Extended Abstract
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Paper/Poster Title	**Using a Technology Acceptance Model to test factors influencing farmers' intention to perform result-based contract solutions**

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

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Abstract	***200 words max***
In Europe's "Green Deal", the better delivery of public goods by agriculture is in the focus. Improvements are expected by applying innovative agri-environmental contracts, e.g. based on results-based payments. For the implementation of such contract solutions, farmers' willingness to participate is key to success. This empirical study determines factors influencing farmers' intention to perform result-based contract solutions based on a Technology Acceptance Model (TAM). The direct and indirect relationships are tested by applying a Structural Equation Model (SEM). Primary data of 235 Austrian farmers are collected. Findings reveal that the intention to perform is significantly and directly driven by the attitude towards performing result-based contracts and by self-efficacy. Perceived usefulness and perceived ease of use are indirectly influencing the intention to perform via attitude. Furthermore, subjective norm is influencing perceived usefulness directly and the intention to perform indirectly. Our findings furthermore show that especially for new voluntary AES, the socio-psychological constructs of farmers should be considered, which allows new levers in the design and successful introduction of these measures.	

Keywords	Structural equation modelling; Technology Acceptance Model; Result-based Agri-Environmental Schemes
JEL Code	Q18; Q57; Q28; C12 see: www.aeaweb.org/jel/guide/jel.php?class=Q)

Introduction	***100 – 250 words***

New Agri-Environmental Measures (AEMs), using results-based or collective approaches are increasingly fostered as tools of EU agricultural policy to improve the delivery of Agri-Environmental-Climate Public Goods (AECPG). In result-based approaches, farmers' payment is based on achieving an environmental improvement rather than on implementing specific actions (Burton & Schwarz, 2013). For both traditional and new AEMs, farmers' willingness to participate is key. In this contribution, we address factors influencing farmers' intention to perform innovative AEMs, particularly for result-based contract solutions. Purely economic models that treat farmer decision-making as a predictable response to economic stimuli are considered insufficient for explaining farmer behaviour (Brown et al. 2017, 2021; Nilsson et al., 2019). Dessart et al. (2019) states that taking behavioural factors into account enriches the economic analysis of farmers' decision-making and can lead to more realistic and effective agri-environmental policies. On this basis, we incorporated

socio-psychological factors into a structural equation model in addition to context and structural factors. We used the Technology Acceptance Model developed by Davis et al. (1989) being one of the best-known models for determining acceptance. Existing studies apply the TAM in agricultural contexts (Naspetti et al., 2017; Rezaei et al., 2020; Schulze & Spiller 2010; Michels et al., 2019), as well as in a political context (Pierce et al., 2014; Zhu et al., 2016). This is the first study, however, applying the TAM in an agri-political context, aiming to generate fresh insights about the socio-psychological factors influencing the farmers' decision to participate in innovative AES.

Methodology | ***100 – 250 words***

We applied a covariance analytical approach and developed a structural equation model (figure 1) implementing a TAM. The basic TAM hypothesises that attitudes towards perform a contract solution (Att) (H1) and ultimately the intention to perform (ITP) it, are influenced by individual beliefs regarding the perceived ease of use (PEOU) (H3) and perceived usefulness (PU) (H2) of that contract solution (Ducey & Coovert, 2016). To increase the explanatory power of the model, we extended the basic TAM with additional latent constructs such as “Subjective norm” (SN) (H5/H6), “Self-efficacy” (SE) (H7/H8), “Perceived risk” (PR) (H9/H10) and “Ecological responsibility” (ER) (H11). Data used in this study was gathered from a sample of Austrian farmers through an online survey (N = 235) conducted in Summer 2021. The questionnaire was designed to contain 54 items in 10 sections. Two mutually complementary pretests were conducted.

