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Understanding motivations and determinants of direct sale strategy. The case of Tuscany Region

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Abstract

The paper investigates the determinants of a direct selling strategy as a two steps process. The model firstly identifies barriers or enabling factors that affects the decision to entry in the direct market (both though on-farm selling or through farmers' markets), and then the share of production value sold directly to consumers within this channel. Data used belongs to Tuscany Agricultural Census (2010). Explanatory variables includes the following dimensions: farmers' location, household composition, farms and farmers features and policy as payment received. Preliminary results confirm literature findings which identify in localisation, motivation and skills the main determinants of marketing strategies based on direct sale.

Keywords: direct sale strategy; Tuscany; double-Hurdle model

1. Introduction

During recent years, a growing number of farmers has implemented alternative marketing strategies (Galli and Brunori, 2013). Marketing strategies have been investigated by several angles in agricultural economics, rural sociology and by geographer or regional science literature. Each literature branch has paid attention to specific set of variables, which were considered relevant to describe farm behaviour with respect to the adoption of a particular marketing strategy. The Agricultural economics literature has investigated the different marketing strategies of farm productions. The tendency is driven by the low level of prices paid by retailers, the pressure to diversify marketing strategies to reduce risk exposure (Park et al., 2014) and the change of consumer's preference towards short chain or local products demand (Caputo et al., 2013). The literature highlights the effect of risk reduction in the selection of a portfolio of alternative marketing strategies or in diversifying downstream connections, the role of difference in transaction costs between alternative marketing strategies, and information as a motivation of the coordination mechanisms and the response to the agricultural policy. The paper investigates the determinants of a direct selling strategy. The main novelty is the simulation as a two steps process. Hence, the model firstly identifies barriers or enabling factors that affects the decision to entry in the direct market (both through on-farm selling or through farmers' markets), and then the share of production sold directly to consumers within this channel. Due to expected differences in determinants among direct selling options, we apply a separated model considering the share of production sold through on-farm direct selling and through off-farm direct selling (i.e. farmers' markets). Data used belongs to Tuscany Agricultural Census (2010) then using the entire universe of Tuscany farmers. Explanatory variables includes the following dimensions: farmers' location, household composition, farms and farmers characteristics and amount of payment received. Preliminary results confirm literature findings which identify in localisation, motivation and skills the main determinants of marketing strategies based on direct sale.

The paper is structured as follow. the next section presents a brief literature review on short supply chain determinants, then methodology and data used are introduced. The final section contains results and discussion.

2. Adoption of short supply chain strategies

Adoption of direct strategies have been studied by several disciplines: agricultural economics, rural sociology; geographer or regional science. Each literature branch has paid attention to specific sets of variables, which were considered relevant to describe farm behaviour. Altogether, narratives used to explain determinants and motivation can be framed into: re-establish human connections around food demand and supply (Sage and Goldberger 2012); evolving societal ties and embeddedness (Hinrichs, 2000; Marsden et al., 2000); portfolio diversification and risk management strategies (Hardesty and Leff, 2009); agglomeration effects and transaction costs to exploring new channels (Park et al., 2014; Ullah et al., 2016).

Sage and Goldberger (2012), provide evidence of spatial relationships in direct-to-consumer marketing by applying a Logistic Geographical Weighted Regression. Spatial patterns follow agricultural history and dominant cropping systems in local production and producers' structural connections and proximity to viable direct markets. Uematsu and Mishra (2011) explain the intensity of adoption of direct marketing strategies, by applying a count model using 2008 Agricultural Resources Management Survey data. Authors find that farmer's characteristics, such as agricultural and high level education and farm characteristics, such as large farm size and farming systems, positively affect the intensity of adoption of direct marketing strategies due to requirements in skill and ability. Uva (2002) finds negative effects of experience and ageing due to the requirement of skills related to managerial rather than technical components. Uematsu and Mishra (2011) investigate also the role of policy in determining the adoption of direct sale. Authors find significant effects of both direct payments and Conservation Reserve Program payments (CRP), which work in opposite directions. Authors show that direct payments negatively affect the adoption of direct marketing due to support of commodities productions, while participation to CRP has opposite effects, due to more household labour availability (as a consequences of the reduction of intensification). Other authors investigate direct marketing as a component of the diversification process, which is governed by increasing returns of productive factors and reduction of the risk of

agricultural activities, as the main reasons to diversify farm activities (Damianos and Skuras, 1996).

