

The Association between Access to Finance and Agricultural Productivity: Evidence from Southwest Oromia Region, Ethiopia

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Abstract - *Improving agricultural productivity is an important policy direction where agriculture represents an important sector in the economy. However, the impact of access to finance on agricultural productivity is still controversial. The main objective of this study is to examine the association between accesses to credit and agricultural productivity using evidence from smallholder farmers in southwest Oromia region, Ethiopia. For this purpose, 400 sample respondents were selected from three zones in southwest Oromia to collect data and chi-square test were used to see the association between access to finance and agricultural productivity. The study found that farmers who have accessed credit both from formal and informal sources have improved their productivity. However, the effect of access to informal credit was found to be stronger as compared to the effect of credit from formal financial sources.*

Keywords: *Access to finance, agricultural productivity, west Oromia*

INTRODUCTION

Agriculture remains the main economic activity and employs the majority of the people in most African countries. Experts estimate that agricultural production must increase by 50 percent to feed an estimated population of 1.3 billion Africans by 2030. Currently studies show that more than a quarter of Africans are below poverty level out of which smallholder farmers comprise half of these people. The main reasons that Africa cannot feed itself though the majority of its people are occupied with agriculture is because farmers lack access to modern farming inputs like selected seeds, fertilizers, insecticides, fungicides and other agricultural technologies mainly because of lack of access to finance and absence of proper marketing channel for their agricultural outputs [1].

Ethiopia is one of the largest countries in Africa both in terms of land area (1.1 million km²) and

population (100 million). Ethiopian economy is based mainly on agriculture which provides employment for 85 percent of the labour force and accounts for 37 percent of the GDP and about 90 percent of export revenue [2]. However, Ethiopian agricultural sector is also facing the same problems similar to its African brothers and sisters which forced the current government to make economic reforms in 1992.

In 1992, the current government of Ethiopia has introduced a several types of reforms aimed at enhancing macroeconomic stability, speedup economic growth, and reducing poverty [3]. Central to all of the economic reforms of the country was Agricultural Development Led Industrialization policy (ADLI); enacted in the belief that agricultural sector can serve as the driving force for the rest of the economy. In ADLI, it is hoped that growth in agricultural sector ultimately leads to growth in the country cognizant of the fact that majority of the people resides in rural areas where agriculture is the main means of life. The policy was aimed at exploiting the country's labour force and land with modernization of the agriculture sector thereby increasing agricultural productivity. It was believed that the surplus agricultural product would provide the industry a cheap source of raw material, while the demand for industrial goods would increase for agricultural inputs and consumption [4].

Most of the agricultural activities in Ethiopia are undertaken by smallholder farmers. Smallholder farmers produce 94 percent of the food crops and 98 percent of the coffee which is the leading export product. Private and state mechanized farms produce only six percent of food crops and two percent of the coffee grown [5]. This indicates to what extent smallholder farmers are the key in enhancing agricultural growth and consequently to the overall economic growth. Smallholder farmers are increasingly being recognized as important contributors to enabling global food security.

Some researchers argue that access to finance is the most critical factor for the use of improved agricultural inputs and technologies. They further argue that access to finance provides funds for farm investments, improve post-harvest management, enable better access to markets and promote better management of risks. Access to finance can also play an important role in climate adaptation and increase the resilience of agriculture to climate change, thus contributing to long term food security.

On the other hand, other researchers argue finance is not everything. They further state that finance alone does not bring the required change in farm productivity if the associated commitment is not there among smallholder farmers. Some farmers will tend to use credit from financial institution for consumption purpose instead of purchasing agricultural inputs such as fertilizer, improved seeds and insecticides. This indicates that access to finance whether it is from formal or informal sources has a controversial role.

The authors have undertaken a survey research on the topic “Financial and Marketing Challenges of Smallholder Farmers: A Study on Members of Agricultural Cooperatives in Southwest Oromia” in the academic year 2016/17. The objective is to identify the bottle necks surrounding smallholder agriculture in the country and provide appropriate suggestions for solving them. This article is part of the above mentioned study specifically aimed to shed light on the role of access to finance on agricultural productivity taking evidence from developing country, Ethiopia. To achieve this purpose, the remaining part of this paper is structured as follows. Section two explains the research problem, section three reviews related literatures. Section four presents the research design and methodology adopted in the study. Section five presents the result, analysis and discussion and finally section six concludes the paper.

