Determinants of farm diversification in the Netherlands

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ABSTRACT

Farm diversification has been prominently supported by agricultural policy makers aiming to support rural development. To increase the understanding of determinants influencing diversification and hence to increase the efficiency of policies aiming to support farm diversification this paper presents the results of an analysis of diversification determinants. The research investigates Dutch farms diversification strategies using Farm Structural Survey (FSS) data of 2011 including 70,392 farms. The study uses a binary logit model to determine the characteristics influencing the diversification decision in general. Furthermore, an in-depth analysis for six diversification strategies was conducted. Additionally the study categorised the specific diversification activities in order to estimate a multinomial probit model, analysing three choice categories simultaneously. This enables us to compare determinants of farm diversification in general with determinants of specific activities. The analysis includes socio- demographic, economic and geophysical farm characteristics assumed to influence the diversification decision. Even though diversification is largely influenced by similar determinants, we find differences that are most pronounced for the adoption of nature conservation strategies. Consequently, it is important for policy makers to target policies at specific diversification activities in order to increase efficiency.

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Introduction

Multifunctionality and diversification have been supported within the European Common Agricultural Policy to escape the crisis of the productivist model of agriculture, where the focus was on raising farm output (Van Der Ploeg and Roep, 2003). By emphasising the multifunctionality of agriculture, the European Union's agricultural policy model focuses on green box measures (i.e. agri-environmental support schemes). This shift of policy paradigm could be seen as encouragement of on- and off-farm activities to increase the farm household's income, as a mean to save farm support in the EU. A different interpretation of the farm diversification trend can be found in the simple need of farms to survive in a tough market environment characterised by high variability in both yield and prices. Furthermore, diversified farms are seen as responding to upcoming consumer demands in a more flexible manner in order to maximise profits. Yet, diversification can also be interpreted as a return to the past in farming, as, historically, farms used to pursue several activities simultaneously in order to ensure survival (De Vries, 1993).

This analysis focuses on the above introduced two different perspectives to look at the diversification decision: the societal and the farmer's viewpoint. From the societal viewpoint, the diversification decision can be seen as the internalisation of externalities, resulting from the multifunctional characteristics of each farm (Finocchio and Esposti, 2008). From the viewpoint of the farm, the diversification decision can be seen as a strategy to reduce the risk resulting from an especially risky market environment (Mishra et al., 2004; Aguglia et al., 2009).

Heringa et al. (2013) presented an extensive literature research on different definitions of multifunctional agriculture and its spillover effects on regional economic development in the Netherlands. However, as yet little has been known about the farm characteristics that influence diversification, this article aims at increasing our understanding of those determinants. Such understanding can have significant implications for policy makers, as certain socio-demographic farm characteristics as well as land or capital assets can determine the diversification decision. When analysing the determinants of farm diversification, we aim to increase the efficiency of policies aimed at promoting farm diversification. Additionally, a better understanding of the farm characteristics influencing farm diversification gains in relevance when considering numerous calls for more empirical as well as theoretical work on rural development practices (Knickel and Renting

(2000), Van Der Ploeg et al. (2000), Wilson (2007)). The latter, for instance, emphasizes that "*more empirical work will be needed in future to further substantiate theoretical and conceptual issues of multifunctional transitions*" (Wilson, 2007).

We shall first investigate which farm characteristics determine the general decision to diversify, and then proceed to analyse the characteristics leading to specific forms of diversification. The research was carried out using econometric methods to analyse Farm Structural Survey (FSS) data of the Netherlands of 2011. A binomial logit model was used to analyse the characteristics associated with the general diversification decision. Furthermore, the decision regarding the different specific diversification activities was analysed using a set of binomial logit models as well as a multinomial probit model.

The article is structured as follows. The subsequent section presents the theoretical background in which the essential distinction between multifunctionality and diversification is explained, as well as some basic definitions and literature-based theoretical implications of the farm characteristics analysed. Next we describe the methodology used in the analysis. The succeeding section describes the data set and descriptive statistics. This is followed by a short section on the geographical clustering patterns of diversification activities. Subsequently the empirical model is explained, and then the results are presented. Finally, we present a thorough discussion of the results based on the theoretical background and present some conclusions, including recommendations for further research and for policy-making.

