Significant Factors in Valuation of Agricultural Land in the Czech Republic – A Review of Past Studies

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Abstract
This paper is motivated by the current situation where during the sale of agricultural land, both the seller and the buyer face many challenges caused by limited and incomplete information on prices achieved in comparable sales. Thus, it is particularly challenging to set a price that would represent the structure and nature of the agricultural market in a satisfactory way. This paper aims to contribute to these challenges by systematically reviewing past literature for key parameters linked to the concept of valuation of agricultural land. While several key factors from different backgrounds (i.e. historical, economical, social, political) were identified, it seems that factors affecting the price of agricultural land market are closely related to the intentions of future tenants and buyers of agricultural land. These intentions and motives to purchase and/or lease agricultural land could be divided into several following groupings: (i) purchase of agricultural land in order to expand existing or establish new agricultural enterprise; (ii) purchase of agricultural land with the aim to obtain grants and funding; and (iii) speculative investment purchase of agricultural land due to the expected increase in prices or rents of agricultural land while maintaining its agricultural use or due to potential future land-use change (e.g. to residential land). When estimating the value of their agricultural land on the open market landowners should consider the applicability of the various factors in the given specific transaction and perform the highest and best use analysis. At that, the Czech official administrative prices coupled to the BPEJs should be perceived as an indicator of soil quality rather than as indicator of market prices.

Key Words
Valuation, price of agricultural land, official administrative prices, Bonited-Soil-Ecological-Units.

Introduction
Agriculture is like other sectors in constant evolution and is affected by changes caused by demands of consumers, politicians, environmental protection and economic pressure. Price of agricultural land is thus affected not only by agronomic but also economic, social and demographic factors (Sklenička et al., 2013). The most important agronomic factor is the quality and size of sold land plots. Among the economic factors are demand, profitability of agricultural production, and market dynamics (Marks-Bielska, 2013). From the perspective of economic theory, three unique characteristics can be identified that distinguish agricultural
land as a production factor from capital and labour. Firstly, the aggregate supply of agricultural land in the short term is inflexible and insensitive to price changes. Secondly, given that principles of good agricultural practice are met, agricultural land is not a subject to depreciation during the production process, unlike other production factors. And thirdly, it is completely immobile. An increasing number of non-agricultural values have been assigned to agricultural land in recent years, including for example the value of landscape, the value for tourism, sports and recreation, and the importance of providing habitat for endangered species (Bastian et al., 2002). Agricultural land does thus not fulfil only the obvious production function but also forms landscape and holds environmental and social functions.

If the owner of agricultural land wants to determine its value for the purpose of a possible sale, he or she should be able to evaluate all of its functions, which are affecting its price. However, reliable and robust data needed to perform such an extensive analysis are often missing and incomplete, and the landowner will be therefore faced with lack of input data for such analysis (Goodwin et al., 2003; Bastian et al., 2002). Another drawback of empirical models used to determine the price of agricultural land remains the fact that its prices are based on expected long-term income flows from production and program supports (Goodwin et al., 2003). Expected future cash flows are, however, not an observable variable. Research conducted in this direction therefore faces issue of expectations errors. This most clearly affects results of authors modelling impacts of direct payments which are often contradictory (Patton et al., 2008). Hence only those factors that can be clearly quantified and verified should enter into the process of agricultural land valuation.

**Objectives and methodology**

This paper is motivated by the current situation where during the sale of agricultural land, both the seller and the buyer face many challenges caused by limited and incomplete information on prices achieved in comparable sales. It is hard to obtain reliable and detailed market parameters and thus particularly challenging to set a price that would represent the structure and nature of the agricultural market in a satisfactory way. This paper aims to contribute to these challenges by (i) systematically reviewing past literature for key parameters linked to the concept of valuation of agricultural land; (ii) tabulating and commenting factors reported in past studies; and (iii) by advising on the suitability of the individual factors and recommending a plausible set of steps for the buyer and/or seller to derive more reliable agricultural land values.
The issue was analysed using secondary data from specialized foreign and domestic literature, relevant legislation, and fundamental indicators published by the Ministry of Agriculture and the European Commission. Several online databases (e.g. AGRIS, Web of Knowledge) were utilized, to compile a bibliography of past studies which attempted to empirically analyse factors influencing price of agricultural land. Initially, by using systematic, comparative, logical analysis, and drawing subsequent synthesis from the individual results of different authors the most important factors affecting the price of agricultural land were identified. In the next steps these factors were split into several groupings, and an overview of factors affecting the price of agricultural land was drawn. This overview was commented in order to serve both landowners, as well as professional land valuers.

