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Profession and residency matter: Farmers' preferences for farmland price regulation in Germany

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Abstract

Local farmers' preferences for farmland price regulations in competitive markets have not been studied systematically. We investigate farmers' preferences in Germany, where recent price increases have driven calls for regulatory changes. The results of an online vignette experiment show that farmers prefer stricter regulation against the admission of non-local (but even more so of non-farmer) land buyers. Our analysis also shows that local farmers' preferences are motivated primarily by self-interest rather than adherence to principles. We conclude that most farmers prefer price regulations that consider their particular concerns about increasing competition in Germany.

KEYWORDS

agricultural ethics, experimental evidence, farmers' preferences, farmland price regulation

JEL CLASSIFICATION

Q12, Q24, R38

1 | INTRODUCTION

Farmland price surges during the last few decades in Europe (Eurostat, 2021) and non-farmer buyers' substantially increased interest (e.g., Kay et al., 2015) have sparked extensive scientific and societal debates about increased farmland market regulation, particularly in terms of price regulation and farmer favouritism. For instance, starting with the 2008 financial crisis, increasing demand from non-agricultural buyers to hedge against inflation or to store wealth has often been blamed for price surges (Baker et al., 2014; Hüttel et al., 2016; Plogmann et al., 2020). Farmland has also been discussed as a risk-reducing element in investment portfolios (Noland et al., 2011), which contributes to the attraction of non-farmer buyers. Although 'social investments' covering 'investment of labour, ingenuity, and social commitment' along with farmland or farm investments have also been reported (Desmarais et al., 2017, p. 153), the increased competition and price surges are often perceived as a threat to sustainable farm structures and development

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(Brady et al., 2017; Clapp & Isakson, 2018; Fairbairn, 2014; Magnan & Sunley, 2017). Indeed, increasing prices might limit farmers' abilities to afford additional land ownership, posing a burden for young farmers in particular (Desmarais et al., 2017; Katchova & Ahearn, 2016). Yet, price increases can also be an advantage, especially for landowners willing to sell their land or landowning farmers who might benefit from additional collateral (Katchova & Ahearn, 2016) or increased wealth (e.g., Salois et al., 2012; Salois & Moss, 2011). However, the influence of such increased wealth on farming structure remains unclear (Weber & Key, 2014; Weber & Key, 2015) and has received little attention in the debates.

Rigorous empirical evidence and scientific consensus on whether and how non-farmer buyers contribute to rising prices and pose a threat to sustainable farming are scarce. For instance, Desmarais et al. (2017) describe an increase in non-farmer buyers' owned land from 0.09% in 2002 to 1.44% in 2014 in Saskatchewan (CA), a region that prohibited out-of-province investments prior to 2003. For Germany, our study focus, Tietz et al. (2021) report a largely heterogeneous ownership distribution for selected municipalities. Non-farmer buyers comprise quite a heterogeneous group that varies largely across regions. Existing data sets provide limited information, often tied to binary farmer/non-farmer distinctions, and therefore provide limited insights (Seifert et al., 2021; Tietz et al., 2013). This challenges scientific investigations on how increased demand from non-farmer buyers influences farmland price formation. Magnan and Sunley (2017) report non-farmer buyers paying higher farmland prices, yet without rigorous statistical analysis. Their results may be biased, because non-farmer buyers as investors might mainly be interested in better, easily accessible, higher-priced parcels (Brorsen et al., 2015). However, Curtiss et al. (2021) attribute price surges to the increased activities of non-farmer buyers in the Czech post-transition farmland market. They note that markdowns for farmer buyers—given their bargaining power—decrease due to the increased activities of non-farmer buyers, and they conclude that these new market participants foster the development of market transparency and, therefore, market efficiency. Similarly, Seifert et al. (2021) report price markdowns for tenants in Eastern German farmland markets; yet, Croonenbroeck et al. (2020) cannot find substantial differences between bidder groups' price strategies in land auctions by legal or tenancy status.

Farmland sales markets in Germany are regulated at the federal state level, and are overall rather liberal compared to other European countries (Humpesch et al., 2022; Vranken et al., 2021). Farmland market regulations are intended to facilitate sustainable agricultural and rural development, and transactions are subject to approval by a local authority from the (agricultural) administration. Reasons for disapproval include, for instance, a non-local and non-farmer buyer; however, a non-local buyer can only be rejected if a local farmer is willing to match the bid and can testify to the 'need' for additional land. These regulations are presently under debate.

Discussions on revising land-market regulation laws at the federal and state levels were partly fuelled by recent land acquisitions of considerable size, which—according to popular perception—should have been prevented by land transaction laws. These discussions have raised considerable public interest, particularly in farming communities, and they are likely to have influenced (and perhaps polarised) farmers' attitudes towards the issue. Several groups of stakeholders call for intensified farmland market regulation to protect local farmers, for instance, by excluding non-farmer buyers or granting rights of first refusal to a group of farmers (Lehn & Bahrs, 2018).¹

However, it is unclear whether such increased regulation would provide the intended results (Heinrich et al., 2019). Scientific studies of the German land market suggest improved access to information as a first step, as well as consistent application of existing farmland market

¹The working group's demands on peasant agriculture (Germany) can be accessed at: https://www.bauerwilli.com/wp-content/uploads/2021/10/2020-07-10_Ackerland_in_Baurenhand_-_Vorschlag_der_AbL_zu_regulierung_des_Bodenmarktes.pdf (accessed 12 October 2021).

regulation across regions (Seifert & Hüttel, 2020; Seifert et al., 2021; Balmann et al., 2021). Yet, other studies emphasise additional (public) expenses of regulation measures to favour farmers, for instance, through land privatisation auctions granting rights of first refusal to tenants (Isenhardt et al., 2022) or by excluding non-domestic buyers (Lawley, 2018).

