103	11 304	94
65 Financial interm. services	9 999	-21 014	-210	11 929	119	19 084	191
66 Insurance, pension fund. serv.	7 299	-4 005	-55	4 219	58	7 084	97
67 Services aux. to fin. interm.	1 396	-2 026	-145	1 255	90	2 167	155
70 Real estate services	5 955	-21 039	-353	30 564	513	-3 571	-60
71 Rent. services of machinery, eq.	-4 689	-9 615	205	4 731	-101	195	-4
72 Computer and related services	9 487	-11 860	-125	6 297	66	15 051	159
73 Research and develop. serv.	-586	-1 575	269	1 120	-191	-131	22
74 Other business services	14 810	-5 533	-37	23 889	161	-3 547	-24
75 Public adm. and defence serv.	10 233	-978	-10	27 331	267	-16 120	-158
80 Education services	7 541	-480	-6	10 911	145	-2 890	-38
85 Health, social work services	2 695	-433	-16	13 719	509	-10 591	-393
90 Sewage, ref. disposal services	2 288	446	19	2 399	105	-556	-24
91 Membership org. serv.	485	-1 531	-316	1 387	286	629	130
92 Rec., cult. and sport. s.	6 405	-943	-15	7 841	122	-493	-8
93 Other services	2 572	-1 993	-78	2 157	84	2 408	94

Appendix 12 - Decomposition of changes in output - C-component (in million SKK)

Commodities (CPA)	*Output Change*	*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	-16 048	-9 901	62	5 870	-37	-12 017	75
02 Prod. forestry, logging	1 135	-284	-25	325	29	1 095	96
05 Fish and other fishing products	30	26	87	4	13	0	0
10 Coal and lignite, peat	-356	-219	61	67	-19	-205	57
11 Crude petroleum, natural gas	-261	-302	115	45	-17	-4	2
13 Metal ores	-64	-57	89	4	-6	-11	17
14 Other mining and quarr. prod.	-56	-22	39	54	-97	-88	157
15 Food products and beverages	-24 985	-3 185	13	7 039	-28	-28 839	115
16 Tobacco products	-1 132	22	-2	71	-6	-1 225	108
17 Textiles	-1 144	76	-7	129	-11	-1 349	118
18 Wearing apparel, furs	-2 488	-118	5	223	-9	-2 593	104
19 Leather and leather products	-410	-35	8	69	-17	-444	108
20 Wood, prod. of wood and cork	-1 606	-22	1	276	-17	-1 860	116
21 Pulp, paper and paper prod.	-3 299	-2 730	83	347	-11	-917	28
22 Printed matter, recorded media	2 650	-1 920	-72	688	26	3 882	146
23 Coke, ref. petr. prod., nucl. fuel	-6 265	-3 163	50	891	-14	-3 993	64
24 Chemicals, chemical prod.	-1 386	-388	28	377	-27	-1 375	99
25 Rubber and plastic products	-1 375	-725	53	231	-17	-881	64
26 Other non metallic min. prod.	-522	22	-4	287	-55	-832	159
27 Basic metals	-2 586	-2 222	86	298	-12	-662	26
28 Fabricated metal products	-669	-337	50	403	-60	-735	110
29 Machinery and eq. n.e.c.	-192	297	-155	375	-195	-864	450
30 Office machinery, computers	1 039	624	60	74	7	341	33
31 Elect. machinery, app. n.e.c.	2 628	1 121	43	149	6	1 358	52
32 Radio, tel. and comm. eq., app.	536	252	47	102	19	182	34
33 Med., prec., opt. instr., watches	53	354	668	104	197	-405	-765
34 Motor vehicles, trailers, s.-tr.	-307	2 188	-714	416	-136	-2 910	949
35 Other transport equipment	202	169	84	106	52	-72	-36
36 Furniture, other m. goods n.e.c.	3 780	106	3	457	12	3 217	85
37 Secondary raw materials	-296	-280	95	33	-11	-48	16
40 Elect. energy, gas, steam, hot w.	-10 436	-22 090	212	9 898	-95	1 756	-17
41 Coll. and pur. water, distrib.	-1 997	-599	30	507	-25	-1 905	95
45 Construction work	161	-3 443	-2 142	1 594	991	2 010	1 251
50 Trade, maint., rep. s. of m. veh.	573	-1 330	-232	909	159	994	174
51 Wholesale, commission tr. s.	-8 521	-5 883	69	2 626	-31	-5 265	62
52 Retail trade services	-7 979	1 631	-20	5 029	-63	-14 638	183
55 Hotel and restaurant services	-7 592	-2 254	30	1 235	-16	-6 573	87
60 Land transport, t. via p. serv.	-7 635	-15 311	201	3 610	-47	4 066	-53
61 Water transport services	-583	-109	19	45	-8	-518	89
62 Air transport services	-377	-111	29	36	-10	-302	80
63 Supp. and aux. trans. s., TA s.	4 267	306	7	955	22	3 006	70
64 Post and telecomm. services	11 670	-4 608	-39	2 594	22	13 684	117
65 Financial interm. services	14 371	-9 175	-64	2 457	17	21 089	147
66 Insurance, pension fund. serv.	8 600	-2 220	-26	1 374	16	9 446	110
67 Services aux. to fin. interm.	2 477	-531	-21	333	13	2 675	108
70 Real estate services	10 530	-9 724	-92	9 151	87	11 104	105
71 Rent. services of machinery, eq.	-1 893	-1 862	98	473	-25	-503	27
72 Computer and related services	-1 815	-3 199	176	422	-23	962	-53
73 Research and develop. serv.	81	68	84	28	35	-16	-20
74 Other business services	649	-3 598	-554	2 570	396	1 677	258
75 Public adm. and defence serv.	406	29	7	173	43	204	50
80 Education services	-211	-189	89	501	-237	-524	248
85 Health, social work services	-1 316	46	-3	527	-40	-1 888	143
90 Sewage, ref. disposal services	318	105	33	552	174	-340	-107
91 Membership org. serv.	-315	-323	103	49	-16	-41	13
92 Rec., cult. and sport. s.	831	-343	-41	1 316	158	-142	-17
93 Other services	2 137	-413	-19	216	10	2 334	109

Appendix 13 - Decomposition of changes in output - G-component (in million SKK)

Commodities (CPA)	*Output Change*	*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	-1 026	-1 429	139	242	-24	160	-16
02 Prod. forestry, logging	-507	-332	66	33	-7	-208	41
05 Fish and other fishing products	7	6	82	0	4	1	13
10 Coal and lignite, peat	-338	-365	108	24	-7	3	-1
11 Crude petroleum, natural gas	-131	-119	91	8	-6	-19	15
13 Metal ores	-44	-32	73	1	-3	-13	30
14 Other mining and quarr. prod.	59	65	109	8	13	-13	-22
15 Food products and beverages	-863	-1 160	134	182	-21	115	-13
16 Tobacco products	-9	-10	110	1	-6	0	-4
17 Textiles	23	16	68	4	19	3	13
18 Wearing apparel, furs	-53	-64	121	8	-15	3	-6
19 Leather and leather products	-9	-13	141	2	-17	2	-24
20 Wood, prod. of wood and cork	-759	-817	108	47	-6	11	-1
21 Pulp, paper and paper prod.	-1 485	-1 583	107	71	-5	27	-2
22 Printed matter, recorded media	-1 646	-1 892	115	121	-7	125	-8
23 Coke, ref. petr. prod., nucl. fuel	-2 398	-2 438	102	139	-6	-99	4
24 Chemicals, chemical prod.	-11 836	-195	2	573	-5	-12 213	103
25 Rubber and plastic products	95	80	84	27	28	-11	-12
26 Other non metallic min. prod.	-149	-192	129	36	-24	8	-5
27 Basic metals	-919	-851	93	56	-6	-124	14
28 Fabricated metal products	-290	-239	83	48	-16	-98	34
29 Machinery and eq. n.e.c.	-1 099	-1 084	99	74	-7	-89	8
30 Office machinery, computers	198	171	87	12	6	15	7
31 Elect. machinery, app. n.e.c.	318	301	95	13	4	4	1
32 Radio, tel. and comm. eq., app.	87	54	62	18	21	15	17
33 Med., prec., opt. instr., watches	1 909	230	12	138	7	1 541	81
34 Motor vehicles, trailers, s.-tr.	167	145	87	14	8	8	5
35 Other transport equipment	22	17	79	4	18	1	4
36 Furniture, other m. goods n.e.c.	-615	-733	119	70	-11	49	-8
37 Secondary raw materials	-149	-233	157	18	-12	67	-45
40 Elect. energy, gas, steam, hot w.	-2 211	-1 952	88	902	-41	-1 161	53
41 Coll. and pur. water, distrib.	-108	-186	173	59	-55	20	-18
45 Construction work	1 884	1 237	66	312	17	334	18
50 Trade, maint., rep. s. of m. veh.	-458	-572	125	59	-13	55	-12
51 Wholesale, commission tr. s.	-1 259	-1 675	133	254	-20	162	-13
52 Retail trade services	-1 067	-1 283	120	146	-14	69	-6
55 Hotel and restaurant services	-1 272	-1 695	133	196	-15	227	-18
60 Land transport, t. via p. serv.	-3 943	-4 055	103	312	-8	-200	5
61 Water transport services	-43	-35	81	3	-7	-11	26
62 Air transport services	62	26	41	15	25	21	34
63 Supp. and aux. trans. s., TA s.	-1 078	-598	55	342	-32	-823	76
64 Post and telecomm. services	-598	-1 135	190	339	-57	198	-33
65 Financial interm. services	-3 217	-1 809	56	234	-7	-1 642	51
66 Insurance, pension fund. serv.	-403	-428	106	25	-6	0	0
67 Services aux. to fin. interm.	-257	-295	115	17	-7	20	-8
70 Real estate services	-2 790	-2 666	96	405	-15	-528	19
71 Rent. services of machinery, eq.	-498	-639	128	82	-16	58	-12
72 Computer and related services	-894	-1 558	174	196	-22	469	-52
73 Research and develop. serv.	-710	-1 265	178	174	-25	381	-54
74 Other business services	-1 539	-2 115	137	526	-34	49	-3
75 Public adm. and defence serv.	9 777	-867	-9	6 470	66	4 174	43
80 Education services	7 622	-138	-2	2 312	30	5 447	71
85 Health, social work services	3 456	-385	-11	2 895	84	946	27
90 Sewage, ref. disposal services	1 761	542	31	151	9	1 069	61
91 Membership org. serv.	1 044	-768	-74	273	26	1 539	147
92 Rec., cult. and sport. s.	238	-636	-268	557	234	316	133
93 Other services	-341	-395	116	41	-12	13	-4

Appendix 14 - Decomposition of changes in output - THK-component (in million SKK)

