Farmers Participation in Short Channels in Italy: An Empirical Analysis

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Abstract

This paper analyses factors affecting the likelihood of farmers to participate in short supply chains to market their products. While in literature participation in farmers markets is often emphasised as a re-action to mainstream production strategies, mainly imposed by large retailer, relatively little attention has been given to whether short channel mechanisms and location-related features induce selection for specific typologies of farms and farmers. Our results indicate that more attention needs to be given by both researchers and practitioners to the complexity of factors leading farmers to participate in short supply chains.

1. Introduction

In recent years farmers participation in so-called direct marketing, short or alternative supply chains has become a central issue for both researchers and policy-makers. In Europe as well as in the north America the strategic interest of farmers for participating in direct marketing and reduce relationships with "traditional" buyers (often intermediaries or wholesaler-contractors) led to an increase in the number of participants in short supply chains such as Farmers Markets, Community Supported Agriculture (CSA) or in direct selling via on-farm shops (Martinez et al. 2010; King, 2010; Wubben et al., 2013).

In spite of several cases study existing that assess the profitability of farms participating in direct sales activities (see the literature reviews in Brown (2002) and Brown and Miller (2008)), few analyses exist assessing the economic drivers and the actual features of farmers undertaking sales through the short channel. Particularly it is not yet understood the type of farms and farmers which more likely participate in short supply channels, and how relevant is the role of the socio-economic context in which farmers operate. The objective of this analysis is to present an exploratory analysis and a first assessment of the main drivers behind farmers participation in short supply chains. To that end, we use four years of Italian Farm Accountancy Data Network (FADN) data, for the year 2008-2011, and an empirical model derived from a simple theoretical framework which predicts salient points on the drivers of the intensity of participation. Preliminary empirical results allow to provide a profile of factors that impact the intensity of farmers participation in the short supply chains.

2. The conceptual model

We assume farmers market their products in two channels, representing two different level of horizontal quality. We define total market size for a given geographic area as S.[1]Let Mbe the total number of farms in a given area; all the farmers participate in the traditional (b) channel while $m_a < M$ farms participate in the short channel only. Consider the *i-th* farmer who can choose to sell a portion $\delta_i (0 < \delta_i < 1)$of its output to the short channel (a), or to participate in one channel alone (that is $\delta_i = 0$ represents participation in the traditional channel and $\delta_i = 1$ in the short channel). Let S_i be the output by farmer$i$; let's focus on the case where a farmer does not specialize$(0 < \delta_i < 1)$: the quantity sold through the short channel is $S_{ai} = \delta_i S_i$; while that sold thought the traditional channel is $S_{bi} = (1 - \delta_i)S_i$.

We assume that farmers already participating in traditional channels consider whether or not to join the non-traditional channel to cater to different consumers, and achieve higher margins while spreading the production risk. Consequently, we view adding the short channel as a secondary outlet. The price in either channel (P) is determined by the market (that is, farmers are price takers). We assume the average variable cost (AVC) for producing and selling products in each channel to be constant. Thus, the per-unit margin for each product sold through each of the channel is defined as $\theta = (P - AVC)$. Each farmer participating in the short channel pays a fee$F$ which is proportional to a function of theshare of outputsold to the short channel $f(\delta_i)$which is a continuous and differentiable increasing function in δ; the participation fee F is set by a perfectly competitive channel manager (for example, the manager of a farmers market) which is set as to recover the total costs for establishing the channel, Eor that $F=E/m_a$.We assume that farm$i$ participating in both cannels sets strategically the level of participation solving:

$$(1) \max_{\delta_i} \quad \pi_i = \delta_i \theta_a S_i + (1 - \delta_i)\theta_b S_i - \frac{E}{m_a} f(\delta_i)$$

which gives

$$(2) \quad (\theta_a - \theta_b)\frac{m_a}{E} S_i = f'(\delta_i)$$

An empirical question is the specification of $f(\delta_i)$. One can envision constant participation cost elasticity specification or $f(\delta_i) = \frac{1}{\gamma}\delta_i{}^{\gamma}$ where $\gamma > 1$. In the special case of $\gamma = 2$ one has the optimal condition of:

$$(3)\delta_i = (\theta_a - \theta_b)\frac{m_a}{E} S_i$$

The equation above suggests that the level of participation is positively related the profitability of the short channel (θ_a), number of participants in the short channel (m_a),and the total production of the farm S_i, while it is negatively related to the margins of the traditional channel (θ_b) and the cost of establishment of the short channel (E).

