An aerial photograph of a landscape. In the foreground, there are green and yellow fields with some small trees. A road runs horizontally across the middle ground, with a white car visible. Behind the road is a dense forest of green and yellow trees. Three white rectangular boxes are overlaid on the image: one on the left side of the forest, one on the right side, and one at the top right corner of the slide.

# Land market regulations: between expectations and effectiveness

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### Introduction

Agricultural land prices in Germany have been rising for about ten years, and many farmers are worried that they can no longer compete on the land market and will become unviable (LANGENBERG and THEUVSEN, 2016). There are also concerns that the price increases represent a failure of the market mechanism. Over the past few years, several German Länder, such as Lower Saxony (NASG 2017) and Saxony-Anhalt (LANDTAG VON SACHSEN-ANHALT 2020), have discussed draft legislation aimed at limiting the size of farms and introducing upper price limits for agricultural land. The academic literature includes a few studies on the objectives of land market regulations, but to date hardly any analyses exist studying the effectiveness of various land market regulations and whether they can fulfil the expectations placed on them. As part of the DFG project FORLand, we are researching this question using the agent-based simulation model AgriPoliS (FORLand 2017, HEINRICH et al. 2019).

### The aims of land market regulations

The regulation of land markets is primarily aimed at limiting the increase of land prices in the interest of farmers, and to strengthen the competitiveness of family farms against non-agricultural investors. It should also restrict the local market power of large agricultural enterprises (DEUTSCHER BUNDESTAG 2018). These criteria are often linked to the goal of preventing a negative trend in the

agrarian structure (NASG 2017, LANDTAG SACHSEN-ANHALT 2020). By the terms of the Property Transactions Act and the Land Lease Contracts Act, however, sales and rental contracts can already now be rejected in Germany if the contract (i) leads to an 'unhealthy' distribution of land, (ii) divides land parcels into uneconomic sizes, or (iii) the sales or rental price is in an unreasonable relation to the value of, or return from, the land. While these regulations have traditionally been applied in a liberal, market-oriented way, current proposals are more restrictive and set harsher limits. Examples include the maximum size of a landholding or the extent to which prices can diverge from the average.



Early in 2021, a few months before the next state parliament election, again a legislative process for the law on agrarian structure in Saxony-Anhalt was stopped. (Photograph: debating chamber, Saxony-Anhalt state parliament, 2019)



### The simulation model AgriPolS

The agent-based model can simulate the development of agricultural regions over time (e.g. HAPPE et al. 2006).

### AgriPolS is mainly used to analyse the effects of policy measures on structural change in agriculture.

Since 2003, the model has been used for many research projects at IAMO and elsewhere. AgriPolS can be adjusted and calibrated to empirically gathered data for real regions, thereby leading to a better understanding of structural change in the past and future (SAHRBACHER et al. 2012). The model works on the assumption that individual agents in agriculture maximise their profits or household income through mixed-integer optimisation, and react to price or policy changes by leasing or renting land, changing their production system, or quitting agriculture. The individual agents interact on the land

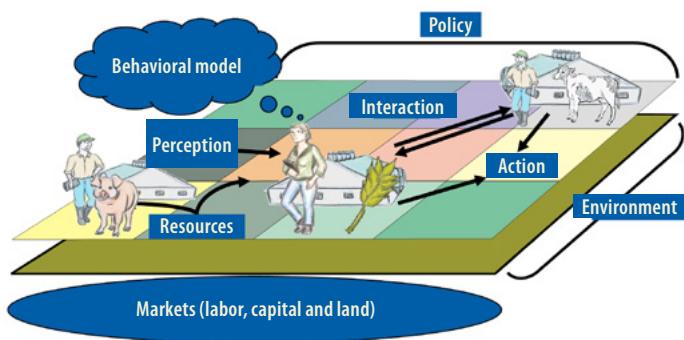
market, which takes the form of a repeated auction where they compete with neighbouring farms for available land plots.