Commodities (CPA)	*Output Change*	*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	1 952	-762	-39	598	31	2 117	108
02 Prod. forestry, logging	-328	-620	189	211	-64	81	-25
05 Fish and other fishing products	1	0	-30	0	28	1	102
10 Coal and lignite, peat	154	-144	-93	106	69	192	124
11 Crude petroleum, natural gas	-3 292	-483	15	347	-11	-3 155	96
13 Metal ores	223	-100	-45	22	10	301	135
14 Other mining and quarr. prod.	-1 342	-1 552	116	205	-15	6	0
15 Food products and beverages	775	-816	-105	144	19	1 447	187
16 Tobacco products	-669	12	-2	77	-12	-758	113
17 Textiles	19	63	327	35	185	-79	-412
18 Wearing apparel, furs	7 589	-31	0	-779	-10	8 400	111
19 Leather and leather products	-978	-17	2	124	-13	-1 085	111
20 Wood, prod. of wood and cork	431	-1 133	-263	752	174	813	189
21 Pulp, paper and paper prod.	-809	-316	39	298	-37	-791	98
22 Printed matter, recorded media	589	-430	-73	217	37	802	136
23 Coke, ref. petr. prod., nucl. fuel	378	-900	-238	558	148	720	191
24 Chemicals, chemical prod.	686	989	144	309	45	-612	-89
25 Rubber and plastic products	-5 061	-91	2	788	-16	-5 758	114
26 Other non metallic min. prod.	-4 208	-4 460	106	2 216	-53	-1 964	47
27 Basic metals	5 249	-3 011	-57	459	9	7 801	149
28 Fabricated metal products	3 696	-1 351	-37	1 012	27	4 035	109
29 Machinery and eq. n.e.c.	-9 171	405	-4	2 056	-22	-11 632	127
30 Office machinery, computers	2 199	546	25	141	6	1 512	69
31 Elect. machinery, app. n.e.c.	-2 478	1 439	-58	1 157	-47	-5 074	205
32 Radio, tel. and comm. eq., app.	-615	407	-66	367	-60	-1 390	226
33 Med., prec., opt. instr., watches	-349	265	-76	435	-125	-1 049	300
34 Motor vehicles, trailers, s.-tr.	6 999	849	12	-230	-3	6 379	91
35 Other transport equipment	-670	25	-4	206	-31	-901	135
36 Furniture, other m. goods n.e.c.	-236	38	-16	307	-130	-581	247
37 Secondary raw materials	-604	-140	23	103	-17	-567	94
40 Elect. energy, gas, steam, hot w.	4 781	-2 477	-52	1 157	24	6 101	128
41 Coll. and pur. water, distrib.	-95	-164	173	64	-67	5	-6
45 Construction work	39 293	7 180	18	31 245	80	869	2
50 Trade, maint., rep. s. of m. veh.	615	-726	-118	728	118	612	100
51 Wholesale, commission tr. s.	-8 746	-2 862	33	4 373	-50	-10 257	117
52 Retail trade services	-1 928	252	-13	831	-43	-3 010	156
55 Hotel and restaurant services	-874	-1 116	128	257	-29	-15	2
60 Land transport, t. via p. serv.	-8 886	-7 617	86	2 025	-23	-3 294	37
61 Water transport services	-20	-5	24	14	-70	-29	146
62 Air transport services	-17	-34	207	12	-74	5	-33
63 Supp. and aux. trans. s., TA s.	252	168	67	284	113	-200	-79
64 Post and telecomm. services	-793	-1 417	179	552	-70	72	-9
65 Financial interm. services	-1 853	-2 444	132	642	-35	-51	3
66 Insurance, pension fund. serv.	-223	-283	127	96	-43	-36	16
67 Services aux. to fin. interm.	-279	-345	123	50	-18	15	-5
70 Real estate services	-3 327	-4 268	128	1 193	-36	-252	8
71 Rent. services of machinery, eq.	-998	-1 660	166	592	-59	70	-7
72 Computer and related services	14 346	-2 319	-16	1 705	12	14 961	104
73 Research and develop. serv.	-25	-49	200	26	-105	-1	5
74 Other business services	-1 161	-1 986	171	2 107	-181	-1 282	110
75 Public adm. and defence serv.	-129	-195	151	39	-30	27	-21
80 Education services	-3	-44	1 284	25	-742	15	-442
85 Health, social work services	-26	-36	137	10	-37	0	0
90 Sewage, ref. disposal services	-92	-95	103	50	-55	-47	52
91 Membership org. serv.	-36	-58	163	24	-67	-1	4
92 Rec., cult. and sport. s.	-475	3	-1	175	-37	-653	137
93 Other services	-132	-181	137	53	-40	-4	3

Appendix 15 - Decomposition of changes in output - EX-component (in million SKK)

Commodities (CPA)	*Output Change*	*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	7 156	-4 106	-57	6 179	86	5 083	71
02 Prod. forestry, logging	3 719	-1 105	-30	4 276	115	548	15
05 Fish and other fishing products	11	8	79	27	251	-25	-230
10 Coal and lignite, peat	123	-377	-306	579	470	-78	-64
11 Crude petroleum, natural gas	2 205	-980	-44	875	40	2 311	105
13 Metal ores	-571	-538	94	204	-36	-236	41
14 Other mining and quarr. prod.	542	133	25	1 575	290	-1 166	-215
15 Food products and beverages	13 687	-1 979	-14	10 128	74	5 538	40
16 Tobacco products	-1 541	40	-3	581	-38	-2 162	140
17 Textiles	1 766	301	17	4 469	253	-3 004	-170
18 Wearing apparel, furs	-4 971	-171	3	7 312	-147	-12 112	244
19 Leather and leather products	2 520	356	14	4 653	185	-2 489	-99
20 Wood, prod. of wood and cork	6 810	107	2	6 965	102	-263	-4
21 Pulp, paper and paper prod.	201	-1 796	-893	11 256	5 601	-9 260	-4 608
22 Printed matter, recorded media	443	-2 897	-653	3 522	795	-182	-41
23 Coke, ref. petr. prod., nucl. fuel	8 481	-6 983	-82	22 055	260	-6 591	-78
24 Chemicals, chemical prod.	-3 045	343	-11	19 564	-643	-22 952	754
25 Rubber and plastic products	22 084	625	3	12 333	56	9 126	41
26 Other non metallic min. prod.	5 757	974	17	9 551	166	-4 768	-83
27 Basic metals	-4 104	-41 205	1 004	44 367	-1 081	-7 266	177
28 Fabricated metal products	19 055	-1 951	-10	15 155	80	5 852	31
29 Machinery and eq. n.e.c.	26 105	-1 291	-5	25 138	96	2 258	9
30 Office machinery, computers	15 547	1 239	8	4 252	27	10 057	65
31 Elect. machinery, app. n.e.c.	32 385	5 270	16	18 940	58	8 175	25
32 Radio, tel. and comm. eq., app.	47 875	1 558	3	13 822	29	32 495	68
33 Med., prec., opt. instr., watches	2 503	1 386	55	2 636	105	-1 520	-61
34 Motor vehicles, trailers, s.-tr.	83 135	15 212	18	56 361	68	11 562	14
35 Other transport equipment	898	809	90	3 574	398	-3 486	-388
36 Furniture, other m. goods n.e.c.	9 347	796	9	7 459	80	1 092	12
37 Secondary raw materials	249	-32	-13	357	143	-75	-30
40 Elect. energy, gas, steam, hot w.	10 365	-11 877	-115	23 406	226	-1 164	-11
41 Coll. and pur. water, distrib.	102	-457	-446	633	618	-74	-72
45 Construction work	2 717	-4 891	-180	7 090	261	519	19
50 Trade, maint., rep. s. of m. veh.	3 690	-1 444	-39	3 459	94	1 675	45
51 Wholesale, commission tr. s.	8 034	-9 187	-114	29 329	365	-12 107	-151
52 Retail trade services	11 442	-188	-2	10 791	94	839	7
55 Hotel and restaurant services	5 600	-3 511	-63	4 890	87	4 221	75
60 Land transport, t. via p. serv.	-11 325	-23 508	208	33 985	-300	-21 803	193
61 Water transport services	-188	-68	36	303	-161	-422	224
62 Air transport services	3 571	-93	-3	854	24	2 809	79
63 Supp. and aux. trans. s., TA s.	6 244	332	5	6 353	102	-440	-7
64 Post and telecomm. services	1 760	-4 473	-254	5 764	327	469	27
65 Financial interm. services	697	-7 587	-1 089	6 151	883	2 133	306
66 Insurance, pension fund. serv.	-676	-1 074	159	918	-136	-519	77
67 Services aux. to fin. interm.	-545	-855	157	455	-83	-145	27
70 Real estate services	1 541	-4 380	-284	6 259	406	-339	-22
71 Rent. services of machinery, eq.	-1 300	-5 454	420	3 606	-277	548	-42
72 Computer and related services	-2 150	-4 784	223	3 279	-153	-645	30
73 Research and develop. serv.	68	-328	-480	468	685	-72	-105
74 Other business services	16 861	2 166	13	18 841	112	-4 146	-25
75 Public adm. and defence serv.	179	55	31	721	402	-597	-332
80 Education services	134	-110	-82	345	258	-101	-76
85 Health, social work services	582	-57	-10	816	140	-177	-30
90 Sewage, ref. disposal services	300	-107	-36	491	163	-83	-28
91 Membership org. serv.	-208	-382	183	203	-97	-30	14
92 Rec., cult. and sport. s.	5 812	34	1	2 979	51	2 799	48
93 Other services	907	-1 005	-111	2 134	235	-222	-25

Appendix 16 - Decomposition of changes in employment - Total figures

Commodities (CPA)	*Employment Change*	*Labour Productivity Change Cont.*		*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	-33 700	-23 485	70	-20 969	62	27 217	-81	-16 464	49
02 Prod. forestry, logging	-1 100	-7 660	696	-3 973	361	6 686	-608	3 848	-350
05 Fish and other fishing products	100	-18	-18	96	96	68	68	-47	-47
10 Coal and lignite, peat	-4 100	-2 902	71	-3 213	78	2 361	-58	-346	8
11 Crude petroleum, natural gas	-2 100	-1 178	56	-1 209	58	807	-38	-520	25
13 Metal ores	-600	1 815	-302	-3 781	630	785	-131	582	-97
14 Other mining and quarr. prod.	-3 300	-2 495	76	-1 443	44	1 534	-46	-896	27
15 Food products and beverages	-6 700	953	-14	-4 796	72	17 354	-259	-20 212	302
16 Tobacco products	-400	3 540	-885	109	-27	793	-198	-4 842	1 211
17 Textiles	-9 000	-10 087	112	772	-9	5 376	-60	-5 061	56
18 Wearing apparel, furs	-4 600	-4 820	105	-1 115	24	12 001	-261	-10 666	232
19 Leather and leather products	-700	-2 616	374	498	-71	5 766	-824	-4 347	621
20 Wood, prod. of wood and cork	-2 800	-9 868	352	-2 734	98	9 487	-339	315	-11
21 Pulp, paper and paper prod.	-5 300	-3 334	63	-2 369	45	3 280	-62	-2 878	54
22 Printed matter, recorded media	600	-1 098	-183	-5 980	-997	4 030	672	3 648	608
23 Coke, ref. petr. prod., nucl. fuel	-1 800	-1 815	101	-1 030	57	1 370	-76	-325	18
24 Chemicals, chemical prod.	-2 400	4 093	-171	308	-13	6 873	-286	-13 675	570
25 Rubber and plastic products	3 600	-6 227	-173	-43	-1	6 234	173	3 636	101
26 Other non metallic min. prod.	400	-229	-57	-2 622	-655	7 301	1 825	-4 050	-1 013
27 Basic metals	-3 100	-2 321	75	-15 712	507	10 146	-327	4 786	-154
28 Fabricated metal products	13 500	-17 361	-129	-5 662	-42	17 913	133	18 611	138
29 Machinery and eq. n.e.c.	3 700	-5 572	-151	-1 029	-28	12 246	331	-1 945	-53
30 Office machinery, computers	3 900	-1 747	-45	799	20	958	25	3 890	100
31 Elect. machinery, app. n.e.c.	23 900	2 965	12	5 150	22	9 279	39	6 507	27
32 Radio, tel. and comm. eq., app.	13 100	-20 759	-158	1 797	14	7 132	54	24 930	190
33 Med., prec., opt. instr., watches	500	-850	-170	742	148	1 017	203	-409	-82
34 Motor vehicles, trailers, s.-tr.	17 600	-2 492	-14	4 141	24	8 402	48	7 548	43
35 Other transport equipment	1 000	578	58	953	95	2 698	270	-3 229	-323
36 Furniture, other m. goods n.e.c.	5 900	-5 889	-100	216	4	6 456	109	5 117	87
37 Secondary raw materials	600	1 570	262	-837	-139	611	102	-744	-124
40 Elect. energy, gas, steam, hot w.	-7 100	-7 643	108	-8 497	120	10 059	-142	-1 018	14
41 Coll. and pur. water, distrib.	-400	2 586	-646	-1 977	494	2 892	-723	-3 901	975
45 Construction work	42 100	64	0	79	0	51 152	122	-9 195	-22
50 Trade, maint., rep. s. of m. veh.	4 500	-2 463	-55	-6 442	-143	9 220	205	4 185	93
51 Wholesale, commission tr. s.	2 600	8 071	310	-10 151	-390	17 112	658	-12 431	-478
52 Retail trade services	2 600	1 602	62	881	34	46 427	1 786	-46 310	-1 781
55 Hotel and restaurant services	25 100	37 059	148	-23 974	-96	21 197	84	-9 182	-37
60 Land transport, t. via p. serv.	-10 000	16 799	-168	-42 327	423	29 274	-293	-13 746	137
61 Water transport services	800	2 558	320	-439	-55	696	87	-2 016	-252
62 Air transport services	1 300	-1 170	-90	-173	-13	586	45	2 057	158
63 Supp. and aux. trans. s., TA s.	-700	-4 223	603	-2	0	3 034	-433	491	-70
64 Post and telecomm. services	-11 400	-21 166	186	-9 848	86	10 395	-91	9 219	-81
65 Financial interm. services	6 100	717	12	-11 280	-185	6 399	105	10 264	168
66 Insurance, pension fund. serv.	4 500	-2 824	-63	-4 108	-91	4 282	95	7 150	159
67 Services aux. to fin. interm.	400	-787	-197	-1 768	-442	1 091	273	1 865	466
70 Real estate services	1 900	1 229	65	-2 361	-124	3 431	181	-398	-21
71 Rent. services of machinery, eq.	2 400	2 817	117	-733	-31	312	13	4	0
72 Computer and related services	10 200	3 942	39	-7 597	-74	4 018	39	9 836	96
73 Research and develop. serv.	-900	366	-41	-3 401	378	2 411	-268	-277	31
74 Other business services	25 000	13 006	52	-4 391	-18	19 293	77	-2 908	-12
75 Public adm. and defence serv.	-3 700	-19 726	533	-1 537	42	42 815	-1 157	-25 252	682
80 Education services	2 100	-28 651	-1 364	-1 989	-95	44 516	2 120	-11 776	-561
85 Health, social work services	2 100	-5 912	-282	-1 288	-61	40 784	1 942	-31 484	-1 499
90 Sewage, ref. disposal services	-8 000	-13 774	172	1 090	-14	6 005	-75	-1 321	17
91 Membership org. serv.	1 800	1 247	69	-1 715	-95	1 554	86	713	40
92 Rec., cult. and sport. s.	3 500	-4 723	-135	-1 218	-35	10 076	288	-635	-18
93 Other services	7 700	-1 739	-23	-7 342	-95	7 946	103	8 835	115

