Government Subsidies Impact Assessment in Albania

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Abstract

This study analyzes the impact of Albanian government subsidy scheme, using a quazi-experimental design by applying Propensity Score Matching Method, based on a structured survey administrated in 2013, focusing on olive and vineyard sectors, on the measures of support for new plantations. The study results show that the government subsidy scheme has had a clear net impact on increasing areas under fruit plantation and production in Albania, but not on farm size. The impact on fruit tree area has not affected farm size, however. However, no major impact has been observed regarding farm employment, crop yield level and product prices.

Key words: Subsidy impact, Propensity Score Matching, Albania

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1. Introduction

1.1. Background of subsidies schemes in Albania

The Albanian national support schemes combine elements of investment support and direct payments intended to increased production in the priority agricultural sectors. Recently actions to support the promotion of rural credits in agro-processing and farm mechanisation have also been introduced.

During 2007 – 2012 almost ALL 6 billion (Euro 43 million) were allocated on various support schemes. The annual total Ministry of Agriculture, Rural Development and Water Management (MARDWA) budget has since 2007 increased with 22 % from ALL 5,264 million (Euro 37.6 million) to ALL 6,418 million (Euro 45.8 million) in 2011. The total support to the agricultural, in 2011, was down to ALL 723 million (Euro 5.1 million), but it increased, in 2012, to a level of ALL 1,120 million or approximately Euro 8 million (MARDWA, 2014).

The support schemes have contributed to an increase of the area under plantation and production growth in several subsectors. More specifically, the area of utilized agricultural land has increased more than 20,000 ha since 2007 consisting mainly due to new fruit plantations. That having said, only 2/3 of the total agricultural land is utilized, which implies that there is need for increased land utilization in the years to come (MARDWA, 2014).

There have been changes from year to year regarding targeted sectors (e.g. initially high priority was given to vineyards while recently support was extended to the cultivation of MAPs too). The main beneficiaries have been farmers who have invested in olive plantations – given that the olive sector has been a priority sector for GoA, this support scheme has received more than 1/3 of the total budget. Other supported sectors include orchards (plantation), agro-food processing, vineyard (plantation) and livestock.

We have chosen to focus our analysis on the olive and vineyards sector. These are among the most important and fastest growing agri-food sectors in Albania. Production of olives has increased significantly the last years. The production in 2012 was about 100,000 ton, which implies a drastic increase compared to 27,600 ton in 2007. After 2007, there was a marked expansion of plantations stimulated by national support schemes, and the number of olives plantations has increased by about 60% since 2007. Also the production of grape has increased significantly by almost 1/3 compared to 2007 (MARDWA, 2014).

Olive sector has been by large the most attractive sector for the support schemes. Olives are followed by orchard plantations and agri-food processing – but these categories are less homogenous for the purpose of our analysis (e.g. it is not feasible to compare yields and other parameters - for example under orchards we have different types of fruit trees with different technical and economic parameters.). Thus, the next "important priority sector" which is feasible within this research scope is vineyards.

The regions of Shkodra and Fier have both received significant share/funding for the plantation of olives and vineyards to the total support schemes budget for each region respectively. For example, more than half (55 %) of the support schemes budget of Fier has been allocated to for olive plantations, while almost 1/3 (32 %) of the support schemes budget of Shkodra has been allocated for olive plantations.

1.2. Study objectives and evaluation questions

The current assignment is a partial impact assessment exercise focussing only on investment support schemes, using the case of olive and vineyard subsectors. Other studies may assess the impact of other support schemes. More specifically, this *study's objectives* are as follows:

1. Assess the outcomes (benefits to direct beneficiaries) of government support policy;
2. Assess the impact (indirect benefits of other beneficiaries) of government support policy;

Evaluation questions (Table 1) specify the study objectives and the hypothesis to be tested.

Table 1: Impact assessment evaluation questions

Chain of results and other issues	Evaluation questions
Outcomes or direct benefit of targeted beneficiaries	– Has government subsidy had any net effect on increased area under fruit trees? Has it affected farm size? – Has government subsidy had any net effect on introducing new technologies? Has it any net effect in crop yield increase – Has government subsidy had any net effect on farmers' productivity increase?
Mobilization of additional resources by targeted beneficiaries	– Has government subsidy had any effect on investment? Has it contributed to mobilizing additional resources from other sources, including other grants, farmers own money, bank loans?
Impact or indirect benefits of other beneficiaries from government subsidy scheme	– Has government subsidy had any net effect on increased demand for inputs both raw materials and advice from extension service and consultancy? Has it had any impact on increased sales to farmers own benefit and to the benefit buyers downstream? – Has government subsidy had any net effect on promoting cooperation among farmers and cooperation with other value chain actors? – Has government subsidy had any net effect on farmers overall status?

The paper is structured as follows: Methods and procedures where data collection, research design and data processing procedure are described, Study results following the logic of evaluation questions, and Summary of findings and recommendations.

2. Methods and procedures

Quasi experimental research design using Propensity Score Matching method has been used to assess the outcome and impact of Albanian investment support schemes, based on impact assessment evaluation questions (Table 1).

2.1. Data

A survey of 256 farmers – 79 treated and 177 not treated with investment grant - has been

conducted. Farmers have been selected randomly. The structured questionnaire has been designed in order to assess outcomes and impact.