Despite academic analyses questioning the intended effects of increased regulation, the claims for regulatory protection of farmers against non-farmer buyers of agricultural land are frequently raised in the German regulation discourse (Balmann, 2020b). These claims, by farmers and their advocates (Balmann, 2020a; Die Grünen, 2021; Jakobi & Barth, 2022; Hamberger & Hanover, 2020), have not yet been subject to systematic analysis. To the best of our knowledge, Emmann et al. (2015) provide the only German study. Their data show that in general, German farmers favour tighter regulations, and that the desired regulations should protect farmers against non-farmer buyers, which are widely perceived as a problem. However, this evidence is based on straightforward survey questions without theoretical underpinning and is potentially subject to social desirability bias (Grimm, 2010).

Various land market regulations and intensities exist in Europe (Vranken et al., 2021). Here, we concentrate on farmland price regulation (FPR) for price discrimination between buyer types by profession and residency. Furthermore, we focus our investigation on farmers as an important stakeholder group in the regulations discourse because they are supposedly the beneficiaries of regulations restricting the land market for non-farmer buyers. Yet, whether farmers as land-owners (and potential sellers) really see themselves as profiting from this restriction is an open question, which we explore in our study. There has been no research on the drivers of farmers' preferences for FPR and on how these drivers might influence farmers' willingness to engage in open discourse and compromise. We argue that understanding farmers' preferences and the underlying drivers regarding FPRs, which is this study's aim, is a prerequisite for efficient FPR adjustment processes.

Regarding the possible FPR drivers, we propose two psychological concepts, which can be justified as two opposing drivers for preference formation: self-interest and principles. If self-interest drives a preference, the objective is to further one's own interest (Cropanzano et al., 2005). If principles drive a preference, this preference is considered as being fundamental, disregarding who benefits (McConnell, 1981). Economic psychology research shows that consumers (Kahneman & Knetsch, 1992) and companies (Kahneman et al., 2000) are sometimes willing to forgo profits (i.e., self-interest) to promote a moral good (principles). Yet, in a tax redistribution experiment, self-interest mainly influenced participants' votes, despite their self-reported adherence to fairness or equality principles (Esarey et al., 2012). In an agricultural context, Weersink and Fulton (2020) question whether farmers simply seek to maximise profits in making technology-adoption decisions, and Sautter et al. (2011) investigate farmers' internal negotiations to balance self-interest and principle-based objectives when deciding on conservation practices. The challenges of disentangling self-interest and principles as drivers lie in the fact that principle-based preferences can simultaneously advance one's self-interest. Experimental studies can help to discover the 'true' motive. If participants still opt for a principle-based option, even though it is to their own disadvantage, we can identify a principle-based decision.

Generally, experiments have proven useful for agricultural policy evaluation (for an overview, see Colen et al., 2016). They have been used to study issues such as farmers' selling behaviour (Vollmer et al., 2019), farmers' decision to buy or rent land (Buchholz et al., 2020), and the effect of price floors on farmland investment (Maart-Noelck et al., 2013). We investigate price regulation, specifically farmers' preferences regarding this policy tool, with the help of an online vignette experiment. Vignette experiments are scenarios constructed to assess dependent variables, which enhance experimental realism while allowing for controlling independent variables (Aguinis & Bradley, 2014). Our vignette experiment is intended to surpass the limitation of the social desirability bias by identifying farmers' hidden preferences. The results should provide useful information and perspective to the FPR debate in Germany, and possibly elsewhere.

The overarching goal of this paper is to identify which FPR objectives farmers prefer (regulatory protection against non-farmers and/or non-locals) and to investigate what drives these FPR preferences (self-interest or principles). The article first formulates our conjectures in Section 2. In Section 3, we present the study design, study implementation, and econometric data analysis. Section 4 describes the sample and results, which we discuss in Section 5. Section 6 concludes.

2 | CONJECTURES

The few empirical investigations of farmers' FPR preferences have mostly focused on farmers' acceptance of foreign land buyers. A study surveying Ethiopian farmers (Tefera & Lu, 2019) shows that 54% of farmers rejected foreign investors' activities in their local land market. Stewart et al. (2015) elicited local farmers' opinions regarding foreign land investment against the background of prevalent public and media narratives that widely reject foreign investors in Australia. Semi-structured interviews with local farmers reveal a more nuanced picture: Farmers identify advantages and disadvantages of foreign investment in Australian agricultural land, and they are evenly divided between rejection and support for it. In both those studies, farmers' circumstances affected their FPR evaluations, calling for a localised investigation.

Considering Germany, anecdotal evidence from stakeholders and media is the main type of data available (Agra-Europe, 2018a, 2018b, 2018c; Bauernstimme, 2018; Proplanta, 2017; Topagrar, 2019), indicating a rejection of non-farmer and non-local buyers, and thus favouring tighter FPR. The lack of rigorous investigation of farmers' FPR preferences motivates this experimental vignette study.

We develop conjectures to guide our vignette study as follows.² The conjectures are based on existing literature. Given that we want to explore the balance between principle and self-interest underlying preferences for FPR, we do not consider that the conventional theory of utility maximisation is a reliable theoretical basis for our ex-ante propositions. Instead, building on the reviewed literature suggesting that a majority of German farmers see non-farmer buyers critically, we start by investigating which roles a potential buyer's profession (farmer or non-farmer) and residency (local or non-local) play in German farmers' FPR preferences. Thus, Conjectures 1.1 and 1.2 are as follows.

Conjecture 1.1. Farmers prefer FPRs that benefit farmers as opposed to non-farmer buyers.

Conjecture 1.2. Farmers prefer FPRs that benefit locals (farmers and non-farmers) as opposed to non-locals.

