Structural characteristics of the agricultural sector in terms of access to agricultural credits in Turkey

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Abstract

The purpose of this study is to determine the credit needs and analyse the structural effects of loans with a view to contributing to develop strategies with banks, cooperatives and all other institutions and organizations involved in agricultural credit. The master data was processed using the primary data obtained from 2,029,116 farms. Farmers are registered with the Farmer Registration System and 640 are registered with the Farmer Accounting Data Network. Farms were classified based on farm type and cropping system. Results showed that the education level of farmers is low and household size is high, farm holdings are small and fragmented and there is an imbalance in land distribution. These characteristics affect negatively the utilisation of credit, although 56% of farmers utilise credits and the equity ratio is very high (97.3%). The new regulations on the Inheritance Law will help both increase farmland and solve the problem of fragmentation in Turkey. The institutions and organizations concerned should satisfy this demand taking into account the specific characteristics of the sector (by facilitating utilisation of credit, supporting small businesses and providing additional loan opportunities, renewing machine fleet and regulations on land acquisition) in order to contribute to its advancement.

Keywords: *Turkey, structural development, agricultural credits.*

Résumé

L'objectif de cette étude est de déterminer les besoins du secteur agricole en matière de crédit et d'analyser les effets structurels des prêts afin de contribuer au développement des stratégies avec les banques, les coopératives et toutes les institutions et les organismes intervenant dans le domaine du crédit agricole. Les données primaires, constituant le principal matériel d'étude, ont été obtenues auprès de 2 029116 agriculteurs inscrits au registre des agriculteurs et de 640 agriculteurs inscrits au Réseau d'information comptable agricole. Les résultats ont été évalués en fonction du type de fermes et des systèmes de culture. D'après les résultats, le niveau d'instruction des agriculteurs est faible, les ménages sont de grande taille, les exploitations agricoles sont petites et fragmentées et il y a un déséquilibre dans la répartition des terres. Cette structure affecte négativement l'utilisation du crédit, bien que 56% des agriculteurs utilisent le crédit et le ratio d'équité soit très élevé (97,3%). Les nouveaux règlements sur le droit des successions contribueront à la fois à accroître les surfaces agricoles et à résoudre les problèmes de morcellemt des terres en Turquie. Les institutions et les organismes de crédit agricole doivent satisfaire cette demande tenant compte des caractéristiques du secteur (en facilitant les procédures d'accès au crédit, soutenant les petites entreprises et accordant des prêts supplémentaires, renouvelant le parc machines et les règlements sur l'acquisition des terres) afin defavoriser son essor.

Mots-clés: Turquie, développement structurel, crédit agricole.

1. Introduction

Agriculture created 7.5% of the gross national product of $ 820 billion and contributed by 12% to the 152 billion dollar export earnings in 2014 (TSI, 2014). The sector has targeted agricultural incomes of US $ 150 billion for 2023 and agricultural exports of US $ 40 billion. It also stands out in terms of production and export of nuts, apricots, figs, raisins, cherries and has a favourable outlook for growth. This encouraging trend has gained momentum for supporting policies, land consolidation programs and irrigation investments. It has also been enhanced by the creation and modernization of the value chain, the conversion to more profitable products, the access to regional, national and international markets, the use of certified high yielding seeds, increased mechanization and more efficient inputs. Producers wanting to use more intensive inputs and expand their production, have started to reshape their production patterns to meet rising input demands. Along with the change in the agricultural structure and the replacement of traditional subsistence production models, there is an increased number of profitable products for the market. This recent advancement has made it possible to focus on specialized or specified products. In fact, in recent years, not only vegetable and fruit planting areas have proportionately increased, but there has been also an upswing in productivity in Turkey. The Antalya region has developed significantly in greenhouses; it has actually become the center of both production and export of vegetables. In some regions, there is a growing number of dairy cattle, livestock and poultry businesses that use packaging, storage, operation tools and equipment support. Unlike other sectors, agriculture has not yet developed at the desired level. Setbacks have occurred due to many reasons, including the dependence on natural production conditions, the presence of risks and uncertainties, relatively low capital turnover rates, drought, diseases, floods, fluctuations in income due to natural disasters, irregularities in cost and price, imbalance between income and expenditure. In addition, low income levels and limited savings opportunities, the need to overhaul the technology, structural problems, generality of small businesses, cost increases, real