Appendix 17 - Decomposition of changes in employment - C-component

Commodities (CPA)	*Employment Change*	*Labour Productivity Change Cont.*		*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	-37 418	-16 838	45	-12 626	34	7 610	-20	-15 565	42
02 Prod. forestry, logging	282	-1 571	-558	-468	-166	534	190	1 787	635
05 Fish and other fishing products	67	-6	-9	63	94	9	14	1	1
10 Coal and lignite, peat	-1 638	-614	37	-635	39	199	-12	-587	36
11 Crude petroleum, natural gas	-266	-103	39	-196	73	30	-11	3	-1
13 Metal ores	-224	113	-50	-312	139	16	-7	-41	18
14 Other mining and quarr. prod.	-287	-231	80	-27	9	55	-19	-84	29
15 Food products and beverages	-16 132	662	-4	-2 141	13	4 730	-29	-19 383	120
16 Tobacco products	-317	1 014	-320	37	-12	85	-27	-1 453	459
17 Textiles	-2 850	-979	34	129	-5	209	-7	-2 209	78
18 Wearing apparel, furs	-7 816	-638	8	-341	4	644	-8	-7 481	96
19 Leather and leather products	-832	-133	16	-60	7	118	-14	-757	91
20 Wood, prod. of wood and cork	-3 362	-1 033	31	-32	1	400	-12	-2 696	80
21 Pulp, paper and paper prod.	-1 535	-332	22	-998	65	134	-9	-340	22
22 Printed matter, recorded media	1 814	-397	-22	-1 610	-89	577	32	3 243	179
23 Coke, ref. petr. prod., nucl. fuel	-694	-226	33	-237	34	69	-10	-300	43
24 Chemicals, chemical prod.	-335	242	-72	-163	49	156	-47	-571	170
25 Rubber and plastic products	-1 219	-360	30	-445	37	147	-12	-561	46
26 Other non metallic min. prod.	-390	-16	4	16	-4	206	-53	-596	153
27 Basic metals	-914	-60	7	-733	80	100	-11	-221	24
28 Fabricated metal products	-2 333	-1 386	59	-471	20	575	-25	-1 050	45
29 Machinery and eq. n.e.c.	-364	-251	69	172	-47	221	-61	-507	139
30 Office machinery, computers	215	-94	-44	188	88	20	9	101	47
31 Elect. machinery, app. n.e.c.	1 755	81	5	710	40	96	5	868	49
32 Radio, tel. and comm. eq., app.	-122	-501	410	190	-156	69	-56	120	-98
33 Med., prec., opt. instr., watches	-53	-70	133	116	-219	34	-63	-132	250
34 Motor vehicles, trailers, s.-tr.	-135	-66	49	489	-363	92	-68	-649	482
35 Other transport equipment	244	55	22	157	65	99	41	-67	-28
36 Furniture, other m. goods n.e.c.	2 608	-1 021	-39	115	4	438	17	3 077	118
37 Secondary raw materials	-108	251	-232	-344	319	34	-31	-49	45
40 Elect. energy, gas, steam, hot w.	-6 484	-4 215	65	-4 841	75	2 179	-34	392	-6
41 Coll. and pur. water, distrib.	-1 189	1 654	-139	-864	73	716	-60	-2 696	227
45 Construction work	158	5	3	-3 285	-2 077	1 521	961	1 918	1 212
50 Trade, maint., rep. s. of m. veh.	-67	-969	1 438	-2 097	3 111	1 436	-2 131	1 563	-2 319
51 Wholesale, commission tr. s.	-2 793	1 650	-59	-3 075	110	1 359	-49	-2 727	98
52 Retail trade services	-16 061	942	-6	3 475	-22	10 718	-67	-31 197	194
55 Hotel and restaurant services	-6 629	15 310	-231	-6 485	98	3 486	-53	-18 939	286
60 Land transport, t. via p. serv.	-1 970	4 466	-227	-12 935	657	2 989	-152	3 509	-178
61 Water transport services	-381	848	-222	-223	58	88	-23	-1 095	287
62 Air transport services	-417	-129	31	-86	21	29	-7	-231	55
63 Supp. and aux. trans. s., TA s.	290	-1 262	-436	129	44	346	120	1 077	372
64 Post and telecomm. services	-1 804	-11 270	625	-3 834	213	2 161	-120	11 139	-618
65 Financial interm. services	8 106	369	5	-4 922	-61	1 319	16	11 340	140
66 Insurance, pension fund. serv.	6 330	-2 300	-36	-2 288	-36	1 389	22	9 529	151
67 Services aux. to fin. interm.	1 580	-528	-33	-476	-30	286	18	2 297	145
70 Real estate services	2 123	936	44	-1 093	-51	1 029	48	1 252	59
71 Rent. services of machinery, eq.	582	751	129	-181	-31	34	6	-21	-4
72 Computer and related services	-565	633	-112	-2 066	366	264	-47	604	-107
73 Research and develop. serv.	198	24	12	147	74	61	31	-34	-17
74 Other business services	4 013	3 487	87	-2 842	-71	2 067	52	1 300	32
75 Public adm. and defence serv.	315	-321	-102	48	15	270	86	318	101
80 Education services	-4 161	-3 299	79	-791	19	2 047	-49	-2 119	51
85 Health, social work services	-4 485	-573	13	135	-3	1 566	-35	-5 613	125
90 Sewage, ref. disposal services	-7 187	-7 989	111	240	-3	1 389	-19	-827	12
91 Membership org. serv.	-247	111	-45	-367	148	54	-22	-46	18
92 Rec., cult. and sport. s.	-935	-2 002	214	-437	47	1 691	-181	-187	20
93 Other services	7 395	-449	-6	-1 513	-20	793	11	8 564	116

Appendix 18 - Decomposition of changes in employment - G-component

Commodities (CPA)	*Employment Change*	*Labour Productivity Change Cont.*		*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	-2 414	-1 097	45	-1 850	77	318	-13	216	-9
02 Prod. forestry, logging	-1 073	-246	23	-551	51	57	-5	-333	31
05 Fish and other fishing products	16	-1	-5	14	87	1	4	2	14
10 Coal and lignite, peat	-1 330	-358	27	-1 051	79	75	-6	4	0
11 Crude petroleum, natural gas	-109	-28	25	-78	71	5	-5	-9	8
13 Metal ores	-163	68	-42	-186	114	5	-3	-50	30
14 Other mining and quarr. prod.	10	-50	-508	62	622	7	74	-9	-88
15 Food products and beverages	-553	27	-5	-779	141	122	-22	77	-14
16 Tobacco products	1	12	1 143	-12	-1 091	0	31	0	17
17 Textiles	-18	-56	318	26	-148	7	-40	5	-29
18 Wearing apparel, furs	-191	-37	19	-187	98	23	-12	9	-5
19 Leather and leather products	-20	-5	23	-22	110	3	-13	4	-19
20 Wood, prod. of wood and cork	-1 380	-280	20	-1 193	86	74	-5	19	-1
21 Pulp, paper and paper prod.	-646	-104	16	-583	90	29	-4	13	-2
22 Printed matter, recorded media	-1 481	-108	7	-1 582	107	103	-7	106	-7
23 Coke, ref. petr. prod., nucl. fuel	-237	-58	24	-182	77	12	-5	-9	4
24 Chemicals, chemical prod.	-4 354	579	-13	-80	2	238	-5	-5 091	117
25 Rubber and plastic products	-4	-64	1 467	47	-1 084	16	-380	-4	97
26 Other non metallic min. prod.	-110	-3	3	-138	125	26	-23	5	-5
27 Basic metals	-322	-19	6	-280	87	19	-6	-42	13
28 Fabricated metal products	-676	-266	39	-335	49	69	-10	-144	21
29 Machinery and eq. n.e.c.	-728	-77	11	-647	89	45	-6	-50	7
30 Office machinery, computers	35	-24	-67	51	146	3	9	4	12
31 Elect. machinery, app. n.e.c.	214	11	5	192	90	9	4	2	1
32 Radio, tel. and comm. eq., app.	-77	-138	180	38	-50	12	-16	11	-14
33 Med., prec., opt. instr., watches	474	-152	-32	76	16	45	9	505	107
34 Motor vehicles, trailers, s.-tr.	34	-4	-10	32	96	3	9	2	6
35 Other transport equipment	23	3	13	16	68	4	15	1	3
36 Furniture, other m. goods n.e.c.	-826	-235	29	-711	86	70	-8	51	-6
37 Secondary raw materials	1	181	20 061	-251	-27 801	18	2 017	53	5 824
40 Elect. energy, gas, steam, hot w.	-1 094	-613	56	-431	39	198	-18	-247	23
41 Coll. and pur. water, distrib.	152	305	201	-260	-171	83	55	23	15
45 Construction work	1 799	2	0	1 181	66	298	17	319	18
50 Trade, maint., rep. s. of m. veh.	-819	-99	12	-904	110	95	-12	89	-11
51 Wholesale, commission tr. s.	-404	252	-62	-869	215	131	-32	82	-20
52 Retail trade services	-2 232	43	-2	-2 733	122	312	-14	147	-7
55 Hotel and restaurant services	218	3 892	1 787	-4 819	-2 213	529	243	616	283
60 Land transport, t. via p. serv.	-2 720	604	-22	-3 410	125	254	-9	-169	6
61 Water transport services	6	97	1 587	-75	-1 225	5	84	-21	-346
62 Air transport services	-44	-91	207	20	-45	12	-26	16	-36
63 Supp. and aux. trans. s., TA s.	-1 095	-703	64	-221	20	126	-11	-297	27
64 Post and telecomm. services	-2 803	-2 318	83	-947	34	284	-10	178	-6
65 Financial interm. services	-1 675	57	-3	-974	58	126	-8	-884	53
66 Insurance, pension fund. serv.	-470	-66	14	-431	92	27	-6	0	0
67 Services aux. to fin. interm.	-260	-41	16	-255	98	16	-6	21	-8
70 Real estate services	-249	65	-26	-300	120	45	-18	-60	24
71 Rent. services of machinery, eq.	157	202	128	-53	-34	6	4	3	2
72 Computer and related services	-95	494	-519	-1 020	1 072	125	-131	306	-321
73 Research and develop. serv.	-1 306	229	-18	-2 731	209	374	-29	822	-63
74 Other business services	-96	1 150	-1 197	-1 697	1 765	421	-438	29	-31
75 Public adm. and defence serv.	-3 720	-19 032	512	-1 363	37	10 135	-272	6 540	-176
80 Education services	6 409	-24 673	-385	-564	-9	9 431	147	22 215	347
85 Health, social work services	5 172	-5 101	-99	-1 145	-22	8 606	166	2 812	54
90 Sewage, ref. disposal services	890	-3 555	-400	1 389	156	366	41	2 690	302
91 Membership org. serv.	2 180	990	45	-853	-39	308	14	1 734	80
92 Rec., cult. and sport. s.	-1 042	-1 347	129	-826	79	717	-69	414	-40
93 Other services	-1 381	-132	10	-1 453	105	153	-11	50	-4