This simple theoretical framework predicts, as one may expect, that as the difference in variable margins between the short and traditional channel increases, farmers' incentive to participate in the former will be larger. At the same time, as more farms join the short channel, it will be more profitable for farms sell in the short channel, because more of the establishment cost will be spread across multiple farms (note that $F=E/m_a$); similarly, as the establishment cost grows larger, farmers will have a lower incentive to divert part of their production to the short channel. We derive that a farmer will be more likely to intensively participate in a short channel, thus selling more output through the short channel (S_{ai}), when factors affecting profitability of participation will be more likely to be present. These factors includes farm size, famer's management skills, farm specialization, locational features, including the relevance of short channels in the context farmers are operating.

3. Data and empirical strategy

We first introduce our data. We gather information by using the Italian Farm Accountancy Data Network (FADN) data and using four years (2008-2011) of observations. The Italian FADN contains detailed information on more than 10,000 farm businesses, collected and organized by the Italian National Institute of Agricultural Economics (INEA). The data is representative of the Italian farmers population, and it is aligned with the formal procedures of the European Commission. The database contains information on farm location that allows us to match market-specific variables such as provincial population and regional household consumption to each observation. Our sample refers to 40,076 farms. Within the Italian FADN sample almost 9% of the farms are participating in, at least, one short supply chain.

We now shortly describe our empirical strategy. We aim to test whether a relationship exists between our measures of intensity in participation in short channels (share of turn-over from products marketed in short channels over total value of sales) and a series of farm related and contextual factors, to find an empirical validations of our theoretical model. For brevity we will refrain from discussing the explanatory variables in the model, which are illustrated in the different panels of Table 5, below. We specify the following equation:

$$(4)S_{ikt} = \alpha + \beta_1 A_{ikt} + \beta_2 B_{kt} + \beta_3 C_{ikt} + \beta_4 D_{kt} + eikt$$

Where S_{ikt} represents the intensity of participation, given by the share of turn-over due to sales in short channels of farmer i in region k and time t, where $k=1,...,20$, and $t=1,...,4$. A_{ikt} refers to a vector of variables capturing farm's and farmer's characteristics, B_{kt} are variables related to the socio-economic profile and other features of the market where the farmer operates; C_{ikt} are variables capturing farms' specialization and D_{kt} are location control variables. We also consider regional and year fixed effects. Given the truncated nature of our dependent variable we use a Tobit estimator to recover the parameter of equation (4).

4. Empirical Results

We present results on the relationship between intensity of participation to short channels and main driving factors. In the table in the Appendix, we report the estimated parameters, which are obtained for different subsamples. We compare the results obtained with the full sample at our disposal (Full Sample), and two other set of results, obtained for samples of farms clustered according to size groups (Size Samples) or by geographic area (Area Samples).

The Results highlight that likelihood to intensively participate in a short market increases when farm economic size decreases, indicating a higher suitability of small and medium farms (below 100 UDE) to participate. The results also indicate that there is a considerable heterogeneity across geographic areas on how the size of the farm impacts the intensity of participation, as the magnitude and the significance of the farm size estimated coefficients varies largely by geographic area. Also, farms with a larger endowment in terms of land are more likely to participate, indicating a reverse relationship between intensification of the production process and likelihood to intensively participate in a short channel, fact which is corroborated by the fact that this positive relationship disappears if one considers the smaller farm size groups.