Our inquiry, which takes the region of the Altmark in Saxony-Anhalt as a case study, is examining the effects of price and size restrictions as outlined in the proposed legislation in Lower Saxony and Saxony-Anhalt. Specifically, we are simulating three regulation scenarios which are compared to a reference scenario (REF) that simulates the development of the region without land market regulations. In the regulation scenario 'price limit' (PL) the price of new rental contracts is restricted. Farms can offer a maximum of 10% above the average rental price of a comparable land plot in the region, differentiating between arable land and grassland. If several farms make the highest offer, lots are drawn to determine whose bid is accepted. The scenario 'size limit' (SL) restricts farm size to a maximum of agricultural land per holding which must not exceed five times the current average farm size in the region. The scenario 'price/size limit' (PSL) combines the two regulation scenarios above.

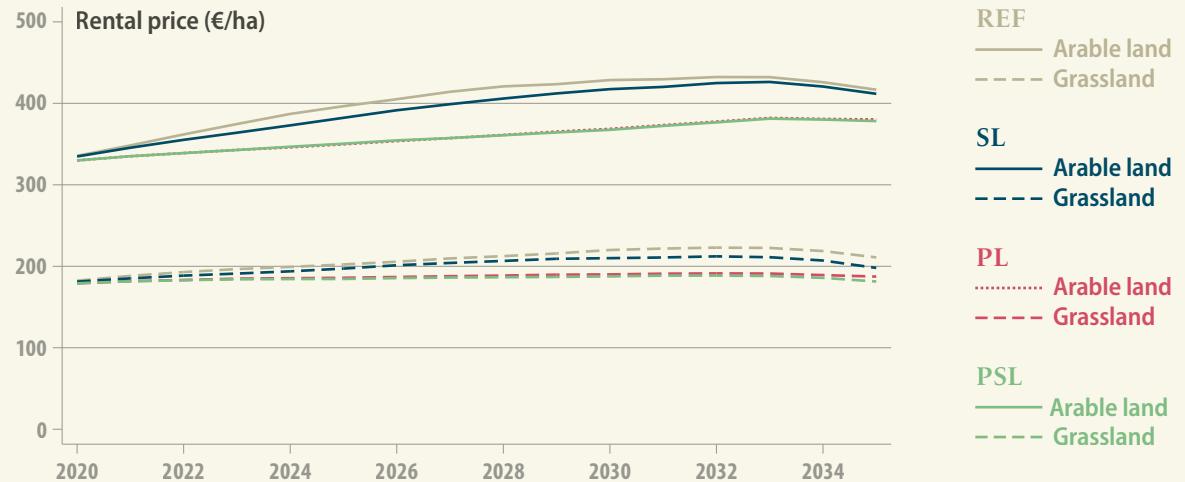
### How do land market regulations work?

AgriPolS simulates the development of the region over 20 years. For reasons of data availability, the simulation begins in 2016. After an initialisation phase, the regulation measures in the policy scenarios become active in 2020. The current policy measures of the Common Agricultural Policy (CAP) are assumed to be continued after 2020 as well. The analysis focuses on the period 2020 to 2035.