Appendix 19 - Decomposition of changes in employment - THK-component

Commodities (CPA)	*Employment Change*	*Labour Productivity Change Cont.*		*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	1 559	-945	-61	-1 014	-65	778	50	2 740	176
02 Prod. forestry, logging	-1 076	-541	50	-1 034	96	360	-33	139	-13
05 Fish and other fishing products	3	0	-13	-1	-33	1	32	3	114
10 Coal and lignite, peat	-105	-548	523	-419	400	311	-297	552	-527
11 Crude petroleum, natural gas	-2 509	-457	18	-281	11	223	-9	-1 994	79
13 Metal ores	1 537	353	23	-515	-33	103	7	1 596	104
14 Other mining and quarr. prod.	-1 817	-460	25	-1 609	89	243	-13	9	0
15 Food products and beverages	530	9	2	-549	-104	97	18	974	184
16 Tobacco products	-208	579	-278	21	-10	92	-44	-900	432
17 Textiles	-124	-156	125	109	-88	55	-45	-133	107
18 Wearing apparel, furs	23 042	1 148	5	-90	0	-2 248	-10	24 231	105
19 Leather and leather products	-1 792	-124	7	-29	2	212	-12	-1 850	103
20 Wood, prod. of wood and cork	-950	-1 575	166	-1 672	176	1 112	-117	1 185	-125
21 Pulp, paper and paper prod.	-449	-154	34	-117	26	110	-25	-289	64
22 Printed matter, recorded media	419	-72	-17	-359	-86	182	44	667	159
23 Coke, ref. petr. prod., nucl. fuel	-49	-77	158	-70	144	43	-87	56	-114
24 Chemicals, chemical prod.	397	111	28	410	103	132	33	-256	-65
25 Rubber and plastic products	-3 786	-627	17	-57	1	493	-13	-3 595	95
26 Other non metallic min. prod.	-3 082	-68	2	-3 197	104	1 589	-52	-1 406	46
27 Basic metals	1 692	-41	-2	-1 011	-60	154	9	2 590	153
28 Fabricated metal products	3 298	-1 935	-59	-1 974	-60	1 456	44	5 751	174
29 Machinery and eq. n.e.c.	-6 169	-733	12	236	-4	1 217	-20	-6 888	112
30 Office machinery, computers	536	-118	-22	176	33	39	7	440	82
31 Elect. machinery, app. n.e.c.	-1 272	307	-24	918	-72	741	-58	-3 238	255
32 Radio, tel. and comm. eq., app.	-1 381	-946	69	299	-22	250	-18	-984	71
33 Med., prec., opt. instr., watches	-275	-161	58	88	-32	142	-51	-344	125
34 Motor vehicles, trailers, s.-tr.	1 575	12	1	192	12	-52	-3	1 422	90
35 Other transport equipment	-571	55	-10	24	-4	193	-34	-844	148
36 Furniture, other m. goods n.e.c.	-583	-357	61	32	-6	294	-51	-553	95
37 Secondary raw materials	-297	436	-147	-198	67	120	-40	-654	220
40 Elect. energy, gas, steam, hot w.	775	-264	-34	-562	-73	257	33	1 345	174
41 Coll. and pur. water, distrib.	-23	111	-477	-229	981	88	-378	6	-26
45 Construction work	37 545	52	0	6 851	18	29 813	79	829	2
50 Trade, maint., rep. s. of m. veh.	541	-427	-79	-1 148	-212	1 151	213	965	178
51 Wholesale, commission tr. s.	-3 081	1 480	-48	-1 484	48	2 271	-74	-5 347	174
52 Retail trade services	-4 026	82	-2	538	-13	1 771	-44	-6 416	159
55 Hotel and restaurant services	-820	1 707	-208	-3 141	383	669	-82	-55	7
60 Land transport, t. via p. serv.	-6 127	1 364	-22	-6 434	105	1 658	-27	-2 715	44
61 Water transport services	106	147	139	-10	-10	28	27	-60	-56
62 Air transport services	-35	-22	63	-29	85	10	-29	7	-20
63 Supp. and aux. trans. s., TA s.	-101	-193	191	52	-52	102	-101	-63	62
64 Post and telecomm. services	-1 917	-1 274	66	-1 194	62	479	-25	72	-4
65 Financial interm. services	-944	53	-6	-1 314	139	344	-36	-27	3
66 Insurance, pension fund. serv.	-305	-82	27	-291	95	99	-32	-31	10
67 Services aux. to fin. interm.	-284	-47	16	-292	103	46	-16	8	-3
70 Real estate services	-309	66	-21	-480	155	132	-43	-28	9
71 Rent. services of machinery, eq.	395	483	122	-119	-30	39	10	-9	-2
72 Computer and related services	10 992	1 529	14	-1 430	-13	1 106	10	9 788	89
73 Research and develop. serv.	-40	14	-34	-108	273	56	-141	-1	3
74 Other business services	620	1 560	252	-1 568	-253	1 692	273	-1 065	-172
75 Public adm. and defence serv.	-242	-39	16	-307	127	64	-26	41	-17
80 Education services	-106	-92	87	-181	171	105	-99	62	-59
85 Health, social work services	-84	-6	7	-107	127	29	-35	0	1
90 Sewage, ref. disposal services	-630	-398	63	-240	38	134	-21	-126	20
91 Membership org. serv.	-11	30	-283	-66	621	27	-251	-1	12
92 Rec., cult. and sport. s.	-753	-143	19	4	-1	225	-30	-839	111
93 Other services	-542	-57	10	-665	123	195	-36	-15	3

Appendix 20 - Decomposition of changes in employment - EX-component

Commodities (CPA)	*Employment Change*	*Labour Productivity Change Cont.*		*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	4 573	-4 605	-101	-5 478	-120	8 050	176	6 606	144
02 Prod. forestry, logging	768	-5 302	-690	-1 919	-250	7 035	916	954	124
05 Fish and other fishing products	15	-11	-76	20	141	64	440	-59	-405
10 Coal and lignite, peat	-1 028	-1 382	134	-1 108	108	1 702	-166	-240	23
11 Crude petroleum, natural gas	785	-590	-75	-655	-84	571	73	1 459	186
13 Metal ores	-1 750	1 281	-73	-2 768	158	918	-52	-1 180	67
14 Other mining and quarr. prod.	-1 207	-1 755	145	131	-11	1 586	-131	-1 168	97
15 Food products and beverages	9 455	255	3	-1 327	-14	6 806	72	3 721	39
16 Tobacco products	124	1 936	1 562	62	50	691	557	-2 564	-2 069
17 Textiles	-6 008	-8 897	148	508	-8	7 283	-121	-4 903	82
18 Wearing apparel, furs	-19 634	-5 293	27	-497	3	21 100	-107	-34 944	178
19 Leather and leather products	1 944	-2 355	-121	609	31	7 931	408	-4 241	-218
20 Wood, prod. of wood and cork	2 892	-6 979	-241	163	6	10 091	349	-384	-13
21 Pulp, paper and paper prod.	-2 671	-2 744	103	-671	25	4 124	-154	-3 380	127
22 Printed matter, recorded media	-151	-521	345	-2 430	1 609	2 957	-1 958	-157	104
23 Coke, ref. petr. prod., nucl. fuel	-820	-1 454	177	-541	66	1 667	-203	-493	60
24 Chemicals, chemical prod.	1 892	3 161	167	142	7	8 156	431	-9 567	-506
25 Rubber and plastic products	8 609	-5 176	-60	412	5	7 688	89	5 685	66
26 Other non metallic min. prod.	3 982	-141	-4	697	18	6 840	172	-3 414	-86
27 Basic metals	-3 557	-2 201	62	-13 688	385	14 744	-415	-2 411	68
28 Fabricated metal products	13 211	-13 773	-104	-2 883	-22	21 533	163	8 335	63
29 Machinery and eq. n.e.c.	10 962	-4 510	-41	-790	-7	14 908	136	1 354	12
30 Office machinery, computers	3 114	-1 511	-49	384	12	1 248	40	2 993	96
31 Elect. machinery, app. n.e.c.	23 203	2 566	11	3 330	14	12 098	52	5 209	22
32 Radio, tel. and comm. eq., app.	14 680	-19 173	-131	1 269	9	9 696	66	22 888	156
33 Med., prec., opt. instr., watches	355	-466	-131	462	130	854	241	-495	-140
34 Motor vehicles, trailers, s.-tr.	16 126	-2 434	-15	3 427	21	12 556	78	2 577	16
35 Other transport equipment	1 304	464	36	756	58	3 349	257	-3 264	-250
36 Furniture, other m. goods n.e.c.	4 700	-4 276	-91	779	17	7 144	152	1 053	22
37 Secondary raw materials	1 004	701	70	-43	-4	430	43	-84	-8
40 Elect. energy, gas, steam, hot w.	-297	-2 551	859	-2 663	896	5 144	-1 731	-227	76
41 Coll. and pur. water, distrib.	661	515	78	-624	-94	886	134	-115	-17
45 Construction work	2 598	5	0	-4 667	-180	6 765	260	495	19
50 Trade, maint., rep. s. of m. veh.	4 846	-968	-20	-2 293	-47	5 467	113	2 640	54
51 Wholesale, commission tr. s.	8 878	4 689	53	-4 723	-53	15 230	172	-6 318	-71
52 Retail trade services	24 919	535	2	-399	-2	22 996	92	1 786	7
55 Hotel and restaurant services	32 331	16 150	50	-9 529	-29	13 650	42	12 060	37
60 Land transport, t. via p. serv.	817	10 365	1 268	-19 548	-2 392	28 332	3 466	-18 331	-2 243
61 Water transport services	1 069	1 466	137	-131	-12	623	58	-889	-83
62 Air transport services	1 795	-928	-52	-78	-4	655	36	2 146	120
63 Supp. and aux. trans. s., TA s.	207	-2 064	-997	38	18	2 302	1 112	-69	-33
64 Post and telecomm. services	-4 877	-6 305	129	-3 872	79	4 886	-100	414	-8
65 Financial interm. services	613	238	39	-4 071	-664	3 299	538	1 147	187
66 Insurance, pension fund. serv.	-1 055	-377	36	-1 098	104	941	-89	-521	49
67 Services aux. to fin. interm.	-636	-172	27	-745	117	402	-63	-120	19
70 Real estate services	335	162	48	-488	-146	701	209	-39	-12
71 Rent. services of machinery, eq.	1 266	1 381	109	-380	-30	228	18	37	3
72 Computer and related services	-132	1 286	-974	-3 081	2 333	2 079	-1 574	-416	315
73 Research and develop. serv.	248	100	40	-708	-286	1 010	407	-154	-62
74 Other business services	20 464	6 809	33	1 715	8	15 292	75	-3 351	-16
75 Public adm. and defence serv.	-53	-334	628	85	-161	1 128	-2 119	-932	1 751
80 Education services	-42	-587	1 400	-453	1 082	1 413	-3 372	-415	990
85 Health, social work services	1 498	-232	-16	-172	-11	2 427	162	-526	-35
90 Sewage, ref. disposal services	-1 073	-1 831	171	-300	28	1 256	-117	-198	18
91 Membership org. serv.	-122	116	-95	-429	352	222	-182	-30	25
92 Rec., cult. and sport. s.	6 230	-1 231	-20	40	1	3 824	61	3 597	58
93 Other services	2 228	-1 101	-49	-3 711	-167	7 856	353	-815	-37

Appendix 21 - Decomposition of changes in value added - Total figures (in million SKK)

