AGRICULTURE LENDING FROM THE BANKING SECTOR (ALBANIA CASE)

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Abstract

Agriculture is one of the main sectors in Albanian economy, were most of rural population is engaged in (according to 2013 official data, 52% of total employees is engaged in agriculture). Regardless of this, agriculture contribution to domestic GDP is around 18.9% (according to 2012 official data). There are 16 banks operating in Albanian financial market, which dedicate to agriculture no more than 2-5% of their lending portfolio, mainly because of creditworthiness of farm units. Lack of agriculture lending constitutes a limiting factor for agriculture development. As such, in our study we tried to find solutions on how to increase farm units' creditworthiness, firstly by understanding the banks perception on agriculture lending. A survey, among 10 banks in Albania was made, to identify factors which might be taken in consideration when analyzing agriculture lending expansion (such as future expectations for agriculture lending, performance of loan portfolio). Secondly, a linear regression model was build which links the seasonality of agricultural products prices with loans granted to agriculture. While the model showed some positive results, variables used are selected in terms of limited quantitative data and short time series. The goal of this paper is to contribute to discussion of the possible ways of increasing agriculture lending from banking sector through the seasonality of agriculture products prices, based on the actual conditions of farm unit, by providing a comprehensive overview of the performance of banking sector in Albania.

Keywords: Agriculture, Lending, Banking

Introduction

Agriculture in Albania, for more than two decades of transition, has faced and continues to face in its path of development, multiple difficulties and challenges. These difficulties mainly are connected to supporting services for agriculture farms such as infrastructure, market information and agricultural lending. Lack of agricultural lending, translated in insufficient

availability of investing resources, constitutes a limiting factor in the development of agriculture in general.

If we refer to the Albanian financial market, during the transition period, it widely grew in the banking sector and also in the microcredit financial institutions. Still, agricultural lending is not considered as one of the strongest sectors to lend. Main factors that have adversely affected lending in this sector are (Salko, 2001): (a) the inability of one bank in the market to meet the agricultural loan demand; (b) asymmetric information of rural financial markets, and (c) low profitability of domestic farm units.

Regardless the worldwide financial crisis, Albanian banking sector during last years has mantained its stability. Nevertheless, high standards for loan approval, applicable by the banks increases the difficulty of lending to farm units. Under these circumstances, some measures that can be taken from the financial sector are (Meyer, 2014): (a) extending agriculture lending by including farming and rural non-farm activities in approving loan criteria; (b) saving mobilization plans (as an important tool in the creditworthiness of the farmer-borrower); (c) approving loans in response to market demand; (d) reforms in the financial sector as a very important element to improve the performance of financial institutions; (e) improving legal framework for rural financial markets.

General view

As a first step in our study, in order to find solutions on how to increase the creditworthiness o f farm units, a review of the actual conditions of agriculture lending was performed. Preliminary data shows that agriculture has followed constant and slow growth steps as per financing from the banking sector. Over the years, agriculture farms are using credit to invest for a whole range of products. To this end, agriculture farms are relying more on loans taken from family members or remittances from the same working abroad other than loans taken from the banks. Agricultural lending can not be reviewed without an analysis of the situation of the sector in its main indicators. Some of these indicators are shown below (Ministry of Agriculture, Rural Development and Water Management, 2014):

Table 1: Agriculture land structure (%)

	2000	**2005**	**2010**	**2011**	**2012**
Agriculture Land	24	24	24	24	24
Non Agriculture Land	76	76	76	76	76

What is clearly visible about agriculture land over the last 10-years is that there has not been a significant change in its use. According to Ministry of Agriculture, Rural Development and Water Management data, for the last 20 years, the structure of field crop plantings since the early 90’s until 2012

has changed. The structure of the plantings is dominated from cereals and forages. This testifies the growth of knowledge, experience and adaptation of agriculture farm units to the market demand. Also the trend of agricultural products import-export for a 8-year period reflects no major fluctuations, confirming so the specialization of farm units in planting specific products.

Banking survey on agriculture lending

As a next step in our study, the banking sector view on agriculture was taken in consideration. Credit officers, when analyze the possibility to approve loans to farmers, consider the farm as an economic unit, by evaluating all sources of revenues that they might have, while preparing the loan repayment schedule. Based on the foregoing, it can be said that the most important sources of income for farm units are (Zeller, 2003): (a) from the sale of agricultural products (which are in continous exposure from weather conditions, volatility of demand and supply for agricultural products); and (b) remittances.

