The developing trends of Hungarian agricultural loans in the term of 1995 and 2012

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Abstract: The article analyses the agricultural HUF and FX loans and trends between 1995 and 2012. The authors use the linear and *exponential analysis* in trends of loans for agriculture in Hungary. During the period of 1995–2012, the bank loan for agriculture in percentage of the total bank loan in Hungary was at the highest level, namely 9.76%, when the total loan amount was 192.1 billion HUF in 1998, and this was at the lowest level, namely 3.69%, when the total loan amount was 265.6 billion HUF in 2010. The authors draw a growing linear trend of loans until 2005, namely the loan amount was 358.8 HUF billion, after that little decreasing occurred until 2008, and the loan amount has considerably decreased since 2008, when the economic and financial crisis started; while a decreasing trend of the loan ratio was going on. The average yearly credit increase is 24.486 billion HUF. The Hungarian agricultural sector is in a better position than other sectors of the economy.

Key words: credit, financing, guarantee, regression calculation

The study overviews the possible favourable agricultural loan conditions for farmers and enterprises in Hungarian agriculture to compensate the *lack of capital*, to develop the innovation in their agricultural activities and to purchase inputs. The *earlier highly interest level* of bank loans for farmers could increase the backwardness from their competitors either in the world market or the national and local markets. New financial resources provided by the agricultural loans for farmers can compensate and decrease the actual wider gap among Hungarian farmers, enterprises and the international one.

The financial constraint is a frequent discussed problem, which the farmers must face. The financial constraint is based on the imperfect capital market or the phenomenon of *credit rationing*, respectively (Čechura 2009).

External financial resources can partly be the state supports including the investment support additionally to own resources, as the capital reserves of farmers and agricultural enterprises, stocks and price income. The considerable *investments* could be implemented by agricultural enterprises at a low level of costs based on the lack of capital. The self-financing means that the company's developments are financed from the company's own private resources. Due to the characteristics of the rural economy, the ability of self- financing is at a very low level in the case of agricultural enterprises (see in detailed in Széles 2006).

Also as Szabó and Zsarnóczai (2004) declared, "The main aim for agricultural producers was to increase their capital accumulation to implement improvement of production in order to be competitive on the world and domestic markets. At the end of 1990s, there is a difficulty that only about 30 percent of the supports was directly provided for agricultural producers. In Hungary, without taxes and other different deprival, the current value of production supports was over the level of the incomes obtained in agricultural sector, but according to the calculation methods of the OECD, the value of the PSE (PSE = Producer Support Estimate) index was at a very low level and it had a decreasing tendency, which could not ensure enough income for agricultural producers in Hungary" (p. 249). This difficulty also emphasizes the lack of capital for Hungarian agricultural producers.

According to Béza et al (2007), in the agricultural sector the SMEs face during their operations the following problems and challenges: functions of the financial financing, low capitalization, low risk-bearing capacity, chronic under-financing, *liquidity problems*,

economies of scale, transaction costs, lack of transparency, lack of clarity and insufficient funds. Our opinion is that all of these unfavourable financial-economic conditions mentioned can increase the lack of capital and the backwardness of farmers in Hungary. More agricultural credits accompanied with a decreasing interest of credits can supply more capital and financial resources for the innovation and investments of agricultural enterprises.

MATERIAL AND METHODS

Bank loan is the biggest part in the institutional financing forms and that is the correct data. The research was conducted and based on secondary data. The loan data was available from the Hungarian National Bank database.

The analytical trend calculation is the most often used way of the trend calculation. The permanent tendency of the time series can be expressed by a certain well-fitting function (Barrow 2006). In the course of fitting the function, similarly to the regression calculation, using the least square method we search for the trend best fitting to the values of the time series. So the analytical trend is the specific function, where the differences of the square amounts in the values of the same data within the time series and the function's own values is the least (Szűcs 2004).

$$\sum (y_i - \hat{y}_i)^2 \Rightarrow \min.$$

where:
y_i = the i^{th} power of the time series
$\hat{y}_i$ = the value of the trend with the i^{th} date (i =1, ..., n)

During the trend calculation, there were used the following types of function:
– linear trend
– exponential trend.