We also want to investigate what drives farmers' FPR preferences—principles (i.e., considered ultimately right and hard to change by considering consequences) or self-interest (which can theoretically be changed, e.g., by compensation for losses). Farmers may prefer FPR based on their (moral) principles to promote broader societal justice. The phenomenon of principle-based policy preferences has been studied in the field of political science. Empirical evidence suggests that people vote to express their moral beliefs rather than to follow material self-interests (Feddersen et al., 2009; Kinder & Kiewiet, 1979; Sears et al., 1980) and vote for policies driven by other-regarding reasons (Huddy et al., 2001). Moreover, political judgements are derived from collective-level considerations rather than from personal economic experiences (Funk & Garcia-Monet, 1997). In the agricultural literature, Duke and Gao (2018) conducted an economic experiment to investigate landowner investments under various property tax regimes and found that participants unexpectedly voted in favour of the land tax. In a land-value taxation

²We use the term 'conjectures' to underline the exploratory character of the propositions we test.

experiment, they found that about 17% of participants voted for a tax institution that did not maximise their individual earnings (Duke & Gao, 2021). Transferred to the context of FPR, these findings suggest that farmers' FPR preferences could be based on principles.

Nevertheless, experimental evidence also suggests that people prefer rules that benefit themselves (DeScioli et al., 2014). We expect this mechanism to be present in the debate about FPR in the sense that farmers advocate for positions that are most beneficial to themselves. The well-documented phenomenon of political rent-seeking in the agricultural sector (see Rausser, 1992; Schmitz et al., 2010, pp. 74–75) may also hint that self-interest might be a potent driver of farmers' FPR preferences.

Self-interest may still motivate the argument framed as being based on principles. Therefore, we formulate Conjecture 2 as follows.

Conjecture 2. Self-interest rather than principles drive farmers' FPR preferences.

3 | METHODS

3.1 | Study design

We conducted a vignette experiment using the online platform SoSci Survey (Leiner, 2019). The full study is presented in the online appendices (see Appendix S1 for a translation into English³). Our vignette experiment consisted of a between-subjects design that allowed comparing treatments. Furthermore, in contrast to conventional surveys, we believe that social desirability bias is less likely to distort our experimental setup (Grimm, 2010), as is the desire to preserve a favourable self-image (Alicke & Guenther, 2011).

Our vignette experiment consisted of six hypothetical land transaction scenarios, which were constructed under two conditions. The first condition determined the buyer type (buyer-type), whereas the second condition determined the role of the participant (role-of-participant). For an overview of the conditions and the resulting scenarios, see Table 1. The scenario reads as follows (variations of Condition 1 [buyer-type] are in square brackets):

A piece of farmland (not expected to be developed) owned by the public sector is for sale. Mr Meier, a non-local farmer [a local investor who has not yet been active in agriculture/a non-local investor who has not yet been active in agriculture], wants to buy the piece of land. Mr Huber, a local farmer, would also like to buy the land. At what price would it be justified to sell the land to Mr Meier?

Mr Meier is the land market agent, whose access to the land market is what we wanted our participants to assess. Depending on the scenario, he was a non-local farmer, a local non-farmer, or a non-local non-farmer. Mr Huber, the local farmer, served as a baseline and remained the

TABLE 1 Overview of the experimental conditions.

		Role of participant	
		Observer	Seller
Buyer type	Farmer, non-local	Vignette 1: observer	Vignette 1: seller
	Non-farmer, local	Vignette 2: observer	Vignette 2: seller
	Non-farmer, non-local	Vignette 3: observer	Vignette 3: seller

³For detailed information on the study and the collected data, see the meta data files as part of the publication in the Gesis research data repository (Jauernig, 2021).

same in all scenarios. To elicit participants' willingness to accept the land market agent as a buyer of the land for sale, each participant was asked to decide a price this agent must pay for the land. These included 'the agent should be able to buy the land at the local price', 'the highest bid should win the contract, regardless of who the buyer is', and 'the agent should not be able to buy the land under any circumstances'. In between, there were options to demand a price mark-up from the agent, ranging from 10% to 100% more than the local price in steps of 10 percentage points. The scenario deliberately did not specify how the exclusion of a buyer type or the price mark-up would be implemented (e.g., by a special tax), because we are interested in the *intent* of a regulation that farmers prefer, regardless of the specific implementation details or difficulties.

While the first condition manipulated the type of buyer, the second condition (role-of-participant) identified the seller of the piece of land. The land for sale was either owned (and sold) by the public sector *or* the participant was put in the role of the seller. In the former case, the public sector was selling the land, and our participants observed the transactions; hence, we called these scenarios 'observer scenarios'. In the latter case, the scenario indicated, 'You want to sell a piece of farmland...', and the participant was placed in the seller position; hence, we called those scenarios 'seller scenarios'. All participants were randomly assigned to either observer or seller scenarios, which constituted a between-subjects design.

As can be seen in Table 1, there is a total of six scenarios. For each of the three buyer-types (non-local farmer, local non-farmer and non-local non-farmer), we have either the observer perspective (public sector as the seller) or the seller perspective ('You want to sell a piece of farmland'). Each participant was presented with observer *or* seller scenarios. We limited the number of scenarios per participant to two to avoid boredom and to ensure reliability of the results. However, we presented the 'non-local non-farmer' scenario to every participant because we are most interested in that specific buyer type. The role-of-participant variation allowed us to investigate whether farmers' attitudes regarding FPR changed if the vignette's framing differs.

By varying the buyer type, we highlighted participants' attitudes about who should be admitted to the land market, have to pay a premium, or be completely excluded (and in reverse, against whom farmers prefer to be protected). This presents a fine-grained picture of participants' preferences for certain FPRs. If participants' willingness to accept was low with non-local and non-farmer buyers, we could conclude that participants were in favour of regulations that restricted market access for these buyer types. Thus, the various type-of-buyer scenarios helped us address Conjectures 1.1 and 1.2.

