THÜNEN

Determinants of competitiveness of agriholdings and independent farms in Ukrainian arable production

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Thünen Report 15

Bibliografische Information:
Die Deutsche Nationalbibliothek verzeichnet diese Publikationen in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet unter www.dnb.de abrufbar.

Bibliographic information:
The Deutsche Nationalbibliothek (German National Library) lists this publication in the German National Bibliography; detailed bibliographic data is available on the Internet at www.dnb.de

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Zitationsvorschlag – *Suggested source citation:*
Walther S (2014) Determinants of competitiveness of agriholdings and independent farms in Ukrainian arable production. Braunschweig: Johann Heinrich von Thünen-Institut, 230 p, Thünen Rep 15

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Herausgeber/Redaktionsanschrift – *Editor/address*

Johann Heinrich von Thünen-Institut
Bundesallee 50
38116 Braunschweig
Germany

thuenen-report@ti.bund.de
www.ti.bund.de

ISSN 2196-2324
ISBN 978-3-86576-119-4
DOI:10.3220/REP_15_2014
urn:nbn:de:gbv:253-201403-dn053389-9

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Braunschweig im März 2014

Preface

This work was accepted as a doctoral dissertation by the Faculty of Agricultural Sciences at the University of Hohenheim on the 26th of August 2013. The date of submission was the 12th of June 2013, the date of the oral examination was the 18th of October 2013.

The examination committee was:

Supervisor and reviewer:	Prof. Dr. Drs. h. c. Jürgen Zeddies (University of Hohenheim)
Co-reviewer:	Prof. Dr. Folkhard Isermeyer (Thünen Institute and University of Göttingen)
Additional examiner:	Prof. Dr. Enno Bahrs (University of Hohenheim)
Vice dean:	Prof. Dr.-Ing. Stefan Böttinger (University of Hohenheim)

The research was conducted in the context of the *agri benchmark* project at the Institute of Farm Economics of the Johann Heinrich von Thünen Institute in cooperation with the Institute of Farm Management at the University of Hohenheim.

My warmest thanks go to everyone in Braunschweig, Hohenheim and Ukraine who supported me in this endeavor, as well as – especially – my family. It is you who made this possible in the first place.

Simon Walther

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Abbreviations

2F	2,000 ha typical independent farm
2H	2,000 ha typical agriholding farm
10F	10,000 ha typical independent farm
10H	10,000 ha typical agriholding farm
AH	agriholding (organizational form)
CEO	chief executive officer
cf.	confer
DEA	data envelopment analysis
EBRD	European Bank for Reconstruction and Development
ed.	editor
EU	European Union
EX	group of externals included in the modified panel process
et al.	et alii (= and others)
FA	independent farm (organizational form)
FAT	Fixed Agricultural Tax
GMO	genetically modified organism
GPS	Global Positioning System
IFCN	International Farm Comparison Network
IFRS	International Financial Reporting Standards
IPO	initial public offering
KRU	Kazakhstan, Russia and Ukraine
KTBL	Kuratorium für Technik und Bauwesen in der Landwirtschaft
LIBOR	London Interbank Offered Rate
NGO	non-governmental organization
NIE	New Institutional Economics
OECD	Organisation for Economic Co-operation and Development
RTK	real time kinematic
SOP	standard operating procedure
TAMU	Texas A&M University

TFP	total factor productivity
TX	Texas
UK	United Kingdom (of Great Britain and Northern Ireland)
US	United States (of America)
USA	United States of America
VAT	value added tax
vs.	versus
w/	with
w/o	without

1 Introduction

1.1 Problem statement

After the collapse of the socialist economic system, agriculture in the three large countries of the former Soviet Union, Kazakhstan, Russia and Ukraine (KRU[1]), entered a severe crisis with production declining throughout most of the ensuing decade. However, starting in the late 1990s, the trend in arable production has reversed and the region has developed from a net importer into a net exporter (Liefert and Liefert, 2012). Today Russia, Ukraine and Kazakhstan are among the biggest exporters of arable commodities in the world (Von Cramon-Taubadel, 2012).

Much of the revitalization of arable farming in the three countries can be attributed to the investment activities of agriholdings, horizontally and/or vertically integrated corporate farming organizations of often huge dimensions. This organizational form has emerged in KRU since the late 1990s (Rylko, 2005; Lapa et al., 2010; Petrick et al., 2012) – about the time when the trend reversal in arable production occurred – and has since then been expanding continuously. Today it plays a dominating role.

Ukraine is one of the three big players in which the development of agriholdings has been very pronounced. From 2007 to 2010 the farmland controlled by agriholdings in the country tripled from 1.7 million ha to 5.1 million ha. Those 5.1 million ha are controlled by roughly 80 companies and make up more than a quarter of the country's commercially farmed arable land (Byerlee et al., 2012; Ukrstat, various).

During the farm crisis in the 1990s a considerable part of Ukraine's farmland has fallen out of production (Ukrstat, various) because a large number of insufficiently restructured former kolkhozes and sovkhozes[2] lacked the liquidity to work it (Liefert and Liefert, 2012). Hence, the demand for farmland was not particularly high in the past and competition for it was weak. Today land rents in Ukraine are still very low in comparison to other regions with comparable productive potential (Byerlee et al., 2012). However, with the current strong expansion of arable farming, demand for land is increasing and, according to local experts, by now there is hardly any more unused land available.

Consequently it can be expected that competition for land will increase in the future and in the longer run land will be transferred to the most competitive businesses. Agriholdings will then compete among each other as well as with independent farms, the dominant organizational form in global arable production so far. In order to be able to assess which of the two organizational

[1] This abbreviation has also been used by Liefert and Liefert (2012).

[2] Kolkhozes and sovkhozes were collective farms in the Soviet era. Kolkhozes were technically owned by the farm labor (the "collectives"), while sovkhozes were state-owned.

forms will be more competitive in the future also under changing conditions, the question arises: on which factors does the competitiveness of the organizational forms depend and how great are their respective effects. Further, when businesses get under economic pressure, they do not simply cease to exist but rather undertake adaptations in order to maintain or increase their competitiveness. Hence the question also arises of how agriholdings and independent farms will adapt in the future in order to remain in business.

However, scientific literature on the current competitive advantages and disadvantages of agriholdings in comparison to independent farms allows for no clear conclusions. The information tends to be relatively old when measured against the current speed of structural change, or is based on small samples and/or suspicious official accounting data. Further, no empirical research on future adaptations of the organizational forms has been published yet.

1.2 Research objectives

Therefore this thesis aims to

- identify competitive advantages and disadvantages of agriholdings and independent farms in Ukrainian arable production;
- quantify the effect these factors have on the competitiveness of the two organizational forms; and
- explore likely future adaptations of the organizational forms in order to maintain or increase their competitiveness.

1.3 Approach and data

The approach taken in this thesis commences with a literature review (Chapter 2). Therein the definitions of the term agriholding are reviewed, the role of the organizational form in KRU is elaborated and explanations for its prolific development are reviewed. Thereafter the structure of agricultural producers in Ukraine is analyzed in order to understand the competitive environment. The existing findings on the competitiveness of agriholdings as well as potential future adaptations are reviewed and the need for this research is shown.

Thereafter a methodology for the empirical part of this thesis is derived (Chapter 3.1). After a delimitation of the research subject, the different approaches for analyzing competitiveness are reviewed and their strengths and weaknesses pointed out. Based on the requirements of this study, the typical farm approach for competitiveness analysis is derived as the most suitable approach.

While most studies that analyzed the competitiveness of KRU agriholdings in the past relied primarily on official farm accounting data, it is shown that this data is of doubtful quality and lacks the level of detail required for this study. Therefore the *agri benchmark* panel methodology, an approach that is based on focus group discussions with farm business decision makers, is utilized to gather and validate data. This approach has the further advantage that it is also suitable for analyzing likely future adaptations of agriholdings and independent farms.

It is shown that specific challenges under Ukrainian conditions, which are rooted in an as yet lacking culture of farm level economic data utilization and exchange, pose challenges to the standard panel process. Modifications to improve the data gathering and validation process are therefore applied. With these changes the methodology is referred to as a *modified panel process for the analysis of typical farms*.

In order to be able to design the required discussion guidelines for the panel process, hypotheses on competitive advantages and disadvantages of the two organizational forms are required. They are derived theoretically using New Institutional Economics as a framework for systematic analysis (Chapter 3.2).

The modified panel process is then used to collect and validate the necessary data. It comprises three rounds of interaction with agriholding and independent farm managers, as well as externals in the form of agribusiness representatives, scientists and analysts. The first round is conducted in one-on-one interviews with all participants. Thereafter, using the gathered data, typical farms are drafted which are then completed and validated in the second panel round. This second round consists of two separate focus group sessions, one with the participating independent farm managers and one with the participating agriholding managers. In the third and last panel round, a final validation of the typical farms is conducted and likely future adaptations of the organizational forms are discussed. This takes place in a single focus group discussion that includes both the agriholding and independent farm managers.

The process of the empirical research (Chapter 3.3) and the results (Chapter 4) are subsequently documented. The discussion of the utilized methodology and the results follows, in which conclusions are drawn and needs for further research are considered (Chapter 5).

2 Literature review

2.1 Definition of agriholding

Agriholdings are farming companies that are made up of multiple operations under a more or less centralized management. In literature, the terms *agroholding* and *agriholding* are used synonymously. Rylko and Jolly use the term *New Agricultural Operator (NAO)* for the same phenomenon (Rylko and Jolly, 2005). In this thesis the term *agriholding* is used. In the following, definitions from literature are reviewed.

There is wide agreement that agriholdings have a head company that controls a number of other companies (Usachev, 2002; Gerasin et al., 2003; Ilienko and Lapa, 2009; Rylko, 2010). They are usually bound by legal ties and/or asset relationships (Gerasin et al., 2003; Hockmann et al., 2005; Lapa et al., 2010). Gerasin et al. (2003) point out, however, that agriholdings can also be informal, with a group of companies economically depending on a center with few or no legal ties at all. The center in that case consists of one or more natural or legal person(s). The informal ties can, for example, consist of family relations (Wandel, 2011). Legal independence of the constituent companies is part of the definitions of Gataulina et al. (2005), Hahlbrock et al. (2011) and Wandel (2011), which excludes setups that have been consolidated into a single entity. The latter setups are called *agrofirms* by Gataulina et al. (2005).

Some authors include as part of their definition that agriholdings are projects of companies who have their core business outside primary agriculture. Some, while not making it a defining criterion, point out that this is often the case (Rylko et al., 2008; Ilienko and Lapa, 2009). Agriholdings are often very large. The size of the operation is consequently sometimes used as a defining criterion. While Rylko (2010) remains unspecific on the exact size, Lapa et al. (2010) make it 10,000 ha and more.

Vertical integration is also mentioned as a criterion by some authors (Lapa et al., 2010; Wandel, 2011). Sometimes more detailed differentiations are made. Hockmann et al. (2005), for example, differentiate between agriholdings and agro-financial-industrial complexes, with the latter including banks.

As can be seen, the definitions of agriholdings vary in their details. The subsequent literature uses varying definitions as well. It is therefore necessary to derive a clear definition for the empirical part of this thesis. This will be accomplished in Chapter 3.1 Subsequently the role of agriholdings in Kazakhstan, Russia and Ukraine will be shown.

2.2 The role of agriholdings in Kazakhstan, Russia and Ukraine

The three big players in arable production in the Former Soviet Union are Russia, Ukraine, and Kazakhstan. The development in the three countries, as well as the current conditions and challenges are for the most part very similar (Liefert and Liefert, 2012). In order to show the role of agriholdings in the region, a brief overview of the development of the agricultural sectors since the demise of the Soviet Union in 1991 is subsequently provided. The historical overview is kept short as the history of transition has already been covered by many authors. Liefert and Liefert (2012) give a good overview, and they also point to further references.

In the Soviet Union farming was organized in collectivized farms (kolkhozes) and state farms (sovkhozes). It was expected by many Western scientists that after privatization those would break up and family farms would develop (World Bank, 1992). However, this has not turned out to be the case – the now independent collective farms (Rylko and Jolly, 2006) proved quite persistent. They had been formally restructured from kolkhozes or sovkhozes into different legal entities, such as joint-stock companies. However, in most cases their internal structures remained largely unreformed – only the "*sign on the door*" had been changed (Lerman, 1998). The unreformed structures of the collective farms, however, were inadequate for managing businesses under market economy conditions, one reason being incentive misalignments in the collective setup. For example, an elected farm manager in a collective who is interested in being re-elected is unlikely to take painful measures to make the business profitable (Koester and Striewe, 1999).

In the Soviet Union the agricultural sector used to be heavily subsidized. This was expressed mostly in prices set by central planners in a favorable manner – with (artificially) low input prices and (artificially) high output prices. After the end of the socialist system, prices were liberalized and the terms of trade for agricultural producers deteriorated severely (Liefert and Liefert, 2012).[1]

While prices had been liberalized quickly, there was a lack of political and institutional reform. An example is that farms for a long time worked under soft budget constraints. Bankruptcy was not enforced when a business was unable to meet its debts.[2] For instance, there have been no farm bankruptcies in Ukraine as of 1999 (Koester and Striewe, 1999). A consequence was that agriculture was seen as a high-risk investment by banks, and farms could not get credit, or only at extremely high interest rates (Rylko and Jolly, 2005).

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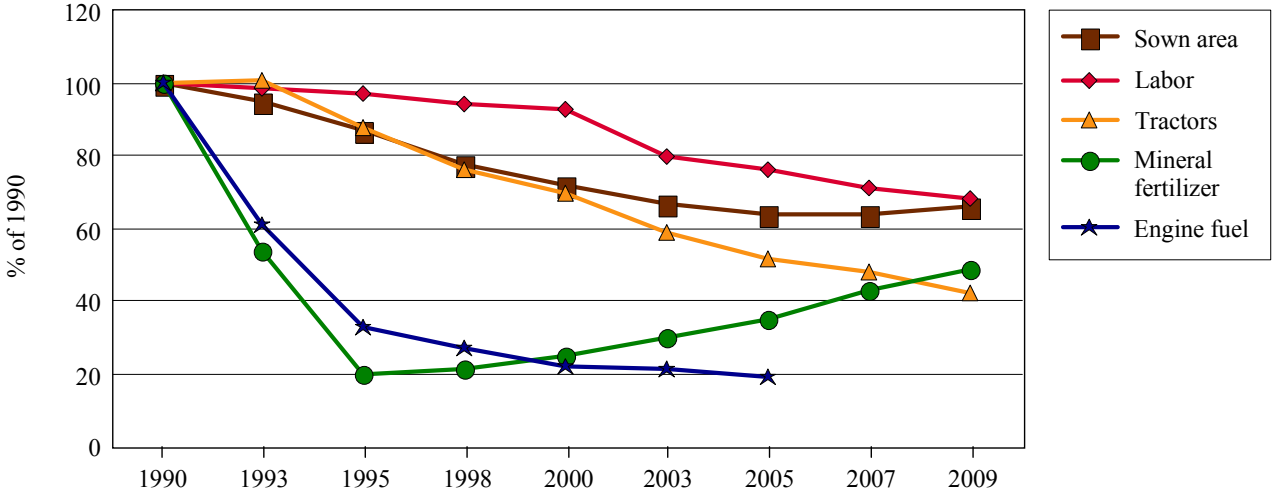
[1] As an example Liefert and Liefert (2012) provide an analysis of official statistics in Russia according to which in 1992 the price of a ton of nitrogen fertilizer was equivalent to the price of roughly 300 kg of wheat while by 1997 the price ratio had changed to about 1,400 kg of wheat for the same amount of fertilizer.

[2] In developed market economies the situation is typically such that when a business cannot meet its debts, legal steps (initiated by, or on behalf of its debtors) are taken to minimize the loss of the debtor(s) by either restructuring the business under external supervision, or liquidating the business' assets to repay (at least part of) its debts. In Ukraine, such procedures were not enforced and debtors of insolvent farms had to write off the loans they had provided.

Figure 2.1 shows the results of the lack of farm restructuring as well as political and economic reform, of the less favorable terms of trade after price liberalization, and of the difficulties in getting credit for the example of Russia: Input use in agriculture decreased sharply. Asset re-investments became increasingly overdue and often even the most essential variable inputs, such as diesel fuel, could not be paid for any more. The result was a severe crisis of the whole sector. Although these numbers were readily available only for Russia, the situation in Kazakhstan and Ukraine was similar (Liefert and Liefert, 2012).

Figure 2.1: Input use at Russian farms, 1990-2009 (% of 1990)

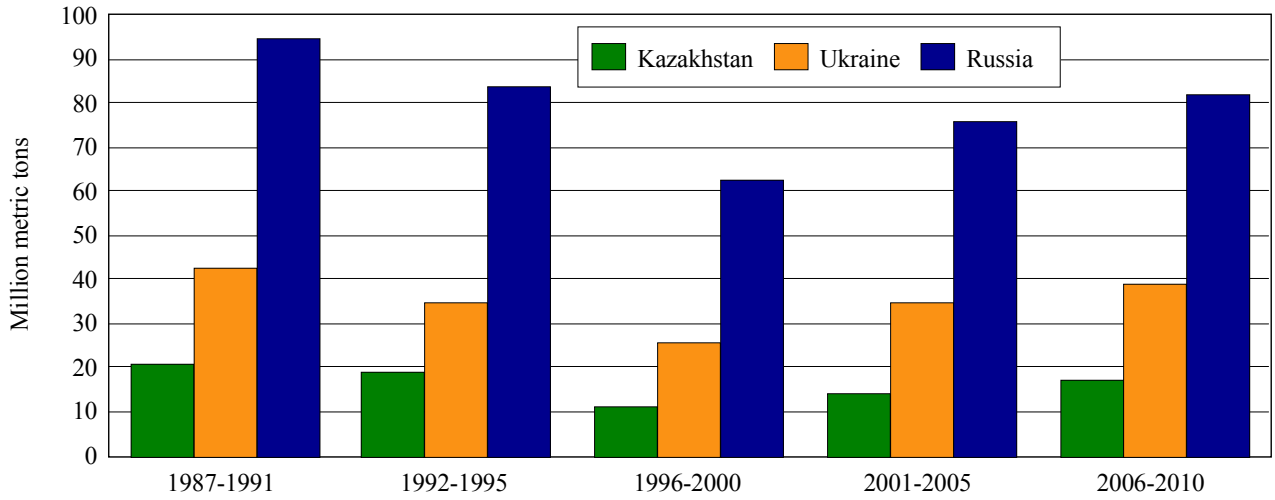


Note: Sown area and labor cover all farm types whereas the remaining inputs cover only agricultural enterprises (all farms excluding households and small family farms). Tractors are units delivered to farms. Engine fuel use 2007-2009 was not available.
Source: Own illustration, based on Liefert and Liefert (2012).

Figure 2.2 shows the effect on grain production in the three countries: From the demise of the Soviet Union to the late 1990s grain production contracted by almost 40 %. Livestock products were affected more severely. Meat production, for example, had contracted by even 54 %. While the contraction of arable production in KRU had continued throughout the 1990s, the trend had begun to reverse in the early 2000s and crop production by the end of the decade has almost reached its pre-transition level again. Conversely, the output of most livestock products still stagnates at roughly half its former level (Liefert and Liefert, 2012). The poultry sector is a noteworthy exception (Ukrstat, various).

As a result of increasing crop production and stagnating livestock production, the KRU region has developed from a net importer into a net exporter of arable commodities (Liefert and Liefert, 2012). As of 2012, Russia, Ukraine and Kazakhstan are among the biggest exporters of arable commodities in the world (von Cramon-Taubadel, 2012), while on the other hand all three countries remain net importers of meat (Liefert and Liefert, 2012).

Figure 2.2: Development of grain production in KRU (million metric tons, 1987-2010)



Note: Figures are average annual values (marketing years July-June) over the periods identified at the x-axis. Grain excludes rice, sorghum, and pulses.
Source: Own illustration, based on Liefert and Liefert (2012).

In the late 1990s, concurrent with the beginning trend reversal in arable production, the emergence of agriholdings began to become apparent. While some of those organizations had already been founded in the mid-1990s, the development gained speed around the turn of the millennium. A further boost occurred in the mid to late 2000s when world agricultural commodity prices began to rise (Rylko and Jolly, 2005; Lapa et al., 2010). Table 2.1, which summarizes findings from different sources, shows the fast expansion of agriholdings in that period. The world financial crisis 2008 did not sustainably slow the development. Rather, it probably reinforced it even further. As on the one hand conventional investments started to appear less favorable than before and on the other hand agriculture appeared to have a "bright future", more money may actually have entered the agricultural sectors of KRU and thus agriholdings.

Although there are no stringent scientific findings on the issue, it appears very likely that agriholdings are strong contributors to the recent revival of arable farming in KRU. As can be seen in Table 2.1 the organizational form today accounts for a considerable share of agricultural land use and production in the countries. As there are no official statistics on agriholdings, the available numbers mostly comprise estimations and survey data of local experts. However, even if the numbers are not firm, the relevance of the development is obvious. In Russia, according to Liefert and Liefert (2012) agriholdings as of 2012 controlled 15-20 % of the arable land. 200 companies accounted for one quarter of the country's grain output as of 2010, according to Rylko (2010). In Ukraine, 79 companies larger than 10,000 ha controlled 27 % of the commercially

farmed land as of 2012.[3] The average size of those companies amounted to more than 60,000 ha (Byerlee et al., 2012; Ukrstat, various). In Kazakhstan, 35 % of the arable land in the three major grain-producing regions of Northern Kazakhstan was controlled by 15 large companies in 2010. In that region, 76 % of Kazakhstan's wheat was produced. The largest agriholding in Kazakhstan, the Ivolga-Holding, controlled about 1 million ha in the country and another 140,000 ha in Russia. The country had two other agriholdings of more than 700,000 ha (Oshakbayev, 2010; Petrick et al., 2012).

Table 2.1: Relevance of agriholdings in Russia, Ukraine and Kazakhstan: Information from different sources

Country	Year of info	Share of land controlled by AHs	Additional information	Source
Russia	2006	8.6 %	713 companies[1)]	Wandel and Hahlbrock 2011
	2010	13 % of total arable land 16 % of used arable land[2)]	> 35 companies of > 100,000 ha	Rylko 2010, Rosstat, various
	2012	15-20 %		Liefert and Liefert 2012
Ukraine	2007	6.5 % of total arable land 9.1 % of arable land farmed by commercial farms[3)]	20 agriholdings > 10,000 ha	Lapa et al. 2010, Byerlee et al. 2012, Ukrstat, various
	2012	19 % of total arable land 27 % of arable land farmed by commercial farms[4)]	79 agriholdings > 10,000 ha	Byerlee et al. 2012, Ukrstat, various
Kazakhstan	2010	35 %[5)] in Northern Kazakhstan	35 % farmed by 15 largest companies in Northern Kazakhstan; 3 companies > 700,000 ha	Oshakbayev 2010

Notes: 1) Caveat: The definitions of agriholdings used by the different authors for their calculations are not always clear and obviously not always identical.

2) The figures provided by Rylko (2010) state that 200 companies control 14.5M ha of arable land out of 113M ha of total nominal arable land. This translates into 13 %. However, according to Rosstat, various, only roughly 90M ha of arable land are in use (cf. Walther 2008). This yields the 16 %.

3) Lapa et al. (2010) and Byerlee et al. (2012) state 11 % of the land farmed by agricultural enterprises. That figure does not include the land farmed by small family farms and by households. In order to maintain consistency with the figures below this figure was not used.

4) According to Byerlee et al. 2012 agriholdings farmed 5.1M ha in early 2012. According to Ukrstat, various approximately 27M ha arable land are farmed in Ukraine in total and 19M ha are farmed by commercial farms (excluding household subsistence farms). These figures were used to calculate the shares.

5) Land controlled by the 15 largest companies in the three major grain-producing regions of Northern Kazakhstan. In that area 76 % of the country's wheat is produced.

Source: Author's compilation, sources listed in the table.

[3] The commercially farmed land does not include the land farmed by households. Agriholdings control 19 % of Ukraine's *total* farmland. Further details can be found in the notes below Table 2.1.

Agriholdings outside KRU

Although agriholdings have developed most rapidly and have gained the most relative importance in the KRU countries, they are not a phenomenon exclusive to that region[4]. Globally, agriholding structures have traditionally had some importance in plantation and specialty crops (such as vegetables), but not in broadacre[5] arable farming. Family farms and extended family businesses have rather been the dominating organizational form, except in communist countries with forced collectivization. Most historical examples of agriholdings, such as the Bonanzas of North Dakota (Drache, 1964) and the Peak Downs Scheme in Australia (Rogers, 1964) have been unsuccessful in the longer run and disappeared again (Deininger and Byerlee. 2011).

In spite of this history there is an increasing development towards agriholding structures in arable farming in a number of countries again, especially in land-abundant emerging economies (Deininger and Byerlee, 2011). Only in South America, however, is the extent of the development as well as the size of the agriholdings comparable to the situation in KRU.[6] In spite of these obvious similarities, however, the situation in that region differs substantially from the one in KRU. The big players, especially Brazil and Argentina, did not go through a transition from communism to a market economy. Land markets[7] are open, transparent and competitive. A very common operating model of South American agriholdings is *contract farming*, which means that they are pure management and marketing organizations which rent most or all their land and have little or no mechanization of their own (Manciana et al., 2009, Byerlee et al., 2012). This sets them strongly apart from agriholdings in the former Soviet Union.

Summarizing the information above, the following conclusions can be drawn:

- Agriholdings have gained a considerable market share in Kazakhstan, Russia, and Ukraine. They are by far the fastest-growing organizational form.
- The coincidence of agriholding development with the recovery of arable farming in the region strongly suggests that agriholdings play a large part in the recovery of the sector.
- KRU has become one of the most important exporting regions of arable commodities.
- The development during transition in the three countries is very similar, the conditions are largely comparable.

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[4] The organizational form in countries outside the former Soviet Union is usually not called *agriholding*. Varying denominations have been used to describe the phenomenon. *Corporate farming* is common, although it strictly speaking describes a legal concept rather than a form of farm organization (Byerlee et al., 2012; Lang, 2012). For the sake of consistency the term *agriholding* is used here also for countries outside the former Soviet Union.

[5] The term *broadacre* production, which is used primarily in Australia, describes the production on "*extensive parcels of land*" (OECD 2013) and is used here to differentiate against very intensive forms of arable land use on small areas, such as the production of vegetables, or other specialty crops.

[6] Deininger and Byerlee (2011) provide an overview of the phenomenon worldwide.

[7] This at least holds true for Argentina (Manciana et al., 2009). It will be shown in Chapter 2.3 that the situation is different in KRU.

- The strongest development of agriholdings outside the former Soviet Union has taken place in South America. However, the conditions in that region differ considerably from those in KRU.

In the subsequent research it is necessary to limit the scope of the analysis. While in an ideal world it would be desirable to use a very broad focus and conduct in-depth research on all three KRU countries, or even include countries outside the region, this is not possible in the context of a dissertation. In order to reduce complexity and make the research manageable, the focus of the analysis will therefore subsequently be on Ukraine as an example within KRU.

2.3 Explanations for the development of agriholdings

The development of agriholdings as it could and can be observed in KRU has not been expected by Western economists. Rather the development of smaller family farms was anticipated (World Bank, 1992). Past studies in Western countries found family farms, or farms in which family ownership and management play a dominant role, to be particularly competitive and resilient (Isermeyer, 1993; Deininger and Byerlee, 2011). Economies of scale in broadacre arable production (unlike in marketing or processing) were found to be small beyond the size of larger family farms (Deiniger and Byerlee, 2011). The development of agriholdings therefore appears to be contrary to economic theory, and the question arises why it has still happened. Most studies explain the phenomenon with factors specific to transition economies. Pertinent literature is subsequently reviewed.

The focus of this review is on Ukraine. However, not all aspects are covered specifically for Ukraine. Therefore studies with a focus on Kazakhstan and Russia are also taken into account. Most results can conditionally be transferred thanks to the great similarity of the situation in the countries. Some of the studies do not even differentiate between the countries at all.

The explanations of agriholding development in KRU can be grouped in the following five categories:

1. Explanations based on economies of scale
2. Land speculation as explanation
3. Political economy explanations
4. Explanations as results of market failure
5. Explanations as results of mental models of people

ad 1: Explanations of agriholdings based on economies of scale

A number of authors use economies of scale as part of their explanations for the development of agriholdings in KRU (e.g., Zimmermann 2004; Wandel, 2007; Demyanenko, 2008). Their general

tenor is, however, that these are at best contributing factors and that the more important causes are among those which will subsequently be pointed out. The reason is that many agriholdings in KRU have by far exceeded those sizes up to which relevant economies of scale are expected from the experience in other countries.

ad 2: Land speculation

Visser et al. (2012) name land speculation as a possible reason for the massive accumulation of agricultural land ("*land grabbing*") by agriholdings in Russia. According to this line of explanation, investors buy agricultural land in the expectation of future value appreciation. In Ukraine, on the other hand, trading agricultural land is currently prohibited by a moratorium (Agrarzeitung, 2012). Therefore land accumulation by agriholdings can only happen by renting the land.

At the first glance, the fact that agricultural land currently cannot be traded in Ukraine speaks against land speculation as a reason for the development of agriholdings there. However, Visser et al. (2012) point out how farm directors and other stakeholders in Russia had brought themselves into a position to be able to quickly buy or sell land already *before* it could be traded, using various semi-legal or illegal approaches. For example, farm directors transferred land from the shareholders of their collective farms to the farms' charter capital, which made it relatively easy to sell the whole land belonging to these farms. After trading agricultural land was legalized, these businesses then often quickly changed owners. From this it could be concluded that in Ukraine, too, investors who currently rent massive amounts of land bring themselves into a position to be able to buy quickly as soon as it becomes possible in the future. This argumentation is also sometimes made informally by local experts in Ukraine. However, no literature was found which explicitly explains agriholding development in Ukraine this way.

ad 3: Political economy explanations of agriholdings

The next group of explanations of the development of agriholdings refers to political economy factors. The explanations go in two directions. Either, (1) the state actively interferes by treating agriholdings preferentially or even getting financially involved, or (2) there are conditions in the administrative environment with which agriholdings can cope better than independent farms.

The most straightforward way farm structures are directly politically influenced is through policy measures. While this happens in Western countries, too, agricultural policies there traditionally often treat smaller farms relatively more favorably than larger ones. As Isermeyer (1993) points out, this can be expressed in support programs that provide relatively more support to smaller farms, but also in environmental and other regulations that impose higher restrictions on larger farms. In KRU, on the other hand, a number of authors found evidence to the contrary, i. e., a relative preference of larger operations.

Gataulina et al. (2005) point out that the development of agriholdings in Russia was strongly supported by the authorities through the provision of credit, property, or certain privileges. An example is tax privileges (Hockmann et al., 2005). Gerasin et al. (2003) explain this behavior with the state wanting to reverse the negative development of agricultural production during the

1990s and to create the necessary preconditions for a restructuring of debts by providing investment support to agriholdings. Agriholdings that were supported were expected to not only maximize profit, but also perform other functions, such as restructuring insolvent farms. In some Russian regions the state even invested directly in agriholdings (Gataulina et al., 2005).

There is also evidence that in Russia large agribusiness companies were actually pressured to invest in primary agriculture. Rylko and Jolly (2005, p. 117) give the example of the oilseed crusher and processor EFCO, who "*in the spring of 2000* […] *was asked by the governor of Belgorod Oblast to participate in the farm restructuring process*"; with the result of the creation of an agriholding.

While these examples paint a clear picture of the situation in Russia, no literature was found that explicitly describes such strong and direct governmental intervention in Ukraine. It will nevertheless be part of the empirical part of this thesis to analyze whether or not this happened or still happens in Ukraine.

While such direct interference of political decisions as pointed out above can have a strong influence on structural developments in agriculture, the influence of the political environment is not limited to that. Not only official policies and written laws matter, but also the way they are construed and enforced can foster the development of a certain organizational form.

In Ukraine, policy measures affecting agriculture, as well as other parts of the economy, often change rapidly and rather unpredictably. There is an overabounding bureaucracy with many procedures that do not serve any legitimate purpose any more or that are at least unnecessarily complicated. Corruption also remains a problem. That is partly caused by an excessive reliance on subjective and discretionary procedures in all fields of administration (Thiel, 2002; Lapa et al., 2010).

The *Doing Business Project* of the World Bank Group publishes an *ease of doing business* ranking of (as of 2011) 183 countries. A number of factors are taken into account in that ranking, such as the ease of starting a business, dealing with construction permits, registering property, enforcing contracts, and others. As of June 2011 Ukraine ranked 152nd, which is lower than countries such as Liberia, Mali, or Iran (Doing Business, 2012).

In a system where government officials have a lot of discretion in their procedures and where corruption and nepotism play a relevant role, businesses that are good at influencing decision makers – be it through official lobbying, unofficial contact to political decision makers, or outright bribes and the like – can be expected to have a considerable advantage. However, only information on the effects of official (i.e., legal) lobbying on the part of agriholdings was found in literature. Rylko and Jolly (2006) for instance describe how agriholdings in Russia have used their lobbying power to reach policy measures that serve their interest. Examples are import tariffs on rice, sugar beets, and meat that were either newly introduced or increased strongly, a grain market intervention fund that was newly established, as well as credit subsidies that were introduced.

ad 4: Explanations of agriholdings as results of market failure

The fourth line of thought explains agriholdings as results of market failure. Wandel (2011) points out that two different conditions are meant by the term: (1) missing or insufficiently developed markets for certain inputs or outputs, and (2) a lack of (functioning) market-supporting institutions, such as contract-enforcing courts, accounting and disclosure rules, or intermediaries that help reduce transaction costs and information asymmetries.

Strubenhoff (2011) found the market for capital to be particularly under-developed in Ukraine. The traditional farm accounting system is of little value for lenders to assess the default risk of (potential) borrowers. Further, contract enforcement is a pronounced weakness of the institutional environment in Ukraine. Under such conditions the access to and the cost of capital for agricultural businesses is a serious challenge. Agriholdings were found to have considerably better development options than traditional farms because they have the means to establish international accounting and auditing systems that reduce the risk of lenders. Further, they can access international capital markets (Strubenhoff, 2011).

Besides advantages with regard to under-developed markets, studies have also come to the conclusion that agriholdings have an advantage in Ukraine's economic environment which has serious deficits in market-supporting institutions.

A serious problem in Ukraine (and KRU) is the lack of contract enforceability and the rule of law. According to Thiel (2002), "*there is no security of private property rights, contracts are difficult to verify and enforce and most businesses expect to pay bribes of varying levels to be able to execute claims awarded in dispute resolution*" (Thiel, 2002, p. 181).

Another important set of market-supporting institutions is the standardization of goods and services, as well as quality assurance and control systems. They serve to decrease market transaction costs (Beckmann, 2000). In this field Ukraine has a particular disadvantage. Lapa et al. (2010, p. 5) even consider *"the system of quality and safety of production* [to be]*, by common consent, one of the weakest points of Ukrainian agro-industrial complex".*

One of the most frequently given explanations of agriholding development is based on these shortcomings: Agriholdings therein are seen as a way to save transaction costs (Koester, 2003; Hockmann et al., 2005; Wandel, 2007; Wandel, 2011, etc.). One example of where transaction costs occur is when a processing business has difficulties in securing its raw material supply. This can happen, for example, when a sugar factory cannot enforce the contracts with its growers and the sugar beet supply is therefore unreliable. Vertical integration between supply and processing is the most important way of decreasing such transaction costs. Ilienko and Lapa (2009) provide the results of interviews with agriholding decision makers about the reason for becoming engaged in agriculture. By far the most important reason was to secure inputs for a processing business.

Another line of explanations of agriholding development assumes that they aim at gaining and increasing market power. Especially in such a difficult market environment as in Ukraine, this is more likely possible for an agricultural company than it would be in more developed markets. If successful that would mean that they get a rent from restricting competition. This could go as far

as driving competitors out of markets or preventing their entry utilizing their "*"deep pockets," "first mover advantage," and ties to the government."* (Khanna and Yafeh, 2007). For the case of Russia there are findings that agriholdings are successful in doing so. FAO (2009) state, that *"In particular on the regional level, the biggest agroholdings monopolise the main agri-food markets with all the demerits of a monopoly*" (FAO, 2009, p. 48).

In summary, it can be stated that the market conditions in Ukraine are probably the most important cause of agriholdings in Ukraine (and KRU). However, there is yet another stream of explanations that focuses on the mentalities of people.

ad 5: Explanations of agriholdings as results of mental models of people

A number of authors explain the lack of development of smaller commercial farms on the one hand, and the perpetuation and expansion of large integrated structures on the other, with inherited mental models of people that lead to (1) a lack of persons with entrepreneurial qualities, (2) political and business decisions that are not well suited for a market economy, and (3) a lack of reform of political and economic institutions.

Koester and Petrick (2010) provide empirical evidence from a survey in Russia that entrepreneurial attitude in the country is scarce in general and the rural population in particular in comparison with Western countries. People also have a lack of trust in formal transactions with strangers, which causes them to preferentially do business with trusted personal acquaintances. People are further reluctant to deviate from collective behavior, and those who do tend to be frowned upon. The authors argue that these traits can be attributed to "*the historical contingency of a patrimonial society that is both hierarchical and egalitarian"* (Koester and Petrick, 2010, p. 18). Hockmann et al. (2005, p. 4) emphasize the importance of *"the low self-responsibility und the reliance in public institutions regarding the co-ordination of individual behaviour".* Those factors taken together lead to a lack of persons who are able and willing to found and run private commercial farms, leaving the playing field to their large-scale competitors.

Further, Hockmann et al. (2005, p. 4) argue that the lack of progress in agricultural restructuring during the transformation phase led to *"a return of mental models and ideological values developed within the 70 years of socialism*" on the part of political and business decision makers. This bigger-is-better mentality represents path dependency (Wandel, 2007) and can explain political decisions that preferentially treat agriholdings, as well as the decisions of business decision makers to expand large integrated structures. Further, the authors also found mental models of farm managers to account for a lack of restructuring at the Independent Collective Farms (i.e., kolkhoz and sovkhoz successors) because farm managers there often still have the goals they had in communist times (such as creating employment) rather than the main target of generating profit. The authors hypothesize that agriholding management, coming from other industries, is more used to acting according to market signals and profit maximizing principles. Thus they explain the stronger development of agriholdings and the stagnation of the (unreformed) independent collective farms.

Finally, when political decision makers have mental models strongly influenced by a communist socialization, this also accounts at least partly for the lack of reform of formal institutions (Wandel, 2011) which causes the difficult market environment which was above found to give agriholdings advantages.

As can be seen, there are various explanations for the development of agriholdings in Ukraine and KRU. Now in order to be able to analyze the organizational form's competitiveness in Ukrainian arable farming in the empirical part of this thesis, it is necessary to understand the competitive situation in the country. For this purpose in the subsequent part the farm types in Ukrainian arable production are reviewed.

2.4 Structure of arable producers in Ukraine

The official Ukrainian statistics differentiate three basic farm types: Households, private farms, and agricultural enterprises. Private farms and agricultural enterprises are differentiated by legal forms: While the former are run by individual entrepreneurs, the latter are legal entities (stock companies, limited liability companies, etc.). Agriholdings are not treated separately in the official statistics and are therefore part of agricultural enterprises there (Ukrstat, various). In spite of this lack of official statistical recognition, with them four farm types can be distinguished: households, private farms, independent agricultural enterprises[8], and agriholdings.[9]

2.4.1 Private household production ("households")

Private household production ("households") already played a considerable role during Soviet times. Back then households accounted for a major share of the production of meat, milk, eggs, fruits, vegetables, and potatoes. Since 1991 their importance for these products has hardly decreased. As of 2010 they produced 97 % of Ukraine's potatoes, 86 % of Ukraine's fruits and vegetables, 80 % of Ukraine's milk and about half of its meat (Lapa et al., 2010). Besides this importance in their traditional domain, households after 1991 have also gained importance in the production of broadacre crops, such as grains and oilseeds, as can be seen in Figure 2.3. This is reflected in the arable land farmed by households, which increased from 2.0 million ha in 1990 to 7.8 million ha in 2009, the latter figure constituting roughly 29 % of Ukraine's total arable land (Ukrstat, various). The average size of households as of 2010 is 1.2 ha. Almost 99 % of them have less than 10 ha (Lapa et al., 2010). While subsistence plays an important role, they often also sell part of their product.

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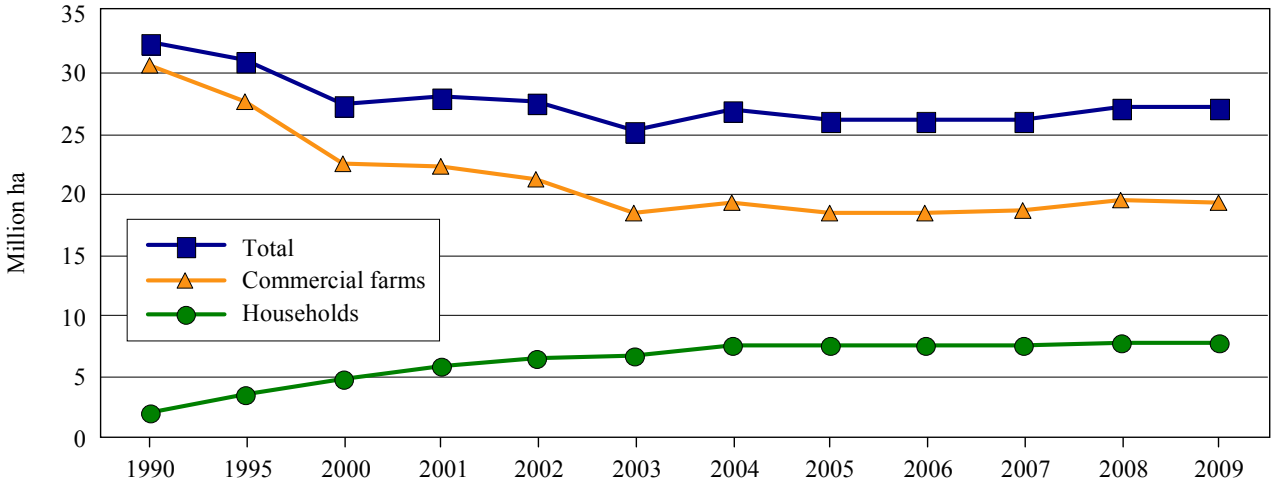
[8] It could be argued that agriholdings are also independent and this is therefore not a precise description. However, it is in line with what has been frequently used in literature (e.g., Hockmann et al., 2007; Hahlbrock and Hockmann, 2011; Hahlbrock et al,, 2011). The term is therefore also employed in this thesis.

[9] Lapa et al. (2010) are an example in which these four segments of the total Ukrainian farm population are analyzed.

There is traditionally a somewhat symbiotic relationship between households and commercial farms. Often village dwellers work at a commercial farming operation and have their own household production at home. Feed for the animals held at the households is often bought from commercial farms, or it is part of an in-kind land lease payment (Koester and Striewe, 1999). Fieldwork in household production is frequently done as a service provided by commercial businesses.

Figure 2.3: Arable land used by households and commercial farms in Ukraine (million ha, 1990-2009)



Note: Commercial farms are all farms except households.
Source: Ukrstat.

Household farming is mostly a sign of sheer rural poverty. Most of the people working in such households can be counted as hidden unemployment (LAPA et al., 2010). In the longer run, with increasing standards of living and decreasing rural population, the importance of subsistence farming can therefore be expected to decrease, especially in broadacre crop production.

2.4.2 Private farms

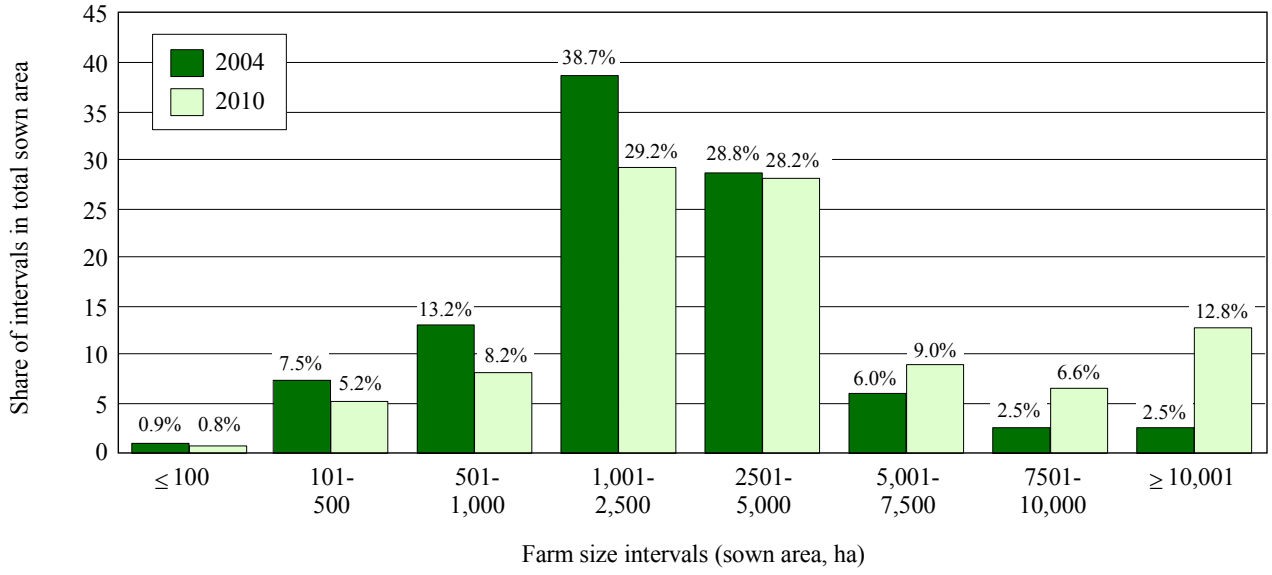
While private farms are the most common farm type in many countries worldwide, they have not gained much importance in Ukrainian agriculture. The country has some 34,000 such farms with an average size of 124 ha, accounting for roughly 5 % of Ukraine's total agricultural output. This farm type in Ukraine is mostly active in crop production. Limited access to capital and know-how poses serious challenges to many of these businesses. While on average this farm type develops very slowly at best, some individual businesses have grown to sizes of up to 10,000 ha (Lapa et al., 2010).

2.4.3 Independent agricultural enterprises

Independent agricultural enterprises are commercial farm businesses with employed labor and typically employed management. This farm segment is very heterogeneous. It contains the successors of the former kolkhozes and sovkhozes, which are often in dire economic straits (cf. Chapter 2.2). On the other hand, it also contains economically successful restructured operations. The problem is that the legal form alone is no sufficient indicator to differentiate these. As of 2009 there were about 8,000 independent agricultural enterprises in Ukraine (Tovstopyat and Walther, 2009).

Figure 2.4 shows the size distribution of agricultural enterprises in Ukraine. As can be seen there, as of 2010 more than half of the land farmed by agricultural enterprises[10] in Ukraine is cultivated by operations of between 1,000 and 5,000 ha (Gagalyuk, 2011). It can also be seen that there has been a clear trend towards larger farm sizes from 2004-2010. It is necessary to understand that the chart not only shows independent agricultural enterprises. Rather, agriholdings are also hidden in these numbers, an issue that will be further elaborated below.

Figure 2.4: Size distribution of agricultural enterprises in Ukraine (% of Ukraine's total sown acreage, 2004 and 2010)



Note: 1) Agricultural enterprises are all farms except households and small family farms.

2) Often agriholdings are not legally consolidated into a single entity. They therefore do not appear with their total size, but their member farms appear in various size intervals.

Source: Gagalyuk (2011), modified.

[10] Agricultural enterprises exclude households and private farms.

2.4.4 Agriholdings

The remaining farm type in Ukraine is the agriholding, definitions of which were reviewed in Chapter 2.1. Many agriholdings are organized as multiple legal entities. Hence, the individual operative locations remain legally independent and show up in the official statistics among other independent farms, because agriholding membership is not discriminated in the official statistics. When looking at Figure 2.4 one therefore needs to keep in mind that while some agriholdings are consolidated into single legal entities which can be discerned by their size, most of them are hidden in the distribution.[11]

Agriholdings in Ukraine mostly specialize in broadacre arable production. Livestock plays a small role, with the notable exception of poultry. The production of grains and oilseeds is mostly aimed at export markets whereas other outputs are mostly for the companies' own processing facilities (Lapa et al., 2010).

Ukrainian agriholdings differ with regard to how they were established. Three principal entry paths can be differentiated:

- Investments of processors
- Growth of farms
- Investments of financial and industrial companies

The first group of agriholdings comprises those that originated from investments of processors of agricultural commodities. Besides pure profitability considerations, securing their input supply – or part of it – reliably, timely, and in the required quality was typically the primary goal for those investors.[12]

Agriholdings that started as investments of processors are often strongly vertically integrated, risk-spreading over the vertical supply chain plays a role. Examples for such agriholdings are Mironovsky Hliboprodukt with the main focus on poultry meat production and Astarta with the main focus on sugar production. Companies like Glencore, which started out as a commodity trading company, could also be counted in this category (Slaston, 2010).

The next group of agriholdings consists of those that had their origins in successful farming operations that grew beyond their single operation. To this end, such companies usually got external investors or other sources of finance involved. The largest and most prominent example in Ukraine is Mriya. The company was founded by a former collective farm manager after the

[11] When analyses of agriholdings are made that involve statistics, local experts usually group the farms in agriholding members and other farms. For further information refer to Chapter 2.5.

[12] For details on the market conditions necessitating such measures refer to Chapter 2.3.

collapse of the Soviet Union. From 1992 to 2012 it has grown from 50 to 240,000 ha (Mriya, 2012; Byerlee et al., 2012[13]).

The third group of agriholdings is the result of domestic or international outside investments, e.g., by banks, industrial companies, or investment funds. Often these investors had no prior connection to the agricultural sector. The focus of these investments has been mostly on broadacre crop production. Some of the largest agriholdings by arable acreage fall in this category. Motives are mainly perceived profit opportunities, with the notion of agriculture as a sector with a promising future and Ukraine as an opportunity to get into it at a low cost being a driver. Diversification of the investors' original business can play a role (Slaston, 2010), as might the expectation to be able to buy land at favorable terms once the moratorium on the land market is lifted. An example of this group of agriholdings is NCH Capital, an investment company that offers closed investment funds primarily for institutional investors (NCH, 2012). The company started investing in agriculture in the mid 2000s and has since then become the largest agriholding by arable acreage in Ukraine with 449,000 ha (Byerlee et al., 2012). NCH has its main focus on broadacre arable farming and is also active in Russia.

Irrespective of their origins, agriholdings of all three groups have grown strongly and are now found among the ten largest agriholdings in Ukraine, which are shown in Table 2.2. To put things into perspective: The German federal state of Saarland has a total area[14] of roughly 257,000 ha (FU Berlin, 2012). Two of these agriholdings are larger than that, three others come very close.

Table 2.2: Size and production of the ten largest agriholdings by arable acreage in Ukraine (as of early 2012)

Name	Total area 1,000 ha	Cereal and oilseed production (2010) 1,000 t
NCH Capital	449	505
Ukrlandfarming	378	782
Ukrainian Agrarian Investments	253	205
Myronivsky Hliboproduct (MHP)	242	819
Mriya	240	499
HarvEast (Illich-Agro)	226	282
Astarta	217	280
Kernel	183	293
Agroton	133	n.a.
Valars Group (Valinor)	120	199

Source: Byerlee et al. (2012), modified.