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declines in product prices, the use of a large part of the remaining revenues in other sectors have been the main drawbacks. On the other hand, small-scale and fragmented companies, land sharing, the tendency to fragmentation due to inheritance, small farm size and inadequately trained personnel, and growing elderly population strengthen capital accumulation in agriculture and limit the effective use of production factors. Bearing in mind the importance of agricultural capital and claims and, without exception, the above-mentioned reasons,the agricultural enterprises have chosen to satisfy their capital needs by way of foreign capital. Use of external credit in the sector has soared substantially in the last four years. Total agricultural credit was $ 16 billion in 2010, but there was a 12% increase in the first quarter of 2014 and a rise in credit utilization of $ 18 billion (TEB, 2014). Although the Ministry of Food, Agriculture and Livestock provides long-term and low-interest loans to agricultural cooperatives under its own coordination, it has allowed cooperatives to benefit from subsidized loans (25-100% interest rate reduction) by 2014. Since 2005, 50% of grants have been provided under the Rural Development Investment Support Program for the establishment of processing facilities and agricultural product packaging. Rural Development (IPARD) Programme, named after the Rural Development-RD component under Instrument for Pre-Accession Assistance-IPA was given by the European Union. Approved by the European Commission for Turkey on 25 February 2008, this programme aimed at supporting EU candidate and potential candidate countries. Furthermore, the Programme has been designed to cater the priorities and needs of rural development in Turkey‘s Pre-Accession to the EU. In this context, the 9th Development Plan for 2007-2013, the Agricultural Strategy and National Rural Development Strategy including 2006-2010, as well as the strategic priorities of the European Union Multi-annual Indicative Planning Document have been taken into account. As of 2014, 5761 projects with IPARD Programme contribution of 882,554,727 € have been signed and 3984 projects with an IPARD Programme contribution of 205,918,925 € have been finalized. This has also had a positive impact on the use of agricultural credits. As a result, the share of agricultural credits in the gross national product, which was previously 1.3% (BRSA, 2014), increased to 2.3% by 2013. Accordingly, traditional public institutions such as Ziraat Bank and the agricultural cooperatives, as well as commercial banks, have now begun to steadily provide loans to the agricultural sector. Despite Sekerbank being the only private capital bank supplying agricultural credit in 2001, the involvement of Denizbank and Anadolu Bank in 2004 and of Finansbank in 2005 in the agriculture sector was noticeable (Gunes, 2009). In addition, banks like Vakıfbank, Halkbank, Is Bank, Garanti Bank, Akbank, Yapı Kredi and Turkey Economy Bank have also been willing to supply loans to the agriculture sector. The outcome has been fruitful, the share of the private sector in agricultural credits between 2010 and 2014 was high, rising from 28% to 37% (TEB, 2014). In the studies conducted, it resulted that 88% of producer loan applications were input purchases. A significant disadvantage of credit is that a 65% collateral is insufficient. (Tercan *et al.,* 2012). This study examines the factors that determine why agribusiness firms claim credits, and it also analyzes the effects of credit utilization development on the structural characteristics of agricultural holdings. It is a fact that small agricultural producers have not sufficient financial resources to purchase new and efficient technologies (Miller, 1977). In addition, their credit needs are barely fulfilled (Bulbul, 1981); however, if the agricultural sector lags behind other sectors, credit is crucial (Braverman and Guasch, 1990). As support, there are claims that the limited credit has a negative effect on the resource budget (Lianto, 1993) and the most important problem of Turkish farmers is finance. (Özçelik and Güneş, 2005). Despite the importance of the credit, there are certain points that negatively affect the use of credit in agriculture. For example, studies on agricultural credit in Turkey are at a micro level and research at the national level is compulsory (Taskıran and Ozudoğru, 2010; Akdemir, 2012; Isık *et al.*, 2015). Inevitably, investments in areas such as economic development, intensive input use, access to the market and new regulations in the Inheritance Act will surely boost the sector’s urgent needs for credit. Undoubtedly, the firms that develop strategies in accordance with the sector's structural characteristics will most likely be able to meet this demand. This said, this is a pioneer study that utilizes Turkey’s land and farmer registry system and FAND records.

