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**Fiscal and trade distorting effects of capital gains tax on land sales
- empirical evidence from agricultural land market in Finland**

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Abstract:

Capital gains taxes are likely to distort the market and resource allocations through so called “lock-in” effect, meaning discouraging trade transactions that trigger the tax payments. When it comes to agricultural land, the lock-in effect implies that the land ownership and active farming deviate from each other and, as a result, land tenancy increases. Increasing land tenancy and land tenure insecurity incur a significant social cost, because they deplete productivity of land by discouraging and delaying irreversible land improvements that would be necessary for maintaining land productivity. This study estimates the fiscal effects of reduction in capital gains taxes imposed on land sales and provides grounds for optimizing the tax scheme. The results suggest that certain temporary tax waiver programs could maintain the current tax revenues with less trade distorting effects on the land market. By simulating the land trade quantities conditional on alternative tax rates, the study gives information on how much a particular tax waiver program would trigger land sales. The results signal that tax waiver programs could shift the current structural development pattern of gradually increasing tenancy and land tenure insecurity to a pattern, in which the share of land ownership would be increased.

Introduction

Capital gains taxes are, in addition to labour and capital income taxes, an essential part of fiscal policies in most countries. They are important, in particular, in Scandinavian countries where the public sectors are large, as compared to other economic sectors, and the share of taxes out from the total GDP is amongst the highest in Europe. Nevertheless, the existing literature supports the view that capital gains taxes also have significant market distortion effects and adverse effects in the real economies. They likely distort the market and resource allocations through so called “lock-in” effect, which has a tendency to postpone asset sales and to discourage trade transactions that trigger the tax payments (Ayers *et al.* 2007; Daunfeldt *et al.* 2007; Dammon and Spatt 1996; Holt and Shelton 1962). The lock-in effects would most probably apply also land assets.

When it comes to agricultural land, at least in many European countries, the lock-in effect implies that the land ownership and active farming deviate from each other. Land ownership fragments through heritage gradually to a larger and larger number of individual land owners, while competition and structural adjustment programs lead to the concentration of active farming through land tenancy to a smaller and smaller number of active farmers. When more land is cultivated under lease contracts, land tenure insecurity increases and affects adversely in real economies. Recent literature reveals that increasing land tenure insecurity significantly depletes productivity of land by discouraging and delaying irreversible land improvements that would be necessary for maintaining land productivity (Soule *et al.* 2000; Myyrä *et al.* 2006; Yoder *et al.* 2008). At the same time agricultural policies reach decreasing number of the true land owners losing their efficiency.

Even if the significant market distortion effects and adverse economic effects are acknowledged in the asset markets, the existing literature does not, nevertheless, include analysis on how these problems, driven up by the lock-in effect could be solved in the agricultural land market, and how elastic the land sales decisions would be with respect to adjustments in the capital gains

taxes. Similarly, we do not currently have estimates on the fiscal effects, if certain tax waives were scheduled in the land market.

New knowledge about the magnitude of the trade distortion effects of capital gains taxes in land market has high policy relevance for several reasons. First, in many countries the trade for land is a crucial element and determinant in steering the necessary structural developments and improving productivity of their agricultural sectors. Second, if the capital gains tax turns out to exhibit significant lock-in effects, it drives a wedge between the development of land ownership and active farming. This would imply that the current tendency of gradually fragmenting land ownership and its deviation from active farming could be reversed by revisiting the tax policies, and the value of land as an income generating asset for its owner could be enhanced. Finally, the income distribution and spill over effects of agricultural support to landowners could be more predictable when the future Common Agricultural Policies (CAP) are designed in Europe (Ciaian and Swinnen 2006). So far, the results from decoupling the CAP-supports from agricultural production have been two fold and farmland prices are still increasing in many European countries. The shortcut to achieve the goals of CAP is to rejoin agricultural landownership and agricultural production. This makes temporary reduction on capital gain tax on farmland sales interesting instrument from agricultural policy point of view.

The capital gains tax on land sales raises at least two important empirical questions. First, is the tax rate set optimally, so that there does not exist a lower tax rate, which could collect at least the same tax revenue with less distorting trade effects. And more broadly, if the tax rate is adjusted how much do these adjustments affect tax revenues. Second, do these taxes distort land market and do they discourage trade for land to the extent that is harmful for the necessary developments in the agricultural sector.

