ANALYSIS OF OPERATING COSTS VARIABILITY IN SELECTED SECTORS OF THE CZECH REPUBLIC FOR THE PERIOD 2007–2010

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Abstract

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One of the major approaches to the analysis of economic performance is the concept of variable and fixed costs. This concept analyzes the relationship between corporate costs and profits. The tightness of this relationship (i.e. the costs variability rate) is an essential element of cost and profit management in different periods of a business life cycle. The type of business activity (production, trade and services) has a significant influence on the relationship between costs and profit (in particular of the operating type). This relationship can be examined mainly on the basis of the financial development of economic sectors. This article deals with the relationship between operating costs and operating profits in selected business sectors. For the analysis, the concept of synthetic and analytic cost model is used. The tightness of the relationship between operating costs and operating profits is determined by the method of correlation analysis. The quarterly data on the development of the Czech economy for the period of 2007–2010 represent the basis of the analysis; this period includes a phase of growth, of decline and of stagnation. The analysis of the costs variability allows us to understand the behavior of the "average" companies in various sectors in creating their costs and their management with the aim of achieving a profit. The results of the analysis show that the most companies are able to "control" their operating costs significantly in the relation to realized outputs; at the same time this means that a substantial part of the operating costs has a character of variable costs.

cost models, variable costs, fixed costs, economic performance, economic sectors, operating leverage, degree of operating leverage

One of the major problems concerning company costs is their relation to the earned profits, which is particularly in a situation, when the profits show fluctuating tendencies in different phases of a company development. A creation of classification of costs in proportion to the volume of performed activities and their division among variable costs (dependent on the volume of activities) and fixed costs (relatively independent on the volume of activities) was the result of attempts to determine the above mentioned relation.

The concept of variable and fixed costs[1] is at the **level of individual economic subjects** used for a large number of decision tasks – in particular for tasks aiming at management of costs and profit on the existing production capacity, but also in solution of investment decision tasks.

This article, however, deals with a relation between profits and costs at the **level of sectors, or sector categories**, and it is necessary to mention here that the research of the costs variability rate represents a very substantial part of the total view of the economic (or financial) characteristics of individual sectors (other categories of economic characteristics of sectors are e.g. liquidity, capital profitability, financial stability, realized outputs etc.).

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1 See mainly Garrison (1988), Král *et al.* (2002), Kalouda (2009), Synek *et al.* (2011), and others.

This article aims at identification and evaluation of the time relation between operating profits and operating costs. This relation allows then the conclusions on the variability rate of different types of operating costs in the evaluated sectors to be formulated.

Data used and methods applied

If the main topic of this article is the research on the costs variability rate in relation to outputs in different economic sectors, it was necessary to choose a correct database to meet following criteria:

- variety of sectors in regards to production orientation: database should contain data from different economic activities – production, trade and providing services, so that the final conclusions can be considered relevant,
- time aspect: in an ideal case, the database should include both the periods of economic growth, as well as of decline – only then the costs variability can be tested in various phases of company developments.

Having considered both above mentioned criteria, a data complex contained in the documents of the Financial Analysis of the Business Sphere for 2009 (MPO, 2010) and of the Financial Analysis of the Business Sphere for 2010 (MPO, 2011), which is to various sectors and sector categories[2], was chosen to represent the basic research sample. Operating costs and their variability in the following sectors are the subject of the analysis:

I: *Overview of analyzed sectors*

Category	Name
B	Mining and quarrying
C	Manufacturing industry
D	Production and distribution of electricity, gas and steam
E	Water supply
F	Construction
G	Wholesale and retail trade
H	Transporting and storage
I	Accommodation and food service activities
J	Information and communication
L	Real estate activities
M	Professional, scientific and technical activities
N	Administrative and support service activities

Source: MPO (2010, 2011), own selection.

Looking at the above overview, it can be clearly stated that there is a relatively complex view of the non-financial business areas in front of us, which includes three key activity subjects: production activities, trade activities and providing of services.