RESEARCH PROBLEM

In many rural areas of developing countries, significant part of the population lives below poverty level. Improvement in their levels of income and welfare strongly depends on possibilities for creating value added opportunities from agricultural production. Smallholder farmers are increasingly believed as main players to enabling global food security. However, smallholder production is fraught with several challenges including lack of access to finance and markets. Getting access to finance to purchase inputs like seeds and fertilizer, invest in machinery, and pay for transport to sell outputs is a challenge that

smallholder farmers face every harvest season. This problem is critical in Ethiopia where agriculture accounts 85% of total employment.

Majority of smallholder farmers in Ethiopia cannot implement improved agricultural technologies out of their own pocket. They need credit to finance agricultural input and implement new technologies. It is believed that agricultural credit makes traditional farming more productive through the purchase of farm equipment and other agricultural inputs. Credit can also be used as an instrument for market stability. Rural farmers can build their bargaining power by enabling them to have storage facilities and providing transport system. Credit can further be used as an income transfer mechanism to remove the inequalities in income distribution among the small, middle, and big farmers. In general, it is argued by some that access to credit will enhance farm productivity.

On the other hand, other researchers argue that credit alone does not bring the required change in productivity. It should be accompanied by awareness creation, entrepreneurial development and commitment for growth by the smallholder farmers. They further argue that, Credit obtained from financial institutions can be used to cover consumption deficits of farm households instead of being used for enhancing productivity. Especially in Ethiopia, where there are significant numbers of household, who cannot cover their daily bread, giving access to finance has only the role of covering short term consumption requirement [6].

Hence, although access to finance is believed to bring agricultural productivity by some, other evidences shows that it will be used only for daily consumption. On the other hand, to our knowledge, there is no sufficient evidence that show the practice in developing country. Therefore, it essential to clarify the controversy on the issue by using evidence from developing country like Ethiopia. The main objective of the study is therefore, to investigate the association of access to finance and agricultural productivity using evidence from west Oromia region, Ethiopia. Specifically, this study examines the relationship between access to cooperative credit and agricultural productivity; investigates the association between access to MFI credit and agricultural productivity; and studies the link between access to informal credit and agricultural productivity

LITERATURE REVIEW

Theoretically, productivity is concerned with producing output efficiently and it specifically

addresses the relationship between output and the inputs. Productivity is a measure of an overall efficiency and effectiveness of productive units computed as a ratio of output to the corresponding inputs used. Therefore, agricultural productivity could be defined as the ratio of output to inputs in relation to fertilizers, improved seeds, labour and technology employed in agriculture. Specifically, in agriculture, productivity can be increased by using agricultural inputs such as fertilizer, selected seeds, pesticides and labourers [7].

However, measuring productivity accurately as defined above is very difficult for smallholder farmers for the following reasons. First, smallholder farmers do not have the habit of keeping proper record of inputs and outputs related to their farming activity for long years and it is very difficult for them to recall back everything accurately in quantitative terms. Second, farm productivity will be affected by other uncontrollable external factors such as weather and climate condition. Third, the price of output is determined by the market and it is out of control of the smallholder farmers. As a result of the above mentioned reasons, different researchers have used farmer's perception to measure agricultural productivity. From experience, farmers can tell the increase or decrease in productivity over some years.

Providing smallholder farmers with access to credit is essential to get long-term, sustainable gains in farmer productivity. Without access to finance, smallholder farmers cannot afford the relatively high price of seed and fertilizer and rely instead on poor quality seed and little to no fertilizer. Without access to credit, they may be unable to purchase farm equipments that increase efficiency and reduce labour costs. In addition, they may not be able to afford the training services needed to maximize seed and fertilizer application and general farm management. In general, different types of agricultural inputs require sufficient sources of finance at appropriate time. Therefore, access to adequate finance is believed to enhance agricultural productivity. Increased access to finance combined with support from agricultural experts has increased smallholder productivity [8].