This study contributes to the existing literature by simulating land owners' willingness to sell their land under alternative capital gains tax rates, imposed on their land sales. The

econometric model underlying the simulations has been estimated based on a survey data from Finland by Myyrä and Pouta (2009). This study extends the analysis of Myyrä and Pouta (2009) and focus on practical tax policy design with two main goals. The first goal is to estimate the fiscal effects of the capital gains taxes imposed on land sales. These results provide new grounds for optimizing the tax scheme while taking into an account both fiscal and market distorting effects. The results suggest that certain temporary tax waiver programs could maintain the current tax revenues with less trade distorting effects on the land market. The second goal is to simulate the land trade volumes on alternative tax rates. These results give signals how much certain tax waiver programs would trigger land sales and help in solving the land tenure problems.

In the rest of the paper we first discuss about land as an asset under capital gains taxes and introduce Finnish case of land trade and taxation. Based on survey data and models form Myyrä and Pouta (2009) we present the simulation results of varying tax schemes.

Capital gains tax and land as an asset

Over the last decade, the importance of capital gains taxes in collecting government income in the high tax countries has increased, because the international tax competition has accumulated pressures to cut high labour and capital income tax rates. It is evident that the capital gains tax is an attractive means of generating tax income particularly in the land market, because land prices have been increasing rapidly over the years, and the sellers have to report significant capital gains from their land sales. Over the last 12 years, for example, the real price for arable land has increased in Finland by 200 %. Land has often been purchased at a low price at a distance in the past, inherited or otherwise received as a gift for free, which also decreases the deductibles in capital gains taxation – a market characteristic that at least potentially increases the amount of capital gains taxes collected.

The existing literature on the trade distorting effects and the lock-in-effects of capital gains taxes deal with securities and other assets than agricultural land (e.g. Dammon and Spatt 1996; Ayers *et al.* 2007). These studies suggest that the lock-in-effect is likely to be significant also in the agricultural land market, but it is obvious their results cannot be generalized to the trade of land and used in filling in this information gap for several reasons. First, land ownership involves, as such, significant non-monetary and non-marketable values that are not necessarily involved in owning other real assets. Landowner objectives vary from economic objectives to large variety of non-market objectives such as recreation or conservation (Kline *et al.* 2000a, Kline *et al.* 2000b, Kendra & Hull 2005, Majumdar *et al.* 2008). The non-monetary objectives have been found to be useful in understanding and predicting land owner economic behaviour (e.g. Kuuluvainen *et al.* 1996, Ovaskainen *ym.* 2006), and reactions to policy alternatives (Kline *et al.* 2000a, Kline *et al.* 2000b). Some owners are also found to be passive towards their land property, meaning that they do not have expectations to receive monetary or non-monetary benefits from the ownership, or these expectations do not matter (e.g. Kline *et al.* 2000a, Kline *et al.* 2000b). Because of these non-market objectives some landowners may be particularly insensitive to changes in tax policy and some owners, especially the passive ones, may be eager to take the bait of possible tax reduction.

Land can also be characterized as a strategic platform, which is expected to open valuable new business options and opportunities in the future, while in other asset markets these options may have already been, for the most part, executed. An example is a future option to convert land to a more intensive land use, such as housing. For some land owners, these future options may also involve selling or donating their land to the land conservation programs. However, the recent literature suggests that the trade and competition over assets, which are characterized as strategic platforms, can result in unpredictable outcomes in particular when the competition involves a small number of agents, as is often the case in local land market (Stillman 2005, Mason and Weeds 2005, Huisman *et al.* 2003). Spatial questions and speculations over land use are hard to

reveal, but larger scale regionalism, based on regional history and heritage in agriculture, can be observed in land owner choices. Thus, the land owners and the local land market's response to the capital gains taxes is a valuable empirical question that has distributional consequences in reforming the tax policy.

The institutions of Finnish land market and capital gains tax

The fragmented land ownership and farming structure in Finland is a result of two major land reforms in the past. The land reform of 1922, freed the land tenants and gave them the right to purchase the land they have been cultivating under tenancy. The second reform was after the Second World War when land was allocated to war veterans and farmers, who have lost their land to Russia. This arable land was either cleared from the forest or taken from the large existing farms. As the result, the number of small sized, owner occupied farms increased and the average farm size decreased until 1950's.