There are some important points of view for choosing a type of trend:
– searching for the reason of changes, and
– time length of series.

Linear trend

The basic tendency can be expressed by a linear function if the development of the time series is steady and the rate of the time change is permanent.

The general form of the linear function:

$$\hat{y} = a + bx$$

where:
$\hat{y}$ = the value of the trend
x = the values of the time changes equidistant from each other
a, b = the unknown parameters of the function

According to Szűcs (2004), the aim is to estimate the parameters that can be determined with the standard equations. The standard equations are the equations where the $\sum (y_i - \hat{y}_i)^2 \Rightarrow \min.$ function's primary partial derivates are equalised with 0.

Exponential trend

We use the exponential trend for determining the relative change of the examined time series and the pace of the change, as permanent. We often use the (Hunyadi and Vita 2002) exponential trend in the social-economic time series.

The equation of the exponential function:

$$\hat{y} = ab^x$$

where:
a = the trend value belonging to the x=0 period of time,
b = the average pace of time change
$x = n + 1, n + 2, ..., n + k$; n indicates the number of examined periods

RESULTS AND DISCUSSION

One tool of increasing the performance is to provide the proper level of financial resources, which is important for all business establishments including the agricultural one for the continuous running. Increasing supplying loans for the agricultural sector at the appropriate level of capital and credit within the essential conditions can ensure a more competitive and market oriented agriculture. Those factors, which determine the agricultural financing, have specific characteristics. Most of the capital and financial resources required in the agriculture is locked for a long run and used not only during a short period of time (Széles 2006).

The financing is necessary for the national enterprise operation to be independent from the foreign capital, competitors and to reach competitiveness in the market. The main task of the financing politics is to determine the share of the national and foreign

resources. This means the decision about the resource structure. The equity capital is a part of the company's capital, which is not to be repaid. The bigger the rate of the company's equity capital, the bigger financial independence it has. A significant rate of the equity capital makes the company more resistant to the crisis. There is a private property, which reduces in the case of losses, the companies can more easily manage their economic activities and overcome their temporary difficulties, if the rate of their equity capital is high. The primary private resource is the called-up share, which can increase with the external capital or with other financial contribution, and which also increases in every year by the retained profit. Self-financing means that the company's developments are financed from the company's own private resources.

Financing resources of enterprises can be the internal and external one. We have mentioned above the internal resources. There are several kinds of external recourses, which are as follows:

(a) *External debt, non-institutionalized forms of financing* are non-institutional involvement with an additional source of funds, which are not specialised in financial institutions and non-financial companies giving the principal activity, which are not engaged in granting loans. Non-institutionalized forms can be the ownership or shareholder's loan, the family loan or the loan form friends, the suppliers' credit, the customer deposit and the warehouse credit.

(b) *External debt, the institutional financing forms are recourses coming from financial institutions* for example the bank credit, leasing and factoring. This means that companies have to pay back the loans to banks.

(c) *External, capital-related financing options means,* when companies or financial institutions have "unnecessary" money and want to invest into other profitable business activities, which are the informal investors, the Business Angels and the risk capital.

(d) The state support is the last external resource; it is often said that it is an independent group, and a very special resource.

The enterprises can be supported by the Hungarian government or the European Union. The strategy of governments should be flexible in the individual fields, which are as follows:

– creating jobs,
– stimulating competition,
– keeping the economy on the move,
– helping to set up product channels, distribution networks, diversification of products and services (product variety, flexibility in meeting unique needs)
– achieving social objectives, for example, for the regions lagging behind.

In Hungary the direct role of the state assets are the following: tenders announced from domestic sources, co-financed by the European Union announced proposals, access to credit assistance programs, capital programmes, guarantees, collateral security.

Csáki and Jámbor (2009) state according to the EU membership, which has led to a significant increase of subsidies received by the farmers and through led to increasing of farmers' income in Hungary. The support, however, is not evenly distributed. The SME farmers are handicapped in many ways. Though they are also eligible for direct payments, due to the small and medium sized farms (SMEs) and administrative procedures, most of them receive marginal amounts or even no part of the system. In Hungary, more than 90% of the enterprises are small businesses in the agricultural sectors. We can declare that the *land use and land ownership are separate very much*, which stimulates creating such a unified agricultural loan system for strengthening the commonly co-operations of farmers in Hungary.