Commodities (CPA)	*Value Added Change*	*Value-Added Coeff. Change Cont.*		*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	2 461	5 849	238	-6 839	-278	8 828	359	-5 377	-218
02 Prod. forestry, logging	2 404	135	6	-1 320	-55	2 284	95	1 305	54
05 Fish and other fishing products	31	16	52	12	39	9	29	-6	-20
10 Coal and lignite, peat	-14	266	-1 850	-739	5 144	528	-3 673	-69	480
11 Crude petroleum, natural gas	166	1 123	677	-1 187	-716	770	465	-541	-326
13 Metal ores	-226	-72	32	-248	110	65	-29	30	-13
14 Other mining and quarr. prod.	324	657	203	-564	-174	607	187	-377	-116
15 Food products and beverages	-3 031	-246	8	-1 747	58	6 318	-208	-7 356	243
16 Tobacco products	-1 155	167	-14	27	-2	264	-23	-1 613	140
17 Textiles	-542	-798	147	178	-33	1 271	-235	-1 193	220
18 Wearing apparel, furs	-715	-749	105	-175	25	1 885	-264	-1 675	234
19 Leather and leather products	-1 301	-1 703	131	105	-8	1 208	-93	-911	70
20 Wood, prod. of wood and cork	2 604	777	30	-697	-27	2 435	93	89	3
21 Pulp, paper and paper prod.	-4 263	-2 949	69	-1 590	37	2 203	-52	-1 929	45
22 Printed matter, recorded media	849	130	15	-2 520	-297	1 691	199	1 548	182
23 Coke, ref. petr. prod., nucl. fuel	5 783	5 751	99	-2 163	-37	2 906	50	-710	-12
24 Chemicals, chemical prod.	-7 980	-3 318	42	227	-3	4 930	-62	-9 819	123
25 Rubber and plastic products	2 546	-1 265	-50	-21	-1	2 417	95	1 415	56
26 Other non metallic min. prod.	740	429	58	-1 287	-174	3 597	486	-2 000	-270
27 Basic metals	14 100	14 726	104	-11 936	-85	7 659	54	3 652	26
28 Fabricated metal products	11 823	3 156	27	-1 512	-13	4 987	42	5 192	44
29 Machinery and eq. n.e.c.	6 131	1 701	28	-462	-8	5 845	95	-953	-16
30 Office machinery, computers	2 274	201	9	278	12	363	16	1 432	63
31 Elect. machinery, app. n.e.c.	5 905	-2 992	-51	2 234	38	3 901	66	2 762	47
32 Radio, tel. and comm. eq., app.	1 932	-6 986	-362	487	25	1 873	97	6 558	340
33 Med., prec., opt. instr., watches	971	-797	-82	969	100	1 336	138	-537	-55
34 Motor vehicles, trailers, s.-tr.	19 394	5 993	31	2 656	14	5 670	29	5 076	26
35 Other transport equipment	189	88	46	228	121	646	342	-773	-410
36 Furniture, other m. goods n.e.c.	4 596	1 742	38	43	1	1 565	34	1 246	27
37 Secondary raw materials	-293	79	-27	-319	109	247	-84	-300	102
40 Elect. energy, gas, steam, hot w.	13 349	12 592	94	-11 392	-85	13 661	102	-1 512	-11
41 Coll. and pur. water, distrib.	-511	536	-105	-697	136	1 019	-199	-1 369	268
45 Construction work	19 059	2 495	13	35	0	20 157	106	-3 627	-19
50 Trade, maint., rep. s. of m. veh.	3 502	1 393	40	-1 927	-55	2 764	79	1 271	36
51 Wholesale, commission tr. s.	15 055	20 207	134	-9 447	-63	15 975	106	-11 681	-78
52 Retail trade services	10 560	10 294	97	265	3	12 392	117	-12 391	-117
55 Hotel and restaurant services	6 725	8 643	129	-3 785	-56	3 342	50	-1 474	-22
60 Land transport, t. via p. serv.	10 144	24 053	237	-21 752	-214	14 782	146	-6 939	-68
61 Water transport services	-70	292	-419	-92	132	146	-210	-416	596
62 Air transport services	536	147	28	-24	-5	90	17	322	60
63 Supp. and aux. trans. s., TA s.	5 587	2 708	48	112	2	2 484	44	283	5
64 Post and telecomm. services	9 514	2 180	23	-7 044	-74	7 497	79	6 881	72
65 Financial interm. services	11 255	4 464	40	-14 064	-125	7 959	71	12 897	115
66 Insurance, pension fund. serv.	5 573	1 543	28	-2 162	-39	2 303	41	3 889	70
67 Services aux. to fin. interm.	2 824	2 292	81	-642	-23	411	15	763	27
70 Real estate services	3 017	-1 391	-46	-15 589	-517	22 646	751	-2 649	-88
71 Rent. services of machinery, eq.	-1 426	935	-66	-4 800	337	2 346	-165	94	-7
72 Computer and related services	6 289	1 374	22	-6 065	-96	3 215	51	7 764	123
73 Research and develop. serv.	308	605	197	-793	-258	553	179	-57	-18
74 Other business services	21 312	14 284	67	-2 527	-12	11 276	53	-1 722	-8
75 Public adm. and defence serv.	13 508	6 388	47	-679	-5	19 010	141	-11 212	-83
80 Education services	6 185	-212	-3	-408	-7	9 255	150	-2 451	-40
85 Health, social work services	1 351	-380	-28	-278	-21	8 813	652	-6 803	-504
90 Sewage, ref. disposal services	2 534	1 308	52	242	10	1 290	51	-306	-12
91 Membership org. serv.	2 846	2 704	95	-387	-14	353	12	177	6
92 Rec., cult. and sport. s.	5 915	2 975	50	-427	-7	3 593	61	-225	-4
93 Other services	2 380	390	16	-1 536	-65	1 663	70	1 864	78

Appendix 22 - Decomposition of changes in value added - C-component (in million SKK)

Commodities (CPA)	*Value Added Change*	*Value-Added Coeff. Change Cont.*		*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	-2 631	4 193	-159	-4 228	161	2 476	-94	-5 072	193
02 Prod. forestry, logging	669	28	4	-161	-24	183	27	618	92
05 Fish and other fishing products	14	5	36	8	58	1	9	0	-3
10 Coal and lignite, peat	-183	56	-31	-146	80	45	-24	-138	75
11 Crude petroleum, natural gas	-71	99	-140	-188	266	27	-38	-8	11
13 Metal ores	-26	-5	17	-19	72	1	-6	-4	16
14 Other mining and quarr. prod.	37	61	163	-8	-21	23	60	-38	-101
15 Food products and beverages	-6 282	-171	3	-779	12	1 722	-27	-7 054	112
16 Tobacco products	-399	48	-12	9	-2	28	-7	-484	121
17 Textiles	-518	-77	15	30	-6	50	-10	-520	100
18 Wearing apparel, furs	-1 227	-99	8	-54	4	101	-8	-1 175	96
19 Leather and leather products	-233	-86	37	-13	6	25	-11	-159	68
20 Wood, prod. of wood and cork	-520	81	-16	-8	2	103	-20	-697	134
21 Pulp, paper and paper prod.	-1 098	-293	27	-668	61	91	-8	-228	21
22 Printed matter, recorded media	984	47	5	-677	-69	243	25	1 371	139
23 Coke, ref. petr. prod., nucl. fuel	-322	717	-222	-523	162	140	-44	-657	204
24 Chemicals, chemical prod.	-611	-196	32	-115	19	113	-19	-413	68
25 Rubber and plastic products	-406	-73	18	-174	43	57	-14	-215	53
26 Other non metallic min. prod.	-154	31	-20	8	-5	102	-66	-294	191
27 Basic metals	-307	378	-123	-596	194	71	-23	-160	52
28 Fabricated metal products	-14	252	-1 819	-135	976	160	-1 153	-291	2 096
29 Machinery and eq. n.e.c.	22	77	345	85	384	106	478	-246	-1 107
30 Office machinery, computers	124	11	9	68	55	8	7	37	30
31 Elect. machinery, app. n.e.c.	630	-81	-13	308	49	39	6	365	58
32 Radio, tel. and comm. eq., app.	-69	-169	245	51	-74	18	-26	31	-45
33 Med., prec., opt. instr., watches	-43	-66	153	152	-352	44	-102	-174	402
34 Motor vehicles, trailers, s.-tr.	114	160	140	324	285	64	57	-434	-381
35 Other transport equipment	54	8	16	38	70	24	44	-16	-30
36 Furniture, other m. goods n.e.c.	1 181	302	26	21	2	106	9	751	64
37 Secondary raw materials	-125	13	-10	-131	104	15	-12	-22	18
40 Elect. energy, gas, steam, hot w.	3 781	6 944	184	-6 633	-175	2 955	78	515	14
41 Coll. and pur. water, distrib.	-654	343	-52	-301	46	252	-39	-948	145
45 Construction work	250	189	76	-1 296	-519	598	239	758	304
50 Trade, maint., rep. s. of m. veh.	821	548	67	-633	-77	431	52	475	58
51 Wholesale, commission tr. s.	-53	4 131	-7 778	-2 907	5 474	1 263	-2 378	-2 540	4 782
52 Retail trade services	1 513	6 050	400	931	62	2 865	189	-8 333	-551
55 Hotel and restaurant services	53	3 571	6 753	-1 038	-1 963	553	1 046	-3 033	-5 736
60 Land transport, t. via p. serv.	3 054	6 395	209	-6 739	-221	1 502	49	1 896	62
61 Water transport services	-156	97	-62	-47	30	19	-12	-225	144
62 Air transport services	-29	16	-56	-13	46	4	-14	-36	125
63 Supp. and aux. trans. s., TA s.	2 078	810	39	80	4	285	14	904	43
64 Post and telecomm. services	8 270	1 161	14	-2 797	-34	1 575	19	8 332	101
65 Financial interm. services	12 060	2 299	19	-6 121	-51	1 644	14	14 239	118
66 Insurance, pension fund. serv.	6 005	1 257	21	-1 192	-20	753	13	5 188	86
67 Services aux. to fin. interm.	2 480	1 535	62	-132	-5	120	5	957	39
70 Real estate services	6 737	-1 060	-16	-7 203	-107	6 778	101	8 221	122
71 Rent. services of machinery, eq.	-704	249	-35	-943	134	235	-33	-246	35
72 Computer and related services	-720	221	-31	-1 642	228	213	-30	488	-68
73 Research and develop. serv.	80	39	49	34	43	15	18	-8	-10
74 Other business services	4 138	3 830	93	-1 628	-39	1 204	29	732	18
75 Public adm. and defence serv.	386	104	27	19	5	120	31	143	37
80 Education services	-204	-24	12	-160	79	425	-209	-444	218
85 Health, social work services	-882	-37	4	29	-3	338	-38	-1 213	137
90 Sewage, ref. disposal services	929	759	82	59	6	296	32	-185	-20
91 Membership org. serv.	149	242	162	-92	-62	10	7	-10	-7
92 Rec., cult. and sport. s.	1 643	1 261	77	-160	-10	603	37	-62	-4
93 Other services	1 755	101	6	-319	-18	166	9	1 807	103

Appendix 23 - Decomposition of changes in value added - G-component (in million SKK)

Commodities (CPA)	*Value Added Change*	*Value-Added Coeff. Change Cont.*		*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	-163	273	-167	-603	370	101	-62	65	-40
02 Prod. forestry, logging	-282	4	-2	-187	66	19	-7	-118	42
05 Fish and other fishing products	3	1	26	2	58	0	4	0	12
10 Coal and lignite, peat	-195	33	-17	-245	126	16	-8	2	-1
11 Crude petroleum, natural gas	-59	26	-45	-74	126	5	-8	-15	26
13 Metal ores	-17	-3	16	-10	58	0	-3	-5	29
14 Other mining and quarr. prod.	38	13	35	28	74	3	9	-7	-17
15 Food products and beverages	-218	-7	3	-284	130	44	-20	28	-13
16 Tobacco products	-3	1	-18	-4	129	0	-6	0	-4
17 Textiles	5	-4	-96	6	134	2	37	1	25
18 Wearing apparel, furs	-30	-6	19	-29	98	4	-12	1	-5
19 Leather and leather products	-6	-3	48	-5	76	1	-9	1	-15
20 Wood, prod. of wood and cork	-262	22	-8	-305	116	17	-7	4	-1
21 Pulp, paper and paper prod.	-454	-92	20	-391	86	20	-4	9	-2
22 Printed matter, recorded media	-569	13	-2	-668	117	42	-7	44	-8
23 Coke, ref. petr. prod., nucl. fuel	-215	182	-85	-405	188	19	-9	-12	6
24 Chemicals, chemical prod.	-4 011	-469	12	-59	1	172	-4	-3 654	91
25 Rubber and plastic products	10	-13	-128	19	186	6	64	-2	-21
26 Other non metallic min. prod.	-46	6	-13	-68	146	13	-27	3	-6
27 Basic metals	-126	118	-94	-232	185	13	-10	-25	20
28 Fabricated metal products	-67	48	-72	-96	143	19	-28	-38	57
29 Machinery and eq. n.e.c.	-288	24	-8	-306	106	21	-7	-26	9
30 Office machinery, computers	24	3	11	19	77	1	6	2	7
31 Elect. machinery, app. n.e.c.	75	-11	-14	82	109	3	4	1	1
32 Radio, tel. and comm. eq., app.	-30	-47	154	10	-33	3	-11	3	-10
33 Med., prec., opt. instr., watches	677	-143	-21	99	15	59	9	662	98
34 Motor vehicles, trailers, s.-tr.	33	8	25	22	65	2	6	1	3
35 Other transport equipment	5	0	9	4	72	1	16	0	3
36 Furniture, other m. goods n.e.c.	-73	70	-95	-168	230	15	-21	10	-14
37 Secondary raw materials	-60	9	-15	-107	178	8	-13	30	-49
40 Elect. energy, gas, steam, hot w.	340	1 010	297	-581	-171	271	80	-360	-106
41 Coll. and pur. water, distrib.	10	63	665	-92	-967	29	309	9	93
45 Construction work	768	59	8	465	61	118	15	126	16
50 Trade, maint., rep. s. of m. veh.	-162	56	-34	-271	167	28	-17	25	-16
51 Wholesale, commission tr. s.	13	632	4 690	-812	-6 030	120	891	74	550
52 Retail trade services	-330	277	-84	-722	219	80	-24	34	-10
55 Hotel and restaurant services	319	908	285	-767	-241	82	26	96	30
60 Land transport, t. via p. serv.	-860	865	-101	-1 762	205	124	-14	-87	10
61 Water transport services	-8	11	-145	-15	200	1	-15	-5	60
62 Air transport services	19	11	61	3	16	2	10	3	13
63 Supp. and aux. trans. s., TA s.	131	451	345	-175	-134	101	77	-246	-188
64 Post and telecomm. services	-126	239	-190	-688	548	206	-164	118	-94
65 Financial interm. services	-1 829	356	-19	-1 228	67	156	-9	-1 113	61
66 Insurance, pension fund. serv.	-186	36	-19	-235	126	13	-7	-1	0
67 Services aux. to fin. interm.	21	119	572	-100	-481	4	20	-2	-11
70 Real estate services	-2 140	-74	3	-1 975	92	300	-14	-391	18
71 Rent. services of machinery, eq.	-184	67	-36	-320	174	41	-22	29	-16
72 Computer and related services	-291	172	-59	-804	277	100	-34	242	-83
73 Research and develop. serv.	18	378	2 107	-636	-3 540	85	475	190	1 058
74 Other business services	533	1 264	237	-986	-185	244	46	12	2
75 Public adm. and defence serv.	12 966	6 164	48	-601	-5	4 500	35	2 903	22
80 Education services	6 283	-182	-3	-117	-2	1 962	31	4 621	74
85 Health, social work services	1 892	-328	-17	-247	-13	1 860	98	608	32
90 Sewage, ref. disposal services	1 282	338	26	289	23	82	6	573	45
91 Membership org. serv.	2 453	2 146	87	-179	-7	74	3	412	17
92 Rec., cult. and sport. s.	958	849	89	-286	-30	255	27	140	15
93 Other services	-234	29	-13	-305	130	32	-14	10	-4

