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# **Can direct payments facilitate agricultural commercialisation: Evidence from a transition country**

## ***Abstract***

This paper investigates the possible impact of direct payments on agricultural commercialisation in Kosovo. Kosovo is one of the poorest countries in Europe but provides substantial funds to support agriculture, which is populated by small and often semi-subsistence farms. Thus, the effectiveness of this support is a central policy issue. Estimating the effect of direct payments on market integration faces endogeneity issues arising from the possible simultaneous determination of participation in support programmes and market participation. In order to achieve proper identification of the endogenous direct payments, the paper suggests a strategy of targeted identification search that combines several different methodological approaches. We find that direct payments for fruit and vegetables, and those for cereals and oilseeds have a positive effect on market participation. However, no definite effect of livestock payments has been established.

Key words: direct payments, market participation, endogeneity, identification, Kosovo

## **Introduction**

During the transition and pre-EU accession period, several Central and Eastern European countries (CEECs) used the so-called ‘CAP-like’ policies (Swinnen 1994). This was a deliberate step to resemble some of the EU Common Agricultural Policy (CAP) instruments in order to facilitate the way to accession to the EU and policy adjustments in agriculture. These developments during the transition period should not be interpreted as harmonisation with the CAP, as some measures in transition economies only “vaguely” resembled the CAP instruments (Tangerman, 1998). The main objective of the CAP-like policy support has been to boost output, which had declined substantially during the transition. Kosovo is not an exception of these policy developments, although since the country started later than CEECs, their measures resemble the CAP architecture after McSharry reform and, in particular, after the Agenda 2000 establishing Pillar2 – Rural Development. Major policy instruments introduced in Kosovo included direct payments coupled to production and rural development grants.

Direct payments, similarly to other output subsidies, ‘leak’ into the upstream and downstream sectors and also partially capitalise in land values. On the other hand, through their productivity and production enhancing effects direct payments keep land in cultivation, even more marginal quality land, in comparison to what would have been under free market conditions. They keep more farmers in operation and thus may mitigate rural outmigration and depopulation of rural areas. This is important for Kosovo where urban unemployment is high (the unemployment rate 2018 was 29.6% (KAS, 2019)), there is lack of non-agricultural rural jobs and there is widespread underemployment of family members on-farm (Osmani et al., 2013).

Differently to the EU, in the Western Balkans there is a large semi-subsistence sector which is partially or often not at all integrated into the market mechanisms. The objective of this paper

is to investigate the effect of direct payments on commercialisation of partially market integrated semi-subsistence family farms in a country with a very fragmented farm structure and predominance of semi-subsistence farmers, i.e. Kosovo. This is an important economic, as well as social issue. Davidova (2011), basing her rationale on Barrett (2008), argues that commercialisation of semi-subsistence farmers is a preferable situation, since the restructuring of the semi-subsistence sector will increase the wellbeing of farmers, at least in the long run. The distribution of risk free policy flow (direct payments) to farmers creates additional liquidity which helps technological improvement (e.g. more purchased inputs), and increases productivity and output. The question of whether direct payments affect market integration in countries with predominant small family semi-subsistence farmers has important policy implications. If there is a positive relationship, this can provide justification for and guide towards the design of support policies.

Typically direct payments recipients have to meet some requirements, e.g. in Kosovo usually a requirement is of a minimum size. In the case that these requirements only make more commercially oriented farms eligible for direct payments support, the expected effects on commercialisation of semi-subsistence farmers would not materialise, since the semi-subsistence sector will be largely excluded. The result from the above is that empirical analysis should be expected to show correlation between the receipt of direct payments and the degree of market integration, but such correlation cannot be used to directly infer a casual effect. Technically, the above problem is a type of endogeneity in that the potential explanation (i.e. direct payments) and the outcome are simultaneously affected by the design of the policy support system in a sense that more market integrated farms are more likely to be eligible for direct payments compared to more subsistence oriented ones. This paper addresses the question on whether direct payments encourage market participation by explicitly accounting for the endogeneity issues present in the empirical design.

The paper is organised as follows. Section two conceptualises the possible effects of direct payments on the market participation decisions of semi-subsistence farmers. In the third section a short overview of the design of direct payment programme and the eligibility requirements in Kosovo is presented. This overview also provides a guide to the search of identification of the endogenous direct payments in explaining market integration. The methodology used to derive the appropriate results is described in section four, followed by presentation of the data sources and measures used in the model. This is followed by explanations of the logic behind the specification search and the approach undertaken to derive the results. The identification strategy and the construction of different instruments for each policy measure are discussed in section five. This leads to the analytical results, presented in section six. Finally, some conclusions and policy implications are developed.

## **Conceptual Framework**

In order to conceptualise the possible effects of direct payments on market participation, a simple household model is considered. Household models are a standard tool for analysing semi-subsistence farms and we want to infer the effect of direct payments on the marketing behaviour of such a semi-subsistence farm. The standard non-separable household model is widely used to explain differentiated market access (see e.g. Barrett, 2008 for a detailed

overview). The basic assumption is that there are market imperfections and farmers face transaction costs in accessing markets. These costs are household specific.

A representative household maximises its utility ( $U$ ) over consumption of a vector of agricultural products ( $c$ )  $c=1,\dots,C$  and a composite of all other tradables ( $x$ ) subject to production function and cash income constraints.

$$\text{Max } U(c,x)$$

The consumption of agricultural products ( $c$ ) originates from two sources – from self-produced products ( $c^s$ ) and from products purchased in the market ( $c^m$ ).