2.2. Research design

Quasi-experimental designs using Propensity Score Matching has been used in to create two similar groups from a randomly selected sample, an experiment group and a control group. The groups are formed to be similar in a number of key characteristics, except for treatment. Hence, the difference in outcomes and impact is supposed to be attributed to the treatment. In this study, the key characteristics used to conduct the matching procedure are farmer's age and experience, education, household size, farm size, sector, area; "treatment" refers to having benefited a government subsidy intended to establish fruit tree plantation. For more in depth understanding of Propensity Score Matching procedure, refer to Annex 1: Methods and procedures

2.3. Data processing procedures

In our analysis, we assess – where possible - net treatment effect as a result of double difference – the difference between 2012 and 2008 outcome for treatment and control groups, and the difference between difference of treatment and difference of control group, as visually represented by the Table 2.

Table 2: Net treatment effect

Treated Group	Outcome 2008	Outcome 2012	Δ_1 in Outcome treated = Outcome 2012- Outcome 2008 for treated group
Un treated Group	Outcome 2008	Outcome 2012	Δ_2 in Outcome non-treated = Outcome 2012- Outcome 2008 for treated group
		Net treatment effect = difference of differences	Δ_1 in Outcome treated - Δ_2 in Outcome non treated

Net treatment effect – difference of differences - is measured by running simple linear regressions to find out whether the subsidy has made any statically significant impact. The simple regressions take the following form:

$$Y = \alpha + b_1 * X + b_2 * T + \varepsilon$$

where Y is the post-score of an outcome variable, α is the estimated intercept, X is the pretest score of the same variable, and T is a dummy variable taking value 1 for treatment and 0 for control group. Treatment effects were hence computed as difference in the outcome between treatment and control groups conditional on pre-test score. Actually, the b_2 coefficient associated with T (Treatment) provides a measure of net treatment effect, or difference of differences.

Paired Samples Tests have been run to assess the statistical significance of mean differences between the impact of government subsidy impact and other investment sources impact. Significance lower or equal to 0.05 supports a statistical difference in the impact of government subsidy and other income sources. The positive sign stands for additional impact of government subsidy compared to other investment sources, and the negative sign stands for lower impact of government subsidy compared to other investment sources.

3. Study results

3.1. The similarity of treatment and control group

Quasi experimental study results are generated by analyzing the information collected from 158 farmers, half of them subsidized and half not subsidized. The procedure makes it possible that for each subsidized farmer, a similar non-subsidized farmer – based on several characteristics - has been found (refer to Annex 1: Methods and procedures). The rest of non-treated farmers (98 farmers) have been excluded from analysis since they are not matched.

Members forming the subsidized (treatment) group are similar to farmers forming non-subsidized (non-treatment) group. Farmers are similar on sectors; 80 farmers are olive farmers and the rest, 78 farmers, are vineyard farmers. Farmers in both treatments and control groups are similar in terms household head age. The average age for the household heads included in the survey is 54 years old with almost no difference between subsidized and non-subsidized group. The education level is similar for both groups. The median value for both groups is 4 corresponding to Agriculture high school, and the farmers' distribution through different education levels is similar. Groups are also similar in terms of main employment with Self-employed on farm representing the most frequent main employment. The average farm size for non-subsidized groups is slightly larger than for subsidized farmers – 15.03 versus 14.79 – but when average without outliers (5% trimmed mean) both averages are the same – slightly larger than 14 dynyms.

3.2. Farming, production capacities

Government subsidy has no impact on farm size. The double difference – between subsidized and non-subsidized farmers in two points in time (2012 and 2008) is not statistically significant (significance of coefficient B associated with Subsidy in 2008[1], Table 3).

Table 3: Government subsidy impact on farm size and fruit area

		Farm size in 2012	Farm size in 2008	D Farm Size
			Dynyms	
Subsidy in 2008	Non-subsidized	15.6	15.0	.54
	Subsidized	14.9	14.8	.11
Double difference				-0.43

Table 4: Significance of government subsidy impact on farm size

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.946	.371		2.548	.012
Farm size in 2008	.973	.017	.976	56.741	.000
Subsidy in 2008	-.435*	.377	-.020	-1.154	.250

a. Dependent Variable: Farm size in 2012

[1] Sig > .05 support no significant impact

The two groups have similar farm size in 2008 (Table 3) – the non-subsidized farmers have at the start a farm size of 15 dynyms (1.5 ha) which increases to 15.6 (1.56 ha) dynym in 2012 with a slight increase of 0.54 dynym, while farm size for subsidized farmers remains virtually unchanged.

Though there are signs of land rental market, but this has not affected farm size. In five cases, or 6% of farmers, subsidized farmers have rented land to establish fruit plantations. The area rented is between 0.5 ha and 2.3 ha. Qualitative information from the field interviews supports that land rental market is an opportunity with land managed by rural communes. The rental of private land market for establishing new fruit plantations is a rather unlikely option due to land ownership titles insecurity.

The government subsidy has an obvious impact on cultivated fruit area. The double difference – between subsidized and non-subsidized farmers in two points in time (2012 and 2008) – is 4 dynyms (0.4 ha), Table 5. The difference is statistically significant[2] (Table 6)

Table 5: Government subsidy impact on fruit area

		Total fruit area in 2012	Total fruit area in 2008	D Tot Fruit Area (2012-2008)
		Dynyms		
Subsidy in 2008	Non- subsidized	6.9	3.7	3.2
	Subsidized	10.0	2.8	7.2
Double difference				4.0

Table 6: Significance of government subsidy impact on fruit area

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.103	.625		6.564	.000
Total fruit area in 2008	.751	.079	.592	9.522	.000
Subsidy in 2008	3.763	.784	.298	4.798	.000

a. Dependent Variable: Total fruit area in 2012

The two groups depart on a similar start in terms of fruit area by farm – the fruit area in 2008 was 2.8 dynyms for subsidized farmers and 3.7 for the non-subsidized farmers. The subsidy has clearly impacted the area planted by quadrupling the fruit area between 2008 and 2012 for the subsidy beneficiaries. There is also an increase in fruit area for non-subsidized farmers but at a significantly lower pace. The fruit area for non-subsidized farmers has only doubled between 2008 and 2012. The government impact subsidy has also a clear impact on *increased number of trees*. The significant impact of government subsidy on increasing number of trees is in line with the finding that the area under plantation has increased.

