



**Szent István University**  
**Doctoral School of Management and Business Administration**

**Thesis of doctoral (Ph.D.) dissertation**

**THE STRUCTURAL CHANGE ON THE DEMAND SIDE OF THE GRAIN  
MARKET AFTER THE EU ACCESSION**

**Keményné Horváth Zsuzsanna**

**Supervisor: Dr. Kapronczai István Ph.D.**

**Gödöllő**

**2014**

**Name of PhD School:** Ph.D. School of Management and Business  
Administration

**Scientific field of PhD school:** Management and Business Administration Sciences

**Head of PhD school:** Dr. Lehota József  
Professor,  
member of the Hungarian Academy of Sciences  
Szent István University, Gödöllő

**Supervisor:** Dr. Kapronczai István  
Director General, Ph.D.  
Research Institute of Agricultural Economics

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approved by head of school

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approved by supervisor

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## 1. INTRODUCTION

### **Importance of the issue**

The cereal production that can be considered a key component of the Hungarian identity is a dominant sector of Hungarian agriculture. This role of the cereal production is not only because it is the most important domestic agricultural sector, providing good quality products and foreign trade surplus, but because the alimentation of population is inconceivable without the daily bread and grain fields are indispensable picture of the countryside in a country with the majority of lowland characterised by continental climate.

After the change of regime during the transition period significant changes have taken place in Hungarian food industry and trading. Privatization and foreign investments made major changes on demand side of the grain market. This period of privatization and development of free market based on competition was characterised by quick-enter and -exit of the market players on the demand side of cereal market. The foreign owners have also appeared in this period on the market, but have not become dominant players yet.

After EU accession the structure of the processing and commercial sector further modified, the players' behaviour changed in Hungary. Strong concentration processes has started once the uncompetitive producers and companies with capital deficit closed their operations. The market cleaning process was facilitated by the appearance of multinational companies engaged in global business operations, which as competitors had both positive and negative effects on the demand side of the Hungarian grain market actors' behaviour.

The reasons of choosing this topic for my thesis are the following. I have been working in the Research Institute of Agricultural Economics for 6 years and I have been involved in the price data collection and analysis of the Hungarian grain market where I have gained expertise on the pricing and strategic decisions of cereal producing individual farms and companies. There are only few investigations dealing with the demand side of cereal market despite of major structural changes in the Hungarian cereal sector in the last 15 years. I noticed that understanding and presenting the changes in this sector is essential for the analysis of market processes as the structural change of demand side in grain market influence the market strategy of companies, which in turn have impact in the cereals market. Finally investment support and integration collaborations (both vertical and horizontal collaborations) of the domestic small and medium size companies in the Common Agricultural Policy (CAP)

for the 2014-2020 financial framework is going to be preferred, which not only creates the opportunity to survive for these SMEs but based on a new strategy they would be able to become the competitors of international companies in the cereals market.

### The research problem

Major changes have been taken place on the world market of cereals in the last decades. These changes affected the domestic markets of the main cereal producing countries and market relations between the countries as well. The increasing demand for food, water and energy are facing agricultural enterprises in the world with serious challenges because limited natural resources are available to fulfil these expanding needs. The changes in consumer behaviour and healthy food requirements may have significant impact on the sector. Therefore the structure of production and the quality of the raw materials and the processed products has considerably changed involving major changes in production and business strategies of processing and trading companies. The adaptation to demand and supply increased the presence of multinational companies in every country, which was accompanied by the consolidation in the domestic market or integration in the leading international companies of mills and feed companies.

The supply and the demand of cereals in the European Union (EU) have been influenced by CAP regulating this sector to provide a "safety net" for the producers. The cereal market beside CAP regulations is influenced by the GATT and the WTO agreements on reducing export subsidies, increasing international competition, and the dynamic development of BRIC countries (Brazil, Russia, India, and China). The trade liberalization, the economic crisis started in 2008 and the development of ABCD companies intensified the transformations in the cereal markets leading to an extensively concentration of milling and feeding industries in the Union. These influences prevailed Hungarian grain market in the period of transition and after EU accession. Despite of these common effects the demand of grain products in Hungary and other post-socialist EU Member States has many particularities. The international grain trading companies are present in a larger extent in the new EU Member States then in the Western European old Member States.

### **The objectives of the thesis**

The following objectives are formulated for the examination of the demand in the cereal sector.

The objectives of literature review:

1. Examination of the main causes and the consequences of these major changes on the demand side of cereal markets.
2. Providing a historical overview of the changes on the cereal market demand in some EU Member States (France, Germany, and Slovakia) and Hungary since the 60s.
3. Presentation of the similarities and the differences on the cereal market demand of these countries based on the historical overview.

The objectives of the empirical research:

4. Presentation of the concentration experienced on the cereal market demand.
5. Analysing the factors promoting the concentration on the cereal market demand in the first decade of 2000 (EU accession and financial crisis).
6. Delimitation of the winners of these changes.
7. Investigation of the strategies how companies respond to the changes on the cereal market demand.

### *Hypotheses*

Hypothesis 1: The evolution of the Hungarian demand on cereal markets has been following a different path comparative to EU Member States, foreign-owned multinational companies play a greater role in the domestic market than in the Western European Member States.

Hypothesis 2: The concentration has increased on the demand side of the Hungarian cereal market between 2000 and 2012.

Hypothesis 3.1: This concentration process was accelerated by the EU accession and the outbreak of financial crisis.

Hypothesis 3.2: The winners of this concentration process are the international companies operating in the cereal market.

Hypothesis 4: The reactions to the changes are the following: the successful agribusiness policy, specialization (primary and processed products), market growth (export orientation)

## **2. MATERIAL AND METHODE**

I used primary and secondary data sources in my doctoral research. The secondary data are collected from the tax declarations database provided by National Tax and Customs Administration of Hungary and the investigated period is from 2000 to 2012. The analysis is based on the following financial indicators: revenue, the share of foreign capital, earnings before and after tax. Unbalanced panel data analysis is applied because many mergers and owner changes have been taking place during the analysed period. Other secondary data were collected from the Hungarian Central Statistical Office (CSO) databases (agricultural production and yields, production structure data), as well as EUROSTAT, HGCA and USDA (world market prices, yields,).

Grain market investigations in this dissertation are focusing on the purchasing, processing and trading of the main cereals in Hungary, corn and wheat. The demand-side of cereal market consist the primary dealers, the processors and the traders. Are considered foreign companies those with the share of foreign ownership of 50% or higher than 50%.

In the dissertation are used two- and multivariate calculations. The measurement of concentration is based on the Lorenz curve and the Gini coefficient. The changes were demonstrated by the homogeneity tests and cluster analysis.

The successful strategies of the companies operating on the demand side of the cereal market are examined based on a survey data collection. The questionnaire contained closed answers applying the orthoimagery method. In the sample were collected 30 companies, cereal mills, feed processors and trading companies. These companies provided a good representation of the whole population analysed. In the case of each activities from the smallest size to the largest firms were included in the sample.

### 3. RESULTS

The basic aim of the research is to demonstrate that the demand side of the cereal market has been changed in many ways (the number and composition of companies, business strategy) in the EU Member States and Hungary. The major changes in the analysed sector have been proved by the findings of historical overview (EU market) and the results of statistical calculations (the demand side of the Hungarian market) applied in the dissertation.

#### 3.1. The comparison of Hungarian, French, German and Slovak cereals industries

The relevant literature focusing on the cereal sector of France and Germany, the most important grain producing and processing countries in the EU, as well as Slovakia and Hungary, provide evidences that continuous concentration is taking place and the role of foreign-owned enterprises is increasing as a result of globalisation, liberalisation and increased competition. However there are significant differences concerning the role of these companies in the old and new EU Member States.

**Table 1: Concentration and ownership structure of the milling and feed industry in 2011-2012**

Countries	Milling industry	Feed industry	Relation of foreign-owned firms (mills)	Relation of foreign-owned firms (feed)
France	CR 4 55%	CR 6 43%	<5%	<5%
Germany	CR 3 50%	CR 10 55%	20%	5%
Slovakia	CR 12 90%	CR 7 55%	>40%	>40%
Hungary	CR 10 50%	CR 10 60%	43%	42%

(Source: My own research, Literature review chapter)

The concentration rate is high in the selected EU Member States, which are important players in the EU cereal market. In the milling industry 3-10 companies are responsible for the



production of more than 50% (table 1). The concentration in feed processing industry is lower than in the milling industry and the concentration rates of the analysed countries are more closed, the first 6-10 companies in size are producing about 40-60% of the output in the sector.