[13] The company website states 295,000 ha. The information often varies very much, depending on sources. One might assume that the company website provides the most reliable information. However, there are often fine distinctions between "controlled" land, actually farmed land, and so on. This is just to illustrate the low level of certainty most data shows in Ukraine.

[14] All land, not only agricultural

In order to be able to sustain their rapid growth, Ukrainian agriholdings have recently started to tap international stock exchanges as sources of equity capital. The trend started when Mironovsky Hliboprodukt in 2008 was the first Ukrainian agriholding to do an IPO. As can be seen in Table 2.3, as of early 2011 fourteen agriholdings were being traded at the stock exchanges of London, Warsaw, Frankfurt and Paris, and three others were scheduled to follow in the same year (Gagalyuk, 2011). Market capitalizations of those companies who had been public in early 2010 have roughly doubled within the following year and four of them have made it in the midcap segment of companies, which is defined as having a market capitalization of more than 1 billion USD (AXA Equitable, 2012).

Table 2.3: Publicly traded Ukrainian agriholdings and their market capitalizations as of early 2011

	Company	Stock exchange	Capitalization in million USD	
			01/2010	02/2011
1	Kernel Holding SA	Warsaw	1,103.7	2,115.1
2	MHP SA	London	1,218.3	2,022.3
3	Avangardco Investments Public Ltd	London	-	1,212.3
4	Mriya Agro Holding PLC	Frankfurt	408.8	1,150.3
5	Astarta Holding NV	Warsaw	376.6	814.8
6	Milkiland NV	Warsaw	-	468.4
7	Agroton Public Ltd	Warsaw	-	281.0
8	Creativ Industrial Group	Frankfurt	68.3	148.4
9	Sintal Agriculture PLC	Frankfurt	119.0	145.4
10	Agro Generation	Paris	-	85.2
11	Tsukrovyy soyuz Ukrros	Frankfurt	8.1	58.6
12	MCB Agricole Holding AG	Frankfurt	59.7	42.7
13	Landkom International PLC	London	37.4	34.5
14	Ukrproduct Group PLC	London	18.1	17.0
15	Industrial Milk Company	Warsaw	IPO April/may 2011	-
16	KSG Agro	Warsaw	IPO April/may 2011	-
17	Ovostar	Warsaw	IPO June 2011	-

Note: IPO = initial public offering.

Source: Gagalyuk (2011), modified.

As has been demonstrated, households, private farms, independent agricultural enterprises, and agriholdings are active in Ukrainian arable farming, with agriholdings being by far the fastest expanding organizational form. In the next part, the findings on the competitiveness of agriholdings in comparison with independent farms in scientific literature are reviewed and analyzed.

2.5 Competitiveness of agriholdings

Competitiveness is "*the sustained ability to profitably gain and maintain market share"* (Martin et al., 1991). Findings in scientific literature on the competitiveness of agriholdings in Ukraine are scant. Some more information is available on Russia. As the situation in the two countries is comparable in many regards, that literature is also reviewed. Even when including literature on Russia, the empirical findings on the competitiveness of agriholdings are very weak. Some of the information is based on rather small datasets and often only partial indicators of competitiveness are analyzed.

The data used in most cases is the disaggregated accounting data that commercial farms have to provide to the administration. The publicly available statistics are also generated from this data. With good contact to local or central authorities it is sometimes possible to obtain the disaggregated data, i.e., the datasets for each individual farm, for scientific purposes. As has been mentioned before, agriholdings are not discriminated in official statistics. Therefore when analyses on agriholdings were done with these data, the farms in the datasets had been categorized by local experts into agriholding and non-agriholding farms. Apart from such accounting data, survey data was used in some studies.

Gataulina et al. (2005) analyzed accounting data in the Russian region of Orel in the year 2002 and found a tendency that (four) vertically integrated agriholdings there were less efficient than their independent farm counterparts. They came to that conclusion on the basis of physical indicators, such as yields, as well as financial indicators, such as profitability.

Hockmann et al. (2007) analyzed 1999-2003 survey and accounting data in the Russian regions of Orel and Belgorod. They found that the land/labor ratio and the manager/worker ratios in agriholdings are higher than in independent farms. However, their data indicated that agriholdings are less profitable and also do not allow for a higher factor remuneration than independent farms. The authors caution that in the regions in the analysis there was a strong support for agriholding formation by the government. They conclude that agriholdings may therefore have formed that would not have done so without political interference.

Hahlbrock et al. (2011) analyzed accounting data and other information provided by local scientific and rating institutions in Russia's Belgorod region. The data covers the years 2001, 2004, and 2007. The authors found that agriholdings over that time were able to constantly improve their total factor productivity (TFP), driven primarily by the application of new technologies. While in 2001 the TFP of independent farms had been higher than that of agriholdings, this reversed through 2004, and in 2007 agriholdings had higher TFP than their independent peers. The same holds for labor productivity. The authors caution that the results might be driven by a limited number of frontrunner agriholdings.

Serova (2007) shows results from a 2001 survey (of 14 agriholdings and 949 independent farms) in the region of Rostov in South Russia. The performance of the surveyed agriholding farms there

did not differ much from that of the surveyed other farm enterprises. Yields of the agriholdings were marginally lower, production costs marginally higher. With reference to those results, the authors of FAO (2009) expect that the returns to investments made in the early 2000s will come with a delay. They hypothesize that the potentially superior performance of agriholdings is therefore merely not yet reflected in the data.

Rylko et al. (2008) quote the same survey in Rostov Oblast as Serova (2007). Additionally they analyze data from another small sample of 33 agriholdings from a database of the Russian Academy of Agricultural Science in 2001 and compare them to the official accounting data of all corporate farms. From that analysis they find that although the agriholdings in the sample had almost twice the labor and land productivity of average farms, they did not perform significantly better financially. However, they first point out that the variation is very large and second that larger agriholdings tend to perform better financially than smaller ones. In their conclusion they emphasize that "*There is obviously a very strong need to collect information for a detailed performance analysis of this new sector*" (Rylko et al., 2008, p. 125).

Furthermore, in FAO (2009) expert estimates are quoted stating that agriholdings in Southern Russian cereal production occupy 9-12 % of the arable land but account for one third to one half of the output, implying a physical productivity considerably above the regional average.

Slaston and Larsén (2010) analyzed the efficiency of wheat production in the Ukrainian oblasts of Kiev, Poltava and Cherkasy using Data Envelopment Analysis (DEA) of 2006-2008 accounting data. In the analysis no differentiation between agriholdings/agriholding members and other organizational forms is made. However, a positive impact of farm (land) size on technical and cost efficiency was found.

Byerlee et al. (2012) provide data on the profitability of agriholdings (>10,000 ha) and independent farms (<10,000 ha) in Ukrainian arable farming in 2010 for six crops based on accounting data and estimates of the Ukrainian Agribusiness Club. For all crops except one, their figures indicate lower profitability of agriholdings, in three cases almost by 50 %. Yields at the agriholdings were relatively high and had increased significantly over the last decade, which the authors attribute to the adoption of modern management approaches and technologies. Higher production costs are identified as the cause of the lower profitability. Here it could also be hypothesized (like in FAO, 2009) that deferred investment returns will in the medium term improve the performance of agriholdings. Besides, the authors emphasize that a lot of variability is hidden in the average figures they provide.

A general finding of several authors is that the variability of farms is enormous and remains hidden when averages are used (Nivyevskiy et al., 2008; Rylko et al., 2008; Slaston and Larsén, 2010; Byerlee et al., 2012).

Regarding future adaptations of the organizational forms, only one group of authors has been found that undertook notable reflections on the future of agriholdings. Rylko and Jolly (2005) as well as Rylko et al. (2008) point out the managerial dilemmas faced by agriholdings in Russia: The

management typically has a strong bottom-down management approach, as is customary in the industries from which the decision makers come. This approach conflicts with the requirements of arable farming, where short-term expert decisions are needed at the individual operations. However, delegation of competences quickly leads to losses from local mismanagement and abuse of freedoms, especially under the conditions faced in KRU. For these reasons they conclude that the agriholdings in their present form may not be sustainable. In that context, they draw parallels to the bonanza farms which in the late 19th century constituted a temporary development in the settlement of the US Northwest and were succeeded by family farms. They also point out a possible solution attempted by some agriholdings which created – in some cases actually family-managed – quasi-independent farms within the agriholding structure. Such an approach could potentially combine the advantages of centralization and decentralized farm management.

Conclusions

From the literature review above, the following conclusions can be drawn:

- A lot of the information available in literature is rather old. Ten years are a very long time given the current pace of structural change in KRU. Therefore there is a strong need for more up-to-date information.
- The results on the competitiveness of agriholdings in comparison with independent farms are quite limited and inconclusive. More research is needed.
- The existing studies mostly rely on farm accounting and survey data. The reliability, especially of the accounting data, however, warrants serious doubts.[15] For that reason it makes sense to attempt a different approach that gathers and validates its own data.
- Only one group of authors has been found that undertook notable reflections on the future of agriholdings. So far no empirical approaches that involved farm business decision makers have been used. Therefore further research is required. It makes sense to include an approach that involves decision makers in the research of this thesis.

[15] Further elaborations on the issue of data quality are made in Chapter 3.1.2.2.

3 Development and application of a research concept

In this chapter, the research concept, a *modified panel process for the analysis of typical farms*, is developed (Chapter 3.1). This approach is based on interviews and focus group discussions with farm decision makers. It is necessary to prepare these with an interview guideline. As a basis for this, research hypotheses on the competitive advantages and disadvantages of agriholdings and independent farms in Ukraine's arable farming sector are derived from theory (Chapter 3.2). Thereafter the application of the modified panel process is documented (Chapter 3.3).

3.1 Development of a research concept

In this section, the research concept is developed. For this purpose, the research subject first needs to be delimited.

3.1.1 Delimitation of the research subject

The focus of this thesis is on broadacre arable production.[1] Broadacre crops account for by far the largest share of arable production. Specialty crops such as vegetables have quite different requirements and are therefore not included. Vertical integration is not part of the analysis.

However, vertical integration has no entirely clear-cut boundaries. For example, the employment of an agronomist who makes certain consultation services obsolete is, strictly speaking, a form of vertical integration. Therefore the limits of how far vertical integration finds consideration in the empirical research of this thesis must be clearly specified. The limits are defined to start with product processing at the output side and production of own physical inputs at the input side. The employment of specialists is not considered vertical integration, nor is the internal provision of services that independent arable farms also provide, such as grain handling and storage.

3.1.2 Definition and analysis of competitiveness

For the empirical analysis of determinants of competitiveness it is first necessary to describe what competitiveness is, and to derive a concrete definition to be used in the empirical analysis. Further, it is necessary to review possible approaches to measuring competitiveness, and to select an approach for the empirical analysis. This will be accomplished in the following.

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[1] The term *broadacre* production, which is used primarily in Australia, describes the production on "*extensive parcels of land*" (OECD 2013) and is used here to differentiate against very intensive forms of arable land use on small areas, such as the production of vegetables, or other specialty crops.

3.1.2.1 Definition of competitiveness

A widely accepted definition of competitiveness was first termed by Martin et al. (1991, p. 1456): [Competitiveness is] "*the sustained ability to profitably gain and maintain market share*." In this thesis, broadacre arable farming is analyzed. Market share there is equivalent to a farm's cultivated arable land. Therefore the following definition of competitiveness will be used in this thesis:

The competitiveness of a broadacre arable farming business is its sustained ability to profitably expand and maintain its cultivated land area.

When two businesses compete for land in a perfect market environment, the business that can pay more for the land will get it in the longer run. Therefore a suitable quantitative indicator of competitiveness is the return to land a business generates. Return to land is the sum of a business' entrepreneur's profit[2] per hectare and its land cost. This indicator reflects the maximum land cost a business could afford in the longer run – either in the form of land rents or the opportunity costs of owned land – without making economic losses. Land ownership currently plays only a small role in Ukrainian arable farming because a moratorium prevents the sale of farmland, and land is owned by the state or proprietors of land shares with an average size of around 4 ha (Lapa et al., 2010).

While in a perfect market[3], return to land would be a sufficient indicator of the competitiveness of a business in arable farming[4], this condition rarely exists in reality. As has been shown in Chapter 2.3, especially in Ukraine there are ample indications of market failure. In such a situation, other factors besides the return to land a business generates play a role in determining its *sustained ability to profitably expand and maintain its cultivated land area.* Such a factor could, for instance, be the connections a business has to local authorities who approve or reject land rental contracts. Hence, in this thesis qualitative determinants of competitiveness besides the quantitative indicator return to land are considered and analyzed.

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[2] Entrepreneur's profit is defined as the profit of the business after all factors of production have been remunerated, including opportunity costs.

[3] With rational and fully informed profit maximizing actors that act strictly according to the rules.

[4] Caveat: The competitiveness of different businesses or organizational forms can only be compared using this indicator when they face the same soil quality and other natural conditions. In this thesis, comparability is ensured by establishing and comparing typical farms which reflect the conditions in a defined region. This concept is explained in the following parts of Chapter 3.1, especially Chapter 3.1.3.

3.1.2.2 Approaches to competitiveness analysis and methodological choice

In order to be able to derive a concrete methodological approach to analyzing competitive advantages and disadvantages of agriholdings and independent farms in Ukraine, first the methodological approaches to competitiveness analysis are reviewed. Isermeyer (1993) differentiates three fundamental approaches: (1) the survivor technique, (2) the evaluation of farm records, and (3) the engineering approach. They are subsequently reviewed with regard to their suitability for the research in this thesis.[5]

The survivor technique

The survivor technique analyzes ex post which organizational forms have been able to prevail on the market. The underlying assumption is that a competitive organizational form by definition withstands the market forces, survives and expands. Its competitiveness is revealed ex post by its development on the market. If other methods are used to determine competitiveness ex post and they show an organizational form that has not prevailed in competition to be competitive, the other method must obviously have been faulty (Isermeyer, 1993).

The survivor technique was already implicitly used in Chapter 2.2. The fact that agriholdings have been growing very strongly in Ukraine during recent years is an indication that they are competitive at least in the current weak competitive environment. However, the method has the following shortcomings with regard to this thesis:

1. It is likely that the recent strong development of agriholdings was at least partly driven by strategic goals, such as to secure as much land as possible while it is available. It is at least conceivable, that the growth of agriholdings was not profitable, but that investors expect profitability in the future. In that case, these agriholdings would not meet the definition of competitiveness used here although the survivor technique indicates otherwise. The period of agriholding development in that case would have been too short for the survivor technique to yield a reliable result.

2. There are agriholdings which are active in arable farming mainly to secure input for their own processing facilities (cf. Chapter 2.3). In such a case it is also conceivable that companies pursue arable farming without making a profit there (but only elsewhere in the value chain). In this case the definition of competitiveness used here would also not be met.

3. While the survivor technique gives the most accurate information on the competitiveness of organizational forms in retrospect (after a sufficiently long time), its downside is its limited ability to predict future adaptations (Isermeyer, 1993), which, however, is a goal of this thesis.

[5] The review of the advantages and disadvantages of the methods is purely instrumental for the methodological choice in this thesis. Hence, aspects that are of no relevance in this context are omitted.

4. Finally, the method is unsuited to determine and quantify the underlying causes of competitiveness, which is the key goal of this research.

It is therefore obvious that the survivor technique, being an entirely retrospective approach, is unsuitable for the analyses of this thesis.

Evaluation of farm records

The next approach to measuring competitiveness is the evaluation of farm records, such as accounting data and fieldwork documentation. It has the advantage of allowing good ex post statements about firms' competitiveness. It is also well suited to validate results generated using the engineering approach which will be explained further below (Hemme, 2000). If sufficiently large samples are utilized, statistical representativeness can be obtained and even distributions shown.[6]

As has been shown in Chapter 2.5, most of the studies on the competitiveness of agriholdings and independent farms in Ukraine and Russia so far used the official accounting data delivered by farms to the authorities, usually with expert input to sort the farms into agriholding members and others (e.g., Gataulina et al., 2005; Hockmann et al., 2007; Serova, 2007; Hahlbrock et al., 2011).

However, with regard to the requirements for the empirical part of this thesis, the method has the following shortcomings:

1. Firstly, the reliability of the results the method generates depends directly on the quality of the analyzed data. However, the quality of the available data in Ukraine is problematic.

   Although most studies so far used these datasets, the data have quality problems that local experts often point out informally (Tovstopyat, 2009), which however are usually not given much explicit consideration in the studies utilizing them. Nivyevskiy et al. (2008) are an exception by mentioning the potential shortcomings.

   One issue is that the accounting data delivered by the farms may have been manipulated by farm managers who wanted to reach certain goals, e.g., to receive subsidies (NIVYEVSKIY et al., 2008), or to leave a good impression with local politicians. Further, the rules for generating this accounting data do not necessarily lead to the reflection of economic realities, for example with regard to depreciation. As will be elaborated in Chapter 3.1.4.2, there is no real culture of utilizing the collected data for operational decision making in Ukraine, which has a detrimental effect on data quality.

   It should be noted that data which is collected using questionnaires is usually no better, because those questionnaires are typically filled by the accounting department of the farms

[6] Hemme (2000) still notes that creating averages is problematic because of the large variation between farms. That is certainly true, but with econometric methods and suitably large samples, the distributions of whole populations can be shown. For an example refer to Nivyevskiy et al., (2008).

with the same information as the official accounting data forms. It is further often a challenge to motivate farms to participate in complex surveys in the first place (experiences in Russia: Walther, 2007).

2. Another problem with the evaluation of farm records is, that in order to analyze the determinants of competitiveness (and not only an aggregate indicator), a rather high level of detail is necessary. Such detailed data is not readily available in Ukraine. Therefore, while it might be possible to read some of the individual determinants of competitiveness of agriholdings and independent farms from farm accountancy figures, some others would undoubtedly remain hidden.

   More detailed data is not available from other sources, either. A reason for this is that unlike in most OECD countries, where relatively detailed datasets are collected from representative samples of farms, the level of detail in the datasets collected in Ukraine and KRU is low in comparison (Nivyevskiy et al., 2008). In the European Union, for example, rather detailed data is collected in the Farm Accounting Data Network (FADN, cf. European Commission, 2012). Ukraine has no such institution.

3. Further, there are potential competitive advantages or disadvantages of the two organizational forms that are neither reflected in accounting nor in other farm record data. They might not even be reflected in conventional indicators of economic performance, such as profit or return to land. An example for such a competitive advantage would be when one of the two organizational forms has better connections to the local authorities who authorize or reject land rental contracts. In such a situation a business of the competing organizational form might generate a higher return to land per hectare, but it would still not be able to grow. Thus it would not fulfill the competitiveness criterion defined in Chapter 3.1.2.1. Such issues could not be analyzed solely by evaluating farm records.

4. Another disadvantage of the method is that its abilities to make predictions about future adaptations are limited (Hemme, 2000). This, however, is a research goal of this thesis.

For these reasons, the analysis of farm records is also not a suitable approach for this thesis. The third approach to competitiveness analysis, the engineering approach, is evaluated in the following.

The engineering approach

In the engineering approach the cost and return structures and their causes in the firm are modeled – the scientist “engineers” a virtual farm – and economic indicators are calculated from which competitiveness is deduced. The advantage of this approach is that the “engineered” farm model shows and quantifies the causes of competitiveness. Changes can be applied to it and its effects observed. It is therefore also very well suited to analyzing changes of competitiveness under changing conditions (Isermeyer, 1993; Hemme, 2000). Further, the fact that an “engineered” model reflects causalities also provides a means to check for plausibility of the input data.

Hence, the engineering approach has the necessary capabilities for the empirical analyses in this thesis. However, the method also has the following shortcomings:

- In order to be able to “engineer” a farm model, the scientist needs to know the underlying technological and economic facts, such as realistic price and volume structures in inputs and outputs, in sufficiently great detail. If adaptations to changing conditions are to be analyzed, the scientist has to know the restrictions within which the farm can reorganize.
- If an “engineered” farm model is designed by a scientist based mainly on technological information, and/or changes under changing conditions are analyzed utilizing such information (e.g., in a mathematical programming model), the influence of human behavior, especially of the farm manager, is neglected (Isermeyer, 1993; Hemme, 2000).
- In order to represent the variation of a whole farm population, a very large number of farm models would be needed. As each of the farms established with the engineering approach requires the input of the “engineer”, the degree of variation that can be depicted with limited (time and financial) resources is limited.

Those are major challenges. With an engineering approach one could quite easily model very “creative” farms and adaptation solutions that are completely unrealistic. It is therefore necessary to obtain realistic input farm data in order to achieve realistic results. Further, the fact that the variation of a population cannot realistically be (fully) represented makes a targeted data selection necessary. In order to obtain the required data, two fundamental sampling strategies are available which are evaluated in the following.

3.1.2.3 Sampling strategies

If the goal of an economic analysis of farms (or any kind of research subjects) is to come to conclusions about the entire population (or sub-population), the analysis would ideally have to depict the whole range of variation within this population. That is because what holds true for individual farms within the population (e.g., a certain level of profitability) will practically always differ more or less strongly in other farms of the population.

The reason for this is the diversity of farm populations. For example, farms differ

- In their combination of enterprises
- In their production systems within the different enterprises
- In their input intensity and composition
- In their output production and composition
- In their economic and physical performance

In reality it is obviously not possible to obtain, validate, and evaluate complete information on whole farm populations. This makes it necessary to make compromises between data depth and data breadth. Certain indicators may be available for whole farm populations, but the more in-depth an analysis is to be, the lower the sample size can be with a given financial and research capacity.

If therefore analyses with a limited data breadth are conducted and conclusions about farm populations are to be drawn, (1) a targeted selection of the data to be collected and analyzed has to be made, and (2) the degree and limitations of representativeness need to be clarified. As a rule, the more in-depth an analysis gets and therefore, the smaller the sample necessarily becomes, the lower its representativeness becomes.

There are two basic sampling strategies for obtaining information on a population of research subjects in social sciences – random selection and information-oriented selection of data (Flyvbjerg, 2006).

1. The aim of ***random selection*** is to get an unbiased representation of the population of research subjects in question. To this end, sufficiently large samples of a population are collected and evaluated using statistical tools. The samples are either completely random and represent the whole population in question, or they are stratified and represent subgroups of interest (Flyvbjerg, 2006). However, if random data would be used in the engineering approach, this would effectively boil down to an evaluation of farm records. It has been shown above that this technique is unsuitable for the empirical analyses in this thesis.
2. The aim of ***information-oriented selection***, on the other hand, is to look at specific cases from which inferences for the rest of the population – or certain parts of it – can be made. Therefore the data is evaluated in case studies. Cases are selected based on the information expected from them, and the goal is to make use of in-depth information of the specific case(s) (Flyvbjerg, 2006).

While the latter approach does not provide statistically representative data, its key advantage in the context of this thesis is that it allows gathering the required depth of information to determine competitive advantages and disadvantages of the two organizational forms in Ukrainian arable farming. Further, the approach allows more effort to be put in validating the data than would be possible with large random samples. This is important in the weak data environment of Ukraine.

The *agri benchmark* typical farm approach is a systematic methodology for information-oriented farm-level analysis. It is subsequently explained.

3.1.3 The *agri benchmark* typical farm approach

The *agri benchmark* typical farm approach utilizes the expert knowledge of farm decision makers and farm advisors to establish, validate, and explain typical farms – farm-level datasets that have a case study character.

3.1.3.1 The typical farm concept

A typical farm represents a stringently defined sub-group of a total farm population. It is defined by such attributes as its size, combination of enterprises, production systems, management performance, yield level, input intensity, etc. The aim of the typical farm approach is to allow conclusions to be drawn about larger farm populations or sub-populations. It is therefore essential for the interpretation of a typical farm that its position relative to the distribution of the whole population in question is explained with regard to the aforementioned factors (or at least the most important of them). For example, such an explanation could be that the wheat yield of a typical farm is at around the 80th percentile of the total distribution.

The typical farm approach has originally been developed for inter-regional and international competitiveness analysis, as well as for policy impact analysis. Today there are a number of institutions and networks that use typical farms[7] to evaluate farm competitiveness and the effects of changing conditions on those farms. Important examples are (Isermeyer, 2012; *agri benchmark*, 2012; IFCN, 2012; TAMU, 2011):

- The *International Farm Comparison Network (IFCN)*, headed by the IFCN Dairy Research Center in Kiel, Germany
- The Texas A&M University (TAMU) in College Station, TX, USA with its *Representative Farms* database
- The *agri benchmark* network headed by the Thünen Institute in Braunschweig, Germany
- The Brazilian national agency for supply (CONAB)

While the institutions and networks have different regions and farm enterprises in their focus[8], all three use farm level models representing typical farms. As the methodologies of the networks and organizations are highly similar and this thesis is written within the *agri benchmark* Cash

[7] *agri benchmark* and IFCN use the term *typical farms.* The Representative Farms Network maintained by the Texas A&M University uses the term *representative farms.* The meaning is basically the same.

[8] IFCN is an international project specializing in the economic analysis of dairy farming. The Representative Farms Network is a (mostly) national project comprising the most common arable and cash crop farm types in the US. *agri benchmark* is again an international project with currently four branches: dairy, beef & sheep, cash crop, and horticulture. The CONAB establishes cost of production figures for various crops, livestock, and other products across Brazil.

Crop network, the further methodological considerations are based on the Standard Operating Procedure (SOP) of this network (cf. Zimmer and Deblitz, 2005).

The data in *agri benchmark* is collected and validated using the so-called panel process, which is explained subsequently.

3.1.3.2 The *agri benchmark* panel process

The panel process is an iterative procedure that involves farm decision makers and farm advisors. It can be used to collect, validate, and explain typical farm data, as well as to analyze the adaptation of farms to changing external conditions.

Data collection, validation, and explanation with the panel process

When the panel process is utilized to collect and validate typical farm data, the first part of the procedure is the **pre-panel***.* In this, the scientist drafts the typical farm together with a local farm advisor, based on available statistical information and the advisor's expert knowledge and database. A presentation is made with the key characteristics and indicators, as well as with the calculated performance figures of the drafted typical farm.

With this presentation, the drafted typical farm is subsequently shown and discussed in a **full panel**, a focus group of typically 4-6 local farmers, the local advisor, and the responsible scientist with an assistant. In this full panel the typical farm is validated, corrected, and completed.[9] The key question that is repetitively asked is, whether or not the figures in question can be considered typical for the specific sub-population of farms analyzed (Zimmer and Deblitz, 2005).

A typical farm thus established can in principle be identical to an existing farm. More often, however, it is a virtual farm that has been designed to represent the (sub-) population of interest without the idiosyncrasies of individual farms.

An important aspect is that the panel process not only delivers typical farms, but also explanatory information. Such information is partly a by-product of the process, because the establishment and validation of typical farms requires discussions in which the participants exchange *why* the typical farm is as it is. Additional information can be enquired as necessary.

[9] According to the SOP (Zimmer and Deblitz, 2005) the procedure would be slightly different: The pre-panel would already include farmers and the subsequent full panels would be repeated as an iterative process as often as necessary until a consensus is reached. However, the experiences over the last years showed this approach unpractical because of the time and effort required from all persons involved. The sequence described above reflects how the process has actually been employed in the recent years since the SOP was written (cf. Ebmeyer, 2008; Nehring, 2011, Krug, 2013).

A number of considerations are important in the execution of the panel process:

1. Group dynamics play an important role in focus group discussions. For example, dominant individuals may attempt to impose their opinion on the whole panel, possibly with other aims than to find the truth. On the other hand, the whole group may have a tendency to suppress the views of individual participants, leading to conformity. It is therefore important to consider such issues in the selection of participants and, more importantly, the moderator needs to take active measures to mitigate them in the focus group discussions (Ebmeyer, 2008; Nehring, 2011). The results of the panel process highly depend on the moderator's work. Nehring (2011) provides a detailed explanation of the requirements regarding the selection of participants and the role of the moderator in focus group discussions.
2. The data which needs to be disclosed by the participants of a focus group in order to establish a typical farm is often considered sensitive business information. Farmers are often especially reluctant to disclose financial information. This can, on the one hand, possibly be solved by supplementing information with statistical data. The better solution, however, is to take systematic measures to build trust with the participants so they disclose their information. This includes a professional management of the panel process, confidential treatment of the individual business data, as well as intensive feedback with results (Ebmeyer, 2008).
3. Time is usually a scarce commodity for the participants. Therefore it is necessary to make a compromise between an intensive and comprehensive discussion of specific details and getting through the agenda in a timely manner. This is particularly an issue when multiple panel rounds are planned. The problem is particularly pronounced when managers of large and progressive farms are involved (Ebmeyer, 2008).
4. The datasets obtained in the panel process depend on the personal experiences and data of the participants. If two panels were held with the aim to establish typical farms that represent the same sub-groups of the population, the outcomes would probably concur with regard to the fundamental features of the farms, but there would most likely still be minor differences in details (Ebmeyer, 2008). This may be inconsequential in many applications that look at a "bigger picture". Nevertheless, as an option to reduce this error, Ebmeyer (2008) suggests first holding two separate panels and afterwards one joint panel with the same participants, in which the aim is to come to a consensus.
5. It is possible that participants of the panel process pursue specific goals other than finding the truth. For example, a participant might deliberately provide incorrect information to cause a certain perception of himself or someone else, his or someone else's business, or his or another business' organizational form, thereby reducing the quality of the obtained data. The discussions in the panel process provide a corrective function to counteract such tendencies. Hence, this is another reason why it is important for the moderator to take an active role and make sure that all participants are heard. Further, assuring that data is only published at a typical level and all data pertaining to individual businesses remains strictly within the panel reduces the potential motivations to provide incorrect information.

When these factors are considered, the panel process has proven a useful tool for establishing typical farms (Zimmer (ed.), various issues; Ebmeyer, 2008; Brüggemann, 2011; Nehring, 2011; Krug, 2013). Besides establishing typical farms, it has further also been successfully applied in the analysis of farm level adaptations to changing external conditions.

The panel process for the analysis of farm level adaptations to changing conditions

When the panel process is utilized for the analysis of farm-level adaptations to changing external conditions, an additional focus group discussion round is usually included. In one round the panel is confronted with scenarios for which adaptations are then discussed. In order to counter mental path-dependence of the participants, hypotheses are usually prepared and discussed in the focus group. The adaptations to the new situation on which the discussion settles are subsequently applied to the farm model and the physical and economic results calculated. Thereafter the economic implications of the adaptations are again presented to the panel for validation. Examples for the successful utilization of this approach are Walther et al. (2009), who analyzed the adaptation of German farms to a high energy and commodity price scenario, Nehring (2011) who analyzed intensification options of Australian and German arable farms in a high commodity price scenario, Brüggemann (2011) who analyzed options of German beef producers to adapt to market liberalization, or Krug (2013), who analyzed adaptation options of German arable farms on low yield locations to a scenario without EU single payments.

Conclusions

Taking into consideration the properties of the panel process expounded above, the following conclusions can be drawn regarding its applicability in the context of this thesis:

1. With the approach, consistent datasets of sufficient depth can be generated to analyze the determinants of competitiveness. An important aspect is that besides pure numbers, it is also possible to obtain qualitative information (Ebmeyer, 2008). Thereby information can be obtained on functional relationships, causalities, and especially also competitive advantages and disadvantages that cannot be read from purely quantitative figures (cf. Chapter 3.1.2.2).
2. The direct interaction with decision makers helps to obtain realistic results (Ebmeyer, 2008). All inputs and results can be validated by critical reflection in the focus group discussion. This is important especially in the weak data environment of Ukraine.
3. Utilizing the expert knowledge of the panel participants, typical farm data is not only obtained in the panel but also put into the perspective of the whole population. In other words, it can be explained where the obtained data fit in the total population.
4. The panel approach can not only be used to establish typical farms, but also to analyze future adaptations at the farm level. While this could also be done with mathematical programming, the panel methodology has been found to have advantages when it comes to

realistically analyzing farm level adaptations to changing external conditions.[10] Anyway, in this thesis, the aim is not to analyze adaptations to a certain given scenario, but to the future conditions expected by the decision makers. Therefore the panel is appropriate for this task.

Summarizing these factors, it can therefore be concluded that the panel approach fulfills the requirements of this thesis well. However, there are a number of difficulties in Ukraine that pose serious challenges to its application and therefore necessitate adaptations of the methodology. These challenges arise from different mentalities, knowledge and experience of farmers and farm advisors in comparison to most Western countries. To illustrate them, the requirements with regard to participants – which are met in most Western countries – are explained subsequently, and thereafter the problems in Ukraine are illustrated.

3.1.3.3 Requirements with regard to farmers and advisors in the standard panel process

The successful application of the standard *agri benchmark* panel process depends highly on the participating farmers and farm advisors. A number of qualities are required that are explained subsequently. While not all farmers have all of these qualities to the same degree, they are common with professional farmers in Western countries and deficits of individuals can normally be compensated for by the other focus group participants (Zimmer, 2011).

1. The farmers know the economic and agronomic characteristics of their farms. They have good documentation of economic and technological data and use the generated data and indicators for management decisions.[11] They know many of the key indicators and figures offhand, exactly or approximately. This comprises data like yields and prices, costs and amounts of various inputs used, as well as structural and technological characteristics of their farms.
2. Further, the farmers also know the characteristics of other farms in their region or country and they know where they stand in that population. This knowledge allows them to provide the necessary input to make a drafted farm typical according to specifications (e.g., top management, among the largest of a region, most common production system, etc.). It also

[10] To realistically and completely capture the adaptation options of farms in such a way that they could be utilized in a linear programming model would be an extremely complex, if not impossible task (Ebmeyer, 2008). Further, the statement made in 3.1.2.2 about the analysis of future adaptations with the engineering approach holds: When human factors (here esp. preferences of farm managers other than pure profit) are not accounted for, the results are bound to be unrealistic. A symptom of these weaknesses is that in practical farming and practical farm advisory services, linear programming plays no relevant role (Nehring, 2011).

[11] In DLG (2003) an overview of computer software for fieldwork documentation in arable farming is provided. The article lists 26 different programs from 18 manufacturers. While this is not a solid proof of the statement above, it gives an indication of the importance of documentation and data utilization in German farming.

allows them to classify a given farm in relation to the rest of a farm population (e.g., the farm is about average, but its production system is uncommon).

3. The farmers are interested in economic exchange.[12] Motivations are usually to see how their own farm stands relative to the farms of others in the same region as well as to learn from others what they can do to improve their business. Further, they often like to see how typical farms of their region or country stand relative to other regions or countries worldwide. A result of this is the aforementioned knowledge of the regional or national farm population. This culture of economic exchange is also a prerequisite for farmers to participate in panels and provide the required data along with the required time and patience.
4. Finally, the farmers are generalists who have a holistic view of their businesses. While the individual farmer may have strengths and/or a particular focus in certain fields, such as economics or agronomy, he still usually has a good overview of all aspects of his farm. This allows the farmers to provide necessary input data for typical farms quickly, as well as to assess and validate the results. When it comes to analyzing changes to farm organization, they understand the whole system and can make reliable statements.

The other important participants of the standard *agri benchmark* panel approach are farm advisors. In many Western countries farm level economic advisors who do horizontal farm benchmarking are very common.[13] In principle these advisors have the same qualities as the farmers. They have farm-level knowledge comparable to that of a farmer, and many of them have a practical farming background or at least a very practical farming education. They may have somewhat less knowledge of the practical, farm-internal workings than the farmers themselves. However, they make up for this with a greater overview of the farm population. Such farm advisors are key to the success of the panel process, directly and indirectly.

Their direct function is that they help in preparing and drafting the typical farms. Further, they have a corrective function in the panels, and they supplement the information the farmers provide with their overview of production systems and economics.

Their indirect function is that they make farmers interested in working with numbers in the first place by providing a direct utility from them. The horizontal farm benchmarking they conduct provides the link between what happens physically at the farm and the economic consequences,

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[12] Advisory groups are groups of farmers who work together with farm advisors, typically to improve the physical and economic performance of their businesses. In those groups often horizontal benchmarking is conducted. Proplanta (2012) is a business search engine for agriculture and agribusiness in Germany. A search in the category “advisory groups and farm management advisors” yielded 86 results, the majority of them advisory groups. This is an indication of the relative importance of economic exchange at German farms.

[13] The advisory groups pointed out in the footnote above are managed by such farm advisors. Besides those regional groups, there are also several inter-regional companies who provide farm advisory services in Germany (e.g., Hanse Agro, 2012; LBB Agrar, 2012; BB Goettingen, 2012). Examples of farm level advisory services in other Western countries are Ag Decision Maker (2012) in the US (university extension), and Robin Turney (2012) in the UK (private farm business consultants).

and it makes these factors comparable with peers. This is a highly useful decision making instrument for farm managers. The advisors also play an important part in the knowledge the farmers have of their peers in the region or country by providing the benchmarking results. Even farmers who do not participate in such consulting services benefit indirectly from many results of farm level economic analyses that are published in the local farm journals and other publications.[14] Hence, the work of farm advisors has an important role in shaping the qualities of the farmers expounded above in the first place.

3.1.4 Adaptations of the panel process to challenges in Ukraine

While experience has shown that the *agri benchmark* panel process usually works very well in Western countries, there are also often challenges when the approach is utilized in developing or emerging economies (Zimmer, 2011). Local farmers and advisors in these countries often have deficits in the areas mentioned above. While collecting data for *agri benchmark* typical farms in Ukraine, such problems were found to be quite pronounced (Lison-Culca, 2009; Kaths et al., 2010). They are outlined in the following part.

3.1.4.1 Challenges to the panel process in Ukraine

Subsequently the challenges to the application of the *agri benchmark* panel process are outlined. It should be noted with regard to the subsequent elaborations, which are summarized in Table 3.1, that while some aspects may not be true in the case of individual persons or institutions, the general contrast to typical western countries is not exaggerated.

1. The first issue is that in Ukraine there are no farm advisors who do horizontal farm benchmarking and thus have the knowledge and broad understanding of farm-level economics, farm organization and operative production necessary to fulfill the traditional advisor's role in a panel. During three years of *agri benchmark* project work in Ukraine it was not possible to find such an advisor.
2. Further, there is not a real culture of effectively using data collected at farms for management purposes. The problem is not that data is not being collected at farms in Ukraine. The opposite is the case: commercial farms often employ a whole bookkeeping department. However, as has been shown in Chapter 3.1.2.2, this data collection is done mainly to fulfill government requirements. The system of farm data collection has been

[14] Examples in German farming magazines are Macke (2011) and Bugislaus and Musshoff (2011) (both on machinery costs), Schwerdtle (2012) (on costs and profitability of drainage), Friedrichs (2005) (on farm benchmarking), Friedrichsen (2012) (on how much land rent a farmer can pay based on gross margins). LFL (2012) is a website that provides gross margin calculation tools and information. Schätzl and Reisenweber (2012) provide instructions on gross margin calculation and refer to the aforementioned website.

inherited from Soviet times. Very much like during that period, accounting data is being collected at the farm level, forwarded to the local administrations, and finally collected centrally at the national level. The usability of the data, however, is often limited. Other documentation that would considerably increase the options to use data for the optimization of farm organization and operations, such as fieldwork documentation, is still missing at many farms to this day. This lacking culture of effective data collection and utilization has the consequence that in comparison to many Western farmers, Ukrainian farm managers are often less used to working with economic and agronomic figures and performance indicators. They are not as easily familiar with the figures offhand, and certain data may not be available at all.

3. Moreover, whereas farmers in Western countries usually have a good overview of the farm population in their area, farm managers in Ukraine often have less knowledge of how other businesses work and how they perform. They have more difficulties assessing how their own business fits in with the rest of the farm population.

4. There is a lack of economic exchange culture in Ukrainian farming, an issue which is probably closely linked with the lack of farm advisors. The farm managers, unaccustomed to even using data effectively in their own businesses, tend to be unwilling to share information with others. They probably do not see the advantages in the first place and as a result are not overly motivated and patient. Agriholdings in particular, tend to be quite secretive and to consider economic data as sensitive information. Rylko et al. (2008, p. 122) write that „*Unfortunately, agroholdings surround themselves with a deep shroud of secrecy and confidentiality, so that no data are available for conducting a comprehensive performance analysis.*" This makes it difficult to hold panels, as those require motivated participants who are willing to share and discuss data among each other.

5. Finally, while farm managers in Western countries are usually generalists, the traditional division of labor in management that was inherited from Soviet times is still commonplace in Ukrainian farms. As a consequence managers often only have good knowledge of the specific narrow field for which they are responsible (agronomy, accounting, machinery, etc.). This lack of overview makes any data collection much more difficult and time-consuming.

Table 3.1: Overview of challenges to the *agri benchmark* panel process in Ukraine

Typical Western country	Ukraine/KRU
Very practical farm advisors do horizontal farm benchmarking and provide practical operative and strategic decision support. They have good overview of the farm landscape.	There are practically no such advisors.
Farmers have good documentation of economic and technological data. They use the data for management decisions and know a lot of them offhand.	Documentation at Ukrainian farms is not very effectively used for decision support. Documentation is often incomplete and mainly tailored to fulfilling legal requirements (accounting).
Farmers know characteristics of other farms in the region and know where they stand in the population.	Farm managers have less knowledge about other businesses in the region and how their business compares.
There is a culture of economic exchange. Farmers know the benefits of such exchange and are ready to provide information in panels.	The culture of economic exchange is missing. Farm managers, especially holding managers, tend to be unwilling to participate in panels.
Generalist farmers have a holistic view of their businesses.	Over-specialized farm managers tend to have knowledge rather limited to their particular field of responsibility (agronomy, accounting, mechanization, etc.).

Note: While some aspects may not be true in the case of individual persons or institutions, the general contrast to typical western countries is not an exaggeration.

Source: Own compilation.

These issues lead to the following problems with regard to the standard panel process:

1. The potential participants for the panel process are rare. Further, getting them together for the focus group discussion and to speak openly there is a challenge, because a culture of economic exchange is lacking.
2. The typical farms cannot be drafted in a pre-panel, because the necessary farm level advisors are not available. Simply substituting the pre-panel with an additional farm decision-maker focus-group discussion would probably also not work. This is because the necessary information is spread over many specialized people, who moreover often do not know the required information offhand. The focus group discussion would therefore take too long and require too many people to be brought together.
3. The participants' lack of overview over the economics of their own businesses as well as the sector leads to higher uncertainty with regard to the quality of the data obtained in the panel process.

These challenges make it obvious that the standard *agri benchmark* panel process requires modifications in order to become usable for the empirical part of this thesis. The necessary modifications are explained in the following.

3.1.4.2 The modified panel process

In order to overcome the issues in the standard panel process, it would be conceivable to utilize an approach that does not depend on focus group discussions, but that involves sequential interactions with one participant at a time. Such an approach is the Delphi method, the applicability of which is subsequently evaluated.

Delphi versus focus groups for the interaction with the participants

The Delphi method is similar in many regards to successive focus group discussions. Like the latter, it is a method that collects experts' assessments on an issue, exposes the experts to the views of other participants, and allows for a subsequent adjustment of the participants' assessments. A Delphi is an expert survey or a series of interviews (*Delphi interview*, Kurniawan, 2008) conducted in successive rounds. After each round, the participants' answers are evaluated, and open questions as well as dissenting opinions are determined. The results are incorporated into the questionnaires or interview guidelines of the next round and the participants thus receive the opportunity to refine their opinions. The iterations are conducted until a pre-defined stop-criterion is met, e.g., when consensus has been reached (Skulmoski et al., 2007).

With regard to the challenges to the panel process in Ukraine, the Delphi technique has the advantage that the participants remain anonymous to each other. Given that, it could be expected that the reluctance to participate is reduced, and participants might disclose things they would not share in a group setting. For a Delphi, the participants do not have to come to a common meeting place, which would remove a further logistical obstacle. Finally, if Delphi interviews were used, relatively much time could be spent at the participants' farms or offices (also with accountants, agronomists, etc.) to collect information that individuals may not be able to readily produce.

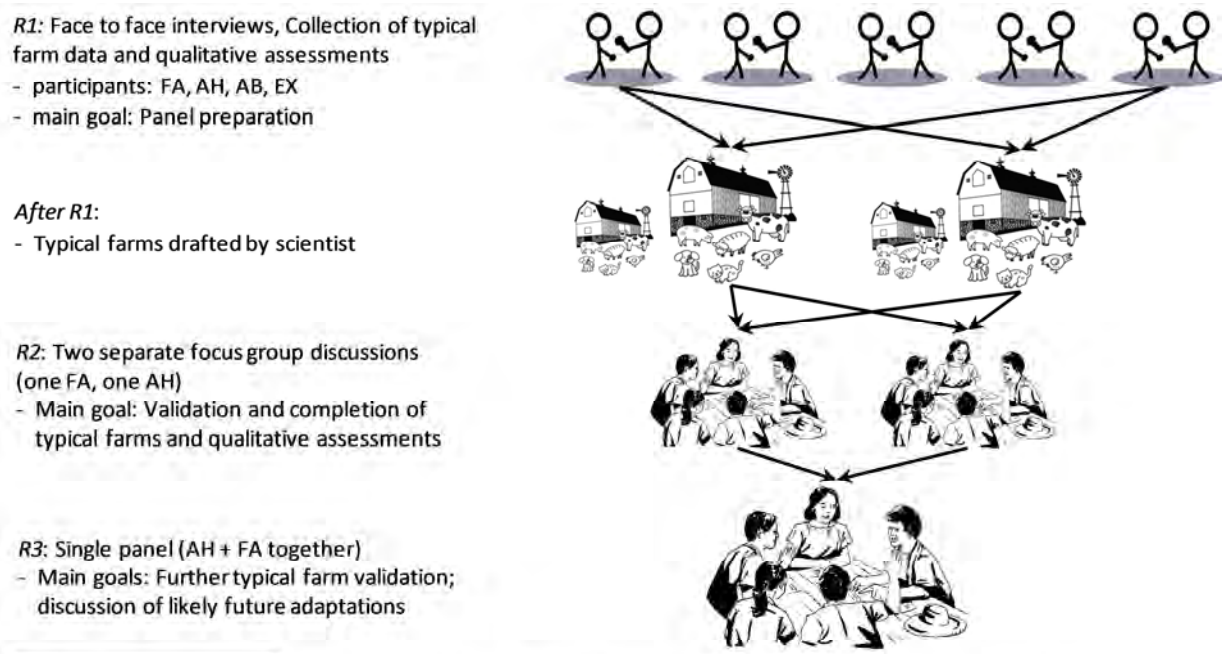
However, while a Delphi interview would have advantages for pure data collection, focus groups are much more efficient when it comes to discussing complex questions and adjusting information during the exchange between participants. This is because during a focus group discussion, many questions and answers can be exchanged in relatively rapid succession, while in a Delphi each response to an issue by a participant requires a new round. For that reason, the establishment of typical farms and their validation would clearly be too complex to tackle with a Delphi.

Hence, as neither the standard *agri benchmark* panel approach nor a Delphi are suitable approaches for the empirical analysis in this thesis, a solution was sought that combines the advantages of a Delphi and focus groups. The outcome is the *modified panel process for the analysis of typical farms*, an overview of which is shown in the following.

Overview of the modified panel process

The modified panel process (illustrated in Figure 3.1) consists of three rounds:

Figure 3.1: Overview of the modified panel process



Note: "R1" = first panel round; "R2"= second panel round; "R3"= third panel round; "FA"= independent farm participants; "AH"= agriholding participants; "AB"= agribusiness representatives; "EX"= external scientists and analysts

Source: Own illustration, based on cliparts from http://www.sheepusa.org/Farm, http://cindrellaforever.blogspot.de/2011/08/was-that-joke.html#more and http://students360.in/current-topics-for-group-discussion/ (all accessed on 2013-05-20).

In the **first round**, which is intended to prepare subsequent focus groups, the participants are visited separately. Individual face-to-face interviews are held, in which the information required to draft typical farms is collected, and qualitative assessments on the competitive advantages and disadvantages of the two organizational forms are enquired. Besides independent farm and agriholding managers, the participants include externals, namely agribusiness representatives, as well as scientists and analysts.

After this round, the **typical farms are drafted** by the scientist based on the provided information. The typical farm drafts, as well as key qualitative statements of the participants are prepared for presentation in the second round.

In the **second round**, two separate focus group discussions are held, one with (4-6) agriholding managers and one with (4-6) independent farm managers. The focus groups are *real groups*[15], i.e., the participants have known each other before. The typical farms, as well as the qualitative assessments, are validated and completed.

In the **third round**, one single focus group is held with both the independent farm and agriholding managers together. In this round, the typical farms, and specifically the competitive advantages and disadvantages of the two organizational forms represented by them, are further validated. Disagreements are discussed with the aim of finding a consensus. Likely future adaptations of the two organizational forms to maintain and increase their competitiveness are enquired.

This modified panel process includes a number of changes to the original *agri benchmark* panel process. They are explained in the following.

Sequence of the modified panel process

The most obvious change to the original panel process is the modified sequence. This sequence has the following advantages:

1. The pre-panel, which is utilized in the standard *agri benchmark* panel approach to draft typical farms together with a farm advisor, is substituted with the first round of face-to-face interviews and the subsequent drafting of the typical farms by the scientist. As the data collection takes place at the respective participants' businesses, written documentation and/or other knowledgeable persons are available who would not be so in a focus group discussion. Sufficient time can be spent with the participants to sort through the information. With this approach, it is expected that the maximum possible information can be gained from the participants up front. After that, the scientist can take as much time as necessary to draft the typical farms based on the information provided.
2. As getting potential participants together for focus group discussions *and* getting them to speak openly is challenging, the sequence of the modified panel approach is designed such that it gradually becomes more "intimate". In the one-on-one setting of the first round, it is easiest to get access to a decision-maker. The least commitment is required on his part (he does not have to leave his office), as well as the least openness and trust (no colleagues/competitors are present). There is no social influence from other participants that might suppress opinions and lead to conformity. Trust between the participant and the researcher can be built in this round, as well as interest roused in the research subject and the exchange with others. In the second round, more commitment (come to a focus group

[15] Real groups are groups of persons that were already familiar with each other before the focus group session. The opposite would be random groups which consist of persons randomly selected from a population who usually did not know each other before. The group size of 4-6 persons technically constitutes a *mini focus group* which was found to be very practical in *agri benchmark* panels (Zimmer and Deblitz, 2005; Nehring, 2011).

discussion), as well as openness and trust (disclose information to familiar colleagues) is required. The discussions and results in this round are expected to further increase the participants' trust and interest. The culmination is the third round, in which also representatives of the other organizational form are present and therefore the most openness and trust is required.

As can be seen, this modified panel process combines the advantages of the Delphi approach in the first round with those of the focus group approach in the second and third rounds. Moreover, the approach allows for further measures to improve the data quality and quantity, which are elaborated in the following.

Addition of externals to the modified panel process

One such measure consists of the addition of external participants – people who are not farm managers at either agriholdings or independent farms – to the one-on-one interviews of the first panel round. The aim is to tap an additional source of information that can at least partly compensate for the lack of the overview farm advisors normally provide in the pre-panel in western countries. To this end, two groups of externals are included: Agribusiness representatives, as well as scientists and analysts.