3.3. Resource mobilization and plans to invest

Government subsidy has a significant impact on resource mobilization, as supported by resource mobilization ratio – investment amount divided by subsidy amount. The resource

[2] Sig > .05 support no significant impact

mobilization ratio is 2.227, meaning that average investment for subsidized farmers is more than twice government subsidy average, or for each ALL subsidized, farmers have managed to mobilize additional ALL 1.227. Quite important differences exist however in resource mobilization ratio between sectors included in the survey. The mobilization ratio for vineyard (2.6) is significantly higher than for olive sector (1.9).

The resource mobilization as described above is not found among all beneficiaries farms. In 20 cases, or 25% of subsidized farmers, the resource mobilization ratio is only 1 or close to 1, supporting that there is no any additional resources mobilized.

Government subsidy impact of promoting investment is also supported by farmers' statements "whether they would have invested without government subsidy". More than half of subsidized farmers (52% - valid percent) state that would have not invested without government subsidy (Table 7).

Table 7: Would you have invested without government subsidy?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	36	45.6	48.0	48.0
	No	39	49.4	52.0	100.0
	Total	75	94.9	100.0	
Missing	0	4	5.1		
Total		79	100.0		

Source: Field survey

Government subsidy has also motivated farmers to invest in the future. More than ¼ or subsidized farmers (28.9% valid percent), state that they have plans to invest in the near future The part of subsidized farmers having plans to invest is not significantly different from the part non subsidized farmers, however – they are virtually the same. This may be interpreted as motivation of non-subsidized farmers to invest after learning from positive experience of subsidized farmers.

It is important to mention that *farmers clearly associate their future plans to invest with the impact of government subsidy* (Figure 1). On a scale 1 (weak impact) to 5 (very strong impact), 71% of farmers state that government subsidy has a strong and very strong impact in future plans to invest.

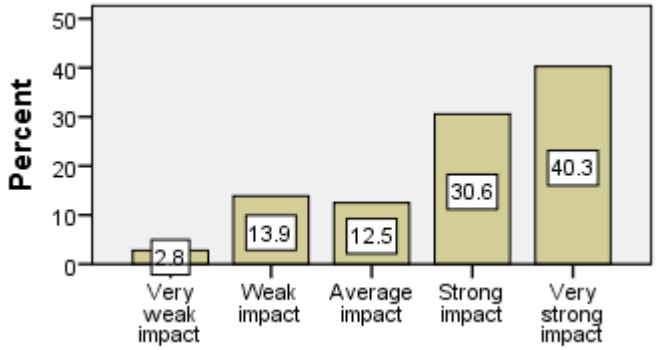

Figure 1: Government subsidy impact on future plans to invest.

Source: Field Survey

Though the government subsidy has an obvious impact on future plans to invest, the impact is not significantly more important in motivating future investment than the impact of own money availability and money coming from remittances. The significance associated with

pair government subsidy - own money and government subsidy – remittances support that the difference in impact is not significantly different.

The government subsidy has however a significantly higher impact in motivating future investment compared to bank loan. High cost of capital and difficulties in accessing commercial loan are among the reasons in the origin of inferior impact associated with bank loans.

Farmers' statements support that government subsidy has a strong impact on applying for other grants. On a scale 1 (weak impact) to 5 (very strong impact), four in five farmers (80.2%) state that government subsidy has a strong and very strong impact on their capacity to apply for other grants (Figure 2).

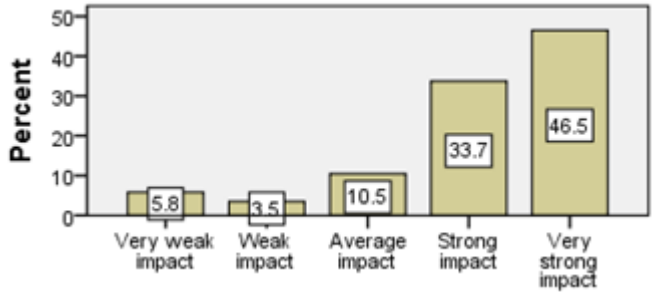

Figure 2: Government subsidy impact on applying for other grants
Source: Field Survey

Government impact on applying for loans is weak. Slightly less than four in five farmers state that government subsidy impact on applying for other loans is very weak and average.

3.4. Technology adoption

Government subsidy impact in introducing new technology is limited. Subsidized famers - as a rule – use common technology in terms of cultivars, plant protection materials, pesticides, and machinery, including spraying pumps.

Only in anecdotic cases, farmers state to have introduced new cultivars and the difference between subsidized and non-subsidized farmers is not significant. The government subsidy impact in terms of grape variety mix production remains therefore limited.

The impact of government subsidy on introducing drip irrigation[3] is negligible when compared to investment in drip irrigation technology by non-subsidized group. While one in four non-subsidized farmers have introduced drip irrigation in fruit orchards, the part of subsidized farmers having introduced drip irrigation is only is 16% - significantly lower compared to non-subsidized group.