2. Materıals and Methods

The data used in this study was obtained from the Farmer Registry System. This system contains information on the national economic structure of 2,029,116 registered agricultural enterprises and 640 agricultural enterprises in the Farm Accounting Data Network (FADN). The data on age, education, social security status and business size of the operators were obtained by the CCS (all registered enterprises) (3 million enterprises). Data (capital structure, vacancy status, credit extension, borrowing and loan) related to production sample, business typology, labor force use, agricultural activity results and loan utilization were taken from FADN (registration carried out by the ministry). Additionally, records from General Directorate of Agricultural Reform and General Directorate of Land Registry and Cadastre, data from TURKSTAT and Ziraat Bank publications, parcel expansions and partnership status were obtained from the General Directorate of Land Registry and Cadastre in the country by means of a complete counting method. The results of the economic activity and results of the enterprises are calculated and analysed according to the business size and typology. Interpreted data are presented in descriptive statistics, tables and graphs.

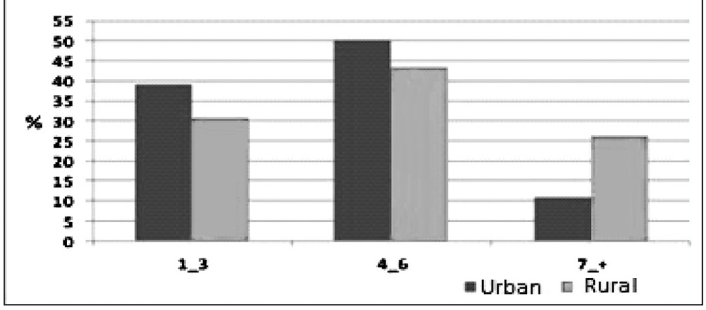
3. Results and Dıscussıon

3.1. Educational levels and household size of agricultural managers

The agricultural manager's age, property, social security, education level, savings etc. were evaluated. In addition, the conditions of membership to agricultural establishments and the use of recruited agricultural workers were analysed.

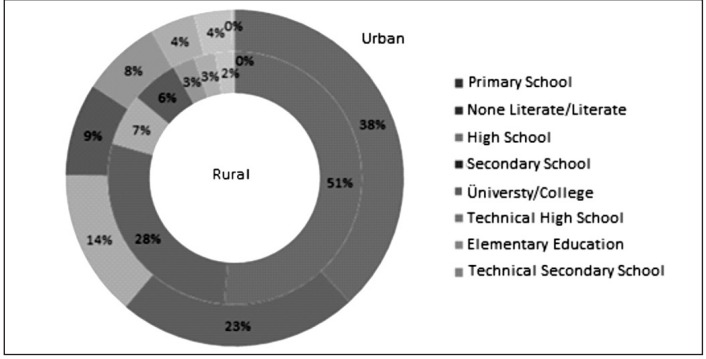
These assessments are vital, because they are all factors linked to the use of agricultural credit. When we analyse the socio-economic structure of farms demanding household credit, we find that the acquired formal education is low and the household size is high. Most agrarian municipalities were found to have middle age (average age of 47 years) and 63% to use agricultural credit (ranging from 53% to 88%) depending on the region. In addition, the proportion and number of loan users is decreasing according to the size of the business; most of them have primary school education (Akdemir, 1992; 1997; 2000, EBRD, 2012). Figure 1 illustrates the educational level of rural and urban population. Figure 1 shows

Figure 1 - *Education level of rural and urban population.*



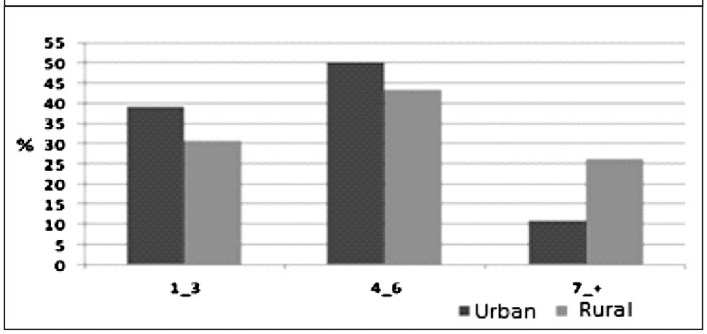
that the population with primary education accounts for 51% and 38%, respectively in urban and rural areas (TSI, 2014). On the other hand, as stated in the Farmer Registration System, among the 2,029,116 agricultural municipalities, 62% of farmers have primary education and only 4% (Figure 2) have graduate or even post-graduate education. Bartın,