The experimental manipulation of the role-of-participant condition (seller versus observer) provides insights into the drivers of participants' FPR preferences. If participants' FPR preferences were principle-based, their attitudes should not change with the roles to which they were randomly assigned. However, finding differences in preferences between participants in the observer role and participants in the seller role would indicate that self-interest also plays a role. Specifically, self-interested participants in the seller condition should be more lenient towards non-local and non-farmer buyers because they could potentially profit from the transaction. Thus, the role-of-participant manipulation was used to address Conjecture 2. Participants were placed in the seller or the observer treatment and did not know about the other treatment. Therefore, they could not anchor their decisions or desires to strive for consistency.

The study closed with a set of post-experimental questions regarding participants' general attitudes towards agricultural ideals and characteristics of their agricultural businesses (see Appendix S1).

3.2 | Study implementation

The target population comprised active farmers/farm managers predominantly from two German federal states with highly dynamic land price developments but different historical

development and farming structures: North-Rhine Westphalia in Western Germany (NRW) and Brandenburg in Eastern Germany (BB), which surrounds Berlin. In the latter, today's farming structure is shaped by its post-communist transition, with large, commercially oriented cash crop farms (Lerman, 2001; Wolz et al., 2009). Both regions are exposed to non-farmers' demand (Balmann et al., 2021) and other non-agricultural drivers of land prices, such as urbanisation, lignite mining (Lehn & Bahrs, 2018), or renewable energy promotion (Haan & Simmler, 2018; Myrna et al., 2019).

The online study was distributed using farm address lists available from the respective federal state's institution responsible for administrative management of farmer education and administration of the EU's Common Agricultural Policy. In addition, the study was distributed via social media, newsletters of the farmers' union, and local farming magazines. The study took place from 27 February 2019 through 29 March 2019. Note that each participating farmer was assigned randomly to evaluate scenarios from the observer or seller perspective. Naturally, the participating farmers could be either net buyers or net sellers of land. This, however, did not matter for our experiment, in which we used framing to elicit possible decision differences between the observer and the seller perspective. Even though some participants might have different experiences, we believe that our framing design should be conservative. If previous experiences happened to be aligned, we would capture the resulting self-interested decision-making. Furthermore, because participants were randomly assigned to the scenarios, and because we compared attitudes between treatments, we should not expect any serious distortion of our analysis.⁴

3.3 | Econometric data analysis

To address our conjectures, we assessed farmers' attitudes about FPR in various land sale contexts (buyer-type and role-of-participant) using the vignette experiment. Participants' choices ranged from favouring to opposing FPR, and they were treated as ordinally scaled discrete-choice data. We considered four choice options for each participant i denoted by $Y_i = j$ and $j = 1, 2, 3, 4$, where $Y_i = 1$ was an unconditional approval of the land sale, $Y_i = 2$ was an approval conditional on the sales price being fixed at the locally common price level, $Y_i = 3$ was an approval conditional on a sales price with a price mark-up on the locally common price level, and $Y_i = 4$ corresponded to no approval for selling the farmland.

To investigate Conjectures 1.1 and 1.2, we formally tested the relation of the choice behaviour and the characteristics of the hypothetical land sale situation by buyer-type: farmer or non-farmer, local or non-local, and by the participants' role. We defined binary-coded variables describing the potential buyer by their profession x_i^{prof} (farmer versus non-farmer buyer), residency x_i^{res} (local versus non-local), and role x_i^{role} (seller versus observer), characterising the participants' role as either the land seller (seller treatments) or the observer of a land sale by a public sector (observer treatments). To ease notation, we summarised all explanatory variables in vector $x_i = (x_i^{prof}, x_i^{res}, x_i^{role})$.

We used the proportional odds version of the cumulative logit model (ordered logit model). That is, we modelled the logits of the choice $Y_i \leq j$ related to $Y_i > j$ as a function of the x -variables linear in respective β -parameters (Winkelmann & Boes, 2009, pp. 177–179). That is, the effects of each of the x -variables captured by the respective β -parameters were assumed to be the same for the logits of the different cumulative probabilities. This ruled out the possibility that participants in the role of land sellers preferred stronger regulation against competing non-local farmers compared to local non-farmer buyers while opposing it in their role as observers. As this model is more parsimonious, stronger inferential conclusions are possible. Writing the respective

⁴We thank an anonymous reviewer for raising this point.

TABLE 2 Empirical testing of the conjectures based on the study design.

Conjectures	Operationalisation in the survey	Data and empirical testing
1.1 Farmers prefer FPRs that benefit farmers as opposed to non-farmer buyers.	In the case that the buying agent is a 'farmer', participants prefer more liberal regulations than they do in the 'non-farmer' scenarios.	Vignette experiment data, ordered logit model: Conjecture 1.1 is refuted for sampled farmers if we cannot reject the effect profession variable x_i^{prof} on the choice to be different from zero.
1.2 Farmers prefer FPRs that benefit locals (farmers and non-farmers) as opposed to non-locals.	In the case that the buying agent is a 'local non-farmer', participants prefer more liberal regulations compared to the scenarios in which the buying agent is 'non-local'.	Vignette experiment data, ordered logit model: Conjecture 1.2 is refuted for sampled farmers if we cannot reject the effect of the residency variable x_i^{res} on the choice being different from zero.
2 Self-interest rather than principles drive farmers' FPR preferences.	Participants prefer more market liberal regulations when they are in the seller role than in the observer role.	Vignette experiment data, ordered logit model: Conjecture 2 is refuted for sampled farmers if we find no statistically significant difference between choices differing by role of participant, i.e., the respective estimated β -coefficient related to x_i^{role} should be different from zero.

probabilities $P(Y_i \leq j|x_i)$ and $P(Y_i > j|x_i)$ in terms of logits, resulting in three comparisons (logits), the respective proportional odds model is given by:

$$\log \frac{P(Y_i \leq j|x_i)}{P(Y_i > j|x_i)} = \kappa_j + x_i' \beta, \quad (2)$$

wherein log denotes the logarithm-operator and κ_j denotes a specific intercept to be estimated for each of the odds that ensures the ordering of the choices with $j = 1, 2, 3$. The model is estimated using the method of maximum likelihood using the R command VGLM within package VGAM (Yee, 2010, 2015).