Documents we used (MPO, 2010 and MPO, 2011) contain a relatively large amount of data and indicators of financial nature, and the data from the table "Profit and Loss Statement" were adopted to be used for the costs variability research. The Profit and Loss Statement corresponds to a simplified form of the standardized profit and loss statement of non-financial business subjects[3]; the analysis concentrated on a group of profits and costs making the **operating profit/ loss** – exactly this area represents a predominant part of company profits and costs, which is the reason for it.

Taking the time into account, the above stated documents contain quarterly economic data of individual sectors, which is essential. The input data were, for the purpose of the costs variability analysis, modified as follows:

1. Input data for the period 2007–2008 were adopted from the document the Financial Analysis of the Business Sphere for 2009 (MPO, 2010); data for the period 2009–2010 then from the document the Financial Analysis of the Business Sphere for 2010 (MPO, 2011) – we combined the sources in order to keep the input data up-to-date.
2. The mentioned input data for the period 2007–2010 were transformed into data for individual quarters; that is because the original data in the mentioned sources are shown in a cumulative way, but for the purpose of the costs variability analysis the relation between profits and costs for the selected period (quarter) is the determinative view.

Methods applied

Two basic methodical problems must be solved in analyzing the operating costs variability rate:

a) how to measure the costs (total or partial ones) variability rate in relation to the profits,
b) whether to use total operating costs or split the total operating cost into specific groups to measure the costs variability.

To the first problem: To find out the costs variability rate e.g. Synek *et al.* (2011) suggest a method of logical sorting of costs (classification method), regression or correlation analysis or the method of two periods.

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2 At present, the Statistical Classification of Economic Activities (CZ-NACE) is being used for a classification of sectors. From January 1st, 2008, it substituted the formerly used Industrial Classification of Economic Activities (OKEČ) in the Czech reporting system. The above mentioned classification distinguishes sector categories in the first level of classification (e.g. class C – Manufacturing Industry) and the sections, groups, classes and subclasses in further levels of classification. Owing to the required variety of analyzed activities, sector categories, which are further for the purpose of this text called the "sectors", were included into the analysis.

3 The internal structure of a profit and loss statement of non-financial business subjects is defined by an implementing regulation for the Act on Accounting No. 500/2002 Coll.

Because of practical reasons, the **method of correlation analysis**, which, in its substance, studies the association rate of two variables, was used to evaluate the mentioned relation. Two variables are, looking at it generally, correlated (or associated), if certain values of one variable tend to appear in together with certain values of the other variable; nevertheless, the tendency rate can reach zero, when there is no correlation, as well as an absolute correlation (Hendl, 2009).

In the viewpoint of the statistical method used (correlation analysis), the relation power of two random continuous variables X and Y when using the correlation coefficient is being researched. Speaking of this, e.g. Meloun and Militký (2006) mention the possibility to use the paired, partial, multivariate, or rank correlation coefficient. On the other hand, Hendl (2009) states mainly the Pearson correlation coefficient r, calculated out of n paired values $\{(x_i, y_i)\}$ measured at n units (which he considers to be the most important ratio of the relation of variables), and this type of the correlation coefficient was selected to become the basic one for an analysis of the above mentioned data.

So that we could identify the variable and fixed cost component, a standard cost function based on regression analysis was applied using proportional linear function in the form

$$y = a + bx \qquad \text{(Synek, 2011)},$$

where
y .... total costs,
x .... volume of outputs (in financial formulation),
a .... estimated fixed cost component,
b .... estimated variable cost component.

To the second problem: The core of the problem is whether we use total costs or partial types of costs for the identification of the variable and fixed cost component. This question is in the theory of management solved in particular by applying **synthetic and analytic cost models** (Král, 1994).

Synthetic cost models are characteristic with their high degree of generalization; different factors causing the costs are being expressed in relation to costs in a form of a **single total cause** impacting their occurrence and height. This type of the cost model features with the following basic attributes:
a) <u>total costs</u>, expended on the performance of a certain volume of outputs, whose only distinguishing mark is the dependency on the volume of performed outputs, are the subject of research,
b) costs are examined for a certain production system as a <u>whole</u> (e.g. as for a company, a factory, an activity, but also an operation), not respecting their internal structure,

c) only a <u>single predominant factor</u> – the volume of performed outputs – is supposed to influence the occurrence and the development of costs[4].

