IDENTIFYING INTER – RELATIONSHIPS BETWEEN THE STRATEGIC SECTORS OF THE COMPANY

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Objectives of the Research

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Objectives

Running an analysis of major components (ACP) to find the most important strategic sectors for the company

Identifying the kpi groups that best explain the variance of the outcomes of the strategic sectors highlighted by the ACP

Revealing the intensity of inter-relationships within the company and possible predictions of strategic interaction lines

Using the *least squares technique* (PLS) to identify correlations between strategic sectors

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Literature Review

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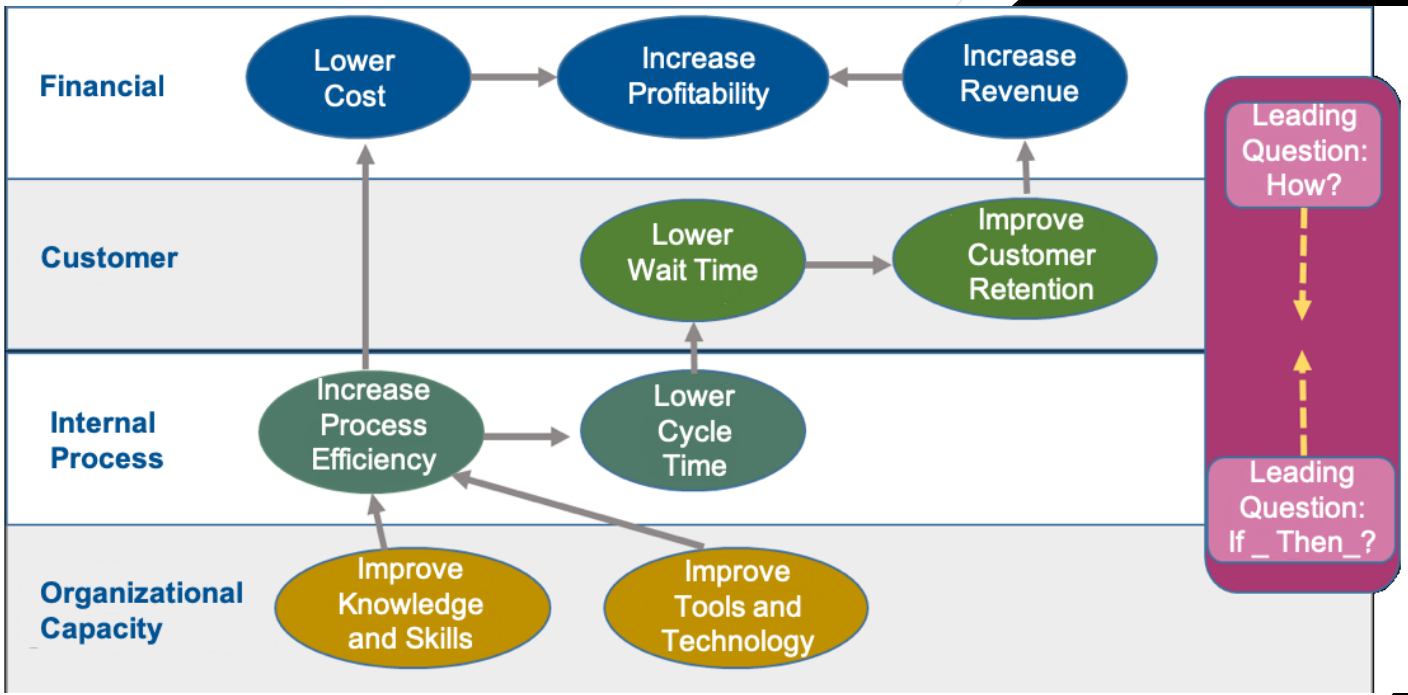
- ***Balanced Scorecard Analysis* (BSC),** developed by Robert Kaplan and David Norton – an innovative concept of Strategic Maganement



Source: The Institute Way: Simplify Strategic Planning & Management with the Balanced Scorecard, Balanced Scorecard Institute, 2010.