For interpretation of estimated effects of the vignette characteristics, we converted β -coefficients to odds ratios using exponential transformation ($\exp(\beta)$). These odds ratios indicate probabilities of lower regulation preference choices at one value of an x -variable relative to another one. For instance, for the variable profession (x_i^{prof}), the effect in the form of an odds ratio expresses how much more (or less) likely a more liberal regulation choice is for farmers compared to non-farmer buyers.

A shortcoming of the proportional odds is that it does not allow effects to differ by logits of choices. For instance, the effect of the buyer's profession may affect the logits between conditional and unconditional approval but could be of minor importance for the logits between conditional approval and denial (or vice versa). We used a likelihood-ratio test to see whether our data supported the proportional odds version and to test against the non-proportional odds model with non-constant effects (Agresti, 2013, p. 76).

To test our conjectures formally, we relied on statistical significance testing and the interpretation of coefficient size. Table 2 summarises our conjectures, how we operationalised them within our vignette experiment, and how we tested them. Conjectures 1.1 and 1.2 were refuted if we could not reject the null hypothesis of a Wald test that β -coefficients related to the variables indicating the buyers' profession (x_i^{prof}) and buyers' residency (x_i^{res}) were zero at any conventional level of statistical significance. Conjecture 2 was refuted for sampled farmers if we found no statistically significant difference between choices by role of participant. That is, under the conditions of Conjecture 2, the respective estimated β -coefficient for x_i^{role} should be different

from zero, and according to a Wald test, we should be able to reject the null hypothesis of a zero coefficient at any usual statistical significance level.

4 | RESULTS

4.1 | Sample

Of the 837 responses we received, 120 records lacked responses to the vignette item, one record lacked credibility (response time below 5 s), and 43 records came from participants not engaged in the agricultural profession. After excluding those, 673 observations remained for analysis.

Our sample is a convenience sample, which does not fully represent the farming population in our target regions of Brandenburg (BB) and North Rhine Westphalia (NRW) in Germany, given that about 80% of the participants provided post-experimental information on farm and personal characteristics. Of all farmers considered in our analysis, 46 indicated being situated in BB, 444 in NRW, and 33 in other federal states. Thus, our sample reflected the heterogeneity of the farming structure in size and types across the regions in Germany.⁵ BB is characterised by large, mainly specialised farms that operated on an average of 242 hectares in 2020. In contrast, in NRW, farms operated at a smaller average farm size (43.8 ha in 2020). Most frequent in our sample are family farms at a moderate size (up to 100 ha), but also larger agricultural cooperatives and corporate farms. The vast majority of the participants were male and aged between 36 and 65 years; although the gender distribution seems well represented, we acknowledge a higher representation of active farmers under the age of 65 (further information can be found in Appendix S2: Composition of sample) (Destatis, 2019, 2021a, 2021b).

Given the missing indication of the post-experimental questions about socio-economic characteristics, inspecting the two-way table (see Appendix S2: Composition of sample and balance in % [italics] across the vignette conditions) reveals a substantial drop in the number of available observations (from 13,250 to 850). Additionally, there is an insufficient balance across vignette conditions of all socio-economic characteristics. However, given the random assignment, the sample achieves balance at least across core vignette characteristics, and thus, we concentrate on the effect of the vignette characteristics in the econometric data analysis. We also present a robustness analysis including all socio-economic variables with a substantially lower number of observations.

4.2 | Preferences for FPRs in various land-sale contexts

Table 3 reports the distribution of choices in the vignette study's items. We note a polarisation of responses: Most frequently chosen was denial of non-locals and non-farmers as buyers of land (in 45.7% of 1325 choices made, i.e., 606 times). The second most frequently made choice was the most liberal, that is, unconditional approval of non-locals and non-farmers buying land (26.1%). The intermediate options (approval conditional on the price being at the local level and conditional approval being that the outsider pays a mark-up on the local price) were less frequently chosen: 11.3% and 16.8%, respectively.

Plots of cumulated choice frequencies (i.e., row-wise cumulations of the relative choice frequencies) against regulation intensity levels are plotted in Figure 1. Panels (a) and (b) are based on *marginal* frequencies by buyer type, ignoring roles, and by role, ignoring buyer types. In panel (a), for instance, the first two data points for buyer type *non-local farmer* reveal a

⁵For further information, we refer to our codebook in the data publication Jauernig (2021), as well as Appendices S2 and S3.

TABLE 3 Choice frequencies of preferred policies favouring local farmers in competition for agricultural land.

Role	Buyer type	Choice frequencies: Preferred regulation intensity [%]				Total N
		Unconditional approval	Approval conditional on local price	Conditional on price mark-up	No approval	
Observer	Non-local farmer	32.9	24.8	19.9	22.4	161
	Local non-farmer	14.4	12.1	19.0	54.6	174
	Non-local non-farmer	12.1	6.5	14.3	67.1	322
	All	17.8	12.5	16.9	52.8	657
Seller	Non-local farmer	47.2	19.3	19.9	13.7	161
	Local non-farmer	32.8	9.6	17.5	40.1	177
	Non-local non-farmer	28.8	6.1	14.8	50.3	330
	All	34.3	10.2	16.8	38.8	668
All	Non-local farmer	40.1	22.1	19.9	18	322
	Local non-farmer	23.6	10.8	18.2	47.3	351
	Non-local non-farmer	20.6	6.3	14.6	58.6	652
	All	26.1	11.3	16.8	45.7	1325

relative frequency of the regulation choices \leq *Unconditional approval* of approximately 40.1% and \leq *Approval conditional on local price* of approximately 62.2 = 40.1 + 22.1 [%], among 322 participants who were confronted with that scenario (as either observers or sellers). The cumulated frequencies of choice \leq *Denial* equals 100% for all scenarios. Levels of other cumulated frequencies contain information on regulation preference levels: the higher the lines are, the more frequently participants chose a market liberal option. This suggests a stronger attitude in favour of market entry for outsiders competing with local farmers for land. However, the curvature of the lines hinges on the distance between the four ordinal regulation levels, which does not convey any (cardinal) meaning. Panel (c) presents *conditional* frequencies to illustrate how regulation preferences differ between buyer types for given role levels and vice versa.