Analytic cost models are from the cited authors characterized as models which are going out of the characters and relations recognized in terms of the synthetic models analysis, these characters are, however, subjected to a further analysis, which aims both at the study of the internal structure of expended costs and at a more detailed identification of factors influencing the costs occurrence. In contrary to synthetic models, the analytic cost models feature following aspects:
a) costs are not considered to be a homogenous unit; in their relation to the final outputs, the costs are determined by a system of consumption functions, expressed through a classification by types,
b) costs are not examined for a production system as a whole; their relation to individual activities, respectively to individual elements of the cost process is respected,
c) when studying mutual relations, not one and only one predominant factor, but the whole structure of factors impacting the occurrence and development of costs represents the basis for research; these factors can eventually be isolated and be studied separately, but also in mutual relations.

Note: Program MS Excel was used to process input data and to visualize them graphically. Statistical calculations were executed using a statistical program Gretl (Gnu Regression, Econometrics and Time-series Library, Source: http://gretl.sourceforge.net/).

RESULTS OF THE ANALYSIS

The process of the analysis of operating costs variability was for the purpose of this article divided into two basic phases, which correspond to the synthetic and analytic cost model. These steps are followed by an application part containing calculation and evaluation of the variable-fixed operating cost ratio in diverse sectors.

Analysis with the application of a synthetic cost model

In the first phase of analytic works, we paid our attention to the basic (total, or synthetic) model of costs variability rate, whose characteristic in particular is that the <u>total costs</u> expended on the performance of a certain <u>volume of profits</u> are the subject of research, where the only differentiating feature of the costs is their dependence on the volume of performed outputs; within the framework of selected sectors, the operating area of the

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4   At this place, the cited authors mention the "volume of performed outputs (employment level)" to be the predominant factor.

management was determined for the examination of this relation.

A standard linear one-dimensional regressive model was created to solve the given problem. It should identify the relation between the values **Total outputs** (sales revenues + outputs) and **Total operating costs** (costs of goods sold + performance consumption + personal costs + other operating costs/profits).

According to the above mentioned Pearson correlation coefficient, the sectors can be divided into four basic groups (Sedláček, 2003):

- sectors with a considerably high relation tightness (class 0.71–1.0),
- sectors with a high relation tightness (class 0.51–0.7),
- sectors with a middle relation tightness (class 0.31–0.5),
- sectors with no or only a weak relation tightness (class 0.0–0.3).

Class with the highest tightness rate (0.71–1.0) is created by 9 sectors (75 % out of the total): sector G Wholesale and retail trade, M Professional, scientific and technical activities, C Manufacturing industry, E Water supply, D Production and distribution of electricity, gas and steam, B Mining and quarrying, N Administrative and support service activities, F Construction, L Real estate activities. Class with a high tightness rate (0.51–0.7) is represented by sector J Information and communication. Class with a middle relation tightness (0.31–0.5) is represented by sector I Accommodation and food service activities. Class with a weak relation tightness (0.0–0.3) is represented by sector H Transport and storage.

The above stated model can be accepted for most of the analyzed sectors, there is, however, a very important part of sectors in the analyzed sample (3 sectors out of 12, i.e. 25 %), where, based on the existing data, a significant connection between total operating outputs and total operating costs can be doubted.

Analysis with the application of an analytic cost model

As shown on the above stated results, a synthetic view of the costs variability rate is characteristic with a too high degree of generalization, and therefore, in the next phase, we paid more attention to a possible impact of cost structure or to a time change of this structure in the evaluated period (taking into account the inhomogeneity of costs).

The essence of the cost structure criterion is to study internal composition of total operating costs. Total operating costs consist, as for the analyzed sectors, of three key costs types:

- total performance consumption, i.e. the sum of the cost of goods sold and the performance consumption (consumption of material, energy and external services),
- total personal costs consisting mainly of labor cost and thereinafter cost component of insurance paid to social security and health insurance, or also other social cost,
- total operating costs/profits: this item includes very diverse operating costs elements (fixed assets depreciation, cost taxes, change in the accruals and provisions, depreciated price of the sold fixed intangible and tangible assets and materials, other operating profits).

