# IMPACT OF FINANCIAL LITERACY AND GRAIN PRICE VOLATILITY ON THE FINANCING STRATEGIES OF HUNGARIAN FOOD PROCESSING SMES

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**-Abstract-**

Food industry is traditionally a pivotal point in the Hungarian economy. In the recent years SMEs suffered significant loss of share both in the Hungarian as well as the international food markets, and the viability of agricultural and food processing SMEs declined. Reasons of this decline may be examined from several points of views. On the other hand, the consumption of local agricultural products receive more emphasis, and the effective exploitation of the growth opportunities in the sector may contribute to the competitiveness of the overall Hungarian economy. Apart from the local products, international agricultural products take significant share, too. International price movements of grains assumed to influence the Hungarian food industry. In this research we explore the SMEs, which are pivotal in the overall Hungarian economy. Based on primary research data from the Northern Hungary region, this study examines how international price moves of basic food produce may influence the national food

industry, and how this contributes to the increasingly more aggressive financing and its' consequences in SMEs in the food industry.

**Key Words:** SMEs, food industry, Hungary, financing strategies

**JEL Classification:** C23, O13, Q01, Q13

## 1. INTRODUCTION

In the European Union (EU) the strengthening of the small and medium size enterprises (SMEs) has been a priority for the economic policy for some years, because the competitiveness and strength of the SME sector has an impact on the economic performance at national level, it has a determining role in employment as well as rural development. In Hungary SMEs are typically high labor- and low capital deployment, their revenue and nominal income is one tenth of the average of the EU-15 SME sector. When evaluating Hungarian SMEs it is important to consider their competitiveness at the industry level, so that the development strategies may be better targeted and more efficiently carried out.

The share of the local food industry in Hungary is 73% (MNÉP, 2009). The industry faced a significant drop in revenues and profits (from 97 billion HUF in 2002 to 21 billion HUF in 2007 and a 7.4 billion HUF loss in 2008) (FVM, 2009). Similarly, the number of employees was reduced on a large scale (in 2002 the sector employed 9% of the total workforce, which dropped to a 3.6% in 2008) (FVM, 2009). The local food industry SMEs need to compete with large and well capitalized multinational firms. In order to gaining back internal market share and utilize the future development potential, a number of conditions needs to be created in which SMEs could prosper (NKTH, 2010).

The liquidity of the sector is largely influenced by the price changes of row materials. In many cases the price of major produce such as grains changes significantly within short time periods and it is difficult for small users of these produce to react to these changes. In case prices rise, the liquidity of the SMEs gets weak, as a consequence their access to loans will also decays. They often turn to informal channels to finance their businesses (Szabó-Morvai 2010).

It is a focal point in the indebtedness of Hungarian food industry SMEs how they can effectively manage these market price fluctuations. The typically small SMEs don't have the adequate management and finance skills to prepare business plans and finance

strategies, and the banking sector does not offer suitable products reflecting the exposure to raw material price fluctuations. Financing the SMEs of the industry the current way is risky for both the SMEs and the financial institutions.

The indebtedness of the current clients threatens the stability of the banking sector in those countries in which the outstanding debts of banks in the agricultural sector is high. The state need to provide liquidity to this sector of strategic importance, because if the supply of raw materials is instable, the processing industry may turn to more stable sources of row material in more distant markets (AKI, 2011) (Piggott al.), and this may have a negative impact on the entire economic performance of the region.

In this study we examine the price changes of the agricultural row materials by modelling the risks of price change in various market conditions.

## 2. PRICE RISK MODELS OF MAJOR GRAINS

Food prices increased significantly in the past decade. The increased volatility at the produce exchanges threat the stability of food industry SMEs (Figure-1). SMEs often do not implement risk management strategies, which could mitigate at least some of their risks (Jordaan and Grové, 2007). Majority of farmers and micro enterprises are not aware of the degree of risk and the alternative costs related to it, therefore they do not quantify these when they plan their production.

There are several strategies that we can use to eliminate price risk but before we choose we should rate the reachable possibilities (M.M.Venter al. 2013). To rank these basic routine strategies we have to find out which is more profitable in the same market situation. The aim is to detect which is more efficient to produce without strategy or produce with strategy. To find out this we can use the Stochastic Efficiency with Respect to a Function (SERF) which was developed by Hardakeret al 2004.

What we seek with this price risk management strategy is to either lock in a price level or to establish a price floor with financial products that eliminate our loss if price is moving into an unfavorable direction. Beside this, if price moving to the other direction we can increase our financial benefit. To set the strategy it is necessary to define the relations between futures prices, basis, and the requested price level.

