Controlling tools for measurement of innovative company development enabling effective allocation of inputs

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Structure of presentation

• 1. Controlling and goals of the firm
• 2. Possible kind of firm´s development
• 3. How to count the share of intensive and extensive factors on the firm´s development
• 4. The development of Nike
• 5. The comparison of Nike and other American innovative companies
• 6. Development of selected Czech innovative companies from Zlin Region
• 7. Questions, comments ...
1. Controlling and goals of the firm
Controlling

• Implementation of a decision method and the use of feedback so that the goals and specific strategic plans of the firm are optimally obtained.

• To do this, managers study accounting and other reports and compare them to the plans set earlier.

• These comparisons may show where operations are not proceeding as planned and who is responsible for what.

• The feedback that management receives may suggest the need to replan, to set new strategies, or to reshape the organizational structure.

• http://www.allbusiness.com
The main goal of the firm

• Profit
• and its
• growth
Controlling and profit

- Does a firm achieve profit?
- How is profit achieved? By increasing inputs? By technological progress and innovation?
- Which factor is more important?
- Could for instance firm simultaneously experience technological decline and achieve profit growth?
2. Possible kind of firm’s development
Firm’s development

• The change of the output and inputs during time.

• Intensive development: a change of output is based on innovation and higher efficiency

• Extensive development: a change of output is based on the change (growth) of inputs
Illustrative example of possible firm development

Initial efficiency:

$$Ef_0 = \frac{TR_0}{TC_0}$$

$$EP_0 = TR_0 - TC_0$$

Efficiency after expansion:

$$Ef_e = \frac{2.TR_0}{2.TC_0} = Ef_0$$

$$EP_e = 2.TR_0 - 2.TC_0 = 2.EP_0$$

Increased efficiency:

$$Ef_i = \frac{2.TR_0}{TC_0} = 2.Ef_0$$

$$EP_i = 2.TR_0 - TC_0 = 2.EP_0 + TC_0$$

$$EP_i = EP_e + TC_0$$
Typical firm´s development

- Possible changes of output:
  - increase
  - decrease
  - stagnation

- All changes can occur due to both a change of intensive factor (efficiency) and due to a change of extensive factors (inputs).

- Necessary a classification.
Classification of firm’s development

• Increase of output, one factor contributes to increase, second factor does not change.
• Increase of output, both factors contribute to increase (in same or different share).
• Increase of output, one factor contributes to increase, second one to decrease, the share of the first factor is higher than the share of the second one factor.
Classification of firm’s development

• Decrease of output, one factors contributes to increase, second factor does not change.
• Decrease of output, both factors contribute to decrease (in same or different share).
• Decrease of output, one factor contributes to decrease, second one to increase, the share of the first factor is higher than the share of the second one factor.
Classification of firm’s development

• Stagnation of output, one factor contributes to increase, second one to decrease, the share of the factors is same and they balance each other.
Classification of possible developments

The coefficient of efficiency

The coefficient of inputs
Possible firm´s development and the share of intensive or extensive factors

- It useful to know for all possible firm´s development (it means both for increase of output, decrease of output and the stagnation of the output):
  - the share of the intensive and extensive factors
  - how the factors contributes to the change of the firm´s output: whether the factor changes in same way or opposite way as the change of the output
Positive firm’s development

• Increase both intensive as extensive factors, intensive one growths in same or higher rate than extensive one.
• Increase of intensive factor and decrease od extensive factor, the intensive one increases in higher or same rate.
• Controlling should be able to identify positive firm’s development.
3. How to count the share of intensive and extensive factors on the firm’s development
How to count the change

• Increment or decline:
  \[ \Delta A = A_n - A_{n-1} \]

• Growth rate:
  \[ G(A) = \frac{(A_n - A_{n-1})}{A_{n-1}} \]

• Change coefficient or index:
  \[ I(A) = \frac{A_n}{A_{n-1}} \]

• It is valid: \[ I(A) = G(A) + 1 \]
How to express firm’s output, input and efficiency

• Output: revenue (TR)
  Input: costs (TC)

• Profit: $EP = TR - TC$

• Efficiency: $Ef = \frac{TR}{TC}$

• It can be written: $TR = Ef \times TC$
Share of change of efficiency and inputs on the change of output