Appendix 24 - Decomposition of changes in value added - THK-component (in million SKK)

Commodities (CPA)	*Value Added Change*	*Value-Added Coeff. Change Cont.*		*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	1 066	235	22	-315	-30	252	24	894	84
02 Prod. forestry, logging	-176	10	-5	-350	199	119	-68	46	-26
05 Fish and other fishing products	1	0	45	0	-20	0	15	0	59
10 Coal and lignite, peat	154	50	33	-96	-62	71	46	129	84
11 Crude petroleum, natural gas	-1 695	436	-26	-332	20	218	-13	-2 016	119
13 Metal ores	61	-14	-23	-35	-57	8	13	102	167
14 Other mining and quarr. prod.	-442	121	-27	-641	145	77	-17	2	0
15 Food products and beverages	187	-2	-1	-199	-106	35	19	354	189
16 Tobacco products	-237	27	-12	5	-2	30	-13	-300	127
17 Textiles	-5	-12	250	25	-500	13	-273	-31	623
18 Wearing apparel, furs	3 617	178	5	-14	0	-353	-10	3 806	105
19 Leather and leather products	-430	-81	19	-6	1	44	-10	-388	90
20 Wood, prod. of wood and cork	286	124	43	-422	-148	280	98	304	106
21 Pulp, paper and paper prod.	-334	-136	41	-78	23	74	-22	-193	58
22 Printed matter, recorded media	217	9	4	-152	-70	76	35	284	131
23 Coke, ref. petr. prod., nucl. fuel	307	245	80	-139	-45	89	29	113	37
24 Chemicals, chemical prod.	115	-90	-78	298	258	90	78	-182	-158
25 Rubber and plastic products	-1 353	-127	9	-22	2	191	-14	-1 394	103
26 Other non metallic min. prod.	-1 358	128	-9	-1 572	116	780	-57	-695	51
27 Basic metals	1 653	262	16	-692	-42	103	6	1 980	120
28 Fabricated metal products	1 822	352	19	-526	-29	398	22	1 598	88
29 Machinery and eq. n.e.c.	-2 373	224	-9	116	-5	583	-25	-3 295	139
30 Office machinery, computers	254	14	5	58	23	16	6	166	66
31 Elect. machinery, app. n.e.c.	-981	-310	32	389	-40	309	-32	-1 370	140
32 Radio, tel. and comm. eq., app.	-433	-318	74	80	-18	65	-15	-259	60
33 Med., prec., opt. instr., watches	-301	-151	50	115	-38	186	-62	-451	150
34 Motor vehicles, trailers, s.-tr.	1 013	-30	-3	120	12	-33	-3	955	94
35 Other transport equipment	-142	8	-6	6	-4	46	-33	-202	143
36 Furniture, other m. goods n.e.c.	51	105	208	10	20	72	141	-136	-269
37 Secondary raw materials	-259	22	-8	-67	26	48	-18	-262	101
40 Elect. energy, gas, steam, hot w.	1 885	436	23	-711	-38	342	18	1 819	96
41 Coll. and pur. water, distrib.	-24	23	-96	-81	335	31	-130	2	-10
45 Construction work	16 811	2 036	12	2 695	16	11 752	70	327	2
50 Trade, maint., rep. s. of m. veh.	535	242	45	-343	-64	345	65	292	54
51 Wholesale, commission tr. s.	-590	3 705	-628	-1 386	235	2 124	-360	-5 033	853
52 Retail trade services	-566	530	-94	152	-27	474	-84	-1 722	304
55 Hotel and restaurant services	-7	398	-5 653	-497	7 064	102	-1 448	-10	137
60 Land transport, t. via p. serv.	-1 935	1 953	-101	-3 351	173	816	-42	-1 353	70
61 Water transport services	8	17	203	-2	-25	6	71	-12	-149
62 Air transport services	1	3	360	-4	-484	1	183	0	41
63 Supp. and aux. trans. s., TA s.	199	124	62	56	28	85	43	-66	-33
64 Post and telecomm. services	-352	131	-37	-858	244	333	-95	43	-12
65 Financial interm. services	-929	330	-35	-1 650	178	424	-46	-33	3
66 Insurance, pension fund. serv.	-78	45	-57	-152	194	52	-66	-22	29
67 Services aux. to fin. interm.	29	136	461	-136	-461	11	36	19	64
70 Real estate services	-2 538	-75	3	-3 161	125	886	-35	-188	7
71 Rent. services of machinery, eq.	-342	160	-47	-826	242	294	-86	30	-9
72 Computer and related services	7 964	533	7	-1 167	-15	876	11	7 721	97
73 Research and develop. serv.	10	22	226	-28	-279	13	129	2	24
74 Other business services	1 162	1 713	147	-897	-77	984	85	-638	-55
75 Public adm. and defence serv.	-77	13	-16	-136	175	27	-35	19	-24
80 Education services	-4	-1	19	-37	1 041	22	-602	13	-359
85 Health, social work services	-17	0	2	-23	134	6	-36	0	0
90 Sewage, ref. disposal services	-11	38	-332	-51	443	26	-230	-25	218
91 Membership org. serv.	54	65	119	-16	-30	6	10	0	0
92 Rec., cult. and sport. s.	-128	90	-70	1	-1	80	-63	-300	233
93 Other services	-90	13	-14	-139	156	40	-45	-3	4

Appendix 25 - Decomposition of changes in value added - EX-component (in million SKK)

Commodities (CPA)	*Value Added Change*	*Value-Added Coeff. Change Cont.*		*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	4 190	1 147	27	-1 693	-40	2 596	62	2 140	51
02 Prod. forestry, logging	2 193	93	4	-622	-28	2 414	110	308	14
05 Fish and other fishing products	13	10	75	2	18	8	63	-7	-56
10 Coal and lignite, peat	209	127	60	-251	-120	385	184	-51	-24
11 Crude petroleum, natural gas	1 990	563	28	-593	-30	541	27	1 479	74
13 Metal ores	-244	-51	21	-185	76	75	-31	-82	34
14 Other mining and quarr. prod.	690	462	67	57	8	662	96	-492	-71
15 Food products and beverages	3 282	-66	-2	-485	-15	2 478	76	1 355	41
16 Tobacco products	-517	92	-18	16	-3	230	-44	-854	165
17 Textiles	-23	-704	3 071	117	-511	1 721	-7 509	-1 157	5 050
18 Wearing apparel, furs	-3 075	-823	27	-78	3	3 314	-108	-5 489	178
19 Leather and leather products	-631	-1 533	243	129	-20	1 661	-263	-887	141
20 Wood, prod. of wood and cork	3 101	550	18	40	1	2 610	84	-98	-3
21 Pulp, paper and paper prod.	-2 378	-2 427	102	-453	19	2 762	-116	-2 261	95
22 Printed matter, recorded media	218	62	28	-1 022	-468	1 243	569	-64	-29
23 Coke, ref. petr. prod., nucl. fuel	6 014	4 607	77	-1 097	-18	3 595	60	-1 092	-18
24 Chemicals, chemical prod.	-3 473	-2 562	74	104	-3	5 853	-169	-6 868	198
25 Rubber and plastic products	4 295	-1 052	-24	156	4	2 984	69	2 207	51
26 Other non metallic min. prod.	2 298	265	12	345	15	3 375	147	-1 686	-73
27 Basic metals	12 880	13 967	108	-10 416	-81	11 185	87	-1 856	-14
28 Fabricated metal products	10 083	2 504	25	-754	-7	6 015	60	2 319	23
29 Machinery and eq. n.e.c.	8 770	1 377	16	-358	-4	7 116	81	634	7
30 Office machinery, computers	1 871	174	9	134	7	466	25	1 098	59
31 Elect. machinery, app. n.e.c.	6 181	-2 590	-42	1 456	24	5 100	83	2 215	36
32 Radio, tel. and comm. eq., app.	2 464	-6 452	-262	347	14	2 548	103	6 022	244
33 Med., prec., opt. instr., watches	638	-437	-68	602	94	1 123	176	-650	-102
34 Motor vehicles, trailers, s.-tr.	18 234	5 854	32	2 191	12	8 457	46	1 732	10
35 Other transport equipment	271	70	26	181	67	802	295	-782	-288
36 Furniture, other m. goods n.e.c.	3 438	1 265	37	181	5	1 740	51	253	7
37 Secondary raw materials	151	35	23	-15	-10	166	110	-35	-23
40 Elect. energy, gas, steam, hot w.	7 344	4 202	57	-3 467	-47	7 004	95	-396	-5
41 Coll. and pur. water, distrib.	158	107	68	-223	-141	313	198	-39	-25
45 Construction work	1 231	210	17	-1 829	-149	2 660	216	191	16
50 Trade, maint., rep. s. of m. veh.	2 308	547	24	-678	-29	1 641	71	798	35
51 Wholesale, commission tr. s.	15 685	11 739	75	-4 341	-28	14 244	91	-5 958	-38
52 Retail trade services	9 943	3 437	35	-96	-1	6 134	62	469	5
55 Hotel and restaurant services	6 361	3 766	59	-1 483	-23	2 154	34	1 924	30
60 Land transport, t. via p. serv.	9 885	14 840	150	-9 901	-100	14 415	146	-9 470	-96
61 Water transport services	86	168	195	-28	-33	130	151	-183	-213
62 Air transport services	545	117	21	-10	-2	102	19	336	62
63 Supp. and aux. trans. s., TA s.	3 180	1 324	42	152	5	1 893	60	-189	-6
64 Post and telecomm. services	1 722	649	38	-2 700	-157	3 490	203	282	16
65 Financial interm. services	1 953	1 480	76	-5 066	-259	4 099	210	1 440	74
66 Insurance, pension fund. serv.	-167	206	-123	-583	348	496	-296	-287	171
67 Services aux. to fin. interm.	294	502	171	-273	-93	130	44	-64	-22
70 Real estate services	958	-183	-19	-3 250	-339	4 640	485	-250	-26
71 Rent. services of machinery, eq.	-196	458	-234	-2 711	1 382	1 785	-910	272	-139
72 Computer and related services	-665	448	-67	-2 452	369	1 669	-251	-331	50
73 Research and develop. serv.	200	165	83	-164	-82	233	117	-34	-17
74 Other business services	15 479	7 478	48	985	6	8 976	58	-1 960	-13
75 Public adm. and defence serv.	233	108	46	39	17	502	215	-416	-178
80 Education services	109	-4	-4	-93	-85	292	268	-86	-79
85 Health, social work services	359	-15	-4	-37	-10	524	146	-114	-32
90 Sewage, ref. disposal services	335	174	52	-55	-16	262	78	-46	-14
91 Membership org. serv.	190	251	132	-100	-53	39	20	0	0
92 Rec., cult. and sport. s.	3 443	775	23	17	1	1 368	40	1 283	37
93 Other services	949	247	26	-772	-81	1 647	174	-172	-18

Appendix 26 - Decomposition of changes in import - Total figures (in million SKK)