*The basis* – which is the cash price minus futures price - changes as the factors affecting cash and/or futures markets change. Two terms used to describe a changing basis are strengthening and weakening. A *strengthening basis* occurs when the cash price increases relative to the futures so cash price becoming strong.

**Figure-1: Price change of food products between 1990-2013**



Source: (http://www.fao.org/worldfoodsituation/wfs-home/foodpricesindex/en/ 2013.04.01.)

A weakening basis occurs when the cash price decreases relative to the futures over time. In this instance, the cash price is becoming weak (Chicago Board of Trade, 2004). We have to compare our cash forward prices, futures prices and basis risk with the help of the Probability Density Function (Parzen 1962). It is demonstrate how historical basis can be used to evaluate different marketing strategies that can help a producer to manage price risk from cash bids and forward contract. The historical basis also offer position in the futures and options market.

The producers face greater exposure to price risk than basis risk. A small variation in futures price can cause local cash prices to change by a greater amount than a large change in the basis. (Piggott, Shumaker, and Curtis, 2004) We demonstrate a possible strategy in four market situations. In the **first** the futures price is high and basis is weak, in the **second** futures price is high and the basis is strong, in the **third** the futures price is low and the basis is weak, in the **fourth** the futures price is low and the basis is strong.

**In the first situation** if *futures prices rises* cash *prices can rise* also according to the historical basis data. So the farmer do not lose money except for the premium of the options because they win when *cash prices goes up* in the cash forward price market and their *loss is limited* in the futures market. Or if the *futures prices decreasing* farmers loose in the cash market but *win in the futures market*. Here farmers should offset their loss and their revenue to be in the same level. *The risk* is if cash prices go down or stay in the same level and/or futures prices go up or stays in the same level.

**Figure-2: Cash Price, Futures Price and Basis Probability Density Function (PDF)**
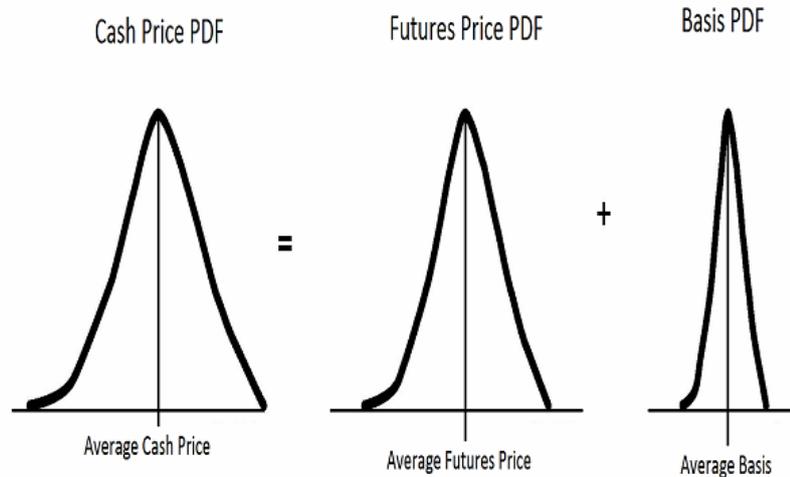


Source: Piggott, Shumaker, and Curtis 2004

**The second situation** the *cash forward price is relatively high* to the actual futures. This is the best situation to eliminate forward price risk and basis risk so that farmers can sell their products in the cash forward market in high price. Here farmers have an opportunity to get extra profit if they expect additional increase in the futures price because they could *long (buy) call option.* This means they pay the premium of the *long call option* and they have a limited possible loss but they can benefit from the increase of the underlying asset. *Risk* in this situation is the premium of the call option and they has an opportunity cost if the cash prices rise further.

**The third group** is the worst situation to seller farmers but favorable for food industry buyers. Here farmers could protect against futures price falling by *buying a put option.* The situation will be the same as it was in the first case. When futures price fall the farmer win in the long put position and they can eliminate futures price risk except for the cost of the option. *If futures prices rise* they have a *limited loss* but at the same time they can expect the *rise* of the *cash forward price* according to the historical basis movement. Here their *risk* is that the basis channel is widening and become wider than the historical movement.

**In the fourth situation** the futures prices low and the basis is high. Here a *basis contract* could eliminate the basis risk and a long put option could limit the futures price risk. In this situation it is recommended to the farmers to sell corps as soon as possible because with this they can get rid of the basis and cash price risk.

## 3. ANALYSIS OF THE INDEBTEDNESS OF FOOD INDUSTY SMEs IN HUNGARY

The financial crisis and the hectic price changes were reflected in the economy and they impacted companies as well as the public. Lack of liquidity however, resulted in increasing number of delayed payments by SMEs. This phenomenon – next to the declined demand – is the second most important cause of working capital issues. Companies used bank loans to solve their working capital financing problems, and proportionally only half of the average of EU companies has been used for innovation. The current crisis of the food sector is a result of reducing workforce, involvement of additional liquidity, restructuring loans and delayed payments (Szabó-Morvai 2010).