Agribusiness representatives are representatives of the companies who produce the most important inputs and buy the most important outputs. The (financially) most relevant inputs are agricultural machinery, pesticides, and fertilizer. Therefore a representative of the sales department of a major manufacturer in each of these branches is included in the first round. In order to account for the output side, a representative of a relevant commodity trading company is included. Here one might interject that farms do not conduct business with manufacturers and large commodity traders, but with intermediate dealers. However, there are indications that agriholdings sometimes skip intermediaries. Intermediate dealers would therefore only have limited insights in the deals with agriholdings. On the other hand, it can be expected that the local sales departments of manufacturers and the buying offices of traders in Ukraine have a good overview of their entire client base.

Scientists and analysts are persons in applied research and consulting that are concerned with the competitiveness of the two organizational forms in the widest sense, as well as with the relevant input and output markets.

It is expected that these externals can provide additional information especially on the following issues:

- Differences in purchase and sales terms of the two organizational forms, as well as reasons for the different terms
- Explanation of the analyzed farms and the derived typical farms in relation to the total farm population

- Monetary and especially also non-monetary competitive advantages and disadvantages of the two organizational forms

When externals are involved in focus group discussions, this entails the possibility that they exert undue influence on the farm managers. This is avoided by only including them in the one-on-one interviews of the first round and not in the subsequent focus group discussions.[16]

Additional data validation

While the addition of externals to the modified panel process can help mitigate the challenges in Ukraine by adding information, it is also necessary to add measures to further validate the obtained data and information.

The following two options to do so were considered but ruled out:

1. A potential option to validate the information gained in the modified panel process would be to compare it with official statistics and farm accountancy data. Further, it would also be conceivable to conduct an additional survey or Delphi with farm and agriholding managers who do not participate in the panels. Both options would have the advantage that they would broaden the empirical basis and thereby allow putting the obtained typical farm data more precisely in the perspective of the total population. They would further provide additional information that could challenge the information obtained in the modified panel process, thus providing an additional stimulus that could be introduced in the second and/or third panel rounds. However, analyzing official accounting data has been ruled out before due to various data issues (cf. Chapter 3.1.2.2). Further, it was explained there that mailed surveys with unknown farm personnel are not expected to work well in Ukraine (response rates, data quality). For these reasons it makes more sense to put all effort into the most effective work possible with the panel participants themselves.
2. It would, however, be possible to conduct a survey or Delphi with these same participants *parallel* to the modified panel process itself. This would utilize the advantages of the Delphi approach that (1) possibly opinions of individuals might be obtained which would not be uttered in the focus group environment, and (2) possible inconsistencies between the survey or Delphi results and the panel results would be exposed. However, this approach is unpractical for two reasons: The time budget of participants is limited and it is very unlikely that this additional parallel workload would be accepted. Further, people would probably not show understanding if they are asked the same or similar questions in focus group discussions *and* a parallel survey or Delphi.

[16] Nehring (2011) raises the issue that the advisors in the standard *agri benchmark* panels can influence the participating farmers in a negative way, for example because they want to "sell" their knowledge to the farmers. He advises that much care is therefore required in the selection and briefing of the respective advisor. Comparable issues could be expected with external agribusiness representatives, scientists and analysts.

Other than these two options that were ruled out, the following options are included in the modified panel process:

1. Two separate streams of analysis are conducted during the panels: On the one hand, the competitive advantages and disadvantages, as well as their expected effect on the competitiveness of the two organizational forms, are enquired qualitatively. On the other hand, typical farms are established and quantitative results produced. In Rounds Two and Three possible discrepancies between the two are exposed and discussed, and additional consideration and revision of information by the participants is encouraged.
2. In the second round of the modified panel process an external assessment of the participants' views by the respective other organizational form is conducted. This means that in the independent farm focus group not only the typical independent farms are shown, but also the typical agriholding farms, and vice versa. Moreover, key statements and assessments of participants of both organizational forms are shown and subject to discussion. This technique is used to critically question the assessments and typical farms of each group, stimulate additional consideration, and potentially bring about an improvement of data quality. This is made possible by the layout of the panel sequence that leads to a direct confrontation of the participants of the two organizational forms not before the third round.[17]
3. A thorough theoretic analysis of the potential competitive advantages and disadvantages of the two organizational forms is conducted and hypotheses are derived (cf. Chapter 3.2). Thanks to this, the plausibility of the outcomes of the modified panel process can be checked. If implausible statements are made, a confrontation of the panel participants with theory can lead to a reconsideration and correction. Further, if potential competitive advantages or disadvantages were derived theoretically but not mentioned by the panel participants, a targeted enquiry is made.

With these measures, it can be expected that the modified panel process yields the best possible results in the difficult data environment of Ukraine. As the typical farms produced with this approach have a case study character, it is necessary to do a targeted case selection. This will be explained in the following section.

3.1.5 Selection of typical farms

If case studies are to yield meaningful results, the utilization of a targeted case selection strategy is necessary. Subsequently the selection of typical farms in the standard *agri benchmark*

[17] This in principle follows an approach suggested by Ebmeyer (2008). He suggests holding two focus group discussions with farmers (in his case of the same organizational form) in order to establish typical farms representing their farm type, and subsequently holding a larger focus group that includes all participants.

application is briefly described. Thereafter, the theoretic possibilities for case selection are explained and the selection of typical farms for this research is made.

3.1.5.1 Selection of typical farms in *agri benchmark*

The standard application of the typical farm methodology within the *agri benchmark* (Cash Crop) network is the analysis of the competitiveness and potentials of arable production regions. In this application, the position of a typical farm within the underlying population is explained in the form of a "farm story". Ideally, distributions are given and the position of the typical farm within the distributions is shown. An example for such a farm story is given in Strohm et al. (2010), where a typical farm in Ukraine is explained.

The guidelines to define typical farms in the context of international benchmarking are provided in the *agri benchmark* Cash Crop Standard Operating Procedure (Zimmer and Deblitz, 2005). They set the following criteria:

- Location: at the most important production region(s) of certain crops of interest
- Farm size: one moderate and one large size farm (measured by arable farmland acreage)
- Management performance: average, if possible additionally one large size farm with top management performance
- Production system: the farms represent the prevailing production system
- Income relevance: the farms provide at least 50 % of the farmers' income, or feed at least one person/family

While these criteria make sense when the subject of the analysis is the competitiveness of regions or countries, different criteria are required for the empirical part of this thesis. They are subsequently derived.

3.1.5.2 Selection of typical farms for this research

Case selection strategies

In order to be able to draw useful conclusions not only about the individual case analyzed in a case study, but also about the rest of the population, the selection of the cases to be analyzed is crucial. The following four principal case selection strategies can be employed (Flyvbjerg, 2006):

1. The selection of ***extreme cases*** serves the purpose of obtaining information on unusual cases, for example cases that are expected to be particularly "good" or "bad" for society.
2. If ***maximum variation cases*** are selected, the goal is to obtain information on the effect of certain circumstances on the process and outcome of the cases. The cases are selected such

that they differ strongly with regard to one or more properties, so that clear differences can be observed. From such extremes (e.g., comparison of a particularly big and a particularly small farm) inferences can also be made about cases that lie in between.

3. ***Critical cases*** are cases that allow logical deductions of the kind "if something is or is not true in this particular case then it is or is not true for all cases". For example, the inference can be of the kind "if an exceptionally large farm cannot use a certain technology profitably (thanks to economies of scale), then other farms (of more common sizes) cannot either".
4. For the sake of completeness ***paradigmatic cases*** should also be mentioned. They aim "*to develop a metaphor or establish a school for the domain that the case concerns*" (Flyvbjerg, 2006, p. 230) and are not relevant in the context of this thesis.

A single case can fulfill several of these criteria. In principle a case can be extreme, maximum variation, critical, and paradigmatic at the same time. In the following the key criteria that define the typical farms to be analyzed in the context of this thesis are considered one by one, and the concrete case selection strategy for each criterion is derived.

Organizational forms

The first case selection that needs to be made is that of the organizational forms that are included in the analysis. As has been shown in Chapter 2.4, arable producers in Ukraine can be grouped in four categories based on the official classification and literature:

1. Households
2. Private farms
3. Independent agricultural enterprises
4. Agriholdings

However, this classification has the disadvantage that it does not reflect differences between farms especially in the *independent agricultural enterprises* group that are very important in the context of structural change in Ukraine. As has been pointed out in Chapter 2.2, most of the successors of the former kolkhozes and sovkhozes are in dire economic straits. They are caught in a vicious circle in which they have little access to capital and know-how and this again prevents them from the necessary restructuring to get that access.

The exit path from this vicious circle for many of these businesses lies in being taken over by investors. Consequentially, taking over financially weak collective farms is the main expansion path of agriholdings. Sometimes they are also taken over by investors that follow the more traditional approach of running a farm as a single business. In that case they either manage the farm themselves as an owner-manager or they install an employed farm manager. In any case the

new management is more business-oriented[18] and investors bring in money. Some kolkhoz/sovkhoz successor farms also manage to restructure of their own power. In all cases a restructured independent farm comes into being, which is in strong contrast to its unrestructured collective counterparts.

In order to come to meaningful conclusions with regard to structural change in Ukrainian arable farming, it is important to account for this difference. Therefore in the following a new classification scheme is applied, in which the following segments are distinguished: (1) households, (2) small family farms, (3) unrestructured collective farms, (4) restructured independent farms, and (5) agriholdings. They are subsequently briefly explained and cases are selected:

Households still have a substantial market share in livestock products, as well as fruits, vegetables, and potatoes. They also play a role in broadacre arable production. However, in the longer run it can be expected that their importance, especially in broadacre arable production, will decline with continuing economic development (cf. Chapter 2.4). This organizational form is therefore not included in the analysis.

Small family farms constitute the vast majority of private farms by legal form (cf. Chapter 2.4). This farm type so far did not play a big role in modern Ukrainian agriculture. They only account for 5 % of Ukraine's agricultural output and their development perspectives are often limited. On the other hand, if such a farm manages to grow to a size comparable to the two (typically considerably larger) subsequent farm types, it must also have an effective and business-oriented management, sufficient finance, and employed labor. Its characteristics are therefore similar to those of restructured former kolkhozes/sovkhozes and it is counted as *restructured independent farm* (cf. below). Therefore, small family farms are also not included in the analysis.

As has been pointed out above, most ***unrestructured collective farms*** are struggling for survival and they are rapidly being replaced by agriholdings or restructured independent farms. Hence, as this farm type is losing importance, the organizational form is also not included in the analysis.

When the competition on the land market increases, it can therefore be expected to take place primarily between *restructured independent farms* and *agriholdings.*[19] These two are likely to be the dominating organizational forms in broadacre arable farming in Ukraine in the future. Therefore these two organizational forms are included in the empirical part of the thesis.

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[18] One aspect is that at unrestructured kolkhoz/sovkhoz successor farms the management is traditionally elected, which reduces the incentive of the management to implement painful changes (cf. Chapter 2.2).

[19] This deduced trend cannot be substantiated with statistical figures because the restructured independent commercial farms and Independent Collective Farms cannot be distinguished in statistics.

Farm sizes

After the relevant organizational forms have been determined, the sizes of the typical farms need to be fixed.

While an independent farm consists only of its single operative location, an agriholding has multiple farms under the roof of a central organization. In this situation, two kinds of size effects are conceivable:

1. There are advantages (and possibly disadvantages) of size that can be realized at a sufficiently large individual operation, i.e., at an independent farm or a farm within an agriholding. For example, when the biggest currently available machines are fully working to capacity at individual farms, or when the same holds true for managers at the farm level, the advantages of size at the farm level in the respective aspects are fully utilized. Conversely disadvantages might arise, for example, if the operation becomes too big and the farm manager loses overview.
2. There are also potential advantages (and possibly disadvantages) of size that can only be realized with the additional structures of the agriholding. For example, it may be possible to increase the utilization of machines if they are used at different geographic locations with different time windows for certain fieldwork operations. On the other hand, disadvantages may arise if, for example, long management chains in the holding structures cause inefficiencies.

It is therefore an aim of the empirical analyses in this thesis to capture both the effects of size at the farm level and at the holding level. The key advantage of this is that it becomes possible to differentiate between advantages of size that only agriholdings can achieve and those that independent farms can also achieve if they grow to a sufficient size.

Hence, two farm sizes will be analyzed: (1) the most important farm size in the current farm size spectrum, i.e., the farm size that represents the most hectares under production in Ukraine; and (2) a farm size at the upper end of the spectrum of independent farms in Ukraine that realistically captures most of the economies of scale that can be achieved at the farm level.

The reference unit of the empirical analysis is the farm. This applies also in the case of the agriholding, where the typical farms get their share of the roof organization's costs allocated as overheads. If it is realistic that agriholding member farms also appear in both of the sizes derived above (which will be enquired in the panel process), both farm sizes will be analyzed in the form of agriholding members *and* independent operations. Hence, four typical farms will be established: a small and a large independent farm, as well as a small and a large agriholding member farm.

The selection of the smaller farm sizes reflects their particular relevance: they currently represent most of the production in Ukraine. The large farm size represents a *critical case*, because it

reflects all (or at least most) of the advantages of size that can be achieved by independent farms. Hence, the conclusion can be made that “if this farm is not competitive against an agriholding, smaller farms are not either”. Caveat: There may be other aspects that make smaller independent farms more competitive than very large ones. Those will be enquired in the modified panel process.

Agriholding size

After the sizes of the farms to be analyzed (independent farms and agriholding members) are derived, it is also necessary to determine the size of the agriholding (i.e., the organization including all the individual farming operations) of which the typical agriholding farms are members.

The agriholding size analyzed should be at the upper end of the spectrum in order to gain as much insight as possible into the advantages and disadvantages of size at the holding level. This has the case selection character of a *critical case*: If the largest currently operating agriholdings do not have advantages in certain fields (such as purchases and sales terms), it can be reasonably expected that smaller agriholdings do not either. Further, it is a *maximum variation case*. The agriholding is much larger than the independent farms and inferences for operations with sizes in between the two can be drawn. Finally, this also has the character of an *extreme case*: These “agricultural giants” are relatively new and they have substantial potential implications on rural development, employment, agricultural markets, and other areas. They are therefore under critical scrutiny by the public and information on their competitiveness is of particular interest to society.

Other factors

Finally, a number of other factors need to be accounted for:

- Other than when the aim is to compare the competitiveness of regions or countries, the region in which the typical farms are located in this analysis is not very important. It is only important that (1) all the typical farms are in the same region, (2) the region is homogeneous, (3) both organizational forms play a role there, and (4) the region should be a relevant broadacre arable production region in Ukraine.
- The management performance of the typical farms should represent an average of the respective organizational form.
- Other features of the typical farms, such as production systems, mechanization, labor endowment, etc. should represent the prevailing structures.

3.2 Derivation of research hypotheses on determinants of competitiveness

The aim of this Chapter is to derive research hypotheses about competitive advantages and disadvantages of agriholdings in comparison to independent farms. These hypotheses are thereafter utilized in the modified panel process as a basis for targeted enquiry about current competitive advantages and disadvantages of the organizational forms, and likely future adaptations to maintain or increase their competitiveness. In the derivation of hypotheses, no differentiation will be made between small and large independent farms. It will rather be evaluated in the subsequent empirical part which potential competitive advantages of agriholdings can also be achieved by sufficiently large independent farms.

The question of competitive advantages and disadvantages of the two organizational forms boils down to the issue of optimal farm size. However, agriholdings are not merely scaled-up individual farming operations but have additional organizational structures. Therefore, while the theory of optimal farm size within the boundaries of traditional farms has been treated in Isermeyer (1993), a more comprehensive approach is necessary for this thesis. A suitable methodological framework for this purpose is New Institutional Economics, an interdisciplinary scientific perspective in which the interplay between institutions (“rules of the game”; North 1990), organizations, and factor allocation within the organizations is analyzed. In this framework, the evolution of the two organizational forms, agriholding and independent farm, is regarded as two different adaptations to Ukraine’s institutional environment.

Subsequently the basics of New Institutional Economics and of Transaction Cost Economics, an important sub-discipline of the former that is important for the analysis, are reviewed. As theory here is purely instrumental for deriving hypotheses on competitive strengths and weaknesses of the two organizational forms, it is only elaborated as far as necessary for this purpose.

3.2.1 New Institutional Economics as a theoretical framework

Often New Institutional Economics are used descriptively to explain the evolution of institutions and organizations, or normatively to determine how institutions should be reformed (North, 1993; ISNIE, 2012). In this thesis the institutional environment in Ukraine and the two organizational forms agriholding and independent farm are taken as givens and potential competitive advantages and disadvantages in that situation are derived using the theoretic insights provided by New Institutional Economics.

3.2.1.1 The four levels of social analysis

New Institutional Economics regard economic activity as being guided by institutions – "rules of the game" that govern and restrict human interaction (North, 1990). Economic and social activity therein is structured in four levels of social analysis. They include two levels of institutions ("rules of the game"), one of organizations (esp. firms), and one of resource allocation and employment (the constant optimization processes of factor use within organizations).

1. The first level is that of embedded institutions. They are informal "rules of the game", such as sanctions, taboos, customs, traditions, norms, codes of conduct, or religion that people in a society adhere to often without reflection. They change very slowly and are mostly treated as givens by economists (Williamson, 2000).
2. The second level is that of formal institutions. They are formal "rules of the game", most importantly the polity, judiciary, and bureaucracy of a government. Formal institutions are made by people. Hence, they are also influenced by embedded institutions (Williamson, 2000). As they set the playing field for economic actors, it is important to bear in mind – especially in an environment where corruption may play a role – that their consequences for the former are not limited to what is written on paper. Certainly the way rules are construed and enforced – or not – matters.
3. Third is the level of governance. At the governance level organizations are located, "*groups of individuals bound together by some common purpose to achieve certain objectives*" (North, 1993). Most important in the context of this thesis are firms, organizations that aim at making a profit.[20] Different organizational setups are the result of an optimization process under the constraints set by embedded and formal institutions (Williamson, 2000). Agriholdings and independent farms are therefore seen as two different adaptations to the institutional environment in Ukraine. In Transaction Cost Economics, the key theory at this level, different organizational forms are seen as different solutions to the task of minimizing transaction costs.
4. The fourth level finally is the level of resource allocation and their employment. At this level the constant adjustment of production factor use in everyday economic activity takes place (Williamson, 2000). Resource allocation is directly influenced by the organizations of governance. For example, large agriholdings are likely to employ other machines than small independent farms. It is, however, also influenced by formal institutions (e.g., legal restrictions of pesticide use), as well as embedded institutions (e.g., subjective preferences of certain arable production systems).

Potential determinants of competitiveness of the two organizational forms are found at each of those four levels. Therefore each level will be analyzed step-by-step and hypotheses derived systematically. Before that can be accomplished, however, a brief review of transaction cost

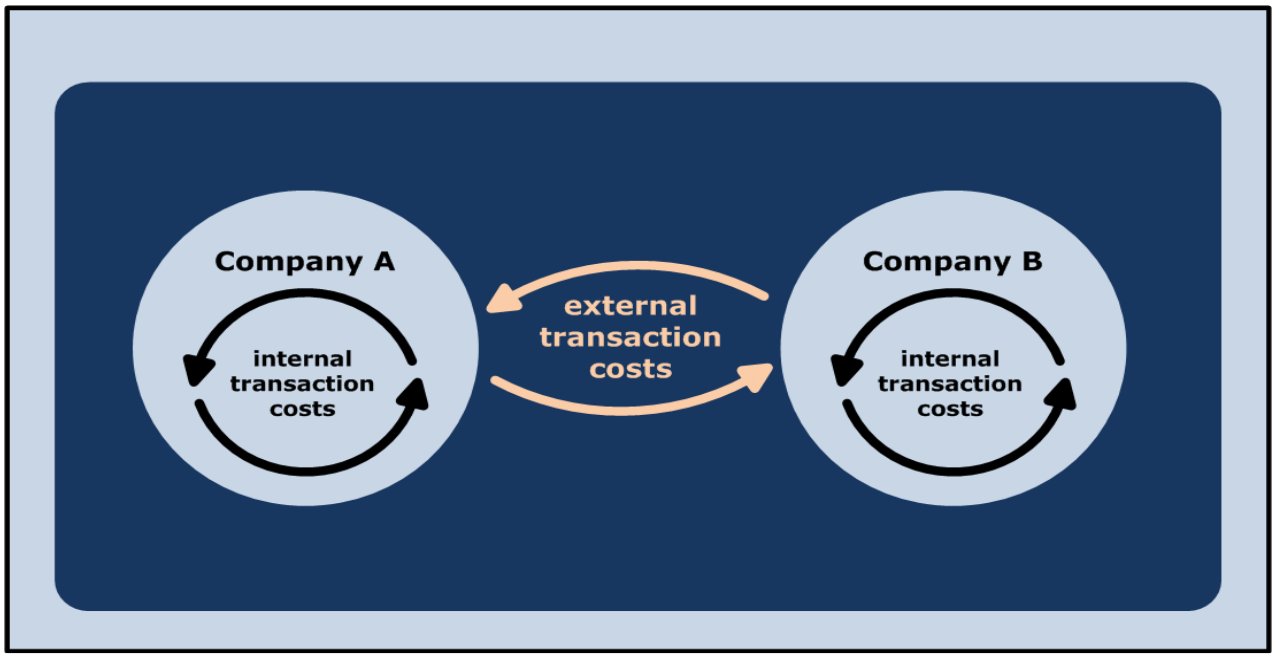
[20] Besides firms as examples of economic bodies which are analyzed here, organizations also comprise political bodies (e.g., parties), social bodies (e.g., clubs), and educational bodies (e.g., schools) (North, 1993).

economics is necessary. The ability of businesses to minimize transaction costs is the most important factor influencing potential competitive advantages and disadvantages at the governance level. As has been shown in Chapter 2.3, most authors explain the development of agriholdings with their ability to economize on transaction costs, which underscores their importance. The outcome of this review will be a set of criteria according to which transactions of the two organizational forms are subsequently analyzed in order to determine their respective competitive advantages and disadvantages.

3.2.1.2 Transaction cost economics

The cornerstone of transaction cost economics has been laid by Ronald Coase in 1937 with his essay *The Nature of the Firm* in which he first explained market ordering and hierarchic ordering within a firm as different means to the same end – organizing transactions. The term 'transaction' in this context should be understood in a very comprehensive manner. It can, for instance, refer to a transfer of grain, but also the transfer of the labor of a person. Both could be pure market transactions in which the grain would be traded between two firms and the labor would be traded between a freelance worker and a firm. A market price determined by supply and demand would be paid. They could, on the other hand, also be conducted in a hierarchical setting. In the case of grain, that would mean the grain is transferred within a firm, e.g., from an arable to a livestock enterprise. In the case of labor, the person would be in permanent employment. As illustrated in Figure 3.2, both internal and external transactions incur costs, and it is an entrepreneurial optimization problem to economize them by finding the optimal organization.

Figure 3.2: Internal (hierarchic) and external (market) transaction costs



Source: Wikimedia 2012, modified.

The fundamental cause of most transaction costs – internal or external – lies in two characteristics of human behavior:

1. In traditional economics it is often assumed that humans act rationally. In reality, however, this is normally not (fully) the case. Even if they intend to do so, the limited cognitive capacity of the human mind prevents full rationality and leads to **bounded rationality** (Williamson, 2000).
2. Humans often do not act strictly according to the rules imposed on them, and they often do not honestly state their preferences. Rather, they exploit information asymmetries with more or less subtle forms of deceit. This includes, but is not limited to, guile, lies, concealment of facts, or stating distorted preferences. This behavior is called **opportunism** (Williamson, 1985, 2000).

Subsequently now the concrete determinants of internal and external transaction costs are expounded. **Internal transaction** costs take two forms:

Firstly they are reflected in costs directly attributable to the **structures** that are needed to organize internal transactions, such the cost of offices, salaries, controlling systems, etc.

Secondly, costs from **inefficiencies** arise when people either unintentionally or deliberately act in a way that is suboptimal for the business. Such costs cannot be measured directly, because it is not possible to know how the business would perform if everything were “perfect” (i.e., without the effects of opportunism and bounded rationality). However, the difference between two businesses with regard to such inefficiencies will show up as a difference in the businesses’ economic performance.

The dependence of this second type of internal transaction costs on firm size is ambivalent. There are factors that tend to increase them with increasing firm size and ones that tend to reduce them. The following factors tend to increase internal transaction costs when firm size increases:

1. Bounded rationality can lead to coordination and friction losses in the management of a firm even if everyone has the best intentions. Individuals do not have the overview of all the consequences their actions have on the business as a whole. In larger operations those losses tend to increase because the larger an operation gets the less overview the individual has (Isermeyer, 1993).
2. Free rider behavior and more severe results of opportunism, such as theft, fraud and deceit, often play a role. These problems tend to become more difficult to control in larger businesses where the effect of the individual employee’s actions on the company’s bottom line – and thereby on the employee’s own salary or likelihood of unemployment – is weaker than in smaller businesses and becomes more difficult to control. Opportunistic behavior then potentially goes unsanctioned and excellence on the job unrewarded because the management does not realize these due to the increasing complexity of larger businesses. This decreases the incentive to the individual employee to put in particular effort and creates

a temptation to gradually reduce his productivity and increasingly work into his own pocket (Isermeyer, 1993).

Apart from these factors that tend to increase the inefficiencies in larger businesses, there are also factors that tend to have the opposite effect:

1. Like all persons, farm managers are subject to bounded rationality. If in smaller companies management is in the hands of a very small number of persons, or even a single owner-manager, and this person does not have to justify his or her decisions to someone else capable of judging them, this can lead to a degradation of the quality of decision making. When more persons are involved in the decision making process the individuals have to justify their decisions to others. This process can reveal shortcomings of the respective suggestions which then can possibly be overcome when the ideas of the fellow decision makers are incorporated. Therefore the involvement of more persons has the potential to decrease management deficiencies by mutual control (Isermeyer, 1993).
2. External control tends to have the same effect as mutual control. As Isermeyer (1993) points out, it is quite possible in smaller businesses, where the owner is typically the manager, that an inept farmer mismanages his business until its assets are utterly spent. In larger enterprises the (employed) management is typically monitored externally and can more easily be replaced in case it does not perform as desired. Individual managers out of several are often more easily exchanged than a single farm manager who has a knowledge monopoly.

So summarizing the effect of firm size on internal transaction costs, it can be concluded that the dependence is ambivalent – there is no unidirectional effect of firm size.

Like internal transactions, **external (=market) transactions** also incur costs, some of which arise ex ante and some of which arise ex post (Williamson, 1985):

Ex ante they incur costs for information gathering, drafting a contract, and negotiating as well as safeguarding an agreement.

Ex post, costs can arise (1) if the contract partner does not fulfill an agreement, or not according to the agreed terms. Moreover, (2) if bilateral ex post realignments have to be made, haggling costs arise. Often dispute settlement is not referred to courts but to other governance structures which (3) incur costs; and (4) when collateral has to be bonded in order to secure commitments, costs are incurred, too.

While the fundamental causes of these external transaction costs are also opportunism and bounded rationality, the magnitude at which they arise in a particular transaction depends on the properties and the environment of this transaction (Beckmann, 2000).

The key **properties of transactions** are (1) asset specificity, (2) uncertainty, and (3) frequency (Williamson, 1985).

1. The first property of a transaction is its **asset specificity**. When longer term investments highly specific to the requirements of a particular cooperation have to be made by one party to the transaction, the investment is called asset specific. This party then has a strong incentive to keep up the cooperation because if problems come up, just ending the cooperation would be a very unfavorable option due to sunk costs (Williamson, 1985). Asset specificity ceteris paribus becomes a bigger problem when contract enforcement does not work well in a country. When vertical integration is under consideration, higher asset specificity ceteris paribus leads to a higher relative advantage of it. When on the other hand the organizational forms are given (which they are in this analysis), one of them has potential competitive advantages when it is able to reduce the costs of asset specific transactions by providing safeguards that the other cannot.
2. The second property of transactions is **uncertainty**. Beckmann (2000, p. 59) considers uncertainty to be *"the central problem in executing transactions".*[21] If there was no uncertainty, transactions could be entirely planned ex ante. All necessary details would be stipulated on what would have to be done or delivered when and how. There would be no surprises ex post. When on the other hand there is uncertainty, ex post adaptations to a contract become necessary and a sequential decision finding process is required (Beckmann, 2000). Again when vertical integration is an option, higher uncertainty ceteris paribus leads to a higher relative advantage of vertical integration. With the organizational forms given in this analysis, one can have a competitive advantage when it has means to reduce uncertainty that the other does not.
3. The third key property of transactions is the **frequency** with which the transaction is conducted. While this is an important criterion when the relative advantage of vertical integration is in question[22], it is not relevant for this analysis in which the two organizational forms are given.

With this the review of the basics of transaction cost theory – as far as required for the purposes of the subsequent analysis – is complete. This information is used below to derive hypotheses on competitive advantages and disadvantages of the two organizational forms at the governance level.

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[21] Translation from German into English by the author.

[22] Frequency has an influence on the setup costs of a transaction because the more often a transaction is conducted with the same contract the smaller the share of the setup costs becomes that is associated with the individual transaction (Beckmann, 2000). This has an influence on the optimum form of contract as hierarchic forms with high ex-ante setup costs are not efficient when the corresponding transactions occur only once or few times (Williamson, 1985).

3.2.2 Derivation of hypotheses at the four levels of social analysis

Now at each of the four levels of social analysis, potential competitive advantages and disadvantages of agriholdings and independent farms are theoretically derived. It is important to understand that it is sometimes ambiguous at which level a certain effect is caused because of the interconnectedness of the four levels. In such a situation, the respective effect is treated at the level which seemed the most appropriate. However, some minor overlaps still do occur.

It is also important to note that only competitive advantages and disadvantages of the two organizational forms in arable farming are part of this analysis. As vertical integration is not part of the research subject, its effects are *not* analyzed here.

3.2.2.1 Embedded level

At the embedded level, it is conceivable that managers at agriholdings are more business-minded than at independent farms, thereby giving the former an advantage such as Hockmann et al. (2005, cf. Chapter 2.3) suggested. However, their explanation pertains to the mental models of managers at agriholdings and unrestructured collective farms. In this thesis, restructured independent farms are analyzed in comparison with agriholdings (cf. Chapter 3.1.5.2). Business-oriented managers were necessary to restructure these independent farms in the first place. Hence, no difference between the organizational forms is expected with respect to the business-orientation of management.

However, embedded institutions could have an influence if Ukrainian workers are uncomfortable assuming responsibility and prefer to do what they are told, and Ukrainian managers conversely have an aversion to delegating responsibility and prefer to give orders. This could be concluded from the findings in literature on embedded institutions reviewed in Chapter 2.3. In such a case agriholdings would potentially be a better “fit” than independent farms for people in Ukraine, and workers as well as managers would both potentially identify more with, and perform better at, that organizational form.

3.2.2.2 Formal institutions level

With formal institutions being the formal “rules of the game”, they can obviously have a considerable influence on the competitiveness of different organizational forms. A number of factors pointed out in the literature review (Chapter 2.3, “explanations of agriholdings as a result of market failure”) are effects that originate from the formal institutions level, but have an indirect effect at the governance level. For example, the inadequacy of contract enforcing institutions leads to high transaction costs. Such factors are treated at the governance level.

However, formal institutions can certainly also influence the competitiveness of agriholdings and independent farms directly. One of the two organizational forms could officially and legally enjoy preferential treatment in taxation, regulations, subsidies, and other policy matters. This would also be a result of legal and official lobbying. Given the indications from the literature review (cf. Chapter 2.3), the hypothesis is that agriholdings have this advantage over independent farms.

Moreover, one of the two organizational forms could have an advantage in an environment where corruption may play a role thanks to having a better ability to manipulate political decision makers, law enforcement officers, and other persons representing formal institutions in their favor. This could be through bribes, political deals, nepotism, coercion, and other "unofficial" means. Given the evidence from the literature review (cf. Chapter 2.3), the hypothesis is that also in this respect agriholdings enjoy an advantage over individual farms.

3.2.2.3 Governance level

At the governance level, deriving hypotheses is less straightforward than at the first two levels. Competitive advantages and disadvantages of the two organizational forms at this level stem from their different abilities to minimize internal and external transaction costs, as well as to otherwise achieve better terms in external transactions. These abilities are subsequently analyzed.

Internal transaction costs

As has been shown in Chapter 3.2.1.2, internal transaction costs arise (1) from the establishment and maintenance of governance structures (offices, salaries, controlling…) and (2) from inefficiencies of the internal management processes.

Regarding the costs of governance structures, agriholdings with their central organization have an additional level of management. Therefore they have overhead costs which the independent farms do not have.

Regarding the inefficiencies of internal management processes, it has been argued in the same chapter that there are factors that tend to decrease negative effects and ones that tend to increase them. It can be expected that there is an optimal business size up to which the net negative effects of opportunism and bounded rationality on internal transaction costs decrease and beyond it increase again. The hypothesis is that large agriholdings in Ukraine are beyond that optimum. Hence, management is expected to be less efficient and losses from theft, fraud and corruption are expected to be higher at the agriholding than at independent farms.

Important external transactions

External transaction costs depend on the properties and the environment of the respective transactions. Therefore the key transactions (those which account for significant turnover) are analyzed below with regard to those determinants.

Independent farms and (not vertically integrated) agriholdings in Ukrainian arable farming basically conduct the same external transactions, which are summarized in Table 3.2:

Table 3.2: Important external transactions of Ukrainian arable producers

Type	Category	Clarifications and examples
Inputs	Variable physical inputs	Fertilizer, seeds, pesticides, etc.
	Fixed physical assets	Mainly machines, buildings
	Finance	Loans (bank, supplier, buyer credit), equity (direct investments, stock capital)
	Land	(Currently only) rented
	Labor	Managers, workers, owner-managers possible at independent farms
	Hedging tools	For inputs and esp. outputs. Example: forward contracts
Outputs	Arable commodities	Wheat, maize, soybeans, etc.

Note: "Arable producers" comprise both agriholdings and independent farms. "Important" transactions are transactions which account for a substantial share of costs and revenues.

Source: Own compilation.

Both organizational forms buy physical inputs in the forms of variable inputs (fertilizer, seeds, pesticides, etc.) and fixed assets (esp. machines, buildings). Finance is brought into the business in the form of short and long term bank loans, as well as supplier or buyer credit. Equity capital can also be brought in, either by attracting direct investments or by placing stocks at the stock exchange.

Land is (currently only) rented. Labor is hired in the form of managers and workers. In the case of independent farms, it is also possible that labor input is provided by an owner-manager and his family, although most commercial farms in Ukraine of the sizes analyzed in this thesis have employed management.

Hedging tools are utilized to manage price risks, possibly on the input and more importantly on the output side. They are analyzed as separate transactions because their properties differ from spot market transactions. Forward contracts constitute the most common hedging tool.

On the output side both organizational forms sell mainly their arable commodities.

There are more external transactions yet, such as purchases of information (especially market information) and services (most importantly advisory services and custom work), or sales of services (custom work). However, they typically account for a relatively small share of costs and revenues and are therefore not analyzed in detail.

Factors influencing external transaction costs

The transactions reviewed above are now analyzed systematically for potential competitive advantages of agriholdings and independent farms with regard to transaction costs. This is accomplished by going through the pertinent criteria – asset specificity and uncertainty – and analyzing where competitive advantages or disadvantages of the two organizational forms can be expected.[23] Regarding the other factor that influences transaction cost, the transaction environment, it can be expected that the difficult conditions in Ukraine raise the total level of transaction costs, thereby increasing the advantage of the organizational form which has better means to minimize them.

Asset specificity

Asset specificity exists when longer term contracts are made on the fulfillment of which (at least) one of the two sides of the transaction depends. It is particularly high in financial transactions, because the provider of loans depends on the re-payment of debt and interest. To reduce the creditor's risk, collateral is often bonded as a safeguard. While in many countries land serves as collateral, this is currently not possible in Ukraine because agricultural land cannot be traded. The creditor's risk is further increased by the low efficacy of contract enforcement through courts in Ukraine (cf. Chapter 2.3).

In this setting, agriholdings may have an advantage when reputation effects work as a contractual safeguard. It is conceivable that because of their size and public presence, large agriholdings cannot "afford" to break contracts because that would damage their reputation, causing negative repercussions on future deals. Independent farms, on the other hand, are less widely known and "misbehavior" is less likely to become known by other potential business partners. Such reputation effects can be expected to be particularly strong when an agriholding intends to do an IPO[24] in the future, or when its shares are already being traded on the stock market. Therefore reputation effects might act as a safeguard for the contract partners of agriholdings, thereby affording them better and cheaper access to capital.

Doing an IPO, as mentioned above, is an example of how an agriholding could further be able to reduce its dependence on loans by attracting equity capital that would not be accessible to independent farms. Conceivable options are either (a) agriholdings tapping equity sources like

[23] The analysis is structured by criteria, not by transactions. While structuring by transactions might have been somewhat more straightforward logically, this would have caused more repetitions in the text and thus made this part unduly long.

[24] Initial public offering (=stock market launch)

stock markets or investment funds, or (b) companies from outside the primary sector using their funds and investing directly in arable farming.

Asset specificity is likewise a problem when tools are utilized to hedge against price risks in variable inputs and outputs, e.g., forward contracts. Reputation effects here could give agriholdings an advantage for the same reasons as in financial transactions. Other than in those, however, a breached contract could also be to the other party's advantage, depending on the development of market prices. In such a situation agriholdings can potentially employ large specialized departments, including legal departments, which can be expected to increase the agriholdings likelihood of success in case of a dispute. Further, if the agriholding has good contacts to the administration, it may have means to exert pressure on contract partners that independent farms do not, thus also increasing their odds of success. This gives agriholdings a potential competitive advantage in asset-specific transactions also when contract breaches would be to the agriholdings disadvantage.

In the case of land rental contracts, there is also asset specificity. When land is rented in longer term contracts, the arable business depends on the landowners' fulfillment of the contract (i.e., them not giving the land to someone else). This is particularly relevant when longer term investments in the land, such as soil melioration, raising nutrient levels, and weed extermination, are made by the tenant. Further, it is important for an arable farming business when a favorable rental rate has been contractually secured for a long term. In such a situation agriholdings may likewise have a competitive advantage because they can better safeguard their contracts. Conversely, the landowners also depend on the fulfillment of the contractual obligations of their renters (payments, social services, etc.), and reputation effects can again give agriholdings an advantage.

In the remaining transactions of inputs and outputs, asset specificity is mostly low and hence, little or no advantage of agriholdings is expected with regard to this criterion.

Uncertainty

The next determinant of transaction costs to be analyzed is uncertainty. Uncertainty is particularly problematic in conjunction with asset specificity, a combination which exists in financial transactions: The creditor or investor not only depends on the borrower to pay back his debt and interest, he also lacks information about the borrower and his business which could provide hints on the risk of default. In such a situation, a creditor will increase the interest of the loan as a risk allowance, or he will not offer a loan (or investment) at all. As has been shown in Chapter 3.1.2.2, the standard Ukrainian accounting system is not expected to be very suited for judging the performance of a business and thus probably does little to decrease the uncertainty problem.

In this situation agriholdings potentially have an advantage because thanks to their size they may be able to install measures to reduce the creditors' or investors' uncertainty that would not be feasible for independent farms. Examples for such measures could be the establishment of international accounting systems or external auditing programs. Further, when an agriholding

plans to do an IPO, or has already done so, it faces the disclosure rules for publicly traded companies which potentially further strongly decrease the information asymmetry between the business and its creditors and investors. With these disclosure rules, potential lenders or investors have a good means to review the business' "track record", which helps them estimate their risk.

When an arable producer intends to utilize hedging tools, for example forward contracts, the same combination of asset specificity and uncertainty as in financial transactions applies. Hence agriholdings are likely to have comparable advantages also on this market.

Uncertainty further also plays a considerable role in market transactions of physical inputs and outputs. The input sellers and output buyers are traditionally much more concentrated than primary agriculture, which leads to an information asymmetry about markets to the disadvantage of the primary producers. In Ukraine this is compounded by a lack of available market information that could be purchased or otherwise obtained by producers. Agricultural advisors who provide the respective information are also very scarce (cf. Chapter 3.1.4.2). In this situation agriholdings potentially have advantages from specialization and economies of scale which affect transaction costs: They can employ specialized persons or even departments for purchasing inputs and selling outputs. Further, they can afford to pay higher absolute sums for market information. Thus the agriholdings potentially have better means to decrease the information asymmetry than independent farms, giving them a potential advantage in purchase and sales terms in comparison to the latter.

In output transactions, uncertainty also plays a role when products need to meet environmental, quality, and other standards. When the uncertainty of the buyer with regard to these properties is reduced by effective product quality management programs, environmental certification systems, etc., a business can potentially achieve higher prices, or access markets that would otherwise be inaccessible. Thanks to their size, agriholdings are potentially able to install such systems that would not be feasible for independent farms. It is likely that in an agricultural sector where *"the system of quality and safety of production is, by common consent, one of the weakest points"* (Lapa et al., 2010, p. 5), an organizational form that can offer solutions to these problems has a particular advantage.

As can be seen, agriholdings potentially have means to decrease transaction costs in various external transactions, which potentially yields them more favorable transaction terms and possibly access to markets which independent farms cannot access. Apart from transaction costs, there are also other factors that influence the terms an arable farming business can achieve in market transactions. These factors are analyzed next.

Other factors influencing terms of external transactions

Bias of potential other parties

The first factor is the subjective bias of the potential other party to a transaction. It describes an "irrational" preference to do business with one of the two organizational forms, irrespective of the "objective" terms of the transaction (especially price) as a result of embedded institutions.

Hence, bias could lead a party to a transaction to forego welfare to the benefit of one of the two organizational forms and to the detriment of the other.

In the case of commercial input suppliers and output buyers, such a bias appears rather unlikely. On the other hand, judging by the experience in Western countries, a bias is conceivable on the land and labor markets. Landowners (i.e., mostly the rural population) and general workers in Ukraine, however, tend to be relatively poor and consequently probably do not have much room for subjective preferences. Managers, on the other hand, have more freedom to be biased in their decision on who to work for with their higher incomes. They may even be willing to accept lower payment than at the other organizational form. Given the findings in literature on embedded institutions shown in Chapter 2.3, the hypothesis is that Ukrainian managers have a preference for working at agriholdings and the organizational form therefore has better access to managers than independent farms.

Suppression of competition

The next factor that can influence the transaction terms of arable businesses is the suppression of competition. Firstly, competition is suppressed when a party to a transaction has monopoly power.[25] In such a situation the monopolistic party is able to get a more favorable price in a transaction than under market conditions with more bidders. Such effects can be expected especially when individual agriholdings are strongly concentrated in certain regions and dominate local and regional markets. At the national level it is unlikely that now or in the near future a level of concentration will be reached that leads to monopoly rents for agriholdings. Hence, if monopoly power plays a role it is probably at the inherently local land market and possibly in local and regional product markets. In the market for workers the same is conceivable, while managers are probably more mobile.

Secondly, competition can be suppressed when agriholdings use their “financial power” to push independent farms out of markets.[26] This can happen when the two organizational forms compete locally for a scarce factor that is critical for production, namely land. The agriholding could locally pay higher prices for this critical factor until the competitor has been driven out of the market. Thereafter the respective agriholding has a local monopoly and can re-adjust prices in its favor. The same is conceivable for workers again, while managers again are probably more mobile.

Large volume advantage

Another factor that can lead to better transaction terms for agriholdings in comparison to independent farms is the advantage the former have from the large volumes they turn over in

[25] Strictly speaking such market power can arise from oligopoly, monopoly, oligopsony, or monopsony. For the sake of simplicity in the text only reference to “monopoly” is made but all the above is meant.

[26] This is part of what is generally referred to as “market power”. The term is defined by Khanna and Yafeh (2007) as restriction of competition by using financial endurance, influence on political decision makers, and utilizing first-mover advantage.

input purchases and output sales. This can lead to them having a price advantage for the following reasons: On the one hand, both parties to the deal have economies of scale. One large deal incurs lower costs than the same volume traded in many small deals. On the other hand, an agriholding can potentially capture a larger share of the rents in a transaction because the other party makes greater concessions than it would in smaller deals. For example, if a large agriholding would order all its sugar beet harvesters at one time, this deal could comprise a major share of the (typically small) manufacturer's annual production. In such a situation that manufacturer has a strong incentive to not lose that deal to a competitor.

The large volume advantage can be expected whenever large deals are made with a single party, i.e., in most inputs and outputs except land and labor.

Advantage from skipping intermediaries

Finally, agriholdings have a potential advantage when they can skip intermediaries on which independent farms have to depend, and do business directly with the next stages in the input and output supply chains. An agriholding in this case would have to take over functions that the respective intermediaries had fulfilled before, which would incur costs. For example, when an intermediate grain trader had collected grain from the agriholding's farms before and shipped it to a port terminal, this task would then have to be fulfilled by the agriholding itself. In exchange, however, the intermediary's margins would be saved. This potentially leads to better terms for the agriholding in comparison to independent farms in all transactions which involve intermediaries, i.e., most major transactions except land and labor.

Summary of the hypotheses regarding external transactions

The results of the analyses of the different factors above are summarized in Table 3.3. As can be seen, an advantage of agriholdings is expected in all external transactions, except for workers. The greatest advantage of agriholdings is expected in financial transactions and price hedging tools for inputs and outputs. The reason for this is that both transactions exhibit a high degree of asset specificity and uncertainty, both together leading to a strong increase in transaction cost. Agriholdings have potential advantages over independent farms with regard to both these criteria. The expected better availability of hedging instruments gives agriholdings a potential risk advantage over independent farms.

Table 3.3: Summary of hypotheses – advantages in different transactions and derived competitive position of agriholdings in comparison to independent farms

Transaction	Criteria						Result: Expected competitive position of AH vs. FA
	Asset specificity	Uncer-tainty	Bias	Suppression of competition	Large volume advantage	Skipping retail levels	
Var. physical inputs	0	+	0	0	+	+	+
Fixed physical assets	0	+	0	0	+	+	+
Finance	+	+	0	0	+	+	++
Land	+	0	0	+	0	0	+
Workers	0	0	0	+	0	0	0
Managers	0	0	+	0	0	0	+
Hedging tools	+	+	0	0	+	+	++
Output commodities	0	+	0	+ (locally)	+	+	+

Note: The transactions in the left column were analyzed with regard to the criteria in the middle columns. Derived potential advantages of agriholdings are marked with "+". Where no advantage is expected, "0" is noted. In the right column the expected competitive position of agriholdings relative to independent farms is shown on a scale of "0" (no or little advantage) to "++" (strong advantage). "AH" denotes the organizational form agriholding, "FA" independent farm.

Source: Own considerations.

3.2.2.4 Resource allocation and employment level

The fourth and final level of social analysis in New Institutional Economics is the resource allocation and employment level, at which the constant optimization of factor use within the boundaries of an organization of governance takes place. At this level, agriholdings have potential cost, revenue, and risk advantages, which will be elaborated in the following.

Cost and revenue advantages from higher factor utilization

Thanks to their size, agriholdings have more freedom in their utilization of fixed factors of production.[27] From this arise a number of potential competitive advantages in comparison to independent farms:

1. Producing in larger structures potentially incurs lower costs than doing so in small structures, because unproductive factor use can be lower. In arable farming, this is particularly relevant in fieldwork: When machines work larger fields, the ratio between the time spent actually working and the time spent turning at the headland becomes more favorable (Isermeyer,

[27] The theoretic basics of these issues are elaborated in greater detail in Isermeyer (1993).

1993). This gives agriholdings a potential cost advantage when their farm-level structures are larger than those of independent farms.

2. Many factors of production (most importantly physical and human assets, but also services such as accounting, etc.) incur fixed costs. By increasing their utilization, the average costs of production decrease because the fixed costs are spread over a larger number of units of service provided (e.g., hectares plowed). Agriholdings can potentially achieve higher factor utilization than independent farms thanks to their larger size which gives them a potential cost advantage.
3. The utilization of factors of production can not only be expanded by increasing a business' size ceteris paribus, but also by diversification. If an agriholding is *geographically* diversified, i.e., has operations in multiple locations, it can potentially further increase machinery utilization when the time windows for certain fieldwork operations at the different locations are not identical. The way this could work is that combines start their work at more southerly locations where a crop ripens first and subsequently move north, thus giving agriholdings a potential cost advantage.
4. Similar advantages can be gained from diversifying *production*[28], i.e., increasing the number of crops. For example, adding corn to a business that only grew wheat before would considerably increase the possible utilization of combines because both crops are harvested at different times of the year. Diversification of production, on the other hand, also incurs additional fixed costs (e.g., for a corn header). Therefore less diversification is potentially feasible at independent farms than at agriholdings, giving the latter a potential cost advantage from higher diversification of production.
5. This diversification can further lead to *synergies* which potentially lead to lower costs and higher returns at agriholdings, e.g., when a more diverse crop rotation leads to lower plant protection costs and higher yields.
6. In the case of labor, diversification further has the potential to level work peaks in certain periods, which has the potential to reduce negative impacts on the business' bottom line caused by mistakes made under the impact of stress (Isermeyer, 1993).
7. Larger mechanical factors of production, such as machines or buildings, are often cheaper per unit of service provided than smaller ones. For example, a large tractor typically has a lower price per horsepower than a smaller one.[29] The same relationship typically holds, for example, for grain silos (Isermeyer, 1993). However, to be able to capitalize on that, a business has to be large enough to utilize the respective factor "to capacity". With their size, agriholdings can potentially utilize very large, or even the largest, factors "to capacity", giving them another potential cost advantage.

[28] These are economies of scope (Mecke, 2012; Weber and Vogt, 2012).

[29] For an analysis of the relationship between tractor size and price refer to Appendix 2.

8. The agriholdings' ability to utilize more expensive factors of production "to capacity" further allows them to use factors of production with more favorable properties than independent farms (e.g., tractors with more sophisticated features), or factors that are entirely unfeasible for the latter because of the high fixed cost component (e.g., a sophisticated GPS telematics solution). Both can potentially give agriholdings a cost advantage as well as advantages on the revenue side (e.g., when the better factors lead to higher yields).
9. Indivisible factors of production often have to fulfill multiple purposes in smaller operations because more specialized assets could not be utilized "to capacity" and would thus incur prohibitive costs. A sufficiently large operation, however, can also utilize highly specialized factors of production "to capacity". In the case of staff, this can mean, for example, that at a small farm the manager has to do marketing and sales as one of multiple activities whereas at a large operation specialized persons or whole departments are employed for these activities (Isermeyer, 1993). This can be particularly relevant in a difficult market environment like Ukraine: When advisory services are scarce or unavailable, an agriholding can have a particular advantage from its own in-house experts. When machinery maintenance services are slow and unreliable, an agriholding can have a particular advantage from its own maintenance departments, etc.[30] This gives agriholdings a potential cost and a revenue advantage.[31]
10. In the case of machinery, a larger operation might have dedicated machines for different tillage operations where a smaller farm uses a single multi-purpose implement. The potential result is that the service in question is done more effectively (e.g., better tillage), and/or at lower cost, thus giving agriholdings another potential advantage from factor specialization.
11. In the case of labor, the additional advantage applies that it is more easily possible to take someone off duty for a limited time to allow for professional training, for visiting a conference, or other measures that increase the performance of the person at a larger business with more workers and managers (cf. Isermeyer, 1993). This gives the agriholding potential management advantages (which decrease internal transaction costs at the governance level). It can also have social advantages when it is more easily possible for a person working at an agriholding to take a vacation (Isermeyer, 1993).

