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Does agriculture matter? Revisiting the farm income problem in Italy

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The prevalence of low income among agricultural households has long been known as the "farm problem". Although revisited by a number of recent studies the farm problem is still one of the rationales of agricultural policies. We apply the Oaxaca decomposition to investigate how differences in well-being between agricultural and non agricultural households in Italy are affected by the structural characteristics of households rather than specificities of the agricultural sector. Findings indicate that the latter component accounts only for one third of the difference in well-being. Therefore, tackling the adverse mix of characteristics that negatively impact well-being in agricultural households would seem to require the implementation of targeted – but not necessarily sector-specific – policies.

JEL codes: Q18, J790

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I. Introduction

Traditionally, low and unstable farm income has been the main rationale behind agricultural policy interventions in developed countries. Article 39 of the Treaty of Rome lists the attainment of fair living standards for farmers among the goals of the Common Agricultural Policy (CAP). One of the main instruments of the current CAP – the single farm payment scheme – still pursues this goal.

However, several studies in both the USA and the European Union have revisited the issue of the low-income prevalence among agricultural households. According to Gardner (1992) this so called "farm problem" has progressively diminished in the USA since the '60s. Both Mishra et al. (2002) and Katchova (2008) found that, on average, income levels (from both farming and other sources) are similar across farming and non-farming households in the USA. Similarly, the last available survey on total income of agricultural households (Eurostat, 2002) shows that the average income of agricultural households in the narrow sense[1] is likely to be comparable with the average income of total population across most European countries although income disparities persist in some countries. De Frahan et al. (2008) recently analysed data from the Luxembourg Income Study for 12 OECD countries. They found that, if anything, there is evidence that the average income of farm households is larger than the corresponding non-farm

[1] A "narrow" concept of Agricultural Households includes only households where income from self-employed labour in agriculture accounts for more than 50% of total household income whereas a "broad" definition includes all the households earning at least a share of their income from farming (United Nations, 2012: chapter 8).

average across most of the countries investigated.

However, undertaking such studies is not as straightforward as it may seem. Besides issues of data availability (Hill, 1999), any attempt to compare the income of farming and non-farming households faces a number of other difficulties. Comparison of households showing a very diverse income mix needs to be complemented with the analysis of income distribution across narrow groups such as households relying mainly on self-employment income (Peake and Marshall, 2009). Location, education and life stage are other possibly blurring factors (Katchova, 2008). Furthermore, farm income is volatile and comparison should average across years or focus on more stable indicators such as expenditure (Hill, 1999; Mishra et al., 2002).

Expenditure is also a proxy for wellbeing and the equivalised consumption expenditure, that is the per adult equivalent consumption expenditure (PCE), is an obvious choice when looking for an indicator to compare well-being across groups of households. Some authors (see, for instance, Hill, 1999) have reported that the relative position of agricultural households in the income ranking worsens when consumption expenditure is expressed in per capita terms[2]. However, it is not clear if this is due to differences in structural characteristics between agricultural and non-agricultural households, to differences between farming and non-farming activities or both.

The aim of this paper is to explain how differences in wellbeing between agricultural (AG) and non-agricultural (NAG) households are due to sector specificities once factors other

[2] Italy was one of those EU countries which showed a lower expenditure figure for agricultural households.

than earning a living from farming have been controlled for. We propose to disentangle differences in PEC across the two household groups using the Oaxaca (1973) decomposition. This technique is well known in the labour market literature (Weichselbaumer and Winter-Ebmer, 2005)[3]. It allows the decomposition of expenditure differentials into an "endowment" effect, due to differences in average household characteristics, and a "yield" effect, due to the various ways in which these characteristics impact on expenditure (i.e. differences in the coefficients of PEC regression on household characteristics). The latter effect may be understood as relating to a specific aspect of farming, i.e. a measure of sectoral bias that may provide a rationale for specific income support policies.