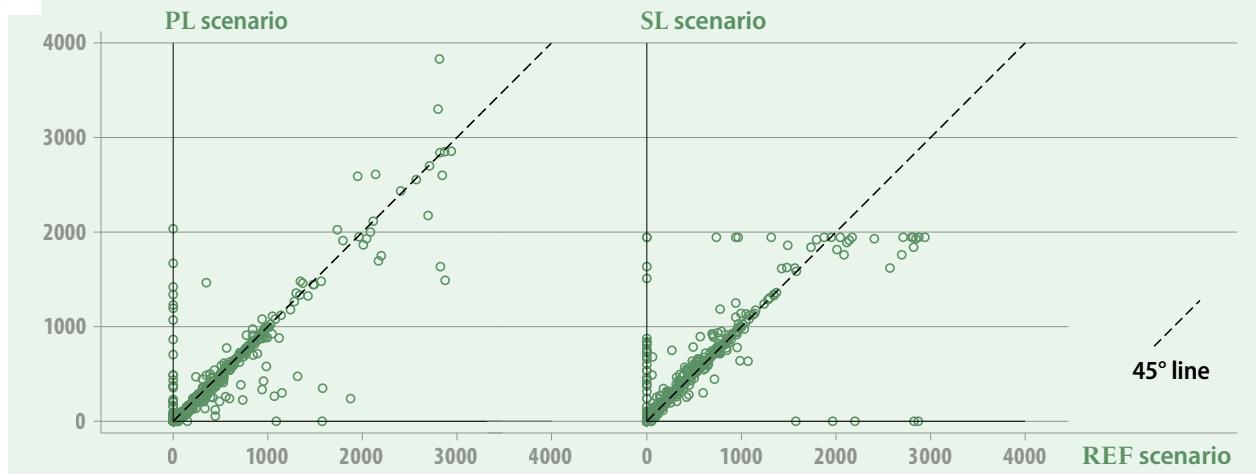
To analyse whether the price and size restrictions are effective and fulfil the expectations placed in them, we are



**Figure 1: Development of rental prices**



**Figure 2: Farm size in hectares in 2035**



**Table 1: Number of farms by year and scenario**

Year	Scenario			
	REF	PL	SL	PSL
2016	928 (100%)	928 (100%)	928 (100%)	928 (100%)
2020	858 (92%)	858 (92%)	858 (92%)	858 (92%)
2025	762 (82%)	771 (83%)	773 (83%)	774 (83%)
2030	706 (76%)	723 (78%)	725 (78%)	726 (78%)
2035	629 (68%)	664 (72%)	662 (71%)	673 (73%)

examining the effects of the regulations on rental prices, the number and size of farms, the production structure, added value, and efficiency.

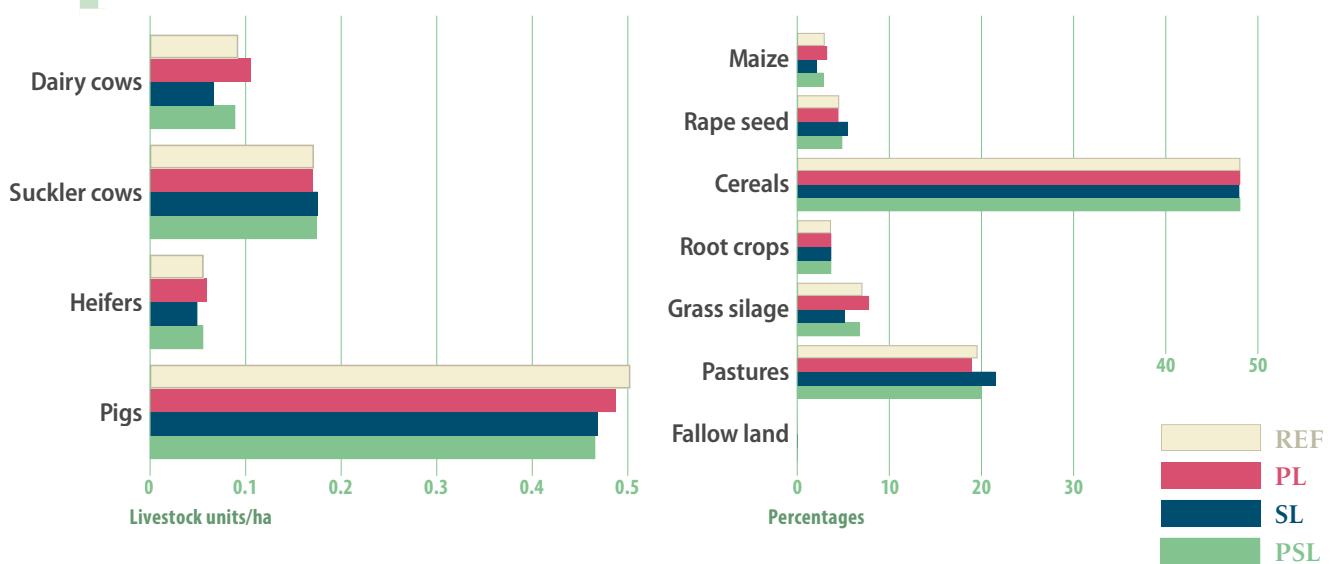
**Figure 1:** Regarding the development of rental prices, we see that the price limit (PL) counters a further increase of rental prices compared to the reference scenario, whereas the price effect in the size limit scenario (SL) is small. In 2035, the rental prices for arable land in the PL scenario are around 9% (11% for grassland) below those in the reference scenario, whereas in the SL scenario the prices for arable land are only 1% lower and 6% lower for grassland. The combination of both instruments (PSL) leads to an even stronger reduction in land rental prices compared to the reference scenario (REF) in 2035 with 9% for arable and 14% for grassland. **Table 1:** The regulations slow down structural change. Whereas around 32% of farms will have quit agriculture by 2035 in the REF scenario, only 28% in the PL scenario will have ceased production. For the SL and PSL scenarios the figures are 29% and 27%, respectively. Consequently,