Common plant protection materials and fertilizers are used both by subsidized and non-subsidized farmers with only limited number having reported any new types of pesticides or fertilizer but not falling necessarily into subsidized group of farmers. The agricultural machinery, including spraying technology, is quite the same for both subsidized and non-subsidized farmers; and it is common technology.

Overall, the impact of government subsidy on new technology introduction is significantly lower than the impact of own money farmers spent to create new fruit plantations, as supported Paired Sample Test (comparison of government subsidy impact with farmers' own

[3] Though not innovation any more, the drip irrigation is still limited and therefore is considered a new technology

money impact in terms of technology introduction. It may be argued that one reason in the origin of such a phenomenon might be the "moral hazard"- farmers tend to make less sound investment when they do not have to pay the full cost of investment. Qualitative information supports that, in some cases, farmers benefit the subsidy and do not care very much about fruit plantations afterwards; in extreme cases that neglect the fruits tree plantations. New investigation is needed however to shed light on inferior impact of government subsidy in terms on new technology introduction.

3.5. Production and yields

Government subsidy has a significant net impact on fruit production, for both olive and vineyard sector. The net subsidy impact measured by double difference is 16.9 kv (1.69 Ton) per farm for olive sector and 42.3 kv (4.23 Ton) per farm for vineyard sector (Table 8). The net impact is statistically significant.

Table 8: Government subsidy impact on fruit production

	Sector					
	Olives			Vineyard		
	Production 2012	Production 2008	Diff. Production	Production 2012	Production 2008	Diff. Production
	Average (kv)					
Non- subsidized	14.5	6.7	7.87	101.5	38.9	62.58
Subsidized	29.3	4.5	24.78	120.8	15.9	104.88
Double difference			16.9			42.3

Source: Field Survey

If one compares the government subsidy impact on fruit tree areas and fruit production, it comes out that the impact on production is less obvious than the impact on increasing cultivated area, particularly in vineyard sector. The "picture" of subsidy impact on production is blurred by unclear impact of yields.

Government subsidy has a "blurred" impact on crop yield in studied sectors. Though the data in Table 9 (last raw: Double difference) shows that there is a net positive impact in the case of both crops (3.09 Ton per ha for Olives and 1.39 Ton per ha for vineyard), the One way ANOVA inform that this net impact is not statistically significant, meaning the difference may be due to chance.

Table 9: Government subsidy impact on yields

		Sector					
		Olives			Vineyard		
		Yield 2012	Yield 2008	Diff. yields	Yield 2012	Yield 2008	Diff. Yields
		Average (Kv per ha)					
Subsidy in 2008	Not subsidized	6.25	9.17	-2.92	13.42	16.00	-2.58
	Subsidized	4.14	3.98	.17	9.97	11.16	-1.19
Double difference				3.09			1.39

Source: Field Survey

While farmers massively state that government subsidy has had strong to very strong impact on increased yield, a comparative analysis – using Paired Sample Test - to look at the impact of government subsidy versus farmers' money impact on yield increase inform on a clear inferior impact of first source of investment (government subsidy) on the second (farmers' own money).

The limited impact of government subsidy on yields may be considered jointly with analysis on technology adoption (refer to Technology adoption) to explain unclear impact of subsidy on crop yields.

3.6. Employment and productivity

Government subsidy does not have any significant impact on increased farm employment. Survey results show that there is not any net impact in terms of both part time and full time farmers working on the farm. Since reported full time on farm employment is anecdotic, the results of part employment are discussed below.

Net impact of government subsidy, measured by double difference indicator (Table 10) is quite small though slightly different for olive and vineyard sector.

Table 10: Government subsidy impact on farm part time employment

		Olives			Vineyard		
		PT farmers in 2012	PT farmers in 2008	Diff PTF	PT farmers in 2012	PT farmers in 2008	Diff PTF
		Average part time workers per farm					
Subsidy in 2008	Not subsidized	2.44	2.25	.19	2.88	2.81	.06
	Subsidized	2.00	1.78	.22	3.53	3.32	.21
Double difference				0.03			0.15

*PT stands for part time Source: Field Survey

The difference in impact for subsidized and non-subsidized farmers is statistically insignificant (Table 11: significance associated with Subsidy in 2008). The non-significance should be interpreted as a net impact that may be due to chance.

Table 11: Significance of government subsidy impact farm part time employment

		Un-standardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
Olives	(Constant)	.399	.266		1.501	.147
	PT farmers in 2008	.906	.103	.886	8.763	.000
	Subsidy in 2008	-.010	.219	-.004	-.044	.965
Vineyard	(Constant)	.008	.212		.036	.972
	PT farmers in 2008	1.020	.056	.949	18.052	.000
	Subsidy in 2008	.138	.192	.038	.719	.478

a. Dependent Variable: F3. Part time farmers in 2012
Source: Field Survey

The average number of part time farmers in the olive sector in 2008 was 1.78 and it increased to 2 part time farmers in 2012 (Table 10). The increase on average by 0.22 part time farmers is quite important but it is probably not due to subsidy – but to other factors – since the number of part time farmers' increases at almost the same pace for non-subsidized farmer. Similar pattern is observed in vineyard sector. The average number of part time farmers in vineyard sector in 2008 was 3.32 and it increases to 3.53 part time farmers in 2012 (Table 10). The increase by 0.21 is quite important. In case of vineyard, the net impact is larger – 0.15 part time farmers – but still it is not statistically significant.

The indicator of the total time worked on farm support the conclusion that government subsidy has not had any significant impact on employment increase. In olive sector, subsidized farmers spent more time than non-subsidized ones but the inverse is true for the vineyard sector, where subsidized spent less time than non-subsidized ones (Table 12).