In the survey participated 10 banks active in Albania for the 2007-2012 period. The survey showed that banks in Albania have generally followed a prudent lending policy (in general the level of lending for the 2012-2013 period has been constant) where in 2012 reaching a total value of 28,470 million Lek.

The weight of "Agriculture, hunting and silviculture" sector to total loans provided by the banking sector remains low (without reaching 2% of the loan portfolio). The affecting factors resulted: (1) global economic crisis; (2) banking experience in agricultural lending; (3) decreasing remittances to farmers, making it more difficult for them to find other sources of income for credit flows. The survey showed that banks in Albania (starting from 2008) have followed a careful credit policy to businesses generally by keeping somewhat tighter credit standards.

In general, for the second quarter of 2013, the surveyed banks responded that lending standards for businesses will be kept not different from the previous quarter. In addition the survey showed that major factors which have determined the low demand for loans to businesses are macroeconomic situation in the country, as well as the use of alternative sources of financing (informal sources).

Another conclusion from the survey is that the factors that have contributed to reduce the demand for credit in the 2008 - 2013 period were investment financing decisions of Bank of Albania, and the general macroeconomic situation in Albania.

A separate part of the survey was dedicated to the performance of the loan portfolio of the banking sector.

Table 2: Total loan portfolio by banks and trends for the subsequent two years (in%)

		2010	2011	2012	2013	2014
1	Bank 1	9.0	14.0	1.0	3.5	5.5
2	Bank 2	7.6	11.3	3.0	4.0	3.6
3	Bank 3	7.0	8.0	4.0	7.0	10.0
4	Bank 4	9.0	13.0	2.5	4.0	7.0
5	Bank 5	14.5	21.0	5.0	4.0	8.0
6	Bank 6	5.0	8.0	8.0	5.0	10.0
7	Bank 7	1.0	7.0	5.0	5.5	6.0
8	Bank 8	16.7	16.9	6.0	7.0	10.0
9	Bank 9	0.0	0.0	2.0	2.8	3.0
10	Bank 10	10.0	20.0	2.5	4.0	7.0

From the above data it can be perceived that banks in Albania have predicted growth of lending to the private sector. The survey demonstrates that, for the 2013 - 2014 period banks have identified as factors affecting demand for loans: a) the financial situation of clients; b) postponement of investment decisions, and c) the perception of higher risk from customers.

Table 3: Banks expectations for agriculture loan portfolio increase

	0-5%	5 - 10%	10-15%	15-20%	over 20%
2011	5	1			1
2012	2	1		1	1
2013	4	2	1	1	

The survey noted that banks do perceive the agriculture sector as profitable, and interest is growing in this sector due to media marketing, and a strong support from the public sector.

Table 4: The performance of the loan portfolio quality for agriculture

2010/2009	2011/2010	2012/2011	2013/2012
13.8%	1.9%	3.2%	20.6%

From the survey it resulted that if in 2010 the banks expected an improved loan portfolio for agricultural businesses, such situation was not expected in the previous two years. For 2013, apart from the expected growth of agriculture loan portfolio, banks expected credit quality improvement in this sector. But, in overall, agricultural sector occupies at a maximum 1,54% of the loan portfolio of the banking sector.

The seasonality of agricultural lending

Following the survey results, as agriculture sector being perceived as a risky one to finance, our study continued with a review of the problems of agriculture lending. The review aims to find areas in the agriculture sector

which might help in reducing the risk perceived from the bank. As such, the seasonality of agricultural product prices was taken into account, the later a factor that affects the rate of loan repayment. A more detailed research was conducted to relate the seasonality in approving loans to farm units with the seasonality of the selling price of agricultural products. For such purpose, we used a simple model to explain precisely the impact of seasonality in prices of agricultural products *vis à vis* the lending seasonality from the banking sector. The methodology used in building the model is Ordinary Least Squares (OLS) as a general modeling technique used in the evaluation of unknown parameters in a linear regression model.

The model takes in consideration five key variables such as: (1) price index of agricultural products; (2) loans approved in agriculture; (3) inflation; (4) gross domestic product for agriculture; (b) imports of goods included in "Food, drinks and tobacco" category. Variables were evaluated based on their relation and impact they may have with the unobserved variable (prices of agricultural products).

Price index of domestic production - food industry sector (this indicator was used as representative of agricultural prices). Time series refers to 2007 - 2012 period, published by the Institute of Statistics in Albania, on quarterly basis. The time series was translated in monthly base by using the average quadratic interpolation method (quadratic-match average). In accordance with the length of the other time series included in the model, the duration of the series was extended for July - December 2012 period using monthly average rate of growth of domestic output prices (eg. for July it was used the average monthly growth rate of domestic product prices during the month of July from previous years). The translation into lower frequency of this series allows better identification of seasonal factors on the performance of agricultural products prices.