there is a quantifiable effect but the differences in the survival of farms tend to emerge only in the longer term. Aside from the development in the number of farms, land market regulations aim to prevent few very large agricultural enterprises from wielding market power. The scatterplots in **Figure 2** show the land under cultivation per farm in the PL and SL scenarios compared to the REF scenario in 2035. Farms on the 45° line cultivate the same area of land in the REF scenario and the corresponding regulation scenario. Farms below the 45° line are larger in the REF scenario, whereas farms above the 45° line in the PL or SL scenarios can increase their farmland. Points on the axes mark farms that cease production in one scenario but survive in the other.

Some farms, which attain a medium to very large size in the REF scenario, are significantly smaller in the PL scenario because the price limit prevents them from being successful on the land market despite high shadow prices. For the SL scenario, the size limit becomes noticeable when it is around 2,000 hectares. Some farms that grow



**Figure 3: Livestock and land use in 2035**



larger than 2,000 hectares in the reference scenario cannot do this when a size limit is in place. Some other farms, however, which are smaller than 2,000 hectares in the reference scenario, grow to the upper size limit. Although many small farms benefit from the size limits, they rarely grow by more than 100 hectares.

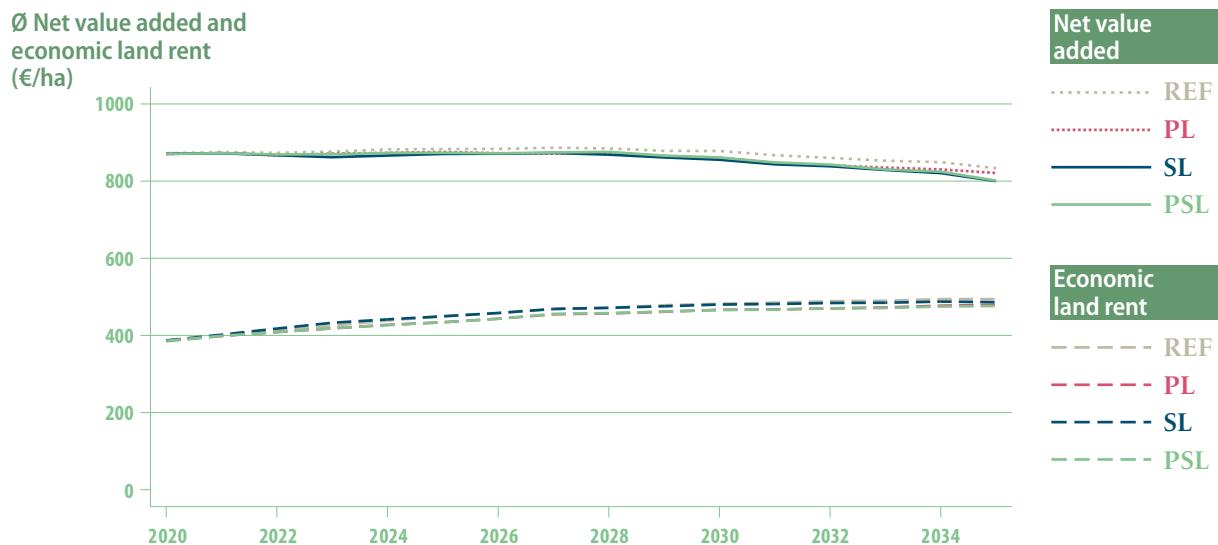
The land market regulations also have an effect on the production structure. In the PL scenario, we can detect a slight shift towards more intensive land use of arable land (maize) and grassland (grass silage). The farming of dairy cows sees a slight increase in this scenario too. Pig farming, by contrast, is reduced in comparison to the reference scenario. In the SL scenario, livestock production apart from suckler cows is reduced and land use is more