**Results**

**Effect of official administrative prices and Bonited-Soil-Ecological-Units**

In the Czech Republic there are two kinds of prices on the market with agricultural land: the official administrative prices on the one hand, and market prices on the other hand. Official administrative prices are used for valuations of land for tax purposes, transfers of state-owned property, and for the implementation of land consolidations. Market prices are formed directly on the market solely by the forces of supply and demand. Official administrative prices were normatively determined on the basis of production assessment of Bonited-Soil-Ecological-Units (referred to as BPEJ in the Czech literature). This was done by assessing parameterized natural yields of nine major crops arranged into valuation pattern structures of arable land (Research Institute of Agricultural Economics and Nutrition et al., 1990). As a source of information, data from a comprehensive soil survey carried out in the sixtieth of 20th century were used; the economic assessment followed in the eighties of 20th century (Voltr, 2011). Official administrative prices are updated by regulations to the Act No. 151/1997 Coll., on Valuation of Property. To this date, the Regulation No. 3/2008 Coll. from the year 2008 is the most recent one. In total there are 2199 BPEJ identified, and valued in the Annex No. 22 of this Regulation. The minimum price is set at 1 CZK/square meter; the maximum price per square meter is 17.25 CZK (for BPEJ with the code 30300); the arithmetic mean is equal to 4.28 CZK/square meter. Actualization of published official administrative prices is done merely by adjusting it for average inflation. In other words, the methodology of economic assessment of individual BPEJ codes has remained unchanged since 1990.
Results of the analysis of market prices of agricultural land sales contracts in five selected districts of the Czech Republic during 2008-2009 published by Medonos et al. (2011) showed that the official administrative price of land was in most regions an important guide for the determination of the resulting market prices (with exceptions of regions adjacent to urban agglomerations, such as Prague-East or Olomouc). The authors of the paper justified this effect of official administrative prices by two possible explanations. First, the official administrative prices include characteristics of agricultural land quality which was possibly transferred into the sales contract. Second, due to lack of knowledge about situation and prices on the agricultural land market the parties may have inclined to use the official administrative prices as a guideline. Nevertheless, by using the official administrative prices as a guideline during a transaction on the open market the involved parties can be damaged.

As stated in the original methodology used to assess the price of individual BPEJ codes back in 1990, the conducted soil bonitation respected the basic unchangeable factors including the climate, soil type, slope of the land, and depth of topsoil of the particular parcel. It further states that “the real (market) price is significantly influenced by other factors”, and the published official administrative prices provide only “indicative” information about the open market with agricultural land, because it provides only “hypothetical prices reflecting only to some extent the expected market conditions” (Research Institute of Agricultural Economics and Nutrition et al., 1990, pp. 2, 4, 9). The aim of the methodology used for assessment of official administrative prices of agricultural land was not to reflect the actual market prices, and therefore should not be used for this purpose by participants involved in transfer of agricultural land in the free open market. This finding is supported by the obvious difference between the average official administrative price for the Czech Republic which is now 6.23 CZK/square meter and the average market price of agricultural land which ranges between 8 to 11 CZK/square meter (Ministry of Agriculture, 2012).

**Effect of other factors**

The professional literature mentions several factors that affect the market price of agricultural land. As these factors are often repeated by different authors, the aim of this paper was to create their concise overview. Table I presents these results. Individual factors are not ranked according to their significance. This is caused by the fact that they were taken from several different studies whose results cannot be empirically compared to each other due to differences in used methods, and the individual characteristics of the data.
## I: Overview of factors influencing market price of agricultural land