**Table-1: Distribution of Hungarian food industry SMEs by their enterprise form and their number of employees**

| Description | 2009 (Number) | 2009 (%) | 2010 (Number) | 2010 (%) |
|---|---|---|---|---|
| **Total Hungary** | **6489** | *100,00* | **6556** | *100,00* |
| ***Total North Hungary*** | *818* | *12,61* | *828* | *12,63* |
| Distribution based on enterprise form in North Hungary: | | | | |
| individual entrepreneur | 353 | 43,15 | 341 | 41,18 |
| company | 465 | 56,85 | 487 | 58,82 |
| Distribution | | | | |
| 1-4 people | 588 | 71,88 | 584 | 70,53 |
| 5-9 people | 64 | 7,82 | 79 | 9,54 |
| 10-19 people | 74 | 9,05 | 72 | 8,70 |
| 20-49 people | 57 | 6,97 | 57 | 6,88 |
| 50-249 people | 32 | 3,91 | 33 | 3,99 |
| **Total SMEs** | **815** | 99,63 | **825** | 99,64 |
| More than 250 people | 3 | 0,37 | 3 | 0,36 |

Source: authors' own compilation based on the data of the Hungarian Central Statistical Office

Managers running micro-sized companies (1-9 people) have a determining influence on the financial performance of these companies. In this study we examine the indebtedness of food industry companies with the purpose to uncover their financing strategies based on their market behavior. We reviewed 247 food industry SMEs in one of the most underdeveloped regions of the EU, North Hungary. The sample is not representative, however it covers 30% of the 828 food industry companies in the region, and this gives us confidence that due to the large number of cases in the sample we may take valid conclusions.

We examined the ratio of the net working capital and the total assets for these companies. The ratio in our sample spreads between -100% to 100%. We have ignored the extreme values of the sample, which is a regular procedure of data cleansing.

We used the value of the net working capital to draw conclusion on the financing strategy of the analyzed companies. When the net working capital is negative, then the company most probably applies an aggressive financing strategy. If the net working capital is positive, then the company is more likely adopting a conservative financing strategy. In the analysis we did not include the moderate financing strategy as we wanted to uncover the preference towards aggressive or conservative financing strategies. In our analysis we applied a longitudinal panel study to examine the change in the financing strategy.

More than 25% of the companies the net working capital was negative in both 2009 and 2010. This indicates that financing longer term investments were also carried out mainly through short term resources, in other words they used aggressive financing strategy. The results of the longitudinal study are illustrated on Figure-4.

**Figure-3: Boxplots of Net working capital/Total assets ratios (in 2009 and 2010) of the sample**
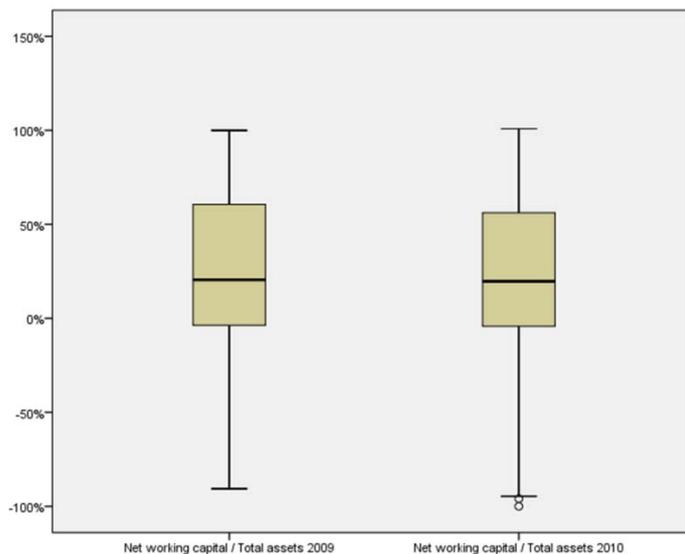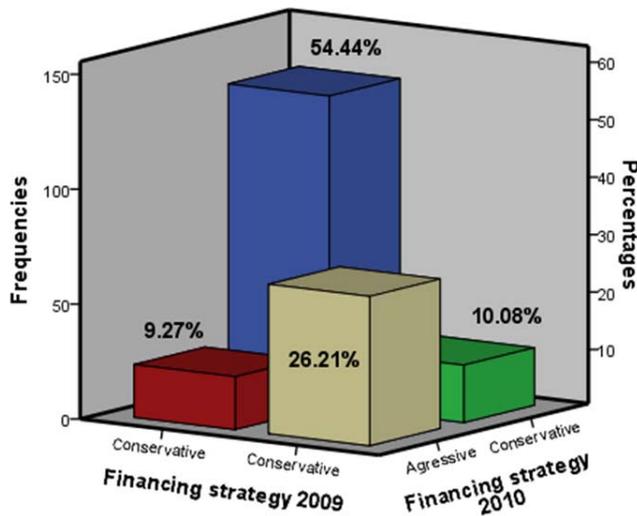