Farms with higher presence of hired workers external to the famer family, as well as managed by a young and educated farm manager are more likely to participate. However, these relationships are highly sensitive to the sample considered. Presence of agro-touristic activities is also positively related to likelihood to participate while the higher is the public support received by the farm the lower the likelihood to participate. Looking at the role of production specialization it is possible tom highlight that farms with organic productions are more likely to participate (although the relationship becomes negative for large farms and for farms operating in the Southern regions), while among the specialised farms only the ones dedicated to pork and poultry productions do not show any significant relationship with participation in short supply chains.

Location in areas where competition from traditional supply chains decreases highly the intensity of participation, while location in highly populated regions (urban areas) is positively related to decision to intensively participate. At the same time location in mountainous and hilly regions also increases likelihood to participate. Finally we notice a positive effect on highly concentration of "*Campagna Amica*" farmers markets on likelihood to participate, which is consistent with our simple theoretical model, predicting that participation intensity increases with the number of participants.

Discussion and conclusions

This paper analyses factors affecting the likelihood of farmers to participate in short channels to sell their products. Despite the increased interest for this topic and its relevance in terms of policy-making, fewer studies addressed explicitly the issue of screening and analysing driving

factors of participation. While in literature participation in farmers markets is often emphasised as a re-action to mainstream production strategies (Roep and Wiskerke, 2012), mainly imposed by large retailer, relatively little attention has been given to whether short channel mechanisms induce to selecting for specific typologies of farms and farmers. Our study preliminary indicates that participation to direct marketing shouldn't be consider as a "residual" or "plan-b-type" of strategies for marginalised farmers. It is indeed related to farmers with small and medium size more than larger farms however it deals with professional and specialised farms and it goes beyond specific specialization boundaries. While we confirm that farmers oriented towards more "environmental-friendly" practices, such as organic producers, are more likely to participate and use short supply chains as an outlet to market their products, also young and dynamic farmers are oriented to this strategy. Even more interestingly we figure that location does matter to understand this type of strategic decisions. Being close to urban centres it is confirmed to be a driver for selecting short supply chains as well as in areas where these typologies of marketing opportunities are more abundant. Location in areas with relatively less economic dynamicity, see the South and Central Italy, seems to be more likely connected with participating in short supply chains. Finally we have also figured that the typology of short chains also matters, indicating that farmers markets organized by Coldiretti (Campagna Amica) are more likely to invite for participation than other short supply chains. From a policy perspective we would like to highlight how rich and complex appears the mechanisms of participation in short supply chains., These should lead to reflect on more accurate analyse as well as interventions in this domain which is often see as a panacea for small and marginalised farmers or as a niche for environmentalist or social-activists. We figure that direct marketing and short supply chains represent a clear strategies to market agricultural products that involves transversally Italian farms. Future research will lead to better understand the role of how short supply chain mechanisms affect participation, as well as the role of farmers markets managers and public authorities.

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Appendix - Econometric results