<table>
<thead>
<tr>
<th>Factor</th>
<th>Influence on market price of agricultural land</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land inheritance by the family’s next generations</td>
<td>These transfers do not enter the market and thus negatively influence market dynamics. The character and volume of these transfers may lead to absence of information about sales prices.</td>
<td>Marks-Bielska, 2013</td>
</tr>
<tr>
<td>Environmental factors</td>
<td>Hedonic models applied to evaluate agricultural land show that the environmental characteristics of the land (e.g. landscape view, recreation possibilities, wildlife habitat etc.) are more valued in locations distant from populated parts of the region, and on agricultural land whose quality is not suitable for agricultural production. Environmentally interesting agricultural land near to large municipalities is at risk of losing its ecological and landscape features at the expense of conversion into a residential area.</td>
<td>Bastian et al., 2002; Plantinga et al., 2002</td>
</tr>
<tr>
<td>Soil quality</td>
<td>For agricultural use of land its soil quality is more valued. In speculative transactions where change of use from agricultural to residential land is anticipated, buyers are looking for lower soil quality. In this market sector, the lower soil quality is often surprisingly connected to higher market price (especially in close distances to bigger municipalities).</td>
<td>Medonos et al. 2011; Sklenička et al., 2013</td>
</tr>
<tr>
<td>Location – population size in adjacent municipalities</td>
<td>Price of agricultural land increase with increasing population in the neighbouring municipalities. This is explained by mostly speculative reasons for these types of land transfers.</td>
<td>Medonos et al., 2011; Sklenička et al., 2013</td>
</tr>
<tr>
<td>Location – distance from the nearest municipality</td>
<td>Distance of agricultural land from the nearest municipality significantly influences its price. Price of agricultural land directly adjoining to residential area may be by several times higher then price of agricultural land in further distance from build-up area.</td>
<td>Medonos et al. 2011; Sklenička et al., 2013</td>
</tr>
<tr>
<td>Direct agricultural payments</td>
<td>Support to agriculture in form of direct payments should in the terms of economic theories have positive impact on agricultural land prices. This should be true with both, decoupled direct payments, as well as coupled direct payments. However, results of different researches suggest that this statement is too general. Effects of direct payments are fundamentally different, depending on the type of payment, the nature of the production of given agricultural commodity, the region in question, the size of the sample etc. Findings also show that direct payments are partially capitalized into agricultural land rents. This means that owners of agricultural land gain share in the support provided to tenants who farm on their land. Authors of similar studies performed in the USA point to the methodological shortcomings associated with the study of impacts of agricultural subsidies, and the</td>
<td>Patton et al., 2008; Goodwin et al., 2003</td>
</tr>
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considerable differences in conclusions of the individual published papers.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility of the land for sale</td>
<td>Good accessibility of the agricultural land to be sold positively influences its price.</td>
<td>Sklenička et al., 2013</td>
</tr>
<tr>
<td>Transaction costs</td>
<td>High transaction costs may negatively influence price of agricultural land.</td>
<td>Marks-Bielska, 2013</td>
</tr>
<tr>
<td>Size of land parcel to be sold</td>
<td>Bigger size of land to be sold may positively influence its price (given that continuous agricultural use is anticipated).</td>
<td>Medonos et al., 2011</td>
</tr>
<tr>
<td>Rent paid for the agricultural land</td>
<td>Higher rents positively influence price of agricultural land as expected future rent incomes are a significant factor of demand.</td>
<td>Patton et al., 2008</td>
</tr>
</tbody>
</table>

Source: Author’s own analysis

Discussion
Factors affecting the price of agricultural land market are closely related to the intentions of future tenants and buyers of agricultural land. These intentions and motives to purchase and/or lease agricultural land could be divided into several following groupings: (i) purchase of agricultural land in order to expand existing or establish new agricultural enterprise; (ii) purchase of agricultural land with the aim to obtain grants and funding; and (iii) speculative investment purchase of agricultural land due to the expected increase in prices or rents of agricultural land while maintaining its agricultural use or due to potential future land-use change (e.g. to residential land).

Owners of agricultural land who are interested in selling their land on the open market should perform a deep analysis concerning prices of agricultural land in the given place and time prior to assessing the land price. An important step before the sale itself is to analyse the highest and best possible use. In this process the factors named in Table I should be carefully analysed and taken into account. The reason is that the landowner should be fully aware of potential future land uses and consider for what purposes the potential buyer enters the transaction. In other words, the seller should be price conscious and gather all appropriate data before entering the transaction and agreement about the final selling price.

Conclusion
The process of agricultural land valuation is very complex one, and is influenced by a number of factors. The domestic and foreign literature specialized on this topic suggests that not all of these factors can be properly quantified and determined leading to problematic and limited
application of empirical valuation models. When estimating the value of their agricultural land on the open market landowners should consider the applicability of the various factors in the given specific transaction. An important element in the sale of agricultural land is the intention of the buyer which may be speculative and undirected to further agricultural use of the land. The price of agricultural land is thus affected not only by its agronomic indicators (e.g. soil quality) but increasingly also by economic, demographic, and social indicators (e.g. direct payments, distance from the nearest municipality and its population, worsen market dynamics caused by systematic inheritance of agricultural land in families etc.). Landowners may take into account the economics valuation of BPEJ but should perceive it primarily as an indicator of soil quality. Methodology of economic evaluation of BPEJ did not aim to reflect market prices of agricultural land and official administrative prices may thus differ from the market to the disadvantage of the seller.

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References