3. Methodology and Data used

Several modelling options are available in agricultural economics literature to assess determinants of farmers' strategies. The application of these is a growing topic in the agricultural economics fields, due to the ability to cope with farmers' behaviours (Amanor-Boadu, 2013). There is a large taxonomy of available models, depending of distribution and functions assumed and by the mechanism of decision making (Wooldridge, 2010). In the paper we apply a double hurdle model. The model allows to explain adoption of direct selling as a two steps model: firstly identifying the determinants of the decision to adopt direct selling strategy (i.e. whether invest or not in direct selling) and then the determinants of the share of farmers' production sold directly to consumers, among all other commercialisation forms. Hence, the model firstly identifies barriers or enabling factors that affects the decision to entry in the direct market (both though on-farm selling or through farmers' markets), and then the share of production value sold directly to consumers within this channel.

A growing popularity of the double hurdle can be observed in empirical work as developing the econometric specification of the model as well as formally integrating two choices into the same model (Cragg, 1971). The two –step procedure is often applied to dataset that contains a considerable among observation with zero value (Jones and Yen, 2000). In fact, compared with binary choice modelling the double-hurdle model allows a better representation of the process as the first binary selection can be affected by other variables than in the second step and covariates can have different effect between the first and the second steps. Formally the double hurdle model can be specified as follows (Eakins, 2016):

$$y_{i1}^* = w_i \alpha + u_i \quad \text{participation decision (1a)}$$

$$y_{i2}^* = w_i \beta + v_i \quad \text{level decision (1b)}$$

$$y_i = x_i \beta + v_i \quad \text{if } y_{i1}^* > 0 \text{ and } y_{i2}^* > 0 \quad (1c)$$

$$y_i = 0 \quad \text{otherwise} \quad (1d)$$

where y_{i1}^* is a latent endogenous variable representing a households participation decision to enter into direct sell marketing, and y_{i2}^* is a latent endogenous variable representing the level decision on the amount of production value sold on direct to consumers channels; w_i is a set of individual characteristics explaining the participation decision, x_i is variables explaining the level decisions; u_i and v_i are independent, and normally distributed error terms (Wooldridge, 2010; Eakins, 2016).

The double hurdle model is estimated using maximum likelihood techniques formalized in the following equations:

$$LL = \sum_{y=0} \ln \left[1 - \Phi(w_i \delta) \Phi \left(\frac{x_i \beta}{\sigma_i} \right) \right] + \sum_{y>0} \ln \left[\Phi(w_i \delta) \frac{1}{\sigma_i} \Phi \left(\frac{y_i - x_i \beta}{\sigma_i} \right) \right] \quad (2)$$

Data used belongs to Tuscany Agricultural Census (2010). The dependent variable measures the value of agricultural production sold directly to the consumers, within farm gates (on-farm) or outside farms gates like for example farmers' markets (off-farm). The census questionnaire explicitly asks farmers to state share of production sold through direct marking strategies for each crop and for each typology (on-farm or off-farm). Hence, using standard outputs compute using FADN data it was possible to sum-up all production value and then to identify the entire value of production sold directly to the consumers either on-farm or off-farms. Due to expected differences in determinants among direct the two direct to consumers options, we apply separated models considering the share of production sold through on-farm and through off-farm. Descriptive statistics used are shown in table 1.