Inspecting the cumulative frequency plots reveals stronger liberal tendencies if buyers were farmers compared to non-farmers, regardless of whether these buyers were locals or non-locals (panel a). Liberal tendencies were stronger if survey participants responded in the seller role compared to the observer role (panel b). The difference regarding participants' roles was not as marked as the difference in buyer type; in particular, the difference according to profession appeared smaller compared to residence (panel c).

None of the lines in the graphs intersect, which shows that the scenarios have a clear stochastic ordering with respect to regulation preferences throughout. There is a consistent ordering of competitor type and role with regard to popularity of liberal or regulative tendencies throughout the range of restrictiveness levels.⁶ Intersecting lines in panel (b) would, for example, have meant that the liberal tendencies of 'sellers' are in some range of regulation preferences stronger than 'observers' tendencies, but that in other ranges, it is the other way round.

Table 4 presents the results of the ordered logit ('vglm' in R 4.0.2) and respective confidence intervals. The deviance estimate indicates a low model fit.⁷

⁶This (purely descriptive) result is a strong justification for choosing the proportional odds version in the ordinal logit model (Agresti, 2010, pp. 72–73) as described in Section 3. It also suggests that our understanding of the ordinal ranking of regulation of restrictiveness levels (unconditional approval < local price < top-up < denial) is consistent with the average notion on this ordering on this in our sample.

⁷Another fit measure is the model's contribution in explaining the variation of an assumed latent variable that measures liberality of regulation preference. In an estimation based on case form data, the model explains only 12% of the variance of predicted values for the latent continuous variable assumed to govern choices. Considering all socio-economic variables at a lower number of observations (850) in the robustness analysis increases this value to 22%.

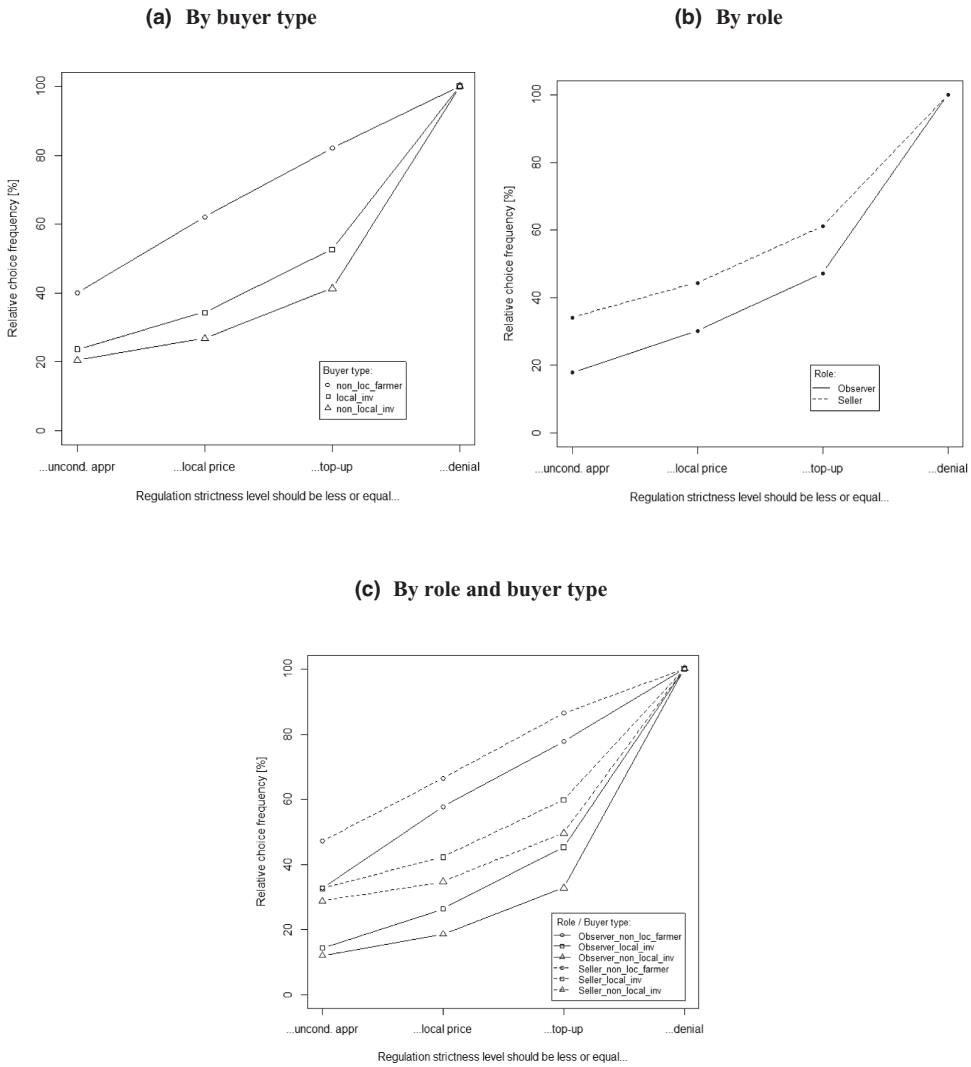


FIGURE 1 Cumulative (relative) frequencies of ordered levels of FPR strictness by role and buyer type.

TABLE 4 Estimation results of ordered logit model.