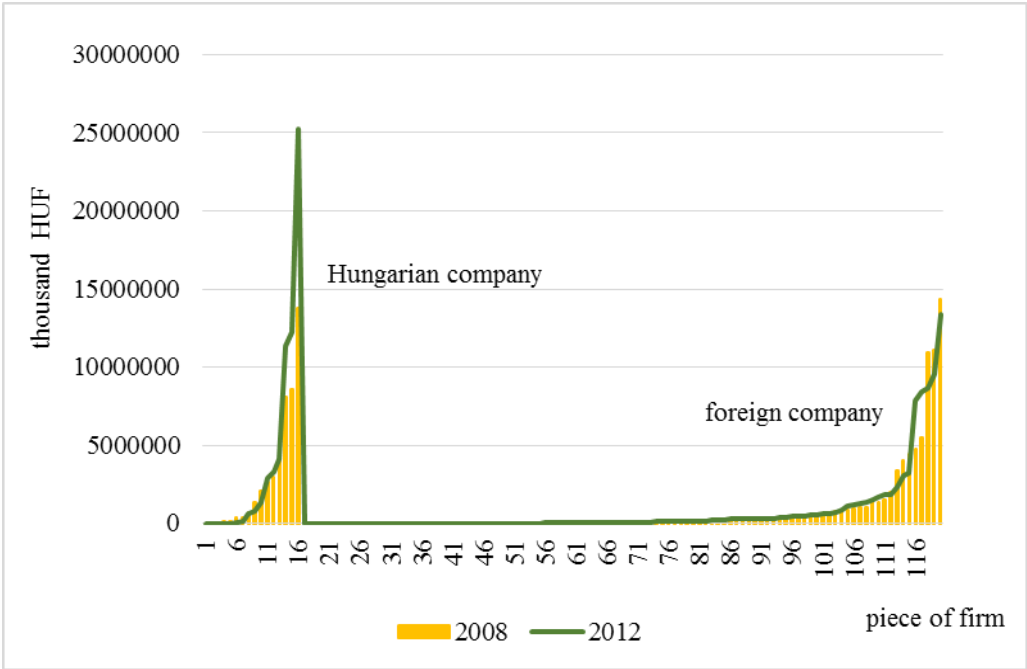
The share of foreign ownership is higher in the newly established open market economies in the Slovakian and Hungarian cereal industry (above 40%) in Germany and France (under 20%) with traditional market economies.

Consequently the evidences support hypothesis 1, the structural development of milling and feed industry in the EU15 Member States, in France and Germany follow a different path comparative to EU10 Member States, i.e. Slovakia and Hungary. In the new Member States the share of foreign ownership is much higher than in old Member States in the demand side of cereal industry.

**3.2. The transformations on the demand side of the Hungarian cereal sector**

*Milling industry*

Figure 1 shows that Hungarian milling companies yielded significantly lower revenue in 2012 compared to the previous period than the international-owned corporations.



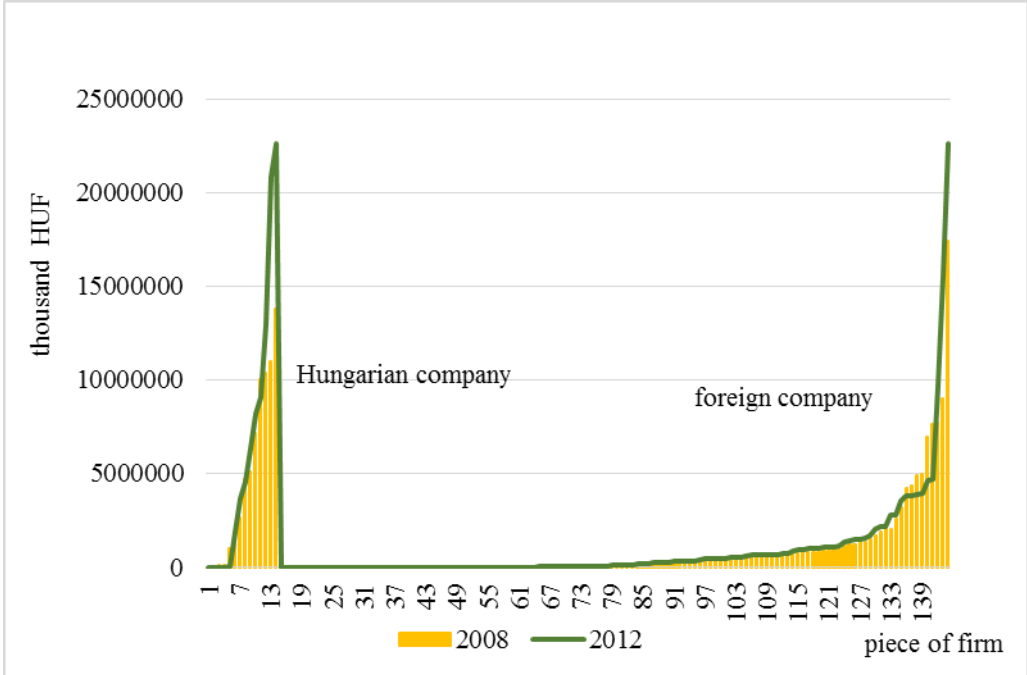
**Figure 1: Changes in the enterprise number and revenue in 2008 and 2012 in both domestic and foreign-owned milling companies**  
 (Source: Author’s editing based sales data from NAV database)

The difference of revenue between domestic and foreign-owned mills was smaller in 2000 than in 2012 while in 2004 the revenue of these two groups of mill was almost the same. Some of the medium and large companies failed and were forced to exit from the market; others have lost their market share. Many of the small milling companies closed their operations.

Therefore the foreign-owned milling companies increased their turnover and market share gradually by acquisitions of the medium-sized mills. The homogeneity tests on the revenue of the studied mills for 2000 and 2004, 2004 and 2008, 2008 and 2012 years support the hypothesis 2 at 1% significant significance level (Chi squared values: 129,3482, 213,7354, 31,2783 ). Hence the structure of the milling industry in Hungary has continuously changed in the analysed period (2000/2004, 2004/2008 and 2008/2012).

*Feed industry*

The companies in the feed industry have been further increasing their revenue in 2012 compared to 2008 (Figure 2).



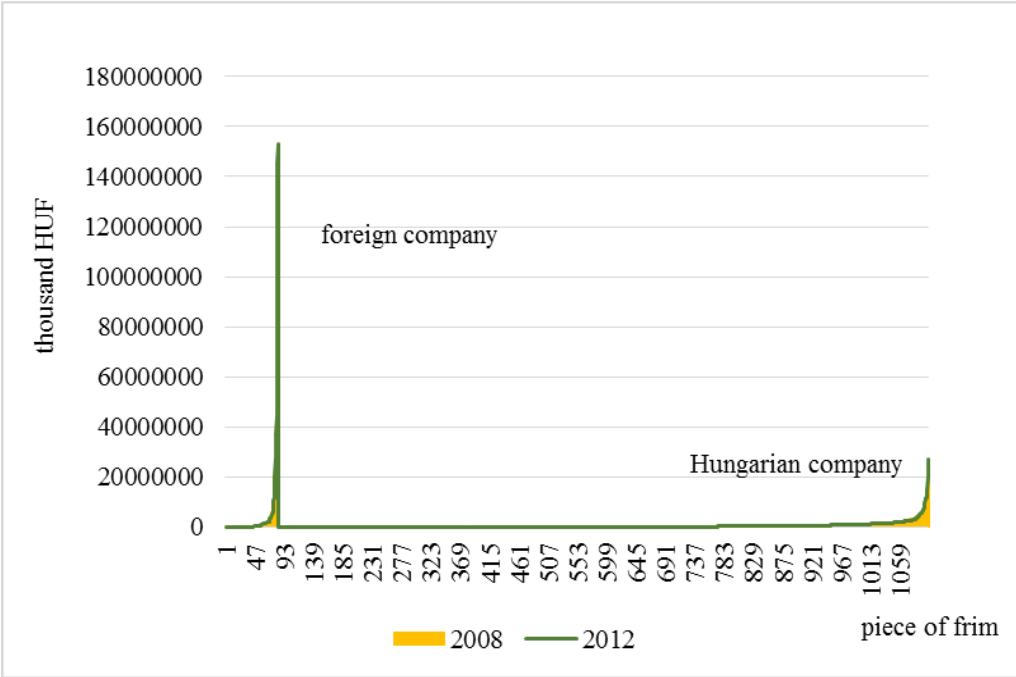
**Figure 2: Changes in the enterprise number and revenue in 2008 and 2012 in both domestic and foreign-owned feed companies**  
 (Source: Author’s editing based sales data from NAV database)

The larger and medium-sized domestic operators have increased their turnover. The market share of the smaller Hungarian companies has decreased. The international actors of the feed industry henceforward were medium and large companies consolidating their market position.

