FARM ECONOMIC SUSTAINABILITY IN THE EU: A PILOT STUDY

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ABOUT THE FLINT PROJECT

FLINT will provide an updated data-infrastructure needed by the agro-food sector and policy makers to provide up to date information on farm level indicators on sustainability and other new relevant issues. Better decision making will be facilitated by taking into account the sustainability performance of farms on a wide range of relevant topics, such as (1) market stabilization; (2) income support; (3) environmental sustainability; (4) climate change adaptation and mitigation; (5) innovation; and (6) resource efficiency. The approach will explicitly consider the heterogeneity of the farming sector in the EU and its member states. Together with the farming and agro-food sector the feasibility of these indicators will be determined.

FLINT will take into account the increasing needs for sustainability information by national and international retail and agro-food sectors. The FLINT approach is supported by the Sustainable Agriculture Initiative Platform and the Sustainability Consortium in which the agro-food sector actively participates. FLINT will establish a pilot network of at least 1000 farms (representative of farm diversity at EU level, including the different administrative environments in the different Member States) that is well suited for the gathering of these data.

The lessons learned and recommendations from the empirical research conducted in 9 purposefully chosen Member States will be used for estimating and discussing effects in all 28 Member States. This will be very useful if the European Commission should decide to upgrade the pilot network to an operational EU-wide system.

PROJECT CONSORTIUM:

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LIST OF ACRONYMS

CAP	Common Agricultural Policy
EU	European Union
FADN	Farm Accountancy Data Network
FAO	Food and Agriculture Organisation of the United Nations
OECD	Organisation for Economic Co-operation and Development

EXECUTIVE SUMMARY

The measurement of farm economic sustainability has received intermittent academic interest in recent times, while the conceptual discussions are often quite limited. Moreover, this concept receives more attention at periods of difficulty for the sector. The measurement of farm viability is an important precondition to enrich these discussions. Therefore, it is necessary to develop more comprehensive and detailed measurement techniques to provide more clarity on viability and vulnerability levels in the sector. This paper refocuses attention on this issue, using a pilot dataset collected at farm level across a range of Member States in the European Union, which facilitates the assessment of an additional category of viability, namely that of economically sustainable farms i.e. farms that are economically vulnerable but which are deemed sustainable by the presence of off-farm income. Differences in viability and economic sustainability across the eight Member States surveyed are shown. The analysis is sensitive to the factors included in the measurement of viability as well as to the threshold income used to define viability. While this analysis is a pilot study, it nevertheless provides a greater understanding of the factors affecting cross-country evaluation of viability and sustainability, and the policy instruments that could improve viability levels.

1 INTRODUCTION

Within the context of the long-term sustainability of agricultural production which encompasses the three pillars of economic, environmental and social sustainability, this paper particularly addresses the economic sustainability of a sample of farms across the European Union (EU).

The family farming model is the dominant form of farming globally. FAO (2014) estimates that 500 million farms in the world can be classified as family farms, defining family farming based on ownership by an individual, small group or household. These family farms are highly important for a variety of reasons including food security; they are supplying 80 percent of the world's food (FAO, 2014) and they are contributing to the sustainability of rural areas (Brouwer, 2004; Hennessy *et al.*, 2008). Supporting farm viability in 'ensuring a fair standard of living for the agricultural community' is one of the key objectives of the EU's Common Agricultural Policy (CAP). A key issue in relation to this objective is the evaluation of the achievement or otherwise of this goal across EU Member States. Measurement of farm viability, in terms of the achievement of a specific income objective, would appear to be the simple option in determining the effectiveness of the CAP income objective. However, with the changing and restructured agricultural sector and the surge in pluriactivity and the growing contribution of other income sources in the EU (EC, 2008), the measurement of farm household income is complex and data demanding.