The farm size turned to an upward sloping trend in 1970's, but it was Finland's entry to European Union in 1995 that initiated a new and drastic structural adjustment period in the Finnish agriculture. Small farms started to exit and quit faster than before, while others started to expand their operations and their expansions were supported by the agricultural adjustment and investment programs. However, compared to the overall structural development since 1995, the trade of land has been to some extent stagnated. About 40,000 hectares of arable land has been traded annually, which accounts only for 1.7% from the total arable land area of 2.4 million hectares (Figure 1). About half these hectares (20,000 hectares) are transactions between nonrelatives and subjected to the capital gain tax (Figure 2).

Because the trade for land has been, at least to some extent, locked in small volumes the fast structural development and concentration of active farming into a smaller number of larger farms has been feasible through increased land leasing. Approximately two thirds of the structural

development in active farming has been realized through land leasing and only a third through trade for land. As a result, already more than one third (750,000 hectares) of all arable land is currently cultivated under lease contracts. The number of land owners has been increasing, e.g. through inheritance, while the number of active farmers has been decreasing. The number of land owners is estimated at 487,000 and about one out of ten persons are owners of arable land. The number of active farms has fallen to less than 67,000.

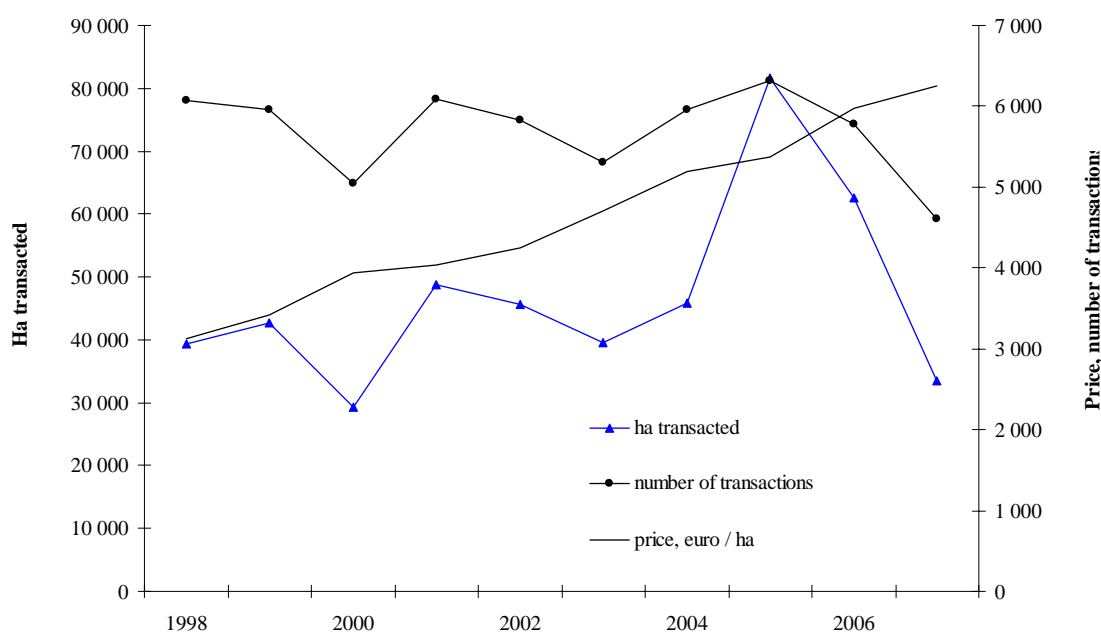


Figure 1: Land price and the number of trade transactions and the total transacted area in 1998-2007.

In Finland the trade for agricultural land belongs to the common capital gains tax scheme and the capital gains are not taxed until the owner sells the land. When the land is sold, capital gains tax is carried out from the discrepancy (arbitrage) between the selling price and the deductible expenses. Under the standard scheme the deductible expenses involve the purchase price and different closing fees that are required for registering the land ownership. The level of the tax has varied in recent decades: the capital gains tax rate was increased from 25%-points to 29%-points in 1996, however, decreased to 28% in 2005. More recently, also the formulas for deductibles were adjusted to

increase the effective tax rates in collecting the tax. As the result, the total sum of capital gains taxes account in Finland currently for about 5.4% of all government tax revenues.