Following Barrett (2008), agricultural output ( $Y$ ) is a function of the flow of services from private assets ( $A$ ) (land, labour, capital) and public services, e.g. physical and market infrastructure, public standards, extension service ( $G$ ).

$$Y = f(A,G)$$

Agricultural output is divided into two uses, self-consumption ( $y^s$ ) and sales ( $y^m$ ); the self-consumed output ( $y^s$ ) is equal to the consumption coming from own production ( $c^s$ ).

The cash income is earned by sales of agricultural products  $y^m$ , through non-agricultural enterprises and/or off-farm wage employment  $W$ , and through unearned income (including a non-risky flow of policy income payments)  $TP$ . This non-earned income is where we can include the direct payments.

However, when deciding to sell its produce the household faces transaction costs per unit of output sold  $\tau^{cs}(A,G,W,TP,y^m)$  (Barrett, 2008). The logic behind this specification of transaction costs is simple.  $A$  reflects the household specific assets and also the characteristics of labour such as education and training which may affect the search costs or the willingness to market the output jointly with other farmers.  $G$  reflects public services including roads, price information, marketing advice, advice on meeting standards that can decrease substantially the transport, search and enforcement costs, and facilitate the contractual relations with the downstream sector.  $W$  and  $TP$  may decrease the transaction costs in accessing credit in that they increase household's credit 'rating'. Furthermore both  $W$  and  $TP$  can create wealth effects in a risky choice framework and, hence, decrease risk averseness thus further reducing transaction costs. Note that a larger volume of sales  $y^m$  helps spread the fixed transaction costs over more units and, thus, reduces the total transaction costs per unit. Since direct payments are often directly (e.g. for milk) linked to requirements for a minimum sold quantities (hence increasing  $y^m$ ), or indirectly having similar effect via requirements to maintain production, they can be expected to reduce unit transaction costs. Therefore, we have three distinct channels through which direct payments can reduce transaction costs, i.e.  $W, TP$  and  $y^m$ .

In this case, the cash income constraint can be written as follows:

$$p^x x + \sum_{c=1}^C p^{c*} c^m = \sum_{c=1}^C y^m (p^{c*} - \tau^{cs})(1 + d^c) + p^{s*} y^s + W + TP \quad (1)$$

where  $p^x$  is the price of all non-agricultural tradables,  $x$  is their quantity and  $p^{c*}$  is the equilibrium market price of agricultural products. The RHS represents the household's expenditure with the income recorded in the LHS. The self-consumption is recorded as

‘income’. The direct payments effects are assumed to work through two separate channels. First, they can directly affect output via a unitary effect  $d^c > 0$  and in addition to this they have a ‘wealth’ type of effect by being part of the total payments (TP). The exact way these two effects are distributed depends on the nature of the product and the specifics (requirements) of the direct payment under question.

Direct payments are expected to increase market participation through reducing transaction costs. This transaction cost reduction can follow from several distinct impacts. First, the production enhancing effect of the DP creates a larger market potentially reducing the per unit transaction costs  $\tau^{cs}$ . Second, the production effect of the direct payments can be either viewed as increasing the marketed output from  $\sum_{=1} y^m$  to  $\sum_{=1} y^m(1 + d^c)$  or as acting as a transaction cost reducing effect via changing the product specific transaction cost losses from  $(p^{c*} - \tau^{cs})$  to  $(p^{c*} - \tau^{cs})(1 + d^c)$  which since  $d^c > 0$  and hence  $(1 + d^c) > 1$  also relaxes the budget constraint. Finally, the wealth effect of the DP (via including part of them in TP) also relaxes the budget constraint.

Since DPs increase the RHS (income part) of the budget constraint, this needs to be offset by equivalent increase in the LHS (expenditure), equivalent decrease in other terms in the RHS (decrease in other income) or combination thereof. The overall increase in production needs to be distributed amongst self-consumption and marketable surplus. Except in cases of extreme poverty, when basic household needs are not fully met (and therefore the relaxation of the budget constraint may lead to a large increase in  $p^x$ ), it can be expected that most of the increase in overall production will be translated into marketable surplus and, hence, will increase market participation. Therefore, a larger increase in the marketable output than the own consumption is expected to lead to larger market participation. Realistically, in addition to extreme poverty, there is the case of well-off households, where increased income may lead to increase in savings. Our model does not include savings explicitly but accounts for them via the non-agricultural tradeables. This is intentional since we focus on semi-subsistence households, where the likely proportion of additional income leading to increase in savings is expected to be relatively small.

Technically, the increase on the income side may necessitate a decrease in self-consumption  $y^s$  not only in relative but strictly speaking in absolute terms. So additional income, whether coming from direct transfer (the monetary value of direct payments), decrease in transaction costs, or increase in sold output (which can follow from both transaction costs reductions and requirements of the direct payments) may typically displace self-consumption.

Furthermore, DPs can be viewed as risk-free cashflows in the sense that unlike market returns they will not fluctuate with market conditions. Therefore, by providing risk reduction in the overall farm business they diminish the prominence of the main *raison d’être* for subsistence, namely extreme risk avoidance by insulating oneself from market fluctuations. This means that DPs can crowd out subsistence behaviour by playing the same risk reduction role that subsistence does. Hence, in the presence of DPs, both DPs and subsistence behaviour have the same function and one can replace the other in the sense that maintaining the same level of risk reduction can be achieved by weakening the role of subsistence.