Smallholder farming practices are not productive because smallholders typically lack access to resources for optimal inputs, such as high-performing seeds, fertilizer, irrigation, and machinery. Smallholders typically lack financial literacy. Poorly defined property rights often prevent the use of cultivated land as collateral. The cost of credit in developing countries is high, especially the cost of long-term credit

appropriate to capital investments. Without access to financial sources, most farmers are confined to limited inputs and methods, and therefore to low productivity [8]. International Financial Corporation (IFC) [9] argue that the scarcity of long-term financing for investing in fixed assets and cash crops with long gestation periods is an often-cited factor decreasing productivity of smallholder farmers.

Access to credit allows smallholders farmers to participate on more equal level with larger commercial enterprises and therefore gain better prices for their yields [6]. Farmers who produce more consistently at higher yields with better quality will reduce upstream risks for buyers and other value chain actors. By increasing productivity, smallholder farmers can play an important role in meeting the demand for commodities in local and global markets. Microcredit may enable small and marginal farmers to purchase the inputs they need to increase their productivity, as well as financing a range of activities adding value to agricultural output. Rural financial services help the poor, low-income households increase their incomes, and build the assets that allow them to mitigate risk, plan for future, increase food consumption, invest in education, and other lifecycle events.

Zeller *et al.* [10] argue that access to credit affects household welfare outcomes through two pathways. The first is through the alleviation of the capital constraints and thus encouraging the adoption of labour-saving, higher-yielding technologies and therefore increasing land and labour productivity. The second pathway through which access to credit affects household welfare is by increasing household's risk-bearing ability and by altering its risk-coping strategy. This indicates that access to credit may not have a direct impact on productivity, but it could have a significant positive indirect impact through its influence on agricultural technologies adoption, increased capital for farm investment, hired labour, and improved household welfare.

In addition, Feder *et al.* [11] argued that credit allows farmers to satisfy the cash needs induced by the production cycle which characterize agriculture; land preparation, planting, cultivation, and harvesting are typically done over a period of several months in which very little cash revenue is earned, while expenditure on materials, purchased inputs, and consumption need to be made in cash. Thus, access to credit affects farm productivity because farmers facing binding capital constraints would tend to use lower levels of inputs in their production activities compared to those not constrained.

For many smallholder farmers, lack of access to financial services is one critical constraint to the establishment of viable agricultural business. Lack of adequate access to credit have had significant negative consequences for various aggregate and household-level outcomes, including technology adoption, agricultural productivity, food security, nutrition, health, and overall household welfare.

Though many studies documented the theoretical explanation how lack of access to credit hurt agricultural productivity, a study by Foltz [12] found a much more convincing arguments. The study argued that constraints to credit can influence level of farm profits and farmer's resource allocation decisions. Credit constrained farmers will not be able to smooth their expenses over time implying that they will not make long-term investments. Farmers without adequate capital cannot invest in a new technology irrespective of that technology's potential benefit [13].

There are some studies on the impact of credit rationing on agricultural productivity or efficiency in Ethiopia. For instance, a study by Matsumoto and Yamano [14] evaluated the impact of fertilizer credit on crop choice, crop yield, and income using two-year panel data of 420 households in rural Ethiopia. Fertilizer credit is found to increase input application for crop production. They found that credit access increases inorganic fertilizer consumption by 35 kilograms per household. They also tried to show the crop specific impact of access to fertilizer credit, arguing access would increase the yield of teff by 37 and do nothing on maize and wheat crops. They tried to explain this variation by the presence of low adoption rates of high-yielding varieties of maize and wheat, even among those households who receive the fertilizer credit. They finally argued that fertilizer credit programs are effective only with better responsiveness of households to high yielding crop varieties. They also partly argued that adoption of fertilizer depends on the profitability of the crop under consideration. The more the crop is highly demanding in the market the more will be the willingness of households to adopt high yielding varieties simultaneously with high propensity to fertilizer credit [13].

The study by Komicha [15] used a survey of 240 households from Merti and Adamitullu Jido Kombolcha districts in Oromia regional state of Ethiopia. The study further tries to show the impact of credit constraints on technical efficiency of farmers and uncovered a 12 percent efficiency gap between constrained and unconstrained households. It also showed a positive correlation between loan size and

level of agricultural productivity. Further, World Bank economists, Ali and Deininger [16], studied the causes and implications of credit rationing in two zones of Amhara region. Under their study a survey of 1,587 households were exploited. The studies dealt with credit rationing of rural households in the semi-formal sector alone. The study found an 11.4 percent productivity gap between constrained and unconstrained households. Therefore in this study, it was hypothesized that access to credit positively affects the productivity of smallholder farmer.