	Full		Large	Medium	Medium-large	Medium-small	Small		Central	Islands	South	North-	North-
					Size Samples						Area Samples		
Medium-large	0.1425***								0.1406***	-0.0043	0.1501***	0.1819	0.0349
	-0.027								-0.0388	-0.1265	-0.0573	-0.1164	-0.0615
Medium	0.1228***								0.0865**	-0.0135	0.0752	0.1764	0.1304**
	-0.0253								-0.0357	-0.1154	-0.0542	-0.1123	-0.0545
Medium-small	0.1805***								0.1692***	0.1365	0.2042***	0.1366	-0.007
	-0.0288								-0.0421	-0.1293	-0.0599	-0.1207	-0.0722
Small	0.1956***								0.1821***	0.1139	0.2517***	0.171	0.0008
	-0.0307								-0.0452	-0.1368	-0.0626	-0.1276	-0.0784
plv	0.0127		-0.0037	0.4625**	0.3083***	1.0156***	0.4363		-0.0126	-0.0736	-0.123	0.1082	0.0576**
	-0.0148		-0.0175	-0.1801	-0.0577	-0.3429	-0.2794		-0.0214	-0.108	-0.0842	-0.0919	-0.0258
SAU	0.5387***		0.5941***	0.5169*	0.5166**	0.4523	-2.2033*		0.3149	0.0106	0.6947***	1.1013***	-0.0336
	-0.1322		-0.1896	-0.3001	-0.2346	-0.5486	-1.1553		-0.2448	-0.4985	-0.2374	-0.2747	-0.5487
lav_famp	0.1007		1.5523	0.4040*	1.4705***	0.2378	-0.0901		0.1241	0.3051	0.0115	-0.1061	-0.0067
	-0.0943		-0.9804	-0.222	-0.3667	-0.2107	-0.158		-0.1407	-0.3298	-0.1615	-0.2626	-0.3281
lav_extrap	1.3372***		0.2878	1.2297	1.5901*	0.7101	3.3896***		1.7228***	2.3826**	0.4207	0.0327	-1.8499
	-0.4446		-1.4179	-0.8573	-0.9079	-1.044	-0.9949		-0.6347	-1.2123	-0.7199	-1.9018	-2.117
costi_varp	-0.2161***		-0.1114	-0.1455**	-0.1131*	-0.3046***	-0.2817***		-0.2508***	-0.1908	-0.0807	-0.2539**	-0.2522***
	-0.0326		-0.0972	-0.059	-0.061	-0.0831	-0.0788		-0.049	-0.1163	-0.0589	-0.1046	-0.0931
altre_entrate	0.0437		0.0624	-0.1734	0.1326	-0.217	-1.5683		0.0901	1.4886	0.5814**	0.1331	-0.0539
	-0.0797		-0.0794	-0.511	-0.3011	-1.1258	-1.4387		-0.1085	-1.1528	-0.2837	-0.4118	-0.1557
agriturismo	0.1737***		0.1492**	0.2276***	0.1250***	0.0844	0.0728		0.0671**	0.1229	0.1895***	0.1916**	0.2763***
	-0.0226		-0.0618	-0.0418	-0.0404	-0.0697	-0.073		-0.0272	-0.17	-0.0536	-0.0845	-0.0554
aiuti	-1.6967***		-1.4611***	-2.2987**	-1.3089**	-7.6346***	-4.3089		-1.3376*	-1.4701	0.7849	-8.2213***	-1.5864
	-0.3912		-0.5395	-1.1424	-0.6296	-2.584	-3.0551		-0.6925	-1.6669	-0.7025	-1.5659	-0.969
bio	0.0534*		-0.2385*	0.0556	0.0242	0.1628**	0.1316*		0.0737*	0.2195**	-0.1376***	0.3883***	0.1831*
	-0.0284		-0.1296	-0.0499	-0.052	-0.0647	-0.0715		-0.0388	-0.1035	-0.0475	-0.0983	-0.0984