Table 1 descriptive statistics

	Variable	Obs	Mean	Std. Dev.	Min	Max
Localization	poli_urb	48270	0.1698	0.3755	0	1
	rur_int	48270	0.0952	0.2935	0	1
	rur_trans	48270	0.3403	0.4738	0	1
	rur_decl	48270	0.2666	0.4422	0	1
	rur_probsv	48270	0.1281	0.3342	0	1
	d_protected	48270	0.3736	0.4838	0	1
Farm characteristics	d_bio	48270	0.0471	0.2119	0	1
	Uaa_ha	48270	15.0558	42.2871	0.01	2292.08
	c_diff	48270	0.1839	0.5439	0	10
	d_rearing	48270	0.1525	0.3595	0	1
	spec_arable	48270	0.2300	0.4208	0	1
	spec_ortic~t	48270	0.0645	0.2456	0	1
	spec_perm	48270	0.4697	0.4991	0	1
	spec_rumin~t	48270	0.0632	0.2434	0	1
	spec_grani~e	48270	0.0051	0.0711	0	1
	spec_polic~p	48270	0.0970	0.2960	0	1
	spec_polil~e	48270	0.0039	0.0621	0	1
	spec_polimix	48270	0.0383	0.1919	0	1
Farmers/Housheold Characteristics	live_on	48270	0.8488	0.3583	0	1
	lav_FTEall	48270	1.3466	1.8977	0.0041	90.8123
	lav_FTEfam	48270	1.0974	1.0825	0	12.82
	d_young	48270	0.1283	0.3344	0	1
	d_old	48270	0.3776	0.4848	0	1
	age2	48270	3682.7610	1757.0610	256	9801
	edu_low	48270	0.6616	0.4732	0	1
	edu_high	48270	0.3384	0.4732	0	1
	edu_agr	48270	0.0485	0.2148	0	1
	inform_d	48270	0.0864	0.2810	0	1
Payments per year	p_axis1	48270	263.5770	1981.4520	0	83051
	p_axis2	48270	257.1136	2522.0280	0	446495
	p_axis3	48270	44.5167	835.7651	0	33333
	p_decoup	48270	1719.1650	5808.4410	0	355685

The number of observations correspond to the 52% of the surveyed Tuscany farms. We excluded entirely all farms who are mainly oriented to self-consuming agricultural productions as lack of involvement into agricultural markets.

Explanatory variables belong to four categories: location, farms, farmers and household, and policy. The first category (i.e. location) includes location in zone as classified for RDP purposes. Tuscany is classified into 5 zones: the first includes farms located in municipalities with the highest density of inhabitants (i.e. urban areas, poli_urb). The second (rur_int) includes farms located in rural areas (density lower than 150 inhabitants per square km) but with intensive agriculture. There are three other zones that specify location in rural areas. these zoning differs by increasingly socio-economic concerns: rural areas in transition (rur_trans), declining rural areas (rur_desc) and rural areas with development problems (rur_probsv).

The second category contains the farm characteristics and it includes the typology of production (organic or not d_bio) the farm size (uaa_ha); the specialisation using FADN classification (spec_*) and the intensity of diversification measure as count of diversified activities rather than growing crops and rearing animals (c_diff). For explanation of the latter variables see Bartolini et al., 2014.

The third category contains the farmers and household's characteristics, and it includes: the share of farmers who is living, or not, on the farm (live_on), the relation between household and hired labour. Two variables are considered in this regard: household labour used on-farm (ftefam_farm) and the average value of external labour used on-farm (fteext_farm). The third category of explanatory variable considers also farmers' characteristics. These characteristics provide information on farmers' education and age. The fourth category includes farm characteristics: production typology such as organic production (d_org) and whether the farm has a web site or does e-commerce (informat). Finally, belong to policy variables the amount of payments received under first pillar (p_decoupled) and in the three RPD axes (p_axis).

4. Results and Discussion

In this section we presented the distribution of farms on the basis on share of agricultural production value sold through direct to consumers strategy and then the determinants of

both decision to be involved in direct marketing strategies and the level of production sold directly through short supply chain. Table 2 presents distribution of the farm based on the share of direct selling strategies, while table 3 and table 4 the main model results

Table 2. Distribution of the farms based on share of direct selling.