Risk advantages from size and diversification

Besides pure cost and revenue advantages, agriholdings also potentially face lower risk:

1. A larger operation can not only use larger and more specialized (human and physical) assets, it also employs a greater number of them. For example, even when the largest available (i.e.,

[30] Strictly speaking it is vertical integration when an in-house department of an agriholding assumes tasks that would otherwise be purchased on markets (such as advisory services). However, the examples mentioned here are still within the delimitation of the research subject made in Chapter 3.1.1.

[31] Some of these issues have an influence at the governance level and have also been referred to there. For example, specialized purchase and marketing departments potentially give agriholdings advantages in transactions.

potentially most cost-efficient) machines are in use, a sufficiently large operation employs several of them. A large operation also employs more staff, and from a certain size onward, key positions are manned with multiple employees. This reduces the risk when a factor becomes unavailable. In the case of machines, this might be a breakdown. In the case of labor or management, this might be disease, invalidity, death, or (unexpected) resignation. If at a larger operation more of the named factors are in use, the remaining ones can potentially partly or fully step in and limit losses (Isermeyer, 1993). Even if this is not possible because the remaining factors are already utilized to full capacity, the relative loss if one factor of production becomes unavailable is smaller when the pool of factors (i.e., the denominator) is larger. For example, when one combine out of ten at a larger operation fails, the capacity is reduced by ten percent. When, on the other hand, the single combine of a small operation fails, all capacity is lost.

2. Further, geographic diversification and diversification of products reduces the risk on the return side. The reason for the former is that weather varies regionally and especially severe adverse events, such as hailstorms, are often local. The reason for the latter is twofold: On the one hand, different crops react differently to weather and other adverse factors (like diseases). On the other hand, the prices of different products are not all closely correlated. As a result, risk (expressed in the cash-flow volatility) of more diversified businesses can be expected to be lower than that of less diversified peers, thus giving agriholdings another potential advantage.

Potential competitive disadvantages of agriholdings at the resource allocation level and conclusion

At first glance there can also be disadvantages at the factor allocation and employment level. Isermeyer (1993) points out the example of large scale livestock production where large production units potentially have a higher risk of animal diseases. In arable farming it could be argued that larger companies have longer distances to travel for fieldwork and haulage. However, this argument does not hold insofar as an agriholding has the freedom to arrange its production in an optimal manner. For example, it can arrange its production using multiple farmyards instead of one should that be preferable for whatever reasons. If it does not arrange its production optimally, the underlying reason is “mismanagement” due to bounded rationality and/or opportunism. Such “mismanagement” is a part of transaction costs which are treated at the governance level.

Hence, at the resource allocation and employment level, agriholdings have only potential advantages.

3.2.2.5 Summary and conclusions

At the **embedded institutions level** potential competitive advantages and disadvantages of the two organizational forms resulting from informal "rules of the game" – mental models acquired in long-term socialization – were analyzed. At this level the following hypothesis has been derived:

- Stemming from their long-term socialization, both Ukrainian workers and managers in Ukraine are more suited to working in larger, hierarchically organized structures than in smaller and less hierarchic ones, identify more with such businesses, and consequently perform better at agriholdings than at independent farms.

At the **formal institutions level** potential competitive advantages and disadvantages of the two organizational forms resulting from formal "rules of the game" – the polity, judiciary, and bureaucracy of Ukraine – were analyzed. At this level the following hypotheses have been derived:

- Agriholdings officially enjoy preferential treatment in taxation, regulations, subsidies, and other policy matters in comparison to independent farms.
- Agriholdings have an advantage because of a better ability to manipulate political decision makers, law enforcement officers, and other persons representing formal institutions in their favor through bribes, political deals, nepotism, coercion, and other "unofficial" means.

At the **governance level** potential competitive advantages and disadvantages of the two organizational forms resulting from factors that influence transaction costs and terms were analyzed.

At this level the following hypotheses have been derived regarding internal transaction costs:

- Agriholdings have overhead costs that independent farms do not have, stemming from their additional roof organization above their arable operations.
- Agriholdings suffer from more inefficiencies than independent farms, which stem from opportunism (theft, fraud, corruption, lack of effort) and bounded rationality (unintentional management shortcomings).

Regarding external transaction terms the following hypotheses have been derived:

- Agriholdings have advantages (better terms and/or access) in all external transactions except workers.
- Agriholdings have particularly strong advantages regarding their access to and cost of capital, as well as input and output price hedging tools, because of their large volumes, potential to skip intermediaries, own specialized departments that decrease information asymmetry, and especially their ability to provide contractual safeguards and measures against uncertainty.

- Their better access to price hedging tools gives agriholdings a risk advantage over independent farms.
- Agriholdings further have access to equity capital that is inaccessible to independent farms (direct investments, stock markets, investment funds).
- They also have advantages in the purchases of physical inputs (variable and assets), mostly thanks to their large volume advantage and their potential to skip intermediaries, as well as their own specialized departments that decrease information asymmetry.
- The same advantages apply for product sales. Additionally agriholdings there have better means to decrease uncertainty on the buyer side with quality management systems, environmental certification, and other means.
- Agriholdings have advantages on the land market, because they have better abilities to safeguard rental contracts, and because they can use their financial power (liquidity) to locally pay higher land rents until competing farms have been pushed out of the market.
- Agriholdings have better access to managers because those have a subjective preference to work at the business model due to embedded institutions.

At the **resource allocation and employment level** factor utilization within the boundaries of the institutions of governance is analyzed. At this level agriholdings have potential revenue and especially cost advantages:

- Producing in large structures potentially leads to higher productive factor utilization (e.g., less turning time on headland).
- An agriholding can utilize larger factors (esp. machines) “to capacity” than an independent farm. Larger factors are usually cheaper per unit of service provided.
- Geographical and product diversification can lead to increased factor utilization, synergies, and in the case of labor, less stress-induced mistakes from work peaks.
- An agriholding has advantages from specialization of human and physical assets, which leads to better results and/or lower costs.
- At an agriholding positions are manned with multiple employees, making it more easily possible to temporarily take someone off-duty to receive training, attend conferences, but also to go on vacation, leading to better work and more motivated employees.

Agriholdings further also have potential risk advantages:

- A larger number of each factor of production (e.g., machines, managers) is in use. This reduces the risk when a factor of production becomes unavailable (machine breakdown, disease, unexpected resignation of staff, etc.).
- Geographic and product diversification reduce risk on the return side.

Conclusion

As can be seen, agriholdings have potential competitive advantages and disadvantages in comparison to independent farms, which do not lead to an unequivocal theoretical conclusion about which organizational form in the end has the higher total competitiveness. While agriholdings potentially enjoy advantages in many fields, their main expected challenge is management. The bottom line competitiveness of the two organizational forms depends on how strong the effect of the respective advantages and disadvantages turns out to be.

Roughly twenty years ago, when no one had yet thought of agriholdings, unusually large farms for the time entered the competitive playing field in Germany with the successors of the former East German cooperatives. At that time, Isermeyer (1993) concluded in a theoretical analysis that "*in the competitive environment of a market economy, a continuously changing spectrum of farm sizes evolves as a result of the conflicting advantages and disadvantages of size*"(Isermeyer, 1993, pp. 2-3).[32]

Little remains to be added to this, except that the following empirical analysis will shed some light on the relative importance of the derived factors.

3.3 Preparation and application of the modified panel process

In this chapter, the preparation and application of the modified panel process is documented. The focus is on technical aspects, i.e., it is clarified what steps were taken by the researcher when and why. The results and their development over the course of the panels, on the other hand, are the subject of the subsequent Chapter 4.

This chapter is structured chronologically according to the sequence of the modified panel process (cf. Chapter 3.1.4.3). The first step was the preparation of the process, which is subsequently described.

[32] Translation from the German language by the author.

3.3.1 Preparation

3.3.1.1 Recruitment of panel participants

As a first step, it was necessary to recruit panel participants. In accordance with the considerations made in Chapter 3.1.4.3, four groups of persons were included in the modified panel process: (1) agriholding managers, (2) independent farm managers, (3) agribusiness representatives, and (4) external scientists and analysts.

Agriholding managers

The agriholding participants were selected by the following criteria:

1. According to the considerations made in Chapter 3.1.5.2, the agriholding population represented in the typical agriholding farms should reflect the upper end of the agriholding size spectrum (by arable land area). Therefore participants were selected who represent businesses of no less than 100,000 ha.[33]
2. As broadacre arable production is the key focus of this research, and vertical integration is not part of it, participants were selected who represent companies which have their main or exclusive focus on this type of production.
3. With regard to organizational structures, the only criterion was that the represented companies have multiple operations under the roof of a central management. The detailed legal setup (e.g., whether the operations are legally independent or consolidated in a single entity) was not important.

It would have been optimal to have participants representing several different agriholdings in the panel process. However, not quite unexpectedly (cf. Chapter 3.1.4.2), it proved the biggest challenge to find agriholding managers to participate. The outcome of the effort was that only a single agriholding could be found that was willing to participate in the study. This agriholding had conducted a project with the author before and therefore a trustful relationship had already been built.

Doing the research with managers of only a single agriholding has the disadvantage that the derived typical agriholding farms can be expected to exhibit some idiosyncrasies of the participating agriholding, even if measures are taken to “typify” the data. Further, the degree of certainty on how the typical farms fit in the total population of the organizational form is somewhat decreased. It is, moreover, possible that the views and opinions of the managers within this agriholding are more similar than those of managers of different agriholdings would be, which somewhat decreases the corrective power of the panel process.

[33] For information regarding the size structures of agriholdings in Ukraine refer to Chapter 2.4.3.

On the other hand, having multiple participants from a single agriholding permits a more comprehensive insight in a business than would be possible if single participants from multiple agriholdings would participate. This can help to increase the consistency and depth of the obtained information, especially given the division of labor in management. Therefore the situation that only managers of one agriholding participated was accepted.

The agriholding has started arable farming in 2007 and is now among the largest (by arable acreage) in Ukraine.[34] It specializes in cash crop production and has farms in all major regions of Ukraine. Livestock production plays a very minor role, with only some existing operations being upheld for mostly social reasons (to avoid layoffs).

The following persons of the agriholding participated in the panel process:

- The CEO.
- The Director of Farming Operations, who decides on the technologies to be used in production and is responsible for machinery acquisition.
- The Director of Agriculture Investments, who also oversees all larger purchases and sales.
- A financial analyst, who has a good overview of quantitative figures.

Independent farm managers

The independent farm participants were selected by the following criteria:

1. As derived in Chapter 3.1.5.2, their businesses represent the organizational form restructured independent farm.[35]
2. It was derived in Chapter 3.1.5.2 that the typical farms to be established should represent (1) the farm size which works most of the arable land in Ukraine, and (2) a very large farm size which can exploit all (or at least most) of the economies of scale at the farm level. Therefore, the independent farm participants were selected to cover a wide range of farm sizes.
3. As in the case of the agriholdings, the selected participants represent companies which have their main or exclusive focus on broadacre arable production.

Four businesses could be recruited ranging in size from 800 to 10,000 ha. They had management structures more akin to Western farms than is the case in agriholdings, with a farm manager who has a broad overview of the whole business. Hence, the general managers of the four businesses were included. In the case of the largest independent farm, specialization in management is more pronounced and therefore the head agronomist of this farm was also included.

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[34] For confidentiality reasons, further details, such as the exact size, are not disclosed.

[35] Other than unrestructured collective farms, restructured independent farms have modern production systems and management. In comparison to the former, they can be considered “westernized”. For further details refer to Chapter 3.1.5.2.

Agribusiness representatives

In accordance with the procedure derived in Chapter 3.1.4.3, one sales manager each of a major agrochemical and a major agricultural machinery manufacturer, as well as a grain trader of a large agricultural commodity trading company were recruited. It was also attempted to include a representative of a major fertilizer manufacturer which, however, remained unsuccessful. To substitute, an advisor specialized on fertilizer markets was recruited.

External scientists and analysts

The aim of including external experts into the panels was to tap the knowledge of persons who have already dealt with the question of competitive advantages and disadvantages of agriholdings and independent farms at a scientific or advisory level. The following persons who fulfill that criterion were found and included:

- An agricultural economist and policy as well as agribusiness advisor
- The general manager of an institution specialized in the transfer of know-how on modern Western production and management systems with long-time firsthand farming experience in KRU
- A scientist who did research on the technical efficiency of Ukrainian farms, as well as various other aspects of Ukrainian farming
- An agricultural advisor who, among other things, specializes in market entry support for agricultural investors, farm strategy consulting, and interim farm management

3.3.1.2 Selection of a research region

Besides the recruitment of participants, it was necessary to select a research region. As has been pointed out in Chapter 3.1.5.2, the region in which the typical farms are located is not crucial for this analysis, as long as (1) all the typical farms are in the *same* region, (2) the region is homogeneous, (3) both organizational forms play a role there, and (4) the region is a relevant broadacre arable production region.

The approach taken in this research was therefore primarily a pragmatic one: A region fulfilling the above criteria was selected in which the participating agriholding has farms and independent farmers could be recruited. Its geographic expanse is shown in Figure 3.3. It consists of the whole Oblast Vinnitsa and immediately bordering parts of the Oblasts Cherkasy and Kiev.

Figure 3.3: The research region

The research region is marked in red.

Source: Own illustration.

The research region is one of the core regions of arable production in Ukraine. Agriholdings account for 37.5 % of arable land use in Vinnitsa Oblast, 17.5 % in Kiev Oblast, and 28.5 % in Cherkasy Oblast (Lapa et al., 2010). While there are no statistics on the share of *restructured* independent farms in the area, the panel participants reported that the region is one where structural change has been going on for longer than in other parts of Ukraine and therefore the share of progressive farms is relatively high. A likely reason is that the yield potential in the area is high in the national comparison and investors therefore arrived early in the region. It has high quality Chernozem soils. The average annual precipitation amounts to 630 mm, most of which falls in summer, and the average temperature is 7.1° C (Muehr, 2007).

3.3.1.3 Preparation of an interview and discussion guideline

In order to conduct the modified panel process in a structured and systematic manner, it was necessary to devise a plan that specifies what questions to ask and what data to raise when and how. To this end an interview and discussion guideline for all three rounds of the modified panel process, as well as a farm data questionnaire to collect (qualitative and quantitative) typical farm data, was prepared.

Qualitative interview and discussion guideline

The first round of the modified panel process was a round of face-to-face interviews with each participant in order to collect qualitative assessments as well as (qualitative and quantitative) typical farm data for the preparation of the subsequent focus group discussions (cf. Chapter 3.1.4.3). In order to optimally prepare the subsequent focus group discussions, it was important in this first round to already collect as much relevant information as possible without over-stressing the participants' time and patience. To ensure that the optimal set of questions is asked in the qualitative part, pilot interviews were conducted. They revealed that the initially planned set of questions was much too long and complex, and it was consequently simplified and shortened.[36] This part was subsequently integrated into a comprehensive qualitative interview and discussion guideline for all three rounds of the modified panel process.

This qualitative interview and discussion guideline, which can be found in Appendix 1, was structured as follows:[37]

In the **first round** (face-to-face interviews), the participants were initially asked in an open question to state what they currently consider to be the most important strengths and weaknesses of agriholdings. After this introductory question the participants were guided through a list of topics with potential influence on competitiveness. This list is based on the hypotheses derived in Chapter 3.2. In each topic, they were asked whether they think that either agriholdings or independent farms have a competitive advantage, how much of it (if any), and why. For example, this was asked with regard to the access to and cost of capital.

In the **second round** of the panel process (two separate focus groups) the participants' assessments with regard to the same topics as in the first round were again enquired. Other than in that, however, the participants were exposed to hypotheses on underlying reasons of competitive advantages and disadvantages as derived in Chapter 3.2, and their assessment was enquired. An example is: "*What are the reasons for the advantage in capital cost and access of agriholdings? Do they have access to other sources than independent farms? Is their volume important? Can they provide additional measures that reduce creditors' risk? Can they better provide information to creditors? Do they have an advantage from specialization?*"

In the **third round** (single focus group), the future adaptations of the organizational forms to maintain and increase their competitiveness were enquired. To this end, the participants were asked where they see opportunities for and limitations of growth. Then they were asked, with

[36] The pilot interviews were conducted with an agriholding manager and an advisor in Russia. Russia is a country with similar agricultural structures and mentalities and it was therefore assumed that the results of the test are transferable. This approach was chosen to avoid "wasting" any of the scarce potential Ukrainian participants for a mere test of the methodology, and to have the best possible interview guideline for the latter persons. Only the conclusions on how to design the interview guideline were used. The assessments obtained in the pilot interviews (contents-wise) were not used in the results of this thesis.

[37] While the theoretic considerations of Chapter 3.2 were structured by the four levels of social analysis in New Institutional Economics, the interview guideline was structured and phrased such that it is suitable for interacting with practitioners who are not familiar with this theoretic framework.

reference to the competitive strengths and weaknesses determined in the preceding rounds, how they think both organizational forms will adapt in the future to prevail in the competition with the respective other organizational form.

Note that these points describe the contents of the questions raised in the three rounds. The setup of the three rounds (face-to-face interviews, separate focus groups with external assessments, etc.) was elaborated in Chapter 3.1.4.3.

Typical farm data questionnaire

In addition to the qualitative interview and discussion guideline, questions were prepared to obtain the information necessary to draft the typical farms in the first round and to complete and validate them in the second and third rounds.

To this end, the participating agriholding and independent farm managers (but not the agribusiness participants and external experts) were asked to provide the following data on their businesses:

- Arable land in production
- Share and yields of crops grown
- Production systems (fieldwork, types and amounts of variable inputs used)
- Mechanization and buildings
- Labor organization
- Financial structures
- Overhead costs
- Prices

Along with this data on their individual businesses, the participants were asked to provide information that permits drafting typical farms, i.e., farm models from which the idiosyncrasies of individual businesses have been removed. For this purpose, the following questions were asked along with the collection of the aforementioned data:

- *How does your business compare to the population of your peers (i.e., other farms of the same organizational form)?*
- *Does the other organizational form differ systematically in this regard from yours? If so, how?*

The agribusiness participants and external experts were asked in the typical farm part where they see systematic differences between the two organizational forms. Further, they were asked to assess how the participating businesses (as far as they are known to the respective persons) fit in the total population.

This interview and discussion guideline for qualitative assessments and typical farm data was subsequently put into use in the three rounds of the modified panel process, which are described in the following.

3.3.2 Face-to-face interviews in the first panel round

In the first round of the modified panel process, individual face-to-face interviews with all participants were conducted in accordance with the procedure derived in Chapter 3.1.4.3. The following procedural issues were noteworthy:

1. The interviews with the agriholding and independent farm managers (with the qualitative assessments and the whole typical farm questions) could easily take three hours and more. In some cases interviews had to be ended although especially the farm data was not completely collected yet. Hence, time was a strongly limiting factor.
2. In the typical farm part, not only interviews in the strict sense of the word were held. Rather, the participants also provided various documents (machinery lists, fieldwork documentation, agriholding farm reports, etc.) which contained information required or useful for drafting the typical farms.
3. Not from all businesses the entire enquired farm information could be obtained. This is a result of the aforementioned scarcity of time, but also of the participants' inability or unwillingness to provide certain pieces of information. It was clear from the outset that the complete data to model each individual participating business could not be obtained in this setting. This was accepted, as the goal was only to collect sufficient information to draft typical farms. The discussions in the successive rounds then would go on directly at the typical farm level, and required supplemental information would be collected in that context.

It was refrained from approaching the participants with questions between the three rounds (unless absolutely necessary) in order not to overstress the participants' patience and willingness to contribute.

3.3.3 Drafting of the typical farms

With the information gathered in the first round of the modified panel process, the typical farms were then drafted by the scientist. This process is explained in the following.

3.3.3.1 Data basis for the drafts

The typical farm drafts were based on the following information:

Farm data from the agriholding

The participating agriholding at the time of the data gathering had 14 operations in the research region. The following data was provided:

1. Internal farm reports[38] of all the farms in the sample. These contained yields, output prices, a number of cost positions, and some information on the labor organization. However, they lacked key information necessary to determine competitiveness or performance indicators. The fixed costs of physical assets, for example, were not part of these reports, nor were the amounts of inputs used.
2. For part of the farms, so-called "technology maps" were provided[39]. This format, which is very common in the former Soviet countries, documents planned fieldwork. This differs from fieldwork documentation as it is common at many Western farms insofar as the latter records the *actual* fieldwork conducted.
3. The asset list from the accounting system of one of the farms, with purchase values and asset types (especially machinery).
4. Some actually paid input prices (fertilizers, machines, etc.), as well as some offers which had been made to the agriholding. This information was not part of the farm reports and was only provided exemplarily.
5. Verbal explanations of the material by the participating agriholding managers.

From the 14 farm records provided, 3 had to be eliminated as they had been taken over by the agriholding too recently. The employed selection criterion was that the farms must have been in operation within this agriholding at least since the cropping period 2007/2008. The remaining 11 farms comprised approximately 70,000 ha.

The evaluation of the data provided by the agriholding showed the following problems:

1. The production system data provided by the agriholding in the form of the "technology maps" was inconsistent, incomplete, and sometimes contradictory. Some of the "technology maps" contained information that did not appear credible (e.g., unusually high amounts of certain pesticides applied). The technologies differed considerably between the farms and between the years (where multiple years were available). In further investigation the impression arose that these documents often have little to do with what is actually done at

[38] The farm reports are sent to the to the agriholding center by the individual farming operations on a regular basis for evaluation purposes.

[39] *Tekhnologicheskie Karty* in Russian. They were not available for all farms.

the farms. It was therefore not possible to draft the production system of the agriholding typical farms from this data.

2. The second problem was that mechanization data was not available with which the machine inventory of the typical farms could have been drafted. While the asset list from the accounting system of one of the farms was provided, it became clear that the machines in this list are not necessarily the machines that work at that farm, because there are many internal long-term renting arrangements between the agriholdings farms. Hence, it was not possible to deduce the mechanization actually in use at that farm.

It therefore became clear that the collected data from the agriholding was inadequate for drafting the typical agriholding farms. Hence, it was decided to obtain additional data at a farm visit to one of the agriholding farms. To this end, the participating agriholding managers designated one farm which they considered to be representative for the majority of their farms in the research region with regard to its production system and mechanization. This farm was then visited, and a complete farm data set (as described in 3.3.1.3) was obtained in expert interviews with the local farm management.

The data collection at that farm confirmed the challenges under Ukrainian conditions described in Chapter 3.1.4.2: It required a number of different people, most importantly the head agronomist, the head bookkeeper, and the farm director. Necessary pieces of information were often not readily available and had to be retrieved and/or calculated it in a lengthy process. As a result, it took almost three days at the farm to complete the data collection.

Farm data from the independent farms

On the independent farm side, four businesses participated and provided data. The smallest of the farms had 800 ha of arable land, the largest 10,000 ha. The data collection with the independent farm managers proved easier than with the agriholding managers. They could provide much of the required information offhand. Consequently, the greatest share of the information provided was verbal. In addition, some written information was provided (varying between the farms), e.g., fieldwork documentation excerpts, sales prices, input prices, and machinery lists. This information sufficed to draft typical farms.

3.3.3.2 Technical considerations

Before the typical farms could actually be drafted contents-wise, some preliminary technical considerations were necessary. They are explained in the following.

Analyzed period

The first consideration to be made was the period to be analyzed, i.e., the years which are reflected in the typical farms, and their aggregation.

The profit – and with it the return to land – of an arable farming business fluctuates more or less strongly over the years. This fluctuation stems from yields and input volumes[40] which vary due to weather, as well as prices which vary due to market volatility. As these are known facts, the decision of a farmer or investor on whether or not to continue farming is therefore normally based on longer term average figures or expectations. Hence, as long as short-term liquidity restrictions do not become an immediate threat, the (quantitatively measurable) competitiveness of an arable farming business is expressed in its longer-term average return to land. The goal in establishing the typical farms was therefore to analyze the effect of competitive advantages and disadvantages of the two organizational forms on this figure.

As it is possible that the organizational forms agriholding and independent farm differ with regard to the availability of short-term liquidity, or their ability to decrease liquidity fluctuations, it would have been ideal to also establish time series data. However, to this end it would have been necessary to collect and validate the input and output amounts and prices in the modified panel process for multiple years. This would have considerably increased the complexity and required time for the panel process – which was challenging under Ukrainian conditions anyway – and would therefore not have been justified for the limited additional relevant information gained. Hence, a comparative static, deterministic model was employed with the goal to reflect longer-term averages.

To achieve this end, the following was done:

1. In yields and input amounts, long term averages were explicitly enquired in the modified panel process. Where these were not directly available at the beginning of the process, they were approximated using data of the 2007/08-2009/10 period.

2. In prices, specifying “long term average” as a basis of reference would have been problematic, because other than yields and input amounts, they do not fluctuate around a more or less constant average, but also their long-term mean changes over time.[41] Therefore, the basis of reference for prices was explicitly the average of the period 2007/08-2009/10.

While it would have been ideal to have a period of at least five years to approximate long-term averages, the participating agriholding has only become active in arable farming in 2007. The first data that could be provided was therefore from the cropping period 2007/08. With the first round of the modified panel process taking place in early 2011, only the three cropping periods 2007/08-2009/10 were available and could be utilized. This data limitation was accepted because of the lack of better options.

[40] For example, the necessity of a certain pesticide application can depend on weather.

[41] This is in principle also true for yields and input volumes, e.g., thanks to progress in plant breeding. However, this effect is very small in comparison and negligible in the context of this research.

Treatment of currencies and exchange rates

Another consideration before drafting the typical farms was that it was necessary to decide on a currency in which to do the calculations.

Ukraine's national currency is the Ukrainian Hryvnia (UAH). However, the participating businesses all did their internal planning in either EUR or USD. This is a result of the relative instability of the Ukrainian currency. As the businesses produce internationally traded commodities, their output prices are relatively closely linked to the world market. Many inputs are imported, e.g., pesticides and machinery. As could be seen from price lists or offers provided by the businesses, these offers are also often in USD or EUR. Consequently, if and when the UAH devaluates, the nominal prices of a business' key inputs increase. At the same time, however, the nominal prices of its outputs also increase[42] and the currency devaluation has no major net effect.

In the focus group discussions of the modified panel process, it was easier for the participants to assess and discuss figures provided in an international currency, as this is what they mostly do in their businesses. Moreover, it also makes the numbers more accessible for the reader. Therefore the calculations with the typical farms were done in USD.

3.3.3.3 Establishment of the drafts

After the preliminary technical considerations were solved, the actual typical farms were drafted. This was done as follows:

- With regard to the **sizes of the typical farms**, the goal of the analysis according to the considerations made in Chapter 3.1 was to analyze two farm sizes within each organizational form: A smaller one representing the size which farms most of Ukraine's arable land, and a larger one sufficient in size to fully (or nearly so) exploit the economies of scale at the farm level. The panel participants were confronted with these requirements during the first round. The result was that farms of 2,000 ha and 10,000 ha fulfill the requirements within both organizational forms, and the typical farms were drafted accordingly. Both (approximate) farm sizes were represented among the 11 farms of the agriholding in the region, as well as among the participating independent farms.
- The crop rotations of the typical independent farms were drafted according to the statements the participants had made in the interviews. While the crop rotations of the participants' actual farms varied, unusual situations at individual farms were pointed out and explanations were provided with regard to what is considered typical. The latter assessment did not differ much between the participants. The crop rotation of the drafted typical

[42] Caveat: unless there is political intervention.

agriholding farms was based on the crop rotations which were listed in the provided farm reports, and also on verbal information of the participating agriholding managers.

- The **production systems** of the typical independent farms were drafted based on the written and (mostly) verbal information given by the participating farm managers. For the typical agriholding farms, the production system of the agriholding farm that was visited was used in the drafts. The participants of both organizational forms said that there is no systematic difference between the production systems of the small and large farms within the organizational forms.
- The **output prices** of the typical agriholding farms are 2008-10 averages of the prices provided in the farm reports. The output prices of the typical independent farms were adjusted to be lower by a margin stated by the participants.[43] As the stated margins varied, approximate medians were used. It would have been ideal to obtain the price differences from "hard" data, i.e., price samples provided by both sides. However, this was not possible, because the output prices provided (especially by the independent farms) were insufficient to derive a meaningful price difference – the sample size was too small and the selling times varied. Especially the latter factor precluded comparability, because prices varied strongly over the analyzed period.
- The **fixed asset input prices** of various sources were used for the typical farm drafts. For buildings (including dryers, elevators, etc.), prices named by the participants were used. No price difference between the organizational forms was assumed as the total share of buildings in the cost structure is very small. For machines, the US price list of a large machinery manufacturer was used in the drafts and the agriholding typical farms received an advantage based on the assessments of the participants.[44] This price list was used, because (a) not all required prices could otherwise be provided by the participants, (b) it provided a consistent basis for all the farms, and (c) a manager of this company participated in the first round and said that the prices are realistic for Ukrainian customers. Where no prices were available in this price list, they were substituted with prices provided by the agriholding and the independent farms. Like with output prices it would have been ideal to determine price differences by comparing actually paid prices of the two organizational forms. However, this would not have been possible, because the machine purchases were often not comparable (buying time, manufacturer, specifications, etc.). Instead of using the manufacturer's list prices, it would also have been possible to use planning data, such as from KTBL.[45] However, such data is not available for Ukraine. Further, an evaluation of the German KTBL data (cf. Appendix 2) showed that they assume constant purchase prices per horsepower in different machinery sizes and therefore fail to reflect a relevant source of economies of scale. Hence, these data are unsuitable for this analysis.

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[43] For example "*agriholdings have 10 % better output prices than independent farms*".

[44] For example *"agriholdings pay 10 % less for their machinery".*

[45] KTBL, the German Association for Technology and Structures in Agriculture (Kuratorium für Technik und Bauwesen in der Landwirtschaft) provides fieldwork planning data, including prices (KTBL, 2013).

- The **variable input prices** were used as provided by participants and again a price difference according to the qualitative assessments was applied.
- The **agriholding overhead costs** were obtained in an analysis of accounting data done together with the participating financial analyst of the agriholding.

The typical farm drafts thus established were subsequently shown to the participants in the focus group discussions of the second round, which is expounded in the following.

3.3.4 Separate focus groups in the second panel round

In the second round of the modified panel process, two separate focus group discussions were held in accordance with the considerations made in Chapter 3.1.4.3, one with the independent farm participants and one with the agriholding participants. Presentations were made for the focus group discussions and sent to the participants in advance to allow them to prepare. They contained the following:

1. The key features and indicators of the drafted typical farms for validation, correction and supplementation.
2. Key qualitative statements and assessments of the participants of the own and the other groups in the first round, for comments, discussion, correction, and supplementation.
3. The additional questions of this round according to the interview and discussion guideline (cf. Chapter 3.3.1.3).

The following was noteworthy in the focus group discussions:

- Like in the face-to-face interviews of the first round, time was again a strongly limiting factor in both focus group discussions.
- When the typical farm drafts and the quantitative indicators calculated with them were presented, the independent farm participants pointed out that they consider the plant protection costs at the agriholding farms unrealistically low. As a consequence of this, an additional investigation of the agriholding plant protection costs was made subsequent to the focus group discussion. With the help of the participating agriholding financial analyst, an analysis of the accounting data of the agriholding farm from which the production system information had been obtained before was made and these numbers were applied to the typical farms before the third round.

3.3.5 Joint focus group in the third panel round

In the third and final round of the modified panel process, a single focus group discussion with both the agriholding and independent farm participants was held according to the considerations

made in Chapter 3.1.4.3. A presentation was made again for the focus group discussion and sent to the participants in advance to allow them to prepare. It contained the following:

1. The key features and indicators of the drafted typical farms for a final validation and correction.
2. A review of the competitive advantages and disadvantages of the typical farms as derived in the panel process so far.
3. The new questions according to the interview and discussion guideline regarding the future adaptations of both organizational forms.

The focus groups of the second and third rounds are treated only briefly here as this chapter focuses on technical aspects. The results, as well as their development (contents-wise) over the course of the modified panel process are provided in the subsequent chapter.

4 Results

In this chapter the results of the research are provided. It is structured as follows:

In the first part (Chapter 4.1), the competitive advantages and disadvantages of the two organizational forms and their explanations, as obtained in the modified panel process, are expounded. Issues that were discussed but remained inconclusive are explained thereafter, as well as factors that had been hypothesized in Chapter 3.2 to give one of the two organizational forms a competitive advantage but which were determined in the panel process to play no relevant role. The development of the assessments over the course of the panel process and their consideration in the typical farms, are outlined along with the explanation of each issue. At the end of this part, vertical integration is briefly treated, because although it is not within the scope of this thesis, indications were found that it may give agriholdings a competitive advantage that outweighs most of the factors analyzed here.

Thereafter, other key characteristics of the typical farms that were established in the panel process (besides the competitive advantages and disadvantages of Chapter 4.1) are described in Chapter 4.2. The calculated key performance indicators are shown, including the quantitative indicator of competitiveness in arable farming, return to land. Differences between the typical farms are summarized and quantified, and the yields at which both organizational forms would have equal return to land are shown. The section ends with a sensitivity analysis.

In Chapter 4.3 the development of the key results over the course of the panel process is summarized, and the effect of key methodological aspects on the result development is analyzed in order to permit an evaluation of the methodology (which follows in Chapter 5.1).

Finally, the likely future adaptations of the two organizational forms obtained in the modified panel process are expounded in Chapter 4.4.

4.1 Competitive advantages and disadvantages of agriholdings and independent farms

In this section the results on competitive advantages and disadvantages of agriholdings and independent farms are provided. To permit the interpretation of the results, the management performance level reflected by the participants is first explained.

4.1.1 Management performance level represented by the participants and the derived typical farms

As has been pointed out in Chapter 3.1.3.1, a characteristic of the panel approach is that the results obtained with it – typical farms as well as qualitative information – reflect the personal experience and data of the participants. In order to be able to interpret the results, it is therefore important to know what types of businesses they represent. While the basic technical specifications (size etc.) were already made in the Chapters 3.1.5.2 and 3.3.1.1, it is also important to know the represented management performance, which is explained in the following:

1. The **agriholding** participants represent a business at a roughly average performance level within their organizational form. This assessment was rather unanimously made by the agriholding participants themselves, as well as by the externals familiar with the major agriholdings in Ukraine.
2. In the case of the **independent farm** participants, on the other hand, it turned out that the most sophisticated and high-performing businesses of their organizational form are represented. The farmers themselves, as well as the externals familiar with their businesses, estimated that these participants represent roughly the top 10 % best performers within their organizational form.

It would have been optimal to have the same relative level of management performance in both organizational forms (e.g., average). The selection of participants representing such different management performance was not deliberate, but turned out to be such during the panel process. This should be considered in the interpretation of the results.

4.1.2 Net competitive advantages of agriholdings

In this part, the areas where agriholdings enjoy a net competitive advantage in comparison to independent farms according to the results of the modified panel process are expounded.[1]

[1] The Chapters are structured by *net* competitive advantages and disadvantages of agriholdings. Areas where independent farms have competitive *advantages* are therefore treated in the Chapter “net competitive *disadvantages* of agriholdings”, and vice versa.

4.1.2.1 Access to and cost of capital

The first area where agriholdings have a net competitive advantage over independent farms is their better access to, and lower cost of capital. In order to show the difference between the two organizational forms, the part is structured as follows: First (a) the sources of finance available to *both* organizational forms, and those which can be accessed only by agriholdings, or independent farms under particular conditions, are shown. Thereafter, (b) the requirements for accessing the latter sources of finance are explained and (c) potential specific advantages of independent farms are expounded. (d) Disadvantages of utilizing international capital are pointed out, and finally, (e) the development of the assessments over the panel process and their quantitative consideration in the typical farms are explained.

Sources of finance available to the different organizational forms

Both organizational forms have access to the following main sources of finance:

- Bank loans: The standard interest rate in Ukraine is about 18-22 % for loans in UAH, which was referred to as the highest interest rate in Europe by participants.
- Supplier credit for variable inputs can be obtained. This, however, is extremely expensive. For example, pesticides can be financed that way at an interest rate of about 70 % per annum (sic).
- Financing for machinery is also available for both organizational forms, at rates around 7-10 %. Besides the option to utilize loans, machinery can be financed with leasing arrangements at similar interest rates.
- Sometimes there are interest rate subsidies by the state which apply to various types of loans and are available to every farm business.

Agriholdings, on the other hand, have access to cheaper sources of capital, mostly from abroad. Independent farms only have access to these in special cases:

- The European Bank for Reconstruction and Development (EBRD) hands out loans at interest rates of around 6-8 % above the London Interbank Offered Rate (LIBOR)[2]. In the spring of 2012 the latter was around 1 %, leading to a total interest rate of 7-9 %. Several agriholdings used this source of financing in the recent years.
- Agriholdings can also get bank loans in EUR. At rates around 12 %, these are considerably cheaper than UAH loans.
- Agriholdings can attract private investors' capital (private equity). This being an investment rather than strictly a loan, there is no fixed interest on it. However, the investors expect a longer term return on investment of around 20-30 %. It was stated by the agriholding

[2] The LIBOR is the interest rate at which banks can borrow money from each other. It is determined from submissions of participating banks. For further details refer to BBA (2012).

participants that a business which is not able to generate at least 20 % return on equity in the longer run is not sustainable, because it will lose its investors.

- Agriholdings can further do IPOs[3] and thus access stock capital. Similar considerations apply as with private equity capital. As has been shown in Chapter 2.4.3, several agriholdings have done IPOs in the recent years.

Requirements to access cheaper sources of capital

There are a number of requirements in order to be able to access the latter (mostly international) sources of capital. Agriholdings typically meet these requirements, but only some independent farms do.

1. It is necessary to have people with the qualifications to get access to international sources of finance. They have to have financial know-how, speak language(s) that allow them to communicate with foreigners (English in particular), be able to establish the required contacts, and convince investors. This is a clear instance where agriholdings can capitalize on advantages of specialization.
2. International accounting, reporting, and transparency need to be established to prove the company's profitability. The prerequisite for this is normally the establishment of International Financial Reporting Standards (IFRS). At an independent farm this incurs costs of about 50,000 USD per year. With regard to the standard Ukrainian accounting system, it was remarked that it is "useless for an investor or a creditor to judge the creditworthiness of a business."
3. Credit guarantees need to be given, normally by bonding collateral. For instance, this can be crops, or machines. Unlike in many countries, agricultural land is not available as collateral in Ukraine due to a moratorium on its trade.
4. Being an agriholding by itself is not sufficient to enjoy the trust of potential creditors. There are agriholdings who have a reputation for being reliable business partners, and ones for which the opposite is true. The same holds for independent farms.

Disadvantages of utilizing international sources of capital

The main downside of utilizing international capital is the currency risk. In the case of private equity or stock capital, the risk lies primarily with the investor. As a result, the latter will expect a higher risk premium, i.e., he will not invest unless the expected return on invested capital is higher by a certain amount than in a "safer" investment.[4] If, on the other hand, loans in a foreign

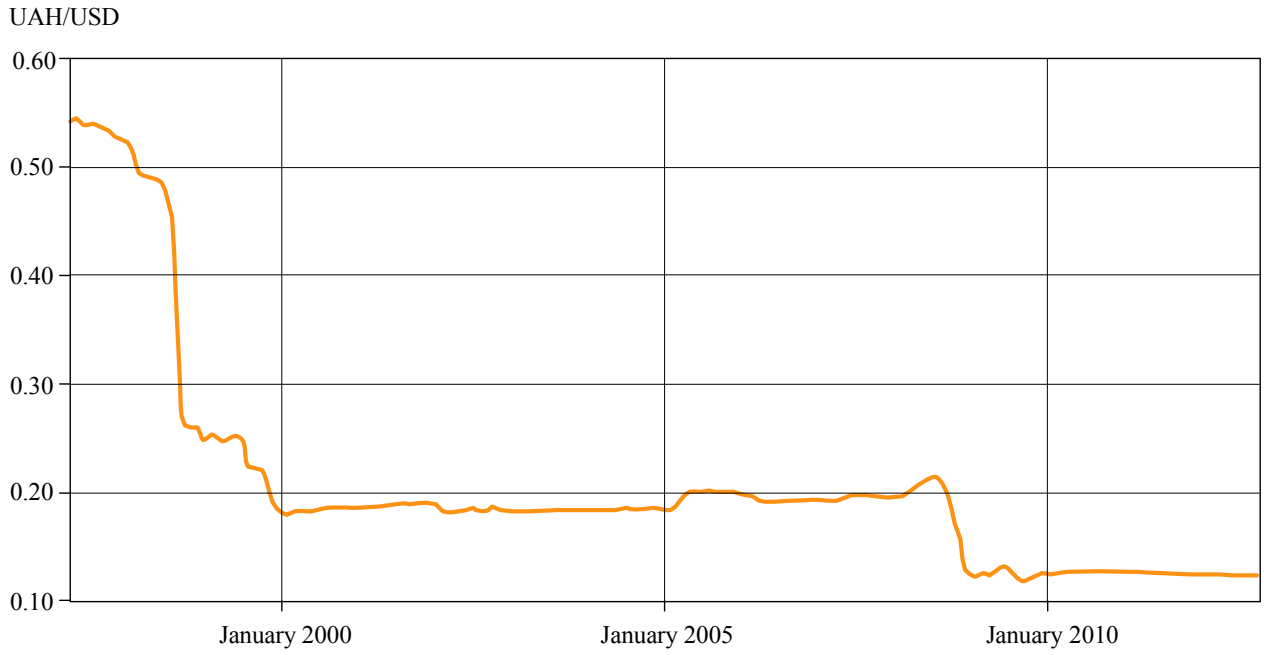
[3] IPO stands for Initial Public Offering, i.e., the placement of stocks on the stock market.

[4] This is described by the concept of the *return-risk-performance* of an investment: To achieve the same performance, a higher risk investment must yield a higher return on investment. For details refer to Breunig (2009).

and potentially more stable currency than the Ukrainian Hryvnia are used (such as the EBRD loans pointed out above), the primary risk is on the borrower's side.[5]

Figure 4.1 shows the exchange rate between the US-Dollar and the Ukrainian Hryvnia over the last 15 years. As can be seen, while the Ukrainian currency historically had relatively stable periods, it also devaluated very sharply twice within short periods of time during the illustrated period. Hence, having loans in a foreign currency can be unproblematic for a Ukrainian business for a relatively long time. However, if one of the devaluations happens during the loan period, the loan becomes much more expensive to pay back.

Figure 4.1: Exchange rate UAH/USD (04/1997-10/2012)



Source: Oanda, 2012.

On the other hand, in the production of arable commodities this risk is limited, because the main products of the businesses are traded on the world market. The domestic prices are therefore closely linked to the world market, at least as long as there is no political intervention, such as the export ban in late 2010. Hence, when a devaluation of the Ukrainian currency makes the loan repayment nominally more expensive, it similarly increases the nominal prices of the farms' revenues from selling their product, thus cancelling out the effect.

Another issue that could be a potential problem when foreign investment capital is used is that the Ukrainian government could make it difficult to get the money, including profits, out of the

[5] This can become a risk of the lender when the borrower becomes insolvent.

country again. However, when this was discussed in the panel process, the participants of both organizational forms agreed that Ukrainian politics encourage foreign investment in the country and creating such difficulties would counteract this policy. They said that there are no problems with regard to transferring invested capital and profits out the country again. In the case of bankruptcy, or the liquidation of the business for other reasons, the participants also did not see a difference in the conditions, whether the utilized capital is foreign or domestic.

Potential specific advantages of independent farmers

In some cases, independent farms can have access to other sources of foreign capital than agriholdings, namely the investment capital of foreign farmers who take over operations to farm them. In such cases, the investors either run the operation themselves as owner-managers, or they hire an (often also foreign) manager. These investments are in a way comparable to the private equity capital agriholdings sometimes use. Other than in those cases, no IFRS or comparable formalized reporting standards are required thanks to the direct involvement of the investors. Further, in line with the "farmer" mentality of such investors, lower returns on investment may be more readily accepted than in private equity investments in agriholdings. However, it is important to note that only a small number of independent farms get to enjoy this kind of foreign investments.

Development of the assessments and consideration in the typical farms

From the outset of the panel process, and over all groups of participants, there was much agreement that their better access to and lower cost of capital constitutes one of the key advantages of agriholdings in comparison to independent farms, with a great impact on competitiveness under the current circumstances in Ukraine. It was further emphasized that it is a key *reason* for the existence of agriholdings, as the unrestructured collective farms have severe difficulties to get credit (at affordable interest rates, or at all). With these assessments the participants confirmed the respective hypotheses derived in Chapter 3.2.

In the second round of the modified panel process, the discussion became more differentiated, however, and it turned out that the situation is less problematic for the very well-performing restructured independent farms in this analysis than for unrestructured collective farms, and that the larger independent farms also have advantages over their smaller peers.

The concrete capital structures and capital costs of the typical farms that were derived and validated in the modified panel process are subsequently expounded.

The **small typical independent farm** does not have access to the international sources of financing pointed out above. The necessary establishment of international accounting standards would not be feasible for such a comparatively small business. Therefore, the typical farm has an average interest rate for long-term debt of 15 %, which is a mix of the cheaper financing available for machinery and the more expensive bank loans. Because of the overall high costs of borrowed

capital, the farm mostly utilizes its profit-generated liquidity and has a high equity ratio (90 %) in its long-term capital structure.

External sources of capital are mostly used for the short-term financing needs to establish crops. The average interest rate for short term borrowed capital mostly consists of UAH bank loans and therefore amounts to 22 %. Dealer financing is avoided because of the extremely high interest rates. The equity ratio of 50 % in the short term capital structure is that of a business which expands its arable land area at a rate of about 10-20 % per annum, a “normal” rate of growth in Ukraine according to the panel participants.

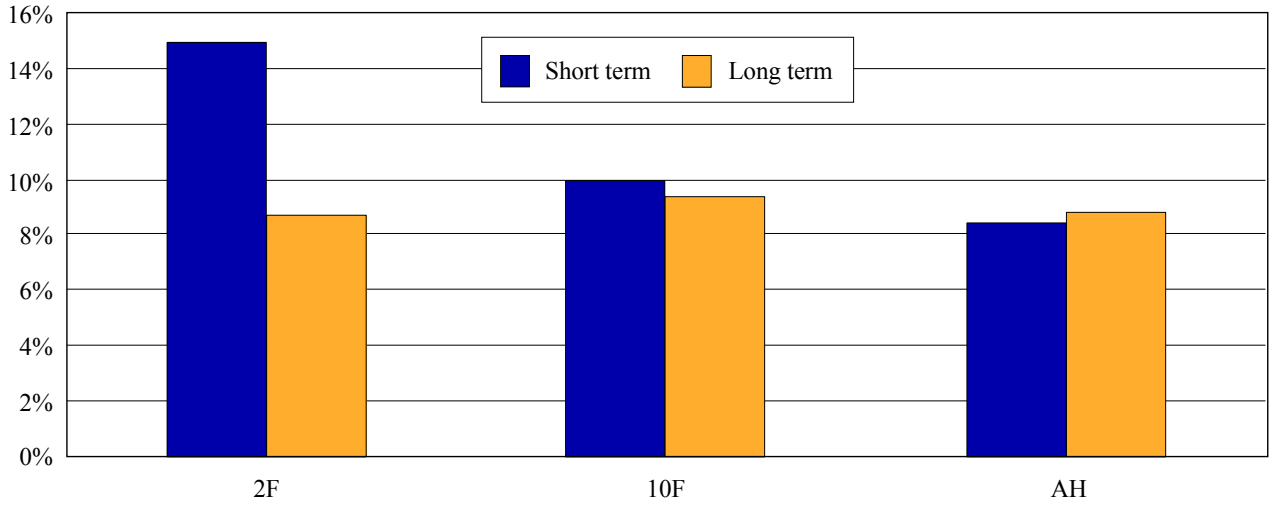
Figure 4.2 shows the average interest rates of the typical farms, which consist of interest expenses for borrowed capital, as well as calculatory interest for equity (8 %[6]). As can be seen there, the high equity ratio of the small typical independent farm in its long-term capital structure makes its long-term interest the lowest of the farms. The short-term interest, on the other hand, is the highest, because of the high interest rates of UAH bank loans for the business in combination with a high debt ratio in the short-term capital structure. Note, however, that the amount of capital bound short-term is much smaller than that bound long-term.

A problem particular for such a farm that is not directly reflected in the capital costs of this typical farm is, that the costs increase considerably when higher shares of debt are required for growth. This becomes a constraint when the business wants or needs to grow faster than the “normal” 10-20 % per year.

The **large typical independent farm**, on the other hand, has established IFRS international accounting standards. Thanks to this, it has access to some of the agriholdings’ foreign sources of finance, namely EBRD loans and other loans in foreign currency. While establishing IFRS incurs overhead costs of 5 USD per ha, it yields the typical farm an average interest rate of borrowed long-term capital of 12 %. The debt capital in the farm is managed in such a way that long-term loans are also used for short-term capital needs. Even if this may cause a liquidity surplus at times, it is cheaper than utilizing Ukrainian short-term loans. Hence, the short term interest rate at this typical farm is the same as its long term interest rate.

[6] This is the bank rate for deposits in EUR.

Figure 4.2: Average short and long term interest rates (expenses for borrowed capital and calculatory interest for equity) of the typical farms (per cent annually)



Note: "2F" = 2,000 ha typical independent farm, "10F" = 10,000 ha typical independent farm, "AH" = typical agriholding farms. The calculatory interest for equity capital is equal to the bank deposit rate in EUR at Ukrainian banks of 8 %.
Source: Own illustration.

Thanks to the lower interest rate for borrowed capital, the farm utilizes a higher share of it also in its long-term capital structure in comparison to the small independent farm. This provides the business with more liquidity for faster growth – it expands faster than the 10-20 % per annum of the small independent farm.

One question could not be conclusively answered: The manager of the largest independent farm participating in the panel process pointed out that with IFRS established at his operation, he has also access to EBRD and other loans in foreign currency, which his smaller peers cannot access. However, it needs to be taken into account that this particular business has foreign employees, as well as good contacts abroad. While these conditions were incorporated in the large typical independent farms, it remained open how common it is among comparable farms of the population to have such access to foreign capital.

The **typical agriholding farms**, finally, have access to the same international sources of debt capital as the large typical independent farm. Other than that, however, they additionally have access to (mostly) foreign sources of equity in the form of stock and private equity capital. Thanks to this, they require less debt capital, and their equity ratio is therefore higher. This further reduces their capital costs slightly in comparison to the independent farms. Moreover, the liquidity the agriholding can mobilize from foreign sources of equity capital provides it with even better growth opportunities than the large typical independent farm. This advantage shows in the rapid growth of the organizational form over the last years.

Table 4.1 provides an overview of the equity ratios and interest rates that were incorporated in the typical farms.

