Small Farm in Romania: evolution under localization constraint?
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Abstract
This paper aims to clarify the recent evolution of Romanian small farms. As a result of complex historic process, the category of subsistence and semi-subsistence farms is well represented within Romanian Farm structure (Mathijs and al., 2004; Giruca and al., 2006). The recent data collected by the General Census and Farm Structure surveys gave some signs of the recent evolution. We focus specifically on the smallest categories and try to differentiate their evolution among different factors. Farm survival and Farm growth literature is abundant and focuses especially on initial farm size, specialisation or pluriactivity of the farm (Weiss, 1999). In contrast, the role of localization, linked to historical background or physical constraints, as a factor is more limited in the literature. Other institutional factors such as inheritance and succession have not really been approached until now. We choose to investigate those factors using multiple regression on the 3 recent data collections in Romania.

Keywords: small farms, farm evolution, Romania, restructuration, historical and geographical determinants
JEL: Q15, Q18, P32, J11
Introduction
A focus on small farms requires a brief tour of work on the definition of farms (Ghib and Berriet-Solliec, 2008). This question has long been addressed in terms of economies of scale, but since the late 90s has been discussed under the umbrella of multifunctionality, along with new meanings of agriculture including the integration of environmental and social aspects of this activity. Finally, at the European level, enlargement to include the countries of Central and Eastern Europe, with the diversity of distribution of agricultural structures raises the question of small farms, particularly through their inclusion in the Common Agricultural Policy. The polarised structure of Romanian farms is strongly marked by many small farms but also by the social role of these structures, making it a particularly interesting case.

This paper is the beginning of work on the determinants of change in Romanian agricultural structures. We present here the first results concerning the relationship between distribution and evolution of structures based on structural factors. Indeed, we find in the literature and through surveys of agricultural Romanian actors, assumptions related to the localization of small farms and their evolution. The location factors most commonly related to structural change were defined: mountain zones, the history of land in the region (prior to communism), and also to the relative wealth of a Judet.

1. Small farm definition and hypothesis on their localization

1.1. Definitions
The issue of small farms leads us first to the definition of agricultural activity. It is noted that the definition of small farms is still not yet determined, despite many attempts at both national and international levels (Lund, 2005 and Remy, 2007). A recent OECD publication (OECD, 2009) made a comparison of the definition of agricultural activity, a prerequisite to the definition of the thresholds of classes. The 17 countries studied were shown to define agricultural activity on various criteria that can be linked to income from business (Canada, Finland, Poland), sales (the United States, Australia, Japan, Korea), potential production (Austria, Germany, Netherlands), factors of production such as area (Denmark, Finland, France, Switzerland, Japan, Korea) or the size of herd (Switzerland, Denmark), but also the number of work units engaged in the business (France and Germany).

Similarly, the small holding, the farm or the farm household are entities that provide the basis for the development of this activity. Again, definitions vary. In the Romanian case that we treat here, this definition has been difficult to elucidate for the establishment of the Common Agricultural Policy in Romania (Ghib and Berriet-Solliec 2008). The latest document, the National Rural Development Plan (PNDR, 2008), tells of a typology of three categories: subsistence farms (0 to 2 ESU), the semi-subsistence farms (2 to 8 ESU) and commercial farms (more than 8 ESU). Within this article, we will use as a definition of "small farms" subsistence or semi-subsistence farms, measured either by ESU or by default surface area in hectares.

1.2. Factors influencing the evolution of farms
Firm size as a factor in their growth is an old subject of research, as far back as Gibrat (1931). Gibrat proposed a theory, called the law of proportional effect, that the rate of growth of a firm is...
independent of its original size. Growth would be a purely stochastic phenomenon resulting from
the operations of many random independent factors. His theory was applied to farms for the first
time by Upton and Haworth (1987) and Shapiro et al. (1987), who arrive at conflicting conclusions
about its validity for agriculture. Other more recent work, in turn, invalidates the theory on
empirical data, in particular in the work of Weiss (1999).

We do not develop in this short article a test of Gibrat on Romanian data. Instead we propose a
synthesis of the data aggregated by Judet examining changes according to the categories of physical
size.