The above considerations can however be attenuated, or even negated in the presence of market imperfections. From income (or welfare) perspective, as argued in Barrett (2008), the market participation choice is conceptually equivalent to production technology choice in the sense

that it can be analysed in the same lines. The overall income and welfare effects then depend on the nature of market transmission. The additional output exerts pressure on market prices and hence on farmers' incomes thus offsetting some (or even all) of the benefits from increased output. This pressure is basically a function of the price elasticity of demand and is related to the size of the market. It will be smaller in better integrated markets (i.e. larger markets), since the additional output will be supplied to a larger market, but the returns to the extra output will reduce quicker in more fragmented markets and can lead to adverse welfare effects. What we mean here is that in a fragmented local market the price of output may fall more sharply compared to the case of an integrated national market, or if the extra output would be exported. Kosovo agricultural market is not well integrated (nationally and in particular internationally) which means that the probability of such adverse effects is greater.

Another argument relates to the consumption bundle of a household.<sup>1</sup> The household meets its consumption needs by either producing and self-consuming a desired quantity of a given product or alternatively producing a different product for the market and using the generated income to purchase the desired product. Therefore, the income realised from the increased output will indirectly affect the output of other products. In this case it is more efficient to choose to increase output, either without policy support, or due to DPs, of products for which the adverse income effects, discussed above, will be smaller. This means products, which have better integrated marketing chains. Such choices are expected to lead to greater increase in commercialisation since they will displace output of products more focused on own consumption.

The above narrative implies that DPs on products that transcend the domestic markets are to be expected to have greater impact of market participation compared to more locally marketed products such as fruits and vegetables. The above discussion however assumes that DPs are universally available to all farms. This however is not the case. There are eligibility requirements for receiving DPs. These are usually expressed in terms of size (acreage for eligible crops or heads of animals) and as such will exclude the smallest farms which are typically the ones which are more subsistence oriented. So higher eligibility thresholds will restrict the availability of DPs to semi-subsistence farms. The possible effects on commercialisation are expected to be greater when more semi-subsistence farms receive DPs. Let's consider a case when payments are allocated to only fully commercial farms. Then there will be no direct increase in market participation, measured as percentage of output sold. It is therefore expected that (everything else being equal) lower payment thresholds will translate into larger effect on market participation. Thresholds will however need to exist for several reasons. Higher thresholds may lead to greater output increase due to the more efficient technologies of commercial farms. They will limit the budgetary costs of the policy and will reduce the administrative costs of the DP schemes.

Note however that lower thresholds for fruit and vegetable products that are mostly sold on regional markets, mean that DPs will reach more semi-subsistence farms and hence have greater potential for increasing market participation, but can (if used excessively) carry the danger of adverse income effects, which under a rational decision-making framework may result in greater self-selection of subsistence farmers out of such programmes.

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<sup>1</sup> In subsistence type of models we can view the farm as a household.

Direct estimation of market participation effects that ignores such selectivity issues is likely to result in upward bias in estimating such effects.

### **Direct payments in Kosovo**

Kosovo contemplates to accede to the EU and its current official status is a potential candidate country. As a potential candidate for EU membership, Kosovo is eligible to use available funding for harmonisation of policies to the EU. As part of this process, in combination with national sources of funding, some EU funds have also been made available. The biggest user of public funds is by far the agriculture sector. In order to support farmers, but at the same time to increase the absorption capacity, the Agency for Agricultural Development (Paying Agency) in Kosovo has implemented direct payments system. The level of direct payments is different for different products, but they are all explicitly linked to current production decisions. The budget for the direct payments programme has slowly but steadily increased, driven primarily by the increase in the EU funds. In the recent years (2017 and 2018) the budget spent on direct payments was €26 and €27 million respectively (Green Report, 2018).

Traditionally, Kosovo supports three main agricultural sectors, namely cereals, horticulture and livestock broken down into 21 sub-sectors – 11 crops (annual and permanent, e.g. existing orchards and vineyards), horticulture (open field vegetables), wine, and organic products, and 10 livestock sectors and milk. One of the most recently introduced direct payments (in 2016) is for organic products but in 2017 – the last year for which data is included in the Green Report – only 10 farmers applied and 7 were approved and received direct payments. Overall, approximately 41,000 farmers/businesses apply every year out of estimated 130,000 that are registered for farming and agriculture production. This represents about 31.5% of the farm producers. This number is relatively low indicating that there is not a very strong drive to apply. Additionally, there are many producers who are not registered and hence cannot benefit from any DP programme.

For each sub-sector there are transparent eligibility criteria. The important point for the analysis in this paper is that they are size related. For example, for cereals and oilseeds, the eligibility criterion is to have 1 ha under planting, only for winter wheat the requirement is for is 2 ha. For open field vegetables, existing orchards, vineyards and organic production the area eligible for support is only 0.5ha, with even lower thresholds of 0.2 ha and 0.1 ha for small fruit and vineyards respectively. In the livestock sector the requirements are to have minimum 5 dairy cows or water buffalos, 30 sheep and 20 goats both for milk production. Apart from quantitative thresholds for milk (e.g. 1500 litres delivered over three months) and for registered slaughtered cattle there are also qualitative requirements, e.g. slaughterhouses-beneficiaries should be classified in the highest quality category.

Looking at the thresholds, one may consider them low enough to encompass semi-subsistence farms. However, it should be noted that land cultivation in Kosovo is extremely fragmented and more than a half of farmers have less than 1 ha cultivated land. This means that more than 50% of farms are not eligible for cereals and oilseed direct payments. Taking into account that the acreage thresholds only apply to the area under the crop for which the corresponding DP refers to and the fact that most of these are mixed farms, this means that the proportion of farms that are excluded from the DP programme due to the size requirement is probably much

higher. In the livestock sector, according to agricultural census, the average number of cattle per agricultural holding having cattle was 3.9 heads and 56% of the holdings only had 1-2 heads (KAS, 2015). This shows again that the typical 'average' livestock farm is not eligible for direct payments.