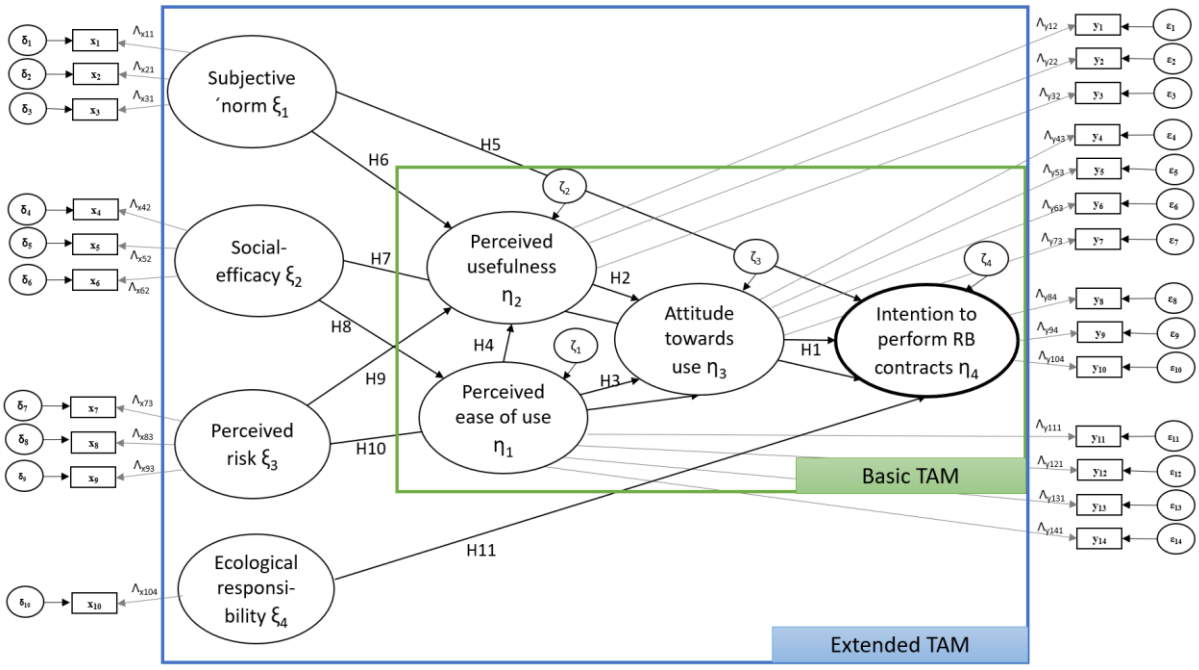

Figure 1: Structural equation model with the formulated hypotheses

Data was analysed using SPSS Statistics 27 and SPSS AMOS 27. As part of the data analysis, a quality check was performed by reliability and validity testing of the reflective measurement models. Subsequently, the structural equation model was estimated with AMOS using maximum likelihood estimation. The fit of the overall model was tested considering various goodness-of-fit criteria. The quality indicators were all in the required range for the basic as well as the extended TAM and thus indicate an acceptable to good model quality (Table 1).

Model fit	Basic TAM	Extended TAM	Sources
RMSEA	.068	.067	≤ 0.05-0.08 Browne & Cudeck (1993)
CMIN/DF	2.110	2.050	≤ 2.5 Homburg & Baumgartner (1995)
SRMR	.069	.087	≤ 0.10 Homburg, Klarmann &Pflesser (2008)
IFI	.964	.930	≥ 0.90 Bollen (1989)
TLI	.955	.917	≥ 0.90 Homburg & Baumgartner (1995)
CFI	.964	.929	≥ 0.90 Homburg & Baumgartner (1995)

Table 1: Quality indicators for the assessment of the overall fit of the basic and extended TAM