Figure 2 - *Education level of agricultural managers according to the farmer registry system.*



Van, Sinop and more than 94% of the farmers in Ağrı have primary education. This rate is less than 75% in cities like Yalova, Rize and Osmaniye. The household size is particularly large in agriculture compared to other sectors. For example, 25% of households living in rural areas have 7 or more members, as compared to 10% in urban areas. These figures clearly show that the primary source of labor is the family. Family labour force is 70% in small enterprises and less than 5% in large enterprises (Figure 3).

Figure 3 - *Household size*



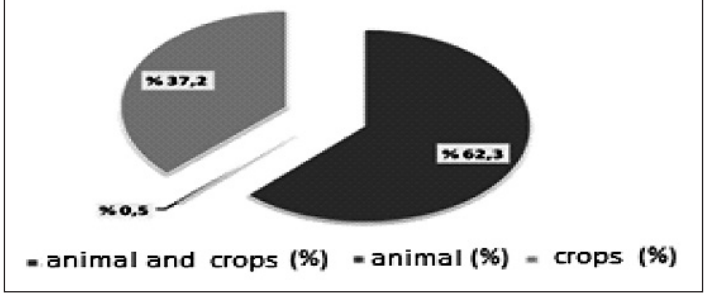
According to FADE, the average workforce of enterprises is 1.38 men per unit of labor, and the average annual working time of a worker is 1800 hours. Results indicate that 38% of the labour force is family based. Family labour force is low in field crops, but it rises to 47% for vegetable growers and dairy farming. The rate of labor is low in vegetable and perennial plants, thus showing that family work power is widespread for this production. We also observe that there is more economic growth in places where more workforce is employed.

3.2. Production pattern

The rate of animal and crop production is 62.3%, while the rate of agricultural holdings is 0.5%.

Therefore, we can come to the conclusion that the production of livestock will develop as an economic activity only if subsidised loans are provided to this sector of production (Figure 4).

Figure 4 - *Crops and animal production in agricultural holdings.*



According to FADN records, 46% of agricultural enterprises are not involved in animal production. This rate is 90% in holdings planted to vines, 76% in multi-annual plant producing farms and 71% in field cropped lands. FADN data show that 34.4% of total sowing area is devoted to cereals, 20% to other field crops and 6.3% to fallow. The gross value added per farm is $ 59,000, consisting of an average of 64% crop production and 36% animal production. The first row covers 78% milk and dairy products in animal production. This is followed by beef with 18.4%. Cereals are at the top with 51% in crop production; oilseeds and industrial crops rank second with 21.3%. Agricultural enterprises mainly produce for markets, only 1% of the production is used for self-

Table 1 - *Structure of agricultural holdings (TSI, 2014).*

Holding size	Total Holdings (pcs)	%	Cumulative %	Total Land (1000 da)	%	Cumulative %	Average holding size (da)
-5	178 006	5.9	5.9	482	0.3	0.3	3
5- 9	290 461	9.6	15.5	1 952	1.1	1.3	7
10- 19	539 816	17.9	33.4	7 378	4.0	5.3	14
20- 49	950 840	31.5	64.8	29 532	16.0	21.3	31
50- 99	560 049	18.5	83.4	38 127	20.7	42.0	68
100- 199	327 363	10.8	94.2	43 884	23.8	65.8	134
200- 499	153 685	5.1	99.3	42 076	22.8	88.7	274
500- 999	17 429	0.6	99.9	11 219	6.1	94.7	644
1000-2499	4 199	0.1	100.0	5 477	3.0	97.7	1 304
2500-4999	222	0.0	100.0	696	0.4	98.1	3 133
5000+	57	0.0	100.0	3 526	1.9	100.0	61 863
Total	**3 022 127**	**100**	**-**	**184 349**	**100**	**-**	**61**