Family farm viability has been documented globally over several decades (e.g. Commins, 1985; Frawley and Commins, 1996; Argilés, 2001; Slavickiene and Savickiene, 2014). Aggelopoulos *et al.* (2007) modelled the financial viability of farms and discussed the difficulties in the Greek agricultural sector and the necessity to measure farm viability in order to avail of financial aid. Hennessy *et al.* (2008) looked at quantifying the viability of farming in Ireland in the context of the persistence of the small farm problem and the idea that the "most economically and physically disadvantaged farming regions tend to rely most on agriculture as a provider of employment" (p.30). Vrolijk *et al.* (2010) examined farm viability across Europe in the context of the impacts that changes in subsidy payments would have on viability rates. Barnes *et al.* (2014) discussed farm viability as a concept which attempts to understand the criteria for "failure at the farm level and to identify factors which determine a switch from viable to non-viable and the consequences of consistent under-performance in the sector" (p.4).

Viability measurement has received attention at different periods in different areas, often at periods of difficulty within the sector, for example in the recent Greek economic context (Aggelopoulos *et al.*, 2007), and in the Irish context in the 1990s when concern was raised about the impacts of free trade on the sector, to the present day where an economic recession and a consequent loss of off-farm employment has an impact on the viability of farm households.

A key finding of the European Court of Auditors' report on the measurement of farm incomes (ECA, 2003) was that "At the present time the community's statistical instruments do not provide sufficient information on the disposable income of agricultural households to allow an evaluation of the agricultural sectors standard of living" (p.18). Also other research stressed the importance of farm household income (Hill 1999; OECD 1995, OECD 2003). This led to several initiatives to evaluate the feasibiliy of farm household income statistics. Due to political resistance and fear of farmer refusal, no systematic collection of farm household income was achieved. At national level some countries achieved to monitor household incomes in a more systematic way.

The objectives of the paper are to review the measurement of farm economic viability internationally and to assess critically the methodologies utilised. The impact of off-farm employment is of particular interest in the context of recent economic turbulence. Indeed, off-farm sources of income can reduce annual variations in farm household income (OECD, 2003). This paper provides a framework to discuss the issues and contribute to the development of a methodology to gain a more detailed understanding of the economic viability of the farm enterprise, while acknowledging the restrictions of available data to assess farm household income. The lack of comparable data to assess the economic viability and sustainability of EU farms is addressed by the utilisation of an international pilot data collection conducted as part of the EU FP7 research project FLINT (Farm Level Indicators on New Topics in policy evaluation).

2 METHODOLOGY AND DATA

2.1 Methodology

2.1.1 Assessment of farm income

In order to develop a common metric that is comparable across EU Member States, the Farm Accountancy Data Network (FADN) definition of family farm income (FFI) is utilised in this analysis i.e. the "remuneration to fixed factors of production of the farm (work, land and capital) and remuneration to the entrepreneur's risks (loss/profit) in the accounting year" (EC, 2015, p. 15) and is defined as:

$$\begin{gathered}\text{FFI} = \text{Total Output} - \text{Total intermediate consumption}\\ + \text{Balance current subsidies \& taxes} - \text{Depreciation}\\ + \text{Balance subsidies \& taxes on investment} - \text{Total external factors}\end{gathered}$$

Total intermediate consumption represents total specific costs (including inputs produced on the holding) and overheads arising from production in the accounting year. Total external factors cover remuneration of inputs (work, land and capital) which are not the property of the holder (wages, rent and interest paid). As discussed above, this income does not take into account off-farm income, as the relevant data are not collected in FADN.

2.1.2 Choice of farm viability threshold

The viability threshold is one of the key issues in viability analysis. Hennessy *et al.* (2008) used the minimum agricultural wage defined by the Irish Labour Court. However, this wage level is not defined for all EU Member States, therefore cannot be used in a comparative study. The same problem arises for a minimum wage in the wider economy (for example, Finland has no minimum industrial wage). On this basis we have utilised the average wage of full-time employees in the total economy (average (industrial) wage) based on data from the Organisation for Economic Co-operation and Development (OECD) in order to facilitate cross-country comparison of farm incomes to those in other sectors. However, these industrial wages are quite high: for example, the average annual wage in Ireland in 2015 was EUR 47,366, whereas the Irish minimum agricultural wage used by Hennessy and O'Brien (2015) was EUR 19,167. This is likely to have a big impact on viability results. In order to compare the farm income to an average agricultural income, we employ the wages paid by the farms in the sample (paid (farm) wages). We approximate the annual FADN hourly wage by country as:

$$\text{Annual hourly paid wage} = \frac{\text{Paid wage}}{\text{Paid labour unit (in h)}}$$

These wages are close to the minimum wages defined nationally and are therefore considered plausible for this analysis.