Results

100 – 250 words

In the basic TAM, the squared multiple correlation coefficient (R^2) of farmers' ITP for result-based contract solutions was 0.335, indicating that 33.5% of the variable's variance was explained by the included constructs (Table 2). Moreover, the results shown in table 3 indicate that Att (β = 0.579, p = 0.001) had a positive relationship with farmers' ITP. Similarly, PU (β = 0.455 p = 0.001) and PEOU (β = 0.317, p = 0.001) had significant positive effects on Att. PEOU (β = 0.419, p = 0.001) significantly affected PU. Therefore, H1, H2, H3, and H4 were supported in the basic TAM. By extending the basic TAM by the constructs SE, SN, PR and ER, the R^2 increased from 0.335 to 0.503, which corresponds to an increase of 16.8% of the variance. Concerning the hypothesised structural relationships, the results reveal that H1, H2, H3, and H4 are supported in the extended TAM similar to the basic TAM. According to the findings, the standardised path coefficients between PR with Att (β = 0.122, p = 0.104) and PU (β = -0.024, p= 0.738) were not significant. Moreover, ER had no effects on ITP (β = -0.082; p = 0.802). SE had a significant positive impact on PEOU (β = 0.587, P = 0.001), and on ITP (β = 0.564, p = 0.001). Finally, SN is impacting PU (β = 0.531, P = 0.001). Therefore, H6, H7, and H8 were supported, while H5, H9, H10 and H11 were rejected.

Construct	Estimate
Basic TAM	
PU	.175
Att	.486
ITP	.335
Extended TAM	
PEOU	.345
PU	.349
Att	.480
ITP	.503

Table 2 Basic TAM and extended TAM - Squared Multiple Correlations R^2

Construct	d	Construct	Estimate	S.E.	C.R.	P	Estimate*	Hypothesis	Result
Basic TAM									
PU	<---	PEOU	,485	,084	5,760	***	.419	H4	Supported
Att	<---	PU	,501	,076	6,595	***	.455	H2	Supported
Att	<---	PEOU	,473	,085	5,537	***	.317	H3	Supported
ITP	<---	Att	,604	,063	9,514	***	.579	H1	Supported
Extened TAM									
PEOU	<---	SE	,566	,069	8,226	***	.587	H8	Supported
PU	<---	PEOU	,214	,081	2,621	,009	.193	H4	Supported

PU	<---	SN	,629	,104	6,058	***	.531	H6	Supported
PU	<---	PR	-,025	,076	-,335	,738	-.024	H9	Rejected
Att	<---	PU	,556	,076	7,283	***	.499	H2	Supported
Att	<---	PEOU	,421	,081	5,184	***	.342	H3	Supported
Att	<---	PR	,122	,070	1,738	,082	.104	H10	Rejected
ITP	<---	Att	,398	,073	5,476	***	.373	H1	Supported
ITP	<---	SN	,176	,149	1,182	,237	.104	H5	Rejected
ITP	<---	SE	,564	,108	5,235	***	.445	H7	Supported
ITP	<---	ED	-,099	,393	-,251	,802	-.082	H11	Rejected

Table 3 Tested hypotheses

Discussion and Conclusion

100 – 250 words

This study investigated the factors influencing farmers' intention to perform result-based contract solutions by applying a SEM implementing a TAM. Regarding the model, the basic TAM explained 33.5% of variance in the farmers' ITP result-based contract solutions, a result suggesting satisfactory efficiency of applying a TAM for studying ITP of innovative AES since being in accordance with literature indicating the basic TAM to typically clarifying the variance of 40% in user's behaviour (Venkatesh & Davis, 2000). Moreover, the results of the extended TAM indicated an R^2 of 50.3%, representing a significant improvement over the original TAM. Our results confirmed that Att influences ITP, PEOU is impacting Att and PU, and PU is impacting Att. These findings are in line with results of empirical studies in the context of TAM research (e.g. Rezaei et al., 2020; Teo, 2010). The added constructs ER and PR have no effect on ITP, and are not in agreement with the results of Uthes & Matzdorf 2013 and Sutherland et al. (2016). SN is influencing PU and are consistent with the findings of Park et al. 2014 and Teo, 2010. Finally, SE is impacting PEOU and ITP directly, also confirmed by the literature (Defrancesco et al., 2008; Kuhfuss et al., 2016). This study is to our best knowledge the first research that has successfully applied the TAM in an agricultural policy context. The TAM model and particularly the extended model proved highly suitable for predicting the farmers' intention to perform result-based contract solutions.

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