Apart from the quantitative thresholds, another factor which is important for endogeneity identification is the application procedure. A standardised application process for direct payments has been implemented. Farmers apply in person in their local municipality. The applicant is supported and the application is accepted by the local advisor (who normally sits at the municipal centre). The advisor performs a technical review of all documents that are part of the application, digitalises and sends them to the Agency for Agricultural Development. This means that the direct payments application is accessible to farmers and the size of the applicant farm is not a defining factor in the application process. The application is free of charge and the only the cost for the applicant, apart from transport, is for the issue and collection of the documentation required by the Agency. Most of these documents are available at the Municipality level and issued within 5 working days. In summary, these are identification documents, bank account evidence, which all applicant will possess, evidence for cultivated land (owned or rented) and financial obligations. Although the whole application process is relatively simple and uncomplicated and there is no apparent discrimination of small farmers in relation to big producing companies, the transport (visiting the municipal centre twice) and other transaction costs may discourage some small family farmers of applying.

## **Methodology**

Since instrumental variables methods are quite widely used and relatively well-known, in order to keep the exposition short, we will not discuss the standard instrumental variables methodology. Instead, we will focus on the less well-known methods to deal with endogeneity employed in this paper.

The first such method avoids using instruments altogether and instead applies a copula correction to overcome the endogeneity issue. The copula correction method (Park and Gupta, 2012) can be used when no instruments are available. In simple terms, it can be viewed as a control function approach which uses Gaussian copulas instead of control variables, to correct for the effect of endogeneity. The validity of this approach rests on the crucial assumption that the endogenous variables are not normally distributed, and in the case of continuous endogenous variables (as in this paper) it is preferable that they follow some type of skewed distribution. Therefore, checking the excess kurtosis and skewness of the endogenous variables provides an indication of the applicability of the method. The underlying idea is that the marginal distribution for the error term (which is given by the statistical model estimated, typically a conditional Gaussian) can be complemented by assuming marginal distribution(s) for the endogenous variable(s). Then one can use a copula specification to specify a flexible multivariate joint distribution of the error term and the endogenous variables, given the covariates. The above specification allows for a very wide range of possible correlations between these marginals. In practice, instead of assuming a particular marginal distribution for the endogenous variables, one can simply estimate their empirical distribution function using a standard kernel density estimation (in this case Epanechnikov kernel with a Silverman's rule of thumb choice of bandwidth). The joint multivariate distribution contains additional terms



which are the correlations between the endogenous regressors and the error term, and which have the role to correct for the effects of endogeneity on estimation. In the case of a single endogenous variable, the model can be estimated directly by maximum likelihood. When there are several endogenous regressors, additional regressors constructed as the inverse of the marginal distribution of the endogenous variables are included in the model. These additional variables act as control functions and provide a correction derived from the correlations between the error term and the endogenous variables.

Lewbel (2012) proposed to identify endogenous models using variables that are uncorrelated with the product of heteroskedastic errors. The instruments are constructed as simple functions of (a subset of) the model's data. The method can be applied when no external instruments are available, or alternatively, in addition to such external instruments (e.g. in order to improve the efficiency of the IV estimator). In simple terms, the Lewbel's (2012) method uses the following instruments  $[Z-E(Z)]v$ , where  $v$  is the error term and  $Z$  is some subset of the exogenous regressors, present in the model. Technically, these instruments are used in exactly the same way as the conventional ones. Identification is achieved if and only if the above instruments are correlated with the error term, and the degree of this correlation (more precisely the extent of the covariance between the above two) provides a measure of the strength of the instruments. The latter is an assumption that can be empirically tested, and since in practice the estimation process proceeds in the same way as conventional instrumental variables estimation, all the usual checks and tests are also applicable.

Lewbel (1997) proved that a subset of exogenous variables present in the endogenous regression model can be used to construct a much wider set of potential instruments. Unlike the method of Lewbel (2012), these instruments require that (i.e. are only valid if) the endogenous variable has a skewed distribution. Otherwise, the same approach and justification as above apply. More specifically these instruments are:

$$\begin{aligned}
 &G(Z)-E(G(Z)) \\
 &[G(Z)-E(G(Z))] [W-E(W)] \\
 &[G(Z)-E(G(Z))] [Y-E(Y)] \\
 &[Y-E(Y)] [W-E(W)] \\
 &[W-E(W)]^2 \\
 &[Y-E(Y)]^2
 \end{aligned}$$

where  $Y$  is the dependent variable,  $W$  is the endogenous variable(s) and  $G(\cdot)$  is any nonlinear function that has finite third moments. In practice, by replacing the expectation operator with a sample mean (which is its sample equivalent) one can obtain a wide range of instruments. Although relying on a more restrictive assumption about the endogenous variables (in terms of skewness) this method gives one opportunity to construct and test a large number of non-linear instruments and thus can alleviate the issues related to the search of identification.

This paper is interested in the differential impact of different types of direct payments. It is to be expected that the impact of direct payments will differ for several reasons. First, the actual production effect of different direct payment may vary from product to product according to the nature of the production system. Then the relative marketability of different products will translate into different effect on market participation. Therefore, it is desirable to split direct payment into different categories. However, there is an inherent trade-off in doing so. Having

too many different types of direct payments worsens the endogeneity problem, since we will need to separately identify all the different types of endogenous subsidy payments. Furthermore, due to the relative scarcity of data, using too disaggregated data will result in having too few observations for each type of direct payment, thus preventing efficient estimation of the effects under consideration. It is hence advisable to group some direct payment together in order to facilitate estimation and identification. In particular, it will be beneficial if these groups are characterised by internal homogeneity in a sense that the product grouped together have common sources of variability which can be used to properly identify the potential endogeneity within the empirical model. Taking into consideration the above, we have grouped direct payments into the following categories: fruits and vegetables, cereals and oilseeds, and livestock payments. This categorisation excludes some relatively minor direct payments such as organic production payments, beekeeping etc., but is able to capture the bulk of the direct payments allocated to Kosovo agriculture. Furthermore, it fulfils the homogeneity requirement.