Definitions and theoretical background

When defining diversification, common literature can be divided into two different streams depending on different contextual frameworks. One approach sees the multifunctional characteristics of agriculture as leading to the diversification decision and the other interprets the agricultural market environment as foundation of the diversification decision.

Multifunctionality

The concept of multifunctionality in agriculture was introduced in 1992, where it was first mentioned within the context of the United Nations Conference on Environment and Development in Rio de Janeiro. Multifunctional agriculture was here defined as: "(...) *multifunctional aspect of agriculture, particularly with regard to food security and sustainable development*" (UNCED, 1992). In 1998, the Organisation for Economic Co-operation and Development (OECD) gave the concept a more feasible shape by declaring that:

"*Beyond its primary function of producing food and fibre, agricultural activity can also shape the landscape, provide environmental benefits (...) and contribute to the socio-economic viability of many rural areas. Agriculture is multifunctional when it has one or several functions in addition to its primary role of producing food and fibre*." (OECD, 1998)

Within this framework, two main assumptions have been made: (1) agriculture produces jointly commodity and non-commodity outputs, and (2) the non-commodity outputs, since they are not priced in the market, have characteristics of externalities or public goods. Furthermore, externalities are defined as positive or negative effects of production or consumption of goods and services on so called third parties (i.e. parties not involved in the decision process). These effects are not accounted for in the decision making or optimisation process, and hence are not reflected in the market price, leading to a suboptimal situation. Positive externalities

enhance social welfare and the absence of a market provokes an under-supply. Negative externalities, on the other hand, reduce social welfare and the absence of a market leads to an over-supply (Van Huylenbroeck et al., 2007). Furthermore, Van Huylenbroeck et al. (2007) propose that multifunctionality is a characteristic of the agricultural system in a certain rural area or region, and not necessarily of an individual farm. This definition of multifunctionality and externalities leads from a society's (i.e. decision maker's) viewpoint to the conclusion that every farm household, independent of size, intensity and other characteristics, is producing intentionally or unintentionally, some commodity and non-commodity outputs. Whenever a farmer makes the rational choice to transfer externalities, arising from the agricultural system's multifunctional characteristics, into marketable goods, to generate an increase of farm income can be interpreted as diversification decision. Diversification in this context is part of rural development on the one hand and on the other hand aims at providing supplementary income. This illustrates that contrary to the common use of farm diversification as a synonym for multifunctionality, both are different but strongly linked concepts (Wilson, 2007).

Agricultural market environment

The OECD (2009) defines the risk in farming as uncertainties in the farmers' actions and production decision resulting from the complexities of physical and economic systems. Moreover specifically agricultural risks are defined as: production risk (i.e. changing production conditions associated with changing weather conditions resulting in fluctuating yields), market risks (i.e. changing market conditions associated with changing prices or business cycles), and regulatory or institutional risk (i.e. changes in agricultural policies, food safety and environmental regulations). Furthermore, uncertainties are associated with adversity or loss which influences individuals negatively (OECD, 2009). The economic behaviour of human beings when decreasing uncertainties is described as risk management (Kostov and Lingard, 2003). The OECD groups different types of risk management strategies into so called risk sharing, risk pooling and diversification strategies. Diversification reduces the risk of volatile farm returns by mitigating price risk and volatility in outputs, since it reduces reliance on only one market and exposure to its price fluctuations (Robison and Barry, 1987). Consequently, resulting from a risky market structure it could be argued that from a farm's viewpoint the diversification decision is a risk management strategy. The analysis of all different possible risk reducing strategies is beyond the scope of this article, we focus on a certain set of on-farm diversification strategies. Additionally we acknowledge that differences in farmer's attitudes towards risk possibly influence the choice of risk management strategy, unfortunately such measurements of risk attitudes are not available in the FSS data. For deeper insights into farmers' attitudes towards risk consult studies from Vik and McElwee (2011), Barbieri and Mahoney (2009), Van Huylenbroeck et al. (2007), and Ilbery (1991). Moreover we have to note that agricultural activities are influenced by many different input factors, not all captured by our research, that may lead to competitive advantages initiating a specific farm management strategy.

The two above discussed approaches to look at the farmers' diversification decision are summarised in Fig. 1.

Diversification

The alternative strategy to "diversification" is in the following called "no diversification", i.e. specialising in one activity rather than diversifying. Specialisation can go hand in hand with expansion of the farm business, but can also be a 'business as usual' strategy, or imply focusing on agricultural production.