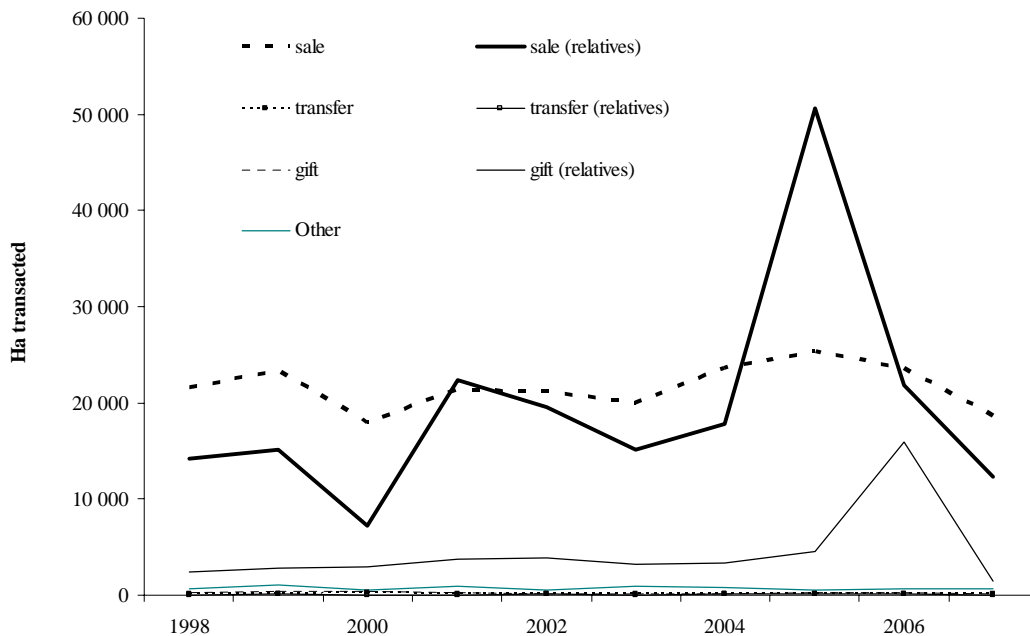


Figure 2: Transacted hectares in 1998-2007 on sale categories.

This standard has, nevertheless, two main exceptions. First, when the seller has owned the land for at least ten years before selling it, either the true purchasing price or a computational 40% deductible out from the selling price can be applied. Therefore, the capital gains tax is in this case at the most 17% out from the sales price, *i.e.* 28% share out from the 60% taxable revenue share, net of the 40% deductible. The deduction was reduced from 50% to the current 40% in 2005. Thus, the capital gains tax constitutes a significant share out from the sales price. It also has two time regimes: “the short regime” with higher tax and “the long regime” with lower tax. Dammon and Spatt (1996) show that, in particular, this type of two regime capital gains tax defers tax triggering sales within the short, high tax regime.

The second commonly realized exception deals with farm successions. When a retiring farmer sells the whole farm, *i.e.* land jointly with the farm compound, to a new farmer, most

often to one of his/her siblings as a farm succession package, the retiring farmer does not have to pay a capital gains tax from the sales price. In addition, there are some special stipulations and tax exceptions when the land is sold or donated to natural conservation purposes. These waiver programs deal for the most part, nevertheless, forest land and not arable land.

In 2006 the annual tax revenue from capital gain taxes on farmland sales was approximated at Euro 18 million. The median price for land was Euro 6250 per hectare and the capital gains tax realized per hectare of land traded was approximately Euro 900 (15%). These figures involve trade transactions for pure arable land, without farm compounds.

Method

The econometric models estimating land owners' willingness to sell land are for the most part based on an earlier and more methods oriented article of Myyrä & Pouta (2009). These models are built on survey data from a random sample of Finnish land owners, including both active farmers, and passive land owners who either rent their field to active farmers or have set them aside. The monograph of Myyrä et al. (2008) describes in detail the data sampling and collection procedures, such as design of the mail survey that was used to acquire data on landowners' sale decisions and intentions. The mail survey yielded a total of 2 684 observations from the sample of landowners. This amounts to 47% of the total number of mailed questionnaires. In addition to the mail survey data, information from the register of agricultural taxation and income taxation was available for the respondents, including income from agriculture.