### **Identification considerations**

The conventional approach to identification under endogeneity relies upon instrumental variables. Instruments need to fulfil several conditions, namely to be correlated to the endogenous variables, but uncorrelated to the residual term. In order to satisfy the latter exclusion requirement one usually specifies instruments that are strictly exogenous (so that they cannot be influenced by either the dependent variable, or the endogenous one). There are however some additional requirements to achieve valid identification. The instruments need to be sufficiently correlated with the endogenous variables, since in the case of weak instruments (which are only weakly correlated with the endogenous variables) the resulting estimates are typically biased. Technically, there are statistical tests to detect this particular problem, if present, in the statistical model. The other requirement is not directly testable and it refers to the need to identify all common with the dependent variable sources of variation in the endogenous variables. If this is not achieved, the endogeneity problem persists. The best way to accomplish this is by discussing these sources of variation and linking instruments to each of the sources. Since the latter is far from a trivial task, the prevailing practice is to employ a larger set of instruments in order to avoid under-identification. In our particular case, this is not a viable strategy since we have a limited set of potential instruments. In particular, we rely on geographical distances. Due the spatial fixity of farms, such geographical distances are clearly exogenous with regard to both market integration and subsidies support, which is a prerequisite for valid instrumentation. As explained later, this study is based on the primary collected survey data. The survey questionnaire has recorded distances from the farm to relevant infrastructure and services. Taking into account the availability of data, the following distance variables were identified as potential viable instruments<sup>2</sup>:

to municipal centre/ public farm advisory service (km);

to a shop for agricultural inputs (km);

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<sup>2</sup> Some relevant variables including distances related to marketing outlets contained a large number of missing observations.

to a farmers market (km);

to a bank (km);

to a public transport stop (km).

The logic to include these distances is the following. The distance to the administrative municipal centre can be used as a proxy for distance to retail market and as such could directly affect market participation. With regard to the application process for direct payments, as explained previously, the actual application takes place in the administrative centre and hence the distance to it could possibly in a non-linear way affect the application process and ultimately the actual receipt of DPs. The same logic applies to farm advisory service. Applications are checked and facilitated by the extension officer which means that instrumentation based on the use of extension services could help identify DPs. Since the use of advisory services is one of the explanatory variables, this means that non-linear type of identification is to be examined.

Our conceptual model, presented previously, implicitly assumes a single year production period. While such an assumption is quite reasonable for crops, the production cycle for livestock is much longer, which means that any expected production and commercialisation effects could take longer to materialise. Due to the lack of panel data, the case of a cross-sectional data as in the present study further complicates the estimation process, including the emergence of additional identification considerations. Farmers in Kosovo sell and purchase livestock using a variety of marketing channels. These include livestock markets, slaughterhouses, butchers, delivery to trader and trade at the farm gate. The most popular method of trading is the livestock market as it accounts for almost 80% of the overall volume of trade. This facilitates identification since due to the spatial fixity of such livestock markets nonlinear transformations of distances could be expected to correlate with the market participation and one might expect, notwithstanding the problems posed by the sparse nature of the direct payments data for livestock, to achieve valid identification. However, these are *a priori* expectations and the issue is left to the empirical estimations. It should be noted that in recent years there are more and more traders that go to the farms and buy livestock directly from the farmer. This process is under strict legal control and the farmer is demanded to follow all administrative and veterinary procedures before engaging in this kind of sale. The increased share of farm-gate sales is another factor that may alleviate identification, since farm gate sales are the marketing channel that is the least restrictive in terms of market participation. Veterinary requirements apply to all farmers and all livestock marketing channels, and may prevent small semi-subsistence farmers from accessing the livestock market. It would however be difficult to find or construct appropriate instruments that are correlated to the level of compliance with such requirements. It is possible that some personal characteristics, such as education level or experience, maybe used since they might reflect the level of understanding and possibility to comply with such requirement, but this is a proposition that needs to be tested within the data. Furthermore, the size of the application form and the need to present addition supporting documentation make the application process more complicated. This means that the personal competencies of farmers can contribute to successful accomplishment of the

application process.<sup>3</sup> The use of advisory services may potentially mitigate difficulties associated with the application process, but education can still be expected to be associated with direct payments receipts. Therefore, we have identified distance to municipal centre and respondent's years in education as variables that can possibly identify the endogenous direct payments. They are part of the model specification and therefore can only be included in non-linear manner following Lewbel (1997, 2002).

Let us now consider the potential for any of the other variables related to distances to identify endogenous direct payments via conventional instrumentation. Since access to farmers market, measured by distance to it, will proxy marketing potential of the farm household, it maybe correlated to certain direct payments. The logic of this is that the market potential will create opportunities for increased production that can satisfy DPs threshold and attract policy support. One could expect that access to farmers' markets will be related in particular to fruit and vegetable sales since these are products that are typically sold on farmers markets and marketing potential may encourage farmers to apply for and consequently receive direct payments. It is however more difficult to see a direct link between farmers markets and cereals and oilseeds, for which wholesale markets would be more appropriate. Unfortunately too many missing values prevent efficient use of the distances to these markets.

Access to agricultural inputs (proxied by the distance to an input shop), will facilitate production and due to the expected link between output, via marketable surplus, and market participation may correlate with the latter. In term of direct payments, access to any type of input market infrastructure may be related to the process of applying for and obtaining direct payments. Yet, the link is an indirect one and needs to be tested empirically.