Commodities (CPA)	*Import Change*	*Import Intensity Change Cont.*		*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	724	1 233	170	-1 026	-142	1 323	183	-807	-111
02 Prod. forestry, logging	41	26	65	-8	-19	14	35	8	20
05 Fish and other fishing products	22	17	75	4	20	4	16	-3	-12
10 Coal and lignite, peat	-2	20	-1 066	-57	3 076	40	-2 197	-5	287
11 Crude petroleum, natural gas	-559	-383	69	-235	42	159	-28	-99	18
13 Metal ores	-38	-19	51	-31	81	9	-23	3	-9
14 Other mining and quarr. prod.	-19	27	-142	-79	416	85	-446	-52	272
15 Food products and beverages	4 393	7 447	170	-1 889	-43	6 890	157	-8 055	-183
16 Tobacco products	-1 426	-523	37	12	-1	179	-13	-1 093	77
17 Textiles	2 198	1 932	88	177	8	1 326	60	-1 238	-56
18 Wearing apparel, furs	278	249	90	-143	-52	1 548	557	-1 377	-496
19 Leather and leather products	1 370	849	62	135	10	1 572	115	-1 185	-87
20 Wood, prod. of wood and cork	2 727	1 973	72	-283	-10	996	37	40	1
21 Pulp, paper and paper prod.	-940	1 202	-128	-2 543	270	3 508	-373	-3 107	330
22 Printed matter, recorded media	1 282	755	59	-1 832	-143	1 222	95	1 138	89
23 Coke, ref. petr. prod., nucl. fuel	-7 592	-7 739	102	-10 226	135	13 630	-180	-3 256	43
24 Chemicals, chemical prod.	-5 019	2 171	-43	343	-7	7 608	-152	-15 141	302
25 Rubber and plastic products	7 588	-857	-11	-56	-1	5 355	71	3 145	41
26 Other non metallic min. prod.	-2 336	-2 544	109	-893	38	2 429	-104	-1 328	57
27 Basic metals	16 657	17 478	105	-15 757	-95	10 116	61	4 819	29
28 Fabricated metal products	9 028	1 951	22	-1 241	-14	4 076	45	4 243	47
29 Machinery and eq. n.e.c.	6 444	-769	-12	-776	-12	9 522	148	-1 533	-24
30 Office machinery, computers	13 810	-450	-3	1 946	14	2 471	18	9 843	71
31 Elect. machinery, app. n.e.c.	21 195	2 441	12	4 616	22	8 310	39	5 829	27
32 Radio, tel. and comm. eq., app.	41 485	8 352	20	1 495	4	7 084	17	24 554	59
33 Med., prec., opt. instr., watches	2 611	1 509	58	582	22	859	33	-338	-13
34 Motor vehicles, trailers, s.-tr.	51 916	-15 654	-30	14 028	27	28 196	54	25 347	49
35 Other transport equipment	-1 740	-1 943	112	464	-27	1 285	-74	-1 545	89
36 Furniture, other m. goods n.e.c.	2 490	-3 711	-149	115	5	3 396	136	2 691	108
37 Secondary raw materials	24	77	319	-46	-189	34	139	-41	-169
40 Elect. energy, gas, steam, hot w.	26 173	25 845	99	-4 533	-17	5 596	21	-736	-3
41 Coll. and pur. water, distrib.	-13	8	-57	-14	105	21	-154	-28	206
45 Construction work	16 734	11 533	69	28	0	6 330	38	-1 156	-7
50 Trade, maint., rep. s. of m. veh.	-1 386	-1 726	125	-332	24	471	-34	202	-15
51 Wholesale, commission tr. s.	-7 103	-6 102	86	-1 926	27	3 216	-45	-2 291	32
52 Retail trade services	763	733	96	28	4	1 389	182	-1 388	-182
55 Hotel and restaurant services	-110	1	-1	-230	209	204	-185	-85	77
60 Land transport, t. via p. serv.	-33 485	-25 831	77	-12 522	37	9 184	-27	-4 315	13
61 Water transport services	-24	2	-10	-7	28	11	-45	-30	126
62 Air transport services	2 644	1 587	60	-55	-2	241	9	872	33
63 Supp. and aux. trans. s., TA s.	1 615	23	1	35	2	1 373	85	185	11
64 Post and telecomm. services	492	-470	-95	-939	-191	996	202	904	184
65 Financial interm. services	2 761	2 456	89	-526	-19	284	10	546	20
66 Insurance, pension fund. serv.	2 488	1 922	77	-250	-10	295	12	522	21
67 Services aux. to fin. interm.	619	516	83	-119	-19	77	12	145	23
70 Real estate services	1 960	1 896	97	-209	-11	306	16	-32	-2
71 Rent. services of machinery, eq.	101	262	259	-319	-315	152	150	5	5
72 Computer and related services	1 497	203	14	-1 606	-107	852	57	2 048	137
73 Research and develop. serv.	-82	-2	2	-216	263	154	-187	-18	22
74 Other business services	-4 806	-6 253	130	-583	12	2 359	-49	-330	7
75 Public adm. and defence serv.	3 714	3 383	91	-31	-1	881	24	-520	-14
80 Education services	1 082	918	85	-9	-1	236	22	-63	-6
85 Health, social work services	3 006	2 642	88	-58	-2	1 850	62	-1 429	-48
90 Sewage, ref. disposal services	60	26	43	7	11	36	60	-8	-14
91 Membership org. serv.	261	245	94	-47	-18	42	16	21	8
92 Rec., cult. and sport. s.	-977	-1 474	151	-76	8	612	-63	-39	4
93 Other services	105	83	79	-16	-15	17	16	21	20

Appendix 27 - Decomposition of changes in import - C-component (in million SKK)

Commodities (CPA)	*Import Change*	*Import Intensity Change Cont.*		*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	-142	884	-622	-637	448	371	-261	-761	535
02 Prod. forestry, logging	9	5	57	-1	-11	1	12	4	41
05 Fish and other fishing products	9	5	62	3	37	1	6	0	-5
10 Coal and lignite, peat	-14	4	-29	-11	79	3	-24	-11	74
11 Crude petroleum, natural gas	-65	-34	52	-38	59	6	-9	1	-2
13 Metal ores	-4	-1	32	-2	58	0	-5	-1	16
14 Other mining and quarr. prod.	-1	3	-344	-1	168	3	-429	-5	706
15 Food products and beverages	-1 531	5 172	-338	-855	56	1 882	-123	-7 729	505
16 Tobacco products	-455	-150	33	4	-1	19	-4	-328	72
17 Textiles	-270	188	-69	30	-11	52	-19	-539	200
18 Wearing apparel, furs	-894	33	-4	-44	5	83	-9	-966	108
19 Leather and leather products	-147	43	-29	-16	11	32	-22	-206	140
20 Wood, prod. of wood and cork	-42	207	-494	-4	9	43	-102	-287	688
21 Pulp, paper and paper prod.	-1 191	120	-10	-1 084	91	135	-11	-362	30
22 Printed matter, recorded media	960	273	28	-492	-51	176	18	1 003	104
23 Coke, ref. petr. prod., nucl. fuel	-5 670	-964	17	-2 378	42	679	-12	-3 006	53
24 Chemicals, chemical prod.	-511	129	-25	-180	35	173	-34	-633	124
25 Rubber and plastic products	-787	-50	6	-388	49	124	-16	-474	60
26 Other non metallic min. prod.	-304	-181	59	3	-1	68	-22	-195	64
27 Basic metals	-451	449	-100	-782	173	94	-21	-212	47
28 Fabricated metal products	-61	156	-254	-110	180	131	-213	-238	387
29 Machinery and eq. n.e.c.	-123	-35	28	136	-111	173	-140	-397	323
30 Office machinery, computers	756	-24	-3	469	62	55	7	256	34
31 Elect. machinery, app. n.e.c.	1 567	66	4	637	41	86	6	777	50
32 Radio, tel. and comm. eq., app.	572	202	35	169	30	72	13	130	23
33 Med., prec., opt. instr., watches	139	125	90	94	68	29	21	-109	-79
34 Motor vehicles, trailers, s.-tr.	-647	-417	64	1 647	-255	306	-47	-2 183	337
35 Other transport equipment	-93	-184	197	78	-83	47	-50	-34	36
36 Furniture, other m. goods n.e.c.	1 266	-644	-51	62	5	230	18	1 617	128
37 Secondary raw materials	-7	12	-170	-19	258	2	-26	-3	37
40 Elect. energy, gas, steam, hot w.	12 884	14 253	111	-2 770	-21	1 206	9	195	2
41 Coll. and pur. water, distrib.	-15	5	-32	-6	40	5	-34	-19	126
45 Construction work	894	875	98	-412	-46	183	20	248	28
50 Trade, maint., rep. s. of m. veh.	-635	-679	107	-103	16	73	-11	75	-12
51 Wholesale, commission tr. s.	-2 061	-1 248	61	-556	27	259	-13	-516	25
52 Retail trade services	-78	431	-554	104	-134	321	-413	-934	1 200
55 Hotel and restaurant services	-204	0	0	-61	30	33	-16	-177	87
60 Land transport, t. via p. serv.	-8 706	-6 868	79	-3 645	42	953	-11	854	-10
61 Water transport services	-17	1	-4	-3	19	1	-8	-16	93
62 Air transport services	52	175	339	-35	-69	10	20	-98	-190
63 Supp. and aux. trans. s., TA s.	708	7	1	50	7	157	22	494	70
64 Post and telecomm. services	682	-250	-37	-370	-54	209	31	1 094	160
65 Financial interm. services	1 703	1 265	74	-219	-13	61	4	596	35
66 Insurance, pension fund. serv.	2 232	1 565	70	-131	-6	99	4	699	31
67 Services aux. to fin. interm.	528	346	66	-23	-4	23	4	182	35
70 Real estate services	1 558	1 444	93	-100	-6	94	6	119	8
71 Rent. services of machinery, eq.	5	70	1 425	-65	-1 333	15	315	-15	-308
72 Computer and related services	-215	33	-15	-434	202	57	-26	130	-60
73 Research and develop. serv.	11	0	-1	9	85	4	35	-2	-20
74 Other business services	-1 613	-1 676	104	-386	24	258	-16	192	-12
75 Public adm. and defence serv.	68	55	81	0	1	6	8	7	10
80 Education services	101	106	105	-3	-3	11	11	-12	-12
85 Health, social work services	79	256	326	6	8	71	91	-255	-324
90 Sewage, ref. disposal services	20	15	76	2	8	8	42	-5	-26
91 Membership org. serv.	11	22	197	-11	-97	1	11	-1	-11
92 Rec., cult. and sport. s.	-560	-625	112	-26	5	103	-18	-13	2
93 Other services	40	21	54	-4	-9	2	4	20	51

Appendix 28 - Decomposition of changes in import - G-component (in million SKK)

Commodities (CPA)	*Import Change*	*Import Intensity Change Cont.*		*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	-8	58	-719	-90	1 128	15	-188	10	-121
02 Prod. forestry, logging	-1	1	-89	-1	120	0	-11	-1	80
05 Fish and other fishing products	2	1	50	1	36	0	3	0	12
10 Coal and lignite, peat	-15	2	-16	-19	125	1	-8	0	-1
11 Crude petroleum, natural gas	-25	-9	36	-15	62	1	-4	-1	6
13 Metal ores	-3	-1	29	-1	45	0	-3	-1	29
14 Other mining and quarr. prod.	4	1	14	4	95	0	11	-1	-20
15 Food products and beverages	-20	212	-1 084	-307	1 567	47	-241	28	-142
16 Tobacco products	-4	-2	41	-3	66	0	-4	0	-3
17 Textiles	20	11	53	6	32	2	9	1	6
18 Wearing apparel, furs	-18	2	-11	-24	133	3	-16	1	-6
19 Leather and leather products	-3	2	-55	-6	216	1	-26	1	-34
20 Wood, prod. of wood and cork	-61	56	-91	-125	203	6	-10	1	-2
21 Pulp, paper and paper prod.	-552	38	-7	-627	113	27	-5	10	-2
22 Printed matter, recorded media	-352	74	-21	-487	138	30	-9	31	-9
23 Coke, ref. petr. prod., nucl. fuel	-2 047	-246	12	-1 830	89	109	-5	-80	4
24 Chemicals, chemical prod.	-5 155	307	-6	-90	2	264	-5	-5 636	109
25 Rubber and plastic products	42	-9	-21	42	100	14	34	-6	-13
26 Other non metallic min. prod.	-72	-36	51	-46	64	9	-12	2	-3
27 Basic metals	-180	140	-78	-304	169	17	-10	-33	19
28 Fabricated metal products	-64	30	-47	-78	122	15	-24	-31	49
29 Machinery and eq. n.e.c.	-517	-11	2	-500	97	34	-7	-41	8
30 Office machinery, computers	142	-6	-4	129	90	9	6	11	8
31 Elect. machinery, app. n.e.c.	191	9	5	172	90	8	4	2	1
32 Radio, tel. and comm. eq., app.	116	56	48	38	33	13	11	10	8
33 Med., prec., opt. instr., watches	782	271	35	61	8	37	5	413	53
34 Motor vehicles, trailers, s.-tr.	103	-22	-22	109	105	10	10	7	6
35 Other transport equipment	-1	-11	1 407	8	-1 009	2	-224	1	-73
36 Furniture, other m. goods n.e.c.	-459	-148	32	-374	82	37	-8	27	-6
37 Secondary raw materials	-1	9	-943	-14	1 470	1	-107	3	-321
40 Elect. energy, gas, steam, hot w.	1 783	2 074	116	-234	-13	113	6	-169	-9
41 Coll. and pur. water, distrib.	0	1	-520	-2	1 064	1	-339	0	-105
45 Construction work	497	274	55	144	29	38	8	40	8
50 Trade, maint., rep. s. of m. veh.	-104	-69	66	-46	44	5	-5	5	-5
51 Wholesale, commission tr. s.	-311	-191	61	-163	52	26	-8	17	-5
52 Retail trade services	-48	20	-41	-81	168	9	-19	4	-8
55 Hotel and restaurant services	-34	0	0	-46	134	5	-15	6	-18
60 Land transport, t. via p. serv.	-1 878	-929	49	-990	53	89	-5	-48	3
61 Water transport services	-1	0	-7	-1	86	0	-7	0	28
62 Air transport services	144	124	86	8	6	5	4	7	5
63 Supp. and aux. trans. s., TA s.	-174	4	-2	-98	57	56	-32	-135	78
64 Post and telecomm. services	-99	-51	52	-91	92	27	-27	16	-16
65 Financial interm. services	98	196	200	-55	-56	5	6	-49	-50
66 Insurance, pension fund. serv.	14	45	329	-32	-233	1	8	-1	-4
67 Services aux. to fin. interm.	8	27	340	-19	-240	1	9	-1	-10
70 Real estate services	71	101	142	-28	-39	4	5	-6	-9
71 Rent. services of machinery, eq.	2	19	1 125	-22	-1 293	3	159	2	109
72 Computer and related services	-96	25	-26	-212	220	26	-27	64	-66
73 Research and develop. serv.	-99	-1	1	-174	176	24	-24	52	-53
74 Other business services	-703	-553	79	-214	30	54	-8	10	-1
75 Public adm. and defence serv.	3 580	3 264	91	-27	-1	209	6	134	4
80 Education services	956	790	83	-3	0	50	5	118	12
85 Health, social work services	2 746	2 279	83	-51	-2	390	14	127	5
90 Sewage, ref. disposal services	33	7	20	8	24	2	7	16	48
91 Membership org. serv.	230	194	84	-22	-10	9	4	49	21
92 Rec., cult. and sport. s.	-402	-420	105	-52	13	44	-11	27	-7
93 Other services	3	6	188	-3	-98	0	9	0	2