The homogeneity tests demonstrated again that the demand structure of cereal industry, in case of the feed industry as well has been change from 2004 to 2008, and from 2008 to 2012. The value of the Chi square probability in two cases (2004/2008, 2008/2012) is significant at 1% (the Chi-square values are 17,8505 and 44,7462). However the homogeneity test do not confirm a change in the structure of feed producing industry from 2000 to 2004 as Chi-square value was not significant (the value of the Chi square is 1,862019).

*Trade*

A small number of large foreign owned companies were present in the domestic market in 2012 and they increased significantly their turnover comparative to 2008 (Figure 3).



**Figure 3: Changes in the enterprise number and revenue in 2008 and 2012 in both domestic and foreign-owned traders companies**

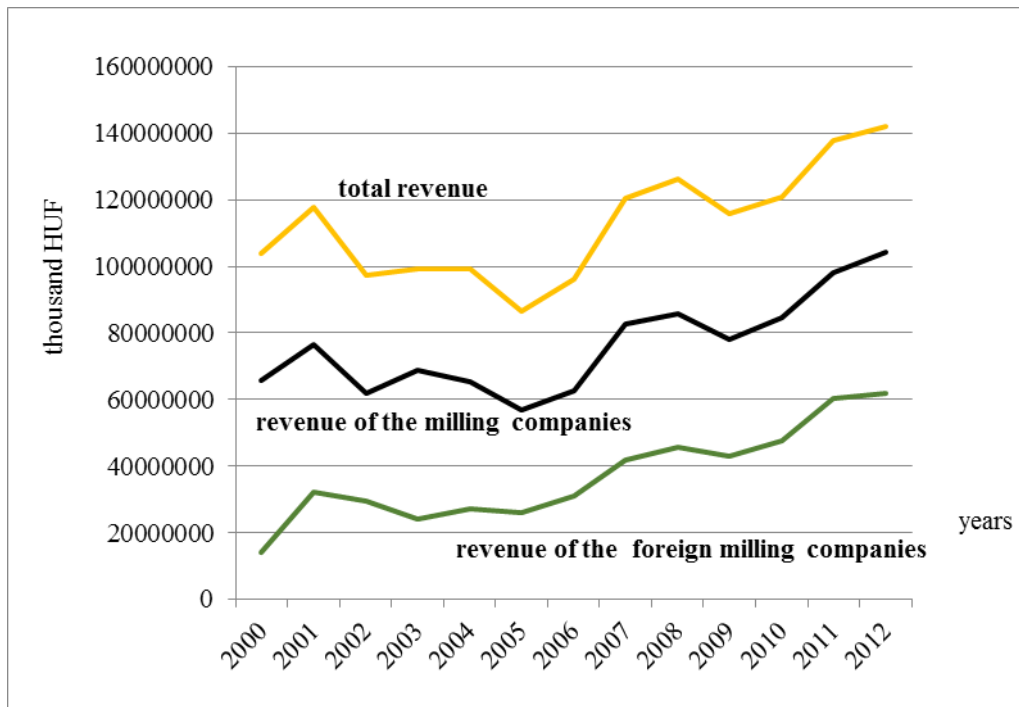
**(Source: Author’s editing based sales data from NAV database)**

These international companies have further strengthened their position on the Hungarian cereal market after the EU accession and their capital endowment make possible for them to avoid the liquidity problems caused by the financial crisis started in 2008. The turnover of the Hungarian-owned smaller companies remained unchanged in 2012 comparative to 2008.

The homogeneity tests confirmed the hypothesis in the case of the commercial companies that the demand structure of cereal market has changed from 2000 to 2004, from 2004 to 2008, and from 2008 to 2012. The Chi-square values in all three compared periods (2000/2004, 2004/2008, 2008/2012) are significant at 1% (the Chi-square values of 2119,407, 1028,033, 448,5581) were.

### 3.3 The change of market concentration on the demand side of cereal market

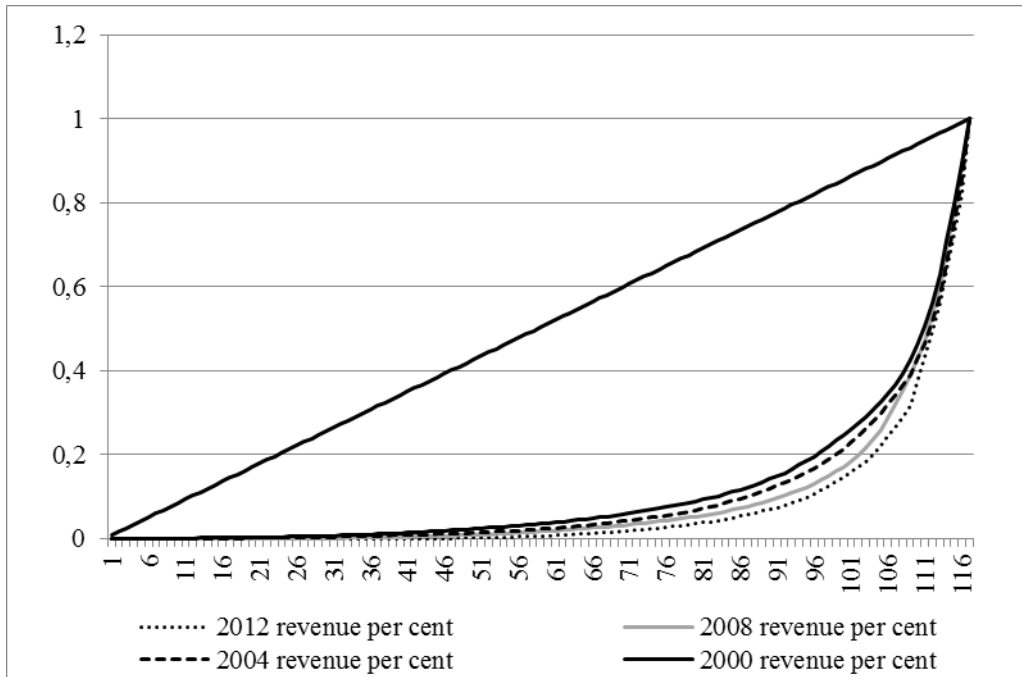
The concentration is measured with the share of the first ten largest revenue-producing companies (CR10) and the concentration process can be observed in case of these CR10 and foreign-owned companies as their share in total revenue of the sector has been increasing in the analysed period (Figure 4).



**Figure 4: The largest milling companies (CR 10), the foreign-owned enterprises and the development of total revenue of the milling companies between 2000-2012**

**(Source: Author's editing based sales data from NAV database)**

After the EU accession the influencing factors of Hungarian cereals market were the changes in domestic cereals supply and the absorption capacity of the market beside the EU legislation (intervention mechanism). The financial crisis started in 2008 and the fluctuating prices in 2009 have been hit rock bottom in the curve. The milling industry is characterised by a strong processes of concentration in the period of transition. This process has been intensifying since 2000 and the highest distance from the diagonal can be noticed in 2012 the year with the highest concentration (Figure 5).