Given the characteristics of the time series considered, initially the stationary tests were performed. There are several tests that can be used for this purpose. In our model, we used the Augmented Dickey-Fuller test (ADF unit root test). The same procedure was used to test all series of the model. Under the unit root test, if “statistics – t” calculated value is greater than McKinnon critical value, as per confidence interval, then the hypothesis 0 is accepted (which in our case is: price index of domestic products series has a unit root and the alternative hypothesis is that the time series has not a unit root, then it is stationary). Unit root test show that the time series price index of domestic production is not stationary, so hypothesis 0 is accepted. For the testing three confidence levels were taken (1%, 5% and 10%). The test data are presented in table 5.

Given that the aforementioned series resulted non-stationary in level, then it was tested if this series turns into stationary in first difference. Test

results show that the unit root in first difference became stationary for all levels of confidence 1%, 5%, 10% (no trend and no constant). The result are presented in table 6.

Table 5

Null Hypothesis: IC has a unit root				
Exogenous: None				
Lag Length: 4 (Automatic - based on SIC, maxlag=10)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test			**-0.19986**	0.6098
Test critic	1% level		-2.60691	
	5% level		-1.94676	
	10% level		-1.61306	
*MacKinnon (1996) one-sided p-values.				

Table 6

Null Hypothesis: D(IC) has a unit root				
Exogenous: None				
Lag Length: 3 (Automatic - based on SIC, maxlag=10)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test			**-2.80376**	0.0059
Test critic	1% level		-2.60691	
	5% level		-1.94676	
	10% level		-1.61306	
*MacKinnon (1996) one-sided p-values.				

Because the variable price index of domestic production resulted stationary in first difference then we might conclude that it is integrated in the first degree or I (1).

Consumer Price Index

"Food, drinks and tobacco" category (this indicator was used as representative of agricultural prices). The model does not consider the "consumer price index" series in total but only the consumer price index of "Food and beverages" since it is more convenient for our study. Time series refers to the 2007 - 2012 period, published by Institute of Statistics in Albania, on quarterly basis. As discussed above, the series will be tested using unit root test. The results show that this series is not stationary at all confidence intervals (1%, 5% and 10%). The test data are presented in table

Following the aforementioned reasoning, the ADF test was applied by considering first differences. Results show that the series of consumer price index becomes stationary, after the first differences are considered, and thus the series is integrated in the first degree or I (1) for all confidence intervals. The result are presented in table 8.

Table 7

Null Hypothesis: ICK has a unit root				
Exogenous: None				
Lag Length: 10 (Automatic - based on SIC, maxlag=10)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test			**4.84118**	1
Test critic	1% level		-2.61203	
	5% level		-1.94752	
	10% level		-1.61265	
*MacKinnon (1996) one-sided p-values.				

Table 8

Null Hypothesis: D(ICK) has a unit root				
Exogenous: None				
Lag Length: 0 (Automatic - based on SIC, maxlag=10)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test			**-5.20796**	0
Test critic	1% level		-2.60475	
	5% level		-1.94645	
	10% level		-1.61324	
*MacKinnon (1996) one-sided p-values.				

Imports of goods included in "Food, drinks and tobacco" category

For the purpose of this study we did not considered the series of total imports but only those of "Food, drinks and tobacco" (to avoid the effects of other import components). Time series refers to the 2007 - 2012 period, published by Institute of Statistics in Albania, on quarterly basis. ADF test shows that the series is not stationary in level at all confidence levels considered. The test data are presented in table 9.

We apply the ADF test but in first differences in manner to judge on its stationarity. Empirical results show that the series is stationary in first difference, so we can say that it is integrated in the first degree, or I (1). The result are presented in table 10.

Table 9

Null Hypothesis: IMP has a unit root				
Exogenous: Constant				
Lag Length: 2 (Automatic - based on SIC, maxlag=10)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test			**-2.17849**	0.2162
Test critic	1% level		-3.54821	
	5% level		-2.91263	
	10% level		-2.59403	
*MacKinnon (1996) one-sided p-values.				

Table 10

Null Hypothesis: D(IMP) has a unit root				
Exogenous: None				
Lag Length: 1 (Automatic - based on SIC, maxlag=10)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test			**-9.8062**	0
Test critic	1% level		-2.60544	
	5% level		-1.94655	
	10% level		-1.61318	
*MacKinnon (1996) one-sided p-values.				