Share of production	Sold on farm		Sold off-farm		All	
	#	%	#	%	#	%
0	36,053	75	44,604	92	34,113	71
<25%	2,162	4.4	954	1.9	1,859	3.8
26- 50%	3,323	6.9	1,153	2.3	3,541	7.3
51- 75%	965	2	319	0.6	1,270	2.6
>75	5,582	12	1,239	2.5	7,488	16

Table 2 shows that direct selling is a relevant strategy for Tuscany farmers, as one third of those farm who sell production adopt it. Among those, more than 50% sell most part of farm production and 15% of the total farms sell entirely all the production directly to the consumers. Between the two alternatives, larger amount of farms sell directly the production on-farm. Seem exists two optimal level of involvement into direct selling strategies: the first concerns on selling through short supply chain about one third of the agricultural production that seem cope with diversification strategies, while the second a deep specialisation and a completely dependency on these marketing channel, by sold more than 75% of the entire agricultural production.

Table 3 and Table 4 presents double hurdle model results. Table 3 show table the determinants of binary variable (direct selling yes/no), while in table 4 the level variable (share of production).

Table 3 model results (binary outcome)¹

variable	ALL		on-farm		off-farm	
	coeff.	sign.	coeff.	sign.	coeff.	sign.
<i>binary outcome</i>						
poli_urb					0.0279	***
rur_probsv	0.0910	***	0.0456	**	0.0295	***
live_on	0.0510	***	0.1267	***	0.0253	***
inform	-0.5576	***	-0.5616	***	0.0290	***
lav_FTEall	0.1813	***	0.2110	***	0.0060	***
lav_FTEfam	0.1256	***	0.0929	***	0.0096	***
spec_arable	-0.3981	***	-0.4196	***	0.0317	***
spec_ortic~t	-0.1373	***	-0.2349	***	0.0401	***
spec_perm	0.1543	***	0.1601	***		
spec_rumin~t	-0.3198	***	-0.3182	***	0.0465	***
spec_grani~e	0.3300	***	0.3497	***	0.1265	***
p_axis1	0.0301	***	0.0000	***	0.0000	***
p_axis2	0.0338	***	0.0444	***		
p_axis3	0.0145	*	0.0159	*		
p_decoup	-0.0043	**				
_cons	0.1573	***			0.0664	***

¹ not significant variables are omitted

Preliminary results confirm literature findings which identify in localisation, motivation and skills the main determinants of marketing strategies based on direct sale (Uematsu and Mishra, 2012; Park et al., 2014). Location seems to have a prominent role in explaining farmers' marketing strategies, as connected with market opportunities, agglomeration and concentration of demand and supply of short supply chain (Boncinelli et al., 2016). Our results suggests that location in urban and in marginal areas positively affects decision to be involved into direct to consumers marketing strategy due to closeness to main urban markets and by the option to adopt diversification strategies, to overcome natural disadvantages for these farms located in marginal areas. Model shows that localisation in urban or peri-urban areas negatively affects the quota of production sold directly to consumers, confirming that other marketing strategies (vertical contract, or through cooperative) are more likely when there are low production costs and low transaction costs derived by closeness to main markets and to decision centres or by high industrial coordination (Verhaegen and Van Huylenbroeck, 2001).