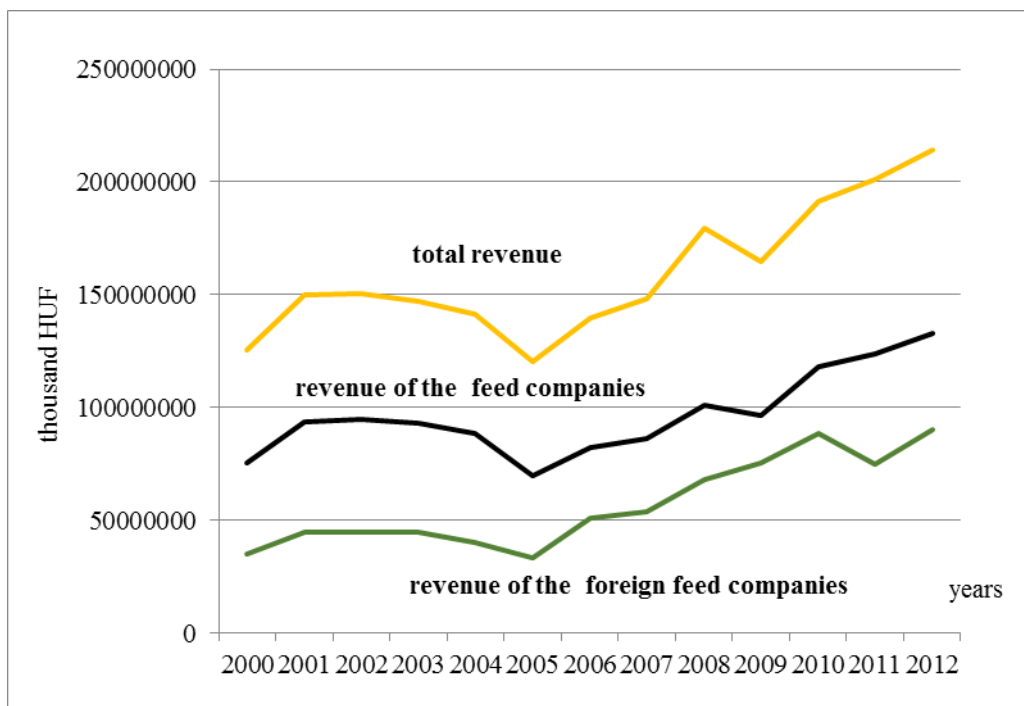


**Figure 5: Lorenz curve evolution of the milling companies**

**(Source: Author's editing based sales data from NAV database)**

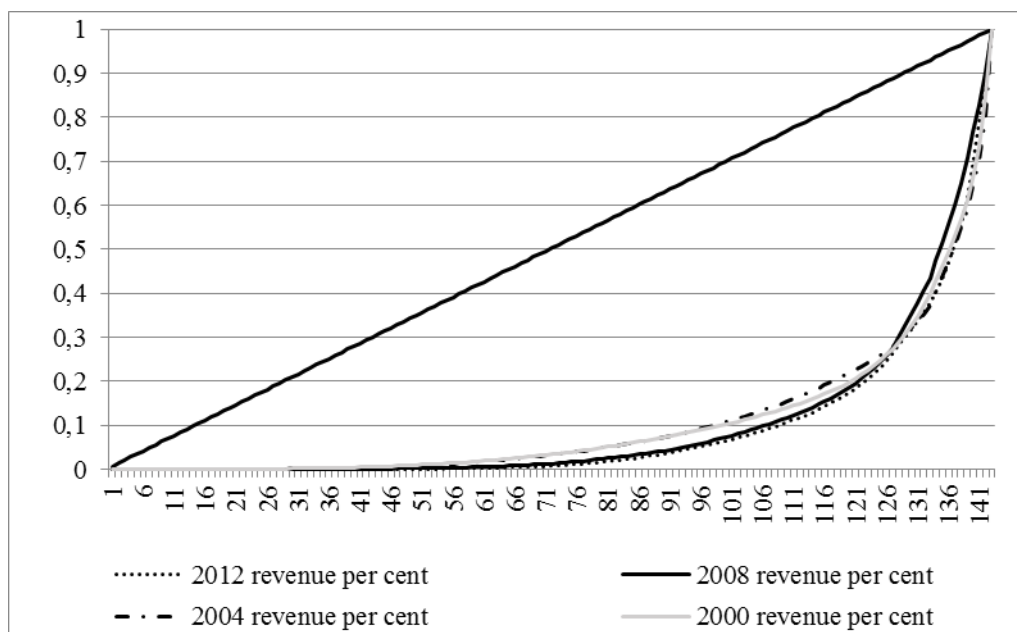
### *Feed industry*

The total turnover in the Hungarian feed processing industry has increased steadily between 2000 and 2012 (Figure 6). The turnover in the feed industry has touched the bottom twice in the analysed period first time in the year of EU accession and second time during the financial crisis started in 2008. The price fluctuations in the industry were determined by the decline of a leading domestic feed producer and recovery after changing the ownership.



**Figure 6: The largest feed companies (CR 10), the foreign-owned enterprises and the development of all the feed business company's revenue between 2000-2012**  
 (Source: Author's editing based sales data from NAV database)

The concentration in feed processing industry has been increasing since 2000 and the highest distance from the diagonal can be noticed in 2012 the year with the highest concentration as in case of milling industry (Figure 7). The Gini coefficient indicates also a strong in this sector.

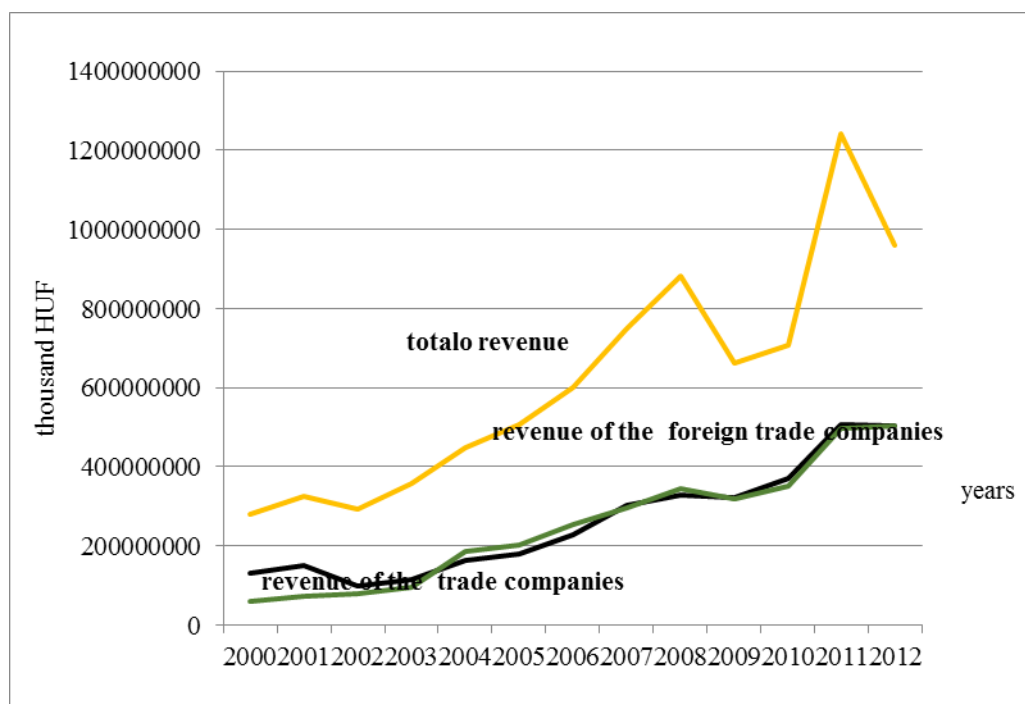


**Figure 7: Lorenz curve evolution of the feed companies**

**(Source: Author's editing based sales data from NAV database)**

### *Trade*

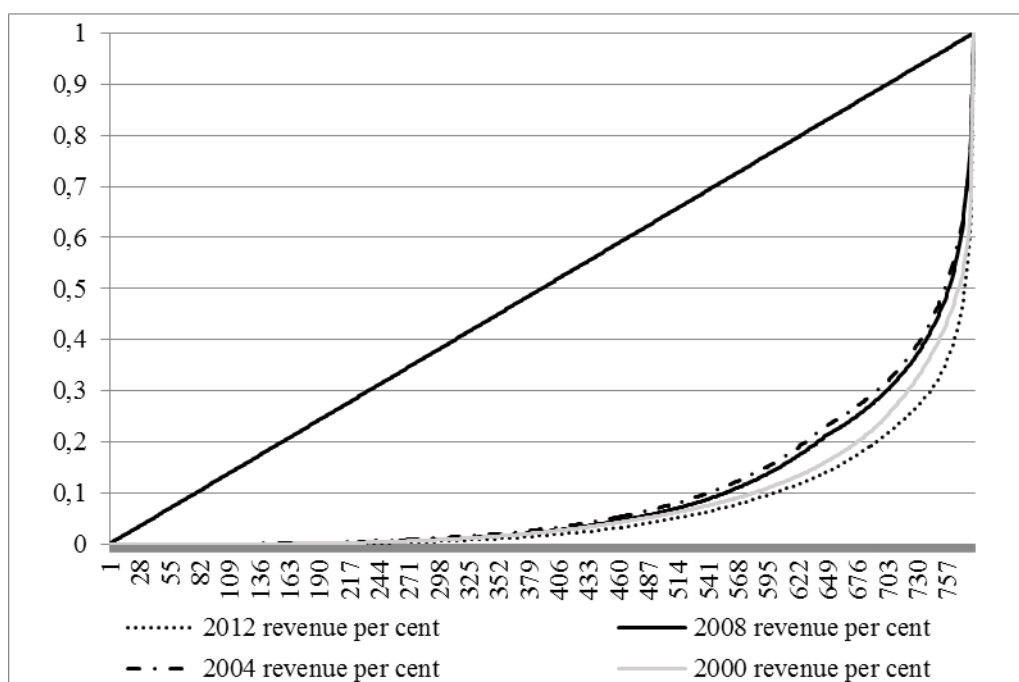
The turnover increase of commercial companies exceeded the increase of revenue in the milling and feed producing industries since 2002 (Figure 8). There was a break in the increase of revenue of the commercial companies as an effect of the unfolding financial crisis in 2008. The CR10-and foreign-owned companies are less affected by the financial crisis because they have not encountered liquidity problems as a result of their financial stability.