2.1.3 Measures of farm viability

This section describes the range of viability measures used in this analysis. Hennessy *et al.* (2008) and Hanrahan *et al.* (2014) used three viability classifications: viable, sustainable and vulnerable farms. A farm is classified as viable if the FFI is higher than the average agricultural wage and provides a 5 per cent return on the capital invested in non-land assets, i.e. machinery and livestock. Farms are economically sustainable if they are not viable but either the farmer or the spouse has off-farm employment. Finally, vulnerable farms are neither viable nor sustainable. They do not produce enough profit to be viable and there is no other income.

The broad model of viability is:

$$\frac{\text{Family Farm Income} - \text{Cost of own capital}}{\text{Hours worked on the farm}} > \text{Threshold wage}$$

Although the condition on 5 per cent return on non-land assets is relevant in Ireland because of the specific land market, it is not relevant in all countries. This is because land assets are rarely sold in Ireland (Hennessy and Rehman, 2008; Hennessy *et al.*, 2008): less than 0.1 per cent of land is sold on the open market each year. Based on Vrolijk *et al.* (2010), we apply a condition on all own assets (total assets – total liabilities): the cost of own capital is defined as a fixed percentage of all own assets (based on long-term European Central Bank interest rates[1]). It is noticeable that farms with a relatively modest income can be viable if they have a small labour input and a low capital investment. On the contrary, farms with a large income may be vulnerable if they have high labour inputs and a significant cost of own capital. We apply eight different models of viability which are distinguished on three criteria:

- *Opportunity cost or farm level approach*. This approach enables us to see if the farmer would be better off financially to spend an hour working off the farm, as an agricultural worker for example. The farm-level approach focuses on the farming activity as a whole. If the farm is not viable at the farm level, the farmer would better spend his or her time in another activity (not on their own farm) and invest their capital elsewhere.
- *Condition on cost of own capital (COC)*. The ability to cover the COC enables us to ensure that farmers will be in a position to continue to invest in farming operations. The absence of this condition can be interpreted as farming as a way of life rather than an activity which has to make money.
- *Viability threshold*: Two kinds of thresholds are used here: average wage in the economy or paid wages as observed in FADN. The differences between them are discussed below.

Table 1 Models of farm viability.

Model no.	Definition	Opportunity cost of farm level	Presence of cost of own capital	Threshold
1	$(FFI - COC)\ /\ Nb\ hours \geq Avg\ wage\ (h)$	Opportunity cost	COC	Average wage
2	$(FFI - COC)\ /\ FWU \geq Avg\ \ annual\ wage$	Farm level	COC	Average wage
3	$FFI\ /\ Nb\ hours\ \ \geq Avg\ wage\ (h)$	Opportunity cost	No COC	Average wage
4	$FFI\ /\ FWU\ \ \geq Avg\ wage$	Farm level	No COC	Average wage
5	$(FFI - \mathrm{COC})\ /\ Nb\ hours \geq Paid\ wages\ (h)$	Opportunity cost	COC	Paid wage
6	$(FFI - \mathrm{COC})\ /\ FWU \geq Paid\ wages$	Farm level	COC	Paid wage
7	$FFI\ /\ Nb\ hours\ \ \geq Paid\ wages\ (h)$	Opportunity cost	No COC	Paid wage
8	$FFI\ /\ FWU\ \ \geq Paid\ wages$	Farm level	No COC	Paid wage

[1] http://sdw.ecb.europa.eu/browseTable.do?node=bbn4864

Notes: COC: Cost of Own Capital; FFI: Family Farm Income; FWU: Family Work Unit[2]; Nb hours: number of hours worked by unpaid labour units; Avg: average; (h): per hour.

Source: own compilation

2.1.4 Taking off-farm employment into account in measuring farm viability

Using the FLINT indicators, it is possible to consider the presence of off-farm employment on the farm, that is to say whether the owner or spouse has an off-farm job. This enables us to distinguish between sustainable and vulnerable farms. Here, only data regarding the presence and not the level of contribution of off-farm employment are available.