Table 2 - *Agricultural parcels and shareholding according to the land registers.*

Parcel Size	Parcels		Total Land		Shareholder		Area/shareholder	Number of shareholders of one parcel
	Pcs	%	1000 da	%	pcs	%	da	Da
0 – 5	17 614.0	59.7	36.170	14.2	40.066	51.0	0.5	4.0
5 – 10	5 752.8	19.5	41.084	16.1	15.424	19.6	1.3	5.0
10 - 20	3 858.3	13.1	54.319	21.3	11.993	15.3	2.2	6.0
20 - 50	1 883.8	6.4	55.605	21.8	7.449	9.5	3.9	7.0
50 - 100	358.7	1.2	24.234	9.5	2.050	2.6	7.2	9.0
100 - 200	94.5	0.3	12.652	5.0	840	1.1	12.7	10.0
200 - 500	27.9	0.1	8.053	3.2	460	0.6	23.5	12.0
500 - 1000	6.1	0.0	4.197	1.6	171	0.2	46.8	14.0
1000 - 2500	2.8	0.0	4.116	1.6	86	0.1	88.2	16.0
2500 - 5000	0.6	0.0	1.885	0.7	16	0.0	189.6	17.0
5000 +	0.4	0.0	12.982	5.1	8	0.0	216.7	50.0
Total	**29.505.3**	**100.0**	**255.296**	**100.0**	**78.564**	**100.0**	**3.0**	**5.7**

consumption at home and 14% for agricultural production (seeds, etc.).

3.3. Structure of agricultural holdings

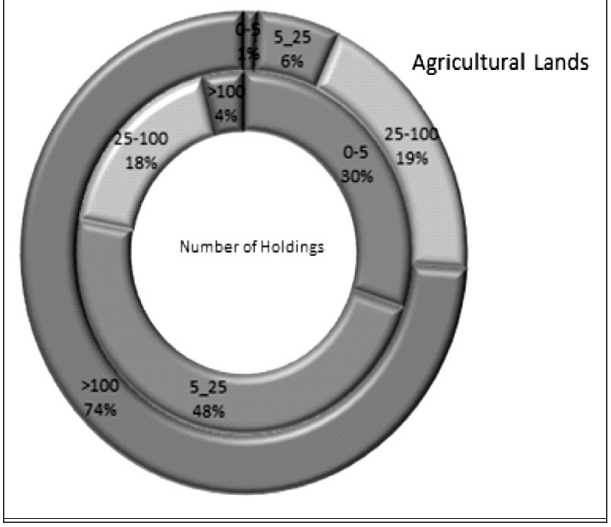
When analysing the structure of agricultural enterprises, we often find small size holdings with fragmented parcels, that is to say that land is divided into multiple shares and ownership is fragmented. This allows the estate to be divided by inheritance. For this reason, the average size of the farm is 6.1 hectares and 65% of total farms are below 5 hectares.

As a result, 21% of total agricultural land is cultivated in privately owned estates (Table 1).

Likewise, official land registry records indicate similar results. Parcels below 5 constitute 60% of 29,505,000 parcels and the total of 255,296,000 is 14% of the agricultural land. Four out of five parcels are less than 10 da, the average parcel size is 8.7 da, the share of parcels is 26%, and the share of each shareholder is 3.2 da. Shared Rate is higher in small parcels. As a result, agricultural land is small, independent and shared. This creates guarantor problems for agricultural businesses and prevents the granting of credits (Table 2).

According to TSI records (2014), there are 3 million agricultural holdings and 78,560,000 shareholders in Turkey; for this reason, 26 shareholders per holding clearly indicate that this is problematic. A similar structure is found in the Farm Registration System (Figure 5).

Figure 5 - *Structure of agricultural holdings.*



3.4. Tractor stock of agricultural holdings

When the fragmented structure in agricultural enterprises is combined with land use, not only does it negatively affect the use of the loan but it also prevents the investment. Therefore, when we examine tractor density, which is an important indicator of mechanization, we observe that the average number of tractors per holder changes from region to region (1-7) to 0.4, and that one out of three farms owns a tractor. The agricultural land per tractor is 210 da (Table 3).