Table 4. Model Results level Outcome¹

variable	ALL		on-farm		off-farm	
	coeff.	sign.	coeff.	sign.	coeff.	sign.
<i>level outcome</i>						
poli_urb	-0.0229	**	-0.0584	***		
rur_int					0.0297	*
rur_trans	-0.0567	***	-0.0726	***		
rur_decl	-0.0900	***	-0.1124	***	0.0244	**
rur_probsv			0.0001	***		
d_protected			0.0153	**		
uaa_ha	-0.0015	***	-0.0015	***	0.0002	***
d_bio	-0.0216	**	-0.0517	***	0.0227	*
live_on	-0.0273	***	-0.0327	***	0.0193	***
spec_arable					0.0266	***
spec_ortic~t	-0.0601	***	-0.1205	***		
spec_perm	0.0505	***	0.0726	***	0.0213	**
spec_rumin~t						
spec_grani~e	-0.1251	***	-0.1557	***	0.0757	**
d_rearing	0.0438	***	0.0617	***		
d_old					0.0305	**
age2					0.0001	***
edu_low	-0.0320	***	-0.0182	**	-0.0164	***
edu_agr	-0.0567	***	-0.0715	***		
p_axis1	-0.0064	***	-0.0076	***	0.0024	***
p_axis2	-0.0070	***	-0.0085	***		
p_axis3	0.0046	*			0.0059	*
p_decoup	-0.0067	***	-0.0062	***	0.0017	**
sataff_d	-0.1055	***	-0.1038	***	0.0158	***
_cons	0.8170	***	0.7315	***	0.0438	***
sigma	0.3263	***	0.3539	***	0.0068	***

¹ not significant variables are omitted

Farms specialisation in permanent crops and in granivores show higher probability to both equation (binary and level equations). This result can somehow be explained by the higher demand of transformed products from these two specialisations (i.e. wine). Otherwise, the specialisation in cereal and in vegetables have low probability as high relevance of production contract for these products or through cooperatives and

requirement for industrial quality due to high coordination with agro-food sector (Verhaegen and Van Huylenbroeck, 2001; Farmer and Betz, 2016).

Farm size and organic production show different effect with respect the two direct strategy. In fact, being large and producing organic positively affects the amount of production sold directly (off-farm) as required better structure to enter and ensure enough production level in these markets as well as an high reputation to compete with other producer in the market (which is get from organic certifications). Otherwise, reputation mechanism for on-farm direct selling strategies seem be based on interpersonal relation between consumers and producers and then there is no needs to invest in further certification costs.

The farmers and household characteristics deeply affects both binary and level outcomes. The use of internet have negative effects on on-farm direct selling strategies, while at the opposite increase the probability to observe off-farm direct to consumers strategy. This seem connected with a reduction of transaction costs or by high mobility required to sell off-farm agricultural production and by the perishable of agricultural productions. Is worthy to note that ageing have only significant effects on the level equation for off-farm direct marketing strategy. Our results shows that to maintain adequate level of income requires a high level of experience and educations, confirming Farmers and Betz (2016) findings. Moreover farmers with agricultural education shows low probability to be involved into direct to consumers marketing strategies as technical expertise seem better exploited entering into more industrial agricultural production (Verhaegen and Van Huylenbroeck, 2001). Policy setting deeply affects the marketing channels. While first pillar payments seem reduce the probability to observe direct marketing strategy, the second pillar affects only decision to be involved, while negatively the amount of production sold directly. This is quite surprising due to high emphasis of direct sell strategy in regional priorities but can be explained by high transaction cost in participation in RDP measures and by pure rental seeking behaviour for some farms. Moreover, these farm that received higher amount of payment from first pillar are more likely to invest in direct to marketing strategy. The results can be seen as a consequence of increasing investment by risk adverse farms as more stable streams of income obtained from decoupling.

5. Conclusions

The paper investigates determinants of direct to consumers marketing strategies. The paper analyses as case study, Tuscany farmers and both decision to entry into direct selling marketing strategies and level of production sold through these channels. Analysis is performed by applying double-hurdle model encompassing both binary and level choices. The model showing that localisation policy and farmer-household characteristics are the main factors enabling to explain diffusion of direct marketing strategies as deeply affecting transaction costs (Verhaegen, and Van Huylenbroeck, 2001) and the agglomeration effects in understanding food demand and supply dynamics (Boncinelli et al., 2016). These results confirms previous literature findings identifying in capital and access to land (Farmer and Betz, 2016), and in transaction cost to enter new marketing channels the determinants of direct to consumers strategies (Traversac et al., 2011). Model shows also a lack of coherent policy setting encouraging on-farm investments where direct to consumers strategy represent a reconnection with consumers and relevant income opportunities. Moreover, our model pointed out that certainty of payment (decoupled) have relevant effects in boost innovation and investment in agriculture.