Regarding the differences of mentioned cost types, also a different relation tightness rate between operating profits in total and individual cost groups can be expected – results of this testing is shown in the following table. Colorful tables show the decline of the Pearson correlation coefficient below 0.51. This value divides all sectors into the class with a high up to very high tightness, and the class with a middle down to no tightness (see above).

Data shown in the table (expressing correlation between operating profits and individual main types of operating costs) require more detail comments:

II: *Correlation of a conformity rate between total operating outputs and operating costs of sectors*

Sector	Pearson correlation coef.
G Wholesale and retail trade	0,99706
M Professional, scientific and technical activities	0,98824
C Manufacturing industry	0,96765
E Water supply	0,96471
D Production and distribution of electricity, gas and steam	0,96176
B Mining and quarrying	0,94706
N Administrative and support service activities	0,94706
F Construction	0,94118
L Real estate activities	0,77941
J Information and communication	0,50000
I Accommodation and food service activities	0,48824
H Transport and storage	0,06176
Average value	0,79534

Source: MPO (2010, 2011); own table (Gretl); the data are sorted out upwards.

III: *Correlation of a conformity between total operating profits and main types of operating costs of sectors*

Sector	Total correl. coef.	Performance consumption	Personal costs	Other oper. costs
B Mining and quarrying	0,96531	0,79210	0,71476	0,22185
C Manufacturing industry	0,88528	0,95659	0,50060	–0,00346
D Production and distribution of electricity, gas and steam	0,92750	0,98347	0,49946	0,54138
E Water supply	0,62392	0,94845	0,85247	–0,45014
F Construction	0,89571	0,98896	0,56875	–0,17301
G Wholesale and retail trade	0,99274	0,99859	0,96162	–0,20283
H Transport and storage	0,08825	0,79931	0,46843	–0,25901
I Accommodation and food service activities	0,43422	0,67014	0,50713	0,03845
J Information and communication	0,10396	0,97152	0,56553	–0,15356
L Real estate activities	0,82829	0,95521	0,66980	0,53204
M Professional, scientific and technical activities	0,99236	0,99368	0,84096	–0,08899
N Administrative and support service activities	0,97363	0,98858	0,91576	0,71492
Average value	0,72593	0,92055	0,67211	0,05980

Source: MPO (2010, 2011); own table (Gretl).

First of all, a high up to very high relation tightness between operating profits and the given cost component can be clearly observed, looking at the **total performance consumption.** This suggests that the companies within individual sectors are able to "control" the consumption of goods, material, services and energy in relation to realized outputs in a significant way; but at the same time this finding means that a substantial part of mentioned cost types has a character of variable costs. This also implies that – in the relation to the above mentioned cost classification – direct costs, or technological costs, constitute a significant part of the given cost group[5].

A completely different situation can be identified for the group of **personal costs** (these costs consist of labor costs, cost component of insurance paid to social security and health insurance and other social costs). Primarily, the data stated in the table show obviously the total variability rate of this cost type to be substantially lower for the studied sample of sectors than the one of the performance consumption (average value of Pearson correlation coefficient was 0.61471 compared to value 0.90221). In addition, it is obvious that 3 out of the total 12 sectors feature Pearson correlation coefficient bellow critical value 0.51, and it is also possible to define a much larger variance compared to the value of the arithmetic average.

A relatively low level of correlation between the quarterly development of operating profits and total personal costs can apparently be interpreted using the following basic factors:

a) the number of workers and the time development of this indicator in relation to the realized outputs,

b) the height of the average wage (this indicator is ordinarily formulated as the share of labor costs and the number of workers),

c) time-lag involved in the process of reducing number of workers (period of notice, severance payments).