- BSC exemplifies how value is created for the company and progressively presents the logical link between strategic objectives in the form of a *cause-effect chain*

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Limitations of BSC

- *Hanne Norreklit ()* states that BSC identifies a logi
between the strategic perspectives under consid
causal relationship between them.
- Because it does not take into account any link
and competition, BSC **is not** a representative
management.
- *Kanji ()* states that the model is too abstract and
measurement model and relationships between st
are not clearly explained, and causal relationships ar
enough being relationships of interdependence rather tha
correlations.
- Malina & Selto () have determined that the kpi's identified in the BSC model are biased, and not objective

PLS Method

- Is a useful tool for statistical modeling in general and financial management, management control, etc. and can be obtained good results with low data samples.
- As a result of the less rigorous assumptions underpinning the [redacted] PLS also has the ability to operate with non-normal data *(Smith[redacted]*

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Limitations of PLS

- It is intended to maximize predictive power with little info[redacted]

but

- *Creamer and Freund* have exceeded these limits of PLS [redacted] **technique:**

  - Alternate decision trees have been generated to ex[redacted] corporate governance variables and business performance[redacted]
  - The most important indicators of the BSC board for stra[redacted] company are selected *(Creamer and Freund, 2010);*
  - There were also developed models of structural equations based on covariance *(SEM, Joreskog, 1973)* or based on manifest and latent variables for situations where the company's performance is measured by a large number of indicators *(LISREL, Haenlein and Kaplan, 2006).*

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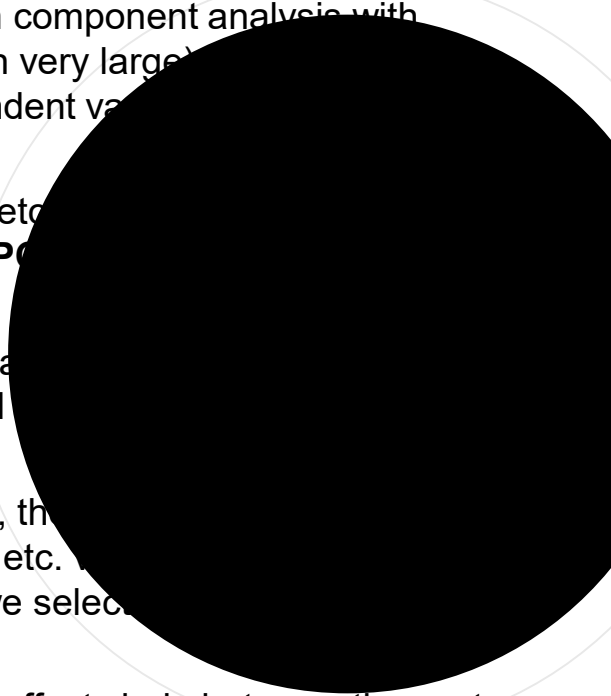
Methodology and Database

General Considerations

3

- PLS generalizes and combines features of the main component analysis with multiple regression; it also operates with large (even very large) independent variables to make predictions of dependent va strategic lines.
- From a large sample of economic, financial, social, etc each other, the **Principal Components Analysis (PC** unrelated variables, called **core components.**
- Further, the PLS regression selects latent factors tha and accurately by directly observable indicators and components.
- To highlight the relevance of the variables available, th **Analysis (PCA)** grouped economic, financial, staff, etc. within **specific activity sectors.** For each sector, we selec economically justified indicators for these choices.
- Finally, the PLS regression generated the cause-to-effect chain between the sectors of activity and the intensity of these inter-relationships.



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Methodology

- Identifying inter-relationships between strategic sectors enables company management to hierarchize its activities, and associated with their intensity coefficients, make possible the analysis of changing the various
company performance
- As a tool for identifying the relationships and interactions
variables we used a software developed by *Prof. Bern*
Stancu and *Dr. Christophe Jeannette* of Geneva Univ

Database

- Historical data was collected from the records available in the an
- we standardized the data on the basis of deviations from the aver
standard deviation.
- Based on 31 economic and financial indicators with an annual freque
identified four strategic sectors (axes):

1. **Profitability** (PROFITAB);
2. **Productivity and Research** (PROD & RES);
3. **Capital and results** (CAP & RES);
4. **Personnel** (PERSONEL).