**Figure 8: The largest traders companies (CR 10), the foreign-owned enterprises and the development of all the traders company's revenue between 2000-2012**

**(Source: Author's editing based sales data from NAV database)**

The concentration process has reached its peak in 2012 when the value (0.86) of the Gini coefficient was the highest (Figure 9). The Gini coefficient has been increasing since 2004 (its value was in 2004 0.84, in 2008 0.82 and in 2012 0.86) except two years during the financial crisis. The revenue and the market share of financially stable companies has been increasing in a market competition environment with many small companies.



**Figure 9: Lorenz curve evolution of the traders companies**

(Source: Author's editing based sales data from NAV database)

Concluding our findings we can state that in the analysed three sectors market cleaning processes have been started and the concentration process peaked in 2012 (Table 2).

**Table 2: The values of the Gini-coefficients in the analysed sectors during the period 2000-2012**

Gini-index <1	Milling industry	Feed industry	Trade
2000	0.78	0.76	0.82
2004	0.81	0.77	0,82
2008	0.80	0.76	0.84
2012	0.83	0.78	0.86

(Source: Author's calculations.)

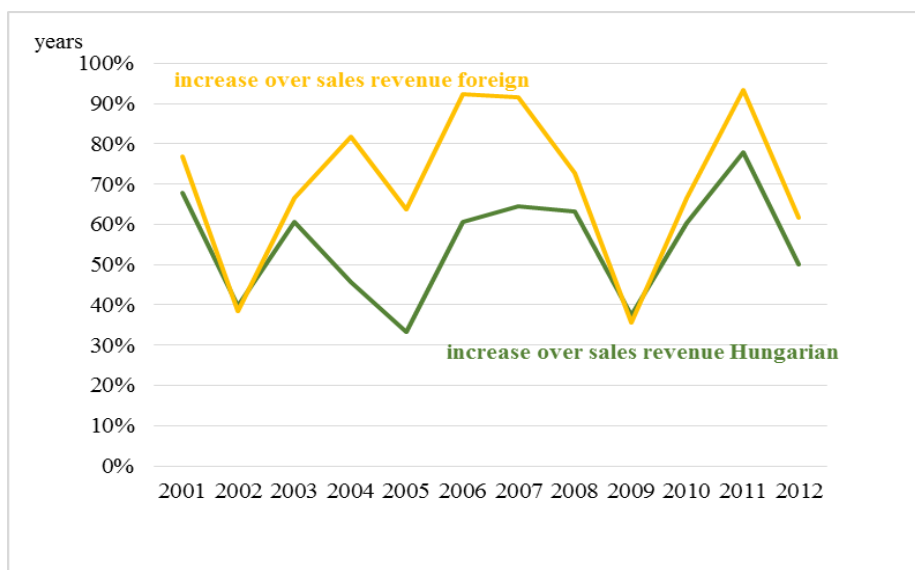
### 3.4. The EU accession and the impact of the financial crisis on the demand side of the market in cereals

#### *Milling industry*

Having examined the demand side of the cereal market based on the revenue increase in the sector between 2000 and 2012 the following results are reported. Decisive impact on the demand side of cereal market has had the EU accession and the financial crisis started in 2008



(Figure 10). The international milling companies have increased their revenue more rapid than the domestic companies.



**Figure 10: The increase of revenue in domestic and foreign-owned milling companies in 2000-2012 period**

(Source: Author’s editing based sales data from NAV database)

The analysed period divided in different periods (2000-2004, 2004-2008, 2008-2012) show how EU accession and financial crisis influenced the number of the firms in the sector and the evolution of revenue (Table 3).

**Table 3: The number of domestic and foreign-owned milling companies and the percentage change in their revenue**

Years		2000-2004	2004-2008	2008-2012
Hungarian-owned companies	number of firms	387	359	300
	The number of companies increasing sales	207	196	169
	The proportion of companies to increase revenue, %	53	55	56
Foreign-owned companies	number of firms	49	47	54
	The number of companies increasing sales	32	38	35
	The proportion of companies to increase revenue, %	65	81	65

(Source: Author’s calculations based sales data from NAV database)

The homogeneity tests indicate that the development of Hungarian cereal market structure in the period 2000-2012 was not homogeneous and two different periods can be identified: the period after EU accession from 2004 and 2008, and the period after the 2008 financial crisis

from 2008 and 2012. This different development path is proved by Chi-squared probabilities presented in Table 4.

**Table 4: The changes of the number of companies and revenue rates in the foreign and domestic companies in the 2000-2004, 2004-2008, 2008-2012 periods**

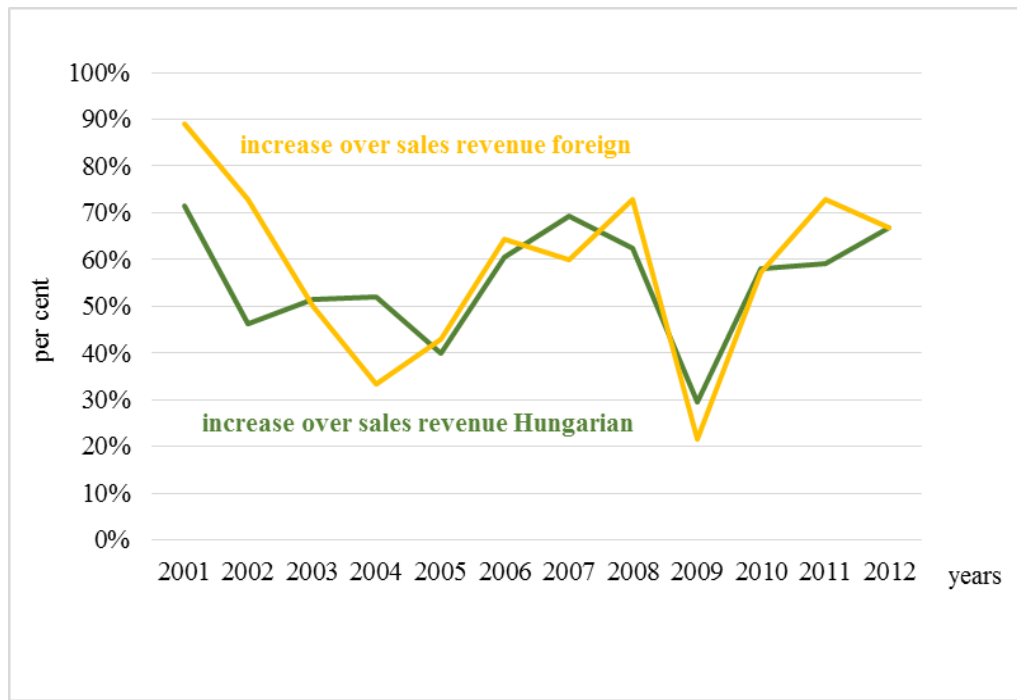
Chi-squared-probabilities	2000-2004/ 2004-2008	2004-2008/ 2008-2012
Comparison of foreign vintage effect	0.087	0.073
Comparison of Hungarian vintage effect	0.762	0.655

**(Source: Author's calculations based sales data from NAV database)**

The increase of the revenue is different in domestic companies comparative to the foreign companies in both 2000-2004 and 2004-2008 periods (Table 4). The comparative homogeneity tests of these two periods confirmed our expectations at the 10% significance level (0.087). The same results showed the comparative homogeneity tests for 2004-2008 and 2008-2012 periods when the decline of revenue is estimated at 10% significance level (0.073). However in case of Hungarian mills no significant differences were found in between the analysed periods.