Table 4.1: Equity ratios and interest rates of the typical farms

	2F	10F	2H	10H
Equity ratio fixed assets	90%	65%	80%	
Equity ratio current assets	50%		90%	
Long term debt interest rate	15%	12%	12%	
Short term debt interest rate	22%	12%		
Calculatory interest for equity	8%			

Note: "2F" = 2,000 ha typical independent farm, "10F" = 10,000 ha typical independent farm, "2H" = 2,000 ha typical agriholding farm, "10H" = 10,000 ha typical agriholding farm. The debt interest rates are averages of different sources of capital used at the farms. The calculatory interest rate for equity capital is equal to the bank deposit rate for Euros in Ukraine, thus reflecting opportunity cost.

Source: Own research.

4.1.2.2 Terms in input purchases and output sales

The second competitive advantage of agriholdings lies in their ability to achieve more favorable terms in input purchases and output sales than independent farms. In this section, first the determinants of price differences between different businesses, as provided by the participants, are explained. Along with the description of each determinant, the participants' assessments of the competitive position of the two organizational forms with regard to the respective determinants are expounded. Thereafter, the development of the assessments of the two organizational forms' competitive position with regard to input and output terms over the course of the panel process and their consideration in the typical farms is expounded.

Determinants of price differences

The following factors were found in the panel process to be relevant determinants of input price differences:

1. Timing of deals
2. Payment modalities
3. Hedging tools employed
4. Volumes of the individual deals
5. Skipping of intermediates
6. Quality of outputs

ad 1: Timing of deals

A very important factor determining the terms at which deals are concluded is timing, as the prices of inputs and outputs vary considerably throughout the year.

In the case of inputs, prices tend to be highest when everybody needs them. Examples are seeds during seeding season, or fertilizers and pesticides during the vegetation period. The difference between off-season and peak season prices in fertilizers can be as high as 30-50 %. It can therefore make a considerable difference at what time a business buys such inputs.

In the case of long-lasting assets, especially machinery (where a certain flexibility as to when to replace them exists), longer cycles play a larger role and a business has an advantage when it can buy counter-cyclically. For example, in late 2009, agricultural machinery manufacturers had full stocks as sales were considerably lower than expected. If a business could buy at that time, it could most likely get higher discounts than at other times when factories are working to capacity and the manufacturers have no difficulties selling their machines. In the case of outputs, prices similarly typically vary during the year, and they are often lowest during harvest.

The ability to exploit such differences of input and output prices over time depends on three factors:

1. Management: The managers of a business need to plan ahead and they need to anticipate price developments. This takes time (i.e., management capacity), requires know-how, and specialization provides an advantage.
2. Liquidity: The business has to have sufficient liquidity to be able to buy inputs early, or to wait with the sale of outputs until prices are favorable.
3. Storage capacity: The business has to be able to store inputs that are bought early, or product that is not sold immediately. The ability to have or create storage capacity is also mainly constrained by liquidity.

While it was pointed out that unrestructured collective farms have deficiencies with regard to management as well as liquidity, the restructured independent farms in this analysis were found to generally have highly qualified management, as well as sufficient liquidity to buy inputs early and/or sell outputs late. Thus, they have no disadvantage in comparison to agriholdings in this regard. Further, while it was discussed in the panel process whether agriholdings have advantages from their specialization in management that provide them with a relevant advantage here, this was not seen to be the case by the panel participants in the end. Regarding storage capacity, the ability to store about 50 % of their total harvest was found to be typical for both organizational forms in the modified panel process.

ad 2: Payment modalities

The payment modalities constitute another important factor in determining (especially input) prices. A concrete example was provided by the agriholding participants with an offer of a seeder that was made to them. Two payment modalities were offered: Either (a) full payment up-front or (b) 20 % up-front and 80 % on delivery. In the latter variant the seeder cost almost 5 % more

than in the former. Mind that the price was fixed in EUR, i.e., there was no risk of sudden currency devaluation for the seller. As was explained in Chapter 4.2.1.1, any sort of dealer financing in Ukraine makes inputs considerably more expensive.

Hence, when a business can utilize the most favorable payment modalities (usually up-front payment), it has a price advantage. As before, this is a matter of liquidity, and the panel again found no difference with regard to this matter between the two organizational forms. Again, it is important to note that the situation at unrestructured collective farms is different.

ad 3: Hedging tools employed

The third factor that can influence the terms of input or output deals is the utilization of hedging tools. While they can improve terms, their main purpose is to reduce price risk. In input purchases, hedging tools were found to be uncommon in Ukraine. In output sales, however, they do play a role. Both organizational forms were found to be able to get forward contracts, but only for 3-4 months in advance. Next year's harvest cannot be contracted, neither by agriholdings, nor independent farms. The participating agriholding uses forward contracts for about 20-30 % of its production, while the rest is currently sold on the spot market. The independent farmers use forward contracts to varying extents.

Obviously, the trust of commodity traders is necessary for an arable business to be offered forward contracts in Ukraine's institutional environment with its severe deficits in contract enforcement. The participating agribusiness representatives of the first panel round pointed out that this trust is very individual and independent of the organizational form. There are businesses of both forms which are offered forward contracts, and there are ones which are not, because they did not honor their contractual obligations in the past.

Besides forward contracts, the agriholding also has access to instruments which are not feasible for independent farms. An example is hedging via the Chicago Board of Trade (CBOT). The agriholding participants pointed out that their business did utilize this instrument before, but did not consider it to be a particular advantage. They saw it mainly as a tool to further diversify risk.

Taking into account these different factors, the panel participants did not see a relevant bottom-line advantage for one of the organizational forms with regard to hedging.

ad 4: Volume of the individual deals

Another determinant of input and output prices is the volume of the deals. Large volumes can create economies of scale on the trading counterpart's side, and they can provide the arable business with a better negotiating position.

With regard to economies of scale for the trading counterparts, the panel participants emphasized that even the small typical independent farm is quite large by the standards of many Western countries. The large typical independent would even be among the largest farms in the Western world. Hence, both buy inputs and sell outputs in such amounts that the economies of scale are small. For example, even the small independent farm buys most pesticides by the pallet,

not by the bottle. Even the small independent farm is not only able to fill trucks with a year's production, but also river barges.

The panel therefore expected the larger effect on prices from the sheer negotiating power of the agriholding, and, to a smaller extent, also of the large typical independent farm. While it has to be considered that also the typical independent farms turn over millions of dollars in outputs annually, the large one even in inputs, the agriholding has many times these volumes.

Therefore, while the effect of volume on prices was unequivocally seen to be smaller than that of timing and payment modalities, it can go so far that an agriholding buys inputs at the entry price of the supplying dealer. In such a case the dealer still makes a profit, because the price he himself gets from the manufacturer depends on his turnover. If the large volume deal with the agriholding brings the dealer into another level of the manufacturer's discount structure, all the goods become cheaper. This includes the goods sold to other customers, which is where profit is made then[7]. Further, it is also possible that a distributer gets additional discounts (outside the normal structure) when deals with agriholdings are made. Ca. 2-5 % "in special cases" were named by a participating representative of a pesticide manufacturing company. The negotiating power of agriholdings is underscored by the fact that several large input suppliers have special "agriholding departments".

On the other hand, agriholdings do not always centralize their input purchases. If they do not, the volumes of their individual deals are comparable to those of independent farms and they lose (at least part of) their advantage. The agriholding analyzed in this thesis has most of its machinery purchases centralized, but is only starting to tender some variable input purchases. The managers of the participating agriholding also deliberately maintain multiple sources of machinery and thus do not conduct the biggest possible deals with single manufacturers and dealers.

In output sales, again the pure volume effect at any given time was considered to be much smaller than the effect of especially timing, or the effect of hedging tools. In comparison to most inputs, the room for price advantages from volume is smaller in the case of outputs, because the outputs are highly standardized commodities with low trade margins.[8] There was general agreement that the main commodity markets in Ukraine by now are functioning insofar, as there are sufficient bidders and thus competition on the buyer side. It was stated by the participating commodity trader that large agriholdings tender their sales, which in the case of rapeseed can gain them 2-5 USD/t. From this the conclusion was drawn that "there are few things in product marketing that cannot be realized at an independent farm", i.e., the pure volume advantage of agriholdings is small. However, this assessment changed in the third round of the modified panel process. This is elaborated in further detail below (cf. *development of the assessments and consideration in the typical farms*).

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[7] This was stated by agriholding participants as well as an agribusiness representative participating in the first panel round.

[8] An external scientist in the first panel round said that the trade margins of commodity traders amount to 2-5 %.

ad 5: Skipping of intermediaries

The fifth determinant influencing input and output prices is whether or not businesses skip intermediaries in the supply chain. While it was hypothesized that this is a relevant advantage of agriholdings (cf. Chapter 3.2), and some of the participants assumed the same in the first panel round, the participants later concluded that this is not often the case.

On the input side, the participating agriholding managers pointed out that their business purchases its inputs from the regular distributors. The participating representatives of pesticide and agricultural machinery producers, on the other hand, said that their companies do not conduct business directly with customers, including agriholdings. They explained that they need their dealers to provide customer service and market the product. The example of another (non-participating) pesticide manufacturer was given who did sell directly to agriholdings in the past, but ceased that practice for the aforementioned reasons. Of course, it is still possible and likely that company representatives take part in negotiations with very large customers, and may give discounts to the distributors who pass them on.

The managers of the participating agriholding also pointed out that they would (currently) not want to skip their distributors of variable inputs, even if they could. This is, because if the input distributers would be skipped, the agriholding would have to distribute very large volumes of inputs internally, which would incur a high risk of theft, fraud and corruption. They pointed out that as long as they work through distributors, those bear this risk, and the roughly 10 % of margin they take can be considered an insurance premium, as well as a fee for the actual distribution task.

In output sales, it was pointed out by the participating commodity trader that if arable businesses deliver directly to a Black Sea port, they can save roughly 10 USD per ton because they can save one elevator turnover.

ad 6: Quality and certification of outputs

The last aspect that can be relevant specifically for output prices is the quality of the produced commodities, as well as quality certification.

The price differentiation of product quality in Ukraine is greatest in wheat, which is classified in six grades (from feed wheat to high quality milling wheat) based on a set of criteria (e.g., weight per liter, protein content, gluten content …). In other products, the differentiation is small in comparison to Western European product markets. For example, the oil content is not a price-determining criterion in rapeseed.

The question arose whether one of the two different organizational forms typically produces higher product qualities where it is price-relevant (i.e., especially wheat). This was deemed not to be the case by the participants.

With regard to certification, it has been hypothesized in Chapter 3.2 that agriholdings have an advantage from being able to better implement quality management and product certification. However, there was great unanimity in the panel that such measures currently do not provide

businesses with an advantage in Ukraine. It was pointed out that there is a certification requirement for rapeseed that is to be exported into the European Union, which, however, is unproblematic to obtain for both organizational forms.

Hence, with regard to the quality and certification of products, no relevant difference was seen between the two organizational forms.

Development of the assessments and consideration in the typical farms

The concrete advantage of agriholdings with regard to input and output terms was a contentious issue. Even after the causal considerations above had been made, and estimations on the magnitude of the individual factors had been made, the confidence in the actual bottom-line advantage of agriholdings remained low. While there was no fundamental disagreement between the participants of the two organizational forms, most participants stated that they have to guess at the actual bottom-line difference.

The price advantages used in the **typical farms drafted after the first round** of the panel process were approximate medians of the estimates provided by the participants. During the first round, a number of participants had seen a considerable advantage of agriholdings with regard to their purchase and sales terms. However, already in this round several participants cautioned that the variability of businesses within both organizations is great.

During the **separate focus groups of the second round** of the modified panel process, the causalities were discussed in greater detail and hypotheses regarding underlying causes of advantages that were derived in Chapter 3.2 were brought into the discussions. In this round, most of the considerations elaborated in the paragraphs above were made.

The **independent farm focus group** of the second round came to the conclusion that agriholdings do not have a relevant advantage on the input side. This conclusion was mainly based on the assessment that the factor “volume” has a much smaller impact than others, especially timing and payment modalities. They concluded that independent farms might even have advantages because they are more flexible in their decision making, also when it comes to input purchases (timing!). On the output side, on the other hand, an advantage from very large volumes, and thus of agriholdings, was seen. It was further concluded that the large typical independent farm also has an advantage of 5 USD/t over its smaller peer. It was emphasized that agriholdings probably have much greater advantages in comparison to unrestructured collective farms, which suffer from management deficiencies and severe liquidity constraints, than they do in comparison to the restructured independent farms in this analysis.

In the **agriholding focus group**, the participants similarly considered their advantage on the input side to be small in comparison to financially sound independent farms. It was even stated that their business is “trying not to be worse than farmers”, because a greater potential for theft, fraud and corruption was seen in agriholdings. It was pointed out that inputs are procured from the same suppliers as independent farmers and therefore no savings are expected.

However, in agreement with the independent farm managers the agriholding managers expected definite price advantages from large volumes on the output side thanks to volume. It was further pointed out that the participating agriholding delivers most of its grain directly to a Black Sea port. This yields an additional 20 to 30 USD/t in revenues and incurs transport costs (by external logistics companies) of about 20 USD/t. Hence, 10 USD/t of grain handling costs (or a bit less) are saved there.

Based on these considerations, the difference in input prices of the typical farms was set to zero after the second round by the researcher. The large typical independent farm received its output price advantage of 5 USD/t in comparison to its small peer. The 10 % sales price advantage of the typical agriholding farms was preliminarily considered to include the advantage from direct port deliveries and volume advantages, and was consequently left untouched.

As the degree of confidence in the numbers had been very low after the second round, the issue was brought up again in the **single focus group** of the **third round**. In this round a direct exchange between the participants of both organizational forms took place. This confrontation yielded additional insights.

The independent farm managers pointed out that they, too, ship part of their grain directly to Black Sea ports and therefore, no systematic advantage of agriholdings in this regard was seen.

Further, in the conversation between the participants, a number of purchase and sales prices of actually conducted transactions were exchanged. Although these prices were often not fully comparable (due to different timing, specifications, etc.), the participants came to the conclusion that other than assumed before, the agriholding does have an advantage in input purchases. Moreover, the agriholding participants explained that their input purchases are becoming more centralized than they were in 2008-2010, thus yielding additional advantages. The participants also estimated that the majority of agriholdings tends to have more centralized purchases than the participating one. Further, the discussion led to the conclusion that the larger typical independent farm also has some advantage on the input side in comparison to its smaller peer.

The participants in the end settled on the final results shown in Table 4.2. The greatest input price advantage of the typical agriholding farms and the large typical independent farm was eventually seen in machinery. To illustrate this matter, an agriholding manager stated that he can buy a certain large tractor at a lower price new in Ukraine than what it would cost used in the United States.[9] Smaller advantages were seen in pesticides and seeds, and the smallest price advantage was seen in fertilizer, being a bulk commodity with low trade margins. No relevant advantage was seen in fuels, buildings, and the remaining miscellaneous physical inputs. Caveat:

[9] This is a considerable statement, as the used machinery prices in the United States are relatively low due to tax incentives on the purchase of new machines (Leibold, 2012).

These factors were not discussed in great detail because their share in the total costs of the typical farms is small[10].

On the output side, it was discussed whether the advantage of 10 % of the agriholding can indeed be realistic. Especially in the case of the higher-value crops, such as rapeseed or soybeans, this relative advantage was considered unrealistically high. Hence, the participants settled on an absolute advantage of 10 USD/t for all crops.

It is important to note that the level of uncertainty with regard to the concrete magnitude of input and output price advantages of agriholdings and large independent farms remained high. Besides the concrete final estimations, Table 4.2 also shows the range within which the estimations after the third round varied.[11] The final results support the hypotheses regarding input and output price advantages of agriholdings derived in Chapter 3.2.

Table 4.2: Input and output prices of the typical farms (relative to the prices of the small typical independent farm, %)

	2F	10F	AH	Range of estimated advantage AH vs. 2F	Range of uncertainty USD/ha
Ag machinery	100%	95%	85%	5-20%	32 (2H) 26 (10H)
Pesticides	100%	97%	90%	5-15%	6
Seeds	100%	98%	93%	3-15%	4
Fertilizer	100%	100%	97%	0-10%	13
Output commodities	100%	100% + 5 USD/t	100% + 10 USD/t	0-10%	69

Note: "2F" = 2,000 ha typical independent farm, "10F" = 10,000 ha typical independent farm, "2H" = 2,000 ha typical agriholding farm, "10H" = 10,000 ha typical agriholding farm, "AH" = typical agriholding farms. The range of uncertainty in the rightmost column shows the difference between the effect on return to land of the lowest and the highest estimated advantage of the AH farms.

Source: Own research.

The output prices have the greatest effect on the return to land of the typical farms and thus on their competitiveness. Because of this high importance the concrete numbers used in the final typical farms are shown in Table 4.3. The key input prices used, on the other hand, can be found in Appendices 3 and 4.

[10] Diesel fuel is the one of these remaining inputs that causes the highest costs. A 5 % price advantage there would lead to a cost advantage of less than 2.50 USD/ha.

[11] The ranges of uncertainty are based on a sensitivity analysis which can be found in Chapter 4.2.3.

Table 4.3: Output prices of the typical farms (USD/t)

	2F USD/t	10F USD/t	AH USD/t
Wheat	116	121	126
Corn	128	133	138
Rapeseed	363	368	373
Soybeans	316	321	326
Sunflower seeds	341	346	351

Note: "2F" = 2,000 ha typical independent farm, "10F" = 10,000 ha typical independent farm, "AH" = typical agriholding farms.

Source: Own research.

4.1.2.3 Risk

The third competitive advantage of agriholdings that was seen by the panel participants is the organizational form's lower risk, mainly thanks to the businesses' size and diversification. The following factors reducing the risk of agriholdings were pointed out:

1. Agriholdings often have their arable operations distributed over a wide geographic area, covering different climatic zones. There are holdings that actively pursue a strategy of regional diversification. Adverse weather events, which are usually more severe in some geographic areas than in others, affect a geographically diversified agriholding less than an independent farm at a single location. The example of hail damage was discussed: Hailstorms are often very local phenomena, which in case of a smaller independent farm can cause losses of more than 30 % of the whole crop. The same event would in the case of an agriholding be a minor problem for the whole business. The agriholding managers argued that while, for example, in the United States yields can be insured, in Ukraine this risk must be borne by the arable businesses, as crop insurance is currently not available. With the regional spread of their business, they would consider crop insurance unnecessary.
2. While the small typical independent farm has a very high equity ratio in its long-term capital structure (90 %), its large peer has a lower equity ratio (65 %), because it utilizes its cheaper capital access for faster growth. The typical agriholding, on the other hand, can sustain the same, or even faster growth with a 90 % equity ratio because it has access to external sources of equity (cf. Chapter 4.2.1.1). Hence, for the same rate of growth, the agriholding has a lower liquidity risk, because it has lower debts. Debts always have to be met, whereas a temporary failure to remunerate equity capital does not force the business into insolvency.
3. It was pointed out that agriholdings have better legal protection thanks to their specialized legal departments.
4. Further, they can also have better political protection when they are politically connected. This issue, however, was not unequivocal. It is further elaborated in Chapter 4.1.4.1.

5. Agriholding farms can help each other out internally when, for example, machines break down.

While a more diverse crop portfolio could also decrease (price and yield) risk, it was pointed out in the panel process that agriholdings are often not more diversified in this regard than independent farms.[12] As a matter of fact, the independent farm managers specifically stated in response to the issue of regional diversification, that crop diversification at their businesses also reduces risk. During the panel process, the typical farms of both organizational forms were found to have the same crop rotations.

Besides the aforementioned risk advantages of agriholdings, the following disadvantages of agriholdings in comparison to independent farms were also pointed out:

1. There was agreement that the extremely rapid growth of agriholdings in the recent years tends to increase risk. Roughly 1,500 USD/ha need to be invested when a farming operation is newly started (fixed assets and variable inputs). If things go wrong, for example, if management does not perform as planned, high financial losses are possible. This is a particular challenge at agriholdings, because they often grow by adding new operations to their company, which require a complete new farm-level management. Independent farms, on the other hand, grow by taking over land and putting it under their existing management, which involves a lot less unknown variables. The lower intensity at which the typical agriholding farms produce (mechanization, variable input use, farm-level management; cf. Chapter 4.2.1) is partly a measure to reduce this risk.
2. Sometimes especially smaller independent farms have owner-managers. If this is the case, the manager's salary is opportunity cost and does not add to liquidity constraints in a situation of crisis. The manager can choose to accept that his work is temporarily (or even permanently) not (fully) remunerated. If, on the other hand, the manager of a business is employed, as it is the case at agriholding farms, his salary is cash cost and always needs to be paid.
3. It was stated that independent farms tend to be more flexible when quick adaptation to changing conditions is necessary. Especially the independent farm managers emphasized that a lack of such adaptability increases risk at agriholdings.

Development of the assessments and consideration in the typical farms

The opinions on the importance of these factors differed substantially between the panel participants. While there was a general agreement that agriholdings have a certain net advantage from facing lower risk, the independent farmers did not consider their risk to be substantially higher than that of agriholdings, whereas the latter considered their organizational form to have

[12] This pertains to diversification within arable farming. Diversification in the form of vertical integration is another matter that is not within the scope of this thesis.

a great advantage in stability. The different assessment of the magnitude of the agriholdings' advantage remained throughout the panel process. There was a consensus that the advantage of agriholdings would be greater if it were not for their currently generally extremely fast growth, which tends to increase their risk. However, the issue in general was considered the least important one of the three competitive advantages of agriholdings.

While risk and the factors which can decrease or increase it at an organizational form were discussed in the modified panel process, the bottom-line advantage of agriholdings could not be quantified concretely enough to include it in the typical farm models.[13]

4.1.3 Net competitive disadvantages of agriholdings

After the description of the competitive advantages of agriholdings obtained in the modified panel process in the preceding section, the competitive disadvantages likewise obtained are expounded in the following.

4.1.3.1 Lower efficiency

The first competitive disadvantage of agriholdings is that the typical agriholding farms were found to have a less favorable ratio between input use and output production – in other words, efficiency – than the typical independent farms.[14] The main underlying reason in the vocabulary of New Institutional Economics is internal transaction cost caused by bounded rationality and opportunism (cf. Chapter 3.2). This is expressed in the fact that the yields (sold product) at the typical agriholding farms are lower than those at the typical independent farms, and more so than warranted by their lower input intensity.[15] This finding results from the information on input use and output production at the farms of the participants, which is expressed in the typical farms.

Subsequently, first the reasons for the lower efficiency of the typical agriholding farms provided by the panel participants are expounded. Thereafter, the development of the assessments over the course of the panel process and their consideration in the typical farms is outlined.

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[13] An exception is that the typical agriholding farms work at a lower intensity of input use, which is elaborated in Chapter 4.2. This lower intensity also reflects, besides other factors, a measure to reduce risk.

[14] Comparing yields alone would not suffice, as the input intensities at the two organizational forms differ.

[15] The different intensities of input use at the typical farms are expounded in Chapter 4.2.

Management performance at the farm level

The first partial explanation of the lower efficiency of the agriholding farms given in the panel process is a lower management performance at the farm level.

The typical agriholding farms have a lower intensity of production, expressed not only in a lower mechanization and variable input use, but also much lower expenses for management at the farm level. It could be surmised that in an organization with partially centralized management, it is a strategy to fulfill more management functions centrally and utilize cheaper managers at the farm level. In that case, the strategy at the typical agriholding farms would simply not work very well in comparison to that of the independent farms. However, this hypothesis was not confirmed in the modified panel process. Rather, the participating agriholding managers agreed with the independent farm managers that success at the farm level is crucial and vitally depends on the management at that level. Their strategy is therefore to increase the payment and incentivization of their farm mangers.

It is important to remember that the represented independent farms were among the best performers in the region (cf. Chapter 4.1.1). They even employed foreign farm managers. However, foreigners who are (1) experienced and capable in farm management, (2) willing and able to accept and cope with the specific circumstances in Ukraine (e.g., different mentalities), and (3) willing to live and work in Ukraine, are very scarce and expensive. The same holds for very good Ukrainian farm managers. It was therefore argued that it is currently simply not possible that agriholdings employ such managers at the majority of their operations.

Longer decision chains and standardization

A further explanation for the lower efficiency of the typical agriholding farms provided by the panel participants was that agriholdings can have a disadvantage because they have longer decision chains and more standardized processes. Longer decision chains lead to lengthier decision making. More standardized processes and decision making according to fixed schemes leads to less flexibility in quickly adapting to variable conditions.

This can be a particular disadvantage in operative arable production, where it is often necessary to react spontaneously, timely and flexibly to external conditions, especially weather. A business that does so effectively can (a) have higher yields (e.g., when a timely fungicide application after rain keeps the crop healthy), and/or (b) save costs (e.g., when a planned fungicide application is skipped because the rain did not come).

The agriholding participants pointed out, that also in their business such farm-level decisions are made at the farms and not in Kiev. However, the farm managers currently certainly have more restrictions imposed on what decisions they can take. A key reason for this is limiting risk. This is necessitated by the fact that the management performance at the farm level is still rather heterogeneous (cf. paragraph above).

It was pointed out by independent farm managers that long decision chains and low flexibility can lead to the problem that knowledge which in principle is available at an agriholding, for example from employed specialists, or from hired consultants, is not effectively applied. Two of the participating independent farm managers, who now run very successful businesses, had worked in advisory functions at agriholdings before. Both said that they had been frustrated with the lack of impact their input had there.

Cost of growth

Another important reason for the lower efficiency of the typical agriholding farms is that the participating agriholding has grown extremely rapidly within a very short time in the three years of the analysis. There was a clear consensus that this has a detrimental effect on performance in production. Part of the lower performance of the typical agriholding farms can therefore be considered cost of growth.

Losses from theft, fraud, and corruption

The fourth explanation for the lower efficiency of the typical agriholding farms are losses from theft, fraud, and corruption. There was great unanimity among the participants that it is common practice in Ukraine for persons at farming businesses, managers as well as workers, to make decisions to their own advantage rather than the advantage of their business. For instance, it was pointed out by several participants that it is common for the persons responsible for input procurement to base their purchase decisions on the bribes they receive, rather than on what is best for the business. Outright theft is also common and managers (such as agronomists) or workers (such as tractor drivers) sell stolen inputs or outputs and take the payment in their own pockets. It was even stated that it is not uncommon that the revenues of mid-level managers from bribes and/or sales of “saved” inputs exceed their regular salaries, which makes, for example, a position as head agronomist very “attractive”.

While explaining the underlying reasons for this behavior is not the subject of this study, the following possible explanations were named by the participants:

- Salaries and wages are very low when measured against the responsibility of the individuals. This is true for farm managers who are responsible for millions of USD in turnover, as well as for workers who handle equipment and inputs worth hundreds of thousands of USD. This discrepancy promotes an attitude that it is legitimate to improve one’s income at the expense of the business.
- Decades of socialism have brought about a mentality in the village populations that farms are there for the (direct) benefit of everyone.

Theft, fraud and corruption at Ukrainian arable farming businesses can take various forms, as the following examples provided by participants show. They did not necessarily occur within their own businesses, but at least in their familiar environment:

- In-house advisors at an agriholding did field trials to find the most suitable sugar beet variety. In the subsequent buying process, they and their results were not involved at all. Their explanation was that bribes were a more important buying criterion than the agronomic suitability of the seeds.
- Independent farmers bought pesticides at a third of the official market price on the black market. It was "saved" (=stolen) product from other businesses. Similar reports were given regarding machinery spare parts.
- In spite of the comparably huge arable farming structures in Ukraine, most of the inputs are still being traded in small packaging units. It is as yet entirely uncommon to deliver loose fertilizer. Instead, it is delivered mostly in big bags. Pesticides are traded mostly in small (e.g., 5 l canisters) rather than large (e.g., 1,000 l containers) vessels. The participating agribusiness representatives pointed out that there is no demand for the large packaging units. When discussed in the focus group discussions, it was stated by some participants that a reason is that small units are better suited to be stolen and sold by farm employees.
- The participating manager of a pesticide manufacturing company pointed out that in some cases agriholdings buy expensive pesticides from major brands. They are then sold by the agronomist, who buys and uses cheaper generics instead.
- Along the highway from Kiev to Odessa, individuals openly advertise that they have (obviously stolen) diesel fuel for sale. This was not only mentioned by the panel participants, but also observed by the author.

It was pointed out that theft, fraud and corruption play a certain role at virtually all farm businesses (as well as businesses in other industries) in Ukraine. However, the losses at agriholdings were estimated to be higher than at independent farms by the participants of both organizational forms. The reason is that a reliable farm manager at an independent farm has a better overview and more control of what happens at the operation.

Development of the assessments and consideration in the typical farms

As has been pointed out above, the efficiency of the typical farms has been determined indirectly from the input volumes and yields provided by the participants in the modified panel process, and the factors elaborated above are qualitative explanations provided by the participants in the process.

At no time of the modified panel process was there a fundamental discrepancy between the typical farm data and the qualitative assessments of the participants, i.e., the participants of both organizational forms considered the organizational form agriholding to exhibit more inefficiencies.

Already in the **first round of the panel process** the participants of both organizational forms, as well as most externals, saw a disadvantage of agriholdings in this regard.

During the **second round**, adjustments to both the input intensities and the yields of the typical farms were made. In the case of the typical agriholding farms, these changes were more profound than at the typical independent farms.[16] A part of these adjustments was the increase of the typical agriholding farms' yields from the 2008-2010 averages which had been used in the drafts. The agriholding participants argued that these yields had been particularly low because of a phase of extremely rapid growth during that time. They pointed out that it takes a while to raise yields when new land is brought into production and that their average yield level in the meantime has already increased. The result of the adjustments was that the average yield difference between the typical agriholding and independent farms decreased from 30 % to 24 %. In spite of the fact that input intensities were also increased, this decreased the economic disadvantage of the typical agriholding farms.

While this way the effect of costs of growth (cf. beginning of this section) was decreased, there was agreement that they still play a certain role in the disadvantage of the typical agriholding farms. There was also agreement that this reflects the typical situation, as agriholdings generally have grown extremely rapidly over the recent years.

During the second round, most of the explanations for the difference in efficiency, which were elaborated above, were provided. However, it was not possible for the panel participants to quantify the impact of the individual causes of the lower efficiency.

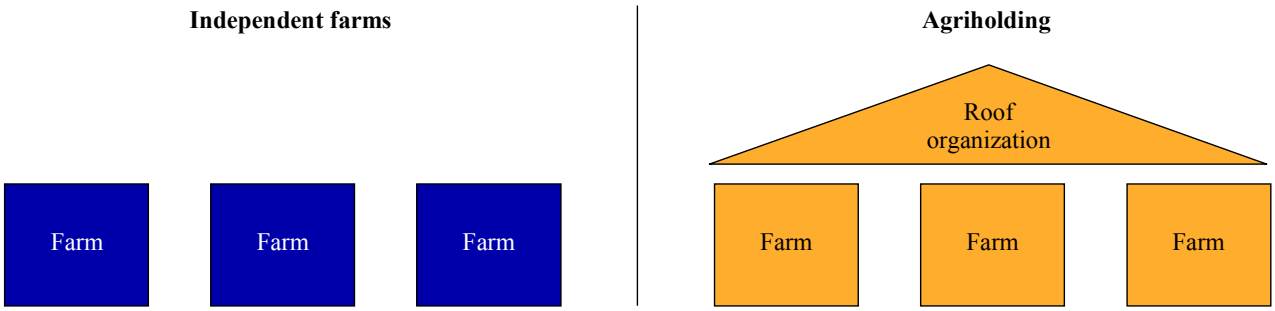
In the **single focus group of the third round**, the key quantitative figures of the typical farms were briefly reviewed and confirmed. Otherwise, the issue of efficiency was not discussed in detail any more in that round.

4.1.3.2 Overhead costs

The second competitive disadvantage of agriholdings found in the modified panel process is that their central organizations cause overhead costs. As illustrated in Figure 4.3, agriholdings differ from independent farms because they have a roof organization in addition to their farming operations. This roof organization takes over certain functions of the farming operations within the agriholding, most importantly input procurement and sales (cf. Chapter 4.2.1.2), as well as accessing capital (cf. Chapter 4.2.1.1). The downside is that additional costs are incurred, which in the typical agriholding farms are accounted for as overhead costs.

[16] Most notably, pesticide costs (cf. Chapter 3.3.4) and yields (soybeans, maize and sunflower seeds) were increased.

Figure 4.3: Organization of independent farms and agriholdings



Source: Own illustration.

Development of the assessments and consideration in the typical farms

The first estimation of the magnitude of the overhead costs was made in the context of the **first round** of the panel process with the help of the participating financial analyst of the agriholding. A partial analysis of accounting data of the agriholding roof organization was conducted, which led to average costs of about 40 USD/ha. There was agreement with the financial analyst that the smaller farms incur higher overhead costs per hectare than the larger ones because of economies of scale – when the size of an operation increases, the amount of resources used from the roof organization does not increase proportionally. Hence, the numbers 30 and 50 USD/ha were used for the two typical agriholding farm drafts.

In the **second round** of the modified panel process, these figures were discussed with the agriholding farm managers. It was pointed out that the numbers analyzed with the financial analyst do not reflect the current situation any more. Like with yields (cf. Chapter 4.1.3.1), it was stated that these numbers reflect effects of the strong growth phase in 2008-2010 and that the average by the time of the second panel round had come down to 30 USD/ha. The numbers 25 and 35 USD/ha were then used for the large and small typical agriholding farms, respectively.

The independent farm participants had no knowledge on the magnitude of these overhead costs.

4.1.4 Inconclusive issues

Besides the clear net competitive advantages and disadvantages of agriholdings in comparison to independent farms which were expounded in the preceding section, a number of issues were also treated in the modified panel process on which no conclusive results could be obtained. While there were indications that these factors may have a relevant impact on the competitiveness of the two organizational forms, this could not be clarified by the end of the process. These inconclusive issues were not incorporated in the typical farms.

As the explanatory information gained in the panel process on these inconclusive issues may be quite relevant for further investigation of the competitiveness of the two organizational forms, it is subsequently elaborated in the same detail as the explanatory information on the conclusive results.

4.1.4.1 Political clout

The first issue which remained inconclusive was the effect of political clout on competitiveness. There was a general agreement among the participants that certain political connections are indispensible for all farms in Ukraine. Participants stated that much more so than in most Western countries, politics in Ukraine are business and politicians often hold their posts and pursue their activities with the aim of personal material gain. They have the power to officially or unofficially take all sorts of decisions that favor certain businesses and/or cause others a disadvantage. For this reason, participants of both organizational forms argued that politicians and administrators need to have the feeling that it is good for them when a certain business is faring well, and political connections are therefore important. It was discussed that they can play a role at the local, regional or national levels.

Political clout at the local level

It was pointed out that in Ukraine, there is a high level of discretion of the administration, as well as inefficient and enormously bureaucratic administrative procedures. For this reason, not only a good working relationship with the local administration is crucial, but also the goodwill of the local politicians. It can make the difference between administrative matters working smoothly, with difficulties, or not at all.

Examples for matters in which such local political connections are needed, or at least helpful, are:

- Land rental (further elaborated in 4.2.3.2)
- Construction permits
- Customs procedures when, for example, machines are imported

There was unanimous agreement that for both organizational forms political connections at the local level are indispensible. None of the participating independent farm and agriholding managers considered their business to have problems from lacking them.

Political clout at the regional and national level

Apart from these local connections, which both organizational forms (need to) have, the point was made that agriholdings often have political clout at the regional and/or national level. The participants argued that this is expressed in two ways: Firstly, agriholdings have (official) lobbying power that is much stronger than that of the independent farmers. Secondly, they may have

"friends" in politics which have a lot of power to act in favor of, or against a business. Sometimes politicians are also directly economically connected with agriholdings. An external participant of the first round said that about 70-80 of Ukraine's 450 parliamentarians are connected with the agribusiness.

It was discussed that such clout at the national level could also have an influence on the local level, for example, when a politician in Kiev instructs a local administrator to not approve land rental contracts.

Further, it was also discussed that influence at the regional or national level can lead to political measures that specifically prefer agriholdings. Examples are subsidies in sugar production which in principle benefit all sugar producers. However, a large share of sugar production in Ukraine is in the hand of agriholdings (who produce part of their own sugar beets and buy part of them). It was subsequently concluded, however, that these subsidies are too small to make a relevant difference (cf. Chapter 4.1.5.1).

It was, however, further pointed out that there are other, more obscure ways in which higher-level politics can strongly influence individual businesses. The example of Khlib Investbud was named. This company, formerly hardly known, in 2010 received the majority of the export quotas during Ukraine's 2010/11 export ban, while other companies, some of them major players for years, came away empty-handed. Participants said that major politicians and/or their "friends" had major stakes in this company.[17] Although not directly related, this example shows how political power and possible corruption can help or hinder companies.

Development of the assessments

While the aforementioned points were made in the panel process, no clear conclusion could be reached on whether these factors provide agriholdings with a competitive advantage. The development of the assessments over the panel process was as follows:

During the **first round** of the panel process (face-to-face interviews), most participants except the agriholding managers considered the political clout of agriholdings to be a major advantage with strong influence on their competitiveness. The agriholding managers argued that such an advantage exists, but it is modest and with little impact on competitiveness.

During the subsequent focus group discussions in the **second round** of the modified panel process, when the concrete causes of competitive advantages and disadvantages were discussed in greater detail, the views on the matter became more differentiated:

[17] Further information on this case can be found in the following newspaper articles: Kyiv Post (2011) and Nikolov (2011).

The independent farm managers came to the conclusion that the advantage agriholdings have from political clout is not very great. They said their organizational form might even have an advantage, because they are personally locally involved and local administrators prefer to work with them, rather than with “subalterns” of an agriholding.

They further pointed out that agriholdings with foreign investors might face a disadvantage because they can get into trouble when they “play the game” the way the locals do. The farmers said that it is not unusual in the country to bribe, for example, to obtain construction permits. The example was then made of US investors who are subject to very strict anti-corruption legislation and face severe penalties if, for example, they are found bribing political decision makers and sued for it in their home country.

The agriholding managers, who from the outset had considered their organizational form’s advantage from political clout to be small, pointed out that their specific business is relatively de-centralized and the farm managers are locally connected, just like the managers of independent farms. They also said that these local contacts are key and “*no deal can be made in Kiev, except in a few special cases, such as export licenses*”. They did state, however, that Ukrainian politics are driven by the desire to get investments into the country and therefore their investment and farming activities are not impeded.

High-level contacts were not considered to be particularly relevant by the participants of either organizational form. The agriholding decision makers pointed out that their company (which has foreign investors) itself does not lobby directly but “lets the Ukrainians do the lobbying”. They also said that they do not engage in any corruption.

In the **single focus group of the third round**, the issue was brought up once again because no final conclusion had been reached so far. The point was made in that round that the participating agriholding, although itself not lobbying, might enjoy the favor of politicians because it does something they want, namely bring foreign money into the country. It was further brought up that possibly other agriholdings, who put more effort into high-level lobbying, enjoy political favors that the participants do not know of. On the other hand, it was also pointed out that the great public presence of large agriholdings can possibly become a disadvantage when it comes to a quarrel between the agriholding and the politicians in power.

In the end the participants of both organizational forms agreed that local political connections are crucial, but no clear outcome was obtained on whether high-level political connections of agriholdings lead to an advantage, and if so, how much. There was no fundamental dissent on the matter, but rather insufficient knowledge for a final judgment, both on the part of both the agriholding and independent farm participants.

4.1.4.2 Access to land

The second issue that remained inconclusive is whether one of the two organizational forms has a competitive advantage from better access to land. Currently the direct competition for land is still relatively weak, and therefore the participants had only limited experience with the matter. However, competition is increasing and possible competitive advantages or disadvantages in this field are therefore becoming more important. This makes the question whether one of the organizational forms has advantages in the competition for land very relevant.

An arable business' access to land is determined by a number of factors, the offered amount of land rent being just one of them. In the following, the land rental procedure as explained by the panel participants is described. Thereafter, the development of the participants' assessments with regard to the competitive position of the two organizational forms over the course of the modified panel process is expounded.

Land rental procedure

It was explained that land in Ukraine is usually still rented out by the villagers collectively. So in order to get access to land, a bidder typically has to come to an agreement with a village community. For this, the amount of land rent offered certainly plays a central role. Besides that, however, other factors are also important. During Soviet times, kolkhozes and sovkhozes were responsible for providing various social services, such as maintaining and cleaning roads, maintaining community buildings, supporting village dwellers in special situations such as bereavement, etc. As these services are not automatically provided by farms any more today, and the state has not filled the void either, the provision of social services by tenants to the rural community has become an important criterion for the decision on whom to rent the land. Further, as institutional contract enforcement in Ukraine is very weak, it is important that the village dwellers have trust in a potential tenant to reliably fulfill his contractual obligations.

Even when there is an agreement between the village community and a potential tenant, there is still a potential bureaucratic pitfall: It is necessary that the local authorities approve the rental contracts. The participants pointed out that here issues of political contacts and potential corruption come into play (cf. Chapter 4.1.4.1 above). If the local authorities do not want the prospective tenant to rent the land in question, they can refuse the contracts.

A final aspect that was pointed out by the participants is that when land changes tenants, this does not always take place via a real market mechanism involving the owners of the resource. Rather, the land rental contracts are sometimes transferred from the current tenant to a future tenant against the payment of a transfer fee, without consultation of the landowners. When individual contracts are then renewed, the respective tenants are factually presented with a fait accompli.

In the following, it is shown where the participants pointed out potential advantages and disadvantages of the two organizational forms, how the assessments developed over the course of the panel process, and why the final result remained inconclusive.

Development of the assessments and land costs of the typical farms

During the **first round** of the panel process, some external participants claimed that agriholdings are able to make more attractive bids to the landowners because they have better possibilities to provide social services and infrastructure thanks to their size, which is consistent with the respective hypothesis derived in Chapter 3.2. The agriholding participants, on the other hand, did not point out such differences.

Conversely, there were statements by independent farm managers that in their vicinity agriholdings provide much less social services than they do, the village dwellers have no personal contact to approach with requests or problems, and the latter therefore much prefer independent farms as tenants.

In the separate focus groups of the **second round**, the first discussed issue was the level of land costs currently paid, and possible advantages of one organizational form in convincing the landowners. The land costs in the typical farm drafts (consisting of land rent and the cost of social services) were shown to the participants. Those of the typical agriholding farm drafts[18] amounted to only 54 % of those of the typical independent farm drafts.[19] This prompted the following comments and explanations by the participants:

- The agriholding participants stated that there are independent farms which conclude rental contracts in which they promise high land rents, but later do not pay them, while their organizational form might promise less, but has a reputation for being more reliable. They said that they do not believe that independent farms typically pay higher land rents.
- The independent farm participants were unable to explain the difference in land rents. They did correct the costs of social services of their organizational form to a slightly lower level, which was then at the same level as at the agriholding. The cost impact of these social services, however, is very low (2-5 USD/ha).
- The participants of both organizational forms were in agreement that the local farm managers are the key success factor in dealing with landowners. He must be there as a contact for the people and he must ensure that land rent payments as well as social services are delivered timely and reliably.
- The participants were also exposed to the hypothesis derived in Chapter 3.2 that landowners might preferentially rent their land out to one of the two organizational forms because of

[18] Based on the average land rents of the agriholding farm sample and statements about the cost of social services in the first round.

[19] Based entirely on statements of the independent farm participants in the first round.

embedded institutions. However, there was agreement of all participants that the landowners are indifferent with regard to the organizational form of their tenants as long as otherwise equal conditions (payment, services …) are provided.

- The participants were further exposed to the hypothesis that agriholdings have advantages on the land market because they have better abilities to enforce rental contracts. It was, however, said by the participants of both organizational forms that the landowners are currently in a weak position anyway, no matter what organizational form their tenant has.
- Finally, the participants were exposed to the hypothesis that agriholdings can push competing farms out of the land market by locally and temporarily paying higher land rents. The locally resulting reduced or even negative profits would only have a minor impact on a large agriholding as a whole. Both sides did not consider this to be currently relevant, as the competition is only slowly beginning to take place through price. However, the participants of both organizational forms pointed out another advantage of agriholdings which is also based on their size: As pointed out above, land is often rented out by whole villages. When this is the case, a potential tenant needs to be able to incorporate large amounts of land in their business at a time, often around 2,000 ha. The larger a business is, the smaller the relative effort is to accomplish this. Hence, larger independent farms currently have an advantage in this regard in comparison to smaller independent farms, and agriholdings have an advantage in comparison to independent farms.

The next matter that was discussed was that of obtaining administrative approval. The discussions went as follows:

- The **independent farm managers** stated that they have no problems from the administration's side when they have an agreement with the village community. They emphasized it is necessary to be on good terms with the local administration to get approval, which they said they are. They further said that a strongly supporting village community can exert influence on their administration, thereby providing a better chance of "pushing the contracts through".
- However, one of the independent farm managers also pointed out that he had wanted to start a new independent farming operation in another part of Ukraine together with investors. He explained that although there was an agreement with the village community, the local administration refused approval and the land was given to a competing agriholding. It was discussed that the farmer had possibly been insufficiently connected locally. The issue was also brought up, however, that the agriholding may have used its influence at a higher level and the local administrator was instructed by his superiors to refuse the contracts.
- When more concretely asked about how they manage to get land in competition with agriholdings, the independent farm managers said that one needs to be faster and have the land secured before an agriholding becomes active. This necessitates good local connections, so that the local authorities actually approach them when land gets available. The independent farm managers further saw an advantage in their higher flexibility and ability to

make quick decisions. However, they stated in agreement that “once an agriholding has put its eye on some land, you do not want to mess with them”. Further enquiry revealed that that they themselves had not been in direct competition for land with an agriholding yet and therefore had no direct experience of their own. It was, however, claimed that even the use of force is not unheard of.

- The **agriholding participants** believed it to be realistic that some agriholdings resort to such means, and get away with it thanks to political power. However, they said that their business neither resorts to political pressure nor any threats. Especially being a company of foreign investors, they would make themselves highly vulnerable with such actions. They pointed out that so far they nevertheless have not had problems with their expansion. They too considered their local farm managers and their connections to be the key success factor in renting land.

In the **third round** of the panel process, the issue of land access was brought up once more, because no conclusion had been reached yet. When the single focus group was confronted with the still unexplained considerable difference between the land costs of the typical farms of both organizational forms, a closer look at the locations of the farms was taken. It turned out that the research area is not entirely homogeneous and there are differences in land rent levels. After some exchanges of concrete examples, the participants came to the conclusion that there is no systematic difference between the land costs of both organizational forms. The land costs in the typical independent farms were consequently reduced and those of the typical agriholding farms increased in order to reflect the regional average.

The final total land rent averages 3.5 % of the local cadaster value, yielding a payment of 60 USD/ha. The social services incur costs of 5 USD/ha at the smaller typical farms of both organizational forms and 2 USD/ha at the larger ones[20]. Therefore the total land costs are:

- 65 USD/ha for 2F and 2H
- 62 USD/ha for 10F and 10H.

In the end there was agreement from participants of both organizational forms that the landowners’ satisfaction is the most important success factor in renting land, and that this can be accomplished by both organizational forms. Further, there was agreement that agriholdings and larger independent farms have a certain advantage because they can more easily incorporate large portions of land than small independent farms. However, no final conclusion was reached on whether typical agriholdings (especially those which do not have foreign investors and act differently) have an advantage from political clout on the land market. It was confirmed that although the competition for arable land in central Ukraine is increasing, it is not particularly fierce yet. When this changes, the issue was expected to become clearer.

[20] There are some economies of scale at the farm level.

4.1.4.3 Motivation and performance of managers

Another factor that remained inconclusive is the motivation and performance of managers at the two organizational forms. This is a key issue, as there was a clear consensus that the scarcity of good managers, especially for the farm level, is one of the most important problems of Ukrainian arable businesses.

It was hypothesized in Chapter 3.2 that Ukrainian managers have a preference for working at agriholdings and perform better in a large-scale, hierarchic environment, due to their long-term socialization. This would give agriholdings a competitive advantage. However, the hypothesis could neither be clearly confirmed, nor rejected in the modified panel process.

Development of the assessments

During the **first round** of the panel process (face-to-face interviews), several participants named examples of specialists who had worked for agriholdings in positions at or above the farm level, but had left again. Two of the participating independent farm managers were actually examples. They said that they themselves, as well as the other mentioned persons, had become frustrated with limited decision authority and long decision chains.

The **independent farm focus group** of the second round did not yield additional insights in this regard. In the **agriholding focus group**, on the other hand, the participants responded to the point made by the independent farm managers in the first round by pointing out that they, too, consider a rigid top-down management to be suboptimal. Consequently, their business follows a comparatively de-centralized approach, with farm managers who are incentivized by a bonus system and have relatively much freedom in operative decisions. They therefore claimed that at least in their business, they are able to motivate managers quite well.

As there had been no conclusive result so far, the issue was brought up again in the **third round** of the panel process (single focus group). The issue of the farm managers who had left agriholdings was raised again, and a new aspect was brought up. The point was made that these specific persons had been foreigners, and that there is possibly a mentality difference between Ukrainians and Westerners. An agriholding participant further made the point that in his agriholding, a few of the top managers, as well as the investors, are westerners, and the company's relatively de-centralized organization might represent the approach of a minority. He pointed out that some of the reputedly most economically successful agriholdings (such as Mironovskiy Khliboprodukt and Mriya) are said to have a very strictly hierarchic, "military style" top-down organization. Continuing along these lines, he hypothesized that the motivation of Ukrainians might not depend as much on them having the opportunity to take over individual responsibility, have high decision authority, and make a strong individual difference with their work, as it is the case with westerners.

In the end, there was no clear outcome on whether one of the two organizational forms has a competitive advantage with regard to the motivation and performance of its managers.

4.1.5 Factors determined to be of no relevance for the competitive position of the two organizational forms

In this part, the factors determined in the panel process to be currently of no or only minor relevance for the competitive position of the two organizational forms are expounded. During the process, the participants were exposed to all the hypotheses on competitive advantages and disadvantages of the two organizational forms derived in Chapter 3.2. Besides the clear competitive differences and inconclusive outcomes expounded before, some of the hypothesized factors were found to have no relevant impact. They are briefly outlined in the following.

4.1.5.1 Subsidies and agricultural policy

Subsidies and other parts of the official agricultural policy were found to not have a relevant impact on the competitive position of agriholdings and independent farms in arable production. The most important subsidy is the Fixed Agricultural Tax, a flat rate tax that considerably lowers the tax burden of agricultural producers. Farm businesses of both organizational forms get that without problems. Apart from that, there are some minor subsidies, such as the financial support of certain input purchases, or interest rate subsidies on various types of credit. All of them are in principle available to both organizational forms. Agriholdings sometimes do have an advantage because they have specialized persons and departments who can deal better with the overabundant bureaucracy involved. The participants of both organizational forms agreed, however, that the competitive impact is very small because the low overall support volumes.

Note that this outcome refers only to arable production. It is possible that the tax regulations and other policy measures give vertically integrated agriholdings a specific advantage. While this is not within the scope of this thesis, the issue is briefly treated in Chapter 4.1.6.

4.1.5.2 Motivation, performance and cost of workers

Another factor with regard to which the panel found no competitive advantage of one of the two organizational forms is the motivation and performance of workers. “Workers” here refers to persons working at the farm level who are not managers. For results on the latter refer to 4.1.4.3.