2.2 Data

The FADN dataset is the 'gold standard' of microeconomic data in EU agriculture. However, it includes only information which is directly related to the farm business and this leads to some notable omissions from the farm household's perspective, including education, gender, marital status, household debt (FADN records farm business debts only), number of household members, number of children, whether the farmer has a successor, and, critically, off-farm employment. In the context of evaluating CAP objectives (such as farm viability) across the EU, the FLINT project commissioned a pilot survey on a sample of 1,000 farms that are currently within the FADN sample. This survey contains supplementary qualitative and quantitative questions to provide new data for new policy topics (Vrolijk *et al*., 2016). Eight countries are included in our analysis: DE-Germany, EL-Greece, ES-Spain, FI-Finland, HU-Hungary, IE-Ireland, NL-The Netherlands, PL-Poland.

For most of the countries, the FADN economic size class defined between 100,000 and 250,000 EUR is close to the median point of the distribution of FADN farms. The largest economic size classes are evident in the Netherlands, and the lowest in Greece. Most of the farms in the sample are family farms, except in the Netherlands where "partnership" is the main type of ownership. The main type of farming in most of the countries (i.e. Germany, Spain, Finland, Ireland, the Netherlands) is "specialist grazing livestock" whereas in Greece, the main farm type is "specialist permanent crops". In Hungary "specialist field crops" and "mixed crops-livestock" are the main types of farming, with "specialist granivores", "mixed livestock" and "specialist crops-livestock" comprising the main farm types in Poland. Regarding total utilised agricultural area, Germany, Finland and Spain have the largest farms on average (more than 70 hectares), whereas Greece has the smallest (6 hectares on average).

A number of adjustments have been made to account for outliers in the data. We exclude the largest farms with asset values of over EUR 10,000,000 and outliers with very negative asset to income ratios, focusing on farms with moderate loss to capital ratios. The Greek data do not include liability information, so cannot be used to assess the return to capital, which depends upon net asset information in the other countries. About 5 per cent of cases are dropped as a result of these exclusions.

[2] Family Work Units are family Annual Work Units (AWU), as defined in FADN (EC, 2015).

Table 2 Average values of the components of economic sustainability of farms in eight EU Member States.

Component	Member State							
	DE	EL	ES	FI	HU	IE	NL	PL
Number of farms	51	123	127	49	92	59	153	144
FFI (EUR)	27,893	8,452	6,264	24,800	11,222	34,542	60,747	14,746
COC (EUR)	2,664	13,469	4,383	2,490	7,144	10,159	12,070	9,042
Unpaid labour input (h)	2,772	1,574	2,072	2,910	1,463	2,412	3,094	4,456
Unpaid labour input (FWU)	1.17	0.68	1.13	1.32	0.66	1.13	1.33	1.87
Paid labour input (h)	1,485	224	629	538	4,490	154	1,753	910
Paid labour input (AWU)	0.73	0.09	0.31	0.25	2.04	0.08	0.79	0.38
Off-farm employment rate (per cent)	0.63	0.34	0.44	0.43	0.61	0.47	0.58	0.26
Annual paid (farm) wage* (EUR)	35,360	10,491	18,770	27,786	7,733	21,633	50,786	6,298
Hourly paid (farm) wage* (EUR)	16.77	4.28	8.12	12.77	3.51	10.23	23.15	2.67
Annual average (industrial) wage* (EUR)	37,613	17,642	27,479	40,893	9,609	47,366	46,384	11,046
Hourly average (industrial) wage* (EUR)	23.69	8.09	14.86	22.85	5.36	22.73	22.20	5.40

Note: Off-farm employment rate is the share of sampled farms with off-farm employment (farmer or spouse)

Data sources: FADN, FLINT and OECD*

Although the small sample size does not enable us to draw conclusions at a larger scale, the relative values of the components of economic sustainability of farms in eight EU Member States can be compared (Table 2). There are large variations in FFI between farms and also between the countries.