Generally, the item of **other operating costs/ profits** shows a very heterogeneous variability rate in relation to operating profits – practically with the exception of sectors F Construction and N Administrative and support service activities, the development of this type of operating costs is to a considerable extent "unpredictable", i.e. rather random influences become here evident. Stated observation is not surprising, given that the mentioned summarizing type of the cost group includes costs of very various types. The costs are influenced by different factors:

● taxes and charges: this item includes miscellaneous types of "cost taxes" – road tax, real estate tax, gift tax etc. and it is clear that the influence of operating costs was very random here,

● the depreciation of fixed intangible and tangible assets are based on the costs of acquisition and rules for depreciation, and these factors show a high stability rate in the companies,

● revenues from sales of fixed assets and material, or the depreciated price of fixed assets and material sold: these profits and costs turn up when selling

5 Unfortunately, the available data resources do not distinguish between material and energy consumption costs (costs of goods sold are important enough just in the sector G Wholesale and retail trade), which means that the specifics of analyzed sectors from the viewpoint of three fundamental types of production factors: material, energy and services, cannot be determined more closely.

unneeded materials and fixed assets and feature generally a high degree of randomness,

- changes in the operating reserves and adjustments and complex costs of future periods: similarly to the previous item, also these costs show a high degree of randomness, which is mainly in dependence on accounting methods used,
- other operating profits and other operating costs: likewise, also this part of the operating profit/loss contains rather random entries, e.g. contractual penalties, interests on late payments, insurance claims, provided donations and received operating grants.

Therefore, it can be concluded that the average value of the correlation coefficient 0.05980 for the item Other operating costs/profits and then in particular the considerable variance of the given value indicates that this type of (in fact regular, but also random) costs can impact the statistical significance of the total cost model negatively. Because of this reason, this item should be excluded from cost models when executing costs variability analysis.

### *Application options for information on operating costs variability*

Identification of the operating costs variability rate clearly leads to area of the creation of operating profit/loss, which is made as a difference between operating income and operating costs. Operating income (in particular revenue from the sale of corporate products) are, however, subject to relatively substantial swings in individual time periods (month, quarter, year). If a business entity wants to reach profit when experiencing changes in income, also the development of its costs must be adapted to these changes; in particular in these situations it is crucial to know the costs variability rate, or to know how big the variable and fixed component of the costs is. The mentioned problem may be demonstrated in the following graphical view of development of the total revenues and of operating costs components:

Development of revenues (operating outputs in financial formulation) in a time period of 2007–2010 is clearly influenced by at least two tendencies: **seasonal trend** within a calendar year (the lowest revenues are shown in the 1st quarter, followed by a growth in the 2nd quarter and a decrease in the 3rd quarter, and then the sector reaches its peak in revenues in the 4th quarter – this trend is in the given time series clearly visible in the years 2007, 2009 and 2010). However, rather a random element affected the economic development of the sector significantly in 2008 and 2009, which changed the final behavior of the revenues as a result of total economic decrease in the given period.

The analyzed sector shows operating profit, even despite regular, or random changes in the volume of revenues (mainly in the times of downturn), which is particularly as a result of the fact that the most important cost category (total output consumption) features considerably variable character (correlation coefficient of 0.9500000).