giovane_imp	0.0347*	0.0444	0.0468	-0.016	0.0990**	0.0609	0.0078	-0.0148	0.0508*	-0.0075	0.036
	-0.0179	-0.054	-0.0304	-0.0311	-0.0455	-0.0503	-0.0294	-0.0704	-0.0299	-0.0543	-0.0444
eta	-0.0012**	-0.0014	-0.0012	-0.0008	-0.0014	-0.0015	0.0013*	-0.0026	-0.0006	-0.0061***	-0.0034**
	-0.0005	-0.0017	-0.001	-0.001	-0.0013	-0.0012	-0.0008	-0.0019	-0.0009	-0.0019	-0.0015
edu	0.0132***	-0.0033	0.008	0.0147*	0.0004	0.0279**	0.0219***	0.0067	-0.0057	0.004	0.0398***
	-0.0046	-0.0136	-0.0085	-0.0083	-0.0114	-0.0111	-0.0068	-0.0157	-0.0075	-0.0171	-0.013
sesso	-0.0114	0.0399	-0.0059	-0.0157	-0.0358	0.0049	0.0087	-0.0632	0.0126	-0.0202	-0.0242
	-0.0132	-0.0505	-0.0248	-0.0286	-0.0295	-0.0274	-0.0206	-0.0498	-0.0202	-0.0444	-0.0384
irrigation	-0.0096	-0.1453***	0.0037	-0.0970***	0.0447	0.0718**	0.0474**	-0.025	0.0940***	-0.1522***	-0.0435
	-0.0125	-0.0443	-0.0226	-0.0247	-0.03	-0.0289	-0.0205	-0.0536	-0.0209	-0.0536	-0.0328
whole_land	-0.2323***	0.1472	-0.2067**	0.1418	-0.5446***	-0.5522***	-0.2891	-1.2051	-0.0728	-0.2845	0.5068
	-0.053	-0.1558	-0.0883	-0.1077	-0.1462	-0.1627	-0.224	-0.7383	-0.2367	-0.4272	-0.5459
popden	0.3649***	0.2229	0.3387***	0.0612	0.6837***	0.6700***	0.348	3.8625	0.9629***	0.4164*	-0.244
	-0.0708	-0.203	-0.1104	-0.1372	-0.2097	-0.2213	-0.2158	-3.0162	-0.2761	-0.226	-0.499
popolazione~t	0.0408**	-0.0015	0.0543*	0.0955***	0.0504	-0.0522	0.0766***	0.0665	-0.9191***	0.4086***	-0.0148
	-0.0168	-0.0582	-0.0304	-0.0308	-0.0445	-0.0424	-0.0292	-0.3674	-0.0837	-0.0644	-0.1671
nr_campagna~t	0.0007**	0.0006	0.0001	0.0032***	-0.0006	-0.0015**	-0.0024***	0.0036	0.0021***	0.0046***	0.0069***
	-0.0003	-0.0009	-0.0005	-0.0005	-0.0007	-0.0007	-0.0005	-0.0056	-0.0007	-0.0008	-0.0014
nr_mercati_~t	-0.0068***	-0.0071**	-0.0045***	-0.0118***	-0.0047**	-0.0048**	-0.0123~t	0.0073	0.0089***	-0.0227***	-0.0065**
	-0.0009	-0.0031	-0.0015	-0.0016	-0.0021	-0.0023	-0.0026	-0.0264	-0.0021	-0.0026	-0.0032
OTE2	0.2822***	0.2089**	0.1462***	0.3092***	0.2385***	0.2122***	-0.1030**	0.0769	0.2443***	0.7042***	0.7740***
	-0.0265	-0.0869	-0.0535	-0.0474	-0.0676	-0.0722	-0.04	-0.1009	-0.0561	-0.0952	-0.0715
OTE3	0.2220***	0.2710***	0.1762***	0.1732***	0.2425***	0.1761***	0.2255***	0.0615	0.0802***	0.3258***	0.2258***
	-0.0173	-0.0735	-0.0319	-0.0368	-0.0404	-0.0369	-0.0256	-0.064	-0.0272	-0.0753	-0.0518
OTE4	0.0586***	-0.0108	0.0569	0.0196	0.1172**	0.0446	-0.0011	-0.1513**	0.0724**	0.1697**	0.0632
	-0.02	-0.0763	-0.0352	-0.0369	-0.0517	-0.0522	-0.0319	-0.0743	-0.0339	-0.0734	-0.0617
OTE5	-0.0117	-0.2357***	0.1708	-0.0762	0.4706***	0.0925	0.0888	0.0645	0.1971***	-0.3932*	-0.3505***