The farm size is very different in the European Union. There were 12.2 million farms across the EU-27 in 2010, working 174.1 million hectares of land (the utilised agricultural area) or two fifths (40.0%) of the total land area of the EU-27. The average size of each agricultural holding (farm) in the EU-27 was 14.2 hectares (Coyette and Schenk 2013).

Financial instability in Europe is also penetrating the agricultural sector and the variation of interest rates for agricultural credit is increasing across the countries. Perhaps the most dramatic signal of the growing financial instability is that the financial leverage (gearing rate) of European farms rose by almost 4 percentage points, from 14 to 18% by 2008 (Pietola et al. 2011). Financial leverage is important for every sector of the economy. In Hungary, the leverage is the highest in the building industry, but this has increased in the agricultural sector since the start of the crisis (Széles 2006). Local and rural capital markets should be closely linked not only to the domestic financial market within the country but increasingly to the EU and even to the global financial markets. Recently, this has become evident that under the modern financial systems, the information, the large economic shocks and the instability observed in the

international markets are also inevitably transmitted to the local capital markets. The sector- and country-specific financial risks are additionally reflected by the international investors, and these risks quickly transmit to the cost of financing, which each country and sector has to pay (Pietola et al. 2011).

As Zander et al. (2013) highlighted, guarantee funds have been used over years, in different form and contexts, as a way to increase the flow of funds into the targeted sectors and groups. Guarantee funds have more frequently been used for small enterprise loans in diverse sectors, but they are now quite common in agriculture and agribusiness. Ulrich (1999) states that the loan guarantee offered by the Foundation has been very important helping the SMEs to receive loans and, where entrepreneurs have suffered a shortage of capital, the activity of such an institution appears indispensable. There is a renewed loan to increase the investment in the sector and to ensure the investment directed towards the target groups and agro-industries, which are deemed too risky for the adequate financing without risk-sharing incentives. The Rural Credit Guarantee Foundation has operated since 1991 as the first credit guarantee institute in Hungary.

The world economic and financial crisis reached Hungary in 2008. This has affected the agricultural financing forms. Trzeciak-Duval (2003) wrote that the agriculture, as other sectors of the economy, needs credit for its development. In a competitive financial environment, profitable agriculture can obtain the credit needed. This means the bank lending to the economy's engine.

In 2009, the main focus has shifted to the bank lending policies. The focus on the rise in the cost of bank loans and the uncertainty of the access to credit were included, which are due to the financing domestic investment has slowed steadily. The high interest rate environment (forint and foreign currency interest rates) has been a constant obstacle to the corporate management. The banks, due to the scarce foreign exchange resources available, did not renew the maturing corporate loans or only did it for a higher interest rate. This forced gradual cuts at the majority of companies that had to postpone their investments and were forced to switch to a "survival model".

The corporate loan portfolio of banks fell by 13.0%, the retail loans fell by 4.9% between December 2008 and July 2012. The decreasing FX (Foreign Exchange) is much higher due to the exchange rate changes. According to the figures of the European Central Bank, in local currency terms in Hungary at the end of July 2012 the domestic loan portfolio of companies was almost by 17% lower than that of December 2008, compared to the EU-27 average, the reduction is only 2%.

The role of the Hungarian banks has been taken over after 2009 partly by the abroad and partly by the companies themselves, or by the bond market investors. The company recorded foreign loans thus grew by 31%, the non-bank commercial loans by 35%, the bond financing increased by 86% between December 2008 and March 2012. This is a distinctive form of borrowing for the multinationals operating in Hungary. To sum one up, we can say that the liabilities of Hungarian companies did not decrease significantly due to the crisis, the growth stopped; the domestic bank loans were partly replaced by other forms of financing (Palkó 2012). The domestic bank financing will really start, when the credit demand and the credit supply meets. The Growth Program of Hungarian National Bank increased its credit supply and hopefully this will be help to the enterprises.

