APPLICATION OF GREY CLUSTERS IN THE DEVELOPMENT OF A SYNTHETIC MODEL OF THE GOALS OF POLISH FAMILY ENTERPRISES' SUCCESSORS

Ewa WIĘCEK-JANKA
Joanna MAJCHRZAK
Magdalena WYRWICKA
Gerhard Wilhelm WEBER
Table of contents

1. Introduction - the reason for the investigations
2. Successors' goals in the context of succession in family enterprises
3. Research methodology
4. The structure of successors’ goals developed using *Cluster of Grey Incidence*
5. Verification of Synthetic Model of successors' goals
6. Conclusion and Outlook
Introduction: Family Enterprise

“Family Enterprise is defined as market system (organism) of a trigonal structure that encompasses family, business and individual, that functions according to various, but mutually adapted, goals to which it dedicates its energy with a multigenerational view, through management and control of its activity and ownership.” (Więcek-Janka, 2013)

- family businesses are more conservative, less likely to invest, innovate less frequently, have fewer patents and act with greater caution, which may mean that they react with delay to emerging market opportunities (Bertrand and Schoar 2006; Bloom and Reenen 2007; Block 2012; Block et al., 2013)
- average family enterprises develop more slowly than non-family ones and struggle in introducing changes and innovations (Gómez-Mejía et al., 2010; Graves and Thomas, 2004; Schulze et al., 2003)
- competitive potential of family enterprises is lower, which, however, is compensated by attachment to tradition and care for relationships (Zając, 2014)

CAN THE EMPHASIS ON SHAPING LONG-TERM GOALS BY SUCCESSORS' GENERATION CHANGE THE SITUATION?
Preparing for executing **the succession is the most difficult stage** in the life cycle of each family enterprise (Otoo et.al., 2009; Kets de Vries, 1993).

The researchers of this subject around the world have observed several aspects that have a direct **influence on the effectiveness** of conducting the successional processes:

- the dynamics of family enterprises' development (Giamarco, 2012, Freedman, 2012)
- the intention of the founder at the beginning of activity and the predicted enterprise development strategy (Langevang et.al., 2012; DeTienne, Cardon, 2012)
- the person of the founder and his/her decision concerning the role in the company after succession (DeTienne, Cardon, 2012; Davis, 2005)
- organisational culture (Oi, 2014; Sharma, Rao, 2000)
- **competences and plans of the successor** (Chaimahawong and Sakulsriprasert 2013)
- the existing legal solutions concerning property administration after succession
- successor's competences (Chaimahawong, Sakulsriprasert, 2013).

THE FAMILY ENTERPRISE — THE SUCCESSION PROCESS — COMPETENCES AND PLANS OF THE SUCCESSOR
Research methodology: Access to Data on Family Businesses

- The **availability of data is limited**, especially in large data sets where the family category is not distinguished (Bird et al., 2002)
- The large number of family enterprises; they are usually privately owned, which **limits access to detailed data by national statistical institutions**.
- The business owners are often **reluctant to provide confidential information** about their company and family (Winter et al., 1998) to collect **information from employees** (Ward 1997), and they protect knowledge about their **internal activities related to competition** (Donnelley, 1988; Zając 2014)
- Family members usually do not want **family secrets to be known** (Schulze et al., 2001) and they prefer to say nothing rather than to say anything that could **damage their reputation**.
- The number of **returned responses from surveys is often too low** (Stamm and Lubiński, 2011)

**UNCERTAIN AND INCOMPLETE INFORMATION, SMALL SAMPLE**
Research methodology: The course of the research process

**THE FIRST STAGE**
- FGI/1
  - n=20
  - \( C_1, C_2, C_3, C_4, C_5, C_6, C_7, C_8, C_9, C_{10}, C_{11}, C_{12}, C_{13}, C_{14}, C_{15}, C_{16}, C_{17}, C_{18}, C_{19}, C_{20} \)

**THE SECOND STAGE**
- FGI/2
  - n=10
  - \( X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10} \)

**THE THIRD STAGE**
- GCA
  - \( r=0.8 \)
  - \( X_1, X_5, X_{10}, X_2, X_3, X_4, X_6, X_7, X_9 \)

**THE FOURTH STAGE**
- \( X_1, X_6, X_8 \)
THE FIRST STAGE:
• **In-depth group interviews** (2 FGI) with successors being in the process of succession at its various stages (research sample = 14).
• The obtained list of 20 goals was recorded, the elimination rule in the collective decision-making process was applied and the obtained list was reduced to 10 goals, which was approved by all participating successors.