Table 12: Total time work on farm

		Total time worked on the farms (months)		
		Olives	Vineyard	Difference Mean vineyard -mean olive
		Average (Months)		
Subsidy in 2008	Not subsidized	13.78	18.28	4.50
	Subsidized	16.24	17.16	0.93
Difference		2.45	-1.12	

Source: Field Survey

One way ANOVA informs however that the average time spent by subsidized and non-subsidized farmers is not statistically different; using the same method (ANOVA) the average time spent is not statistically different for olive and vineyard sector.

The government subsidy impact on productivity is methodologically "challenging" and therefore some precaution is advised when interpreting the following results. The assessment of government subsidy impact on farmers' productivity is difficult for number of reasons, including difficulties in assessing intermediate consumption, difficulties in assessing number of full time workers, and other difficulties in assessing yields and product prices.

Despite the above methodological difficulties, income from olive and vineyard activity has been assessed dividing income (quantity produced multiplied by product prices) with full time employed on the farm (total time spent divided by 12).

Though a sound assessment of government subsidy net impact on productivity – and even income per full time worker – has not been possible, it comes out that subsidized farmers have higher income per full time worker than non-subsidized farmers in both olive and vineyard farmers. The average income per farmer for 2012 was ALL 610,011 (Euro 4357); the average income for non-subsidized farmers was ALL 449,335 (Euro 3,209) and for subsidized was ALL 768,216 (Euro 5,487). The income per full time worker is much higher in vineyard than in olive sector. The result in income per fulltime farmer is mainly due to net impact of government subsidy on area planted with fruit trees. It has been supported that the impact of government subsidy on technology, yields and employment has not been significant.

3.7. Government subsidy impact or indirect benefit

Government subsidy is expected to create also indirect benefit to third parties not directly affected by the intervention. Two sorts of indirect benefits are considered in the following discussion, namely impact government subsidy has on businesses upstream (suppliers) and downstream (buyers) and the impact it has on collective action.

The government subsidy has a *clear net impact on increased demand for inputs*, and not significant impact on demand for technical and economic advice. Government impact on supply of product to buyers downstream is sector dependent. In our study, government subsidy has a significant impact in increased sale for vineyard farmers but not for olive farmers.

During last five years, a strong demand for farm inputs has been perceived, as supported by farmers' statements - more than 3/4 of the interviewed farmers' state that their demand for inputs has increased (Table 13).

Table 13: Change in purchased inputs

			Change in purchased inputs during last five years		Total
			Increased	No change	
Subsidy in 2008	Not subsidized	Count	54	25	79
		% of Total	34.6%	16.0%	50.6%
	Subsidized	Count	67	10	77
		% of Total	42.9%	6.4%	49.4%
Total		Count	121	35	156
		% of Total	77.6%	22.4%	100.0%

Source: Field Survey

Government subsidy is an important factor causing the significant increase in demand for inputs, as shown in ANOVA (Table 14).

Table 14: ANOVA: Change in purchased inputs – factor S_2008

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.358	1	1.358	8.106	.005
Within Groups	25.790	154	.167		
Total	27.147	155			

Source: Field Survey

The impact of government subsidy on increasing the demand for inputs is also supported by looking at the government subsidy in explaining cash production expenses. Subsidy in 2008 (Table 15) shows that government subsidy is associated with a significant increase of ALL 66,018 (Euro 471) in cash production expenses.

Table 15: Cash production expenses explained by government subsidy

Model	Un-standardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	67726	17946		3.774	.000
Cash expenses in 2008	1.125	.183	.435	6.136	.000
Subsidy in 2008	66018	23195	.202	2.846	.005

a. Dependent Variable: Cash expenses in 2012 Source: Field Survey

The demand for advice has increased at a much slower pace than the demand for inputs. Simply, farmers buy more inputs but they do not value enough the technical and economic knowledge. Both information in Table 15 and ANOVA instruct that government subsidy is not an explaining factor for changes in advice received.

Table 16: Change in advice received

			Change in advice needed inputs during last five years			Total
			Increased	Decreased	No change	
Subsidy in 2008	Not subsidized	Count	21	2	44	67
		% of Total	15.4%	1.5%	32.4%	49.3%
	Subsidized	Count	22	4	43	69
		% of Total	16.2%	2.9%	31.6%	50.7%
Total		Count	43	6	87	136
		% of Total	31.6%	4.4%	64.0%	100.0%

Source: Field Survey

Farmers state that their sales have increased - this is the case for two in three farmers having provided an answer (Table 17).

Table 17: Change in product sold

			Change in produce sold during last five years			Total
			Increased	Decreased	No change	
Subsidy in 2008	Not subsidized	Count	43	1	23	67
		% of Total	32.3%	0.8%	17.3%	50.4%
	Subsidized	Count	48	0	18	66
		% of Total	36.1%	0.0%	13.5%	49.6%
Total		Count	91	1	41	133
		% of Total	68.4%	0.8%	30.8%	100.0%

Source: Field Survey

The government subsidy is a significant determinant in explaining the increase in production sales, as shown by the regression analysis (Table 18).

Table 18: Product sales explained by government subsidy

Model		Un-standardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	32.112	11.883		2.702	.008
	Quantity of Produce sold in 2008, in kv	1.215	.194	.536	6.269	.000
	Subsidy in 2008	40.168	15.244	.225	2.635	.010

a. Dependent Variable: Quantity of produce sold 2012, in kv Source: Field Survey

Aggregated analysis hides important difference between the two sectors analyzed – the significance of impact is attributed to vineyard sector while the impact of subsidy in explaining increased sale for olive sector is not significant. This is an expected result if one considers that – as a rule - olive fruit is not sold but it is processed into olive oil using the service of olive oil factories.