Distance to a bank, e.g. a shorter distance may indicate more frequent relations with the bank manager and trust between the two parties, and as a consequence a better opportunity to receive a loan that will boost output, or similarly a shorter distance to a public transport stop facilitates travel to input and output markets. The links to DPs are indirect but similar logic as to the previous variables can be applied here.

In summary, we have identified as potential instruments a small set of variables, but as the identification discussion above shows the link between them and direct payments is quite indirect. As a result, one may expect that such instruments are likely to be weak. For this reason, the possibility for heteroscedasticity based non-linear instruments appears much more promising avenue to explore. Finally, the identification consideration discussion demonstrates that identification appears much more straightforward for fruits and vegetables, while livestock direct payments present a major challenge in this respect.<sup>4</sup>

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<sup>3</sup> For example, out of 41,000 thousand applications for direct payments received, around 3,000 were rejected, either due to the lack of proper documentation or due to incorrect information provided to the Agency for Agricultural Development.

<sup>4</sup> Personal household characteristics (age, education etc.) were mentioned as potential instruments, but our preliminary investigation indicated that they are ineffective in that respect. Therefore, we will not comment further on the household characteristics as potential instruments.

## Data

The paper uses a unique dataset collected for an FAO-sponsored project focused on commercialisation of small and family farms in Kosovo.<sup>5</sup> An international team of experts from Kosovo, Germany and the UK contributed to the survey design and data collection. The survey instrument was designed especially to investigate the opportunities and problems for commercialisation of small and family farmers. Data collection was carried out by face-to-face interviews in the second half of 2018. As a basis for sampling, the nationally representative Farm Accountancy Data Framework (FADN) was used. Since FADN by definition includes commercial farms, the smallest farms from the Kosovo FADN were selected for an interview. Each interviewed FADN farmer was asked to point out to two smallholders in the vicinity. Thus, part of the sample was defined by a snowball method. The final useable dataset included 680 farms – 52% derived from FADN and 48% additionally sampled by the snowball approach. Spatially, all the seven Kosovo regions were covered.

Variables used in the study are summarised in Table 1. The bold typeface is used to distinguish the variables employed in the model, while the other variables are only used as instruments. Brief descriptions of the variables are presented in the second column, since only the abbreviations are used in the analytical results that follow. The dependent variable is the share of sold output as stated by the respondents. Although this is easier to obtain, it presents some challenges. Such a measure is aggregate (covering the whole farm product mix). Estimating the effect of DPs which are directly related to specific products would in principle be better evaluated if a product specific level of commercialisation is calculated as e.g. in Kostov and Davidova (2013). Such calculations are however always problematic, particularly for livestock where a large number of assumptions need to be made. The aggregated and potentially prone to measurement errors nature of our measure of market participation however presents an opportunity. It has two negative effects, namely it dilutes the potential effects of direct payments (over a range of products), thus impeding inference about these. Note, however, that as our conceptual model demonstrates such effects should exist on aggregate level, rather than only for the specific products they refer to, and hence, an aggregate measure of market participation better corresponds to the conceptual model. The other consequence from using such a measure is that due to measurement errors, any empirical model that tries to assess the effect of DPs may suffer from endogeneity problems due to such measurement errors. Hence we may have an additional source of endogeneity. While in most other settings this could be considered an undesirable complication, in the present context it is actually a blessing in disguise. Our methodological approach is explicitly focused at identifying the sources of endogeneity and hence the use of imperfect measure of market participation fits in a more general pattern of simultaneous determination. Therefore, in spite of presenting some methodological difficulties, the use of self-declared market participation is well within the reach of the proposed methodological approach. Furthermore, if we are able to identify such a model, then this would increase the value (and range of potential applications) of the proposed methodology.

The direct payments included in the different categories are as follows. The cereals and oilseeds DP include payments for wheat, wheat seeds, barley, rye, maize and sunflower. Fruit and vegetables category include payments relating to open field vegetables, organic

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<sup>5</sup> FAO TCP/KOS/3602.

agriculture, raspberries, blueberries, walnuts, other nuts, vineyards. The livestock DP category aggregates milk, dairy cows, sheep, goat and sow payments. All direct payments are measured in euros.

### **Insert Table 1 around here**

We present means, minimum and maximum values and standard deviations which are typical summary statistics. In addition to this, we also include the number of full cases (i.e. excluding missing values) as well as the number of non-zero values for each variable. We have pre-screened the data and have excluded from consideration variables with large number of missing values. As Table 1 shows, the data used for estimation contains a limited number of missing values (typically due to answers such as ‘do not know’) and therefore provides sufficient number of valid observations to use for estimation purposes. The table additionally shows the number of non-zero values for each variable. This information is of importance for the direct payments variables since it shows the number of farms in the sample that receive any of the payments under consideration. Only a small portion of the data sample consist of farms that receive direct payments. Cereals and oilseeds direct payments are prevalent with 89 farms (i.e. 13%) receiving such payments. Fruits and vegetables, and livestock payments only cover 28 (4%) and 17 (2.5%) of the sample farms, respectively. This adds an additional layer of complexity since the sparse nature of direct payments (even after we have aggregated them in several groups) presents serious challenges in properly identifying the underlying sources of variation. As an immediate consequence of the sparsity of the direct payments one could expect that many potential instruments will be weakly correlated with them, which will present serious challenges for model identification. This problem is however slightly alleviated by the nature of the sample which uses smaller farms. In fact 65% of the sample farms are subsistence (zero sales share). Since the farms in receipt of direct payment are at least partially market integrated, the zero market participation largely overlaps with the non-receipt of direct payments and, thus, facilitates the estimation of their effect. The latter does not, of course, solve for the possible weak correlation between direct payments and potential instruments, which will need to be dealt with separately.