METHODS

This study is designed to investigate the association between access to finance and agricultural productivity. Thus, descriptive method is viewed as an appropriate research design for the study. The researchers used methods of collecting and analyzing data using both quantitative and qualitative approaches.

This study is based on a sample of smallholder farmers who are members of cooperatives selected from the three zones in south western oromia regional states. The total rural population of the three zones is 4,351,063. Assuming that there are five family members on average in a given house hold, the total number of households expected are 870,213 ($4,351,063/5$). This number of households is the target population for the study. In order to determine sample size for this study, the following estimates are made. According to the information from Jimma and Illu Ababa Bora Zones cooperative agencies, there are above 1,000 primary cooperatives in the three zones. A multi stages sampling procedure were adopted to select 400 sample respondents for the study. First, eight administrative districts which have sufficient number of cooperatives were purposely selected. The districts selected were four districts from Jimma zone, two districts from Buno Bedele Zone and two districts from Illu Aba Bora Zone. Second, two primary agricultural cooperatives from each districts were randomly selected and finally 25 smallholder farmers were randomly taken from each agricultural cooperatives for structured interview.

Data for this study were collected both from primary and secondary sources during 2016/17. Survey instrument was designed and used taking into account the limited level of education of the respondents. The Interview questionnaire includes information on access to finance & marketing issues and household & farm characteristics such as age, gender, education, family composition and farm size, agricultural yields, household income, loans and credit provisions. The

questioner was prepared considering all the variables to be analyzed and using questionnaires of similar researches conducted in other parts of the country.

In addition to primary data, secondary data pertaining to the study were collected from CSA, regional, zonal and district cooperatives promotion agencies. These include population statistics, list of members of the selected primary cooperative agencies, rules, regulations and working procedures related to cooperatives in the region. After collecting primary and secondary data, descriptive statistical tools were used for analysis purpose. We have asserted that one of the main leading objectives of the study is to show if there is any considerable effect of access to credit on agricultural productivity of the smallholder farmer. To test this assertion, Chi-square test of association was used to investigate whether significant relationship prevails between the two variables.

RESULT AND DISCUSSION

Microfinance institutions and cooperatives are formal financial sources that reach a large number of rural poor who are not served by the conventional commercial banks. Especially MFIs that are operating in the study area include Oromia Credit and Saving Share Company (OCSSCO), Harbu Microfinance Share Company, Eshet Microfinance Share Company etc. Respondents were requested to mention their source of finance when they start agriculture for the first time. 72.5 percent and 27.50 of the smallholder farmers replied that they used previous saving and inheritance from family as initial source of capital for starting agriculture respectively. Smallholder farmers rarely use bank loan and machine lease as a source of capital.

After starting agricultural activity, farmers need source of finance for purchase of agricultural inputs and for further expansion of their agricultural activity. These sources of finance include credit from cooperatives and Microfinance institutions. Specifically, the 2004 cooperative credit regulation of Oromia region states that cooperatives can grant the following three types of credit to their members. A short term credit of maximum amount Br.1,500 that should be repaid within a year, a medium term credit of maximum amount Br. 5,000 that should be repaid within three years and a long term credit of maximum amount Br.7,000 that should be repaid within five years. Each of these credits should be used for short, medium and long term agricultural investment respectively so that borrowers will payback within the specified time period. Respondents were also requested whether they

have obtained any credit from cooperatives or Microfinance institutions after starting agriculture and the survey result revealed that only 31.5 percent and 25.5 percent of respondents have requested and succeeded in getting credit from cooperatives and MFIs respectively. Further questions were raised for what purpose they have used the credit. Table 1 below summarizes the result for this question.

Table 1: Use of Credit obtained from Cooperatives or MFIs

For what purpose have you used the credit?	percent
Purchase of farm inputs	41.25%
Purchase of farm Oxen	28.25%
Payment for daily labourer	2.50%
Purchase of fixed asset including land	1.50%
Payment for daily consumption	0.75%

Source: Survey Data

As can be seen from table 1 above smallholder farmers used the credit obtained from cooperatives and MFIs mainly for purchase of farm inputs and agricultural oxen. The use of credit from formal source for consumption, purchase of farm equipment and payment to daily labourers is very rare. Specifically, Cooperatives play a more significant role in providing agricultural inputs on credit. This result is similar with the finding by Zewdie [13] in which informal credit is mainly used for consumption-smoothing purposes while formal credit is sought and used mostly for purchasing agricultural inputs.