The questionnaire focused on a single parcel of farmland owned by the responding landowner and covered the past land sales during the previous ten years and future selling intentions. Hypothetical policy, the taxation on the proceeds of a farmland sale (TTF), were introduced for respondents. TTF currently averages €900/ha, which is about 28% of the average difference between the assumed or actual purchase and selling prices (*i.e.* "arbitrace"). In the

questionnaire, landowners were asked about their willingness to sell their agricultural land under conditions where the current tax (€900) would be immediately reduced for five year period from €900/ha to the level quoted in the questionnaire €600/ha, €300/ha, €100/ha or €0/ha.

Myyrä & Pouta (2009) used logit models to explain past sales and future selling intentions without a tax policy and under TTF scenario. The self selection bias was tested but found not significant. Their models for past sales, selling intentions and selling intentions under TTF are presented in Appendix 1.

These models and the same data set were used to simulate the effect of tax policy and the level of tax on selling probability. By adding ten new observations for each respondent corresponding tax levels from €900, 800 etc. to 0, the reactions for varying taxes were calculated. All simulated observations were then used to estimate the probability for land sale in all possible tax levels. Sale was predicted if estimated probability exceeded 0.5.

Results

The simulation results show the effect of tax scheme on the land owners' willingness to sell land (Figure 3). Even if the overall level of the probability to sell land is low and as much as 87% of all land owners would not sell their land no matter what the tax rates are, adjustments in the tax rates would have economically considerable effect on the land market. If a temporary tax waiver program decreases the sales tax, for example, by one third, from Euro 900 to Euro 600 per hectare, the probability to sell land is predicted to increase by 50%, from 3.1%-points to 4.7%-points (Table 1, Figure 3). A temporary abolition of the tax is predicted to quadruple the probability to sell land, as it is predicted to increase from 3.1%-points to 12.5%-points. Thus, the land owners' willingness to sell land responds elastically to the tax scheme.

The results also indicate that the monetary information regarding the tax rates, as given in the questionnaires to the respondents, does not considerably bias the simulation results as simulated probabilities corresponded probabilities from data quite well.

As mentioned above, approximately 20,000 hectares of land is traded annually, excluding the farm successions, gifts and transfers and could be defined as “arm-length”, and the resulting tax collected per hectare of traded land is Euro 900. This tax revenue sums up to a total of Euro 18 million. Using these figures as benchmarks, a temporary abolition of the tax would trigger (*ceteris paribus*) land trade that is four times the current volume. Without the tax, the traded total land area is predicted at 80,000 hectares. The price tag, in terms of government tax revenues, for the quadrupled quantity of land trade would then be a loss of Euro 18 million tax revenue, corresponding to Euro 225 per traded land hectare (Figure 3; Table 1).

Decreasing the tax temporarily to Euro 100 per hectare of traded land would trigger land sales that are three times the current volume, *i.e.* 59,000 hectares, whereas the tax revenue would decrease from euro 18 million to Euro 5.9 million. Thus, tripling of the traded land quantity would decrease the tax revenue by two thirds, and the fiscal cost in terms of decreased tax revenue would be Euro 12 million. In this case, the lost tax revenue would be Euro 205 per traded land hectare.

When the tax rate is decreased from the current Euro 900 per hectare towards zero, the tax revenue is predicted to remain first about its current level (at Euro 600 tax) and then decrease almost linearly to zero. Thus, the results predict that the current tax revenue could be maintained by a tax waiver program that decreases the capital gains tax from Euro 900 to Euro 600 per hectare.