Indeed, recent statistics collected on farms in Romania suggest that a restructuring is underway. The
general trend is a decrease in the number of farms and cultivated areas:

Table 1: Number of Farms and area farmed  categorised by area

<table>
<thead>
<tr>
<th>Class of Area</th>
<th>Number of farm Area</th>
<th>RGA 2002</th>
<th>ASA 2005</th>
<th>ASA 2007</th>
<th>Evolution 2005 in comparison to 2002 (%)</th>
<th>Evolution 2007 in comparison to 2005 (%)</th>
<th>Evolution 2007 in comparison to 2002 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1ha</td>
<td>VSF</td>
<td>2 169 258</td>
<td>1 851 835</td>
<td>1 685 500</td>
<td>-14.6</td>
<td>-9.0</td>
<td>-22.3</td>
</tr>
<tr>
<td>1-5 ha</td>
<td>SF</td>
<td>4 180 568</td>
<td>4 407 600</td>
<td>4 179 874</td>
<td>5.4</td>
<td>-5.2</td>
<td>0.0</td>
</tr>
<tr>
<td>5- 100 ha</td>
<td>MF</td>
<td>269 615</td>
<td>376 538</td>
<td>391 022</td>
<td>39.7</td>
<td>3.8</td>
<td>45.0</td>
</tr>
<tr>
<td>&gt; 100 ha</td>
<td>LF</td>
<td>2 451 257</td>
<td>3 582 532</td>
<td>3 756 073</td>
<td>46.2</td>
<td>4.8</td>
<td>53.2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>13 930 710</td>
<td>13 906 701</td>
<td>13 753 046</td>
<td>-0.2</td>
<td>-1.1</td>
<td>-1.3</td>
</tr>
</tbody>
</table>


This decrease at the national level was higher in the first period 2002 - 2005 between 2005 and
2007 for Very Small Farms (VSF, <1 ha).
However, for Small Farms (SF), 1 to 5 ha, the trend is completely different- a slight increase on the
first period and decrease the second, more than 6% in number and more than 5% surface.

The medium sized farm (MF) of 5 to 100 ha experienced a sharp increase between 2002 and 2005
with nearly 40% increase in number, which remained positive between 2005 and 2007 but capped at
less than 5%.
In contrast, the holdings of more than 100 ha significantly decreased between 2002 and 2005 ( -12.36%), before experiencing an increase between 2005 and 2007 by 8%.

These developments confirm the gradual establishment of a restructuring process, probably linked
to the agricultural policies implemented during these two periods. In particular, we can highlight the
changes by the Minister G. Flutur from 2005. But we could also attribute these changes to
anticipation of the arrival of subsidies and the first effects of the SAPARD program started in 2002.
1.3. Factors of the localization

- Historical factor

Map 1: Historical variable which represents the percentage of farms below 3ha by Judet in 1941

Romania in its current borders is a young country. The joining in the region of Transylvania with former princely provinces in the south and east occurred in 1918 and was formalised by the Treaty of Trianon (1920) and the defeat of Hungary alongside Germany. These areas were therefore previously subjected to different political regimes but also different land regimes, (Axenciuc, 1996) which have helped shape the present picture of distribution of land structures.

Here we call upon the theories of historical institutionalism, according to which historical institutions affect present phenomena. According to Thelen (2003), the institutions may be resilient in the face of major historical ruptures, *ie* shocks that are a priori expected to break previous models (...).

Here we test the reappearance or reformation of land structures after three major shocks. The first of these shocks is the land reform of 1945 with the seizure of the lands of Saxons⁴ in Romania but also any property over 50 hectares and their redistribution to veterans and war widows. The second was the communist period and the major impact of collectivization, and the third is the land reform of 1991 to the fall of communism with the redistribution and restitution of land to more than 4 million people.

Despite these three upheavals in agricultural structures, political and land regimes anterior at 1945 will also contribute to the history of regions, and the slow rate of present restructuring is differentiated by region. These differences are explained by the persistence and transfer of agricultural know-how maintained during communism on the plots in areas where individual farming prevailed in contrast to regions where the population was predominantly manual or subject to large landowners and which may have lost this element of agricultural knowledge.