The Hungarian agricultural sector now is in a better position than other sectors of the economy. Péter and Domán (2013) have written that 57.5% of the economy's total debt was the foreign currency denominated loans in the first quarter of 2013, in the same period 17% of the agricultural loans. This means that the HUF-based loans were dominant, so Hungarian agriculture is becoming less affected by the currency fluctuations.

It is not easy to analyze the external financing resources of the agricultural sector. There is no database about the capital-related financing options and the -institutionalized forms of financing, so we collected data about the institutional financing forms. The Research Institute of Agricultural Economics has made a survey and they have diagnosed the financing structure in the Hungarian agriculture for the last decades. According to Merkel and Tóth (2010), the rate of the financing forms are 42% bank loan, 18% supplier credit, 15% from integrator, 11% leasing, 1% factoring and 13% from other recourses.

We analysed the bank loan as the most important source. Often, bank loans are not just from the banks. Bank loan means, in our case study, a paper loan from the Monetary Financial Institution. The Monetary Financial Institutions (shortly MFI) are financial institutions which together form the money-issuing sector in Hungary. These include credit institutions and all other resident financial institutions whose business is to receive deposits and/or close substitutes for deposits from entities other than the MFIs and, for their own account (at least in economic terms),

to grant credit and/or invest in securities (Viktorija 2012).

The data overviewing the loans have been collected from 1995 at the Hungarian National Bank. There are several different financial institutions in Hungary, which publish the data coming from banks and special credit institutions. In the EEA (EEA = European Economic Area), there are some financial institutional branches with balance sheet totals exceeding 100 billion HUF (Hungarian forint) and corporative credit institutions with balance sheet totals exceeding 6 billion HUF.

Table 1 shows the loans for agriculture and the related sectors. We have calculated the total agricultural credit in these years and the share of agricultural loans in the total bank loan portfolio. During the period of 1995–2012 in the loans for agriculture, forestry, hunting, fishing, the specialized credit institutions, and the EEA branches, the bank loan for agriculture in percentage of the total bank loan in Hungary was at the highest level, namely 9.76%. The total loan amount was 192.1 billion HUF in 1998, and was at the lowest level, namely 3.69%, when the total loan amount was 265.6 billion HUF in 2010. This means that the other economic sectors, for example forestry, hunting, fishing, obtained more bank loans in percent than the agricultural sector in this period. The agricultural bank loan in the percentage of the total bank loans has increased, but not considerably, since 2010 (Table 1).

Table 1. Monetary Financial Institutions loans to agricultural corporations in Hungary between 1995 and 2012

Years	Loans for agriculture, forestry, hunting, fishing from				Total loans for agriculture, forestry, hunting, fishing (HUF billion)	Agricultural loan in percentage of the total loans (%)
	banks, specialized credit institutions, and EEA branches**		corporative credit institutions***			
	loan amount (HUF billion)	agriculture bank loan in percentage of total bank loan (%)	loan amount (HUF billion)	agriculture loan in percentage of total corporative credit institutions loan (%)		
1995	69.0	7.36	N/A	N/A	69.0*	7.36*
1996	96.8	8.11	N/A	N/A	96.8*	8.11*
1997	151.9	8.90	N/A	N/A	151.9*	8.90*
1998	192.1	9.76	N/A	N/A	192.1*	9.76*
1999	211.1	9.15	N/A	N/A	211.1*	9.15*
2000	237.2	7.83	N/A	N/A	237.2*	7.83*
2001	226.0	6.68	N/A	N/A	226.0*	6.68*
2002	239.7	6.71	N/A	N/A	239.7*	6.71*
2003	269.2	6.29	16.7	19.75	285.9	6.55
2004	329.8	6.83	27.6	22.26	357.4	7.22
2005	358.8	6.52	26.2	18.83	385.0	6.83
2006	328.7	5.25	30.8	17.16	359.4	5.59
2007	338.8	4.84	35.6	15.68	374.4	5.18
2008	330.2	4.26	44.9	16.69	375.1	4.68
2009	292.4	4.01	49.9	16.49	342.3	4.51
2010	265.6	3.69	48.2	14.48	313.8	4.16
2011	279.1	3.81	46.5	14.26	325.6	4.26
2012	265.9	4.06	44.8	14.17	310.7	4.53