THE SECOND STAGE:
• 27 successors, 30 days after the first stage, rated (on a scale from 1 to 5) the **level of significance of the goals** from the list developed in the previous month.

<table>
<thead>
<tr>
<th>$X_i$</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X_1$</td>
<td>Self-realization</td>
</tr>
<tr>
<td>$X_2$</td>
<td>Fulfilling dreams</td>
</tr>
<tr>
<td>$X_3$</td>
<td>Development through learning</td>
</tr>
<tr>
<td>$X_4$</td>
<td>Having friends</td>
</tr>
<tr>
<td>$X_5$</td>
<td>Inner harmony</td>
</tr>
<tr>
<td>$X_6$</td>
<td>Searching for business experiences</td>
</tr>
<tr>
<td>$X_7$</td>
<td>Searching for personal experiences</td>
</tr>
<tr>
<td>$X_8$</td>
<td>Starting a family</td>
</tr>
<tr>
<td>$X_9$</td>
<td>Making use of life</td>
</tr>
<tr>
<td>$X_{10}$</td>
<td>Making a fortune</td>
</tr>
</tbody>
</table>
The structure of successors’ goals developed using Cluster of Grey Incidence

THE THIRD STAGE:

- The Cluster of Grey Incidence method was used to organize goals of the same type in order to simplify their list.
- The methodology of the study consisted of five steps:
  
  **Step 1.** Determination of the sequence of variable characteristics,
  
  **Step 2.** Resetting the variable sequence,
  
  **Step 3.** Calculation of measures of vectors’ behaviour,
  
  **Step 4.** Calculation of the absolute value of similarity,
  
  **Step 5.** Determining the coefficient of selection, and isolation of sets of similar characteristics of the system.

\[ I \text{ Cluster: } X_1, X_5, X_{10}; \ I I \text{ Cluster: } X_2, X_3, X_4, X_6, X_7, X_9; \ III \text{ Cluster: } X_8. \]
THE FOURTH STAGE:

- The Clusters with Variable Weights method was used for checking whether or not the observational objects (i.e., the selected goals of successors) belong to pre-determined classes of high, medium or low importance of goals representing individual clusters in the assessment of family enterprises' successors.
- The successors' goals were rated on the same scale of grades from 1 to 5, where 1 means: I do not strive at all to attain this goal, and 5 means: it is my main goal.
- In the conducted research, 4 groups of successors were distinguished, depending on their position in the organizational structure of the family enterprise.

<table>
<thead>
<tr>
<th>Criteria (successors' goals) / Groups of successors</th>
<th>$X_1$: self-realization</th>
<th>$X_2$: searching for business experiences</th>
<th>$X_8$: starting a family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A: successors who do not work in a family enterprise</td>
<td>2.33</td>
<td>4.33</td>
<td>1.33</td>
</tr>
<tr>
<td>Group B: successors who work in the lowest position in a family enterprise</td>
<td>2.50</td>
<td>3.13</td>
<td>2.13</td>
</tr>
<tr>
<td>Group C: successors who work as a manager in a family enterprise</td>
<td>3.80</td>
<td>1.00</td>
<td>4.80</td>
</tr>
<tr>
<td>Group D: successors who run the whole family business</td>
<td>4.00</td>
<td>1.00</td>
<td>4.00</td>
</tr>
</tbody>
</table>

The cluster coefficient of variable weight for the classification of the significance of the individual goals’ evaluation by the $i$th successor group:

$$A = [x_{ij}]_{4 \times 3} = \begin{bmatrix} 0.53 & 0.58 & 0.22 \\ 0.52 & 0.87 & 0.00 \\ 0.64 & 0.32 & 0.33 \\ 0.60 & 0.40 & 0.33 \end{bmatrix}$$
The developed **synthetic model of the goals of the successors of family enterprises was verified** and it is suitable for examining the significance of goals for successors occupying managerial positions or managing the entire family enterprise.

Shortening the list of goals has its **analytic and practical justifications**.

For conducting studies on large samples with the use of statistical tools, **a reduced number of goals should be taken into account**.

The aim of future research is to **develop a mathematical model using optimization functions that enable selection of elements, representing individual clusters** in such a way that it leads to the extraction of the elements with the highest value in relation to the accepted criterion for assessing their value.
Thank you for your attention

Ewa WIĘCEK-JANKA
ewa.wiecek-janka@put.poznan.pl

Joanna MAJCHRZAK
joanna.majchrzak@put.poznan.pl

Magdalena WYRWICKA
magdalena.wyrwicka@put.poznan.pl

Gerhard Wilhelm WEBER
gerhard.weber@put.poznan.pl