The highest average income is achieved in the Netherlands. This is mainly due to high total output. That is also the case in Germany. Ireland shows the second highest average income, because of relatively low intermediate consumption, external factors and depreciation. Spain and Greece have the lowest average incomes. This is due to low output, and also because of a high ratio of total intermediate consumption to output, in Spain. There is also a strong variation in COC between farms and also between countries. For example, the Netherlands has one of the highest COC, due to high investment in machinery assets on these farms.

Regarding the number of worked hours, strong variations are evident between farms and between countries. Polish farms have the highest average number of hours worked by family labour, whereas Hungarian farms have the highest number of hours worked by hired workers. Differences can be partly explained by the kind of ownership. For example, the sampled farms in Ireland and Greece are all family farms, explaining the low paid labour input, whereas many of the Hungarian farms sampled are owned by partnerships. Germany and Hungary have the highest incidence of off-farm employment and Polish farms have the lowest. Finally, in relation to wages, in most of the countries (except in the Netherlands) the paid wages are lower than the average industrial wages.

3 RESULTS

3.1 Proportion of economically viable farms across countries

Each of the eight farm viability models listed in Table 1 was run on the combined FADN and FLINT dataset to identify the percentages of viable farms (Table 3). It should be kept in mind that these results are only indicative due to the small sample size.

Table 3 Percentage of viable farms in eight EU Member States according to eight models.

EU Member State	Model number							
	1	2	3	4	5	6	7	8
DE	0.09	0.28	0.10	0.31	0.23	0.31	0.29	0.37
EL			0.31	0.31			0.57	0.56
ES	0.11	0.11	0.18	0.18	0.19	0.18	0.25	0.19
FI	0.05	0.15	0.07	0.15	0.24	0.23	0.26	0.27
HU	0.28	0.45	0.47	0.52	0.50	0.50	0.52	0.52
IE	0.12	0.13	0.16	0.18	0.33	0.33	0.40	0.37
NL	0.19	0.21	0.25	0.25	0.19	0.17	0.24	0.25
PL	0.15	0.15	0.22	0.26	0.26	0.26	0.48	0.46

Note: For details of models see Table 1.

Source: own calculations

In general, Hungary has the highest viability rate, while Spain has one of the lowest viability rates. The former is partially due to the nature of the Hungarian sample, which contains a higher share of large cooperative farms. Greek data are only reported for models excluding the return on capital, due to the fact that liabilities are not reported in the data, so that return on capital reflects gross, and not net, capital.

There are particularly strong variations in Greece, Ireland, Finland and Poland, meaning that, for many farms in the sample, the high average wage in the economy compared to paid wages prevents them from being viable. When paid wages are used instead of average wages, the increase in viability rate is higher between the opportunity cost models than between the farm level models. That is the case in Germany and Spain. This can be explained by a higher difference between hourly and annual wages. Thus, from an opportunity cost perspective, for a farmer who earns more than the paid wages but less than the average, it is preferable to work off-farm and achieve the average wage per hour.

When comparing across models, poorer countries such as Greece, Hungary and Poland have the highest viability, reflecting lower minimum wage rates. For Hungary, the low labour input, and the low average wages in the economy explain the high viability rates. For Poland, it is mainly due to the low average wages in the economy. Western European countries such as Germany, Finland, the Netherlands and Spain have lower viability rates due to the higher benchmark thresholds as a result of higher minimum agricultural and average wages.

This point highlights one of the challenges in making cross-country viability comparisons as the paid (farm) wages threshold used to calculate viability differs across countries. This is to be expected as the latter are often lower than the average wages. The viability rate is lower in the Netherlands because of a higher threshold of paid wages. Thus countries with higher viability are not necessarily those with higher farm incomes, but rather lower opportunity costs of labour.

The level and ranking of viability change with the choice of definition. For example Germany has one of the lowest viability levels once one looks at the opportunity cost or rate per hour, but has one of the highest, when one looks at the farm level. Most of the time the farms are more viable at farm level than from the opportunity cost perspective. This means that this category of farms is only viable because of the number of hours worked. A high labour input enables them to achieve a high FFI, but they are not viable when examined on a per-hour basis. This is particularly true in Germany, meaning that hours worked is a key element in the viability of these farms.