In Chapter 3.2 the hypothesis was derived that Ukrainian workers are more suited to large, hierarchic organizations because of their long-term socialization, and they are therefore more motivated and perform better at agriholdings. The panel participants agreed, however, that

workers are indifferent about whether the farm they work on is part of an agriholding or not. How the farm workforce performs and how motivated it is, is predominantly determined by the management at the farm level. The wage level and the reliability of its payment are important aspects. These factors are specific to individual businesses, not organizational forms. This is also true for the potential willingness of workers to support “their” company in times of hardship, e.g., by accepting wage arrears.

4.1.5.3 Economies of scale in operative production

The last factor which was found to be without important impact on the competitiveness of agriholdings and independent farms is economies of scale in operative production.

The large typical farms were deliberately selected such that the economies of scale at the farm level are (approximately) fully exploited. Hence, while there are considerable economies of scale when increasing farm size from 2,000 ha to 10,000 ha (cf. Chapter 4.2.2.1), further relevant economies of scale could only arise from factor use across operations.

It was discussed during the modified panel process that especially machines could be used across operations in such a manner that different fieldwork times at different locations are exploited to reduce total mechanization and increase the utilization of the remaining machines. The primary example would be combines that start harvesting in the south and work their way up north. However, it was concluded by the participants that doing so and consequently reducing mechanization is risky. It may work in some years, but in other years the weather constellations are such that the machines would be needed at different places at the same time. The participating agriholding managers pointed out that for this reason their strategy is to have full mechanization at each of their operations and forego the theoretically possible cost savings.

4.1.6 Effects of vertical integration

In this last part of Chapter 4.1, the effect of vertical integration on the competitiveness of agriholdings is briefly treated. Vertical integration is not within the scope of this research. However, from the outset of the panel process, the issue was brought up by participants as an important competitive advantage of agriholdings. Because of the apparent importance of the matter, the aspects that were raised are briefly summarized here and exemplarily quantified. This part neither claims, nor aims at completeness and exactness.

The following aspects which can give agriholdings an advantage from vertical integration were pointed out by the participants in the panel process:

1. Through vertical integration, businesses can capture the margins of other stages in the value chain.

2. Processing companies can achieve a reliable raw material supply by integrating vertically with primary agricultural producers.
3. Vertical integration constitutes diversification, which decreases risk.
4. Agriculture in Ukraine enjoys a very favorable tax regime with the Fixed Agricultural Tax. If a person or entity owns both processing companies and farming operations, they may be able to save taxes by moving profits into primary agricultural production. This could be accomplished by adjusting transfer prices.
5. The Ukrainian state currently fails to pay its VAT[21] debts when a business has a negative VAT balance. This is a problem in conjunction with exports, because those do not provide VAT revenues. If businesses are set up in such a way that their VAT balance remains positive, they have an advantage. Vertical integration can accomplish this.

While it would be very challenging to quantify the first three points, an exemplary quantification of the points 4 and 5 was possible. To this end the necessary details were reviewed in literature and exemplary calculations were made. The examples are explained and the results of the calculations (in USD/ha of the typical agriholding farms) provided in the following.

ad 4: Fixed Agricultural Tax

Companies that obtain more than 75 % of their income from agricultural activities in Ukraine are eligible for the so-called “Fixed Agricultural Tax” (FAT). It replaces the corporate income tax, land tax, and some other minor taxes. The calculation basis of the FAT is the nominal (cadaster) land value. This nominal land value is set by the authorities; it is not a market value. As of the beginning of 2011, the countrywide average amounted to 1,422 USD/ha. The FAT amounts to 0.15 % of the land cadaster value which equates to roughly 2 USD/ha annually in the Ukrainian average (Lapa et al., 2010).

If one person or entity owns two legally independent companies, one having the status of agricultural producer and the other one being a processing facility which buys its inputs from the former, profits could be transferred by adjusting prices. Suppose that a processing company buys all the outputs of the typical agriholding farms in this analysis and it pays prices which are 30 %[22] above market prices. Then the profits of the typical farms would increase by ca. 220 USD/ha, and those of the processing company decrease by the equivalent amount. The tax burden of the farming operation would not change thanks to the Fixed Agricultural Tax. However, with the normal corporate income tax amounting to 23 % of profits, the processing company would save taxes equivalent to about 50 USD/ha of the typical agriholding farms.

[21] Value added tax

[22] This number for the *exemplary* scenario was subjectively estimated by the author. It was not stated by the participants.

ad 5: VAT regime

The Ukrainian state currently does not meet its VAT debts, which is a problem when exports take place. Until some time ago, this was a direct problem of the exporting companies (Lapa et al., 2010), who had to pass on this loss to their suppliers by paying less for commodities than they otherwise would. This has changed since. As of late 2012 the situation is such that when arable producers sell commodities to exporting companies, they do not receive VAT from the exporter any more.[23]

Hence, if (in the most extreme case) an arable producer sells his entire production to exporters and does not sell anything domestically (including used machinery etc.), he has no VAT revenues at all. However, he does have the VAT expenses from buying inputs. As the state currently fails to pay this balance back, the arable business effectively has 20 % (= the VAT rate) higher input costs. This yields a disadvantage of roughly 90 USD/ha.[24]

This problem can be overcome in two ways:

1. The arable producer imports his own inputs parallel to the commodity exports.
2. The arable producer is vertically integrated with one or more other companies that generate VAT revenues from domestic sales. For example, the arable producer could be integrated with retail stores. That way the VAT expenses for inputs are balanced with VAT revenues.

The first solution can also be accomplished by independent farms. Participants pointed out, for example, that they purchase machinery from abroad and import it directly. The second solution is limited to vertically integrated businesses.

Assessment

Taken together, these two potential advantages add up to 140 USD/ha. Note that the calculations are exemplary. In case of the profit transfer, the 30 % price increase was a subjective estimate. In case of the VAT issues, the 90 USD/ha advantage constitute a worst-case scenario. However, this figure of 140 USD/ha is higher than the profit of both typical agriholding farms, as well as that of the small typical independent farm. This is indicative that vertical integration might currently have a greater impact than most other factors analyzed in this thesis.

[23] This is true for grain, rapeseed, and sunflower seeds, cf. Ukrainian Tax Code (2012).

[24] To calculate the cost difference, the costs of all physical inputs were increased by the VAT rate of 20 %. Changes to capital costs were not included, which would have slightly increased the effect. On the other hand, it was assumed that nothing other than agricultural commodities is sold (omitting used machines, for example), which would have slightly reduced the effect.

4.2 Further characteristics and performance of the typical farms

In the modified panel process, typical independent and agriholding farms were established. With the competitive advantages and disadvantages of the two organizational forms, some of their properties were already explained in the preceding chapter. The remaining key characteristics of these typical farms, which do not reflect competitive advantages and disadvantages and therefore were not explained yet (such as crop rotations), are subsequently outlined.

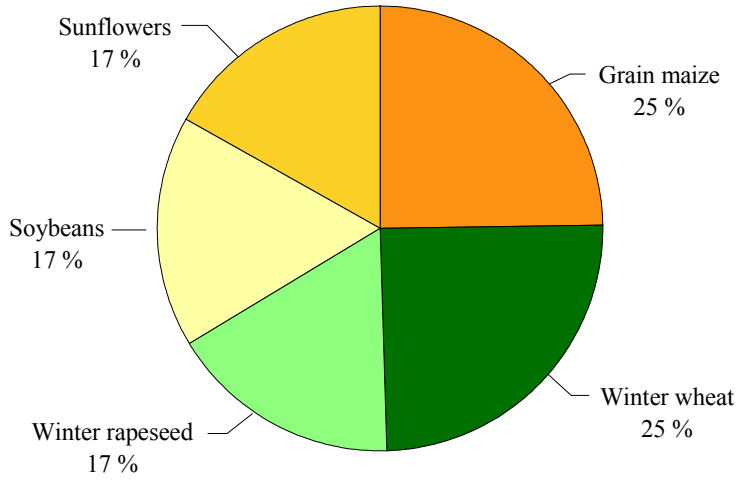
Thereafter the calculated economic performance of the typical farms, including their return to land, is shown. Differences between the typical farms are summarized and quantified, and the yields at which both organizational forms would have equal return to land are shown. Thereafter follows a sensitivity analysis.

4.2.1 Key characteristics of the typical farms

4.2.1.1 Crop rotation

As can be seen in Figure 4.4, the typical farms of both organizational forms grow five crops: Winter wheat, winter rapeseed, grain maize, sunflowers, and soybeans. No systematic difference between the crop rotations of the two different organizational forms was seen by the panel. Further, no difference between the larger and smaller farms within each organizational form was seen.

Figure 4.4: Crops grown by the typical farms (share in rotation, %)



Source: Own illustration.

A relevant number of farms in the analyzed area also grows sugar beets. In the case of agriholdings, this takes place in vertically integrated businesses most of the time. The participating agriholding, on the other hand, did not grow sugar beets. In the case of the independent farms, about half of the businesses of the organizational form in the area grow sugar beets. As the participating agriholding would not have been able to provide data on sugar beets, and because of the frequent connection of sugar beet production with vertical integration (which is not in the scope of this thesis), the typical farms were established without this crop.

4.2.1.2 Production systems

This part describes the production systems of the typical farms. Production system in this context refers to the way crops are grown. For example, this includes tillage operations (time, type of implement, depth), seeding (time, type of seeder, type and amount of seeds), crop protection passes (time, type of pesticide, amount), fertilization (time, type of fertilizer, amount), etc.

With regard to tillage, for both organizational forms a system based on intensive cultivation, but without moldboard plow usage was found to be typical. While in the local farm population there are operations of both organizational forms that do use the moldboard plow at least for part of their crops, the majority tends not to do so any more.

The panel found no systematic difference of the production system of the small and large farms within an organizational form. While this means that the same fieldwork operations are done, the utilized machinery certainly differs between the farm sizes, primarily with respect to the size of the equipment. Between the two organizational forms, however, differences in the production systems were found. The production system at the typical agriholding farms is less intensive especially with regard to fertilizer and pesticide use. On the other hand, the number of tillage operations is slightly higher at this organizational form, resulting in a roughly 10 % higher diesel fuel usage.[25]

Figure 4.5 shows the variable input intensities of the typical farms of both organizational forms. The chart expresses physical intensity in monetary terms. The numbers were calculated by multiplying the different amounts of inputs used per hectare (average over all crops) with the *same* price for both organizational forms in order to clarify the isolated effect of the different physical intensities.[26] Details on the key inputs and their physical quantities can be found in the profit and loss accounts provided in Appendix 4. The effect of price advantages of agriholdings and larger independent farms are analyzed separately. They were already treated in Chapter 4.1.2.2.

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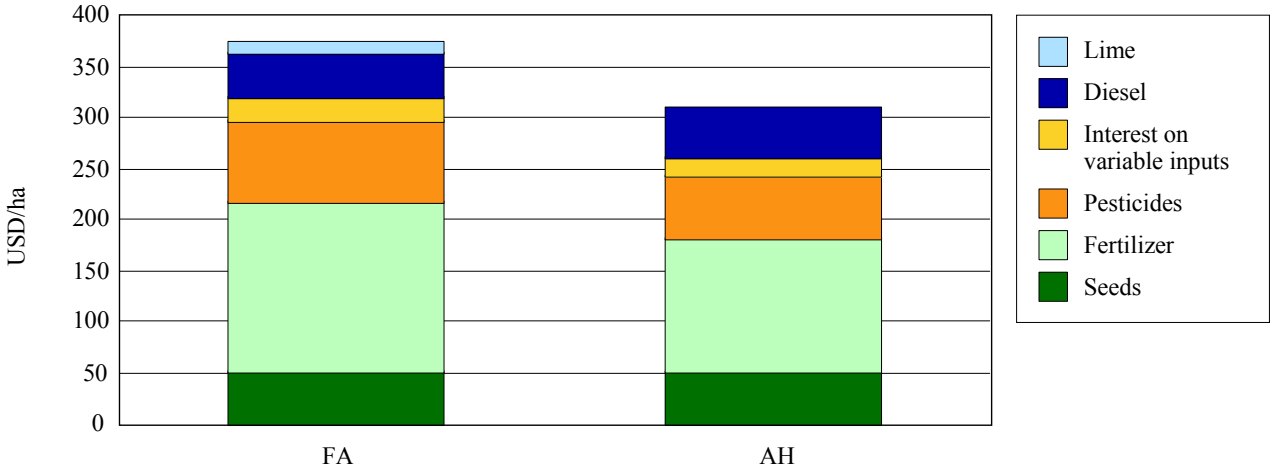
[25] Further details are provided in Appendix 4.

[26] To this end, the numbers in the chart were calculated using the prices of the small typical independent farm (2F), which is the one with the highest input prices.

Figure 4.5: Intensity of variable input use at the typical agriholding and independent farms expressed in monetary terms (USD/ha, average over all crops)



Note: "FA" = typical independent farms, "AH" = typical agriholding farms. The figures show the average physical inputs used at both organizational forms multiplied with the prices of the small typical independent farm, in order to clarify the isolated effect of the different physical intensities. Drying energy has been left out (4 USD/ha at FA, 2 USD/ha at AH).
Source: Own illustration.

As can be seen, the lower amount of fertilizers used at the typical agriholding farms incurs more than 30 USD/ha lower costs in comparison to the typical independent farms. Their lower pesticide use further causes crop protection costs to be more than 20 USD/ha lower. The independent farms apply lime, which the agriholding farms do not. The total difference in variable input intensity amounts to 64 USD/ha.

4.2.1.3 Labor organization and cost

The labor organization of the typical farms is summarized in Table 4.4. As can be seen there, the two organizational forms differ considerably in this regard. The most striking difference is that the typical independent farms have several times higher management costs at the farm level than the typical agriholding farms: While both the small and the large agriholding farms have costs for their general directors of slightly above 30,000 USD per year, the independent farms have 90,000 USD and 250,000 USD per year, respectively. This tendency continues in the second management tier. While the agriholding employs five persons for about 8,000 USD per year each, the small independent farm employs two persons for 15,000 USD per year each, and the large independent farm two persons for 100,000 USD per year and three persons for 50,000 USD.

While the typical independent farms have considerably higher costs for their farm level management, the total number of staff is higher at the typical agriholding farms. Within the organizational forms, the smaller farms have higher numbers of workers per hectare than the larger ones.

Table 4.4: Labor organization and annual costs of different staff at the typical farms

	2F	10F	2H	10H
Cost of general director	90,000 USD	250,000 USD	31,600 USD	
Second tier managers and costs	2 persons 15,000 USD each	5 persons 2 x 100,000 USD 3 x 50,000 USD	5 persons 8,000 USD each	
Average cost per general worker	2,700 USD			
Total staff	26	83	38	138
Total staff per 1,000 ha	13.0	8.3	19.0	13.8

Note: "2F" = 2,000 ha typical independent farm, "10F" = 10,000 ha typical independent farm, "2H" = 2,000 ha typical agriholding farm, "10H" = 10,000 ha typical agriholding farm.

Source: Own research.

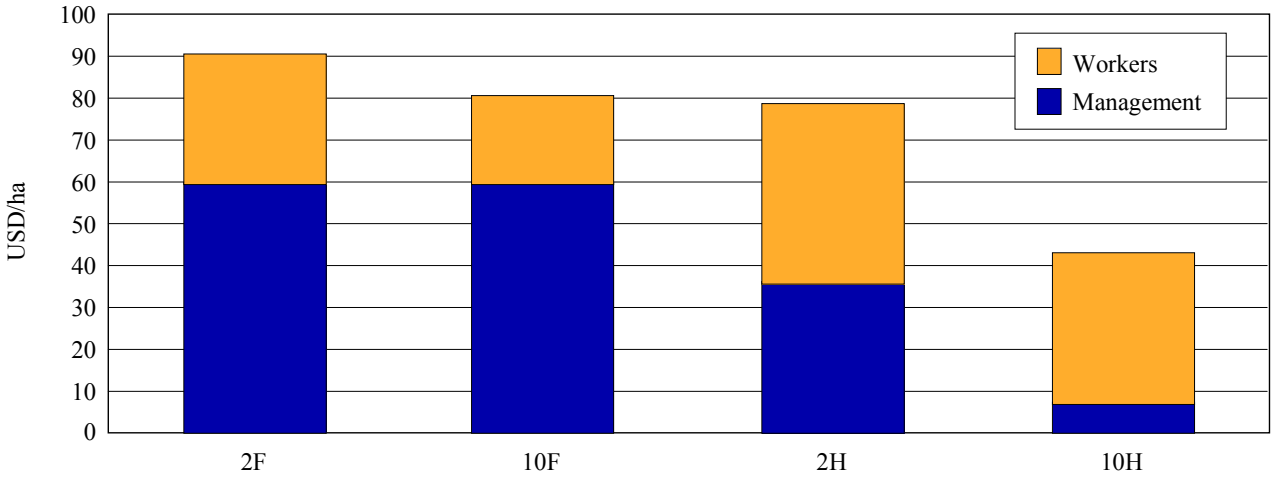
The difference with regard to management, as well as with regard to staff numbers, was explained mostly with the fact that the subpopulation represented by the participating independent farms constitutes the best performers in Ukraine. They have progressed on a path that leads to higher expenses for farm managers, based on the realization that the quality of farm level management is among the most influential determinants of success. The farm managers and/or agronomists at these farms are often foreigners. The other side of this development is that it leads to a smaller number of total workers per hectare, who can then be better supervised and instructed.

In the case of the small typical independent farm, it was pointed out in the panel that there would be some more room for rationalization with regard to workers, i.e., the farm could do with less. However, employment is currently being kept at the higher level for social reasons.[27]

The resulting labor costs of the typical farms per hectare at the farm level (management and workers) are shown in Figure 4.6. As can be seen there, the total labor costs are highest at the small independent farm with about 90 USD/ha. The large agriholding farm constitutes the other extreme. At 43 USD/ha, total labor costs there amount to only about half of those of the small independent farm.

[27] Besides altruistic reasons, creating employment also helps the farmer maintain a good standing with the village population, which improves his access to land (cf. Chapter 4.1.4.2).

Figure 4.6: Annual labor costs of the typical farms (USD/ha)



Note: "2F" = 2,000 ha typical independent farm, "10F" = 10,000 ha typical independent farm, "2H" = 2,000 ha typical agriholding farm, "10H" = 10,000 ha typical agriholding farm.
Source: Own illustration.

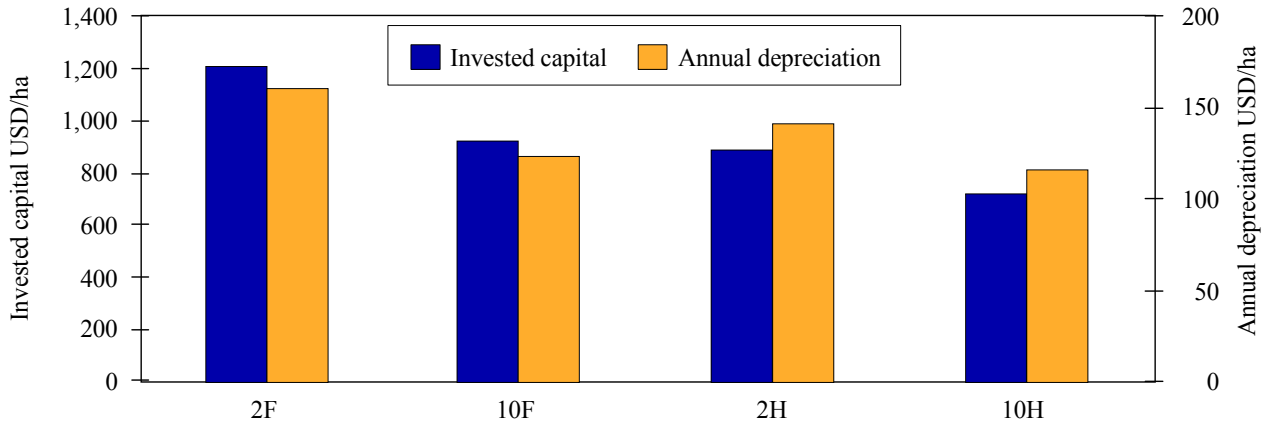
4.2.1.4 Mechanization and grain handling

All the typical farms are fully mechanized for their needs. While they do not systematically rely on contractors and/or, in the case of the agriholding, on machinery that is used across operations, these options can be utilized in special cases, such as machinery breakdowns.

The total invested machinery capital and the annual machinery depreciation of the typical farms is shown in Figure 4.7. In order to clarify the isolated effect of intensities, the figures were again calculated with equal prices (those of the small typical independent farm).[28] As can be seen from the invested capital figures, the mechanization intensity is lower at the typical agriholding farms. Further, within each organizational form, the smaller farm has more machinery capital per hectare than the larger one. This is mainly a result of economies of scale in mechanization: Larger machines are cheaper per unit of service provided, and the larger farms can utilize their machinery to a somewhat higher degree.

[28] The effect of price advantages of the typical agriholding farms is treated in Chapter 4.1.2.2.

Figure 4.7: Invested machinery capital and annual machinery depreciation of the typical farms (price differences not included, USD/ha)



Note: "2F" = 2,000 ha typical independent farm, "10F" = 10,000 ha typical independent farm, "2H" = 2,000 ha typical agriholding farm, "10H" = 10,000 ha typical agriholding farm. In order to show the isolated effect of the different mechanization intensities, the same prices (those of the small typical independent farm) were used to calculate all numbers.
Source: Own illustration.

As a result of the lower mechanization intensity at the typical agriholding farms, the machines there are utilized to a higher degree annually and consequently, the depreciation period at 5 years is shorter than at the independent farms, where it is 6 years. However, due to their higher annual utilization, the residual value of the agriholding machines after 5 years was assumed to be the same as that of the independent farm machines after 6 years. As a consequence, the organizational forms differ less with regard to annual depreciation per hectare than they do with regard to invested machinery capital per hectare.

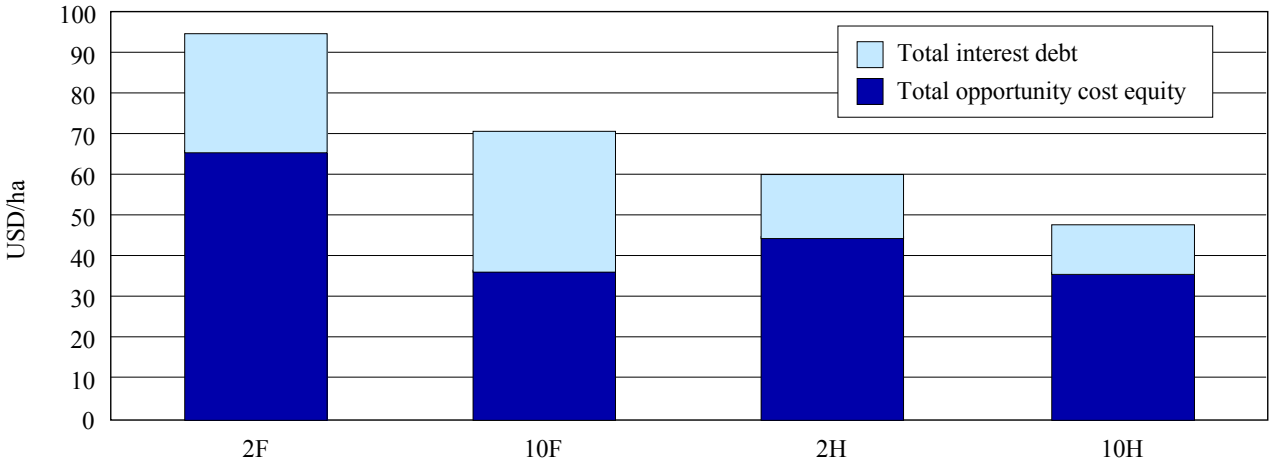
With regard to grain handling, all typical farms have storage facilities for roughly 50 % of their annual harvests. Sufficient drying capacity is also available at all typical farms to dry the total corn harvest[29] in roughly 50 days. It was pointed out by the participants that agriholdings sometimes have on-farm storage and sometimes also centralized elevators. The latter tend to be more expensive to construct than simple on-farm storage facilities (such as hangar-type sheds). Due to the small total cost of these facilities on a per-hectare basis, no differentiation was made in the typical farms.

[29] This crop requires the highest drying capacity.

4.2.1.5 Capital costs

The typical farms differ with regard to their capital structures and interest rates. These differences were expounded in Chapter 4.1.2.1. Besides these, the capital costs per hectare of the typical farms depend on the capital bound long-term in the form of physical assets, as well as short-term in the form of variable inputs. The resulting capital costs per hectare are shown in Figure 4.8. As can be seen, they are higher at both typical independent farms than at both typical agriholding farms. Within each organizational form, the capital costs per hectare are lower at the larger operations. The difference between the large typical agriholding farm and the small typical independent farm amounts to 47 USD/ha – the latter has twice the capital costs of the former!

Figure 4.8: Capital costs of the typical farms (USD/ha)



Note: "2F" = 2,000 ha typical independent farm, "10F" = 10,000 ha typical independent farm, "2H" = 2,000 ha typical agriholding farm, "10H" = 10,000 ha typical agriholding farm.
Source: Own illustration.

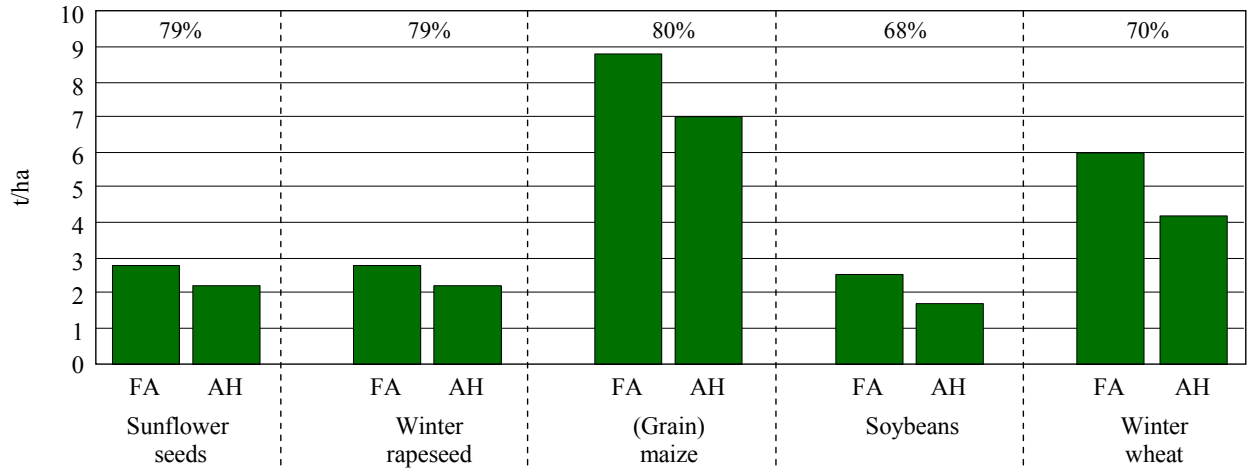
4.2.1.6 Crop yields

As has already been pointed out in Chapter 4.1.3.1, the crop yields[30] of the typical agriholding farms are lower than those of the typical independent farms. Said yields are shown in Figure 4.9. As can be seen there, the relative yield difference varies with crops. On average, the typical agriholding farms reach 76 % of the typical independent farm yields. Within the organizational forms, the yields of the small and large farms are the same. It was discussed during the panel process whether or not the smaller farms typically have higher yields because of better

[30] The yields are dry and clean product for sale. Possible losses within the organization between harvest and sale are already deducted.

manageability. Some participants argued that this is possible, but the consensus was that it is not systematically the case and depends very much on the management of the individual farm.

Figure 4.9: Yields of typical farms (t/ha) and yields of typical agriholding farms relative to those of the typical independent farms (%)



Note: "FA" = typical independent farms, "AH" = typical agriholding farms. The yields of the small and large farms within the organizational forms are the same. The % figures indicate the percentage of the independent farm yields the typical agriholding farms reach.
Source: Own illustration.

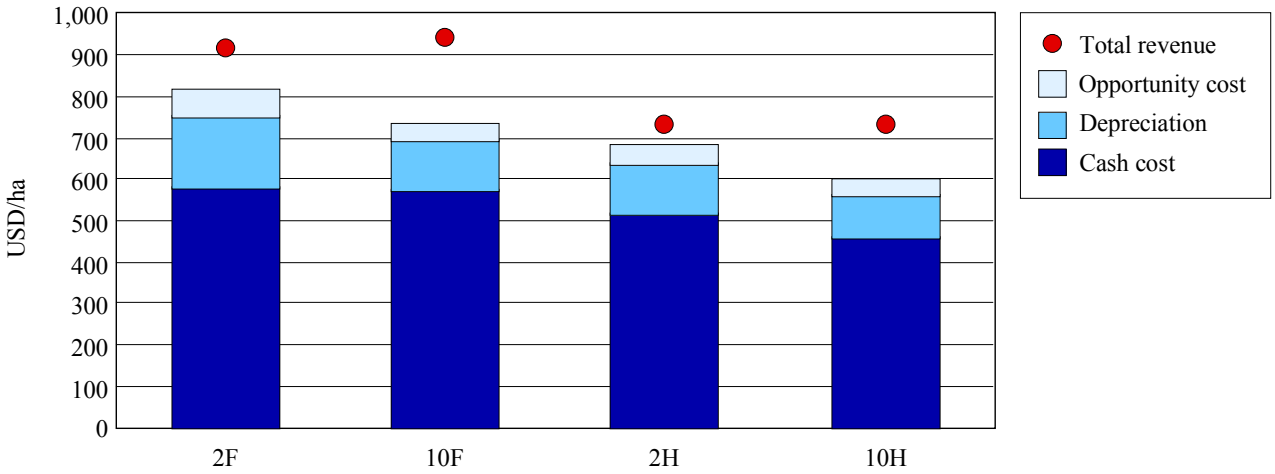
4.2.2 Economic performance of the typical farms and quantification of differences between the organizational forms

After the key characteristics of the typical farms have been outlined, in this section the economic performance indicators which were calculated with the typical farms are first shown.

4.2.2.1 Economic performance of the typical farms

Figure 4.10 shows the total costs and revenues of the typical farms (averages across all crops) per hectare. As can be seen, the total costs of both typical independent farms are higher than those of both typical agriholding farms. Within the organizational forms, the larger operations have lower costs per hectare than the smaller ones. The revenues of the typical independent farms are higher than those of the typical agriholding farms, thanks to their higher yields, with the large typical independent farm having slightly higher revenues than its small peer thanks to its output price advantage of 5 USD/t. The output price advantage of the typical agriholding farms is not sufficient to compensate for their lower yields.

Figure 4.10: Total costs and revenues of the typical farms (average over all crops, USD/ha)



Note: "2F" = 2,000 ha typical independent farm, "10F" = 10,000 ha typical independent farm, "2H" = 2,000 ha typical agriholding farm, "10H" = 10,000 ha typical agriholding farm.
Source: Own illustration.

The chart differentiates between cash cost, depreciation, and opportunity cost. This provides information on the endurance of the farms especially in times of crises. A high share of opportunity costs indicates stability, as an owner can temporarily (or even permanently) decide to forego (part of) the remuneration of his own factors of production without liquidity problems.[31]

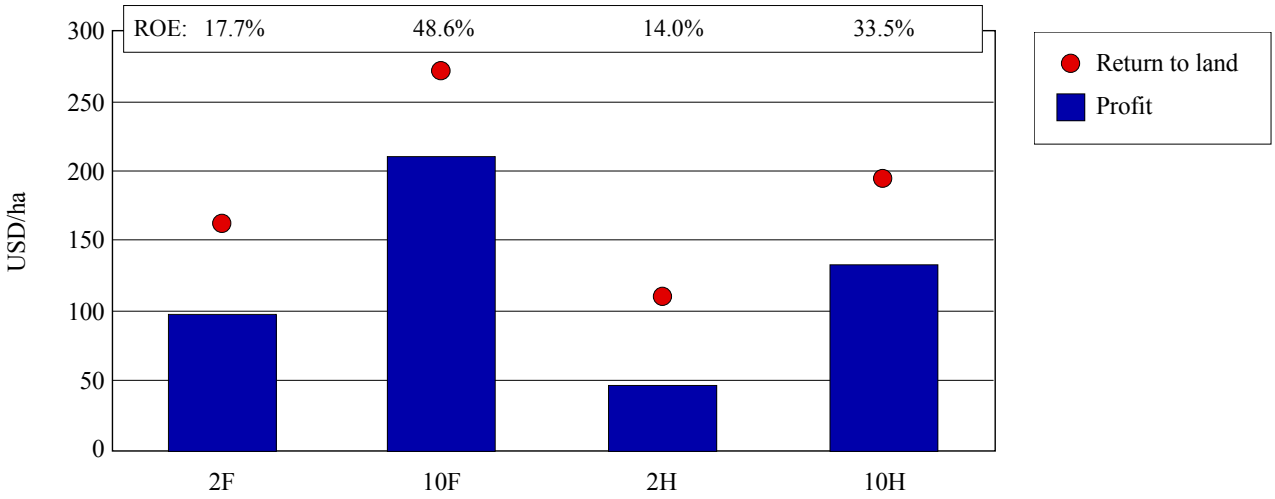
The small typical independent farm has the highest opportunity costs because it has the highest equity ratio. Sometimes especially such smaller independent farms also have managers who are at the same time the owners of their business. If this is the case, the remuneration of the farm manager (45 USD/ha), which is currently part of the cash costs in the typical farm, becomes part of opportunity cost instead. This can also be the case at larger independent farms. In the case of the large typical independent farm the remuneration of the farm manager, which then would become opportunity cost, amounts to 25 USD/ha.

Figure 4.11 shows the economic performance of the typical farms. As has been derived in Chapter 3.1, the key quantitative indicator of competitiveness in arable farming is return to land. As can be seen, this indicator is highest at the large typical independent farm. The second highest return to land is achieved by the large typical agriholding farm. Thereafter rank the small farms, with the typical independent farm again outperforming the typical agriholding farm. Hence, the

[31] Generally, opportunity cost is the calculatory cost for all owned factors of production, namely capital, labor/management, and land. However, the typical farms have all their land rented and thus no corresponding opportunity cost. Further, the calculations with the typical farms were made assuming that they have only employed labor and management and therefore also no opportunity cost for those factors of production, Hence, only opportunity costs for equity capital appear in the calculations.

size of the operations has a greater impact on their return to land than the organizational forms they belong to.

Figure 4.11: Return to land (USD/ha), profit (USD/ha), and return on equity (ROE; %) of the typical farms



Note: "2F" = 2,000 ha typical independent farm, "10F" = 10,000 ha typical independent farm, "2H" = 2,000 ha typical agriholding farm, "10H" = 10,000 ha typical agriholding farm.
Source: Own illustration.

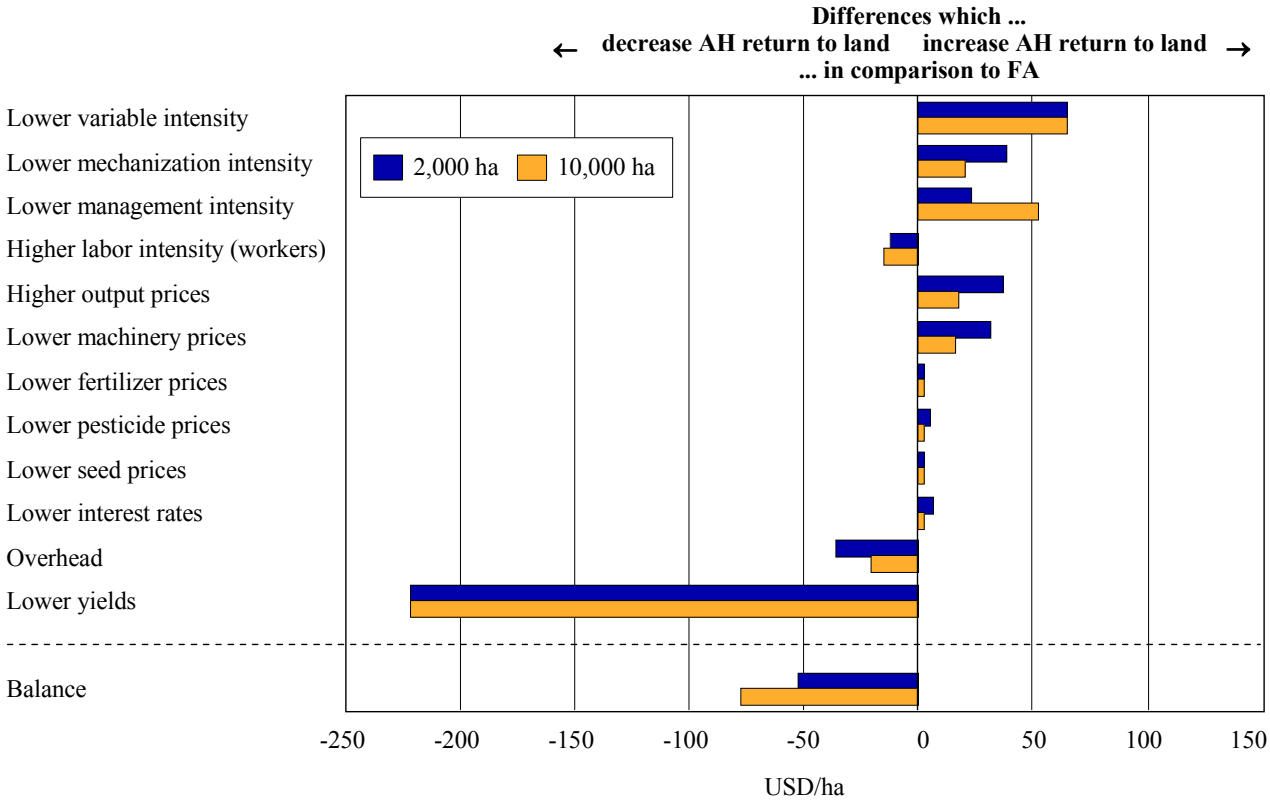
Besides return to land, the profits per hectare of the typical farms are also shown in the chart. They show the same ranking at a lower level, as profit is return to land less land cost. Further, the returns on equity of the typical farms are provided. Their ranking is the same as the profit ranking, although other factors play a role there besides profit, namely the different capital structures and debt capital interest rates of the typical farms. The large typical independent farm not only has the highest profitability, it also has the highest debt ratio in its long-term capital. This provides leverage which increases the return on equity. Overall it can be stated that arable farming in Ukraine has been a very profitable investment for the analyzed farm populations in the 2008-10 period, especially for larger farms within both organizational forms.

4.2.2.2 Quantification of differences between the organizational forms

In the following part the differences between the typical agriholding and independent farms of the same sizes are analyzed. Figure 4.12 summarizes these differences. The bars represent the effect the individual factors have on the return to land of the respective typical agriholding farm in comparison to the respective typical independent farm. As can be seen, the lower intensity of the typical agriholding farms in variable input use, mechanization, and farm level management tend to increase their return to land. The higher intensity of worker input at the typical agriholding farms, on the other hand, has the opposite effect. These intensity decisions by

themselves cannot be considered advantages of either organizational form. They are rather first and foremost a question of management strategy.

Figure 4.12: Key differences between the typical agriholding and independent farms and their effect on the formers' return to land (USD/ha)



Note: "AH" = typical agriholding farms, "FA"= typical independent farms. The bars show the effect of differences between the organizational forms on the return to land of the AH farms in comparison to the FA farms of the same size. The isolated factors do not add up exactly to the balance (1) because of rounding errors, and (2) because in the instances when farms have different volumes and prices, there is not only an additive but also a multiplicative interaction which is not accounted for when factors are isolated. The reason for the effects of the variable intensity and yield differences being the same at 2,000 and 10,000 ha is, that both typical farms within an organizational form have the same production system (for details cf. Chapter 4.2.1.2).
Source: Own illustration.

The subsequent set of factors, however, reflects advantages of the typical agriholding farms in comparison to the typical independent farms: They achieve better terms in input procurement and output sales. As can be seen, the higher output prices and lower machinery prices have the greatest effect. The effect of the lower fertilizer, pesticide, and seed prices, on the other hand, is very small in comparison.[32]

[32] Part of the reason for the small effect of seed prices is, that in winter wheat and soybeans, which together account for 37.5 % of the crop rotation, 90 % of the required seeds are farm-saved and only 10 % are purchased.

The effect of the cheaper access to capital of the typical agriholding farms, especially in comparison to the small typical independent farm, is small. This is, because the latter uses comparatively little external capital in adaptation to the higher costs.

The next factor shows an inherent competitive disadvantage of agriholdings: While their central organization provides them with advantages, it also causes overhead costs, which tend to lower the typical agriholding farms' return to land. The difference is lower at the larger farms for two reasons: (1) As explained in Chapter 4.1.3.2, there are economies of scale that decrease the overhead costs per hectare at the large typical agriholding farm in comparison to its smaller peer. (2) The larger independent farm has costs from the establishment of International Financial Reporting Standards (IFRS; cf. Chapter 4.1.2.1) which were allocated to this farm as overheads, thereby decreasing the difference to the agriholding counterpart.

The last factor in the chart, the lower yield level of the typical agriholding farms, has the most significant negative impact on their return to land. While somewhat lower yields would be without negative consequence taking into consideration the lower intensity of production at the typical agriholding farms, the actual yield difference considerably over-compensates the lower intensity.

The bottom-line difference between the typical farms of opposite organizational forms is shown in the last bars. It amounts to a disadvantage of 77 USD/ha for the large typical agriholding farm, and a disadvantage of 52 USD/ha for its small peer in comparison to their respective counterparts.

4.2.2.3 Required yields of typical agriholding farms to draw level with the typical independent farms

Given the bottom-line disadvantage of the typical agriholding farms, the question arises: by how much would they have to increase their yields ceteris paribus in order to achieve the same return to land as the typical independent farms and thus the same (quantitative) competitiveness.

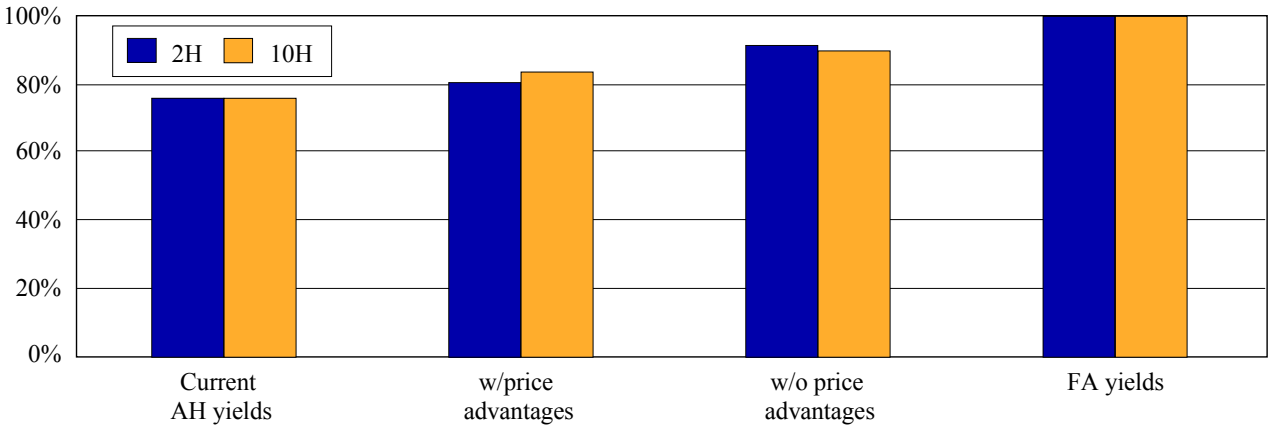
The answer to this question is provided in Figure 4.13. As can be seen there, the typical agriholding farms currently have 76 % of their independent counterparts' yield level on average. With their input and output price advantages being as they are, the typical agriholding farms would have to increase their yield levels ceteris paribus[33] by 7.1 % (2,000 ha) and 10.4 %[34] (10,000 ha) to draw even with their independent counterparts. If, on the other hand, the

[33] Ceteribus paribus here means first and foremost: Without increasing their input use.

[34] The 2,000 ha typical agriholding farm would then have 81 %, and the 10,000 ha typical agriholding farm 83 % of their respective independent counterparts.

agriholdings would not have their price advantages, but the other differences (lower intensity, overhead costs) would remain the same, they would have to increase their yield levels by 21.0 % (2,000 ha) and 18.6 %[35] (10,000 ha), respectively.

Figure 4.13: Required yields of typical agriholding farms to achieve equal return to land as independent counterparts (average over all crops, % of independent farm yield)



Note: "AH" = typical agriholding farms, "FA" = typical independent farms, "2H" = 2,000 ha typical agriholding farm, "10H" = 10,000 ha typical agriholding farm.
Source: Own illustration.

As was shown in Figure 4.11, not only the typical independent farms have higher return to land than their agriholding counterparts, but also the larger typical farms of each organizational form have higher return to land than their smaller peers. If the latter were to reach the same return to land as the former, they would need to increase their yields ceteris paribus by 12 % in both organizational forms.

4.2.3 Sensitivity analysis

The typical farms reflect the assessments of the panel participants. While only clear competitive advantages and disadvantages of the two organizational forms were incorporated in the typical farms (and not, for instance, the inconclusive aspects expounded in Chapter 4.1.4), the exact quantitative magnitude of these differences has a relatively wide margin of uncertainty. Not only were the participants unable to quantify all differences exactly, but the variation of businesses within both organizational forms is also considerable. In order to analyze what effect it would have on the return to land of the typical farms if key quantitative factors were different, sensitivity analyses were therefore conducted.

[35] The 2,000 ha typical agriholding farm would then have 91 %, and the 10,000 ha typical agriholding farm 90 % of their respective independent counterparts.

In the typical farms, competitive differences with regard to the following aspects were included quantitatively (cf. Chapter 4.1):

1. Capital costs
2. Terms in input purchases and output sales
3. Efficiency (output/input ratio)
4. Overhead costs.

For these factors, sensitivity analyses were conducted and the results are shown in the following.

Capital costs

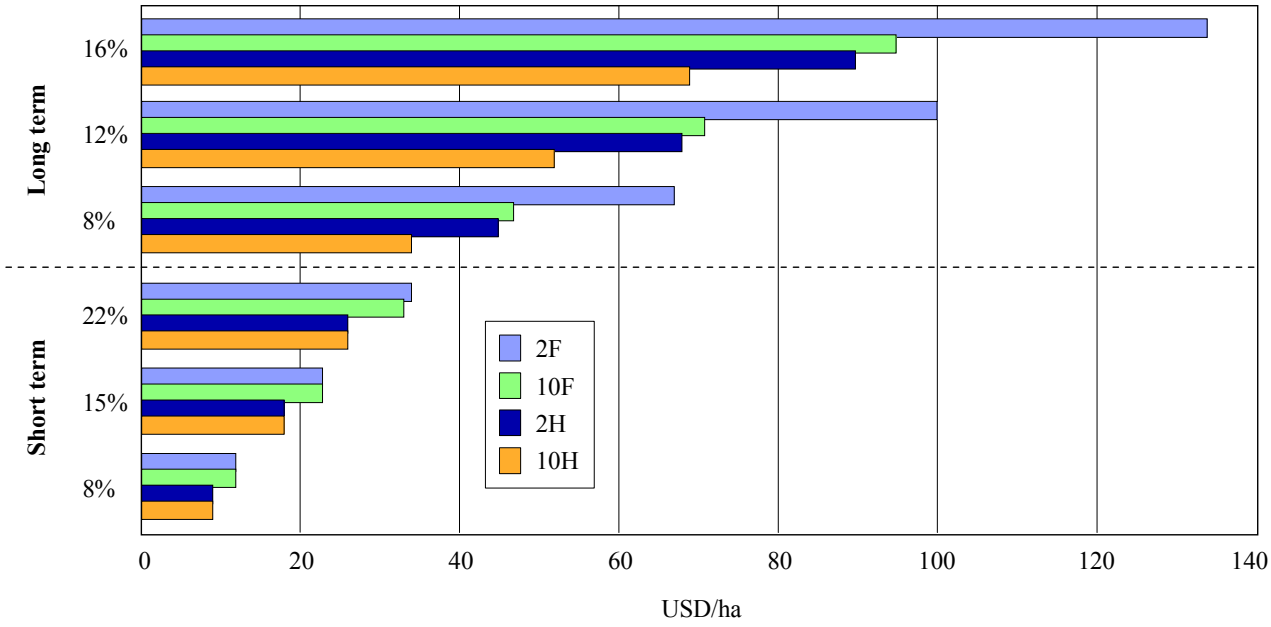
The typical agriholding farms, and to a lesser degree also the large typical independent farm, have an advantage from cheaper capital access in comparison to the small typical independent farm. As has been shown in Figure 4.12, the effect of the differing interest rates of external capital on the bottom-line of the typical farms is not very big, because the different businesses have adapted their capital structures to their situation. However, there are two reasons for which the actual capital costs can differ from those of the current typical farms:

1. While the interest rates of the individual sources of capital are relatively well known, the panel participants pointed out that the capital structures of businesses within both organizational forms vary widely. Therefore, it is possible that the actual average interest rate[36] of a farm differs from that of the typical farms by several per cent.
2. Especially when the businesses intend to grow more rapidly, their capital costs can increase because they have to use more debt capital. This is especially true for the small typical independent farm. With its current setup, it has 90 % equity in its long-term capital structure, thereby minimizing the negative effect of high interest rates. It currently finances its production and growth from its profit-generated liquidity, which is only possible because the farm restricts itself to moderate growth by Ukrainian standards.

A sensitivity analysis was therefore conducted in order to analyze the effect of different average interest rates on the return to land of the typical farms. The results are shown in Figure 4.14. As can be seen there, the negative impact of higher interest rates in short-term as well as long-term capital is greater at the typical independent farms than at the typical agriholding farms. The reason is the higher intensity of production at the former. The effect of higher long-term interest rates is further greater at the small typical farms within both organizational forms than at their large peers because of their higher machine and building capital per hectare.

[36] The average of calculatory interest for equity capital and actual interest for debt capital

Figure 4.14: Influence of different average interest rates (calculatory and actual interest, %) on the return to land (USD/ha) of the typical farms



Note: "2F" = 2,000 ha typical independent farm, "10F" = 10,000 ha typical independent farm, "2H" = 2,000 ha typical agriholding farm, "10H" = 10,000 ha typical agriholding farm.
Source: Own illustration.

In all cases the effect of changes to the short-term interest rate is considerably smaller than that of changes to the long-term interest rate, because much less capital is bound short-term than long-term, and most of it only for a few months per year.