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PCA and PLS Results

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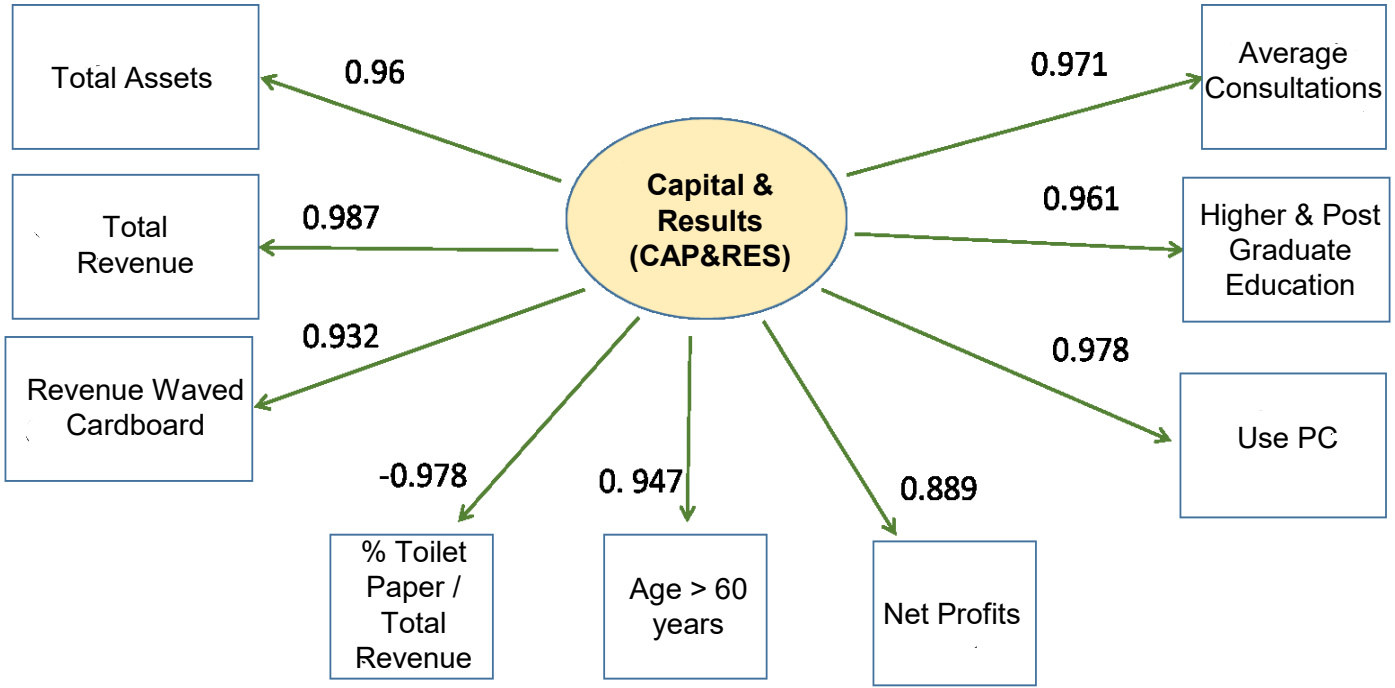
- Strategic Sectors represent the most relevant activities of the company.
- For their correct definition, it is necessary to remove those variables that would not sufficiently explain the definition of the axis, variables that have approximate values, and those that would not fit well in the definition of the axis.
- For example, the CAPITAL AND RESULTS sector has a very good reflection (coefficients between 0.9 and 0.7) of the variability of the six explanatory indicators, as shown in the following figure:

The coefficients of variability of the 9 explanatory indicators of Capital and Results sector



Source: Own processing of statistical data with the Geneva University software "Optimal PLS"

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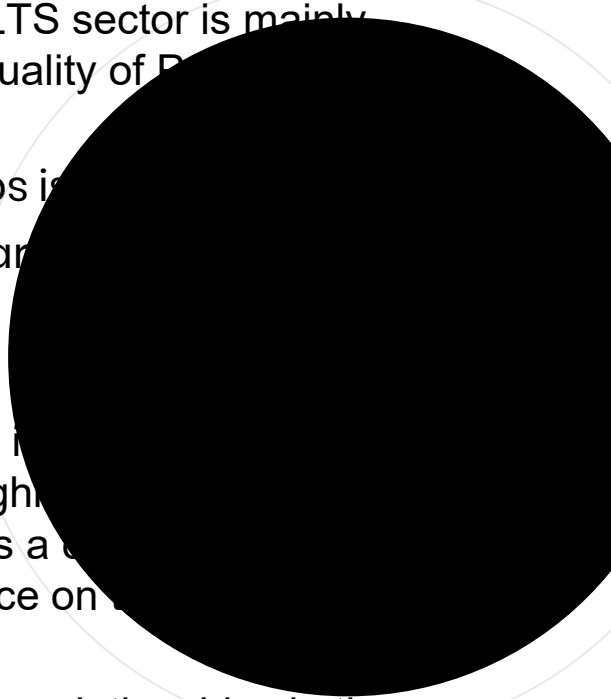
Interpretation (1):