3.8. Collective action – horizontal and vertical cooperation

Positive change has been observed in terms of increased need for cooperation among farmers during the last five years. Slightly less than half (46%) of the respondents state that the need for cooperation has increased during studied period. The remaining 54% perceive no change (53.3%), and decrease in need for cooperation (0.7%). *Government subsidy has no impact on increasing the need for cooperation however.*

The cooperation between farmers (horizontal cooperation) on one side, and input suppliers and buyers of farm product on the other (vertical cooperation) exhibits that same pattern in terms of change in need for cooperation with only minor differences.

The comments provided by the farmers support both increased need for cooperation and farmers reluctance to engage in collective action. Common reasons for cooperation are benefits in terms of joint sale, and technical and economic advice in groups. In some cases, farmers are developing their cooperation project. Cooperation between farmers has proved to be very hard however. Even where there have been some positive experiences in this direction in the past, it was not able to improve the collaboration culture and education between producers. Even when farmers judge cooperation as essential for the future survival of farm business, they are aware of difficulties to put it in practice. According to the interviews, this is mostly due lack of trust, land fragmentation, relative heterogeneity in terms of land and capital, lack of coordination and leadership, lack of government support, and still negative experience with cooperation during the communist regime.

3.9. Farmer's status

The overall farmer's status has improved last five years and this is due mainly to increased income (Table 19). This is less evident concerning consumption, savings and employment status.

Table 19: Income and overall farmers' status

		Subsidy in 2008					
		Not subsidized		Subsidized		Subtotal	
		Count	%	Count	%	Count	%
Change in family income order	Decreased	10	55.6%	8	44.4%	18	100%
	No change	26	59.1%	18	40.9%	44	100%
	Increased	42	45.7%	50	54.3%	92	100%
Change in overall status order	Decreased	5	45.5%	6	54.5%	11	100%
	No change	30	61.2%	19	38.8%	49	100%
	Increased	42	45.7%	50	54.3%	92	100%

Source: Field Survey

At any case, tests run (ANOVA, t test) reveal that – based on farmers self-assessment - government subsidy does not count for changes in farmers' status.

4. Summary of findings and recommendations

The current study aimed at assessing the outcomes and where possible the impact of government of Albania subsidy scheme, using for the first time in Albania a quazi-experimental design by applying Propensity score matching Method.

The study results show that the government subsidy scheme has had a clear net impact on increasing areas under fruit plantation, and therefore in increasing fruit production in Albania. The impact on fruit tree area has not affected farm size, however. The impact of the government scheme on new technology adoption is limited and so is the impact on crop yields increase. Furthermore, impact of the scheme on employment increase is also limited. There are indications that subsidy scheme has an impact on farmers productivity increase mainly due to increased area under fruit production associated with a rather "*status quo*" in on farm employment, crop yield level and product prices. Though an increased need for collective action among farmers and between farmers and other value chain businesses, the government impact in increased need for cooperation is not significant.

Based on study results, the following recommendations may be considered by the Government of Albania:

1. *Continue the support to establish new fruit tree plantation.*

The government support has an obvious impact on increasing area under fruit trees. Albanian agriculture need huge support to establish market oriented farms and support to establish new fruit plantations is one proven way of establishing farm businesses. Other major important advantage of support to fruit plantation is that this is an investment support scheme. This is done only once which makes it superior in budget compared to output related schemes. Additionally, through this scheme, the "responsibility" is transferred to farmers instead of making them depending on output related support. In relation to that, one may hear quite often the expression: "What you have done to us, you have put us to work".

2. *Assess domestic and export market potential*

While it was demonstrated that support schemes enable improvements in production and income, caution should be made of the complex effect in the longer run. As the domestic market may saturate, further increased production may cause a sharp decline in sales prices

which can make the farmers' situation worse-off. Therefore, support schemes for given agriculture activities, should be anticipated by in-depth market assessment.

3. *Design a policy to mobilize land managed by communes for establishing new fruit plantations.*

While the rental market of private land is dysfunctional, the anecdotic evidence supports that farmers rent the commune managed land for establishing new fruit plantations. The government may therefore design a policy to promote using commune managed land for establishing new fruit plantation. The policy mix should consider reducing the direction of commune administration in renting out the land, providing communes with incentives based on land transactions, and providing bonus points in file evaluations in case of commune managed land ranted, to mention only a few.

4. *Improve/enforce farmers' eligibility criteria in terms of resource mobilization and new technology adoption by farmers*

Study results support that a large proportion of farmers have not mobilized any additional resources after benefiting government subsidy. Other subsidy schemes (IPARD like, MADA subsidy scheme, Promali[4] project subsidy scheme) have beneficiary contribution as an eligibility criterion. Hence, the government may consider introducing/enforcing beneficiary contribution as an eligibility criterion. To fit different farmers' types and areas, requirements for resource mobilization ratio may be different for different conditions.

Study results also support a limited subsidy impact on new technology adoption. This finding calls for considering improving eligibility criteria to include new technology adoption. The introduction of new technology would also require more experts' knowledge and advice.

The study shows that farmers rarely make soil analysis before plantations, thus exposing their investment to a growing risk of both production failure and soil degradation. Support for new plantations should be anticipated by soil analysis to reduce such risk.

5. *Consider adopting the 5 years rule of investment maintenance in order to prevent orchard neglecting after having benefited government subsidy*

Following EU rules and practice have of monitoring the investment maintenance 5 years after it has been created, GoA may consider adopting such a rule. In case beneficiary does not properly maintain the investment (orchard), he is sanctioned.