In general, the knowledge of the relationship between income and the variability rate of different cost categories represents a basis for the **Cost-Volume-Profit (CVP) analysis**, which, in corporate practice, accounts for the key factor in a number of operational as well as strategic decision-making tasks, in particular when deciding about price,
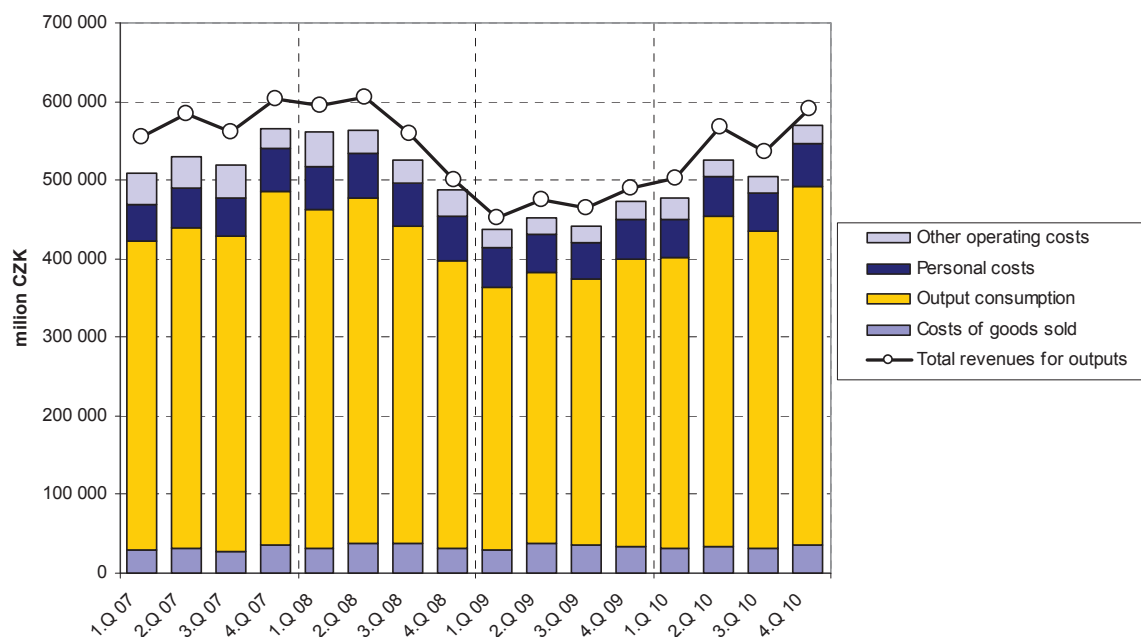
1: *Time chart of development of total revenues and of operating costs components for sector C – Manufacturing industry*
Source: MPO (2010, 2011); own chart.

production volume, cost management or about structure of future outputs (Garrison, 1988; Synek, 2011).

Common basis for the CVP analysis is to determine the **operating leverage**, which characterizes a share of fixed costs in total costs. If this share is high, even a relatively small change in revenues usually causes a big change in the operating profit; this change (expressed as a percentage) is referred to as the **degree of operating leverage**. The degree of operating leverage, however, features also a negative influence, which is an influence on the business risk; it is true that the higher the operating leverage, the higher (under other unchanged conditions) the business risk in a form of operating losses after the decrease in the volume of revenues (Synek, 2011).

The basis set of steps for calculation of the operating leverage and of the degree of operating leverage for individual sector is specified in the following table for sector C Manufacturing industry.

Used shortcuts: FC: Fixed costs, VC: Variable costs.

Comment to the steps of the calculation:

1. Calculation of the parameters of the cost function (one-dimensional linear regression model in the form $y = a + bx$): in accordance with the conclusions about the advantage of using an analytic model, the parameters of the cost function were calculated by groups of operating costs (e.g. cost function to determine the fixed and variable cost component of the category „Total output consumption" is in the form: y (total costs) = 36,018.5 (fixed component) + 0.72742x (variable component), i.e. CZK 428,805 million = CZK 36,019 million + CZK 392,786 million. The same calculation of parameters has been used also for cost categories „Personal costs" and „Other operating costs".

2. The average value of quarterly total operating income (revenues from the sale of goods + outputs) was used as a basic input variable x (independent variable).

3. The result of the calculation (column Reality) represents the calculation of total costs, operating profit and a split of total costs into a fixed and a variable component (including the calculation of the proportion of fixed costs to the total costs, i.e. of operating leverage).

4. Following formula was used to calculate the degree of operating leverage (Synek, 2011): *the degree of operating leverage = change of operating profit in percentage / change of revenues in percentage*; value of the increase in revenues by 1% (column Change + 1%) was used as a criterion. The methodology described above was subsequently used for all the analyzed sectors and the results are listed in the following table.