II. Methodology

Oaxaca decomposition was originally used to explain gender inequalities in wages (Oaxaca, 1973). More generally, the technique explains differences between the averages of two groups for every variable for which a common explanatory model can be built. First a sample of households is divided in two mutually exclusive groups (e.g. AG and NAG). Then, for each group an expenditure equation is estimated which relates the variable of interest – in our case log PEC[4] – to a set of explanatory variables (such as number of working adults) measured at the household level :

$$\log(E_{ij}) = \mathbf{x}_{ij}\boldsymbol{\beta}_j + e_{ij} \qquad (1)$$

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[3] As far as the authors are aware the Oaxaca decomposition has never been used to compare well-being of agricultural vs. non-agricultural households.

[4] The semi-logarithmic form has been already used to explain inequalities in well-being across population groups (see, for example, Nguyen et al., 2007).

where Eij is the PEC of household i belonging to group j, xij is a vector of household characteristics, □j is a vector of coefficients common to households of the same group but possibly different across groups and eij is a stochastic error with the usual properties. Ordinary least squares may be used to separately estimate equation 1 for each group. The average logarithm of PEC for group j is then given by:

$$\overline{\log(E_j)} = \overline{\mathbf{x}}_j \hat{\boldsymbol{\beta}}_j \quad . \qquad (2)$$

Then the difference of log PEC between the two groups can be expressed as:

$$\overline{\log(E_{NA})} - \overline{\log(E_A)} = \overline{\mathbf{x}}_{NA} \hat{\boldsymbol{\beta}}_{NA} - \overline{\mathbf{x}}_A \hat{\boldsymbol{\beta}}_A \qquad (3)$$

which can be rearranged as:

$$\overline{\log(E_{NA})} - \overline{\log(E_A)} = (\overline{\mathbf{x}}_{NA} - \overline{\mathbf{x}}_A)\hat{\boldsymbol{\beta}}_{NA} - \overline{\mathbf{x}}_A(\hat{\boldsymbol{\beta}}_A - \hat{\boldsymbol{\beta}}_{NA}) \quad . \qquad (4)$$

Equation 4 is a particular form of the Oaxaca decomposition that assumes the existence of specific disadvantages for agricultural households according to the farm problem hypothesis. The first r.h.s. term represents the "endowment" effect while the second term relates to the "yield" effect that is the different impact of household characteristics on the level of per capita expenditure in the two groups. Jann (2008) provides formulae for computing standard errors for each decomposition term taking into account the possible stochastic nature of regressors.

III. Data and Results

The analysis on per capita consumption expenditure is based on survey data from the Italian Households Budget

Survey carried out by the Italian Institute of Statistics[5]. The dataset used in this article refers to the year 2007 (ISTAT, 2009). We estimated the number of adult equivalent units per household as the square root of the household size, consistent with the Luxembourg scale. The calculation of the monthly consumption expenditure for each household is based on the definition of consumption given by the European System of Accounts .

AG household are defined in a narrow sense according to the employment status of the reference person, usually adopted as a proxy of the "prevalence of agricultural incomes" rule when detailed information on income composition is not available (United Nations, 2012). Specifically, the reference person must be self-employed in agriculture although not as a consultant or on a term contract. NAG households are selected from among the remaining households in the survey but we only include those in which the head of the household works, which means unemployed, retirees, students, etc are not considered.

For each household group (AG and NAG) we provide an OLS estimation of equation 1 choosing a parsimonious vector of household characteristics as explanatory variables (Tables 1 and 2).

[5] The Households' Budget Survey is one of the main sources for estimations of such things as consumption in national accounts, weights in consumer price indexes and poverty lines.