In recent years, 50% of sales and purchases of tractors and equipment have been received as grants to increase agricultural machinery. Depending on the machine's development, 50% of the loan interest has been turned into subsidies.

Table 3 - *Tractor stock of agricultural holdings according to the agricultural regions*.

Agricultural Region	Tractor Stock	Number of Holdings	Tractor Stock of Holdings
1st Region	180 286	441 576	0.41
2nd Region	284 617	240 648	1.18
3rd Region	156 187	390 830	0.40
4th Region	136 981	259 905	0.53
5th Region	38 919	222 883	0.17
6th Region	54 536	369 178	0.15
7th Region	95 600	617 973	0.15
8th Region	99 729	283 632	0.35
9th Region	166 705	250 030	0.67
Total	**1 213 560**	**3 076 655**	**0.39**

3.5. Agricultural credit activities in Turkey

According to FRS records, 56% of agricultural businesses use agricultural credits. The use of credit varies between sectors, ranging from 70% in dairy cows to 40% in vineyards. As the economic size increases, credit utilisation increases from 41% to 71%. The equity ratio is preferred by agricultural enterprises. The ratio of debts to total capital in milk cow businesses is about 2.7% and this ratio is at the maximum level (7.6%). As the debt ratio increases, the economic size also increases. 42% of debts are short-term debts, mainly in vegetable growing, viniculture and animal breeding businesses. As the economic size increases, the long-term credit ratio also increases. Soil Conservation and Land Use Law (Law 6537) was implemented to solve the existing structural problems of enterprises and reduce the number of parcels. It actually facilitates land consolidation and increases in farm size, the strengthening of the registration system and the rise in the income level per unit based on the economic scale. For this purpose, a sufficient income farm size was determined for each type. It is forbidden to divide agricultural enterprises below this specified size. The law will ensure compliance with the objectives, i.e. reduce the number of agricultural enterprises but increase the size of enterprises and mechanization level. Second, this law will encourage businesses to specialize in areas such as agricultural production and processing, and to use productivity, development and technology in an efficient manner. Thirdly, the proper use of inputs, the revitalization of the agricultural land market and the acceleration of land consolidation are other improvements that this law will provide. Finally, the above Act will inevitably bring improvements in the agricultural credit market. The average equity ratio for agricultural enterprises is 90%. Agricultural land actually accounts for a significant portion of the total capital, and this is due to land ownership. Surveys conducted to meet the revolving fund needs (Güneş, 2009) show that 78% of agricultural enterprises use agricultural loans (Akdemir, 1997) and spend 88% of them for input purchases. Agricultural business managers need credits to build and expand new businesses, to innovate technology, to make investments in irrigation and to cover the capital of businesses. The low profit rate and the emerging individual needs also increase the demand for loans. The producer loan is required for many reasons. The first is the establishment and extension of new businesses, technology renewal, investment in irrigation, marketing of agricultural products, operating capital, low profitability and individual needs. In addition, the most important factor in growing lending is the inadequate savings rates of agricultural recovery. Low saving rates are mainly due to price fluctuations in agricultural commodity markets, increase in production costs, flexibility in low food consumption, increase in income in other sectors and a relatively low average per capita income. Agricultural loans are mainly used for the establishment of new enterprises, expansion/enlargement of existing ones, modernization and technology renovation, irrigation investments and non-agricultural investments and cash needs. During field visits we have found that producers consider 90% of "property capital", which is the main source of their growing/strengthening plans. Moreover, 15% of enterprises prefer to utilise bank loans for business capital needs, 73.6% use credit in case conditions become more attractive. The main obstacles to the use of credit are collateral/guarantee deficits, high interest rates and high loan costs and inconvenient loan payback time (EBRD, 2012). Also, 49.2% see interest rates as a major problem. Apart from traditional lenders (Ziraat Bankası-Agricultural Credit Cooperatives), loans are given by private banks. As a result, 78% of businesses use credits, and as business volume increases, banks are preferred as more credit resources. The agricultural credit resources in Turkey are composed of two main groups which are organized and not scattered. Regular credit resources are Ziraat Bank, Agricultural Credit Cooperatives and other private banks; non-organized sources are relatives, friends, tradesmen and merchants and other sources. There appears to be an increasing trend for agricultural loans provided by organized sources. Organized national credit resources are agricultural credit cooperatives (for small businesses) and agricultural banks in Turkey. The credit policy of these institutions is to apply subsidies in the range of 50% to 100% of loan interest rates. The level of subsidy granted is determined by whether the interest rates are low or not, depending on the production line and technique of the credits. For example, 100% for irrigation investments and 50% for livestock. Recently, many modern agricultural enterprises have been established thanks to the projects supported by the European Union and the Ministry of Agriculture. In addition, operational capacities have been increased and infrastructures improved. 50% grant support is given for the processing,