Source: authors' own research

54.44% of the sample followed a conservative financing strategy in two years in both years. These are the companies which have reserves and they could mitigate the risks of even a more persistent rise of food prices. The other companies require additional

financing to survive. It confirms our assumption that 9.27% of the sample switched from conservative to a more aggressive financing from 2009 to 2010, although 10.08% of the sample changed in the opposite direction, i.e. from aggressive to more conservative financing.

**Figure-4: Tracking of the assumed financing strategies of the sample (2009-2010)**



Source: authors' own research

## 4. CONCLUSION

Our research aimed to answer the question whether there is a financial solution for the agricultural and food industry SMEs which enables them to avoid losses as a result of volatile food price fluctuation.

In the past two decade the volatility of the food prices increased and this could lead to indebtment of agricultural and food industry SMEs. There are opportunities to minimize losses form the fluctuating prices with the involvement of the financial institutions if they offered products to agricultural and food processing SMEs, which reduces the risks of the global price changes to the level of the basis. Our research shows that there are financial products which are able to mitigate the disadvantageous impacts of price fluctuation. There could be a role for the government to support those SMEs which have stable operation but due to their size and exposures have difficulties to access loans. This solution would give extra liquidity to the banking sector, which would manage the risk exposure through balancing funds between reserves and loans. As commercial banks may create money, the multiplicator effect may also increase

funds available for loans. As the liquidity exposure of agricultural and food processing SMEs is strongly related to the price fluctuation of the food products, professionally managing this risk could also contribute to the retention of the good credit rating of SMEs, maintaining liquidity.

## BIBLIOGRAPHY

AKI, (2011) Studies in Agricultural Economies No. 113. 2011., AKI 6.

Brealey, Richard. A., - Myers, Stuart. C. (2005). *Modern Vállalati Pénzügyek* (hetedik. kiad.). Budapest: Panem Kiadó.

Chicago Board of Trade (2004): http://www.gofutures.com/pdfs/Understanding-Basis.pdf [Accessed 4.12.2013]

Hardaker, J.Brian – Richardson, James W. – Lien, Gudbrand – Shumann, Keith D. (2004): Stochastic efficiency analysis with risk aversion bounds: a simplified approach. The Australian Journal of Agricultural and Resource Economics, Volume 48, Number. 2, pp. 253-270.)

Jordaan, H. – Grové, B. (2007). Factors affecting maize producers' adoption of forward pricing in price risk management: the case of Vaalharts. Agrekon Volume 46, number 3, pp 548-565

KSH (2009) A kis- és középvállalatok és a vállalkozás helyzete - Statisztikai tükör III. évfolyam 109. szám 2009. augusztus 04

MNÉP (2009). „Az élelmiszer az életért", A magyar élelmiszeripar egyeztetett innovációs stratégiai terve (2009-2024). Magyar nemzeti élelmiszertechnológiai platform.

NFGM (2009) Nemzeti Fejlesztési és Gazdasági Minisztérium: Áttekintés Magyarország versenyképességének helyzetéről, 2009. december 31.

NFGM (2010). Nemzeti Fejlesztési és Gazdasági Minisztérium: A kis- és középvállalkozások helyzete 2008 jelentés, 2009

NKTH (2004). Nemzeti Kutatási és Technológiai Hivatal: Kutatási és Technológiai Innovációs Alap felhasználásáról szóló jelentést.

NKTH (2010). Nemzeti Kutatási és Technológiai Hivatal: Magyar Nemzeti Éleliszertechnológiai Platform „Az élelmiszer az életért" Innoációs Megvalósítási Terv Vitaanyag 3. tervezet/ 1 változat

Parzen, E. (1962): The Annals of Mathematical Statistics Vol. 33, No. 3 (Sep., 1962) *contains*: On Estimation of a Probability Density Function and Mode pp. 1065-1076

Szabó-Morvai Ágnes 2010 A válság hatása a kis- és középvállalkozásokra HÉTFA Kutatóintézet Bizalom és Vállalkozás Program Műhelytanulmányok III.

Venter, M.M. – Strydom, D.B. – Grové B. (2013): Stochastic efficiency analysis of alternative basic grain marketing strategies Agrekon Vol. 52, Iss. Sup1, 2013