The viability level is higher for the second set of models 5-8, rather than 1-4. This is because the benchmark for viability, the average wage paid for agricultural labour, is lower than the average wage in the economy. There is some mobility, due to the relative differences in wage rate, found across countries. Ireland for example is ranked second and third lowest for models 2-4 for the average wage, but is ranked amongst the highest for models 5-7. The Netherlands moves in the opposite direction, as it is ranked higher for average wage and lower ranked for the agricultural wage.

There is less variability between models when we consider the return on capital. The proportion of viable farms is higher in models without a condition on COC. Clearly, it is easier for a farm to be viable if this condition is not taken into account. In Poland, the highest increase is often reached between models with paid wages, meaning that the condition on the COC plays an important role here. For example, in Poland the difference is about 20 per cent, which means that for 20 per cent of the farms the farmer would be better off to spend an hour working off the farm where his or her wages would not include a condition on COC.

3.2 Proportion of economically sustainable farms across countries

A similar procedure was undertaken to examine the economic sustainability of farms across the eight Member States (Table 4). As there is no strong variation between the rankings of the countries between the models, the rankings are firstly described in the context of country differences in the results for model 1, then compared across all models.

Table 4 Percentage of sustainable farms in eight EU Member States according to eight models.

EU Member State	Model number							
	1	2	3	4	5	6	7	8
DE	0.57	0.49	0.56	0.45	0.53	0.45	0.48	0.41
EL			0.29	0.29			0.23	0.24
ES	0.43	0.43	0.41	0.41	0.41	0.41	0.40	0.41
FI	0.41	0.39	0.41	0.39	0.32	0.32	0.32	0.30
HU	0.49	0.43	0.42	0.40	0.41	0.41	0.40	0.40
IE	0.40	0.39	0.38	0.37	0.27	0.27	0.23	0.26
NL	0.44	0.41	0.41	0.41	0.44	0.45	0.42	0.41
PL	0.26	0.26	0.24	0.22	0.22	0.22	0.17	0.17

Note: For details of models see Table 1.

Source: own calculations

In model 1, the share of sustainable farms ranges from 26 (Poland) to 57 per cent (Germany). The countries with the lowest economic sustainability rates are Poland and Greece. This is because these countries have the lowest incidence of off-farm employment. As a corollary to this, Germany, the Netherlands and Hungary have the highest rates of sustainable farms and also have the highest incidence of off-farm employment, with the order changing relatively little if conditioned on being non-viable. Moreover, the difference between the incidence of off-farm employment and the proportion of sustainable farms is less than 13 per cent in these countries. Thus it is evident that many farms would be economically vulnerable without supplementary income from off-farm employment.

Compared to the significant change in the relative rankings in relation to viability, there is no strong variation in the proportion of sustainable farms and their ranks between the different models. This can be explained by the fact that off-farm employment is the main variable impacting economic sustainability. The only noticeable difference between models is in terms of thresholds. The proportion of sustainable farms is smaller in models using paid (farm) wages, particularly in Ireland. This means that the farms wich are no longer viable if we apply paid (farm) wages, have an income between the average wage and the paid wage, but also have off-farm income. This may indicate that the paid wage is not sufficient to cover their needs.

3.3 Proportion of economically vulnerable farms across countries

The last component of the analysis examines those farms that are economically vulnerable as defined above. Again, there are substantial differences across countries and between models (Table 5).

Table 5 Percentage of vulnerable farms in eight EU Member States according to eight models.

EU Member State	Model number							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
DE	0.33	0.23	0.33	0.23	0.23	0.23	0.23	0.22
EL			0.40	0.40			0.20	0.20
ES	0.46	0.46	0.41	0.41	0.40	0.41	0.35	0.40
FI	0.54	0.46	0.52	0.46	0.44	0.44	0.43	0.43
HU	0.23	0.12	0.11	0.08	0.09	0.09	0.08	0.08
IE	0.48	0.48	0.46	0.45	0.40	0.40	0.37	0.37
NL	0.38	0.38	0.34	0.34	0.38	0.38	0.34	0.35
PL	0.59	0.59	0.54	0.52	0.51	0.52	0.35	0.37

Note: For details of models see Table 1.