Appendix 29 - Decomposition of changes in import - THK-component (in million SKK)

Commodities (CPA)	*Import Change*	*Import Intensity Change Cont.*		*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	175	50	28	-47	-27	38	22	134	77
02 Prod. forestry, logging	1	2	268	-2	-307	1	101	0	38
05 Fish and other fishing products	0	0	70	0	-14	0	8	0	37
10 Coal and lignite, peat	12	4	32	-7	-63	5	46	10	85
11 Crude petroleum, natural gas	-540	-148	27	-51	9	43	-8	-384	71
13 Metal ores	5	-4	-70	-4	-80	1	20	12	230
14 Other mining and quarr. prod.	-73	5	-7	-90	123	12	-16	0	0
15 Food products and beverages	278	70	25	-224	-81	36	13	397	143
16 Tobacco products	-266	-86	32	2	-1	21	-8	-203	76
17 Textiles	38	30	80	24	64	15	39	-31	-82
18 Wearing apparel, furs	2 768	-59	-2	-12	0	-290	-10	3 129	113
19 Leather and leather products	-414	40	-10	-8	2	58	-14	-504	122
20 Wood, prod. of wood and cork	382	315	83	-170	-44	112	29	124	33
21 Pulp, paper and paper prod.	-266	56	-21	-125	47	118	-44	-314	118
22 Printed matter, recorded media	202	50	25	-112	-55	55	27	209	103
23 Coke, ref. petr. prod., nucl. fuel	-46	-329	723	-690	1 515	424	-931	550	-1 207
24 Chemicals, chemical prod.	375	59	16	455	121	144	38	-283	-75
25 Rubber and plastic products	-2 801	-86	3	-49	2	423	-15	-3 089	110
26 Other non metallic min. prod.	-1 753	-757	43	-1 078	61	539	-31	-458	26
27 Basic metals	2 138	312	15	-922	-43	137	6	2 612	122
28 Fabricated metal products	1 418	217	15	-432	-30	326	23	1 306	92
29 Machinery and eq. n.e.c.	-4 330	-101	2	186	-4	948	-22	-5 363	124
30 Office machinery, computers	1 622	-30	-2	414	26	105	6	1 133	70
31 Elect. machinery, app. n.e.c.	-1 162	253	-22	822	-71	664	-57	-2 900	250
32 Radio, tel. and comm. eq., app.	-45	381	-847	277	-617	258	-575	-961	2 139
33 Med., prec., opt. instr., watches	192	286	149	69	36	118	61	-280	-146
34 Motor vehicles, trailers, s.-tr.	5 332	77	1	655	12	-177	-3	4 776	90
35 Other transport equipment	-488	-187	38	9	-2	93	-19	-403	83
36 Furniture, other m. goods n.e.c.	-344	-225	65	17	-5	155	-45	-290	84
37 Secondary raw materials	-19	21	-115	-11	57	7	-35	-36	193
40 Elect. energy, gas, steam, hot w.	1 521	894	59	-244	-16	134	9	738	48
41 Coll. and pur. water, distrib.	-1	0	-53	-2	264	1	-102	0	-8
45 Construction work	14 054	9 414	67	828	6	3 709	26	102	1
50 Trade, maint., rep. s. of m. veh.	-252	-299	119	-59	23	59	-23	48	-19
51 Wholesale, commission tr. s.	-1 953	-1 119	57	-279	14	424	-22	-980	50
52 Retail trade services	-85	38	-44	17	-20	53	-62	-193	226
55 Hotel and restaurant services	-23	0	0	-30	128	7	-29	0	2
60 Land transport, t. via p. serv.	-4 237	-2 097	50	-1 814	43	563	-13	-888	21
61 Water transport services	0	0	-27	0	30	0	-89	-1	186
62 Air transport services	24	30	122	-7	-28	3	13	-2	-7
63 Supp. and aux. trans. s., TA s.	42	1	2	28	65	47	110	-33	-78
64 Post and telecomm. services	-92	-28	31	-114	125	45	-49	6	-7
65 Financial interm. services	125	181	145	-69	-55	13	10	0	0
66 Insurance, pension fund. serv.	38	56	145	-17	-44	6	15	-6	-16
67 Services aux. to fin. interm.	10	31	303	-26	-261	2	18	4	40
70 Real estate services	66	102	155	-44	-67	9	14	-1	-2
71 Rent. services of machinery, eq.	11	45	419	-54	-506	19	178	1	9
72 Computer and related services	2 035	79	4	-311	-15	231	11	2 036	100
73 Research and develop. serv.	-3	0	2	-7	196	4	-104	0	6
74 Other business services	-863	-750	87	-214	25	212	-25	-112	13
75 Public adm. and defence serv.	2	7	267	-6	-244	1	38	1	39
80 Education services	3	3	103	-1	-31	1	18	0	11
85 Health, social work services	-1	3	-296	-5	542	1	-136	0	-10
90 Sewage, ref. disposal services	-1	1	-119	-1	225	1	-117	-1	111
91 Membership org. serv.	5	6	126	-2	-41	1	15	0	0
92 Rec., cult. and sport. s.	-81	-45	55	0	0	14	-17	-51	63
93 Other services	2	3	173	-1	-93	0	23	0	-3

Appendix 30 - Decomposition of changes in import - EX-component (in million SKK)

Commodities (CPA)	*Import Change*	*Import Intensity Change Cont.*		*Technology Change Contribution*		*Final-Demand Level Contribution*		*Final-Demand Distribution Cont.*	
		value	*%*	*value*	*%*	*value*	*%*	*value*	*%*
01 Prod. of agriculture, hunting	700	242	35	-251	-36	389	56	321	46
02 Prod. forestry, logging	32	18	58	-4	-11	15	48	2	6
05 Fish and other fishing products	11	10	90	1	6	3	27	-3	-23
10 Coal and lignite, peat	16	9	60	-19	-123	30	188	-4	-25
11 Crude petroleum, natural gas	71	-192	-271	-131	-185	113	159	281	397
13 Metal ores	-37	-14	37	-23	62	10	-27	-10	28
14 Other mining and quarr. prod.	51	19	38	8	15	91	181	-68	-134
15 Food products and beverages	5 665	1 993	35	-503	-9	2 701	48	1 474	26
16 Tobacco products	-701	-286	41	8	-1	155	-22	-579	83
17 Textiles	2 411	1 704	71	117	5	1 793	74	-1 204	-50
18 Wearing apparel, furs	-1 578	274	-17	-64	4	2 724	-173	-4 512	286
19 Leather and leather products	1 934	764	39	164	9	2 163	112	-1 158	-60
20 Wood, prod. of wood and cork	2 449	1 395	57	15	1	1 078	44	-40	-2
21 Pulp, paper and paper prod.	1 069	989	93	-707	-66	4 465	418	-3 678	-344
22 Printed matter, recorded media	473	358	76	-741	-157	900	190	-44	-9
23 Coke, ref. petr. prod., nucl. fuel	171	-6 199	-3 635	-5 328	-3 124	16 650	9 761	-4 952	-2 903
24 Chemicals, chemical prod.	272	1 677	617	158	58	9 029	3 325	-10 592	-3 900
25 Rubber and plastic products	11 134	-712	-6	338	3	6 614	59	4 894	44
26 Other non metallic min. prod.	-207	-1 570	758	227	-110	2 253	-1 088	-1 118	540
27 Basic metals	15 149	16 578	109	-13 748	-91	14 767	97	-2 447	-16
28 Fabricated metal products	7 736	1 548	20	-620	-8	4 914	64	1 895	24
29 Machinery and eq. n.e.c.	11 414	-623	-5	-599	-5	11 593	102	1 043	9
30 Office machinery, computers	11 290	-389	-3	934	8	3 189	28	7 555	67
31 Elect. machinery, app. n.e.c.	20 600	2 113	10	2 985	14	10 836	53	4 666	23
32 Radio, tel. and comm. eq., app.	40 842	7 714	19	1 011	2	9 596	23	22 522	55
33 Med., prec., opt. instr., watches	1 498	827	55	358	24	725	48	-413	-28
34 Motor vehicles, trailers, s.-tr.	47 128	-15 292	-32	11 617	25	42 150	89	8 653	18
35 Other transport equipment	-1 157	-1 562	135	370	-32	1 594	-138	-1 560	135
36 Furniture, other m. goods n.e.c.	2 027	-2 695	-133	412	20	3 756	185	554	27
37 Secondary raw materials	51	34	68	-2	-5	23	46	-5	-9
40 Elect. energy, gas, steam, hot w.	9 985	8 625	86	-1 284	-13	2 885	29	-241	-2
41 Coll. and pur. water, distrib.	3	2	60	-5	-176	6	247	-1	-30
45 Construction work	1 290	969	75	-533	-41	809	63	45	3
50 Trade, maint., rep. s. of m. veh.	-394	-678	172	-124	31	278	-71	130	-33
51 Wholesale, commission tr. s.	-2 778	-3 545	128	-928	33	2 846	-102	-1 152	41
52 Retail trade services	974	245	25	-11	-1	688	71	53	5
55 Hotel and restaurant services	151	0	0	-94	-63	131	87	113	75
60 Land transport, t. via p. serv.	-18 664	-15 937	85	-6 073	33	8 671	-46	-5 325	29
61 Water transport services	-5	1	-29	-2	47	9	-207	-13	289
62 Air transport services	2 425	1 259	52	-21	-1	274	11	913	38
63 Supp. and aux. trans. s., TA s.	1 038	11	1	55	5	1 045	101	-73	-7
64 Post and telecomm. services	1	-140	-17 532	-363	-45 479	465	58 320	38	4 791
65 Financial interm. services	835	814	97	-183	-22	144	17	61	7
66 Insurance, pension fund. serv.	204	256	126	-70	-34	58	28	-40	-20
67 Services aux. to fin. interm.	73	113	155	-51	-70	24	32	-13	-17
70 Real estate services	266	249	94	-38	-14	60	23	-5	-2
71 Rent. services of machinery, eq.	84	128	153	-177	-211	115	137	18	21
72 Computer and related services	-227	66	-29	-649	286	443	-195	-87	39
73 Research and develop. serv.	9	0	-5	-45	-506	64	721	-10	-111
74 Other business services	-1 627	-3 273	201	230	-14	1 824	-112	-408	25
75 Public adm. and defence serv.	63	57	91	2	3	24	37	-20	-31
80 Education services	22	19	87	-2	-10	7	33	-2	-10
85 Health, social work services	182	104	57	-7	-4	110	60	-24	-13
90 Sewage, ref. disposal services	8	3	43	-2	-20	7	92	-1	-16
91 Membership org. serv.	16	23	146	-12	-76	5	32	0	-2
92 Rec., cult. and sport. s.	67	-384	-575	2	3	231	346	218	327
93 Other services	60	52	87	-7	-12	17	29	-2	-3