*No data available from the corporative credit institutions

**With balance sheet totals exceeding 100 billion HUF (Hungarian forint)

***With balance sheet totals exceeding 6 billion HUF

Source: Own calculation based on data from the Hungarian National Bank

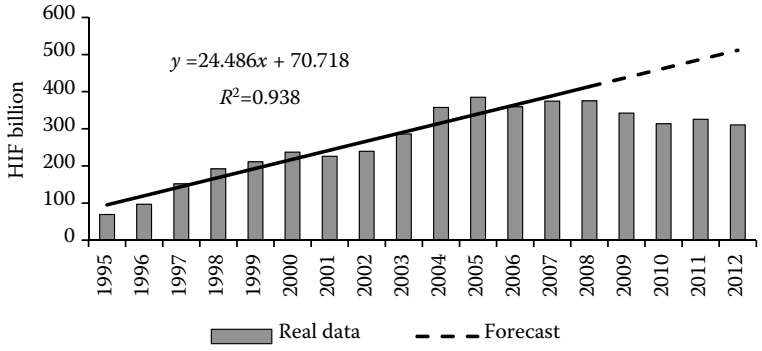

Figure 1. Hungarian agricultural total loans, the linear trend line until 2008 and the forecast from 2008

Source: Own calculation based on data from the Hungarian National Bank

We can draw a growing linear trend of loans until 2005, namely the loan amount was 358.8 HUF billion, after that little decreasing occurred until 2008. The loan amount has considerably decreased since 2008, when the world economic crisis started; while a decreasing trend of the loan ratio was going on. Loans for agriculture in the percentage of the total corporative credit institutions have decreased from level of 22.26% since 2004, and the loan amount in HUF billion has increased since 2003. In spite of this increasing trend, the loans for forestry, hunting, fishing from corporative credit institutions have been faster in these sectors; therefore they used more credit to their financial resources (Table 1).

We can observe a seasonal effect in a year generally; the amount is increasing until September and decreasing after that quarter, so the Table 1 has included data on 31 December. The last year of the research was 2012, when the total loans for agriculture, forestry, hunting, and fishing were 85.6% of 310.7 billion HUF coming from the banks, specialized credit institutions, the EEA branches and the remaining 14.4% came from the corporative credit institutions. The Table 1 shows that the agricultural credit was 4.06% in the bank portfolio and 14.17% in the corporative credit institution portfolio in 2012. Corporative credit institutions are the "banks for the county" and they are important for agricultural producers.

The column means the total agricultural loans and its linear trend (straight line) in Figure 1. We put the linear trend to the real loan data between 1995 and 2008, the crisis started in 2008 in Hungary, which affected on the institutional financing forms. The linear trend equation is

$y = 24.485x + 70.718$

$R^2 = 0.918$

The fittings of the trends are close ($R^2 = 0.938$). The average yearly loan increase is 24.486 billion HUF. Figure 1 shows the total Hungarian agricultural loans between 1995 and 2012. The linear trend is a solid line between 1995 and 2008; the forecast (broken line) is from 2009 to 2012. We can see dominant differences between the period before and after the crisis, the total loans have been 342.3 billion HUF in 2009 and the forecast was 438 billion HUF. It is a huge go-down. The situation was worse in 2012; more than 200 billion HUF was the difference between the real and forecast data in the case of the total loan (Table 1 and Figure 1).

The exponential trend equation (Figure 2) of the agriculture bank loan in percentage of the total bank loan (%) is:

$y = 0.1027e^{-0.056x}$

$R^2 = 0.858$

$y = 0.1027 \times 0.944^x$

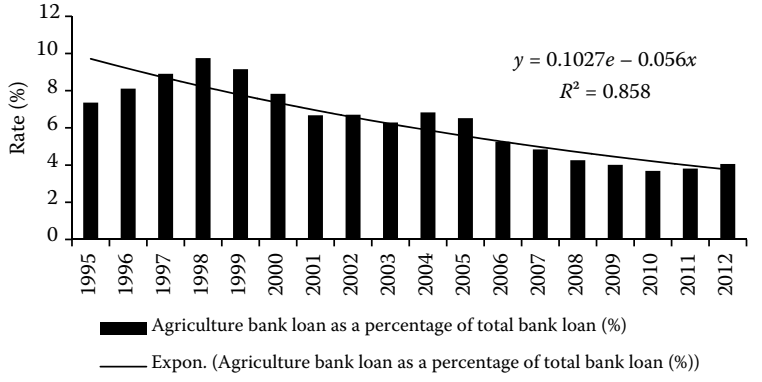

Figure 2. Hungarian agriculture bank loan in percentage of the total bank loan and the exponential trend line between 1995 and 2012

Source: Own calculation based on data from the Hungarian National Bank

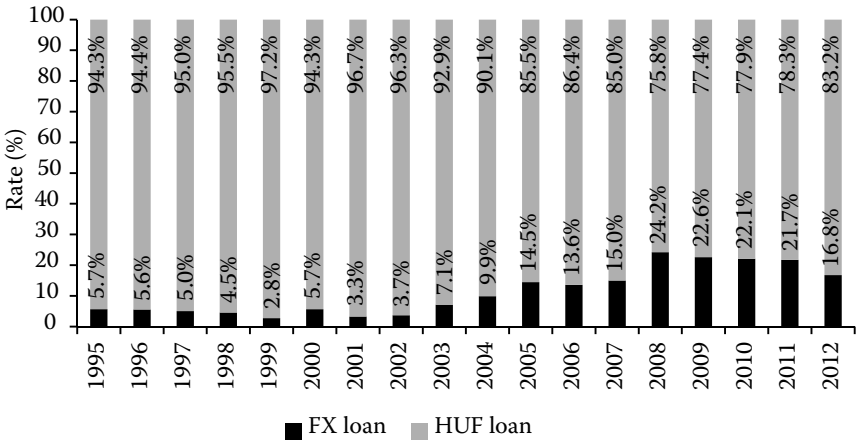

Figure 3. Rate of the Hungarian agricultural FX (Foreign Exchange) and HUF loans

Source: Own calculation based on data from the Hungarian National Bank

The average yearly trend has decreased by 5.6% at the ratio for the period of 1995 and 2012.

The trend value is 0.1027 (10.27%) if $x = 0$ (1995).

The fittings of the trends are close ($R^2 = 0.858$).

The Figure 2 shows the real data and the exponential trend line.

The total loan has already been analyzed since 1995; we would like to show the rate of the FX (Foreign Exchange) and HUF agricultural loan (Figure 3). At present, the huge problem in the Hungarian economy is the foreign debt. 57.5% of the economy's total debt was the foreign currency denominated loans in the first quarter 2013, in the same period 17% of the agricultural loans. This was significantly below the average level of the national economy and positive for the sector. This means, that the HUF-based loans were dominant, therefore Hungarian agriculture became less affected by the currency fluctuations. The highest rate was 24.2% in 2008 and decreased to 16.8% in 2012. Since the beginning of the crisis in 2008, and the rate of FX loan went below 20% first in 2012 (Figure 3).

If we analyze only the HUF loans (Figure 4), the highest amount was 329.2 billion HUF in 2005 (in the period under review) and if we compare the data of 2012 and 2005, we can see that the percentage is 78.5% of 2005 in 2012 (without inflation). An increase can be observed in all three types, namely the long term, overdraft and short term HUF loans, by the end of the 1990s (Figure 4). The increase was significant in 2003, the long term HUF loans almost doubled, the overdraft; short term HUF loans were drastically reduced. The long term HUF loans were 262.3 billion HUF (0.88 billion EUR) in 2004, which was the highest volume in this period of 1995–2012, and this has been on a downward trend since 2004. Also all three types, namely the long term, overdraft and short term HUF loans have stagnated at about 250 billion HUF (0.84 billion EUR) since 2010 (Figure 4).

According to Table 1, it can be said that no significant change has happened before 2003 (Figure 5). The part of FX (Foreign Exchange) loans rate has been very small in the agricultural crediting portfolio. The crisis effect can be observed for the long term FX loans, which have increased until 2008, at the beginning of the world economic crisis. The highest loan volume has been more than 50 billion HUF (0.17 billion EUR) in 2008. We can see a fluctuation of the short term FX loans; their volume has decreased since 2008.