Table 4 - *The situation of banks in agricultural credits.*

Banks	2006		2009		2014	
	Million $	%	Million $	%	Million $	%
Ziraat Bank	2 461	42.3	5 236	55.4	13 966	55.0
Agricultural Credit Coop.	1 015	17.5	1 215	12.9	2 551	10.1
Denizbank	358	6.2	853	9.0	8 862	34.9
Halkbank	273	4.7	579	6.1		
Türkiye Is Bank	375	6.4	416	4.4		
Garanti Bank	331	5.7	365	3.9		
Yapıkredi Bank	237	4.1	286	3.0		
Şekerbank	280	4.8	190	2.0		
TEB	-		148	1.6		
Akbank	245	4.2	89	0.9		
Finansbank	75	1.3	64	0.7		
Vakıfbank	122	2.1	5	0.1		
Fortis	43	0.7				
General Total	**5 813**	**100.0**	**9 445**	**100.0**	**25 379**	**100.0**

packaging and storage investments which are important in the marketing of agricultural products. As a matter of fact, between 2007 and 2014, 270,000 vehicles including 50% of the grant were provided, including the tractor. During the same period, 5,450 projects benefited from 50% grant support to establish better businesses for dairy cattle, fattening, egg chickens, broiler chickens and greenhouses.

The amount of support on a project basis is maximum 3 million TL, according to the characteristics of the project. In view of the accession to the EU, a period of change and transformation took place in the Turkish agriculture sector. Some developments include increased production patterns, mechanization levels and capital requirements. As a result, producers benefited from the decline in subsidized agricultural credits from 60% in 2002 to 0-8.5%, as well as the provision of $ 61 billion in loans to producers (between 2003 and 2013).

In Turkey, the ratio of agricultural loans to GDP tends to increase. In the same period, the share of agricultural loans for agricultural products increased from 12% to 34%. In this period, the capacity of agricultural credits increased in absolute and relative terms. The ratio of agricultural credits to total loans increased from 3% to 6% between 1999 and 2014.

In this process, new actors (private banks, agricultural lenders, agricultural product marketing firms, etc.) entered the agricultural credit market. Ziraat Bank and Agricultural Credit Cooperatives are important actors in agricultural credit market while commercial banks provide credit support to agriculture sector in various fields, such as Denizbank, Halkbank, Isbank and Akbank. (Table 4).

4. Conclusion and Policy Recommendations

In order to expand the size of agricultural enterprises, it is of utmost importance that the Law No. 6537 be effectively enforced. In addition, it may be advantageous to create new agricultural financing models that will meet the operating capital needs of all businesses, particularly small-scale enterprises. Also, developing special financing models to reduce investment costs can be fruitful. A special guarantee system for the collateral required for agricultural financing needs to be established. In addition, improved models together with other land assessments (rented, public, common property, sharing etc.) can be considered other than the individually owned enterprise land. Recommendations also include encouraging agricultural income insurance, improving access to agricultural financing for producers by adjusting credit standard limits according to regional and product-based institutional economic productivity, developing customer representatives' skills in public and private institutions to encourage the use of agricultural credits under value chain financing, establishing financing models for input suppliers, producers and processors at every stage of agricultural production and ensuring active participation of producer organizations. In addition, the development of a production system covering harvesting and marketing activities is another recommendation because of farming's long production cycles and the use of production inputs as basis for the existing capital. Finally, solving the problem of insufficient data of financial providers related to the technical and economic structure of agricultural enterprises and implementation of the Law on Land Acquisition to provide long-term loans for businesses seeking to increase their investment in establishing new businesses are all suggestions for urgent action.

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