Table 1. Household characteristics, 2007

Long name	Short name	AG households		NAG households	
		Mean	SD	Mean	SD
Log per capita equivalised expenditure	*log percap*	6.66	0.64	6.87	0.63
Proportion aged 18 or below	*p. under18*	0.18	0.21	0.19	0.22
Proportion aged over 65	*p. over 65*	0.07	0.23	0.02	0.12
Proportion of adults with primary education	*p. primary*	0.19	0.32	0.06	0.19
Proportion of adults with middle education	*p. middle*	0.52	0.39	0.40	0.42
Proportion of adults with higher secondary education	*p. second higher*	0.22	0.31	0.39	0.40
Proportion of adults with tertiary (BSc or above) education	*p. tertiary*	0.07	0.21	0.15	0.31
Proportion of working adults	*p. working*	0.70	0.27	0.78	0.26
Household located in Southern Italy	*Sou*	0.46	0.50	0.31	0.46
Household located in Central Italy	*Cen*	0.12	0.32	0.20	0.40
Household located in Northern Italy	*Nor*	0.42	0.49	0.49	0.50
Urban household	*urban*	0.54	0.50	0.82	0.39
Number of sampled household		303		11 847	

Because of the dummy trap issue we choose the middle school as the reference level for education. Estimates of NAG household coefficients are all statistically significant showing the expected signs for all variables. PEC rises with level of education (that is human capital), residence in the more developed areas of Italy (North and Centre) and urban centres. The proportion of elderly people in the household shows a positive impact on PEC, possibly because of incoming social transfers related to the elderly, while the presence of younger people negatively affects per capita expenditure.

Table 2. Estimates of log per capita equivalised expenditure equations

	AG households			NAG households		
	Estimates	SE	*p*-value	Estimates	SE	*p*-value
const	6.11	0.12	0.00	6.28*	0.02	0.00
p. under 18	-1.02*	0.16	0.00	-1.05*	0.02	0.00
p. over 65	0.07	0.14	0.62	0.26*	0.04	0.00
p. primary	-0.15	0.11	0.19	-0.24*	0.03	0.00
p. second. high	0.09	0.11	0.41	0.15*	0.01	0.00
p. tertiary	0.23	0.15	0.13	0.34*	0.02	0.00
p. working	0.77*	0.13	0.00	0.69*	0.02	0.00
Cen	0.26*	0.10	0.01	0.19*	0.01	0.00
Nor	0.25*	0.08	0.00	0.28*	0.01	0.00
urban	0.09	0.07	0.19	-0.03*	0.01	0.03
R squared		0.33			0.39	
Number of obs.		303			11 847	

Notes: * significant at 5% level

Estimates for AG households show fewer significant coefficients notably for geographical location, proportion of working adults and younger people. Education levels, although showing the expected signs, are not statistically significant.

Table 3. Differences in log per capita equivalised expenditure between agricultural and non-agricultural households

	Predicted AG	Predicted NAG	R = NAG - AG	Endowment effect	Yield effect
Average log per cap. expenditure	6.66	6.87	0.21	0.14	0.07
SE	0.04	0.01	0.04	0.03	0.03

Average monthly PEC among agricultural households was about 989 euro in 2007. The corresponding figure for NAG households was 1182 euro. Taking logarithms this amounts to a difference between the means of the log PEC of about 0.21. Table 3 illustrates how Oaxaca decomposition applies in this case providing both point estimates and standard deviations. About two thirds of the difference is due to the endowment effect, that is, to differences in household characteristics while the remaining part is due to the different yield of characteristics in terms of expenditure between the two groups. Notably, the yield effect estimate shows greater variability w.r.t. the endowment effect.

IV. Summary and conclusions

This article compares well-being in agricultural and non agricultural Italian households using data from a nationwide household budget survey for the year 2007. Per capita equivalised consumption expenditure (PEC) is used as a proxy for household economic well-being.

Overall, results indicate that PEC correlates positively with the proportion of working adults in the household, the proportion of elderly people, the level of education of household members and living in the more developed areas of Italy. Conversely, PEC is negatively affected by an increasing proportion of young people in the household.

The Oaxaca decomposition shows that two-thirds of the difference we observe in average log PEC between the two household groups is due to differences in average household characteristics and only one third is due to differences in coefficients. In other words agriculture is only partially making

the difference.

On the one hand, our findings support the view that the farm problem and related farm income policies are losing relevance in developed countries. On the other hand, they point to the presence of an adverse mix of characteristics that negatively impact the well-being of agricultural households. We conclude that targeted – but not necessarily sector-specific – policies will be required in order to overcome the observed income inequalities.

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