### **Insert Table 2 around here**

### **Insert Figures 1-3 around here**

Since both the copula approach and that of Lewbel (1997) require that the endogenous explanatory variables have non-Gaussian fat-tailed distribution, we had to test for this. Table 2 presents the skewness and excess kurtosis for all three types of direct payments, together with the corresponding t-tests. It demonstrates that these deviate from Gaussian distribution and are characterised by fat tails. This can be further illustrated by the comparative plots of the empirical density of these variables comparative to a normal density (Figures 1-3). Therefore the two estimation methods – copula approach and Lewbel (1997) - are applicable.

## **Results**

In order to identify and estimate the potential effects of DPs on market participation we follow a systematic approach outlined below. First, purely for illustrative purposes, in Appendix 1 we present the results from a naïve estimation that ignores the problem of endogeneity. As expected, the DPs are correlated with the level of market participation.

Since such a ‘model’ is clearly misspecified, we will not pay any more attention to it and proceed to the step in the identification strategy, outlined earlier.

The first logical step in dealing with endogeneity is to use conventional instrumental variables estimation. Once again, purely for illustrative purposes, in Appendix 2 we present a rather naïve implementation of this approach. Basically, the same 4 instruments were used for the three endogenous variables. Such an approach is naïve since it applies a blind search for identification, using a set of more instruments than the number of endogenous variable and avoids any discussion of why and how the instruments might identify the endogenous variables. Following from the previous discussion on the possible identification role for these instruments, it is clear that they may be able to identify fruit and vegetables direct payments, but they may be weak (if valid at all) for the other two types of direct payments considered in this paper. The purpose of including ‘conventional’ instrumental variables approach is two-fold: to illustrate the type of results one may obtain and to show that such an approach cannot work in this case. Furthermore, since the list of potential instruments that we have identified is very short, it is better to just try them all at the same time.

The results in appendix 2 confirm that this set of instruments is in fact weak for all three types of direct payments and are not valid in general (see Wu-Hausman test). Note, however, that if we were only relying on the Hansen’s J- test for over-identifying restrictions, we might have concluded that the instruments are reliable. The above results demonstrate that the instruments we consider cannot provide full identification due to, on the one hand, their weakness and, on the other, the possible inability to identify all sources of variation in the endogenous variables. The highly insignificant Hansen’s J test, however, suggests that nevertheless they may carry some (however limited) explanatory power which means that in conjunction with a different identification strategy they may help provide a valid identification. Since the Hansen/Sargan test in practice does not test instruments validity, but rather their coherence (Parente and Santos Silva, 2012), it provides some justification for complementing these instruments with a different identification strategy.

Applying a copula based correction for endogeneity is another option to try to identify the model in the absence of suitable instruments. The advantage of such an approach, if it was to work, is that it circumvents the need to search for instruments. This method requires heteroscedasticity in the endogenous variables and more specifically fat tailed distribution. As shown in the data section, all three endogenous variable clearly satisfy this requirement. Appendix 3 presents the results from copula correction. Although the basic assumptions of this approach are met, the correction terms are insignificant, which means that this approach fails to fully identify the model since it does not end up in a significant modification to the estimation procedure. For this reason, we will not discuss these results in any detail. Note, however, that the copula corrected results show significant effect of the fruit and vegetables direct payments.

In our investigation we attempt the Lewbel’s (2012) approach to create heteroscedasticity adjusted non-linear instruments, based on exogenous variables. In this case, the set of conventional instruments, specified in Appendix 2, are complemented by non-linear instruments based on Lewbel’s (2012) constructed from the distance to the municipal centre and the number of years of the respondent’s education. The results are presented in Appendix 4. The Hansen J-test is acceptable, but the instruments are weak except for the fruit and vegetable payments. Notably the effect of these payments is significantly positive. These

results are promising since they demonstrate that we can potentially identify at least one of the three types of direct payments. Therefore, using a different transformation to define non-linear instruments maybe able to help achieve identification for the other two types of direct payments.

This means that if we were able to identify the other two types of DPs we could estimate the full model. In order to do this, the following procedure was employed. Partial versions of the model were estimated only including one direct payment. The purpose of this is to search through different types of non-linear instruments in order to find the ones that can help identify a particular endogenous variable. The instruments found in these separate partial version of the model are then combined in order to achieve full identification. It should be noted that since the preliminary steps define instruments in partial versions of the model in which we there are omitted variables, i.e. the other two types of direct payments, there is no guarantee that simply adding together all such instruments will achieve identification. It may be necessary to tweak the list of used instruments, but the partial versions at least give some indication of how each of the three endogenous variable may be identified. The results from partial model estimation are presented in Appendix 5. The important outcome is that we were actually able to identify separately each of the three types of direct payments. All three types of DP appear to have a significant positive effect on market participation. However the latter does not persist in the final model when all the missing in the partial model results variables are included.