Informal credit is another main source of informal finance for smallholder farmers. It refers to loans that suppliers extend to their customers upon product purchase or any credit from local friends, trade man, landlords etc. Respondents were asked whether they have taken any credit from these informal sources and the associated reasons for doing so. The following table 2 summarize the result of the survey.

Table 2: Taking Credit from Informal Sources and the Associated Reasons

Have you taken credit from informal creditors?	%	Reasons for taking informal credit	%
Yes always	0.75	Willingness to grant credit	7.61
Yes sometimes	45.25	Easy to obtain	58.15
Not at all	39.75	My Being regular Client	3.26
		No collateral is required	23.91

Source: Survey Data

As can be seen from table 2 above, significant percentage of smallholder farmers take credit from informal creditors. The source of credit consists of those farmers who are better-off, tradesmen, and rarely government employees. The transactions are creditors provide cash advance before the crop is harvested and borrowers are then expected to repay in cash or most of the time in kind based on previous commitment made with the lender. Smallholder farmers are further requested the rate of growth of their agricultural productivity. The result of the survey is summarized in the figure 1 below.

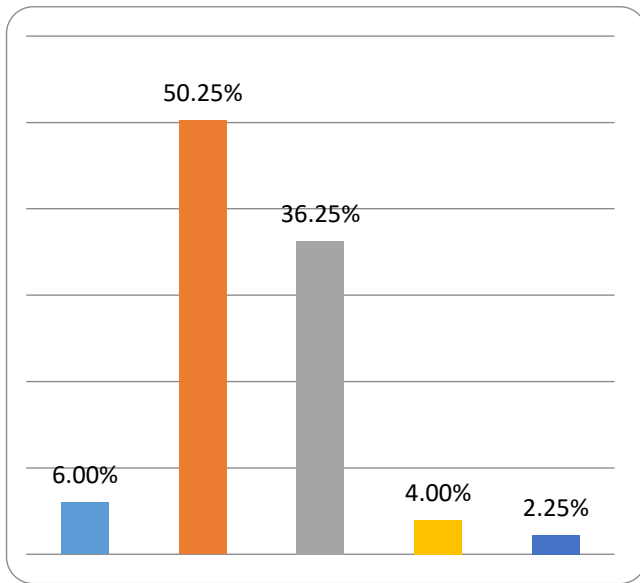


Figure 1: Growth of agricultural productivity of Smallholder farmers

Figure 1 shows the majority of smallholder farmers claim that their agriculture productivity is showing at least slow growth. Only very few of them complained that agricultural productivity has remained the same or declining. The above result might be because of the

high emphasis given by the current government in terms of Policy. The policy that the current government is following is agricultural lead Industrialization (ADLI) which gives priority to agriculture.

In theory, access to adequate finance is believed to enhance agricultural productivity of smallholder farmers. Without having adequate finance, smallholder farmers cannot afford the relatively high upfront costs of quality seed, fertilizer, and insecticide and rely instead on poor quality seed and little to no fertilizer. In order to see the association between access to credit from cooperatives and agricultural productivity, chi square test was used and the result is presented in Table 3.

As can be seen from Table 3, access to credit from cooperatives is significantly associated with agricultural productivity with Chi square equal to 15.408 at significant level of 0.004. The contingency coefficient which shows the degree of association between the two variables is 0.193. This indicates Microcredit from cooperatives enable smallholder farmers to purchase the inputs they need to increase their productivity, as well as financing a range of activities adding value to agricultural output. Access to credit can therefore significantly increase the ability of poor households with little or no savings to acquire agricultural inputs and enhance productivity. This is also the main purpose for which agricultural cooperatives are established throughout the country. This result is in line with the argument of Zeller et al. [10] and Feder *et al.* [11] who stated that access to cooperative credit will enhance agricultural productivity.

Another source of formal finance is credit from MFIs. The association between access to credit from MFIs and agricultural productivity was investigated using the same chi-square method for the sample respondents in southwest Oromia region and the result is presented in Table 4.

