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Analysis

Understanding the uptake of organic farming: Accounting for heterogeneities among Irish farmers

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ABSTRACT

This paper examines the decisions of Irish farmers to convert to organic farming by applying the theory of planned behaviour to control for social influence and technical constraints. Cluster analysis and principal component analysis are utilised to account for sample heterogeneity and to identify heterogeneities in farmer beliefs regarding adoption of organic methods. The results indicate that the impact of economic incentives and technical barriers varies, while social acceptance of organic farming constrains adoption. These findings suggest that policy incentives mainly based on subsidy payments may be insufficient to increase the organic sector in the presence of social and technical barriers.

1. Introduction

Organic farming has attracted increasing attention in recent decades as a means to sustain agricultural production while addressing the environmental problems caused by conventional agricultural methods (Häring et al., 2004; Klonsky and Tourte, 1998; Lampkin and Padel, 1994). Following the MacSharry Reform in 1992, agri-environmental measures, including the financial support for organic farming, have been introduced throughout Europe. Nevertheless, despite strong policy support, the organic sector in the EU is quite small, covering 4.7% of the agricultural area at the end of 2009 (Willer and Kilcher, 2011). However, there is a considerable variation in the uptake rate of organic farming across Member States. The intensity of conventional agriculture, different agricultural policies, as well as differences in soil quality and climate are given as possible reasons for this variation (Häring et al., 2004).

Ireland, for example, has a low uptake rate of just over 1% of the agricultural area. This is despite the fact that in comparison with other European countries Irish agricultural systems are quite extensive and typically grass based. This implies that many Irish beef and sheep farmers could easily switch to organic production with little changes in the farm system and at low costs (Reidy, 2006). Moreover, the Irish organic sector receives strong government support due to a target to increase the organic farming sector to 5% of the agricultural land by 2020 (DAFM, 2010). In addition to supply side subsidy incentives, demand side opportunities exist for Irish organic produce, in particular export opportunities of red meat to the UK and Germany (DAFM, 2010). Given these favourable characteristics, the low uptake rate of organic farming in Ireland is somewhat surprising and an important research question that emerges is: why aren't more farmers converting?

A number of studies have attempted to gain insight into the organic farming adoption process by employing standard economic theory. For example, Pietola and Oude Lansink (2001) estimated farmers' responses to economic incentives when converting to organic farming and Kuminoff and Wossink (2010) applied a real options approach to assess the compensation required to induce conversion to organic farming. Others used a broader approach by considering a variety of socio-economic factors (e.g., Burton et al., 2003; Flaten et al., 2006; Läpple, 2010; Schmidtner et al., 2011). These empirical works demonstrated that output prices, policy changes, farm and structural factors, the farmer's own characteristics as well as information systems all contributed to the uptake of organic farming. Despite providing valuable insight into the adoption process of organic farming, all of these studies treat farmers as a homogeneous group and, more importantly, none of these studies explicitly account for the willingness and ability of farmers to convert to organic farming.

We argue that treating farmers as a homogenous group is a too strong assumption if a detailed understanding of farmer decisions is

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desired. Thus, we explicitly account for farmer heterogeneity with regard to environmental attitude. Environmental attitude has frequently been cited as an important determinant of adoption of organic farming (e.g., Burton et al., 2003; Läpple and VanRensburg, 2011). Despite this, little attention has been paid to the possibility of heterogeneous decision structures among farmers who have different levels of environmental concern.

We further argue that it is important to consider the willingness and ability of farmers to change their current farming systems. In terms of a farmer's willingness to convert, social norms (i.e. community influence) beyond self interest may affect farmers' decisions (Beedell and Rehman, 2000; Lynne, 1995). This impact is important as most people generally aim to be recognized as complying with various social norms in order to gain social acceptance (Cialdini and Goldstein, 2004; Johansson-Stenman and Martinson, 2006). For instance, the adoption of organic farming can be constrained by sociological barriers, such as negative opinions of family and other farmers regarding organic agriculture (Gardebroek, 2006) or positional concerns that can prevent the adoption of socially desirable behaviours (Salhi et al., 2012). In terms of a farmer's ability to convert, perceived control is important as it accounts for people's perceptions of their own abilities and means to engage in economic (Ajzen, 2005) or agricultural activities (Lynne et al., 1995).

In this article, we take these factors into account by applying the social–psychology theory of planned behaviour (TPB) to Irish agricultural survey data. The goal is to understand the determinants of the decision of Irish farmers to adopt organic agriculture. The focus is on conventional farmers since the vast majority of new entrants into organic farming are conversions from the conventional sector. This underlines the need to assess conventional farmers' intentions to pursue organic farming.