6. *Design working policy instruments to promote agricultural collective action in agriculture.*

While promotion of agricultural cooperation is included as one of the measures of current government subsidy scheme, study reveals that government subsidy has had no impact on promoting collective action in agriculture. Given the critical importance of cooperation, government may need to rethink agriculture cooperation policy, including training on benefit and cooperation organization, tailored support to organizational issues, subsidizing salient assets (agricultural machineries, stores, marketing infrastructure) operated in groups of farmers.

[4] A project funded by Danish government and implemented by SNV

7. Promote diversification as an alternative to promote employment

Support to investment tend to affect positively farm efficiency, yields and income (as expected and aimed at) but, does not necessarily result in any employment generation. Reduction in unemployment could be addressed by diversification measures.

8. Research issues of policy interest

Study results reveal that for 25% of subsidized farmers, investment is equal/close to government subsidy, meaning that there are no any additional resources mobilized. Additionally, the impact of subsidy in introducing new technologies is significantly lower compared to impact of farmers own money. Based on these facts it is argued that a "Moral hazard" problem – is associated with government subsidy. More in depth investigation is however suggested in order to better understand the phenomenon.

Bibliography

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Annexes

Methods and procedures

Research design

Quasi experimental design using Propensity score matching has been used to assess the impact of Albanian government subsidy scheme.

Questionnaire

The survey instrument - the questionnaire - was design in such a way that one can assess the likely outcome (and possibly impact) of government subsidy scheme. Additionally, the design would allow for executing Quasi-experimental design using Propensity score matching method. The survey instrument was properly tested and accordingly improved before used for data collection.

Sampling and survey conducting

Several issues were considered when designing sampling, such as making sure that sample contain both subsidized and non-subsidized farmers, sample size, sectors and areas. Sample size for the study was 256 farmers. Sectors selected were vineyard and olive production in two major production areas for the selected sectors, namely in Fier and Shkoder.

The sectors and areas have been selected based on 2 important criteria: magnitude of sector and area support and sector potential to reveal impact in four years – impact of 2008 subsidy scheme impact will be assessed[5]. Vineyard and olive production have absorbed substantial quantity of government subsidy in the two selected regions; and both sectors are supposed to reveal at least sufficient impact within four years. During the research design, we aimed at developing the survey for covering two support schemes in two different regions – to have a balanced approach: one region in the north and one in the south. The regions of Shkodra and Fier (including Lushnje) have both received significant share/funding for the plantation of olives and vineyards. Moreover, Shkodra is the only northern region to have widely developed the olive production and that has received (significant) state support for this sector. Table 20 summarizes relevant information on sample size and interviews distribution by sector and area.

[5] Discussions were conducted within the research team whether to start the impact assessment from 2007 – the first year of government subsidy scheme – or 2008, one year later. The 2008 alternative was opted for given that 2007 – after having consulted the MAFCP statistics - was an unusually bad year and therefore the comparison between 20012 and 2007 would have been resulted in overestimated impact.

Table 20: Sample size and interviews distribution by sector and area

			Qark		
			Shkoder	Fier	Total
Olives	Subsidy in 2008	Non-subsidized	16	61	77
		subsidized	11	49	60
	Total		27	110	137
Vineyard	Subsidy in 2008	Non-subsidized	11	59	70
		subsidized	12	37	49
	Total		23	96	119
Total	Subsidy in 2008	Non-subsidized	27	120	147
		subsidized	23	86	109
	Total		50	206	256

Source: Field Survey

Stratified selection procedure was used to select communes and villages based on weight commune and villages have in both selected sectors. Within selected regions, communes and village selection was based on frequency of supported beneficiaries using the information provided by MAFCP. Beneficiaries (subsidized farmers) were selected randomly based on lists provided by Regional Department of Agriculture (extension service) while non-beneficiaries (non-subsidized farmers) were selected quazi-random selection of following a random route procedure.

Interviews were conducted by well trained (Master of Science) students of faculty of Economics and Agribusiness in Agricultural University of Tirana. Their work on the ground has been facilitated by MAFCP staff (extension workers). The research team has technically supported the whole process, including survey conducting.

Propensity score matching procedure

Propensity score matching is a three-stage process. *The first stage* entails estimating the propensity score, which is the conditional probability of receiving treatment conditional upon observed covariates. This probability is found by regressing membership in the treated versus untreated group (dependent variable) on a set of observed covariates (independent variables, or predictors) typically by means of a logit regression. Our dependent variable is "S_2008", which is a dummy/binary variable taking the value 1 for farmers have received government subsidy in 2008, and 0 for the one not having received subsidy during the same year. The variables included in the equation intended to regress membership to treatment group are described in the Table 21.

Table 21: Variables in the logistic regression to predict membership in treatment group

Variable		Type of variable	Measured as
S_2008	Have received subsidy in 2008	Dummy	1=Have received government subsidy 0=Have not received government subsidy
A1	Age of household head	Scale	Number years

A3	No of family members working on farm	Scale	Number of people
A7	Education level of household head	Ordinal	1= No education 2=Elementary school - four years 3=Mandatory school - 9 years 4=Agricultural high school 5=General and technical high school 6=University
Farm_self-employed	Farming as main employment	Dummy	1= farming as man employment, 0=Other employment as main employment
Sector_ Dummy	Sector	Dummy	1=Vineyard 0=Olives
Qark	Qark	Dummy	1=Fier 0=Shkoder
B3	Farm size in 2008	Scale	No of dynyms
B12	Experience of HH head in chosen activity	Scale	No of years

The second stage is the matching of the treated subjects to the non-treated subjects in such a way that the two groups are similar on all covariates included in the propensity score. In general this entails either matching treated and untreated individuals with similar propensity scores or the re-weighting of the observations in the control group. Various algorithms are available for the matching, including metric matching, nearest neighbor matching with and without replacement, kernel matching and local linear regression. The nearest neighbor matching without replacement was conducted in our exercise, using MatchIt package in R software.