6. References

- Amanor-Boadu, V. (2013). Diversification decisions in agriculture: the case of agritourism in Kansas. *International Food and Agribusiness Management Review* 16: 57-74.
- Bartolini F., Andreoli M., Brunori G. (2014). Explaining Determinants of The On-farm Diversification: Empirical Evidence From Tuscany Region. *Bio-Based and Applied Economics*, 3, 137:157
- Boncinelli F., Bartolini F., Brunori G., Casini L. (2016). On farm non-agricultural activities: geographical determinants of diversification and intensification strategy *Letter in Spatial and Resources Science*, 1-23.

- Caputo, V., Nayga, R.M., Scarpa, R., 2013. Food miles or carbon emissions? Exploring labelling preference for food transport footprint with a stated choice study. *Australian Journal of Agricultural and Resource Economics* 57, 465-482.
- Cragg, J. G. (1971). Some statistical models for limited dependent variables with application to the demand for durable goods. *Econometrica* 39: 829–844.
- Damianos, D., Skuras, D., 1996. Unconventional adjustment strategies for rural households in the less developed areas in Greece. *Agricultural Economics* 15, 61-72.
- Eakins, J. (2016). An application of the double hurdle model to petrol and diesel household expenditures in Ireland. *Transport Policy*, 47, 84-93.
- Farmer, JR, Betz M.E. (2016). Rebuilding local foods in Appalachia: Variables affecting distribution methods of West Virginia farms. *Journal of Rural Studies* 45: 34-42.
- Galli, F., Brunori, G., (2013) Short Food Supply Chains as Drivers of Sustainable Development. Evidence Document; Sismondi: Pisa, Italy.
- Hardesty, S.D., Leff, P. (2009). Determining marketing costs and returns in alternative marketing channels. *Renewable Agriculture and Food Systems* 25 (1).
- Hinrichs, C.C., (2000). Embeddedness and local food systems: notes on two types of direct agricultural market. *Journal of Rural Studies* 16, 295-303.
- Jones, A. M. Yen, S. T. (2000). A box-cox double-hurdle model. *The Manchester School* 68(2): 1463–6786.
- Marsden, T., Banks, J., Bristow, G., (2000). Food supply chain approaches: exploring their role in rural development. *Sociologia Ruralalis* 40: 424-438.
- Park, T., Mishra, A.K., Wozniak, S.J., (2014). Do farm operators benefit from direct to consumer marketing strategies? *Agricultural Economics* 45, 213-224.
- Sage, J.L., Goldberger, J.R., (2012). Decisions to direct market: Geographic influences on conventions in organic production. *Applied Geography* 34, 57-65.
- Traversac, J.-B., Rousset, S., Perrier-Cornet, P., (2011). Farm resources, transaction costs and forward integration in agriculture: Evidence from French wine producers. *Food Policy* 36, 839-847.
- Uematsu, H., Mishra, A.K., 2011. Use of direct marketing strategies by farmers and their impact on farm business income. *Agricultural and Resource Economics Review* 40, 1-19.

- Ullah, R., Shivakoti, G. P., Zulfiqar, F., & Kamran, M. A. (2016). Farm risks and uncertainties Sources, impacts and management. *Outlook on Agriculture*, 45(3).
- Uva, W.-f.L., 2002. An Analysis of Vegetable Farms' Direct Marketing Activities in New York State. *Journal of Food Distribution Research* 33, 186-189.
- Verhaegen, I., Van Huylenbroeck, G., (2001). Costs and benefits for farmers participating in innovative marketing channels for quality food products. *Journal of Rural Studies*, 17, 443-456.
- Wooldridge, J. M. (2010). *Econometric Analysis of Cross Section and Panel Data*. 2nd ed. Cambridge, MA: MIT Press.