extensive. The latter effect can be explained by the reaction of very large farms that reduce their grassland rather than arable land. The combination of price and size limits has barely any effect on the structure of production and, apart from the number of pigs, is comparable to the reference scenario. The change in the production structure also leads to a decrease in the amount of agricultural labour.

Land market regulations have negative structural effects on economic land rents, which reflects the lower overall efficiency of the sector. The negative effects of price restrictions on economic land rents are a result of allocative inefficiencies that increase over time. This is because farms with very high shadow prices, or those which are



**Figure 4: Development of net value added from agriculture and economic land rent**



able to use the land particularly profitably, are not allowed to offer the corresponding high prices.

### Conclusion

It has been shown that land market regulations slow down the rise in land rental prices. Structural change, in terms of the number of farms, is slowed too. As key objectives of land market regulations, both of these results make the measures appear effective. However, the effects are slight and they come with negative side-effects. Contrary to the aims of the land market regulations, they do not considerably support small family farms. Most farms that quit agriculture in the reference scenario cease production in the regulation scenarios too. By contrast, some medium to big farms can increase their profitability.

These are mostly pure arable farms, however, with comparatively little added value per hectare, and thus make a minor contribution to the development of the rural area. A central function of land markets – the efficient allocation of land – is reduced because the land is no longer acquired by those farms which are best at utilising it. Ultimately, a few slightly positive effects are balanced by a few slightly negative effects.

If we consider overall welfare in the sector as an indicator, we have to conclude that the negative effects outweigh the positive ones.

There is also the practicability of the measures, which cannot be accounted for in the analyses. The authorities will certainly be able to check sales and lease contracts for their compliance with the law, but this cannot prevent circumvention of the law, such as under-the-table payments. Such payments are common in other countries with strict land market regulation. Moreover, limits on farm size are probably easy to evade by dividing up farms early between family members or third parties (straw men), or if farming contracts come into play.

The land market regulations as set down in the proposed legislation cannot, in our opinion, improve the agrarian structure. Policy should rather be focused on maintaining or increasing the competitiveness of existing farms. Possible measures to achieve this include investment incentives, innovation support, and training opportunities. In the east of Germany, it is often the really big farms that generate a larger proportion of added value per area of land and also provide more jobs. Weakening these farms, which are an economic pillar of the Altmark, through land market regulations does not appear to be a sensible approach. ■

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## Sources and credits

Title Autumn in Tangerhütte in the Altmark © Peter Kramer, Fotokombinat Altmark, [www.fotokombinat-altmark.de](http://www.fotokombinat-altmark.de)

► The Altmark, a region in the north of Saxony-Anhalt, is one of Germany's oldest cultivated landscapes. Typical of the vegetation is the close interrelationship between arable land and woodland.

p.18 The debating chamber of Saxony-Anhalt state parliament during a parliamentary session © State parliament/Stefan Müller

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