CONCLUSION

The Hungarian agricultural sector is in a better position than other sectors of the economy. At present, the huge problem in the Hungarian economy is the foreign debt. The FX loans ratio is 17 percent of

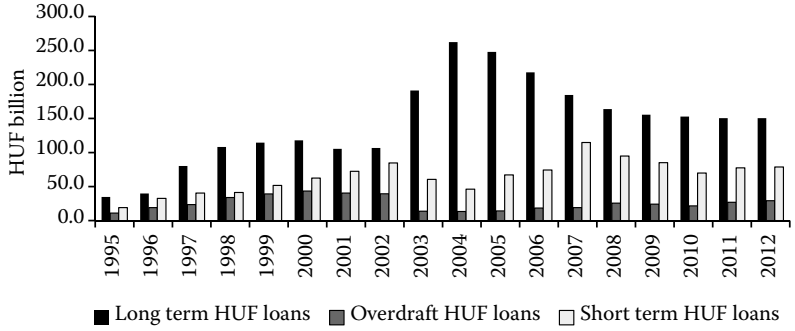

Figure 4. Hungarian agricultural long term, overdraft and short term HUF loans

Source: Own calculation based on data from Hungarian National Bank

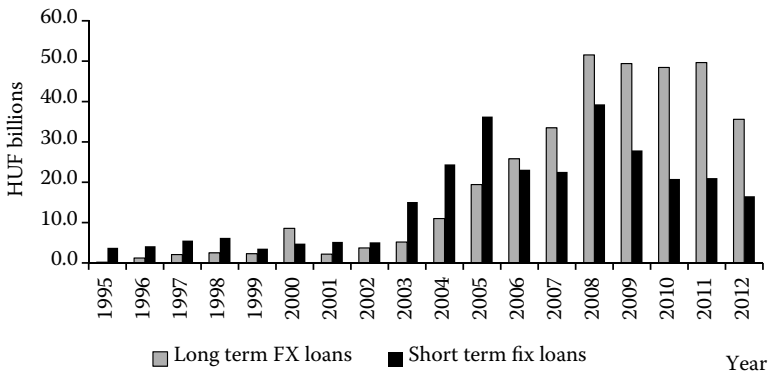

Figure 5. Hungarian agricultural long term and short term FX (Foreign Exchange) loans

Source: Own calculation based on data from the Hungarian National Bank

the total agricultural loans in 2013. The HUF-based loans were dominant, so Hungarian agriculture became less affected by the currency fluctuations. In case of the agriculture bank loan in percentage of the total bank loan, the highest rate was 9.76% in 1998 and this has decreased a little for the last years. Before the beginning of the world economic crisis, the loan for agriculture in the percentage of the total corporative credit institutions loan has been under 20% since 2005 (Table 1). The agriculture bank loan in the percentage of the total bank loans has declined since 2005, before the crisis, naturally the crisis in 2008 made considerable negative effects to decrease the agriculture bank loan in percentage (Table 1).

We put a linear trend to the real loan data between 1995 and 2008, the world economic crisis started in 2008 in Hungary, and therefore this has affected the institutional financing forms since this year. The average yearly loan increase is 24.486 billion HUF. We can see dominant differences between the period before and after the crisis, the total loans have been 342.3 billion HUF in 2009 and the forecast was 438 billion HUF. It is a huge go-down. The situation is the same in 2012; more than 200 billion HUF is the difference between the real and the forecast data at the total loan (Table 1 and Figure 1).

The exponential trend line of the agriculture bank loan in percentage of total bank loan means the average yearly trend decrease is 5.6% between 1995 and 2012. The role of the Hungarian banks has been taken over since 2009 partly by the abroad players and partly by the companies themselves, or by the bond market investors. To sum it up, we can say that the liabilities of Hungarian companies did not decrease significantly due to the crisis, the growth stopped; the domestic bank loans were partly replaced by other forms of financing. The domestic bank financing will really start when the credit demand and the credit supply meets.

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