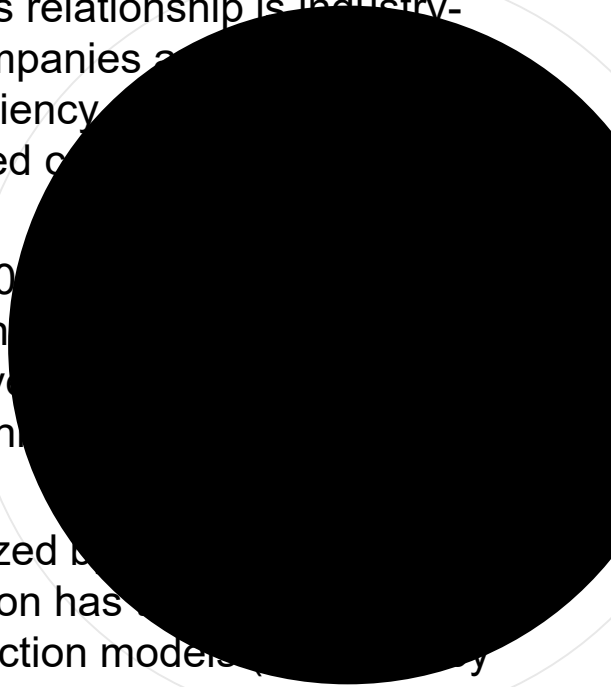
- The performance of the CAPITAL AND RESULTS sector is mainly explained by the Turnover, Total Assets and Quality of P… Training;
- The result of these close inter-relationships is…
- As a result, significant changes in these var… influence CAPITAL AND RESULTS;



- The cause - effect relationships between these i… and the analyzed sector, on the other hand, high… increase in the fixed and current assets (and as a … sales), for example, will have a positive influence on … CAPITAL AND RESULTS
- Similar considerations can be performed to inter-relationships in the other sectors: PROFITABILITY, PRODUCTIVITY and RESEARCH, as well as PERSONNEL.

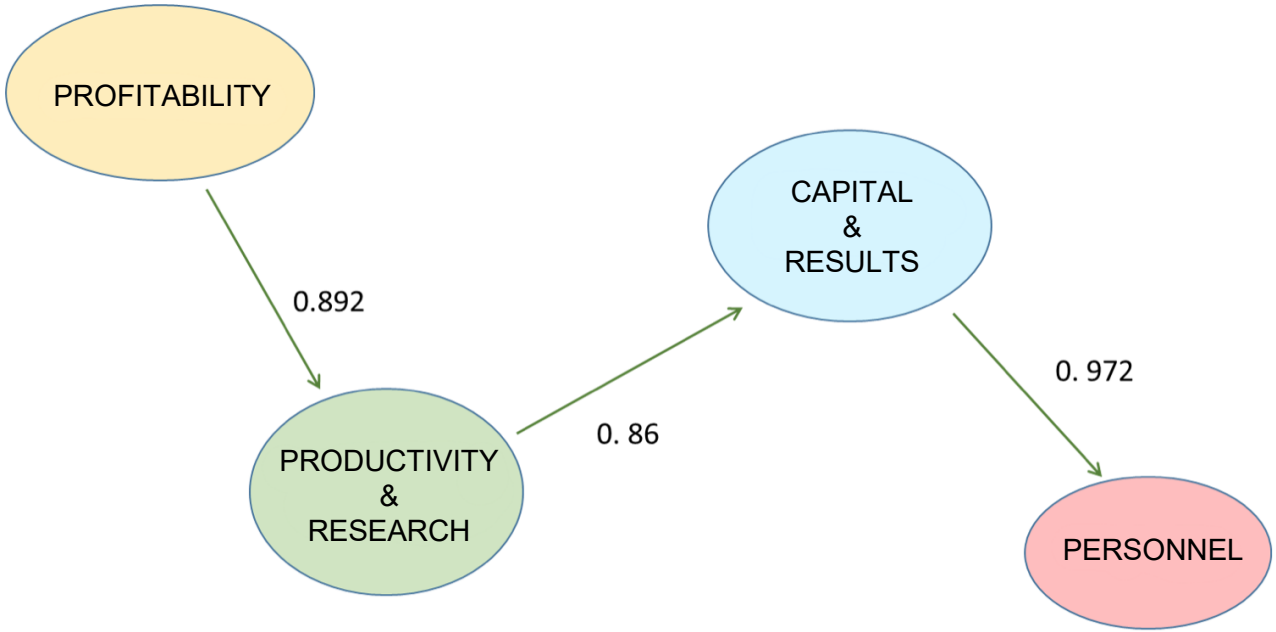
Interpretation (2):