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⁴ People of German origin living in Transylvania since 1200-1300
Factors relating to less favoured areas

Map 2: Distribution by percentage of the total agricultural areas classified as ZMD and ZDS/ZSD

Mountain areas and those classed as ‘disadvantaged’ (ZMD, ZSD and ZDS\(^5\)) are assumed to have handicaps affecting agricultural activity, and farms are expected to disappear faster in these areas. This assumption is the basis of the measures the EU has put in place since 1975 to aid these disadvantaged areas based on zoning according to altitude, slope, or the degradation of agricultural land (EC, 2009).

Juvancic (2006) shows that the phenomenon is reversed in Slovenia: farms disappear fastest in the most urbanized areas, which by default have the most favourable conditions, as the non-agricultural labour market is more developed therefore alternative income strategies become more important. Furthermore, he believes that the relative persistence of smaller farms in remote areas may be due to the rigidity of the land market in these areas.

Factors related to the richness of the Judet

The relationship between regional wealth and maintenance of exploitations is often perceived as unfavorable. The richer a region the greater the importance of alternative employment and exits from agriculture become easier. Conversely, poor regions would see a continuation in agricultural activity, reinforcing its role as a social buffer (Pouliquen, 2001). GDP is here a proxy for regional wealth.

In contrast, in countries where agricultural activity is farming is essentially part-time, this

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\(^5\) ZMD: Zone Montana Defavorizate, altitudes up. to 600m or 400-600m with average slope > 15%. ZDS: Zone Semnificativ Defavorizata, ie low quality of soil, unfavorable climate or humidity and relief conditions. ZSD: Zonele de Conditii Naturale Specifice, areas with natural handicap.
relationship is reversed for survival, but growth of farms remains lower in the more affluent (Juvancic, 2006).

2. Data and variables
We conducted multiple regressions to test the hypotheses presented earlier with the following elements.

2.1. Data
The data used are those of the last data collection at the National Agricultural Census 2002 and the last two surveys of agricultural structures in 2005 and 2007 in Romania. In this article, we use the aggregated data at NUTS 3 level, ie within the 42 Judet.

2.2. Dependant variables
The dependent variables chosen are twofold. We first tested a ratio of economic size (ESU), ie the contribution of different economic classes in size to the total economic size Judets put together: $ctb_{0-2}$ for the contribution of agricultural units from 0 to 2 ESU, $ctb_{2-8}$ for the contribution of agricultural units from 2 to 8 ESU and $ctb_{sup8}$ for the contribution of agricultural units of more than 8 ESU. These data were available from the structure survey in 2005. In a second step, we tested the trend in the number of operations by Judet on 3 periods 2002-2005, 2005-2007 and 2002 - 2007, translated as a percentage of the starting year. These changes have been made for the 4 categories of surface for the holdings. We selected the period 2002-2007 which will be noted by the following $'evol02_07'*$.

2.3. Explanatory variables
The explanatory variables were selected to test the hypotheses presented earlier. Disadvantaged areas are captured by two variables: the mountain $'ZMD'$ and other disadvantaged areas $'ZDS_ZSD'$. These two variables are constructed from information in Annex 4 of NRDP for the period 2007-2013.

To take into account the historical factor, we used an indicator noted $'HISTO'$ based on the percentage of holdings by Judet less than 3 ha in 1941 (Cresin, 1945). We chose to work on data from 1941 because it is a date prior to the agrarian reform of 1945 but above all before the communist period that has significantly changed the distribution of sizes of structures by collectivization and the establishment of state farms.

Finally we also tested the role of $'GDP'$ in the explanation of dependent variables chosen. The equations used are as follows:

$ctb^* = f (ZMD, ZDS_ZSD, HISTO, GDP)$

$evol02_07^* = f (ZMD, ZDS_ZSD, HISTO, GDP)$

3. Results
A first analysis on the whole data set showed a strong role of the GDP variable, but this was strongly influenced by the Judet of Bucharest. We have therefore chosen to remove it from our sample because its features are very important. The
agriculture practised in this region is peri-urban, highly intensive in small areas. The reasons for the development of these farms are also heavily influenced by land markets in conjunction with ongoing with urban sprawl.

The results concerning the contribution of different economic size classes to the total economic size of Judet are presented in Table 2.