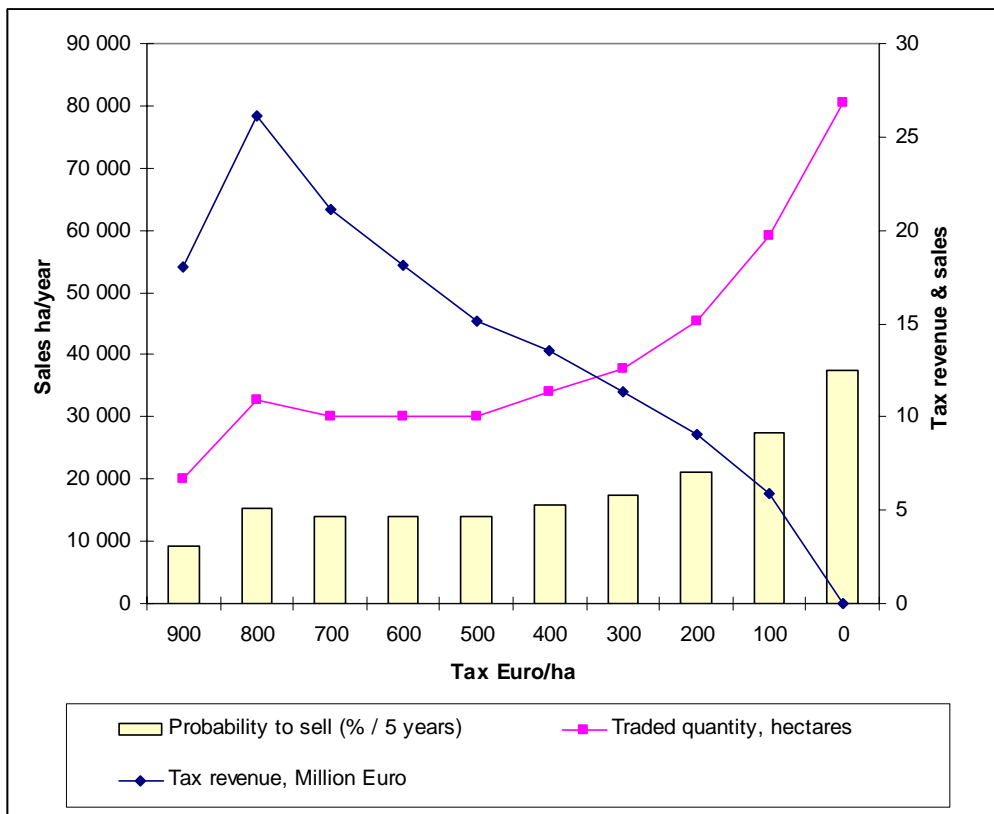


Figure 3. The predicted probability to sell land (the bars), the traded quantity of land (upwards sloping curve), and the tax revenue (downward sloping curve) conditional on alternative capital gains taxes (x-axis). The current tax rate is denoted by “900”.

Given that about 60,000 hectares of land is annually transacted by trade and by a net increase in leasing from exiting farms to expanding farms, a tax cut to Euro 600 hectare would increase the quantity of annually traded land to above 30,000 hectares. This would be a sufficient increase (*ceteris paribus*) for maintaining the share between the leased and owner farmed land unchanged (Table 1). In other words, a tax waive of euro 300 would cease the tenancy problem from gradually increasing pattern and keep the land tenancy at its current level and this would not cut the total amount of taxes collected from the land sales. If the tax is cut to below Euro 400, the traded quantities are predicted to increase to at least 34,000 hectares, which would turn the share of land tenancy to a downward sloping trend.

Table 1. The simulated probabilities to sell land, traded quantities and aggregate tax revenues conditional on the capital gains tax.

Capital gains tax Euro/ha	Traded quantity hectares	Tax revenue Million Euro	Probability to sell (% / 5 years)
900	20 000	18.00	3.1
800	32 710	26.17	5.07
700	30 194	21.14	4.68
600	30 194	18.12	4.68
500	30 194	15.10	4.68
400	33 935	13.57	5.26
300	37 742	11.32	5.85
200	45 290	9.06	7.02
100	59 097	5.91	9.16
0	80 516	0.00	12.48

Concluding remarks

Our results support the view that economic incentives, or merely disincentives, in terms of capital gains taxes that are collected from the trade of agricultural land matter. Land owner willingness to sell land is predicted to respond elastically with respect to temporary waives in the capital gains tax on land sales, even if it is characteristic that majority of land owners do not respond to economic incentives by selling their land. Thus, our results are consistent with the finance literature that the capital gains taxes significantly affect the timing of asset sales that trigger these tax payments. Land market as a whole does not make an exception to these results dealing with assets in general, even if land ownership involves a large amount of other than economic values.