Source: own calculations

The vulnerable cohort is the complementary proportion of the previous results. Poland has the highest proportion of vulnerable farms (59 per cent in model 1). Moreover, the low off-farm employment rate explains why most of the farms are not economically sustainable. At the opposite end of the scale, Germany and Hungary have the smallest proportions of vulnerable farms, due to the high proportions of farms classified as sustainable.

Unlike sustainability, vulnerability is affected by changes in the models. A comparison between thresholds shows that there are fewer vulnerable farms with paid wages. The difference in the vulnerability rates assessed with average wage and those assessed with paid wage represents the farms which become viable when the threshold is changed. These farms generate an income between the two wages, but do not have an off-farm job. It can be surmised that either such an income is sufficient for these farmers or they do not want to work off the farm.

In many cases, there is a higher proportion of vulnerable farms when using opportunity cost rather than the farm level approach. This is the opposite for viability, and sustainability is not impacted. This corroborates our hypothesis that this may represent farms which have a large labour input, preventing the farmers from having an off-farm job. In these cases, the farms generate a sufficient annual income but not a sufficient hourly income.

4 CONCLUSION

The measurement of farm economic viability becomes relevant and receives academic interest at different time periods in different areas. During periods of failure or difficulty in the agricultural sector, attention turns toward the measurement of viability with a view to improving the situation given improved methods of measurement. In addition, there is an ongoing and growing need to evaluate CAP and Rural Development Programme objectives such as the improvement of farm viability. These needs present challenges to researchers and analysts to develop a farm household income measurement which provides details of the income levels of farm households which could then be analysed relative to other sectors within society. However, a lack of comparable data across EU Member States poses difficulties for meaningful evaluation.

While the comparative cross-country analysis undertaken in this paper is a pilot study, limited by the small sample size, it nonetheless presents a template for future work. The analysis highlights the following factors:

There are substantial differences in viability rates between countries. Some of these are related to national policies. There are a number of different definitional choices that can be used when we measure viability as discussed in this paper. These include the comparator wage which determines the threshold at which viability is determined. Similarly we can choose whether to incorporate a return on capital, which also affects the viability rate. Lastly we compare the choice of measuring viability in terms of the opportunity cost of farm resources or as an income measure, comparing farm incomes with an income from another source of employment. In relation to cross-country comparison, we note the importance of the change in both the levels and the rankings of viability between countries, depending upon the measurement choice. It is important therefore in comparing viability across countries to test the sensitivity of results to different measures.

Measuring viability using the current viability definition provides a head count analysis of viability in the country. While the head count measure of viability detailed in this paper is useful in many regards, it lacks detailed results of the issues affecting the unviable group. More detailed analysis is required to identify different improvement instruments for farms which are in states of chronic vulnerability as opposed to farms which experience less severe vulnerability over a shorter time period.

The results demonstrate the sensitivity of the measures to the use of particular thresholds in the measurement of the viability head counts. In particular, the viability rate is sensitive to the threshold or benchmark wage employed. Further work is required at national level to define a comparable threshold metric across the EU. As in the poverty literature, there may be merit in developing measures that are based upon the gap or distance from the threshold as compared to a simple binary measure of being above or below the threshold.

The capacity to evaluate the economic sustainability of farms on the basis of off-farm income, conferred by the use of the FLINT data in this analysis, opens up an important new economic viability classification, by distinguishing between the three categories studied (i.e. economically viable, sustainable, and vulnerable farms).

The extension of the FLINT data collection pilot to the wider FADN sample would enable more robust nationally representative analyses to be undertaken. In addition, the development of further statistics on other sources of income would present an opportunity to refine the three economic viability categories. Further information on household income would also enable analysis of the relative impact of farm total other incomes on the economic viability categories. Additionally, if data collection was to be undertaken at three or five year intervals, a time-series FADN dataset would allow for volatility assessment and the illustration of trends over time as well as providing an early warning of potential future economic, social or environmental threats. Data collection at a larger scale would also enable us to study the impact of agricultural structures and characteristics of the area on economic sustainability.

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