Table 2: Factors explaining contributions in ESU

<table>
<thead>
<tr>
<th></th>
<th>ctb0 2</th>
<th>ctb sup8</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>18.8</td>
<td>56.5</td>
</tr>
<tr>
<td>ZMD</td>
<td>-</td>
<td>-0.14 **</td>
</tr>
<tr>
<td>HISTO</td>
<td>0.72 ***</td>
<td>-0.66 ***</td>
</tr>
<tr>
<td>GDP</td>
<td>-0.002 **</td>
<td>0.003 **</td>
</tr>
<tr>
<td>R²</td>
<td>0.43</td>
<td>0.47</td>
</tr>
</tbody>
</table>

- : insignificant variable
** : significantly different from 0 at 5%
*** : significantly different from 0 at 1%

The variable HISTO, which measure the part of holding below 3 ha in 1941, plays the strongest role in the explanation of the presence of small farm in a Judet: the regions which held many small farms before the collectivization of land are still characterized by this feature at present. Influence of the GDP is lower and less significant: nevertheless it appears that in rich regions holdings tend to be large. Finally, large farms are somewhat less represented in the mountain areas.

For regressions on the evolution, we chose the change over the period 2002-2007 as more significant than for other periods.

Table 3: Explanation of evolution in percentage of farm number given by area.

<table>
<thead>
<tr>
<th></th>
<th>evol02_07 VSF</th>
<th>evol02_07 SF</th>
<th>evol02_07EM 5 – 100 ha</th>
<th>evol02_07GE &gt; 100 ha</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-15.2</td>
<td>-16.2</td>
<td>-</td>
<td>11.8</td>
<td>-5.39</td>
</tr>
<tr>
<td>ZMD</td>
<td>-0.16 **</td>
<td>-</td>
<td>-</td>
<td>0.40 ***</td>
<td>-</td>
</tr>
<tr>
<td>ZSD ZDS</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.83 ***</td>
<td>-</td>
</tr>
<tr>
<td>HISTO</td>
<td>-</td>
<td>0.21 *</td>
<td>-</td>
<td>-0.83 ***</td>
<td>-</td>
</tr>
<tr>
<td>GDP</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.006 ***</td>
<td>-0.00148 ***</td>
</tr>
<tr>
<td>R²</td>
<td>0.12</td>
<td>0.07</td>
<td>0.04</td>
<td>0.37</td>
<td>0.23</td>
</tr>
</tbody>
</table>

- : insignificant variable
* : significantly different from 0 at 0%
** : significantly different from 0 at 5%
*** : significantly different from 0 at 1%

The explanation of the evolution by class of area is lower than the contribution in terms of economic size at a given time.

Unlike in Slovenia (Juvancic, 2006), mountain areas appear to favour a relative preservation of large farms at the expense of the very small. Knowing that we take into account the total agricultural area, including also the pastures, we can explain this correlation by the sheep sector,
which has a strong presence in mountain regions and known for its dynamism (Institut de l'élevage, 2007).

We note also the representation of SF (but not VSF) in the Judet which are "traditionally" refuges of small farms (using the HISTO variable, the percentage of holdings of less than 3 ha in 1941). The importance of this variable on structure of holdings is therefore accentuated.

Moreover, it is evident that the evolution of the number of MF does not depend on the percentage of deprived areas, history or wealth of the region: these variables are expected to play on the survival, growth or decrease of holdings at the extremes of farm size.

When looking at trends for the period on all farms, only GDP and ‘less favoured areas’ are involved. The Judet with a low GDP are those for which farm structures are most ‘resistant’ to change. This confirms the role of agriculture as a social buffer described by Pouliquen (2001).

Conclusions

Within this study, we have been able to show correlations between contribution by economic size class or developments, and the explanatory variables commonly proposed to explain regional differences in terms of agricultural structure and its evolution. Thus the historical variable is particularly important, indicating that earlier agricultural structures have persisted despite 40 years of collectivization. Equally, three land reforms have failed to erase the effects of the land distribution of 1941.

Mountain areas are not particularly characterised by the presence of smaller farms, contrary to what one might expect. Large farms are also absent from mountain regions, but where their numbers change there is an increase. It would be interesting to analyse the role of sheep farming in terms of specialisation and farm size in mountain farms.

Finally, the lack of correlations within the analysis corresponding to medium sized exploitations leads us to question the chosen thresholds.
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