The results make it obvious that especially the small typical independent farm would be strongly affected if it needed to increase its debt share, because the interest rates it has to pay as well as the amount of capital bound per hectare are the highest of the typical farms. An increase of the farm's current average long-term interest of 8.7 % by another 4 % would decrease its return to land by 34 USD/ha, which is a third of the farm's profit.[37]

Terms in input purchases, as well as output sales, and efficiency

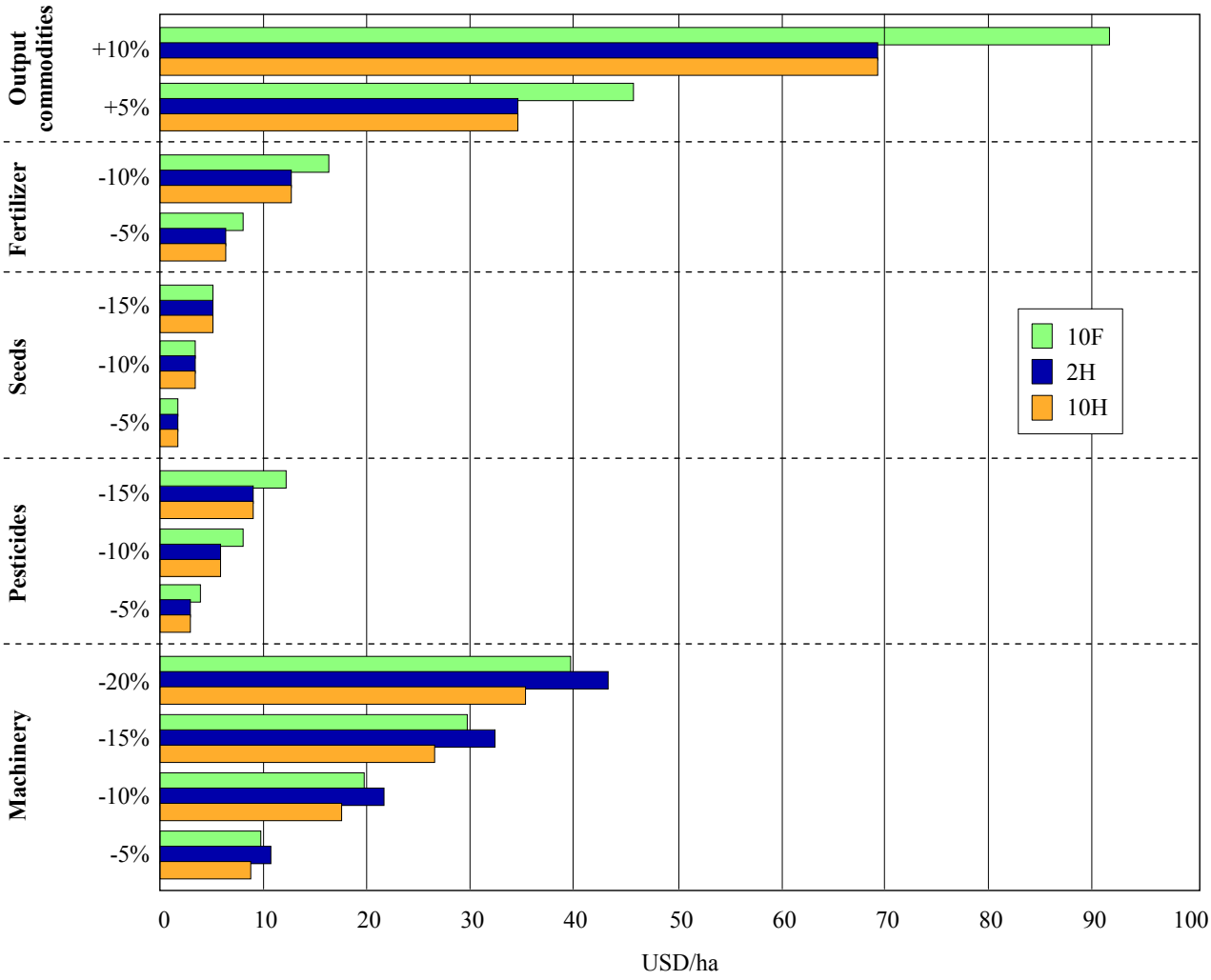
The second factor for which a sensitivity analysis was conducted is input purchase and output sales terms. In light of the fact that especially with regard to the price advantages of large independent farms and agriholdings the confidence in the concrete numbers remained low (cf. Chapter 4.1.2.2), this sensitivity analysis provides important information on the error margins.[38]

[37] This would happen if the farm would increase its debt ratio to 67 %.

[38] The results were used to determine the ranges of uncertainty of the assessments of the input purchase and output sales terms shown in Table 4.2 (Chapter 4.1.2.2).

The results of the sensitivity analysis are shown in Figure 4.15. As can be seen there, price advantages have a comparatively great impact only in two price groups: Those of outputs and those of machinery. Changes to the prices of outputs have by far the greatest effect on the return to land. The reason is that while each individual input only accounts for a certain share of the farm's costs, the outputs account for the complete revenues. Machinery is the most costly input, and therefore changes to its price have the greatest impact on the input side.

Figure 4.15: Influence of different input and output price advantages on the return to land of the typical farms (% difference to prices at 2F; USD/ha)



Note: "10F" = 10,000 ha independent farm, "2H" = 2,000 ha agriholding farm, "10H" = 10,000 ha agriholding farm. The 2,000 ha independent farm is not shown, because its prices are the basis relative to which the other typical farms have advantages and it therefore per definition has no advantage itself.

Source: Own illustration.

An outcome of the panel process was also that the typical independent farms achieve higher efficiency than the typical agriholding farms, which is expressed in a more favorable output/input ratio. Changes to this ratio can be analyzed by varying the physical output *volumes* (= yields)

ceteris paribus. Doing so has the same effect as varying the output *prices* ceteris paribus.[39] Therefore the effect of changes in the typical farms' efficiency can also be read from Figure 4.15: If, for example, the agriholding would be able to increase its yields by 10 % without at the same time increasing its input use, this would lead to a roughly 70 USD/ha higher return to land. In the case of the large typical agriholding farm, this would lead to almost the same return to land as that of the independent counterpart. In the case of the small typical agriholding farm, the counterpart's return to land would even be exceeded by almost 20 USD/ha.

Overhead costs

In the case of overhead costs, the sensitivity analysis is straightforward, because they are defined in USD/ha. Therefore an increase of the agriholding overhead costs by any amount leads to an equal decrease of the respective typical farm's return to land, and vice versa. If, for example, the agriholding manages to decrease its overhead costs by 10 USD/ha, the typical farms' return to land increases by the same amount.

4.3 Development of key results in the modified panel process

In this section, the development of the key results over the course of the panel process (which was outlined in greater detail for each result in Chapter 4.1) is first summarized. Thereafter, the effect of key methodological aspects of the modified panel process on the result development is analyzed in order to permit an assessment of the methodology in Chapter 5.1.

4.3.1 Summary of the development of the key assessments and indicators

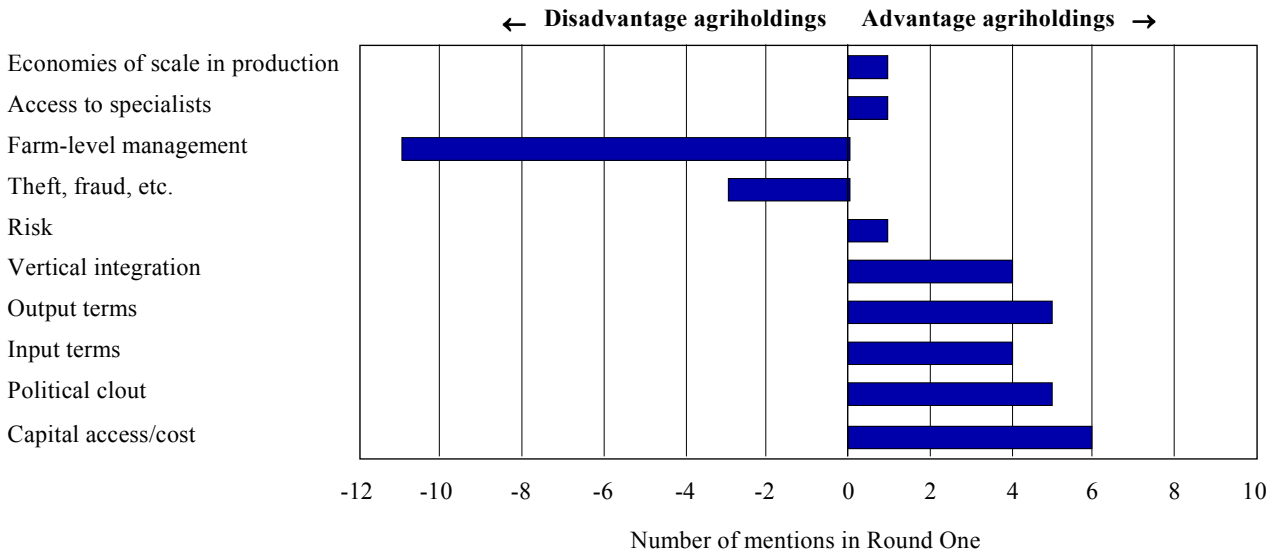
In this first part, the development of the key qualitative assessments, as well as of the key quantitative indicators of the typical farms, is summarized.

Qualitative assessments

In the first round of the modified panel process (the face-to-face interviews), all participants (including the agribusiness representatives and external experts) were asked what they consider to be the most important competitive advantages and disadvantages of agriholdings and independent farms. The results are provided in Figure 4.16.

[39] This is, because revenue is the product of price and yield and a relative change (e.g., 10 % more) to either one of them has the same effect on revenue.

Figure 4.16: Most important competitive advantages and disadvantages of agriholdings in comparison to independent farms (number of mentions in Round One)



Note: Multiple mentions were possible. The number of mentions of all participants were counted as follows: Mentions of advantages of agriholdings were counted +1, mentions of disadvantages of agriholdings -1, mentions of advantages of independent farms -1, and mentions of disadvantages of independent farms +1.
Source: Own illustration.

When comparing these initial assessments with the final results (cf. Chapter 4.1), one can see that all the competitive advantages and disadvantages of the two organizational forms in the final results had already been mentioned at the outset of the process:

- Agriholdings have a competitive disadvantage from management inefficiencies especially at the farm level, as well as from more theft, fraud and corruption.
- Agriholdings have a competitive advantage from more favorable terms in input purchases and output sales.
- Agriholdings have a competitive advantage from their better access to, and lower cost of capital.
- Also the comparatively minor advantage of agriholdings from reduced risk was already mentioned in the first round, albeit only by one participant.
- Only the overhead costs of agriholdings were not specifically pointed out. However, they are not a straightforward competitive disadvantage as they could also be considered strategy (an investment that is made to reach goals, such as getting better prices).

The initial assessment that agriholdings have a competitive advantage from political clout, however, remained inconclusive. Further, while the initial assessment that agriholdings have a competitive advantage from their vertical integration was outside the scope of this thesis, indications were found that this can be strongly the case. None of the initial assessments which were brought up by more than one person has fundamentally changed over the course of the panel process.

Quantitative indicators of the typical farms

Besides the qualitative assessments, the quantitative indicators of the typical farms have also evolved over the course of the panel process. The development of the key indicators (which was explained in the respective parts of Chapter 4.1) is subsequently summarized in Table 4.5.[40] As can be seen, there were some substantial changes over the course of the panel process. The effect they had on the profit and return to land of the typical farms is shown in the subsequent paragraph.

Table 4.5: Development of key indicators over the course of the modified panel process

Factor	Typical farm(s)	Drafts (after round 1)	After round 2	After round 3
Price advantage machinery	10F vs. 2F AH vs. 2F	0 10 %	0 0	5 % 15 %
Price advantage pesticides	10F vs. 2F AH vs. 2F	0 10 %	0 0	3 % 10 %
Price advantage fertilizer	10F vs. 2F AH vs. 2F	0 5 %	0 0	0 5 %
Price advantage seeds	10F vs. 2F AH vs. 2F	0 10 %	0 0	2 % 7 %
Price advantage outputs	10F vs. 2F AH vs. 2F	0 10 %	5 USD/t 10 %	5 USD/t 10 USD/t
Yield disadvantage	AH vs. FA	30 %	24 %	24 %
Agriholding overhead costs	2H 10H	50 USD/ha 30 USD/ha	35 USD/ha 25 USD/ha	35 USD/ha 25 USD/ha
Land cost	FA AH	74 USD/ha 42 USD/ha	69-72 USD/ha 42 USD/ha	62-65 USD/ha 62-65 USD/ha
Pesticide cost	FA AH	71 USD/ha 31 USD/ha	81 USD/ha 57 USD/ha	79-81 USD/ha 54 USD/ha

Note: "2F" = 2,000 ha typical independent farm, "10F" = 10,000 ha typical independent farm, "2H" = 2,000 ha typical agriholding farm, "10H" = 10,000 ha typical agriholding farm, "AH" = typical agriholding farms, "FA" = typical independent farms. Yield disadvantage is average over all crops. Spring barley, which after Round 1 was grown only by the typical agriholding farms and later dropped, was not included in this calculation. Where ranges are shown, the figures differ between the small and large farms within the respective organizational form.

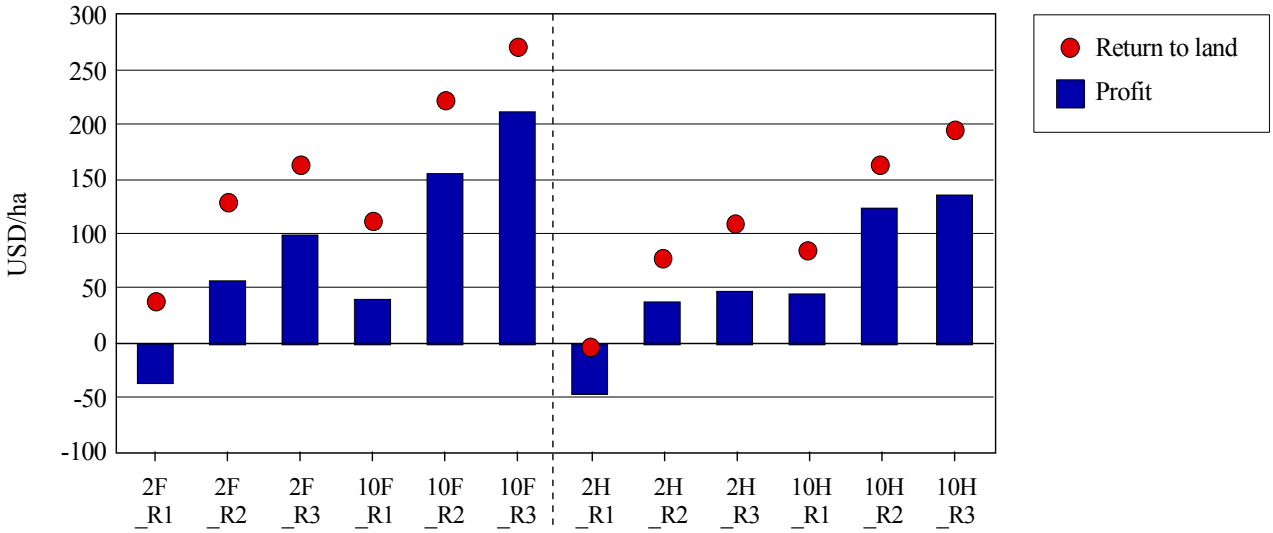
Source: Own research.

[40] The key quantitative indicators of the typical farms of which the development is summarized here are those which are directly connected to the competitive advantages and disadvantages of the two organizational forms elaborated in Chapter 4.1. Additionally the development of pesticide costs is included because major corrections were made to those of the typical agriholding farms after scrutiny by the independent farm focus group in the second round (cf. Chapter 3.3). A considerable number of further in-detail adjustments were made to the typical farms and are not included here, because they are not directly connected to competitive advantages and disadvantages of the two organizational forms. Examples are the mechanization, or the specific fieldwork operations conducted.

Profit and return to land

The development of the key indicators shown above, as well as some other modifications and corrections of the typical farms,[41] led to considerable changes of the economic success indicators, namely profit and return to land. Their development is shown in Figure 4.17. As can be seen there, the profit as well as the return to land of all the typical farms increased over the three rounds of the modified panel process.

Figure 4.17: Development of the return to land and profit of the typical farms over the course of the modified panel process (USD/ha, average over all crops)



Note: "2F" = 2,000 ha typical independent farm, "10F" = 10,000 ha typical independent farm, "2H" = 2,000 ha typical agriholding farm, "10H" = 10,000 ha typical agriholding farm. "_R1"/"_R2"/"_R3" = after the first/second/third round.
Source: Own illustration.

In the case of both organizational forms, a major reason of the increase of profits and return to land from Round One to Round Two was an adjustment of the crop rotations which led to a greater share of more profitable crops (esp. maize).

In the case of the typical agriholding farms, the main reason for the subsequent increase of the return to land is that the advantage in input purchase prices, which after the second round had been reduced to zero and after the third round had been increased again. The profits increased by a lower amount than the return to land, because land rent payments after the third round had been increased for this organizational form.

In the case of the typical independent farms, the main reason for the increase of profits and return to land from Round Two to Round Three was an increase of their revenues. This is,

[41] The technical adjustments to the typical farms pointed out in the last footnote.

because the output prices of the typical independent farms were deduced from the agriholding prices (cf. Chapter 3.3.3.3). Therefore, when the advantage of the typical agriholding farms was decreased after the third round, their prices actually remained unchanged, but those of the typical independent farms were increased.

The participants were informed in both the second and third round about the current return to land and profit of the typical farms of both organizational forms, as they were about the other key indicators. The potential impact this might have on the results is discussed in Chapter 5.1.

4.3.2 Analysis of the effect of key methodological aspects on the development of the results

After the development of the key assessments and indicators has been summarized above, in this section the effect of key methodological aspects of the modified panel process on the result development is analyzed.

Addition of external participants

In the face-to-face interviews of the first round of the modified panel process, externals (agribusiness representatives and scientists/analysts) were included. While their general assessments were largely similar to those of the core participants, they added information and supplemented the core participants' knowledge.

The following concrete relevant information was added by these externals:

- Functions of distributors of agricultural inputs
- Functioning of rebate systems for distributors of agricultural inputs
- Magnitude of distributors' and traders' margins
- Functions of commodity traders and margins for these functions
- Assessment of the participating businesses (as far as known to the externals: e.g., low/average/high performer) in order to explain the derived typical farms in the context of the total population

These pieces of information contributed in a relevant manner to the considerations on the competitive position of the two organizational forms in the focus group discussions, and would otherwise not have been available.

External assessments in the separate focus groups of Round Two

The second round of the modified panel process was organized to take place in two separate focus groups, one each with the participants of one organizational form, which permitted an

external assessment of the typical farms by the participants of the respective other organizational form. This led to the discovery of errors which would otherwise have distorted the results considerably: When the key indicators of both the typical agriholding and independent farms were presented to the independent farm focus group, the participants remarked that they consider the costs of plant protection at the typical agriholding farm unrealistically low. The agriholding focus group, on the other hand, had not pointed out this error. A subsequent further investigation after Round Two (cf. Chapter 3.3.4) led to significant corrections.

Comparison of qualitative and quantitative information

In the second and third rounds, comparisons between the typical farms and corresponding qualitative assessments were made and inconsistencies exposed in the discussions. This cross-checking function is part of the standard *agri benchmark* panel process and not specific to the modified version employed here. Besides minor issues, it revealed inconsistencies with regard to the matter of land rents, which were corrected in the single focus group of the third round (for details cf. Chapter 4.1.4.2). Hence, this corrective feature of focus group discussions has helped to improve the quality of the results.

Hypothesis-based questions in the first and second rounds of the modified panel process

As elaborated in Chapter 3.3.1.3, the qualitative assessments were enquired in the following sequence during the modified panel process:

1. In the first round, the participants were asked what they consider to be the key competitive advantages and disadvantages of the two organizational forms.
2. Thereafter (still in Round One), competitive advantages and disadvantages of the two organizational forms in concrete areas, which had been hypothesized in Chapter 3.2 to cause differences, were enquired. The underlying causes were enquired openly.
3. In the subsequent second round of the modified panel process, the participants were asked to state their view on the competitive advantages and disadvantages of the two organizational forms in the same areas again. This time, however, they were exposed to hypotheses on their *reasons*.

As it turned out, all the aspects which were confidently considered to be relevant by the participants at the end of the panel process had already been mentioned in response to the open questions at the beginning of Round One (cf. also Figure 4.16). The hypothesis-based questions either led to inconclusive issues (cf. Chapter 4.1.4) or the matters were determined by the participants to be (currently) without relevance (cf. Chapter 4.1.5).

Direct exchange in the third round

In the third round of the modified panel process, the agriholding and independent farm participants were brought together in a single focus group discussion. This direct exchange between all participants contributed to the result generation in the following concrete ways:

- The exchange about input and output prices led to the realization that, other than concluded in the second round, the agriholding does have advantages in input purchases. This realization would probably not have been possible without the direct exchange, because the times and specifications of the inputs acquired were often not directly comparable. In a direct exchange the participants were nevertheless able to deduce differences with considerations like "*although we did not actually buy this same tractor, based on my market knowledge I think we would not have been able to get it as cheaply as you have*". Although the confidence in the exact magnitude of the advantage of agriholdings remained low, this has led to better insights.
- The inconsistency between the qualitative assessments and the typical farm numbers regarding land rents was solved in the direct exchange (cf. Chapter 4.1.4.2).

With regard to the way the participants communicated and behaved, it turned out that they were not very confrontational. Rather, the participants of both groups listened interestedly to what the participants of the respective other group had to say. One got the impression that the reason is that the participants of each group knew relatively little about the respective other organizational form. This was confirmed by the participants afterwards.

4.4 Future adaptations of the two organizational forms to maintain and increase their competitiveness

This thesis not only aims at determining and quantifying the competitive advantages and disadvantages of agriholdings and independent farms in Ukrainian arable farming, but also at exploring likely future adaptations of the two organizational forms to maintain and increase their competitiveness. These options were discussed in the third round of the modified panel process and the results are provided in the following.

This chapter is structured in three parts: First, preliminary considerations of the participants with regard to the goals of the investors of the two organizational forms are shown. Thereafter, the estimated future adaptations of agriholdings are explained, and finally those of independent farms follow.

4.4.1 Goals of the investors

At the outset of the discussion on future adaptations of agriholdings and independent farms, the question arose: what is the development goal of the investors of the businesses in both organizational forms in the first place. This question can have an impact on future adaptations, which makes it relevant. The participants saw a difference between the two organizational forms with regard to longer-term goals.

The participating agriholding managers expressed their view that most agriholdings are for sale – it is only a matter of the right price being offered. They said that agriholdings are investments which are liquidated when certain conditions are met, unlike private farms which are passed from generation to generation.

In response, the independent farm managers made the point, that businesses of their organizational form are usually also highly commercial operations, and that the mentality of family farming over generations does not currently play a relevant role in Ukraine.

Still in the end the participants agreed that owners of independent farms have probably more often personal motives other than profit to be engaged in agriculture than the owners of agriholdings, and that they may therefore have a stronger long-term interest in this business.

With regard to land expansion, the participating agriholding managers pointed out that they do not currently aim to further increase the size of their business. Their current agenda is rather to consolidate the operation after the recent years of rapid growth and take measures to increase performance. The point was made, that while some other agriholdings may still keep up their rate of growth at the moment, sooner or later they too will have to consolidate. The farmers, on the other hand, pointed out that they want to continue growing.

Subsequently the concrete future adaptations, which were estimated by the participants, are shown.

4.4.2 Future adaptations of agriholdings

Three approaches were identified with which the participants expected agriholdings to adapt in the future: Business consolidation, improvement of management capacity, and the reduction of management requirement by simplification.

4.4.2.1 Business consolidation

As pointed out in the preceding paragraph, the participating agriholding managers currently mainly aim at consolidating their business after a phase of very rapid growth, and they assume that other agriholdings have the same goal, or will in the future. The following concrete measures for this were pointed out:

1. The size of the farms within the participating agriholding is being grown, and it was pointed out that other agriholdings do very much the same. The goal in the participating agriholding is to bring all operations up to sizes of 7-10,000 ha without at the same time increasing staff numbers (or at least not proportionally). Already now (late 2012), the participating

agriholding does not have any more 2,000 ha farms (such as the small typical agriholding farm).[42]

2. The consolidation includes getting rid of land, for example, because its soil quality is low, or it is located too far from the farms. It can go so far that whole farms are sold again that are not profitable because of local factors, such as land and climate.
3. Further, optimization at the level of the agriholding roof organization is also part of the consolidation process, with the aim of bringing the overhead costs down from currently 30 USD/ha on average to 20 USD/ha.

4.4.2.2 Improvement of management capacity

There was agreement in the focus group discussions that the typical agriholding farms have a competitive disadvantage from their lower management performance, especially at the farm level. Therefore, a number of likely future adaptations that aim at improving management were brought up in the modified panel process. They are listed subsequently.

1. As it was pointed out in Chapter 4.1.3.1, the participating agriholding managers like the independent farm managers consider rigid hierarchies to be a suboptimal solution for management in arable production. Consequently, it is planned to provide farm-level managers with increasingly higher decision authority in the future. This goes hand in hand with an optimization of the incentive structure. To this end, it is planned to increase the payment of good farm managers, albeit not to the same level as at the typical independent farms in the near to mid-term future. The remuneration already consists of a flat salary and success-dependent bonuses, and the latter can far exceed the former. It was pointed out that the majority of agriholdings already have some sort of bonus system. Independent farm managers pointed out that in their experience it is a success factor when the farm manager owns a share of the farm assets. While the agriholding managers did not currently plan to introduce such a system, they agreed that this can be a successful strategy.
2. While the farm-level management is becoming increasingly de-centralized, the agriholding central organization concentrates on its key functions, especially procurement, sales, and providing capital. It was pointed out that as a result of the concentration on, and further development of the core functions of the central organization, the respective agriholding center could even have its own commodity trader at the commodity exchange in Paris. In the end, the agriholding center might fulfill mainly those functions, which in Western countries are often fulfilled by agricultural co-operatives and banks.
3. As a further measure to improve the quality of farm-level management, steps are already being taken to increase the exchange between managers within the agriholding, so that

[42] It still did have such farms in the analyzed period from 2008-2010.

weaker farm managers can learn from their stronger peers. To this end, successful farms within the agriholding are identified and their managers brought together with managers of the less successful farms.

4. If these measures are not successful, farm managers are replaced. In conjunction with this statement, it was emphasized by participants of both organizational forms that the scarcity of good potential farm managers is one of the biggest problems in Ukrainian arable farming.

5. It was also discussed whether technology could serve to improve management, or could even (partly) substitute human managers. An example of the former would be telematics systems that transfer exact data of machines (position, speed, engine load, fuel use, etc.) to a central server and make this data usable for the supervisors of drivers. Examples of the latter would be mainly future propositions, such as using remote sensing and weather models for agronomic decision making. Neither the participating agriholding nor the participating independent farm managers currently saw much value in this technology, because they think that the challenges to their effective implementation in practical Ukrainian arable farming are too great. On the other hand, however, it was brought up that there are currently agriholdings which strongly follow the strategy of implementing technological management aids and it is possible that they will become important in the future. Hence, in the end no conclusive assessment of this approach was reached.

4.4.2.3 Reduction of management requirement by simplification

Besides these options to improve the management capacity of agriholdings, the following measures to reduce the management requirements by simplifying the business were also discussed in the panel process:

1. It was brought up that agriholdings could take complexity out of their farm level management by simplifying production systems. This can mostly be accomplished by the choice of crops. In the recent years the participating agriholding had reduced its share of winter wheat, winter rapeseed, and spring barley, and increased the share of corn, soybeans, and sunflowers. Besides the fact that these crops have a good profitability thanks to their relatively high prices and comparatively low input requirements, their production systems are also less complex than those of winter rapeseed and winter wheat[43]. It was pointed out that a trend towards simpler crop rotations is likely to continue. It was discussed that this could go as far as to an “Iowa rotation” (corn/soybeans) in some cases, and pointed out that even today there are agriholdings that grow 70 % corn. Note that such a tendency was seen for *both* organizational forms.

[43] This is truest especially when rapeseed and winter wheat are produced intensively, which is necessary if the natural potential of the research region is to be utilized.

2. There was agreement among the participants that agriholdings generally tend to move towards using larger machines and fewer workers. Less machines and workers can more easily be supervised. Further, this is also a reaction to the general shortage in qualified labor. This general trend was also seen for both organizational forms, but more so in agriholdings than in independent farms.
3. A third option to simplify management that was briefly discussed was growing GMO[44] soybeans. While GMOs are currently prohibited in Ukraine, illegally growing glyphosate-resistant soybeans is a common practice in Ukraine. The panel participants estimated their share in Ukraine's total acreage to be as high as 50-70 %. Glyphosate resistance in soybeans makes weed management much simpler. Especially the timing of herbicide applications – which constitutes a management challenge in large arable operations – becomes much less critical. However, the illegal use of GMO soybeans was not seen as a solution after all for three reasons: (a) Businesses make themselves vulnerable. This is particularly true for an agriholding with foreign investors, such as the participating one. (b) When the soybeans are exported, they cannot be GMO because exporters would not buy them. The situation is different when they are marketed domestically. (c) The GMO soybeans available in Ukraine are not bred for this location. Therefore their yield potential is limited.

4.4.3 Future adaptations of independent farms

For the independent farms, the participants brought up the following future adaptations:

4.4.3.1 Organization of cooperatives

There was an agreement by the participants that a main advantage of agriholdings consists in purchase and sales terms. It was discussed that in typical Western countries the procurement and marketing functions of agriholding central organizations are often fulfilled by cooperatives. The point was therefore made that it would also be conceivable in Ukraine that farmers found cooperatives to do their procurement and sales in large volumes and with specialized departments. As a confirmation of the advantages of centralized sales even for large independent farms, the manager of the largest participating independent farm (10,000 ha) pointed out that his business already sometimes conducts sales together with a neighbor in order to achieve better prices thanks to volume.

[44] GMO = genetically modified organism.

4.4.3.2 Specialty crop and livestock production

The second possible adaptation of independent farms that was discussed is moving into specialty crop and livestock production. As has been expounded in Chapter 4.1.4.2, agriholdings may have an advantage from political clout on the land market. In this context it was further brought up that they might use their financial leverage to push independent farms out of the land market when competition for land becomes fiercer in the future. This could be accomplished by locally and temporarily paying higher land rents than the respective independent farm would be able to.

The possibility was even brought up that there may be certain regions in the future in which arable farming is almost exclusively done by agriholdings, with hardly any more relevant independent farm competitors in between. In this situation the remaining big agriholdings could then collude to keep land rents down, with detrimental effects for the landowners.

While the independent farm managers in the panel process said that they want to continue growing their businesses, they emphasized that they will not try to grow their arable land area at any price. They explained that they will try to keep their landowners satisfied and take over land if and when it becomes available. If this becomes increasingly difficult, either because of high land prices, or because of agriholdings putting up “unfair” competition, they unequivocally agreed that their primary solution is more intensive land use also beyond broadacre production. This can either mean moving to more intensive and specialized crops, such as vegetables, or moving to livestock production. It was emphasized that these markets are still highly under-developed and that there is a lot of potential when growth in broadacre arable farming becomes difficult.

While these are not measures to increase the competitiveness of independent farms in the strict sense of the definition of competitiveness used in this thesis[45], it provides them with an alternative if and when their growth in arable farming becomes difficult.

[45] Competitiveness in this thesis is measured by a business’ ability to generate return to land from *broadacre arable production*. Specialty crops and vertical integration, including livestock production, were explicitly excluded from the scope of research (cf. Chapter 3.1.2.1).

5 Discussion and conclusions

In this chapter the methodology and utilized data, as well as the results of this thesis are discussed, conclusions are drawn, and needs for further research are derived. The discussion commences with the methodology and data (Chapter 5.1), because the conclusions drawn with regard to the validity and limitations of the data are necessary for the interpretation of the results. The discussion of the latter follows thereafter (Chapter 5.2).

5.1 Methodology and data

The discussion of the methodology and data begins with an evaluation of the modifications to the *agri benchmark* panel process and conclusions with regard to future applications. Thereafter the data generated with the approach in this thesis is qualified by discussing its validity and limitations.

Evaluation of the modifications to the panel process

In the following the modifications undertaken to adapt the *agri benchmark* panel process to the conditions in Ukraine, which are characterized by an absence of farm-level advisors engaged in horizontal farm benchmarking, a scarcity of farm managers with a thorough understanding of farm-level economics and agronomy, and an as yet under-developed culture of economic exchange, are discussed.

The substitution of the pre-panel with a round of face-to-face interviews and subsequent drafting of the typical farms by the scientist worked well. However, as this approach was relatively time-consuming, the question arises, whether this part could be skipped in future research and the typical farms instead be drafted in focus group discussions. This would probably have been possible with the typical independent farms, thanks to the good overview of the participating independent farm managers. However, it is not clear whether independent farm managers who do not run leading-edge farms comparable to those in the analysis have a similar overview. Further, the difficulties in drafting and validating the typical agriholding farms make it clear that it would not have been possible to establish those solely in a focus group discussion.

The addition of externals (agribusiness representatives and scientists/analysts) to the first round helped by supplementing the knowledge of the core participants. While the general assessments of these externals were mostly similar to those of the core participants, they added relevant information from their specific areas of expertise, which led to valuable insights in the further panel process. Therefore the inclusion of externals in a similar manner can be recommended for future research in situations where the core participants lack necessary pieces of information.

The modified panel process was organized such that the degree of “intimacy” increased with each round. The first round consisted of the aforementioned face-to-face interviews. Thereafter

separate agriholding and independent farm focus groups, and finally a single focus group with the participants of both organizational forms followed. By gradually building trust and interest, this setup made it possible to hold focus group discussions, including one with participants of both organizational forms, in spite of the challenges under Ukrainian conditions.

The separate focus groups of the second round permitted an external assessment of the typical farms and qualitative assessments by the participants of the respective other organizational forms. This proved clearly useful because errors in the typical agriholding farms were found and corrected. While it might have been possible that these errors would also have been found in a single focus group with the participants of both organizational forms already in the second round, it turned out that the participants during the single focus group of the third round were not very confrontational and openly critical. Hence, it is possible that the errors would not have been found or pointed out. Furthermore, with time always being a scarce factor in the focus group discussions, two separate sessions in the second round provided more total time to work with participants.

On the other hand, the confrontation of the participants in the single focus group of the third round clearly also led to additional insights. An important example relates to the advantages of agriholdings regarding input purchase and output sales terms.

Hence, all three stages of the modified panel process had their specific advantages. Together they made it possible to apply the process under the difficult Ukrainian conditions. The modifications can therefore be considered an overall success and it can be recommended to utilize a similar three-tiered approach for future research with the panel methodology when similar challenges apply. Such challenges can be expected in Russia and Kazakhstan,[1] but also in other emerging economies, as well as in developing countries.

Validity and limitations of the obtained data

After the methodology has been evaluated, the validity and limitations of the obtained data are subsequently discussed.

Due to the fact that the participating agriholding is relatively new to arable farming, quantitative figures were only available for the period 2008-2010. If possible, it would have been ideal to have data from a longer period. This is true especially considering that there was much variation over the analyzed period, stemming, among other things, from (a) the world financial crisis, which has led to a strong devaluation of the UAH by late 2008, and (b) strong fluctuations of commodity prices. However, the negative impact on data quality is limited, because in the panel process the participants adjusted all numbers except prices to reflect what they consider long-term

[1] The economic and political conditions in these countries are very similar (cf. Chapters 2.2 and 2.3).

averages.[2] Especially the *differences* between the two organizational forms – which are the key subject of the analysis – should not be affected much by the short period of analysis, because the two organizational forms faced the same external conditions (e.g., weather, world market prices, etc.).

A general limitation of the panel methodology that needs to be taken into account, however, is that it systematically collects the knowledge and experiences of the participants (cf. Chapter 3.1.3.2). The results are therefore limited in areas where the participants lack this knowledge, which is reflected especially in the results which remained inconclusive. Further, although the participants were systematically encouraged to "take a step back" and consider typical businesses of their organizational forms, the results are still likely to reflect to a great part the realities of the participants' own businesses.

These limitations of the methodology were somewhat compounded by the selection of participants in this analysis: Only one agriholding in which the investors and a few of the top managers are foreigners could be recruited. The participating independent farm managers turned out during the panel process to represent leading edge farms within their organizational form. Hence, the participants of both groups may in some regards have had different experiences and views than people representing average businesses within their organizational forms in Ukraine.

The following limitations of the obtained data, which result from the aforementioned factors, need to be considered:

1. While a good overview of competitive advantages and disadvantages, as well as their causalities, has been obtained with the modified panel process, this overview may not be complete. Further, the results may be somewhat biased by the specific knowledge and experience of the participants – for example, the weighting of competitive advantages and disadvantages can be different at different businesses.
2. While there are no concrete indications whatsoever, it further cannot be ruled out entirely that participants had certain interests to provide misinformation. Such interests could have been that businesses wanted to show themselves or another business in a good or bad light, for example to impress investors. However, it is expected that this error is limited, because it has been clearly communicated that all information remains anonymous outside the round of the participants and all but the most basic information (e.g., size) is only published at the typical level (i.e., no individual business data is published, not even anonymously).

[2] The prices of the derived typical farms still explicitly reflect the averages of the period 2008-10. Cf. Chapter 3.3.3.2: *In prices, specifying "long term average" as a basis of reference would have been problematic, because other than yields and input amounts, they do not fluctuate around a more or less constant average, but also their long-term mean changes over time*.

3. The typical farms specifically represent certain shares of both organizational forms: Leading edge restructured independent farms and average agriholdings. This performance assessment was also obtained in the panel process and therefore expresses the personal knowledge of the participants. The transferability of the results to other parts of the farm population is limited.
4. The results regarding the future adaptations of the two organizational forms can be expected to be particularly limited by the participants' individual knowledge and experiences. Besides the difficulties and uncertainties in predicting the future, especially in a volatile political and economic environment such as Ukraine, the exploration of these adaptations was only a secondary goal in this thesis and therefore only done in the last round of the panel process.
5. In quantitative information, the limitations of the approach can be expected to weigh more strongly than in qualitative information. This is true, for example, in the terms of agriholdings and independent farms in sales and purchases. Therefore, in order to further clarify strictly quantitative questions in future research, it would be necessary to apply quantitative methods with a random data selection strategy of stratified samples (cf. 3.1.2.3). Mind that while such an approach could provide more representative quantitative information on specific matters such as price or yield differences, it would not provide the comprehensive view and qualitative explanations of the panel approach. Apart from this, gathering data in the required quality and quantity for statistical analyses remains a challenge in Ukraine (cf. Chapter 3.1.2.2).

Most of these issues are rooted in the characteristics of the panel approach and were accepted. It was determined in Chapter 3.1 that alternative approaches are expected to provide less reliable data and/or cannot deliver the required qualitative and explanatory background information. Therefore, it is expected that in spite of the aforementioned limitations the utilized approach has delivered the best possible data for the purpose.

5.2 Results

With the knowledge of the validity and limitations of the data, the results are discussed in the following section. Conclusions are drawn and needs for future research are derived throughout the paragraphs.

Profitability of arable farming

According to the results of the analysis, broadacre arable farming in Ukraine was a very profitable endeavor during the analyzed period, for well-performing independent farms, as well as for average performers among agriholdings. When attempts are made to explain the development of agriholdings in arable farming, possible motives other than profit generation from arable production are often pointed out. Examples would be securing a processing operation's raw material supply, or land speculation (cf. Chapter 2.3).

While this can be the case, the results indicate that profit from broadacre arable farming alone is a sufficient incentive for investments. Considering that agricultural commodity prices have more recently (as of late 2012) risen substantially over the 2008-10 averages with which the profit calculations were made (Chilla, 2012), the profitability since then has even further increased. It can be expected that this current high profitability of farming will accelerate the rate at which competition for land increases. This underscores the relevance of the key results on the competitive advantages and disadvantages of the two organizational forms.

A key reason for the high profitability is the fact that the land rents of the typical farms are currently very low in comparison to locations with similar land productivity in other countries. Hence, the participation of the landlords – i.e., primarily the rural population – in the profits is low so far. If and when land rents are driven up by increasing competition in the future, it will be to the latter's advantage.

Competitiveness of agriholdings and independent farms

According to the results, agriholdings have net competitive advantages[3] with regard to (a) access to and cost of capital, (b) purchase and sales terms, as well as (c) risk. They have net competitive disadvantages from (a) lower efficiency, especially at the farm level, and (b) overhead costs. At the bottom line, typical very well-performing restructured independent farms generate considerably higher return to land than typical average agriholding member farms of the same size. Consideration of only these differences in return to land would suggest that agriholdings will get under economic pressure and independent farms gain market share in the future.

However, this simple conclusion must be qualified by the following considerations:

1. It is important to keep in mind that the typical independent farms derived in the panel process represent the leading edge of the organizational form. It can be expected that the difference between the return to land of *average* restructured independent farms and average agriholdings is smaller, and the former therefore have a smaller net advantage in competitiveness, none at all, or possibly even a net disadvantage. To reliably clarify this, future research would be needed.
2. The participating agriholding is a business that has grown extremely rapidly in the analyzed period 2008-2010. Therefore, although adjustments were made by the participants, the performance figures of the typical agriholding farms still most likely include costs of this rapid growth. The participating independent farms, on the other hand, have grown more conservatively and have been in the arable farming business for longer already. Mind that this does reflect a typical situation as agriholdings in general have grown extremely fast throughout the recent years. As a consequence, however, the potential for performance improvements at the typical agriholding by business consolidation and improved

[3] A net competitive advantage of agriholdings implies a net competitive disadvantage of independent farms, and vice versa.

management – as pointed out in the panel process as future adaptations – is greater than at the typical independent farms in this analysis.

3. The competitive advantages of the typical agriholding farms in this analysis were not sufficient to fully compensate for their competitive disadvantages. However, if they could improve their efficiency, they could reach or even exceed the typical independent farms' return to land without (entirely) reaching the latter's level of efficiency. As elaborated in Chapter 4.2.2.3, the typical agriholding farms would have to increase their yield level by 7.1 % (2,000 ha) and 10.4 % (10,000 ha) to draw even with their independent counterparts. Given that the former's potential for improvement is greater than the latter's, it seems reasonably possible that the economic gap closes in the future.
4. Agriholdings have a risk advantage that is not quantified in the return to land figures, which, however, can play a relevant role in a country with no crop insurance system and also a volatile economic environment. Probably more importantly, there are indications that agriholdings have possibilities to suppress competition on the land market and benefit from political clout. While the results on these factors remained inconclusive, they can give agriholdings further "unofficial" but important advantages if they turn out to be true. Further, while it is not within the scope of this thesis, there are indications that vertical integration provides such agriholdings with considerable advantages which might outweigh most other factors analyzed in this thesis. All these potential advantages depend on the institutional environment of Ukraine and would be decreased by future improvements in areas such as law and contract enforcement, corruption prevention, and political stability. The potentially high influence on the competitiveness of agriholdings, as well as potential disadvantages of other third parties (e.g., landlords who suffer from lower land rents when competition is suppressed) clearly warrants further research on these factors.
5. Probably the most important limiting factor in Ukrainian arable farming is currently the availability of competent farm managers. They are the key persons who farm-level performance depends on. Their lack therefore limits the development of both organizational forms. However, independent farms depend more strongly on the farm manager because they do not have the other advantages of agriholdings. Hence, while there are independent farms with highly competent and entrepreneurial managers, the (macro level) development of this organizational form is particularly limited by the lack of such persons. If there would have been no such lack, agriholdings in their current form might never have developed in the first place.

For the above reasons, in spite of the higher return to land of the typical independent farms in this analysis, it appears unlikely that the market share of independent farms in Ukrainian arable production will increase sharply in the near future. Even if Ukraine would take effective political measures to improve its institutional environment, thereby decreasing the current competitive advantages of agriholdings and strengthening independent farms, the lack of highly capable farm managers would remain a key impediment to the latter's development. Therefore it seems unlikely that the organizational form agriholding will disappear from Ukraine's agricultural

landscape in the nearer future the way it happened in the history of North Dakota (Bonanzas) and Australia (Peak Downs Scheme, cf. Chapter 2.2).

Difficulties of small independent farms

Besides the effect of organizational forms on competitiveness, the effect of farm size was also analyzed in this thesis. The results show that the difference in return to land between small (2,000 ha) and large farms (10,000 ha) within both organizational forms is considerably greater than that between farms of the same size but different organizational forms. Hence, there are considerable economies of scale to be gained from increasing farm sizes.

An agriholding typically has the resources (especially liquidity) to grow its operations. The participants of this organizational form said that they are in the process of doing so, and that their business (as of late 2012) already has no more 2,000 ha farms. The results indicate, however, that small independent farms are in a comparatively difficult position for growth due to the following reasons:

1. They generate a lower return to land than the larger farms of both organizational forms. They could increase it by growing, but their ability to do so is limited by their lack of access to (affordable) capital. Improving the latter would require costly and time-consuming actions such as establishing International Financial Reporting Standards. This, however, is hardly feasible for a small independent farm.
2. It is important to keep in mind again that the typical independent farms in this analysis represent top performers within their organizational form. While they were able to finance their activities from profit-generated liquidity so far and even grow at a modest rate, their weaker peers are in a more difficult situation.
3. Another problem for small independent farms is that land often becomes available in relatively large chunks, such as the land of whole villages (ca. 2,000 ha). Taking over such a large chunk of land is a relatively bigger step for small independent farms than for their larger peers or agriholdings, which constitutes an additional obstacle to growth.
4. There are indications that agriholdings might suppress competition on the land market or benefit from political clout. Smaller independent farms are likely to have fewer options for countering this than their larger peers (e.g., with their own political power).

In contrast to these disadvantages, small independent farms sometimes have the advantage of having owner-managers. When this is the case, the remuneration of the general manager is opportunity cost, and he can decide to forego (part of) it. In the case of the small typical independent farm of this analysis, this would make a difference of 45 USD/ha, which is more than the difference in return to land to either one of the two typical agriholding farms. This fact can considerably increase the resilience of small independent farms. Apart from this, the panel participants also said that the small typical independent farm still has rationalization reserves in mechanization and labor which its larger peer does not have. An additional factor that currently

(late 2012) tends to decrease the pressure on smaller independent farms is the higher profitability in arable farming thanks to high product prices which was pointed out above.

In spite of the latter factors, however, it can be concluded that if and when competition for land increases (and land rents along with it), small independent farms – where "small" refers to the size representing most of the arable land in Ukraine – will face increasing difficulties in competing on the land market. Further, while an end of the moratorium on the trade of agricultural land is currently not in sight[4] (Agrarzeitung, 2012), the difficulties of small independent farms would probably increase further if it were lifted. If land needs to be purchased in the future in order to avoid losing it, the liquidity requirements increase tremendously. Political measures that improve the capital access also of smaller independent farms could partly alleviate these challenges.

Future convergence of the organizational forms

Besides identifying and quantifying the competitive strengths and weaknesses of agriholdings and independent farms in Ukrainian arable production, exploring likely future adaptations of the two organizational forms was the third goal of this thesis. This was done in the third round of the panel process. The participants considered it likely that agriholdings will de-centralize, and strengthen their farm-level management in the future. On the other hand, it was pointed out that independent farms might found co-operatives to fulfill similar tasks as an agriholding center for them, especially in input purchases and output sales. If this happens, the two organizational forms converge.

These future adaptations would be reactions to what was found in this thesis, namely that each of the two organizational forms has competitive strengths where the counterpart has weaknesses, and vice versa. While independent farms perform particularly well in farm level management, agriholdings enjoy the benefits stemming from their central organization, especially in capital access as well as purchase and sales terms.

If the thoughts of the panel participants are developed further, the question arises: how far will the de-centralization of agriholdings go. It is conceivable that it develops even so far that the individual farming operations are run by independent entrepreneurs who (sub-) rent land from the agriholding. They could get their inputs from the remaining agriholding center at contractually defined terms, likewise sell their outputs to it, and otherwise literally work on their own account. It is conceivable that even working capital would be provided by the center. According to Rylko and Jolly (2008; cf. Chapter 2.5), others have had similar ideas before. They point out that there are agriholdings in Russia that have already created – in some cases actually family-managed – quasi-independent farms within agriholding structures.

[4] Although lifting this moratorium had been on the political agenda, it has just been extended again in late 2012.

A look at other industries shows that this thought is not entirely far-fetched. It is not uncommon to have a coordination of strong central organizations and contractually bound independent entrepreneurs when both sides complement each other efficiently. One of the most prominent examples is the franchise system of McDonalds. While such setups cannot be observed in arable farming so far, they are common in the livestock industries of Western countries (e.g., US poultry, egg, and pork production: Martinez, 2002). Future research in the form of an in-depth analysis of future development options[5] to decrease the efficiency disadvantage of agriholdings would be valuable, because it could provide further insights regarding the future viability of the organizational form. Such an analysis should also look into the organization of agriholdings in other parts of the world where agriholdings have possibly already developed different operating models than those in KRU.

With the results of this thesis, it can only be speculated whether or not "franchise holdings" will actually develop in Ukraine in the future, or if possibly an entirely different path will be taken. A strong influencing factor is the evolution of the market conditions. If they improve, the advantage of such setups decreases. If they remain the way they are now (late 2012), or deteriorate, such developments are possible.

Specialty crop and livestock production as future adaptation strategies for independent farms

In the case of independent farms, one future adaptation strategy was stated by the participants of this organizational form with great unanimity: If and when they face increasing problems with expanding their arable land area, for example, because agriholdings suppress competition, a key alternative growth strategy for them will be more intensive land use also beyond broadacre production. Examples are moving to more intensive and specialized crops, such as vegetables, or moving to livestock production.

While agriholdings, too, are increasingly investing in livestock and specialty crop production (AgriSurvey, 2012), the development of these sectors is still considerably behind that of the arable sector[6] (Ukrstat, various) and competition can therefore be expected to remain lower for the near to mid-term future. What is more, it can be expected that independent farms, which currently already have their arable production optimized to a higher degree than competing agriholdings, will have an advantage in farm-level management also in these specializations for at least some time. Hence, while specialty crop and livestock production are not measures to increase the competitiveness of independent farms in the strict sense of the definition used in

[5] In such an in-depth analysis a whole panel process could be devoted to future adaptation options. An example for this approach is Krug (2013), who analyzed adaptation options of arable farms at low-yielding locations in Germany when subsidies are abolished. In this analysis the characteristics and economics of low-input farming systems in other countries were presented as external stimuli, and the effect of proposed adaptations was analyzed quantitatively as a validation of the results.

[6] A notable exception is the poultry sector, where almost two thirds of Ukraine's broilers are produced by two companies. Note, however, that this industry is highly concentrated in Western countries, too.

this thesis[7], it seems likely that they can provide them with a feasible alternative growth path for the near to mid-term future.

It should be noted, too, that from a rural development perspective such developments would be highly beneficial. As has been confirmed by the panel, there is a trend towards reducing the labor input in arable production. With Ukraine hardly having any rural economy other than agriculture, this can become a serious social problem. Specialty crops and livestock production, on the other hand, can create more employment and generate more value per hectare in rural areas. However, growth in specialty crops and livestock production also requires liquidity. Hence, especially for smaller independent farms the challenge of accessing affordable capital remains.

Transferability of the results to other countries

The results of this thesis are in principle only valid under the conditions of the country where the analysis was conducted, which is Ukraine. However, the question arises, to which degree conclusions for other countries can also be drawn. This transferability of results depends on how similar the conditions in the respective countries are to those in Ukraine. While some general considerations can be made in this context, additional research would be necessary to reliably clarify the situation in other countries.