Table 3: Association between Access to Cooperative Credit and Productivity

		Agricultural productivity					Total	Chi square
		Decreasing	The same	Slowly increasing	Moderately increasing	Rapidly Increasing		
Access to credit from Cooperatives	No access	16	16	93	131	23	279	$X^2 = 15.408$ DF= 4
	Have access	11	2	47	60	0	120	
	Total	27	18	140	191	23	399	Sig = .004

Source: Survey Data

Table 4: Association between Access to MFIs Credit and Productivity

		Agricultural productivity					Total	Chi square
		Decreasing	The same	Slowly increasing	Moderately increasing	Rapidly Increasing		
Access to credit from MFIs	No access	20	14	91	145	23	293	$X^2 = 14.208$
	Have access	7	4	49	46	0	106	DF= 4
	Total	27	18	140	191	23	399	Sig = .007

Table 5: Association between Access to Informal Credit and Productivity

		Agricultural productivity					Total	Chi square
		Decreasing	The same	Slowly increasing	Moderately increasing	Rapidly Increasing		
Access to credit from informal sources	No access	11	10	61	105	23	210	$X^2 = 27.323$
	Have access	16	8	79	86	0	199	DF= 4
	Total	27	18	140	191	23	399	Sig = .000

Source: Survey Data

Again as can be seen from Table 4, access to credit from MFIs is significantly associated with agricultural productivity with Chi square equal to 14.208 at significant level of 0.007. The contingency coefficient which shows the degree of association between the two variables is 18.5 percent. This implies availability of MFIs credit to smallholder farmers enables them to obtain the financial means to facilitate the acquisition of productivity-enhancing inputs, such as seeds, fertilizers, chemicals and pesticides, or intensification technologies, and therefore improve their performance.

A similar study conducted by Ali and Deininger [16] in two zones of Amhara region here in Ethiopia found similar finding. The study found that an 11.4 percent productivity gap between those having access to MFIs credit and not having has been observed. The implication is that if smallholder farmers are able to get credit from MFIs, there would be a productivity increase by 11.4 percent. Matsumoto and Yamano [14] also found that access to fertilizer credit would increase the yield of teff by 37%. But they argued that fertilizer credit programs are effective only with better responsiveness of households to high yielding crop varieties.

In addition to the above two formal source of finance, the association between access to credit from informal source such as credit from local traders, friends and relatives and agricultural productivity was investigated using the same chi-square method and the result is presented in Table 5.

As can be seen from Table 5, there is a significant association between accessing credit from informal source and agricultural productivity. The contingency coefficient which shows the degree of association between the two variables is 23.5 percent showing even

a stronger association as compared to formal financial sources. The reason for this can be explained in two ways. First, formal financial sources always involve some amount of interest but informal credit can be obtained interest free. The second reason is in order to get credit from formal source, it takes long time in which the time to purchase agricultural inputs will elapse before getting the credit itself.

CONCLUSION AND SUGGESTION

Improving the production capacity of agriculture in developing countries like Ethiopia through productivity increase is an important policy direction where agriculture represents an important sector in the economy. In this study, we used chi square test to examine the association between accesses to credit and agricultural productivity. The study found that farmers who have accessed credit both from formal and informal sources have improved their productivity. However, the effect of access to Informal credit was found to be stronger as compared to credit from formal financial sources. This might be because; on the one hand formal financial sources always involve some amount of interest whereas informal credit can be obtained interest free. On the other hand, in order to get credit from formal source, it takes long time in which the time to purchase agricultural inputs will elapse before getting the credit itself. In conclusion, access to credit is an important factor in the quest to achieve increase agricultural productivity in spite of its being formal or informal.

This research finding provided consistent conclusion with the literature and it has an important implication for policy makers. By increasing productivity,

smallholder farmers can play an important role in meeting the demand for commodities in local and global markets. Microcredit enable small and marginal farmers to purchase the inputs they need to increase their productivity, as well as financing a range of activities adding value to agricultural output. It further implies reducing the lengthy procedures in the formal financial system will contribute to the enhancement of agricultural productivity. But the study is limited in that, perception was used to measure agricultural productivity and it would have been good if more objective method of measuring agricultural productivity was used. Future studies on the topic should consider this limitation.

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