	-0.0421	-0.0864	-0.1071	-0.0734	-0.1645	-0.2064	-0.0666	-0.1741	-0.0741	-0.2272	-0.1052
OTE6	0.3024***	0.3506***	0.2448***	0.1924***	0.3147***	0.3026***	0.1756***	0.2360***	0.1956***	0.5625***	0.3387***
	-0.0211	-0.0832	-0.0398	-0.0484	-0.0474	-0.0418	-0.0297	-0.0805	-0.0326	-0.0907	-0.061
OTE7	0.1178**	0.2336	0.1607*	0.0021	0.1722	-0.119	0.0024	0.0822	0.0628	-0.0716	0.2821**
	-0.054	-0.152	-0.0841	-0.1169	-0.1216	-0.1612	-0.0792	-0.2796	-0.082	-0.312	-0.1283
OTE8	0.1175***	0.1137	0.0756*	0.0828*	0.0921	0.1169**	0.0353	0.1847**	0.1300***	0.1769**	0.1135*
	-0.0238	-0.0974	-0.0436	-0.0451	-0.0595	-0.0506	-0.0349	-0.0878	-0.0407	-0.0857	-0.0652
Altim 1	0.0659**	-0.1046	0.0986*	0.1056*	0.0341	0.1102*	0.0417	-0.0285	-0.1444***	0.0847	0.2788***
	-0.0278	-0.106	-0.0515	-0.0557	-0.0639	-0.0654	-0.0508	-0.1008	-0.0519	-0.0913	-0.1031
Altim 2	0.1865***	0.1439***	0.1914***	0.1416***	0.1692***	0.2438***	0.1937***	-0.071	0.1468***	0.1222*	0.1284***
	-0.0166	-0.0526	-0.0307	-0.0302	-0.04	-0.0417	-0.0358	-0.0568	-0.0314	-0.0663	-0.0431
Svant 2	-0.0324	-0.0654	0.0312	-0.028	-0.0032	-0.0766	-0.1308***	0.0929	0.0046	-0.2378**	0.1340**
	-0.0203	-0.0662	-0.036	-0.0375	-0.0486	-0.0501	-0.0283	-0.0756	-0.0408	-0.1157	-0.0521
Svant 3	0.0669***	0.1073	0.1032**	0.0501	0.0098	0.0788*	0.0012	-0.0573	0.1575***	0.1216**	0.0345
	-0.0219	-0.0915	-0.0401	-0.0461	-0.0486	-0.0477	-0.0363	-0.0931	-0.038	-0.0598	-0.0744
Svant 4	-0.002	0.0702	0.0149	-0.0016	-0.0356	-0.0121	-0.0216	-0.0186	0.017	-1.8846	-0.124
	-0.0178	-0.0614	-0.0319	-0.0367	-0.0416	-0.0389	-0.0232	-0.0677	-0.0255	0	-0.2687
Svant 5	-0.0123	-0.3981**	0.0654	0.1374**	-0.1513	-0.1737*	-2.6714	-0.0005	-0.0205	0.5360*	0.0925
	-0.0399	-0.1913	-0.0729	-0.0649	-0.1054	-0.1014	0	-0.0817	-0.0707	-0.3088	-0.095
Sigma	0.5627***	0.4759***	0.4990***	0.5216***	0.6029***	0.5992***	0.4591***	0.5644***	0.4721***	0.6647***	0.6404***
	-0.008	-0.0248	-0.0141	-0.0145	-0.0192	-0.0184	-0.0107	-0.0321	-0.0132	-0.0269	-0.0205
Constant	-1.0166***	-0.5842***	-0.8355***	-1.0424***	-0.9063***	-0.8463***	-0.8176***	-1.5493***	-0.8140***	-0.7028***	-1.5793***
	-0.0625	-0.1725	-0.1054	-0.1108	-0.1416	-0.1385	-0.0955	-0.5298	-0.1137	-0.2443	-0.1908
Obs.	40076	4198	9730	10463	7564	8121	8062	3300	9875	8800	10039
Adj-R^2	0.1566	0.2777	0.1611	0.1991	0.1367	0.1945	0.164	0.1497	0.145	0.237	0.2777