Data on the number of operating leverage (proportion of fixed costs to total costs in %) unambiguously demonstrate the greatly diverse proportion of variable/fixed costs in individual sectors:

- sectors M Professional, scientific and technical activities (0.4 %), N Administrative and support service activities (1.6 %), G Wholesale and retail trade (1.9 %) show the lowest value of the operating leverage,
- sectors I Accommodation and food service activities (56.3 %), or B Mining and quarrying (21 %) show, in contrary, the highest value of the operating leverage,

IV: *Calculation of the operating leverage and of the degree of operating leverage*

C Manufacturing industry (million CZK)		Parameters	Reality	Change +1%
Total revenues for outputs			539,975	545,374
Total output consumption	a (FC)	36,018.5	36,019	36,019
	b (VC)	0.72742	392,786	396,714
	in sum		428,805	432,732
Personal costs	a (FC)	33,974.6	33,975	33,975
	b (VC)	0.03101	16,743	16,911
	in sum		50,718	50,885
Other operating costs	a (FC)	–8,387.3	–8,387	–8,387
	b (VC)	0.06995	37,772	38,150
	in sum		29,385	29,763
Total costs			508,907	513,380
Operating profit			31,067	31,994
Degree of operating leverage				**3.0%**
Fixed part of costs			61,606	61,606
Variable part of costs			447,302	451,775
Share of FC in total costs			12.1%	12.0%

Source: MPO (2010, 2011); own chart (Gretl).

V: *Calculation of operating leverage and of the degree of operation leverage of analyzed sectors*

Sector	Operating leverage (share of FC)	Degree of operating leverage
B Mining and quarrying	21.0%	1.8%
C Manufacturing industry	12.1%	3.0%
D Production and distribution of electricity, gas and steam	2.9%	1.2%
E Water supply	–8.0%	0.3%
F Construction	–4.5%	0.2%
G Wholesale and retail trade	1.9%	1.8%
H Transporting and storage	103.2%	–140.9%
I Accommodation and food service activities	56.3%	15.8%
J Information and communication	16.2%	1.6%
L Real estate activities	18.6%	2.0%
M Professional, scientific and technical activities	0.4%	1.2%
N Administrative and support service activities	1.6%	1.2%
Average value	18.5%	–9.2%

Source: MPO (2010, 2011); own chart (Gretl).

- sectors showing extreme values should probably be assessed individually: H Transporting and storage (103.2 %), E Water supply (–8 %) and F Construction (–4.5 %).

Somewhat paradoxically look results gained in terms of the <u>degree of operating leverage:</u> here, it should be true (in theory) that in case of a high share of fixed costs (i.e. when having high values of the operating leverage) also a relatively small change in the volume of revenues (outputs) causes a big change in the operating profit (expressed by the degree of operating leverage). As for the mentioned indicator, very different results can be identified e.g. concerning sector B Mining and quarrying (operating leverage 21%, degree of operating leverage 1.8%) in comparison with sector C Manufacturing industry (operating leverage 12.1%, degree of operating leverage 3 %) etc. The likely cause of these conflicting results may be the application of the analytical model of costs variability and thus also the influence of the cost structure (the influence of the proportion of the basic cost components to the total costs).

SUMMARY

One of the important approaches to the analysis of economic performance is the concept of variable and fixed costs, which analyzes corporate costs in the relationship to the profits. The tightness of this relationship (i.e. costs variability rate) is an essential element of the cost and profit management in different periods of business life-cycle. The type of business activity (production, trade and services) has a significant influence on the relationship between costs and profit (in particular of the operating type). This relationship can be examined mainly on the basis of the financial development of economic sectors. This article deals with a relationship between operating costs and operating profits in selected sectors of a business type. The basis of the analysis between operating costs and profits are the quarterly data on the development of the Czech economy for the period 2007–2010; this period includes a phase of growth, of decline and of stagnation. The results of the analysis prove the synthetic view of costs variability rate to feature a too high generalization. Therefore it is necessary to use rather an analytic view respecting the nature of individual cost types when solving the relationship between operating profits and operating costs.

Analytical cost model is based on the split of the total operating costs into three main cost categories (Total output consumption, Personal costs and Other operating costs); for these three cost categories, the rate of their relation to the operating income was found out. The main application option of the described model is the identification of the operating leverage (the share of the variable and fixed component of cost categories), or of the degree of operating leverage for individual analyzed sectors. These data represent one of the major groups of variables which characterize economic view on individual sectors.

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