The results suggest that the tax collector has the power to redress the important foundations and incentive structures that are driving the gradually increasing land tenancy problem in agriculture –an institutional development pattern that is causing large economic losses in real economics by hindering irreversible land improvements and decreasing the efficiency of agri-environmental programs. The trade distorting effects of capital gains taxes could be decreased (*ceteris paribus*) without fiscal losses to the extent that would cease the development towards land tenancy. In other words the gradual increase of real economic losses due to land tenancy could be stopped without decreasing or jeopardizing the government tax revenue.

The current development pattern could be reversed towards increasing land ownership of active farmers by decreasing the capital tax rate at least to a half from its current level. A tax waiver that would, for example, triple the traded land area would imply that two thirds of the tax revenue is lost. Abolishing the whole tax temporarily would quadruple the trade for land, which would clearly bring relief to the land tenure insecurity problem by turning the share of farmer owned land to an upward sloping trend.

It has to be noted, however, that our simulations involved a temporary tax waive as it is justified by the finance literature to get a large response. Then, the longer term linkage, say, between a sequence of temporary tax waiver programs and land owner response justifies at least a question mark. It is unfortunate that the data are not informative in identifying this important question and it is, therefore, left to a topic for future research. This new research would turn topical, in particular, if or once the temporary tax waiver program is going to be implemented. Nevertheless, we have signals from the option literature and empirical analyses on similar optimal timing problems that a policy uncertainty and public debate over the continuation of a temporary program that encourages to act triggers repeatedly action at the edge of expiry of the program, even if there is a significant likelihood that the program will be continued (see. *e.g.* Pietola *et al.* 2003).

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Appendix 1. Full models, with no variable elimination.

	Model 1 Past sales		Model 2 Selling intentions, no policy changes		Model 3 Selling intentions, under TTF	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Constant	-2.6600	0.0007	-2.3776	0.0016	-0.9100	0.1956
Gender (female2, male 1)	-0.3873	0.0259	0.2616	0.0773	0.2426	0.0658
Age (continuous)	-0.0207	0.1048	0.0254	0.0126	0.0148	0.1224
Education (continuous)	0.1515	0.2912	-0.2448	0.0836	-0.3367	0.0078
Employment						
employee (ref.)						
farmer	-0.7075	0.1208	-0.0323	0.9314	-0.3201	0.3547
entrepreneur	-0.1118	0.8096	0.1047	0.8042	0.2772	0.4912
retired	1.0667	0.0036	-0.9340	0.0077	-0.3913	0.2144
other	-0.2921	0.6925	0.9158	0.0460	0.2492	0.6049
Objective						
agricultural earner (ref.)						
part-time farmer	-0.2609	0.4265	0.0311	0.9114	-0.3354	0.2217
investor	-0.1899	0.5179	-0.0933	0.7325	0.1179	0.6207
immaterialist	0.0063	0.9830	-0.7146	0.0226	-0.7179	0.0090
indifferent owner	0.7268	0.0082	0.8277	0.0036	0.6886	0.0096
Agricultural income						
none (ref.)						
only rent	0.3153	0.3270	0.3361	0.2373	0.5027	0.0477
from sales	0.2396	0.4926	-0.1431	0.6301	-0.1884	0.4852
only subsidies	-0.3321	0.6447	0.3269	0.4952	0.1729	0.7040
Region						
south (ref.)						
east	0.1627	0.5228	-0.1797	0.5003	-0.7577	0.0307
west	0.5377	0.0438	0.4087	0.1293	1.2315	0.0001
north	-0.6245	0.0975	-0.2848	0.3811	-0.3549	0.3406
Expectations of profit from other investments (%)	0.0070	0.7593	0.0654	0.0011	0.0563	0.0025
Adult children living on their own	0.1594	0.1590	0.1591	0.1559	0.1538	0.1434
Previous sales			0.5181	0.0209	0.7048	0.0011
Tax bid					-0.0002	0.7847
District * Tax						
south ref.						
east					-0.0001	0.9482
west					-0.0052	0.0034
north					-0.0004	0.8095
N (weighted)	864.1		506.5		512.0	
Sell on data, %	6.5		14.9		20.9	
Sell based on model, %	0		4.0		9.0	
Correctly classified, % (cut- off point 0.50)	93.4		83.8		78.5	
Log-likelihood (model)	-759		-738		-867	
Log-likelihood (constant)	-832		-854		-1048	
p-value	<0.001		0.003		<0.001	
Pseudo-R ²	0.09		0.16		0.17	