#### *Feed industry*

The rate of revenue change in both cases the Hungarian and foreign-owned companies follow the same path and in many cases the change of the rate in the domestic companies exceeds the change in the international companies (Figure 11). The financial crisis and the EU accession had strongly influenced the feed producing industry. During the preparation period to EU accession and financial crisis the proportion of companies with increasing revenues had been significantly reducing and then after the EU accession as well as the financial a recovery process has been started in both domestic and foreign-owned companies.



**Figure 11: The changes in the rate of revenue in the domestic and foreign-owned feed producing companies in 2000-2012**

(Source: Author's compilation based sales data from NAV database)

The number of Hungarian-owned companies in the feed industry is much higher than the number of international companies and the rate of revenue increase is almost the same in these groups (Table 5).

**Table 5: The domestic and foreign-owned companies, the change in the number and turnover rate of feed business operators,**

Years		2000-2004	2004-2008	2008-2012
<u>Hungarian-owned companies</u>	The number of firms	456	421	379
	The number of companies increasing sales	251	243	201
	The proportion of companies to increase revenue, %	55	58	53
<u>Foreign-owned companies</u>	The number of firms	42	54	51
	The number of companies increasing sales	25	32	27
	The proportion of companies to increase revenue, %	60	59	53

(Source: Author's calculations based sales data from NAV database)

The calculations reveal that the rate of companies with increasing revenue is same in the case of domestic and foreign-owned companies in the Hungarian feed producing industry. Moreover the value of this rate is same (53%) in case of both Hungarian and foreign-owned

companies for the 2008-2012 period. The Chi-square values were not significant in the both groups of companies at 5 or even 10% level (Table 6).

**Table 6: The homogeneity tests of the return in the foreign and the domestic companies**

	2000-2004/ 2004-2008	2004-2008/ 2008-2012
Chi – square-probabilities		
Foreign-owned companies	0.979	0.514
Hungarian-owned companies	0.425	0.183

**(Source: Author’s calculations based sales data from NAV database)**

There was no substantial difference of growth dynamics between the domestic and foreign-owned companies, but the results are significant (Table 7).

**Table 7: The homogeneity test of the return trends in the Hungarian and the foreign-owned companies**

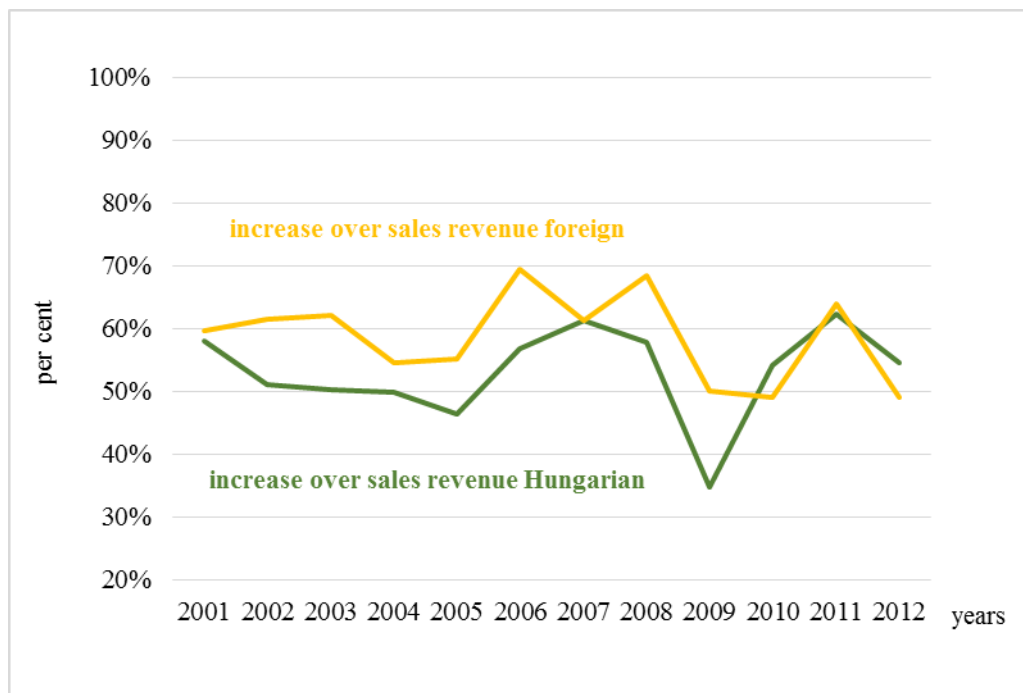
Chi-squared probabilities	2000-2004	2004-2008	2008-2012
Comparison of the foreign and Hungarian companies	0.576	0.829	0.990

**(Source: Author’s calculations based sales data from NAV database)**

The revenue dynamics is homogeneous in the last two periods of the analysed three periods. In the 2004-2008 and 2008-2012 periods neither the Hungarian none of the foreign companies were not able to better take advantage of the benefits of EU accession comparative to the preceding period characterised by closed market conditions (Hypothesis 3.2 is negative). In a much smaller proportion has been reduced the number of the companies with increasing revenue after 2008 comparative to the number of companies operating in the feed industry. Consequently this suggests that the market concentration has increased in this period (see earlier the Hypothesis 2).

## Trade

The hypotheses 3.1 and 3.2 in the case of the commercial companies are hold. Hence the concentration process was accelerated by the EU accession and the outbreak of financial crisis. Furthermore the winners of this concentration process are the international companies operating in the Hungarian cereal market.



**Figure 12: The changes in the rate of revenue in the domestic and foreign-owned trading companies in 2000-2012**

(Source: Author’s compilation based sales data from NAV database)

The share of international-owned trading companies with increasing revenue has exceeded the share of the Hungarian trading companies almost in any cases (Figure 12). The Hungarian companies have been catching up since 2010 and an increasing number of small and medium-sized trading companies have been increasing their turnover (there were companies that almost doubled their sales revenue comparative to the previous years)

**Table 8: The number of the domestic and foreign-owned trading companies and the rate of turnover changing**

Years		2000-2004	2004-2008	2008-2012
Hungarian-owned companies	number of firms	2620	3322	2581
	The number of companies increasing sales	1364	1845	1336
	The proportion of companies to increase revenue, %	52	56	52
Foreign-owned companies	number of firms	260	257	202
	The number of companies increasing sales	154	164	107
	The proportion of companies to increase revenue, %	59	64	53

(Source: Author’s calculations based sales data from NAV database)

A strong market concentration has been taken place in the domestic market (Table 8) leading to a decline in the number of foreign-owned companies and closing some companies in the sector.

**Table 9: The homogeneity tests of revenue trends in the foreign and domestic companies**

Chi-squared probabilities	2000-2004/ 2004-2008	2004-2008/ 2008-2012
Comparison of foreign vintage effect	0.284	0.019
Hungarian vintage effect comparison	0.008	0.004

(Source: Author’s calculations based sales data from NAV database)

The variation between the analysed time periods is significant in the case of the Hungarian companies were and also in case of foreign companies when comparing the 2004-2008 and 2008-2012 periods. The evidences support hypotheses 3.1 and 3.2 that major changes have been taken place in 2004 and 2008 and the winners of these changes are the foreign-owned trading companies (Table 9).

**Table 10: The homogeneity test of the turnover trends in the Hungarian and foreign-owned companies, 2000-2012**

Chi-squared probabilities	2000-2004	2004-2008	2008-2011
Hungarian and foreign company comparison	0.027	0.010	0.740

(Source: Author’s calculations based sales data from NAV database)

The homogeneity test of the Hungarian and foreign companies clearly demonstrated the differences in the dynamics of developments between the period of 2000-2004 and 2004-2008. However this dynamics of development cannot be observed in the period of 2008-2012 when the companies operating in the grey economy distorted the market.

**3.5. The relationships derived from the questionnaire survey**

1. The analysis shed light on a close relationship between the demand side of Hungarian cereal market and changes in the EU legislation (custom union, support measures came into force).
2. A strong relationship indicate the coefficients of correlation between the changes on the demand side of the grain market and the appearance the international companies in the Hungarian grain market. A typical response was that companies affected by EU accession were extremely sensitive to the effects of the financial crisis were as well.