	Coefficients				
	Estimate	Std. error	95% confidence interval	z value	Pr(> z)
Intercept κ_1	-1.9834	0.1098	-2.20 to -1.77	-18.063	< 2e-16
Intercept κ_2	-1.4046	0.1027	-1.61 to -1.20	-13.682	< 2e-16
Intercept κ_3	-0.6300	0.0964	-0.82 to -0.44	-6.533	6.45e-11
Role: seller	0.6937	0.1053	0.49 to 0.90	6.587	4.48e-11
Buyer: local non-farmer	0.4126	0.1254	0.17 to 0.66	3.289	0.00101
Buyer: non-local farmer	1.4589	0.1310	1.20 to 1.72	11.130	< 2e-16

Note: Deviance: 50.8 with 12 df, => $p = 1.008439e-06$ Log likelihood: -71.1598.

TABLE 5 Effect of role and buyer type on preferences for less restrictive FPR using predicted odds ratios (OR).

Scenario	As compared to ...	Rel. Inclination towards less regulation [95% confidence interval]
Role: seller	Observer	2.00 [1.63 to 2.46]
Buyer: non-local, non-farmer	Local, non-farmer	1.51 [1.18 to 1.94]
Buyer: non-local farmer	Non-farmer, non-local	4.30 [3.35 to 5.54]
	Non-farmer, local	2.84 [2.16 to 3.77]

TABLE 6 Estimation results for vignette conditions, ordered logit model with and without socio-economic variables.

	Without socio-economic variables $N = 1325$		With socio-economic variables $N = 850$	
	Coefficient (p -value)	OR	Coefficient (p -value)	OR
Role: seller	0.69374 (4.48e-11)	2.00	0.5563 (9.74e-05)	1.74
Buyer: local non-farmers	0.41258 (0.00101)	1.51	0.3756 (0.020619)	1.46
Buyer: non-local farmer	1.45888 (<2e-16)	4.30	1.6084 (<2e-16)	4.99

To ease the interpretation of the results in relative terms by scenario specifications, we present the predicted odds ratios based on the parameter estimates and their respective confidence intervals (see Table 5). No confidence intervals include unity, so we reject the null hypothesis of zero effects of the participants' role and the respective buyer type on participants' relative inclination towards less restrictive price regulation at any usual statistical significance level. Based on these results, we do not refute Conjectures 1.1, 1.2 or 2. This conclusion rests on the assumption that our sampling is random.

In line with the arguments underlying Conjectures 1.1 and 1.2 (type-of-buyer), inclination towards a more liberal (less restrictive) regulation is more likely when agents are farmers rather than non-farmers and locals rather than non-locals. We note a stronger effect of profession than residence. More liberal policies seem increasingly popular concerning (non-local) professional colleagues compared to non-farmers; they are almost three times as popular in comparison to local non-farmers, and more than four times as popular in comparison to non-local non-farmer buyers. Regarding non-farmer buyers' residences, we find approximately 1.5 times more liberal preferences if non-farmer buyers are local compared to non-local. In line with Conjecture 2, an inclination towards a more liberal (less restrictive) regulation is twice as likely if participants consider themselves sellers of the farmland.

Given the randomised allocation of vignette conditions and the achieved balance (at least across larger characteristics classes (see Table 6), but not across regions and other socio-economic variables), we carried out a robustness analysis in which we considered all available covariates as additional controls. Including all available socio-economic variables reduced the sample size to 850 observations. The results concerning the vignette conditions showed only minor differences in size of coefficients and transformed odds ratios (see Table 6; for full results, see table in Appendix S3).

5 | DISCUSSION

In Conjectures 1.1 and 1.2, we address questions regarding from which buyer group farmers wish to be protected—non-farmer buyers (Conjecture 1.1) or non-local buyers (Conjecture 1.2). Our data corroborate both conjectures. Our results show that both agent types, the farmer and the local agent, are perceived as worthy FPR beneficiaries. This is in line with Emmann et al. (2015), who asked farmers for their preferred FPR objectives and found that (local) farmers feature

prominently among the chosen objectives. In our data, profession is weighted much higher than residency. Hence, we conclude that the participating farmers in our study regions are most concerned about protecting against non-farmer buyers, and less emphasis is attached to non-local buyers. This concern also exists in von Hobe et al.'s (2021) study of German farmers. The authors study German farmers' perceptions of land rental-price drivers. Data reveal that non-farmer buyers, next to policy-makers, are perceived as the strongest influencing factor on land rental prices. These findings can help explain our data. If non-farmer buyers are perceived as a main driver of increasing land prices, charging those same non-farmers higher prices can be perceived as compensatory justice.

With Conjecture 2, we investigate self-interest and principles as two possible drivers of participants' FPR preferences, where we suspect self-interest to play a considerable role. Based on the between-subjects experimental design, we put participating farmers in the role of either an impartial observer witnessing a land sale by the public sector or a farmer who sells the land in question. This allows us to interpret the difference in FPR preference between both roles as self-interest. Our data reveal a significant difference between the observer and the seller treatment, corroborating Conjecture 2. Participants in the seller role have more leniency than in the observer role in granting land market access to non-local buyers, and even more importantly, to non-farmer buyers. We interpret this as a shift in standards, depending on the role as an act of self-interest. It suggests that regulation preference will be tweaked towards the interest of the group to which one happens to belong. Farmers in the seller role are in favour of less regulated or marked-up prices, which means they do not mind non-farmer and non-local buyers as long as they pay the market price or an even higher price, from which they—as sellers—profit. The reverse is true for farmers in the observer role: Here, they prefer lower prices and less access for non-local and non-farmer buyers. This makes sense if those farmers see themselves as potential land buyers. Although we have evidence that self-interest plays an important role in driving FPR preferences, we cannot exclude the idea that principles also play a role. Our results clearly indicate that principles cannot be the *sole* driver (if that were the case, we should have found no difference between the observer and the seller conditions). Research in political science shows that it is not easy to disentangle the motives of self-interest and societal interest behind political attitudes (Funk, 2000). To the best of our knowledge, we are among the first to attempt this disentanglement of policy preference drivers in an agricultural context.

