Extended Abstract
Please do not add your name or affiliation

Paper/Poster Title	**Profiling Flemish farmers by their perceived resilience**

Abstract prepared for presentation at the 96th Annual Conference of the Agricultural Economics Society, K U Leuven, Belgium

4th – 6th April 2022

Abstract	***200 words max***
Farm resilience is the ability of a farm to manage challenges, which is determined by the farm's levels of robustness, adaptability, and transformability. Flemish farmers assessed the performance of those three resilience capacities on their farms through a multi-item scale in a survey that also gauged other farmer personality traits, attitudes, and behavioural factors. The survey data set was extended with FADN variables. Cluster analysis revealed four groups of farmers. The first group of farmers reported low resilience capacities. These farmers tended to be older, less innovation-oriented, more risk averse, with lower involvement in networks with professionals and a more external locus of control. Their farms tended to score worse in terms of profitability and liquidity. The second group of farmers had the most positive perception about resilience and mostly showed opposite characteristics to the first group. The third group reported high robustness but low adaptability and transformability, whereas the fourth group did the opposite. The latter two groups did not have a clear or unique profile in terms of farm and farmer characteristics. Hypothesis for future scientific research and relevant policy implications that arise from our findings are formulated.	

Keywords	Resilience, Risk management, Farmers, Flanders
JEL Code	Q12 Micro Analysis of Farm Firms, Farm Households, and Farm Input Markets see: www.aeaweb.org/jel/guide/jel.php?class=Q)

Introduction	***100 – 250 words***

European farmers are confronted with increasing uncertainty and have to deal with often intermingling social, economic, institutional and environmental challenges. Hence resilience building on farms will be necessary for the long-term survival and thriving of farms and farming systems. Resilience theory, posing that a system manages changes and challenges from its environment by exploiting its available resilience capacities, provides a good analytical lens for examining different capacities in the farming sector for coping well with their faced myriad of challenges. Following Meuwissen et al. (2019), we considered three resilience capacities. First, robustness represents the capacity to withstand or absorb stresses and to continue practices as they were before the disturbance. Second, adaptive capacity is the ability to implement (incremental) changes as a reaction to shocks or stresses. Third, transformative capacity refers to the ability to implement more radical changes in response to changing circumstances that make business as usual impossible. This paper firstly examines the presence of these three resilience capacities in the agricultural sector of Flanders, as reported by the farmers themselves, and secondly explores whether and

how differences in resilience capacities at farm level relate to farm business characteristics and farmer psychometric variables. This empirical study provides useful insights for farm advisors and policy makers who aim to develop effective measures and interventions for enhancing resilience in the Flemish agricultural system. Furthermore, our findings lead to interesting new hypotheses for future research on the relation between farm resilience capacities and certain farm and farmers characteristics.

Methodology	***100 – 250 words***

Through a survey, we captured farmers' personality and agency characteristics, such as risk perceptions, attitudes, management behaviour, perception on future challenges, perceived locus of control, involvement in networks, and innovation-orientation. Most questions aimed to measure latent constructs, hence multi-item sets were used, measured on 7-point-Likert-scales. Scale reliabilities were assessed through confirmatory factor analyses and consultation of Cronbach alphas. Also their judgement about the levels of the three resilience capacities present on their farms was measured through twelve statements. Following factor analyses, these item scores were combined into composite indices that expressed the levels of robustness, adaptive capacity and transformative capacity at the farms. These indices were used in a K-means cluster analysis to find whether different groups of farms exist with regard to combinations of resilience capacity levels. Thereafter, the clusters were characterized in an explorative way, comparing them based on various farm (relating to economic performance, farm structure and typology, and use of resources) and farmer (relating to agency, personality, and competences) characteristics.

The survey was distributed online among all members of the Flemish Farm Accountancy Data Network (FADN) in August 2018, which held at the time a non-random sample of around 650 agricultural holdings. Participation in the survey was voluntary and lasted approximately 40 minutes. By November, 409 surveys were returned, of which 315 observations without missing values, resulting in an effective survey response rate of 48%. The survey data were supplemented with FADN data to add farm structural variables and farm business performance indicators to the cluster profiling exploration.

Results	***100 – 250 words***

With regard to perceived levels of resilience capacities on Flemish farms, four clusters could be identified. Two 'extreme' clusters captured farmers who gave, respectively, significantly lower and higher than average ratings for all three resilience capacities. In the other two 'intermediate clusters, mean scores for all three resilience capacities were higher than cluster 1 but lower than cluster 2. Interestingly, farmers in these two 'intermediate' clusters seemed to judge the robustness level differently than the adaptability and transformability levels on their farm; more precisely, in the opposite direction. Hence, the four clusters represent (1) farms with low resilience levels, (2) farms with relatively high resilience levels (highest levels in the sample, yet still moderate resilience scores); (3) farms with high robustness level, but low adaptability and transformability level; and (4) farms with higher adaptability than robustness.

The two outer clusters were roughly opposites in terms of farm and farmer characteristics. In the highest resilience cluster, farmers tended to be younger, be more open to innovation, be more involved in networks with professionals, have more

internal locus of control, be more risk seeking, and have more diverse risk management portfolios. Farms in this cluster are significantly larger, have more cash flow (better liquidity) and score better on profitability indicators (higher family farm income, more net income per hour worked, higher revenues, higher ROA and ROE). With regard to farming sectors, plant production systems were more likely to be categorized in the highest resilience cluster while livestock farms were more likely to be categorized in the lowest resilience cluster. Significant differences between the two 'intermediate' clusters were scarce, which could be due to sample size limitations.

Discussion and Conclusion	***100 – 250 words***

Knowing how farmers perceive their own resilience and the resilience of their farms is needed to guide the development of policy instruments and other measures that aim to increase farm(er)s resilience. This study contributes to the discussion on how to improve on-farm resilience by investigating perceived resilience capacities and how differences in perceived resilience relate to risk attitudes, risk perceptions, risk management behaviour, farmers' networks and openness to innovation, farm structural characteristics, and farm economic performance indicators. The results indicate that on some farms, a trade-off between robustness on the one hand and adaptability and transformability on the other hand is at place, while on other farms, resilience was estimated to be either low or relatively high in terms of all three resilience capacities. Agricultural sectors (animal production systems) in Flanders that are under high pressure and are expected to need adaptive and transformative capacities during the next decades, were more likely to be in the two resilience clusters with low adaptability scores. This is an alarming observation that need further elaboration.