3. The responses to questionnaire suggest a close relationship between the appearance of international companies on the Hungarian grain market and the negative effects of the financial crisis: lack of bank lending and reduction of purchasing power.
4. A strong relationship was identified among the available subsidies after EU accession, the quality requirements prescribed by international companies and the changing of the payments deadlines.
5. The coefficients of correlation indicate also strong relationship between the decline of bank loans caused by the financial crisis and the perception of contraction in the warehouse possibilities.
6. A strong relationship was found for the majority of the companies among the appearance of the international companies on the Hungarian grain market, the evolution of revenue in different periods and the business strategies of the companies.
7. The coefficients of correlation indicate a close relationship between the relative evolution of revenues in different periods (2000-2004, 2004-2008, 2008-2012) investigated.
8. The majority of the companies, which decided to extend their core activity, were focusing on the export market development or on the quality increase of their products for raising their revenue by producing higher added value products.

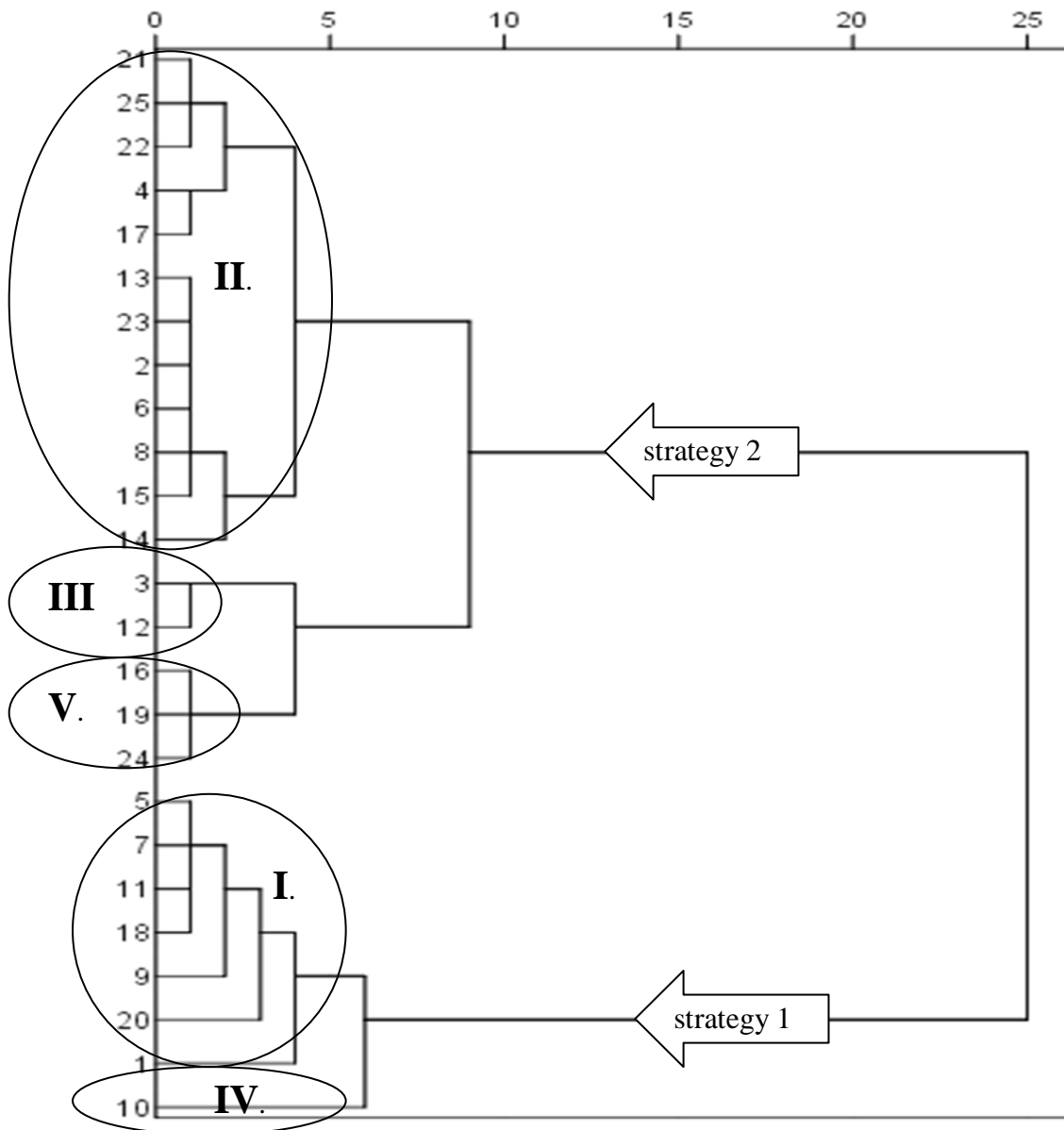
### **3.6. Select the groups on the demand side of grain market and addressing the challenges**

The findings of the cluster analysis based on the questionnaire results are presented in the Figure 13. In the first group (I) of the cluster analysis were included 7 foreign-owned companies with milling, feed producing and commercial activities. The cross table analysis indicates that the developing the agribusiness activities of these companies do not result a better performance. The product specialization is characteristic to large and capital intensive milling companies. The other companies have been not focused on specialization during the investigated period. Consequently the standard strategy in this group was oriented toward increasing revenue.

The second major group (II) was formed from companies producing mainly to the domestic market. The medium-sized trading companies purchased grain to satisfy the needs of large domestic and foreign trading firms. A key strategy of the companies clustered in this group is the product specialisation, which ensures their survival in a market environment with shrinking opportunities. Different answers were received regarding to the expansion of their activity and further developments of their operations.







**Figure 13: The cluster analysis resulted 5 major industrial groups**  
**(Source: Author's compilation)**

The third group (III) includes the smaller milling and feed processing companies. They were not market leaders, but "just" served their old and stable clientele. These companies do not consider a feasible strategy extending their activity to agribusiness activities and neither specialization nor development do not represent a good option for them in a market environment with acerb competition (possible mergers in larger firms in the future, but this is unlikely because of low technological endowment and liquidity problems).

The fourth group (IV) includes only one company engaged in agribusiness activities with a wide spectrum of activities in every stages of the value chain. The fifth group (V) is formed from the small-and medium-size feed producing and milling companies.

In the penultimate step of the cluster analysis two completely separate groups were formed from the domestic and foreign-owned companies (Figure 13). Accordingly two different corporate strategies (strategy 1 and strategy 2) were identified. In case of the strategy 1 the companies consider the best strategy focusing on a continuous increase of their revenue. In case of the strategy 2 the best strategy is considered a cautious behaviour and consolidation of the actual market position without focusing on the economic growth of the company.

From the cross table analysis resulted that the presence of foreign investors has a greater impact on the strategy of the international companies (strategy 1) than the size of their revenue. The domestic firms (strategy 2) are characterised by the fact that they are producing basically for the Hungarian market. Typically they are focusing on regional and local needs, and are open to specialization. They are trying to survive under the pressure of the producer and the consumer prices in the market. The medium-sized companies were able and the smaller companies were not able to develop their operations.. These companies are characterised by a very low export orientation attitude.

### **3.7. New and novel scientific results**

New and novel scientific research results of the dissertation are the following:

- 1) Analysing the literature I found that the presence of international companies in the domestic market is much lower in France and Germany, the most important grain producing Member States of the EU15 in Slovakia and Hungary. This situation has been evolving due to a longer period spent in the CAP by the former countries, which made possible a gradual consolidation of the market positions of domestic companies in the grain sector.

- 2) The homogeneity tests indicate that the structure of the Hungarian grain market demand has been changed many times between 2000/2004, 2004/2008 and 2008/2012 periods for the milling and trading firms. In case of the feed producing industry the homogeneity tests were not significant for 2000/2004, which means that a market structure change cannot be supported in 2004 comparative to the pre-accession period
- 3) The concentration has been increasing in milling, feed producing and cereal trading industries between 2000 and 2012. The value of the Gini coefficient ranged between 0.76 and 0.86 and followed an increasing tendency, which validate the hypothesis of concentration in grain market demand.
- 4) The demand structure changes on the grain market supported by the homogeneity tests were accelerated by the EU accession and the evolution of the financial crisis. The winners of structural changes the large, international corporations.
  - (a) In the Hungarian milling industry the foreign companies exploited the market opportunities after EU accession from 2004 to 2008 opposite to the Hungarian companies. The increase of revenue in case of foreign companies was higher than in case of domestic firms (supported by the homogeneity test) and the share of companies with increasing return is higher in case of foreign companies than in case of domestic companies. The number of companies with increasing revenue remains higher in case of foreign companies after 2008 than in case of domestic companies, but the difference is not significant.
  - (b) In the feed producing industry neither Hungarian nor foreign companies have reached better market positions in the 2004-2008 period. Thus there was no significant difference on the dynamics of growth between the domestic and foreign-owned companies.
  - (c) In the cereal trading business foreign-owned companies have been taken more advantages of EU accession (2004-2008) and the crisis period (2008-2012) than to the Hungarian companies.
- 5) Applying the correlation matrix analysing method the survey results indicate a close relationship of the EU accession and the financial crisis with the profitability and strategic decisions of the companies operating on the grain market.
- 6) The changes in the structure of domestic market demand generated five major groups (cluster analysis), which has led to the distinction of two different strategies. The strategic decisions are dependent from the ownership of companies: (a) the foreign-owned companies were focusing on the revenue growth strategy (and the largest

company in the case of agribusiness), while the domestic-owned firms consider their future strategy based on specialization.