### **Insert Table 3 around here**

Table 3 lists the instruments identified for each of the endogenous variables. The next step is to combine these in order to estimate a full model. There are two important considerations in this procedure. The sources of variation should be considered carefully as it should be avoided that the same instrument identifies more than one endogenous variable. The second consideration is that combining the instruments presented should help identify all possible sources of variation in the endogenous variables. The focus is only on the Lewbel (1997, 2002) type of instruments, since as demonstrated earlier the conventional instruments are weak. The fruit and vegetables direct payments are easier to identify since the Lewbel (2002) approach provides identification. The non-linear instruments for cereals and oilseeds direct payments are quite different and since there is no overlap with those for fruit and vegetables they identify a different source of variation. Let us now consider the livestock direct payments. Three types of nonlinear instruments are used and one of these is based on the respondents years of education and as such is similar to the one used in the identification of cereals and oilseeds. It is nevertheless not the same since it has been created as product of the common element and the endogenous variable's deviations from the mean. Furthermore, all the other instruments for livestock, and cereals and oilseeds direct payments are different, and hence, this precludes the possibility that some instruments may identify the same type of variation. Therefore, the list of instruments used to separately identify the three types of direct payments can be combined in a full model.

The final model is presented in Table 4. Both the weak instruments and the Wu-Hausman tests are highly significant indicating that the set of selected instruments are not weak and are valid. The Hansen's J- test is insignificant hence confirming the null of valid instrumentation.

### **Insert Table 4 around here**



In terms of general determinants of commercialisation, distance to administrative centre reduces the share of sold output, conforming to expectations. This is consistent with our conceptual framework since proximity to the administrative centre proxies the farm's market size/potential and hence increases the welfare effects of commercialisation. Negative effect is observed for the use of only household labour (which implies positive effect for farms with hired labour). Relying only on household labour reflects limited production capacity and hence farms that use hired labour are better placed to use subsidies to expand output and marketable surplus, and thus increase market participation. Risk attitudes (i.e. willingness to take risks) increase market participation, which is to be expected as this variable serves as entrepreneurial proxy.

Concerning the main point of interest, fruit and vegetables direct payment have a significant positive effect on commercialisation. This is to be expected given the nature of Kosovo agriculture, where fruit and vegetables are important cash products, and the fact that compared to the other direct payment identification of the fruit and vegetables payments was relatively easier. Furthermore, even in the partial identification models these payments have consistently shown to be increasing market participation.

An important result for Kosovo policy is that we have also found evidence for commercialisation enhancing effect of cereals and oilseeds direct payments. These direct payments appear to have a strong effect on market participation. The greater, compared to fruit and vegetables DPs, magnitude of this effect is consistent with the conceptual framework. Cereal and oilseeds markets are better integrated and larger in size than those for fruit and vegetables which restricts the potential negative welfare effects from increased market participation.

Finally, our estimates result in statistically insignificant (although formally positive) effect of livestock payments. This result should be treated with caution. As mentioned previously, the production cycle for livestock is longer than the one year cycle typical for crops. Therefore, any effects could be expected to be spread over a longer period of time and it may be difficult to find in a cross-sectional setting. This issue deserves further investigation. It should be noted that in the partial identification model for livestock payments these had a statistically significant effect. Since the latter ignored the effects of the other types of direct payments, this would only signify a significant effect if all livestock farms were highly specialised as in such case omitting the effect of other payment would not have serious impact on the quality of the results. However, since most of farms in Kosovo are mixed, this is clearly not the case.

## **Conclusions**

This paper looked at the effect of direct payments on agricultural commercialisation in Kosovo. In this regard, to the best of our knowledge, it is the first attempt to analyse the effect of specific agricultural support policies on market participation.

Kosovo farms are overwhelmingly small and to a large extent subsistence and semi-subsistence. Therefore, facilitation of market integration is an important policy issue. Despite being one of the poorest countries in Europe, Kosovo has spent a substantial amount of money from the national budget, complemented by EU funds, on farm support. This paper

attempts to reveal the effectiveness of one of the main agricultural policy instrument used, i.e. direct payments, on market integration.

The analytical problem dealt in the paper is characterised by an endogeneity issue that needs to be accounted for in order to avoid erroneous inference. In order to achieve proper identification of the endogenous direct payments we have performed a targeted identification search that combined several different methodological approaches. The results show that direct payments associated with typical cash products such as fruit and vegetables are by far the easiest ones to identify and have positive effect on commercialisation. The conceptual framework suggested that the effect on commercialisation will be larger when a larger number of semi-subsistence farms receive payments. Eligibility criteria for fruits and vegetables (open field) include lower size thresholds than most other direct payments and as such are more accessible to semi-subsistence farmers in Kosovo. Furthermore, fruit and vegetable production is more labour and less land intensive, and semi-subsistence farms are typically more labour intensive than their commercial counterparts but usually work on a small land area. On the other hand, the more perishable nature of fruit and vegetables and the less integrated nature of their markets can present some challenges since the gains from direct payments may suffer larger losses resulting from price drops due to increased supply and high price elasticity. Such a possibility may mean that in part fruit and vegetables direct payments may play the role of consumer aimed subsidy, rather than maintain farmers' incomes. Such welfare losses can however be greatly reduced if the market for fruits and vegetables is enlarged, e.g. imposing stricter standards that can facilitate exports, which have started developing, and probably additional requirements for the receipt of direct payments. Enlarging the market size and preserving the welfare gains for farmers will result in a larger effect on commercialisation.

The study supports the positive effect of cereal and oilseeds direct payments on market participation. Since the markets for cereals and oilseeds are better integrated, one could expect less 'spillage' from the direct payments and correspondingly their commercialisation effect is larger than in the case of fruit and vegetables. One will need to take into account, however, that grains and oilseeds production systems are considerably more land intensive and labour extensive. This means that there are relatively less semi-subsistence farms that in principle may enter commercial production.

Finally, we fail to find any significant effect of livestock direct payments. There are several possible explanations for the latter, such as the longer livestock production cycle and the higher heterogeneity of the direct payments aggregated in that category, which could prevent the discovery of such effects even if they exist. More disaggregated analysis for livestock should be carried out to see whether there is a different policy impact on different type of production.

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