Our findings also contribute to the field of stakeholder research. Thus far, stakeholder researchers have investigated what motivates stakeholders to assume an active role in a debate (Rowley & Moldoveanu, 2003). The motives behind stakeholders' positions are far less researched. Our study represents a first step towards closing this research gap. Identifying and distinguishing stakeholder motives is crucial for various policy issues, exceeding beyond the FPR context investigated here, because it shows how conflict could be mitigated and how compromises could be made. Therefore, our research serves as a basis for future investigation of stakeholder attitudes towards societally and ethically relevant issues that demand policy solutions within and outside of the agricultural context.

The issues of social desirability bias (Chung & Monroe, 2003) and the inclination to preserve a favourable self-image (Grossman & van der Weele, 2017) can be problematic for empirical social research. With our experimental design, we mitigate both biases. The treatment comparisons in our between-subjects design regarding Conjecture 2 highlight the participants' underlying motives (Hertwig & Ortmann, 2001) and avoid allowing participants to anchor their choices. Therefore, on a methodological level, our study demonstrates the importance of complementing stakeholder surveys with experimental research.

Naturally, our study remains subject to various limitations. Our sample is a convenience sample, and therefore, it is not representative of the farmers in our study regions. Our dissemination channels (e.g., emails, agricultural publication outlets, social media posts) condition self-selection in favour of farmers who are online, active information seekers, or part of online

communities. This may cause selection bias in an unknown direction, making it hard to account for a Heckman correction. Furthermore, even though we rely on several pre-tests with students and farmers from other regions in Germany, answers may be subject to understanding bias, and despite the experimental design, some social desirability bias may remain. All of these potentially confound our empirical analysis. Furthermore, we did not control for regional–cultural differences, previous experiences with land sales, and the potential role entrepreneurial understanding may play in farmers' FPR preferences, which might help explain farmers' preferences further.

Our findings are a first step in gaining a better understanding of what drives farmers' FPR preferences. Further research should be aimed at developing a fine-grained picture of the circumstances that determine FPR preferences and rely on stratified sampling to ensure reliability of inferential methods for testing. Our analysis provides tools that can be applied to understand better public discourse on FPR. Although our study is focused on the motivational connection between self-interest or principles and FPR preferences with a convenience sample, future representative studies could further explore farmers' FPR preferences. In that regard, it would be worthwhile to investigate how farmers' previous experiences as land sellers and buyers influence their current regulation preferences, as well as comparing study regions with cultural and regulatory differences. Other interesting questions could relate to possible connections between farm size, organisational form, regional–cultural differences, and the potential roles of entrepreneurial understanding and farmers' regulation preferences. Besides farmers, other stakeholders' FPR preferences would be worth studying. The distribution of land significantly shapes rural and urban communities alike, and the regulation of land markets—especially who has access to them—is of importance to, for example, tenants, small businesses and other stakeholders. A systematic investigation of stakeholders' regulation preferences is necessary to grasp the ongoing land-market regulation debate fully.

Our findings have the following implications for the ongoing FPR discourse. As our results show, participating farmers do not reject land markets in general—only if those markets may be disadvantageous to them. When non-farmer buyers drive up prices of land that a public sector sells, participants are more in favour of restricting non-farmers' access, probably because they see the buyer as a competitor in purchasing land. Yet, if farmers see themselves in the role of the seller of farmland (and thus as a profiteer of more competition among buyers, which drives up prices), they are in favour of less regulated prices. Therefore, we can assume that farmers are willing to accept more liberal land markets as long as they are compensated for their potential losses, for instance, by a compensation for their previous investments in land (Patton & Erlean, 2004).

A predominant motivation by principles, which we did not find in our study, would have made finding a compromise much harder because deeply held, principled convictions are often detrimental to an open dialogue, considering that they foster intolerance towards attitudinally dissimilar others (Skitka et al., 2005), tend to override concerns about fairness principles (Skitka & Mullen, 2002; Skitka & Mullen, 2008), and even provide the motivational basis for political radicalisation (Skitka & Morgan, 2014). The farmers' attitudes in our study suggest that compromise in FPR debates is feasible.

Non-farmer buyers can bring capital inflow to the agricultural sector (Brandao & Feder, 1995; Odening & Hüttel, 2018); such capital is necessary to address transformation challenges in moving towards a sustainable and climate-smart farming system, for example, by investing in new technologies with new business models (Klerkx et al., 2019; Lieder & Schröter-Schlaack, 2021). However, in our study, farmers appear to see non-farmer buyers mostly as a threat and less as a welcome source of capital. Yet, the extent of the perceived threat depends on who benefits from the non-farmer buyers' money. If an increased capital inflow in agriculture is the FPR's objective, regulators need to consider farmers' concerns about unaffordable land and dependency on non-farmer buyers to avoid failure due to the farmers' resistance. Our findings suggest this strategy could be successful.

6 | CONCLUSION

In this study, we investigated farmers' farmland price regulation (FPR) preferences in two German regions, North-Rhine Westphalia in Western Germany (NRW) and Brandenburg in Eastern Germany (BB), using an online vignette experiment. Our findings indicate that the majority of participating farmers see the access of non-local (and even more so, non-farmer) buyers to the land market as critical. Furthermore, an important driver of farmers' FPR preferences is self-interest, rather than principles. Thus, farmers do not generally reject the notion of functioning land markets but make judgements depending on who benefits from higher prices. Regarding the regulation of land markets, our findings suggest that farmers are not generally opposed to open land markets that include non-local and non-farmer buyers, and that they are open to accept liberal regulators' frameworks as long as they profit from higher prices or receive compensation. Our experiment and analysis also illustrate the usefulness of the vignette approach.

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