## 4. CONCLUSION, RECOMMENDATIONS

### 4.1. The initial verification of hypothesis and refutation

*Hypothesis 1:* The evolution of the demand structure in the Hungarian grain market is different from market structure in the other EU Member States, where the foreign-owned multinational companies play a more important role on the domestic market than in the Western Europe countries.

The demand structure of the grain market in Germany and France has been evolving for a longer time and these consolidated grain markets are more responsive to the world market changes. The proportion of foreign capital in the manufacturing sector of these countries is lower than in Hungary. More advanced technology, better marketing and vertical-horizontal coordination applied in these countries overcome the expansion of the international companies in their domestic grain markets.

*Hypothesis 2:* The demand structure Hungarian of the cereals sector has been changing between 2000 and 2012 and this process can be characterised by increasing concentration.

- The structure of demand in grain market regarding the milling industry and the grain trading business has been changed many times in 2000-2004, 2004-2008, and 2008-2012.
- The structure of demand in feed processing industry has been changed many times in 2004-2008, and 2008-2012, but not in relation the 2000-2004 period.
- The concentration has been increasing in milling industry, feed processing industry and grain trading business during the 2000-2012 years and reached its maximum in 2012. The homogeneity tests and the coefficients of concentration (Gini coefficient) support the hypothesis.

*Hypothesis 3.1:* The changes are accelerated by EU accession process and the financial crisis.

*Hypothesis 3.2:* The winners of structural change of demand of Hungarian grain market are the international companies.

- The changes in the structure of demand in the Hungarian grain market was accelerated by the EU accession process and the financial crisis, the winners of these structural changes were foreign companies.

- The foreign companies operating in the milling industry have had higher benefits from the favourable economic conditions in the period of 2004-2008 than the Hungarian companies.
- Neither foreign companies nor domestic firms operating in the Hungarian feed processing industry have had benefited from the favourable economic conditions in the period of 2004-2008  
On the market for foreign-based companies could better use the 2004-2008 and the 2008-2012 period compared to Hungarian companies.

The hypothesis is hold for milling industry and grain trading business (commercial companies), but does not for the feed producing industry. The reason of not accepting the hypothesis for the feed producing industry is due to special of this sector (continuous shrinkage, the falling production of domestic-owned animal husbandry).

Hypothesis 4: These changes in the structure of demand generated to the following reactions of market players:

- Introducing or improving corporate agribusiness policy
- Increasing specialization (in the case of raw materials and processed products)
- Strengthening the market growth strategy (export orientation)

The results of the survey applying clusters analysis and the correlation matrix are presented in the following:

- The companies affected by of EU accession were extremely sensitive to the challenges of the financial crisis were as well.
- The market position of the smaller and medium-sized enterprises has declined; the decreasing lending activity of banks prevented the possibility to compete with the large international companies in terms of development of their operations of acquisition of raw materials.
- The companies on the demand side of Hungarian grain market were clustered in five groups and two types of strategies of these groups were identified. The foreign-owned firms applied the growth strategy (the larger companies agribusiness strategy), while the domestic companies applied the specialization strategy for boosting their competitiveness.
- The multinational companies operating in similar activities significantly affected the development of domestic small, medium and large companies. To maintain their competitiveness the Hungarian companies have changed the destination market for

their products. Some companies directed their focus to export markets and other companies changed the quality parameters of their products. Several companies planned to strengthen or even improve their market position by investments and technological developments.

- The majority of the companies aiming to boost their competitiveness intended to increase their exports or quality of their products producing in this way goods with higher added value for increasing their revenue.

This hypothesis was proved by applying cluster analysis.

## **4.2. Recommendations**

The conclusions of dissertation highlighted that the grain market in Western European countries has been following an organic development path resulting a strong national industrial structure in grain market based on the concentration of internal markets. The demand structure of the grain markets in the Central and Eastern European countries has been changing during the transition period, the second wave of privatization, and due to the best opportunities of EU membership. This was achieved with a more important role in grain markets of the foreign multinational companies than in the EU15 Member States. These international companies has been developing with higher dynamics than the domestic-owned companies and are capable to follow an expansive marketing strategy influencing the whole grain market, while domestic-owned companies tend to apply niche strategies.

The Hungarian economic policy should focus on the improvement of competitive and market positions of the small and medium-sized companies following Germany where family-operated companies have a great tradition. The majority of Hungarian companies operating in the grain market are small and medium-sized companies. Because of inadequate growth potential, insufficient capital and earning generating capacity the development of these companies can be achieved by providing EU funds. The investment supports provided in the framework of rural development measures may lead to the reduction of operating and development costs, the improvement of their survival chance, the strengthening their competitive position. In this way these companies can focus on specialization or export development strategies.

1. These companies are not able to compete alone with translational companies operating in the grain market due to size and capital constraints, and are not capable to run agribusiness activities too. Therefore it is necessary to strengthen the horizontal

relationships on the value chain between the domestic mills and feed producing companies. In this way they become capable to compete with the multinational agribusiness companies in the Hungarian grain market.

2. The vertical and horizontal coordination of Hungarian small and medium companies operating on the grain market can be facilitated by politic support measures from the rural development priorities of the period 2014-2020. Thus the economic policy can contribute to the strengthening the market position and bargaining power in this segment of market operators.
3. The increase of using and consumption of Hungarian processed cereal products is indispensable to implement an appropriate marketing activity following the example of the French marketing in the cereals sector
4. The domestic feed industry is dependent from the development of domestic livestock sectors, as well as from the increase of domestic meat consumption and exports of meat products. This will not only improve the market conditions for feed industry but could lead to a more balanced development of the Hungarian agriculture.



## 5. PUBLICATIONS RELATED TO THE THESIS TOPIC

### Scientific journal articles published in Hungarian language:

- **Horváth Zsuzsanna:** Changes in demand for cereals, Statistical Survey, 2007. 1 January 85 grade. number , p. 57-71., ISSN 0039 0690
- **Keményné Horváth Zsuzsanna:** The transformation of demand of the market operators, Gazdálkodás, 2007.2. number , p. 25-31., ISSN 0046 5518

### Scientific journal articles published in foreign languages:

- **Keményné Horváth Zsuzsanna:** Comparative analysis of grain price fluctuations in Ireland and France, Partium University Review (PESz), XI. year 2012/2., p. 133-140, ISSN 1582-9952

### Conference publications in Hungarian-language based on presentations in scientific conferences:

- **Horváth Zsuzsanna:** The main characteristics of the price deal players in cereals, XXXVIII. National Students ' Scientific Conference, OTDK XVIII., Finance section, Miskolc, April 25-27, 2007, p. 64., ISBN: 978-963-661-768-4
- **Horváth Zsuzsanna:** In the opinion of the purchaser, (II) page conversion operators. Health care Economics Conference, University of Pannonia, Veszprém, June 7, 2007, p. 99-105., ISBN: 978-963-9696-30-3

### Conference publication in foreign-language based on presentations in scientific conferences:

- **Keményné Horváth Zsuzsanna:** The transformation of market players on the demand-side of the grain market, "tradition and innovation", international scientific conference, Szent István University, Faculty of management and school of management. Gödöllő, Hungary, December 3-6, 2007, p. 128., ISBN: 978 963 9483 84 2

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### **Released in print or electronic form to other Hungarian-language publications:**

- **Horváth Zsuzsanna** - Kemény Gábor:The quantity in the foreground. Hungarian Agriculture, 2005. on december 7, 60. Vol. 49. on the map . ISSN: 0025-018X
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- **Horváth Zsuzsanna** - Kemény Gábor: In the domestic context and recapture of Hungarian Farmers Journal, szójaimport, 2006. on January 1. sz.,ISSN: 1417-7811
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- **Keményné Horváth Zsuzsanna**: The main characteristics of the grain on the world market and domestic. Agriculture. Skill-House for rent Zrt., Budapest, 17. grade, 2007/9. September , ISSN 1215 8380