New loans aproved for "Agriculture, hunting and forestry" sector

Data on new loans approved by sectors of the economy are available on a monthly basis published by the Bank of Albania. Data are expressed in million leks and are available for the 2007-2012 period. By testing the series stationarity it resulted that it presents different outputs according to confidence interval considered. At confidence interval of 1%, the series is not stationary. While, for the confidence level of 5% and 10% the series is stationary. Taking into account other studies in the credit area, we can conclude that the new loan given to the "Agriculture, hunting and forestry" sector is not stationary in level. The test data are presented in table 11.

Same as above, the results after applying ADF test in first differences (which appear to be stationary) are presented in table 12.

Table 11

Null Hypothesis: KRE has a unit root				
Exogenous: None				
Lag Length: 1 (Automatic - based on SIC, maxlag=10)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test			**-2.3539**	0.0191
Test critic	1% level		-2.60475	
	5% level		-1.94645	
	10% level		-1.61324	
*MacKinnon (1996) one-sided p-values.				

Table 12

Null Hypothesis: D(KRE) has a unit root				
Exogenous: None				
Lag Length: 0 (Automatic - based on SIC, maxlag=10)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test			**-13.5654**	0
Test critic	1% level		-2.60475	
	5% level		-1.94645	
	10% level		-1.61324	
*MacKinnon (1996) one-sided p-values.				

The real GDP of "Agriculture, hunting, forestry and fishing" sector.

The series is available on quarterly basis and is changed in monthly basis using an interpolation method (the quadratic match – average). This way we use the same interpolation method that was used for the "price index of domestic production" series. The stationary tests show that the series is not stationary in level. The test data are presented in the table 13.

The results after applying ADF test in first differences (which appear to be stationary) are presented in table 14.

In conclusion, all the data series considered resulted not to be stationary in level. They become stationary in first difference, so they are integrated in first degree or I (1).

Table 13

Null Hypothesis: PBB has a unit root				
Exogenous: None				
Lag Length: 10 (Automatic - based on SIC, maxlag=10)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test			**3.99865**	1
Test critic	1% level		-2.61203	
	5% level		-1.94752	
	10% level		-1.61265	
*MacKinnon (1996) one-sided p-values.				

Table 14

Null Hypothesis: D(PBB) has a unit root				
Exogenous: None				
Lag Length: 9 (Automatic - based on SIC, maxlag=10)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test			**-2.84241**	0.0054
Test critic	1% level		-2.61203	
	5% level		-1.94752	
	10% level		-1.61265	
*MacKinnon (1996) one-sided p-values.				

In building our model, the price index of domestic products will be expressed as a function of the variables considered. Also it was considered appropriate and it resulted statistically significant the inclusion of a moving average term.

dlog(icp) = f { dlog(cre_buj(-1)) dlog(pbb_bujq(-12)) dlog(ick_ush(-6)) ma(6) ar(1) dlog(imp(-3))}

In the above equation, the respective coefficients are replaced:

DLOG(ICP) = -0.000832542804635*DLOG(CRE_BUJ(-1)) +
0.00889180870686*DLOG(PBB_BUJQ(-12)) +
0.0438567051876*DLOG(ICK_USH(-6)) -
0.00391477385678*DLOG(IMP(-3)) +
[AR(1)=0.688869541216,MA(6)=0.999834549111,BACKCAST=2009M02,
ESTSMPL="2009M02 2012M12"]

The model was built and refined using software-Views and the results are shown below:

Dependent Variable: DLOG(ICP)
Method: Least Squares
Date: 05/29/14 Time: 15:56
Sample (adjusted): 2009M02 2012M12
Included observations: 47 after adjustments
Convergence achieved after 26 iterations
MA Backcast: 2008M08 2009M01

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(CRE_BUJ(-1))	-0.000833	0.000318	-2.620288	0.0123
DLOG(PBB_BUJQ(-12))	0.008892	0.003598	2.471596	0.0177
DLOG(ICK_USH(-6))	0.043857	0.018906	2.319668	0.0254
DLOG(IMP(-3))	-0.003915	0.002005	-1.952858	0.0577
AR(1)	0.688870	0.101889	6.760977	0.0000
MA(6)	0.999835	0.049859	20.05344	0.0000
R-squared	0.712199	Mean dependent var		0.001941
Adjusted R-squared	0.677102	S.D. dependent var		0.009095
S.E. of regression	0.005168	Akaike info criterion		-7.573845
Sum squared resid	0.001095	Schëarz criterion		-7.337656
Log likelihood	183.9854	Hannan-Quinn criter.		-7.484965
Durbin-Watson stat	1.860405			
Inverted AR Roots	.69			
Inverted MA Roots	.87+.50i	.87-.50i	.00-1.00i	-.00+1.00i
	-.87+.50i	-.87-.50i		

The model above explains the effects of the independent variables taken in consideration regarding to the dependent variable the “Price Index of domestic products”.