The results of matching procedure is that two groups – one treaded group (subsided) and one control group (non-subsidized) have been created, each group having 79 members (Box 1); remember that for each subsidized farmers procedure "find" a similar non-subsidized farmer.

The results in Box 1 have been obtained using a caliper[6] of 0.25, which is a rather standard caliper measuring the difference in propensity scores for treated versus control cases.

Box 1: Summary of matching procedure - MacthIt package in R software Sample sizes:

```
          Control Treated
All           147     109
Matched        79      79
Unmatched      68      30
Discarded       0       0

Percent Balance Improvement compared to whole sample:
                  Mean Diff.  eQQ Med eQQ Mean  eQQ Max
Distance             98.2815  96.7430  97.2280  98.7032
Qark                 53.6934   0.0000  54.0084   0.0000
A1                   85.8504 -33.3333   8.8908  10.0000
A3                   87.0621 100.0000  68.2658   0.0000
A7                -1613.9954   0.0000 -13.6262   0.0000
```

[6] Caliper is measure of difference between propensity score of treated cases and control cases. Caliper is expressed in standard deviations of average propensity scores. A 0.25 caliper means that the difference between propensity scores should be smaller or equal to 0.25 propensity score standard deviations

```
B3                    46.7965   0.0000  25.5996   0.0000
B12                   33.8262   0.0000  11.5890 -36.3636
Farm self-employed     73.4525   0.0000  77.0042   0.0000
Sector dummy           5.0010   0.0000   8.0169   0.0000

The improvement in propensity score right panel (matched) in the figure is
quite obvious. This means that subsidized and non-subsidized groups are
quite similar on selected co-varieties
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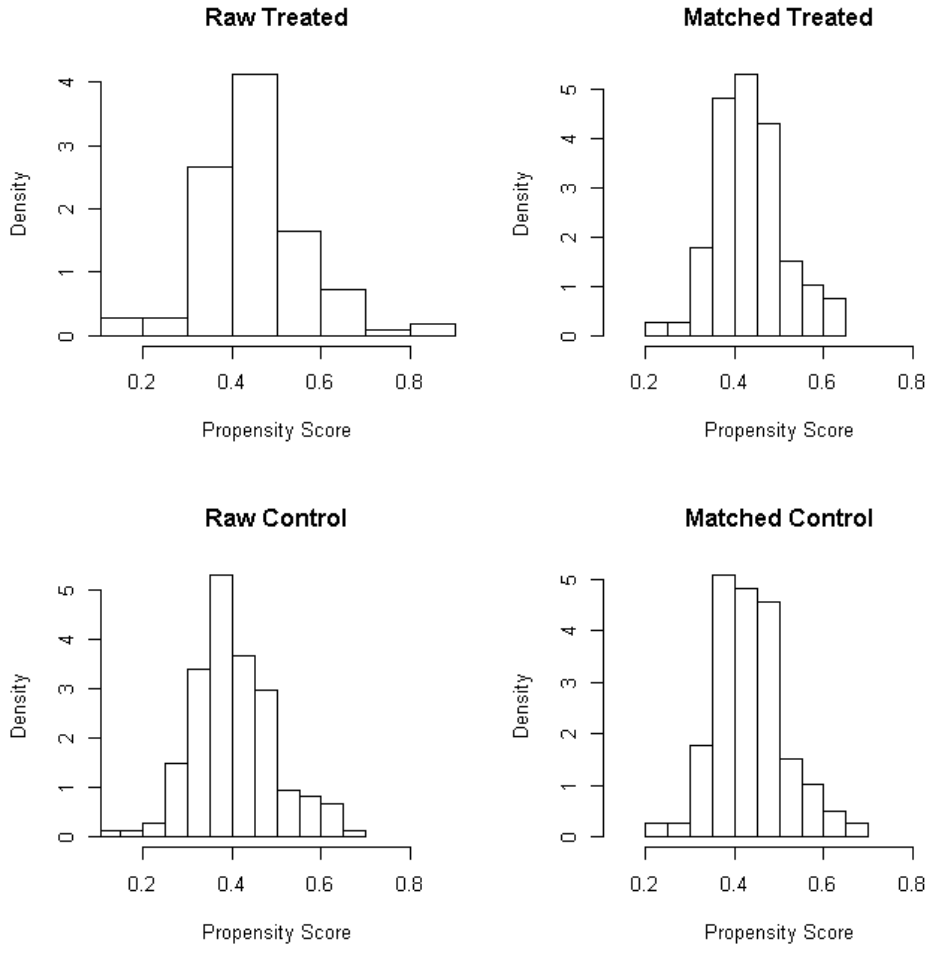

Several matching procedures were run – no caliper, caliper 0.3 and caliper 0.77 - before choosing the one with caliper 0.25. The chosen alternative balances the quality of matching and creates large enough groups that allow for a proper statistical analysis.

The third stage consists of estimating treatment effects based on the balanced treatment and control groups. Strategies may comprise straightforward t-tests of mean differences in the outcomes between the treated and the untreated or in multivariate analyses such as generalized linear modeling, survival analysis, or structural equation.