- $TR = Ef \times TC$
- $I(TR) = I(Ef) \times I(TC)$
- $\ln(I(TR)) = \ln(I(Ef)) + \ln(I(TC))$
Dynamic parameter of intensity and extensity

\[ i = \frac{\ln I(Ef)}{|\ln I(Ef)| + |\ln I(TC)|} \]

\[ e = \frac{\ln I(TC)}{|\ln I(Ef)| + |\ln I(TC)|} \]
Characteristics of dynamic parameter of intensity and extensity

• They are able to: count he share of intensive and an extensive factors for all possible firm’s development (growth, decline or stagnation of production)

• They use basic usually public available data (firms revenue and cost)

• Easily to count
4.
The development of Nike
NIKE

• The world most innovative company for the year 2013 by the magazine Fast Company (www.fastcompany.com)

• Produce sports dress, shoes and other sports equipment.

• Based on outsourcing: external suppliers (mostly from East Asia region) produces goods for it. NIKE sells the goods mostly in the US and Europe.
# Development of NIKE

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<td>43%</td>
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<td>92%</td>
<td>68%</td>
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<td>68%</td>
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Development of NIKE

• Based mostly of extensive factors (e = 97 %, i = 3 %)

• Nike relies on cheap labor.

• The development of the cost depends of the development of exchange of USD.

• If some problems happen, firm usually reduces it costs as the respond.

• Will it be sufficient in the case of some big problems?
Comparison of Nike and other American innovative companies
Comparison of Nike and other most innovative firms

• Amazon
• Apple
• Coca Cola
• Ford Motor
• Google
• Target
<table>
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<th>Indicator</th>
<th>Amazon</th>
<th>Google</th>
<th>Apple</th>
<th>Ford Motor</th>
<th>Nike</th>
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<td>13</td>
<td>21</td>
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<td>12</td>
<td>47</td>
<td>24</td>
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<td>116</td>
<td>744</td>
<td>966</td>
<td>571</td>
<td>516</td>
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<td>80%</td>
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<td>2%</td>
<td>1%</td>
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<td>0%</td>
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<td>i</td>
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<td>11%</td>
<td>67%</td>
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<td>e</td>
<td>92%</td>
<td>96%</td>
<td>89%</td>
<td>-33%</td>
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<td>83%</td>
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Comparison of Nike and other most innovative firms
Development of selected Czech innovative companies from Zlin Region
Selected companies

• Česká Zbrojovka (Czech Arms Factory)
• Austin Detonator

• Both firms received innovation award from Zlin Municipality for 2012.
<table>
<thead>
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<th>Česká Zbrojovka</th>
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<tr>
<td></td>
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<tr>
<td><strong>2009</strong></td>
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<tr>
<td>TR (tis. Kč)</td>
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<td>EP (tis. Kč)</td>
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## Austin Detonator

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<td>1052779</td>
<td>1001548</td>
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<tr>
<td><strong>EP (tis.Kč)</strong></td>
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<td>136443</td>
<td>194255</td>
<td>222263</td>
<td></td>
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<tr>
<td><strong>TC (tis.Kč)</strong></td>
<td>753134</td>
<td>640192</td>
<td>858524</td>
<td>779285</td>
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</tr>
<tr>
<td><strong>Ef=TR/TC</strong></td>
<td>1,181</td>
<td>1,213</td>
<td>1,226</td>
<td>1,285</td>
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<tr>
<td><strong>EP/TC</strong></td>
<td>0,181</td>
<td>0,213</td>
<td>0,226</td>
<td>0,285</td>
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<tr>
<td><strong>G(TR)</strong></td>
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<td><strong>G(EF)</strong></td>
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<td><strong>G(EF/TC)</strong></td>
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<td>3,5%</td>
<td>32,7%</td>
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<td>96,5%</td>
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Evaluation of both companies

• In the given period:
  - positive growth rate both cost (inputs) and revenues (output)
  - output growth rate is higher than input growth rate
  - positive and high value of dynamic intensity parameter

• They can be described as innovative firms.
Thank you for your attention

• Questions, comments ....

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