The independent variable, new loans approved for "Agriculture, hunting and forestry" sector affects the prices with one month lag time and is statistically a significant variable in the model. The negative sign indicates that there is an inverse relationship between agriculture product prices and loans approved. The coefficient is relatively low, however important. Theoretically, the increase of loans, increases domestic production and therefore increases the supply for agricultural products. That would lead to a decline in their prices, and vice versa.

The real GDP of "Agriculture, hunting, forestry and fishing" sector, results an important variable and operates with a time lag of 12 months. Theoretically, if the GDP in agriculture would imply revenue generated by this sector, higher incomes will lead to increased demand for agricultural products and, consequently, a higher demand would translate in higher prices. This explains the positive sign of the coefficient although being a low value. In this case, we have to consider problems arising from the interpolation method used to change the frequency of the series.

The Consumer Price Index results statistically significant in the model, and operates with 6 months time lag. Theoretically, a higher inflation rate would harm domestic prices of agricultural products in the country.

The imports of goods included in category "Food, drinks and tobacco" is a variable which also results statistically significant in explaining the performance of domestic prices and operates with three month delay. Growth of imports (higher bid that falls in the domestic market) leads to reduction of prices of domestic products.

The term MA (six months moving average) which results statistically significant is introduced in the model to capture the effects of historical trends and price series. The same stands for the inclusion of AR term (auto regressive model). Both terms result statistically significant and their coefficients are high.

The coefficient "R2" = 0.712 and "Adjusted R2" = 0.677 indicates that 71.2% and 67.7% of the change in domestic product prices is explained from the variables considered in the model. It also shows that there are other variables that can affect the price level but that are not considered in the model.

The Durbin Watson indicator (resulted 1.860405) is used to test whether the model errors are correlated or not. If this indicator is close to the value "2", it means that the model is accurate and errors (residuals) are not correlated with each other. The test on the correlation of errors in the model are also presented in the above table. The model shows that the private sector can finance agriculture with seasonal short-term loans in manner to help increasing loan repayment rates.

Conclusion

Agricultural sector in Albania suffers from lack of information related to the market behavior (individual farmers lack the necessary knowledge on bidders / suppliers in the domestic market, the type and amount of products offered from other farm units; or the lending alternatives that the financial institutions may offer). Thus, partly due to factors mentioned above, the lending structures for agriculture, or financial services in advising farm units are inadequate. Financial institutions are focused more

in attracting farm units as potential savings / deposit clients than financing them. From a survey conducted with 10 banks active in Albania, it resulted that the agricultural sector in the domestic financial market, is strongly supported from one bank. Other banks set aside for agriculture lending about 0-5 per cent of their respective loan portfolios. Banks do not consider farm units as potential borrowers due to the difficulty in assessing agriculture land to be used as collateral, and the higher risk perceived for the agricultural production supply related to the fragility of weather conditions.

To reduce the risk perceived from banks on agriculture lending, a model taking in consideration the seasonality of agricultural product prices was built. The model shows that banking sector can finance agriculture with seasonal short-term loans. This way domestic production is stimulated, imports and prices of agricultural production in the market are reduced. This means that agricultural products will have broad market sales and income realized that will help increase loan repayment rates. But the model itself presents some defficencies as the variables used are selected in terms of limited quantitative data and short time series, leaving room for further research in the future.

References:

Salko, D. (2001), Rural financial institutions and financing of farm economies, Economic Bulletin of Bank of Albania, 4 (1), 10 – 11.

Meyer, R. (2014), Innovative microfinance: potential for serving rural markets sustainably, Finance for Food, 91-92, http://link.springer.com/chapter/10.1007%2F978-3-642-54034-9_5. Published January 1, 2014. Accessed March 10, 2014.

Ministry of Agriculture, Rural Development and Water Management (2014): http://www.bujqesia.gov.al/al/lajme/statistika/statistikat-bujqesore-te-vitit-2012. Accessed October 1, 2014.

Zeller, M. (2003), Rural finance institutions and systems – models of rural financial institutions, Broadening Access and Strengthening Input Market System, 14, http://www.microfinancegateway.org/sites/default/files/mfg-en-paper-models-of-rural-financial-institutions-2003.pdf. Published January 2003. Accessed March 10, 2014.