The model assumes that agents' decisions are influenced by attitudes, social norms and control perceptions. Due to its expectancy-value framework it is related to the expected utility model in economics (Lynne et al., 1988). For example, from an economics point of view, attitudes can be interpreted as equivalent to utility. This means that a farmer with a positive attitude towards organic farming will gain utility from adopting it. Social norms represent commitment (which is usually not considered in an economic model) and control perceptions correspond to the constraints in an economic model (Lynne, 1995). Hence, this approach contributes to standard economic theory by incorporating additional information that is not covered in a utility/profit maximization framework, i.e. it accounts for the influence of other people on decisions. In the context of the adoption of organic farming, we control for the farmer's expected outcome from adopting organic farming, the social influence on this decision, as well as any constraints faced by the farmer.

To date, only a small strand of the agricultural economics literature has used intent-based models to explain farmers' uptake decisions (Beedell and Rehman, 2000; Lynne et al., 1995; Rehman et al., 2007) and none of these works deal with organic farming. However, intent-based theories, such as the TPB, have also been subject to general criticism (e.g., Bagozzi, 2007). One criticism is that the model is based on multiple beliefs that are assumed to be of equal importance because beliefs are aggregated in an equal weights expectancy-value framework. As a result, potentially important information about the relative effects of these beliefs is eliminated. In contrast, this work uses an approach based on principal component analysis (PCA) that empirically distinguishes the relative importance of these beliefs, while simultaneously controlling for any collinearity among them. It is argued that by allowing for heterogeneity of beliefs it is possible to more precisely identify specific criteria that farmers consider when deciding to convert to organic farming. The broader relevance of such results is to enhance the effectiveness and efficiency of agricultural policy designed to promote organic farming.

This article contributes to the literature by applying a social–psychology model to explain the adoption of organic farming, which has only previously been studied with more traditional economic methods. After 20 years of agri-environmental payments, it is a timely exercise to improve the analysis of farmers' uptake behaviour of environmental schemes by enlarging the focus of the analysis beyond the standard utility maximization framework. In addition, we also account for farmer heterogeneity and extend the TPB by developing a method using PCA that quantifies the heterogeneous effects of farmers' beliefs.

The remainder of the paper is structured as follows: in the next section the theoretical model is explained, followed by a description of the survey. Section 4 describes the empirical methodology and Section 5 presents and discusses the results. The paper ends with conclusions and policy recommendations based on our findings.

2. Theoretical Model

The small uptake rate of organic farming in Ireland (1% of the agricultural area) despite favourable conditions that facilitate easy conversion (strong policy support and extensive agriculture), leads to the hypothesis that social or technical factors may be impeding conversion. Social–psychology models take these factors into account, thus augmenting economic models by providing additional information to explain the decision-making process, see Lynne (1995).

The TPB is suitable to study the conversion to organic farming due to at least three reasons: first, the adoption of organic farming requires careful planning. A characteristic, which makes it ideally suited to apply the TPB (Krueger et al., 2000). Second, the TPB controls for potential constraints or difficulties farmers may experience when adopting organic farming. Third, the TPB allows testing the aforementioned hypothesis that adoption may be constrained by social or technical factors.

The TPB has a long history in social-psychology research investigating the relationship between attitudes, beliefs and behaviour. The theory has been extensively applied to explain and understand different kinds of human behaviours. Prominent applications include leisure choice (Ajzen and Driver, 1992), food consumption (Vermeir and Verbeke, 2008) or entrepreneurial behaviour (Krueger et al., 2000). In addition, the theory has also been used to improve understanding of organic food consumption (Aertsens et al., 2009). The TPB evolved from the theory of reasoned action (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975). While the theory of reasoned action explains volitional human behaviour, the TPB deals with behaviour where people may not have full control over its implementation, which is an important aspect in the adoption of organic farming.

The TPB (Ajzen, 1985, 1991) aims to understand why people act the way they do by trying to identify the determinants of behavioural intentions.[1] Behavioural intention is the central factor as it is seen as the immediate antecedent of any behaviour. The stronger the intention to perform the behaviour, the more likely should be its performance. The main goal of the theory is to identify the factors that form and change behavioural intent. As previously mentioned, in the TPB these factors include attitudes, social norms and perceived behavioural control (see Fig. 1). These can either be elicited directly (see column 2 direct measures in Fig. 1) or derived from farmers' salient beliefs (see column 1 belief based measures in Fig. 1). These beliefs can be combined to form aggregate beliefs. Beliefs uncover why people hold certain attitudes, subjective norms and perceptions of control, thus allowing a more complete examination of the behavioural intent compared to an assessment of directly elicited factors (Ajzen, 2005). This motivates the focus on beliefs (to elicit intent) for further analysis. Therefore, attitudes, subjective norm, and perceived behavioural control are then derived by aggregating the underlying beliefs.

Attitudes, i.e. a person's positive or negative evaluation of performing the specific behaviour, are determined by accessible beliefs about the outcomes of the behaviour and by the evaluation of this particular outcome. Following the expectancy-value model (Fishbein and

[1] Behavioural intentions may change over time, thus the time between measurement of behavioural intention and behaviour should be minimized to maximize prediction. However, implementing the behaviour might require some time, thus it is important to give the respondent an adequate time frame to put the behaviour into action.