- The cause – effect Assets vs. Capital & Results relationship is industry-specific - capital-intensive - and successful companies a
invest in performing assets with increased efficiency
times, implicitly lower investment costs and fixed c
produced.
- Regarding the intense negative correlation of -0
paper / Total Revenue it is also confirmed by th
the company to find the best alternative (de-inv
for this line of production, the only one with sign



The cause-effect inter-relationships are identified and finalized b
and are not predetermined. The model of this PLS regression has
being **statistically stable**, the most stable among all interaction models
the **Bootstrap technique**). The most relevant results of this PLS model are inter-relationships between sectors - possible cause-effect links between them, as presented by the further diagram:

Possible causal links between the sectors of the company



Source: Own processing of statistical data with the Geneva University software "Optimal PLS"

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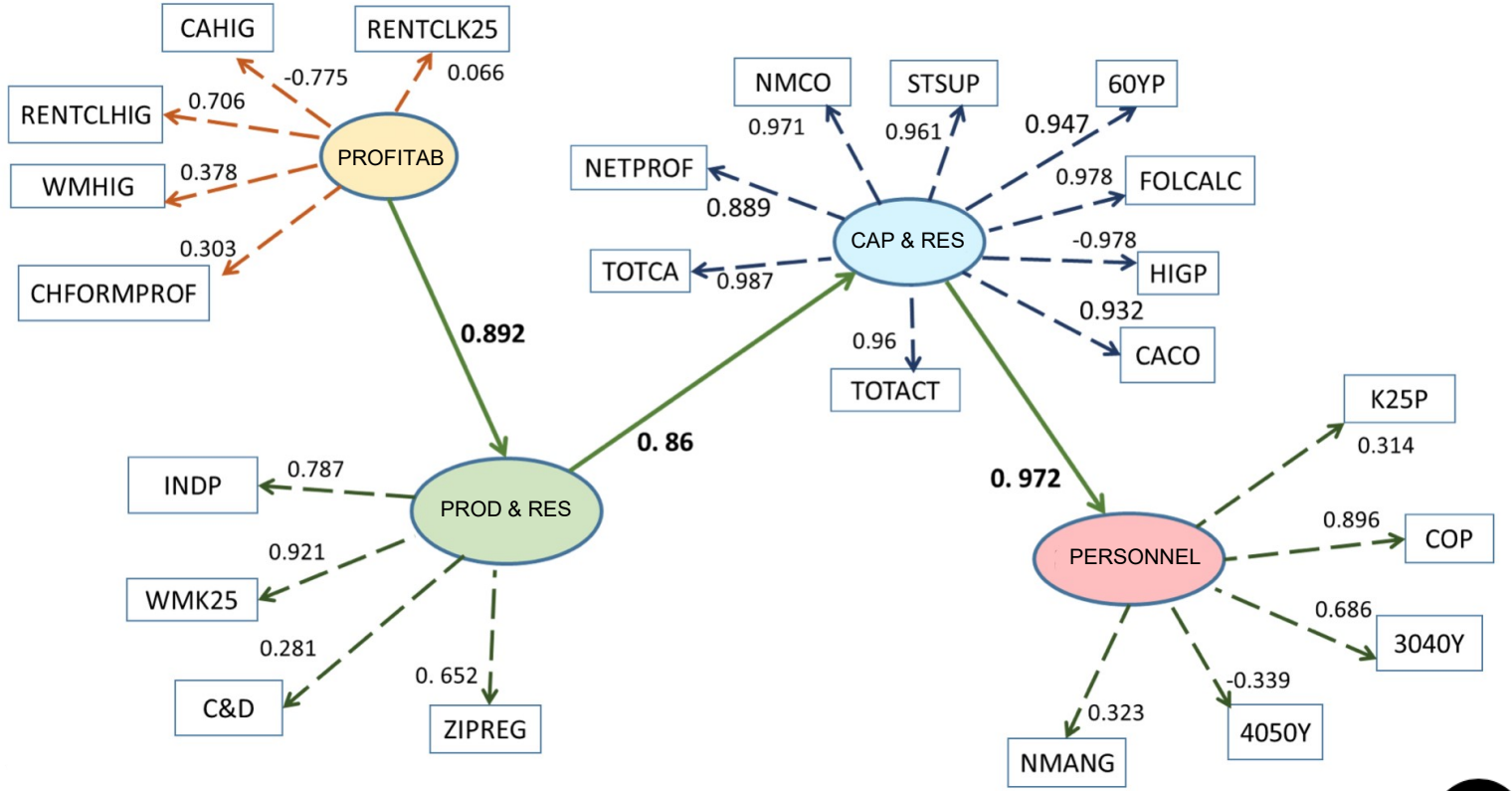
Interpretation:

- PROFITABILITY has a significant impact (0.892) on PROD… …D RESEARCH (0.86), with a further effect on CAPITAL A… which in turn have a strong effect (0.972) on PERS…

- Our research highlights the relevant strategic inc… the strategy pursued by the company's manage… company's capital in performing assets and train… influenced the Turnover indicator as well as the …

- The intensity of the cause and effect connections in t… better understanding of the company's trend. It also sugg… be taken by the management to update, correct and anticipate t… company's strategy with the help of selected sectorial indicators.

The diagram of axle interrelations in detail, as well as the explanatory power of each sector with the meaningful variables



Source: Own processing of statistical data with the Geneva University software "Optimal PLS"

Glossary

1 = Profitability (PROFITAB)	*2 = Productivity & Research (PROD&RES)*	*3 = Capital & Results (CAP&RES)*	*4 = Personnel (PERSONNEL)*
Rentab/client K25 (RENTCLK25)	*Productiv. index (INDP)*	*Total Assets (TOTACT)*	*Ave.*
Rentab/client HIG (RENTCLHIG)	*W K25 (t/h) (WMK25)*	*Total Turnover (TOTCA)*	
CA HIG (CAHIG)	*C&D (C&D)*	*CA CO (CACO)*	
Ch form prof. (CHFORMPROF)	*Days Prof. Prep. (ZIPREG)*	*% HIG (HIGP*	
W MHIG (t/h) (WMHIG)		*Net Profits (NET*	
		Ave. No. of consult.	
		Higher & Postgrad (STSUP)	
		Use PC (FOLCA	
		> 60 years (60YP	

- The statistical validation of the model reveals high values on the *cons* *model's reliability* (exception, axis 2) *of the extracted variance* (exception, a and the *determination coefficient* R^2 (with values of 0,889, 0,611 and 0,503 respectively).
- The explanation of the cause-effect link between axes 1, 5 and 2 is shown further:

Statistical validation of the PLS² model application

>0.6 >0.5 >0.67 strong >0.33 moderate >0.19 weak

Sectors	Composite Reliability	Medium variable extracted	Determination Coefficient R^2	Redundancy Index
PROFITAB	0. 111	0.268	-	0. 343
PROD&RES	0.775	0.493	0.796	0.600
PROD&RES	0.983	0.915	0.740	0.897
CAP&RES	0.509	0.318	0.945	0.454

Source: Own processing of statistical data with the Geneva University software "Optimal PLS"

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CONCLUSION

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Determining the right strategic sectors is essential for gaining added value, as well as efficient resource management, risk control and success in competition.

If the purpose of the study is the **performance strategy**, it is necessary for the variables to explain the sector well.

The correct determination of the sectors is determined by the colle
indicators, resource management, risk control, competition succe

The increased relevance of performance indicators gives mor
model. Further, the PLS regression selects latent factors that
accurately by directly observable indicators and measured by

The intensity of the cause-effect inter-relationships in the mod
understanding of the company's trend. We have thus identifie
each indicator is captured by the strategic sector it is part of. It a
to update, correct and anticipate the company strategy using indu

PLS addresses the synthesis of strategic performance by identifying
relationships between variables and sectors on one hand, and between se
hierarchy), on the other. This approach allows understanding the causal chain of strategic performance. **The PLS approach could give the company a real advantage in economic competition.**

Thank You !

Any questions?