A high degree of transferability can be tentatively concluded for Russia and Kazakhstan. The structural developments in the arable farming sectors of these countries, as well as the political and economic conditions are very similar (cf. Chapter 2.2). On the other hand, the transferability to mature Western economies (e.g., Western Europe, USA, Canada), is probably low, because the economic and political environment in these countries is quite different. Some of the most important distinctions are pointed out in the following. Note that they are not meant as absolute statements, but in comparison to the conditions in Ukraine:

1. The institutional environment in these countries is much more developed. Politics are relatively transparent and predictable. The rule of law is in effect, contract enforcement is effective.
2. The agricultural input and output markets are much more developed. Competition typically functions well, and transaction costs are low. Access to capital is unproblematic and relatively cheap.
3. There is a long-established and highly optimized sector of independent farms, most of them family businesses which have strong motivations beside profit maximization to be active in agriculture. They put up a strong competition on the land market.

[7] Competitiveness in this thesis is measured by a businesses' ability to generate return to land from *broadacre arable production*. Specialty crops and vertical integration, including livestock production, were explicitly excluded from the scope of research (cf. Chapter 3.1.2.1).

Considering these factors, agriholdings in developed Western economies potentially have considerably smaller advantages than in Ukraine. On the other hand, also their disadvantage in farm-level management and efficiency can be expected to be smaller, because (a) more qualified farm managers are available also for agriholdings, and (b) the mentalities leading to losses from theft, fraud and corruption are also less pronounced than in Ukraine. The greatest limitation to their expansion, however, is probably the strong existing competition. Nevertheless developments of agriholding-like structures can also be observed in Western European countries, although at a much smaller scale than in KRU.[8]

A region in which the scale of the development, as well as the size of the agriholdings is quite comparable to Ukraine is South America with its big players Brazil and Argentina. The external conditions there, however, are also rather different from those in Ukraine (cf. Chapter 2.2), which again leads to a low transferability of the results. With agriholdings currently (late 2012) gaining market share in several countries and regions worldwide, further research on the competitive advantages and disadvantages of the organizational form also outside the former Soviet Union would be highly warranted.

[8] An example is the United Kingdom, where pension funds have started investing in agricultural land in the 1970s and have accumulated large land areas. As of 2012, the ten largest landowners in the UK owned 13.5 % of the country's total area. Companies with agriholding structures were formed since the 1970s to provide farm management services as a response to the institutional investments. There are a number of such companies in the UK today that have developed organically over a long period of time. An example is Velcourt which farms roughly 53,000 ha in the UK as of 2012. The three largest agriholdings (also as of 2012) farm over 2 % of England's arable land (Lang, 2009; Lang, 2012; Velcourt, 2012).

6 Summary/Zusammenfassung

Summary

Agriholdings are large horizontally and/or vertically integrated corporate farming businesses which are characterized by having multiple operations under a central management. This organizational form has been developing in Kazakhstan, Russia and Ukraine since the late 1990s and has since then gained a considerable market share, especially in arable production. Ukraine is one of the three countries in which the development of agriholdings was very pronounced.

While the competition for arable land in Ukraine has been weak so far, it is expected to increase in the future. In order to be able to assess whether agriholdings or independent farms will then be more competitive on the land market also under changing conditions, (a) competitive advantages and disadvantages of the two organizational forms in Ukrainian arable production are identified in this thesis, (b) their impact on competitiveness is quantified, and (c) likely future adaptations of both organizational forms in order to maintain or increase their competitiveness are explored.

After a literature review in Chapter 2, the methodology for the empirical part of this thesis is developed in Chapter 3. As is shown there, conducting an in-depth analysis of competitive advantages and disadvantages of arable farming businesses in Ukraine is a challenge, because reliable farm-level data with the necessary degree of detail is not readily available in the country. The *agri benchmark* panel process to define typical farms was identified as a suitable approach for the purpose, as it gathers its own data in the required depth, including qualitative explanatory information. Further, it has mechanisms to validate the gathered information and permits exploring future adaptations. In the approach, focus group discussions with farmers and farm advisors are conducted in which typical farms are established. Typical farms are case studies that represent stringently defined sub-groups of a total farm population.

However, while the standard *agri benchmark* panel process is a proven tool in Western countries, it faces a number of challenges under the conditions of Ukraine:

1. Typical farms are normally drafted by a scientist together with a farm-level advisor and thereafter validated in focus group discussions with farm managers. However, in Ukraine there are currently practically no farm advisors who conduct horizontal farm benchmarking and therefore have the required insights into the economics of different organizational forms.

2. Ukrainian farm managers often lack the detailed combined knowledge of farm-level economics and production systems that is necessary to establish typical farms. Rather, this information is often spread out over several persons at a farm, such as the general director, the head agronomist, the head engineer and the head bookkeeper. This is due to the

traditionally strong specialization in management, in which usually no single person has the overview of their business the way a typical Western farmer would have it.

3. The culture of exchanging data with other farmers, advisors and scientists, which is relatively common in Western countries, is currently hardly existent in Ukraine. While this makes motivating managers of both organizational forms to participate in the focus group discussions a challenge, agriholdings tend to be particularly reluctant to disclose the necessary information.

In order to cope with these challenges, a *modified panel process for the analysis of typical farms* was developed and successfully applied. This modified approach consists of three rounds of interaction with participants:

1. In the first round, the pre-panel in which typical farms are normally drafted by a scientist and a farm advisor was replaced with a series of face-to-face interviews, in which farm data and qualitative assessments were enquired. These interviews were conducted with agriholding and independent farm managers. Additionally, agribusiness representatives and external scientists/analysts were included in this round to contribute information where the other participants lack knowledge. After the interviews, the typical farms were drafted by the scientist based on the spectrum of information provided by the different participants.

2. In the second round, two separate focus group discussions were held, one with agriholding managers and one with independent farm managers. In this round the typical farms and the participants' qualitative assessments were validated and completed.

3. In the third round, a single focus group with both the independent farm and agriholding managers was held. The qualitative and quantitative results were further validated, and future adaptations were enquired.

Managers of four independent farms, but only one agriholding, participated in the panel process. Besides the fact that recruiting managers of more agriholdings to participate was not successful, this approach had the following advantage: At agriholdings, the problem that single persons usually have only a limited overview of their business is even more pronounced than at independent farms, due to the businesses' higher complexity. Involving multiple managers of a single agriholding, rather than individual managers of different agriholdings, therefore had the advantage that their knowledge adds up to a more consistent picture of a whole business.

The subject of this analysis is only arable farming. Vertical integration, including livestock production, is outside the scope of this thesis. The typical agriholding farms reflect an average performer among the largest agriholdings (>100,000 ha). The typical independent farms represent restructured independent farms (as opposed to small family farms or non-restructured collective farms). It turned out during the panel process that the participants of the latter

organizational form represent top performers among their peers. This is reflected in the typical independent farms, and it is important to keep this in mind for the interpretation of the results.

Four typical farms were established altogether:

- One agriholding member farm with 2,000 ha
- One agriholding member farm with 10,000 ha
- One independent farm with 2,000 ha
- One independent farm with 10,000 ha

The unit of reference in the analysis is the single farm, which in case of the agriholding operations has overhead costs from the central organization allocated. The smaller typical farms reflect the farm size which works most of the arable land in Ukraine. The larger ones, on the other hand, reflect a farm size at which the panel participants considered most economies of scale at the farm level to be fully utilized. The two farm sizes per organizational form were established to be able to differentiate between size effects at the farm level and those that arise only from an agriholding roof organization.

The results of the empirical work are provided in Chapter 4. Agriholdings were found to have a net competitive advantage in comparison to independent farms in the following fields:

1. They enjoy better and cheaper access to capital. Both organizational forms have access to bank loans in Ukraine's national currency (interest ca. 18-22 %), supplier financing for variable inputs (ca. 70 %), as well as machinery financing (ca. 7-10 %). Agriholdings, on the other hand, additionally have access to considerably cheaper bank loans in foreign currency (ca. 12 %) and loans by the European Bank for Reconstruction and Development (EBRD, ca. 7-9 %). Further, they can access equity capital in the forms of international private equity and/or stock market capital. While smaller independent farms cannot access these cheaper sources of capital, large independent farms can in some cases establish the conditions to access foreign currency loans or even EBRD loans. However, even they can normally not access international private equity or stock capital.

2. Agriholdings further have an advantage from getting more favorable terms in input purchases and output sales, which stems primarily from negotiating power thanks to the large volumes they turn over. On the input side, the estimations range from ca. 5 % in fertilizer to ca. 15 % in agricultural machinery. On the output side 10 USD/t were estimated on average for all crops. Large independent farms were also found to have some advantages in purchases and sales over their smaller peers, but less than agriholdings (0-10 % in inputs, 5 USD/t in outputs). However, the degree of certainty among the panel participants on the concrete magnitudes of the advantages remained low.

3. Finally, agriholdings were also found to have a risk advantage in comparison to independent farms, which stems from their size and diversification. This was considered by the participants to be the smallest of the agriholdings' advantages.

Besides these net competitive advantages, agriholdings were found to have net competitive disadvantages in the following areas:

1. Agriholdings were found to be less efficient than independent farms. The typical agriholding farms work at a lower intensity of production than their independent counterparts. However, the former's yields are 24 % lower than those of the latter, which is more than would be warranted by their lower intensity. The following reasons for this were given by the panel participants: (a) The typical agriholding farms currently have less capable farm managers than the participating top-performing independent farm managers (whose performance is reflected in the typical independent farms). (b) Agriholdings have longer decision chains and more standardized processes, which makes them less flexible. (c) The participating agriholding has grown extremely rapidly over the last years (which reflect a typical situation in this organizational form). And (d) it is more challenging to control theft, fraud and corruption at agriholdings than at independent farms.

2. The second competitive disadvantage of agriholdings was found to be the costs incurred by their central organization, which appear as overhead costs of (only) the agriholding farms (30 USD/ha on average).

Besides these competitive advantages and disadvantages, a number of factors which according to theory could give one of the two organizational forms a net competitive advantage either remained inconclusive, or were found by the panel participants to (currently) not play a role:

1. Indications were found but not conclusively confirmed that while both organizational forms need to be locally politically connected, agriholdings have competitive advantages from political clout especially at the regional and national levels.

2. Indications were found but not conclusively confirmed that agriholdings can suppress competition on the land market and thereby have better and cheaper access to land than independent farms.

3. Indications were found but not conclusively confirmed that especially very capable farm managers have a preference to work at independent farms, because they have more decision making authority and less bureaucratic constraints there.

The conclusively determined competitive advantages and disadvantages of the two organizational forms (except risk) were quantitatively evaluated with the typical farm models. Return to land was used as the quantitative indicator of competitiveness, because it expresses how much an arable business could maximally pay for land without making economic losses. The

results show that while at the bottom line all of them were very profitable,[1] there are noteworthy differences:

- The 2,000 ha typical independent farm had a return to land of 163 USD/ha
- The 10,000 ha typical independent farm had 273 USD/ha
- The 2,000 ha typical agriholding farm had 111 USD/ha
- The 10,000 ha typical agriholding farm had 196 USD/ha

As can be seen, the difference between farm sizes within the organizational forms is greater than that between the typical farms of the same sizes but different organizational forms. The advantage of the larger farms stems mostly from economies of scale in mechanization and labor organization.

In the third round of the panel process, likely future adaptations of both organizational forms to maintain and increase their competitiveness were qualitatively enquired. The following strategies of agriholdings were pointed out by the participants:

1. Consolidating the business by increasing the size of individual operations and on the other hand taking unprofitable land or whole operations out was named as a likely option.

2. A further strategy is to focus the roof organization on its core functions and at the same time de-centralize management. This includes increasing the payment and incentivization of farm managers and taking measures to train or, if unsuccessful, replace them. As a result, a reduction of overhead costs and higher efficiency especially at the farm level is expected.

3. Finally, it was also pointed out that agriholdings might take complexity out of their businesses, thereby reducing the management requirement. This could be done by simplifying crop rotations, as well as using larger machines and fewer workers.

In the case of independent farms the following strategies were pointed out:

1. It was seen as a possibility that independent farms might found cooperatives in the future to fulfill certain tasks which the central organization fulfills at an agriholding, especially purchases and sales.

2. Moreover it was unanimously pointed out by the participating independent farm managers that they consider diversification into specialty crops (such as vegetables) or livestock production to be their growth alternative of choice should expanding their arable land

[1] Profit is calculated by subtracting the land costs of 62-65 USD/ha from return to land.

become more difficult, either due to high land prices, or agriholdings suppressing competition.[2]

The results are discussed and conclusions are drawn in Chapter 5 of this thesis. In the interpretation of all results it is important to keep in mind that the derived typical farms have a case study character, which limits their degree of representativeness for the whole farm population. Further, as the results are based on the knowledge and data of the participants, certain factors may have been overlooked and others over-emphasized. In spite of these limitations, the following key conclusions can be drawn:

1. The typical independent farms in this analysis generate higher return to land than their agriholding counterparts of the same size. This is indicative that agriholdings will get under economic pressure when increasing competition for land raises land costs in the future.

2. On the other hand, the typical agriholding farms have more potential to improve their efficiency than the already highly optimized typical independent farms in this analysis. Further, they can achieve the same return to land without entirely reaching the independent farms' efficiency thanks to their other competitive advantages (purchases, sales, etc.). Therefore it seems possible that the economic gap between the organizational forms closes in the future.

3. Especially smaller independent farms are in a difficult situation when the competition on the land market increases, as the return to land of large agriholding and independent farms is higher than theirs. While agriholdings have the liquidity to increase the size of their small operations, small independent farms are limited in their ability to grow especially due to restrictions in capital access.

4. The statements regarding likely future adaptations permit the conclusion that there may be a convergence of both organizational forms in the future, with agriholdings strengthening their farm-level management and focusing their central organizations on their key functions, and independent farms co-operating in purchases and sales. This might even go so far that franchise-like setups develop, in which an agriholding center cooperates with largely independent entrepreneurs who manage their farming operations.

The results of the analysis are in principle only valid for Ukraine. However, the more similar the conditions in a country are, the more likely it is that results can be transferred. A high degree of transferability can be tentatively concluded for Russia and Kazakhstan, as the economic and political conditions there are largely comparable to those in Ukraine. In mature Western

[2] These measures do not increase the businesses' competitiveness in the narrow sense of the definition used in this thesis. Competitiveness in this thesis is measured by a business' ability to generate return to land from *broadacre arable production*. Specialty crops and vertical integration, including livestock production, were explicitly excluded from the scope of research (cf. Chapter 3.1.2.1).

economies (such as Western Europe and the USA), but also South America (where agriholdings play the biggest role outside the former Soviet Union), conditions differ strongly and the transferability of the results is probably low.

Zusammenfassung

Agrarholdings sind große horizontal und/oder vertikal integrierte Agrarunternehmen, die sich dadurch auszeichnen, dass sie mehrere landwirtschaftliche Produktionseinheiten unter einer zentralen Verwaltung haben. Diese Organisationsform hat sich in Kasachstan, Russland und der Ukraine seit den späten 1990er-Jahren entwickelt und hat seitdem insbesondere im Ackerbau einen erheblichen Marktanteil erreicht. Die Ukraine ist eines dieser drei Länder, in dem die Entwicklung von Agrarholdings besonders ausgeprägt vonstatten ging.

Wenngleich der Wettbewerb um Ackerland in der Ukraine bisher schwach ausgeprägt war, wird erwartet, dass dieser in der Zukunft zunehmen wird. Um einschätzen zu können, ob dann Agrarholdings oder Einzelbetriebe auch unter sich ändernden Bedingungen eine höhere Wettbewerbsfähigkeit auf dem Landmarkt besitzen werden, werden in dieser Arbeit (a) Wettbewerbsvor- und -nachteile der beiden Organisationsformen im ukrainischen Ackerbau identifiziert, (b) deren Auswirkungen auf die Wettbewerbsfähigkeit quantifiziert und (c) Zukunftsanpassungen, die beide Organisationsformen wahrscheinlich unternehmen werden, um ihre Wettbewerbsfähigkeit zu erhalten oder zu verbessern, untersucht.

Nach einer Literaturrecherche in Kapitel 2 wird in Kapitel 3 der methodische Ansatz für den empirischen Teil dieser Arbeit entwickelt. Wie dort gezeigt wird, ist es eine Herausforderung, eine detaillierte Analyse von Wettbewerbsvor- und -nachteilen von Ackerbaubetrieben in der Ukraine durchzuführen, weil verlässliche Daten auf der Betriebsebene in der erforderlichen Tiefe dort nicht ohne weiteres verfügbar sind. Der *agri benchmark* Panel-Prozess zum Erstellen typischer Betriebe wurde als ein geeigneter Ansatz für den Zweck identifiziert, da mit der Methode eigene Daten in der erforderlichen Tiefe, einschließlich qualitativer Informationen, erhoben werden können. Des Weiteren sind Mechanismen zur Validierung der erhobenen Informationen enthalten, und die Analyse von Zukunftsanpassungen ist möglich. In diesem Forschungsansatz werden Fokusgruppendiskussionen mit Landwirten und landwirtschaftlichen Betriebsberatern durchgeführt, mittels derer typische Betriebe erstellt werden. Typische Betriebe haben den Charakter von Fallstudien, die stringent definierte Untergruppen einer Grundgesamtheit an Betrieben widerspiegeln.

Während jedoch der normale *agri benchmark* Panel-Prozess ein bewährtes Instrument in westlichen Ländern ist, ist er unter den Bedingungen in der Ukraine mit verschiedenen Schwierigkeiten konfrontiert:

1. Typische Betriebe werden normalerweise von einem Wissenschaftler zusammen mit einem landwirtschaftlichen Betriebsberater vorläufig erstellt und danach in Fokusgruppendiskussionen mit Betriebsleitern validiert. Allerdings gibt es in der Ukraine momentan praktisch keine Berater, die horizontale Betriebsvergleiche durchführen und dadurch das erforderliche Verständnis über die ökonomischen Zusammenhänge in den verschiedenen Organisationsformen haben.

2. Ukrainischen Betriebsleitern fehlt oft das gemeinsame detaillierte Wissen von Betriebswirtschaft und Produktionstechnik, das für die Erstellung typischer Betriebe erforderlich ist. Stattdessen sind diese Informationen oft auf mehrere verschiedene Personen innerhalb eines landwirtschaftlichen Betriebs verteilt, zum Beispiel den Generaldirektor, den Hauptagronomen, den Hauptingenieur und den Hauptbuchhalter. Dies liegt an der traditionell sehr starken Spezialisierung im Bereich der Betriebsleitung, bei der in der Regel keine Einzelperson den Überblick über den gesamten Betrieb hat, wie ihn ein typischer westlicher Betriebsleiter über sein Unternehmen haben würde.

3. Die Kultur, Daten mit anderen Landwirten, Beratern und Wissenschaftlern auszutauschen, wie sie in westlichen Ländern relativ verbreitet ist, ist in der Ukraine momentan kaum existent. Dies erschwert es, Führungskräfte beider Organisationsformen zur Teilnahme in Fokusgruppendiskussionen zu gewinnen. Insbesondere Agrarholdings neigen zu besonderer Zurückhaltung, wenn es darum geht, die erforderlichen Informationen offenzulegen.

Um diesen Schwierigkeiten zu begegnen, wurde ein *modifizierter Panel-Prozess für die Analyse typischer Betriebe* entwickelt und erfolgreich eingesetzt. Dieser modifizierte Ansatz besteht aus drei Runden der Interaktion mit Teilnehmern:

1. In der ersten Runde wurde das sogenannte Pre-Panel, in dem die typischen Betriebe normalerweise von einem Wissenschaftler und einem landwirtschaftlichen Betriebsberater vorläufig erstellt werden, durch eine Abfolge von Einzelbefragungen ersetzt. In diesen Befragungen wurden Betriebsdaten und qualitative Einschätzungen erhoben. Sie wurden mit Führungskräften von Agrarholdings und landwirtschaftlichen Einzelbetrieben durchgeführt. Zusätzlich wurden Repräsentanten des Agribusiness sowie externe Wissenschaftler und Analysten in dieser Befragungsrunde mit einbezogen, um Informationen in den Bereichen beizusteuern, wo die anderen Teilnehmer Wissensdefizite haben. Nach den Einzelbefragungen wurden die typischen Betriebe vom durchführenden Wissenschaftler vorläufig erstellt, basierend auf dem Spektrum an Informationen, das die verschiedenen Teilnehmer bereitgestellt hatten.

2. In der zweiten Runde wurden zwei separate Fokusgruppendiskussionen abgehalten, eine mit Führungskräften einer Agrarholding und eine mit Betriebsleitern landwirtschaftlicher Einzelbetriebe. In dieser Runde wurden die typischen Betriebe sowie die qualitativen Einschätzungen der Teilnehmer validiert und vervollständigt.

3. In der dritten Runde wurde eine einzelne große Fokusgruppendiskussion mit den Agrarholding-Managern und den Betriebsleitern der Einzelbetriebe abgehalten. Die qualitativen und quantitativen Ergebnisse wurden darin weiter validiert, und Zukunftsanpassungen wurden erfragt.

Führungskräfte von vier landwirtschaftlichen Einzelbetrieben, aber nur einer Agrarholding, haben in dem Panel-Prozess teilgenommen. Neben der Tatsache, dass Versuche, Manager von mehr als einer Agrarholding zur Teilnahme zu bewegen, nicht erfolgreich waren, hat dieser Ansatz auch den folgenden Vorteil: Das Problem, dass einzelne Personen üblicherweise nur einen begrenzten Überblick über ihr Unternehmen haben, ist in Agrarholdings aufgrund der größeren Komplexität noch ausgeprägter als in Einzelbetrieben. Mehrere Manager einer einzelnen Agrarholding anstelle einzelner Manager mehrerer Agrarholdings einzubeziehen, hatte daher den Vorteil, dass die Summe ihres Wissens ein konsistenteres Gesamtbild eines Unternehmens ergibt.

Gegenstand dieser Untersuchung ist nur der Ackerbau. Vertikale Integration, einschließlich Tierhaltung, ist nicht im Fokus der Arbeit. Die typischen Agrarholding-Betriebe spiegeln ein durchschnittlich profitables Unternehmen aus der Gruppe der größten Agrarholdings (> 100,000 ha) wider. Die typischen landwirtschaftlichen Einzelbetriebe spiegeln restrukturierte Einzelbetriebe wider (in Abgrenzung zu kleinen Familienbetrieben oder nicht restrukturierten Kollektivbetrieben). Während des Panel-Prozesses stellte es sich heraus, dass die Teilnehmer der letzteren Organisationsform Top-Betriebe innerhalb der Organisationsform repräsentieren. Das spiegelt sich in den typischen Einzelbetrieben wider, und es ist wichtig, dies bei der Interpretation der Ergebnisse zu berücksichtigen.

Insgesamt wurden vier typische Betriebe erstellt:

- Ein Mitgliedsbetrieb einer Agrarholding mit 2.000 ha
- Ein Mitgliedsbetrieb einer Agrarholding mit 10.000 ha
- Ein landwirtschaftlicher Einzelbetrieb mit 2.000 ha
- Ein landwirtschaftlicher Einzelbetrieb mit 10.000 ha

Die Vergleichseinheit in der Analyse ist der einzelne Betrieb, welchem im Falle der Mitgliedsbetriebe einer Agrarholding Gemeinkosten der Dachorganisation zugeordnet sind. Die kleineren typischen Betriebe repräsentieren die Betriebsgröße, welche die meiste Ackerfläche in der Ukraine bewirtschaftet. Die größeren hingegen spiegeln eine Betriebsgröße wider, bei der die Panelteilnehmer der Ansicht waren, dass die meisten Größenvorteile, die auf der Ebene des einzelnen Betriebes möglich sind, voll ausgenutzt werden. Die beiden Betriebsgrößen pro Organisationsform wurden erstellt, um es zu ermöglichen, zwischen Größeneffekten auf der Betriebsebene und denen, die nur durch die Dachorganisation einer Agrarholding entstehen, zu unterscheiden.

Die Ergebnisse der empirischen Forschung sind in Kapitel 4 dargestellt. Es wurde festgestellt, dass Agrarholdings Netto-Wettbewerbsvorteile im Vergleich zu landwirtschaftlichen Einzelbetrieben in den folgenden Bereichen haben:

1. Sie genießen einen besseren und billigeren Zugang zu Kapital. Beide Organisationsformen haben Zugang zu Bankkrediten in der ukrainischen Nationalwährung (Zinssatz ca. 18-22 %), Lieferantenkrediten für variable Produktionsfaktoren (ca. 70 %) sowie Finanzierungsmöglichkeiten für landwirtschaftliche Maschinen (ca. 7-10 %). Agrarholdings haben zusätzlich Zugang zu deutlich billigeren Bankkrediten in ausländischer Währung (ca. 12 %) und Krediten von der Europäischen Bank für Wiederaufbau und Entwicklung (European Bank for Reconstruction and Development EBRD, ca. 7-9 %). Des Weiteren können sie auf Eigenkapital in Form von internationalem Private Equity-Kapital und/oder Aktienmarktkapital zugreifen. Während kleinere landwirtschaftliche Einzelbetriebe keinen Zugang zu diesen billigeren Kapitalquellen haben, können große Einzelbetriebe in manchen Fällen die erforderlichen Bedingungen herstellen, um Zugriff auf Kredite in Fremdwährung oder sogar EBRD-Kredite zu bekommen. Auch große Einzelbetriebe können jedoch normalerweise nicht auf internationales Private Equity-Kapital oder Aktienmarktkapital zugreifen.

2. Agrarholdings haben des Weiteren einen Vorteil darin, dass sie günstigere Konditionen beim Kauf von Produktionsfaktoren und dem Verkauf ihrer Produkte erhalten. Diese Vorteile sind primär durch die Verhandlungsmacht begründet, die Agrarholdings dank ihrer großen umgesetzten Volumina haben. Bei den Produktionsfaktoren bewegten sich die Schätzungen von ca. 5 % bei Dünger bis zu ca. 15 % bei Landtechnik. Bei den Verkaufsprodukten wurden durchschnittlich 10 USD/t im Durchschnitt über alle Feldfrüchte geschätzt. Es wurde festgestellt, dass große landwirtschaftliche Einzelbetriebe im Vergleich zu ihren kleineren Pendants ebenfalls gewisse Vorteile im Ein- und Verkauf haben (0-10 % bei Produktionsfaktoren, 5 USD/t in Verkaufsprodukten). Bezüglich der genauen Größenordnung der Vorteile blieb allerdings bis zuletzt ein hoher Grad an Unsicherheit erhalten.

3. Weiterhin wurde festgestellt, dass Agrarholdings im Vergleich zu landwirtschaftlichen Einzelbetrieben einen Vorteil durch geringeres Risiko haben, der sich aus ihrer Größe und Diversifikation ergibt. Dieser Vorteil von Agrarholdings wurde von den Teilnehmern als der am wenigsten bedeutsame erachtet.

Neben diesen Netto-Wettbewerbsvorteilen wurden auch Netto-Wettbewerbsnachteile von Agrarholdings in den folgenden Bereichen festgestellt:

1. Es wurde festgestellt, dass Agrarholdings weniger effizient sind als landwirtschaftliche Einzelbetriebe. Die typischen Agrarholding-Mitgliedsbetriebe arbeiten mit einer geringeren Produktionsintensität als die typischen Einzelbetriebe. Allerdings sind die Naturalerträge ersterer um 24 % geringer als die der letzteren. Dieser Ertragsnachteil ist größer als der, der durch die geringere Intensität begründet werden könnte. Die folgenden Gründe dafür wurden von den Panelteilnehmern vorgebracht: (a) Die typischen Agrarholding-Betriebe haben

momentan weniger leistungsfähige Betriebsleiter als die teilnehmenden Top-Einzelbetriebe (deren hohe Managementleistung sich in den typischen Einzelbetrieben widerspiegelt). (b) Agrarholdings haben längere Entscheidungswege und in einem höheren Maße standardisierte Prozesse, was ihre Flexibilität verringert. (c) Die teilnehmende Agrarholding ist in den letzten Jahren extrem stark gewachsen (was durchaus die typische Situation in dieser Organisationsform widerspiegelt). (d) Es bereitet in Agrarholdings größere Schwierigkeiten als in Einzelbetrieben, Diebstahl, Betrug und Korruption unter Kontrolle zu halten.

2. Der zweite Wettbewerbsnachteil von Agrarholdings, der festgestellt wurde, besteht in den Kosten, die von der Dachorganisation verursacht werden. Diese treten als Gemeinkosten (nur) der Agrarholding-Betriebe in Erscheinung und betragen im Mittel 30 USD/ha.

Neben diesen Wettbewerbsvor- und -nachteilen gab es auch einige Faktoren, die der Theorie nach einer der beiden Organisationsformen einen Netto-Wettbewerbsvorteil verschaffen könnten, bei denen aber entweder kein klares Ergebnis erzielt wurde, oder die nach Einschätzung der Teilnehmer (momentan) keine Rolle spielen:

1. Es wurden Hinweise gefunden, die aber nicht klar bestätigt werden konnten, dass Agrarholdings Wettbewerbsvorteile durch politische Verbindungen auf der regionalen und nationalen Ebene haben (während auf der lokalen Ebene beide Organisationsformen vernetzt sind bzw. sein müssen).

2. Es wurden Hinweise gefunden, die aber nicht klar bestätigt werden konnten, dass Agrarholdings den Wettbewerb auf dem Landmarkt unterdrücken können und dadurch einen besseren und billigeren Zugang zu Ackerland haben als Einzelbetriebe.

3. Es wurden Hinweise gefunden, die aber nicht klar bestätigt werden konnten, dass insbesondere besonders fähige Betriebsleiter eine Präferenz dafür haben, auf landwirtschaftlichen Einzelbetrieben zu arbeiten, weil sie dort mehr Entscheidungsbefugnisse und weniger bürokratische Einschränkungen haben.

Die Auswirkung derjenigen Wettbewerbsvor- und -nachteile der beiden Organisationsformen, die eindeutig ermittelt werden konnte (außer Risiko), wurde mittels der typischen Betriebsmodelle quantitativ analysiert. Als quantitativer Indikator der Wettbewerbsfähigkeit wurde die Grundrente verwendet, weil dieser Indikator zeigt, wie viel ein Ackerbaubetrieb maximal für Land bezahlen kann, ohne einen wirtschaftlichen Verlust zu machen. Die Ergebnisse zeigen, dass alle typischen Betriebe sehr profitabel waren[3], es diesbezüglich aber auch deutliche Unterschiede zwischen ihnen gibt:

- Der typische 2.000 ha-Einzelbetrieb erzielt eine Grundrente von 163 USD/ha

[3] Profitabilität, gemessen durch den Unternehmergewinn, wird ermittelt, indem von der Grundrente die Land(pacht)kosten in Höhe von 62-65 USD/ha abgezogen werden.

- Der typische 10.000 ha-Einzelbetrieb erzielt 273 USD/ha
- Der typische 2.000 ha-Agrarholding-Mitgliedsbetrieb erzielt 111 USD/ha
- Der typische 10.000 ha-Agrarholding-Mitgliedsbetrieb erzielt 196 USD/ha

Wie man daraus erkennen kann, ist der Unterschied zwischen den unterschiedlichen Betriebsgrößen innerhalb einer Organisationsform größer als der zwischen den typischen Betrieben derselben Größe, aber unterschiedlicher Organisationsformen. Der Vorteil der größeren Betriebe ergibt sich hauptsächlich aus Größenvorteilen in der Mechanisierung und Arbeitsorganisation.

In der dritten Runde des Panel-Prozesses wurden Zukunftsanpassungen erfragt, die die beiden Organisationsformen wahrscheinlich vornehmen werden um ihre Wettbewerbsfähigkeit zu erhalten und zu verbessern. Die folgenden Strategien von Agrarholdings wurden von den Teilnehmern vorgebracht:

1. Es wurde als eine wahrscheinliche Option erachtet, dass Agrarholdings sich konsolidieren werden, indem sie einerseits ihre einzelnen Betriebe vergrößern und andererseits Land oder ganze Betriebe, die nicht profitabel sind, aus dem Unternehmen abstoßen werden.

2. Eine weitere Strategie ist es, die Dachorganisation auf ihre Kernfunktionen zu fokussieren und gleichzeitig das Management zu dezentralisieren. Dies umfasst eine höhere Bezahlung und bessere Anreize für die Betriebsleiter, Maßnahmen zu deren Weiterbildung und gegebenenfalls, bei mangelndem Erfolg, den Austausch einzelner Betriebsleiter. Als Ergebnis werden eine Verringerung der Gemeinkosten und eine höhere Effizienz insbesondere auf der Ebene der landwirtschaftlichen Produktionseinheiten erwartet.

3. Schließlich wurde auch noch dargelegt, dass Agrarholdings die Komplexität ihrer Unternehmen verringern und dadurch die Anforderungen an das Management reduzieren könnten. Dies könnte durch die Vereinfachung von Fruchtfolgen sowie den Einsatz größerer Maschinen und weniger Arbeiter erreicht werden.

Im Falle der landwirtschaftlichen Einzelbetriebe wurden die folgenden Strategien vorgebracht:

1. Es wurde als eine Möglichkeit gesehen, dass landwirtschaftliche Einzelbetriebe in der Zukunft Genossenschaften gründen könnten, um die Aufgaben zu erfüllen, die in einer Agrarholding die Dachorganisation wahrnimmt, insbesondere beim Ein- und Verkauf.

2. Des Weiteren bestand große Einigkeit unter den teilnehmenden Einzelbetriebsleitern, dass für sie die Diversifikation hin zu Spezialkulturen (wie Gemüse) oder zur Tierhaltung die Wachstumsalternative der Wahl ist, falls zukünftig Flächenwachstum schwieriger werden

sollte, sei es durch hohe Landpreise oder durch Wettbewerbsunterdrückung seitens Agrarholdings.[4]

Im Kapitel 5 dieser Arbeit werden die Ergebnisse diskutiert und Schlussfolgerungen gezogen. Bei der Interpretation aller Ergebnisse ist es wichtig zu berücksichtigen, dass die erstellten typischen Betriebe einen Fallstudiencharakter aufweisen, wodurch ihre Repräsentativität für die Gesamtpopulation landwirtschaftlicher Unternehmen in der Ukraine eingeschränkt ist. Des Weiteren ist es aufgrund dessen, dass die Ergebnisse auf dem Wissen und den Daten der Teilnehmer basieren, möglich, dass bestimmte Faktoren übersehen und andere überbetont worden sind. Trotz dieser Einschränkungen konnten die folgenden wichtigsten Schlussfolgerungen gezogen werden:

1. Die typischen landwirtschaftlichen Einzelbetriebe in dieser Analyse generieren eine höhere Grundrente als die Agrarholding-Betriebe gleicher Größe. Dies für sich alleine genommen deutet darauf hin, dass Agrarholdings wirtschaftlich unter Druck geraten werden, wenn ein zunehmender Wettbewerb um Ackerland in der Zukunft zu höheren Landkosten führen wird.

2. Andererseits haben die typischen Agrarholding-Betriebe ein größeres Potential, ihre Effizienz zu verbessern, als die schon jetzt stark optimierten typischen Einzelbetriebe in dieser Analyse. Des Weiteren können sie dank ihrer anderen Wettbewerbsvorteile (Ein- und Verkauf, etc.) die gleichen Grundrenten erzielen, ohne ganz das Effizienzniveau der Einzelbetriebe zu erreichen. Von daher scheint es möglich, dass sich der wirtschaftliche Vorteil der Einzelbetriebe in Zukunft verringern oder ganz verschwinden wird.

3. Insbesondere kleinere Einzelbetriebe sind in einer schwierigen Situation, wenn der Wettbewerb auf dem Landmarkt zunimmt, weil die von ihnen erwirtschaftete Grundrente geringer ist als die von großen Agrarholding- und Einzelbetrieben. Während Agrarholdings jedoch die erforderliche Liquidität zur Verfügung haben, um ihre Betriebe zu vergrößern, sind die Wachstumsmöglichkeiten kleiner Einzelbetriebe insbesondere durch ihren eingeschränkteren Kapitalzugang begrenzt.

4. Die Aussagen der Teilnehmer in Bezug auf wahrscheinliche Zukunftsanpassungen lassen den Schluss zu, dass es künftig möglicherweise zu einer Konvergenz der beiden Organisationsformen kommen wird. Agrarholdings würden dann ihr Management auf der Ebene der landwirtschaftlichen Produktionseinheiten stärken und ihre Dachorganisationen gleichzeitig auf ihre Kernaufgaben fokussieren, während landwirtschaftliche Einzelbetriebe im Ein- und Verkauf kooperieren würden. Dies könnte möglicherweise sogar so weit gehen, dass Franchise-ähnliche Konstrukte entstehen, in denen eine Agrarholding-Zentralorganisation

[4] Diese Maßnahmen erhöhen nicht die Wettbewerbsfähigkeit der Unternehmen im engen Sinne der in dieser Arbeit verwendeten Definition. Wettbewerbsfähigkeit in dieser Arbeit wird gemessen durch die Grundrente, die ein Unternehmen aus dem Ackerbau generiert. Spezialkulturen und vertikale Integration, einschließlich Viehhaltung, wurden bei der Eingrenzung der Forschungsfragen ausdrücklich ausgeschlossen (siehe Kapitel 3.1.2.1).

mit weitgehend unabhängigen Unternehmern kooperiert, die die einzelnen Produktionseinheiten leiten.

Die Ergebnisse der Analyse gelten prinzipiell nur für die Ukraine. Je ähnlicher die Bedingungen in einem Land jedoch sind, desto wahrscheinlicher ist es, dass Ergebnisse übertragen werden können. Für Russland und Kasachstan kann daher vorsichtig auf einen hohen Grad an Übertragbarkeit geschlossen werden, weil die wirtschaftlichen und politischen Bedingungen dort zu weiten Teilen mit denen in der Ukraine vergleichbar sind. In weiter entwickelten westlichen Marktwirtschaften (wie beispielsweise Westeuropa und den USA), aber auch Südamerika (wo Agrarholdings außerhalb der früheren Sowjetunion die größte Rolle spielen) unterscheiden sich die Bedingungen hingegen stark von denen in der Ukraine. Die Übertragbarkeit der Ergebnisse ist dort daher wahrscheinlich gering.

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Appendix

Appendix 1

Interview guideline

Interview and discussion guideline for qualitative assessments

In the second and third rounds, open questions from the respective preceding round(s) are clarified. The results of the preceding round(s) are validated and corrected. Thereafter the new questions planned for the respective round are asked.

Opening questions

Round 1

- What are the most important strengths and weaknesses of agriholdings and restructured independent farms in Ukraine today?

Round 2

none

Round 3

- Opportunities and limitations of growth? Consequences?
- In the preceding rounds competitive strengths and weaknesses of both organizational forms were found. How do you think businesses of both organizational forms will adapt in the future in order to overcome the weaknesses and fortify their strengths, and thus maintain or increase their competitiveness?

Hypothesis-guided questions

Terms in inputs purchases and output sales

Round 1

Assessment of the following factors (How much advantage for whom? Influence on competitiveness? Explanation?)

- Ability to purchase inputs at favorable terms?
- Ability to sell outputs at favorable terms?
- Concrete difference between input purchase terms?
  → Fertilizer? Pesticides? Machines? Seeds? Other relevant inputs?

- Concrete difference in output sales terms?

Round 2

- Purchase and sales strategy?
- Reasons for differences in purchase/sales terms? → Volumes? Certification? Quality management? Skipping intermediaries? Specialization?
- Do both farm types have access to the same hedging/marketing instruments? If not, why not?

Round 3

Enquire future adaptations to maintain and increase competitiveness in this field.

Access to and cost of capital

Round 1

Assessment of the following factors (How much advantage for whom? Influence on competitiveness? Explanation?)

- Availability and cost of capital?
- Concrete differences in capital costs?

Round 2

- How does the advantage in capital cost/access come? Access to other sources? Volume? Measures to reduce creditors' risk? Measures to better inform creditors? Specialization?

Round 3

Enquire future adaptations to maintain and increase competitiveness in this field.

Access to and cost of land

Round 1

Assessment of the following factors (How much advantage for whom? Influence on competitiveness? Explanation?)

- Access to land?
- Difference in land cost?

Round 2

- How does the land rental procedure work?
- Concrete difference in land access: Trust by landlords? Better enforce contracts? Pressure tenants? Financial power to push others out? Specialization?

Round 3

Enquire future adaptations to maintain and increase competitiveness in this field.

Scale effects

Round 1

Assessment of the following factors (How much advantage for whom? Influence on competitiveness? Explanation?)

- Economies of scale in operative production (at the farm level)?
- Economies of scale in management (mostly holding level)?

Round 2

- Concrete economies of scale in management? Rental contract management? Bookkeeping? Use of specialists across operations? Other?
- Concrete economies of scale at the operational level? Larger machines? Machinery specialization? Advantages from larger structures (fields etc.)? Utilization of machinery across operations?
- Which advantages of size can, and which cannot be reached by independent farms?

- Disadvantages of size?

Round 3

Enquire future adaptations to maintain and increase competitiveness in this field.

Political influence, power

Round 1

Assessment of the following factors (How much advantage for whom? Influence on competitiveness? Explanation?)

- Ability to influence political decision makers in one's favor?
- Financial power?

Round 2

- How does political influence work, how is "power" exerted? Nepotism? Bribes? Extortion? Others?
- Legal and illegal means of influencing decision makers?
- How is financial power used? Pushing others out of land market? Others?

Round 3

Enquire future adaptations to maintain and increase competitiveness in this field.

Political environment

Round 1

Assessment of the following factors (How much advantage for whom? Influence on competitiveness? Explanation?)

- Taxation system favors the organizational form?
- Agricultural policy favors the organizational form (subsidies…)?
- Legal, political framework favors the system (corruption, imperfect markets…)?

Round 2

none

Round 3

Enquire future adaptations to maintain and increase competitiveness in this field.

Personnel, "human factors"

Round 1

Assessment of the following factors (How much advantage for whom? Influence on competitiveness? Explanation?)

- Availability and cost of managers, specialists, workers?
- Performance, motivation of employees? Identification with company?
- Losses from theft, fraud, corruption?

Round 2

- Are workers and/or managers more motivated and/or perform better at one of the organizational forms as a result of their mentality? Do they have a preference to work at one organizational form (given the same payment and other terms)?
- Management efficiency/efficacy at the two organizational forms?
- Where do losses occur (theft, fraud, corruption, inefficiencies)? How much is lost where?
- Freedom of personnel at agriholdings to leave for conferences, training, vacation, etc.?

Round 3

Enquire future adaptations to maintain and increase competitiveness in this field.

Risk

Round 1

Assessment of the following factors (How much advantage for whom? Influence on competitiveness? Explanation?)

- Risk/stability/endurance in crises?

Round 2

- Difference in risk? Why? Geographic diversification? Product diversification? More machines/person per job?
- Is one organizational form more diversified?
- Can one of the organizational forms endure crises better because of more identification of employees with companies?

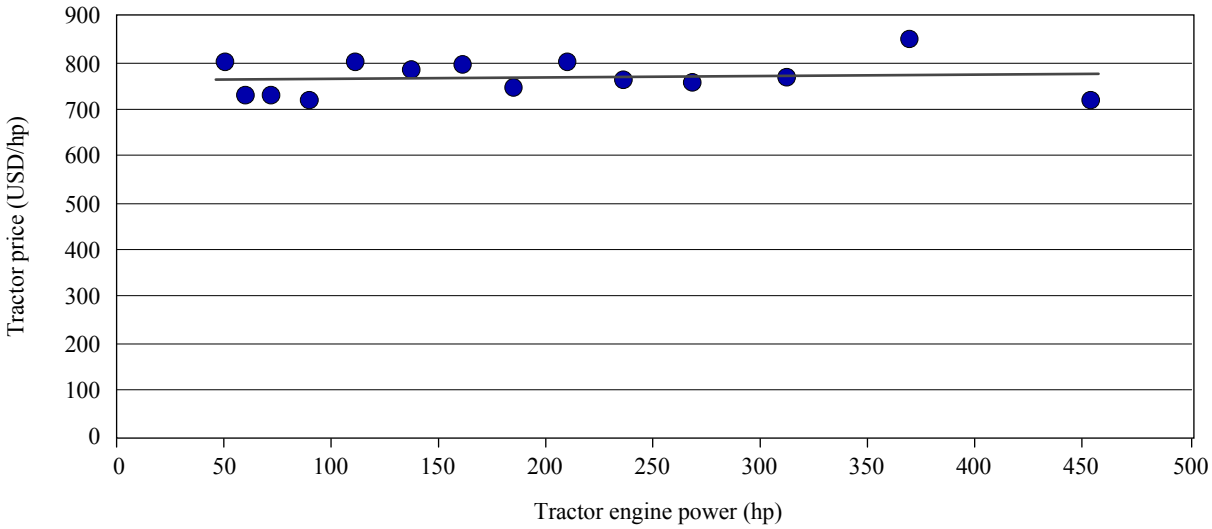
Round 3

Enquire future adaptations to maintain and increase competitiveness in this field.

Appendix 2

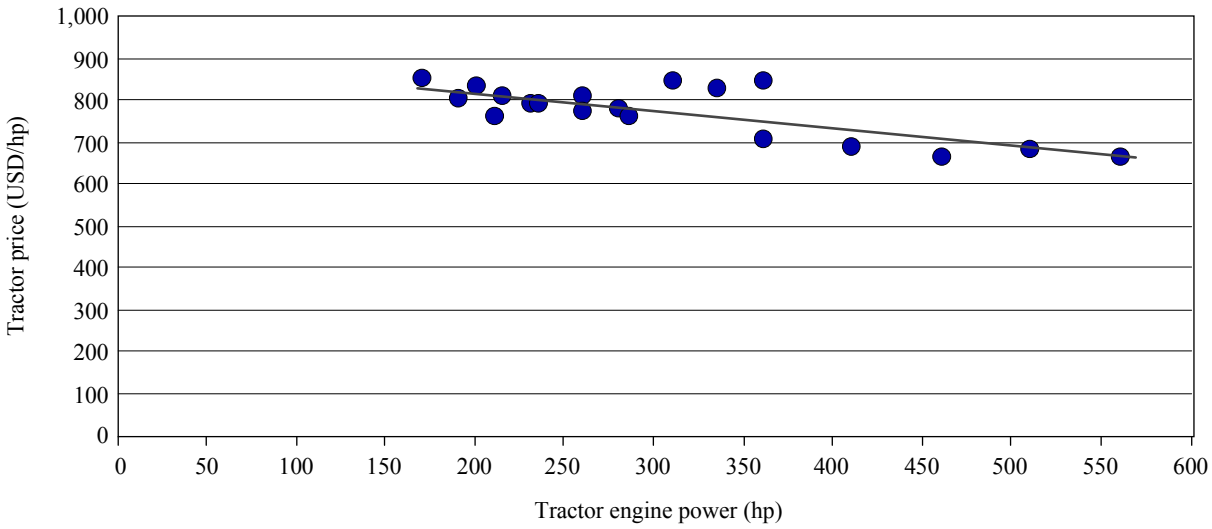
Relationship of tractor price per horsepower and tractor size – Comparison of KTBL planning data with a manufacturer's list prices

Figure A.1: Tractor purchase prices according to planning data provided by KTBL (USD/hp)



Source: Own calculations, based on KTBL Betriebsplanung Landwirtschaft 2008/09 - Standardtraktor allrad bzw. Knicklenker. Exchange rate of 1.4 USD/EUR was used.

Figure A.2: Tractor list prices of a major machinery manufacturer (USD/hp)



Source: Own calculations, based on John Deere configurator: configurator.deere.com, accessed on 2011-10-26.

Appendix 3

Machinery and buildings of the typical farms

Table A.1: Machinery and buildings of the 2,000 ha typical independent farm

Units	Type	Make	Size	Purchase price	Depreciation period	Salvage value
3	Tractor	West	285 hp	218.100	6	43.600
4	Tractor	CIS	90 hp	23.800	6	4.800
1	Grain drill	West	6 m	129.400	6	25.900
1	Planter 75 cm	West	8 row	44.800	6	9.000
1	Heavy cultivator	West	4 m	45.000	6	9.000
1	Medium cultivator	West	6 m	59.300	6	11.900
2	Mounted spreader	West	3 t	19.200	6	3.800
1	Grain header	West	7.6 m	34.300	6	6.900
1	Corn header	West	8 row	62.100	6	12.400
1	Grain cart	West	28 m^3	52.100	6	10.400
1	Light cultivator	West	9 m	43.900	6	8.800
1	Grain header w/rape equipment	West	7.6 m	41.200	6	8.200
1	Roller	CIS	9 m	7.800	6	1.600
1	Flail shredder	West	2.8 m	6.600	6	1.300
1	Trailed sprayer	West	24 m	63.100	6	12.600
1	Water trailer	CIS	-	5.000	6	1.000
2	Combine	West	380	373.800	6	74.800
2	4x4 car	CIS	-	10.600	6	2.100
2	Truck + trailer	CIS	25 t	84.100	6	16.800
1	Telescopic handler	West	100 hp	94.500	6	18.900
1	Grain dryer	-	-	120.000	20	0
1	Grain storage	-	5.000 t	75.000	30	0
1	Machine shed with workshop	-	-	50.000	30	0
1	Workshop equipment	-	-	35.000	10	0
1	Farm yard (w/asphalt, fence)	-	-	60.000	30	0
1	Fuel pump, tanks	-	-	20.000	20	0
1	Seed cleaning + treatment	-	-	30.000	20	0
1	Vehicle scale	-	-	25.000	20	0
1	Administration building	-	-	25.000	30	0

Source: Own research.

Table A.2: Machinery and buildings of the 10,000 ha typical independent farm

Units	Type	Make	Size	Purchase price	Depreciation period	Salvage value
5	Tractor	West	560 hp	354.600	6	74.700
2	Tractor	West	285 hp	207.200	6	43.600
4	Tractor	CIS	130 hp	47.300	6	10.000
5	Tractor	CIS	90 hp	22.600	6	4.800
2	Grain drill	West	18 m	243.700	6	51.300
2	Planter 75 cm	West	16 row	113.200	6	23.800
1	Heavy cultivator	West	8 m	76.500	6	16.100
2	Medium cultivator	West	12 m	114.000	6	24.000
4	Trailed spreader	West	8,000 l	55.000	6	11.600
3	Grain header	West	10.7 m	43.500	6	9.200
2	Corn header	West	16 row	125.700	6	26.500
3	Grain cart	West	34 m^3	63.100	6	13.300
2	Grain header w/rape equipment	West	10.7 m	52.300	6	11.000
2	Sunflower header	West	12 m	52.300	6	11.000
3	Roller	CIS	12.5 m	13.500	6	2.800
1	Light cultivator	West	18 m	75.200	6	15.800
1	Flail shredder	West	8 m	37.100	6	7.800
5	Combine	West	550 hp	413.900	6	87.100
10	4x4 car	CIS	-	10.100	6	2.100
10	Truck + trailer	CIS	25 t	79.900	6	16.000
3	Telescopic handler	West	100 hp	89.700	6	18.900
2	Self-propelled sprayer	West	36 m	355.500	6	74.800
2	Tank truck	CIS	25 m^3	79.900	6	16.000
1	Grain dryer	-	-	500.000	20	0
1	Grain storage	-	25,000 t	375.000	30	0
1	Machine shed with workshop	-	-	70.000	30	0
1	Workshop equipment	-	-	45.000	10	0
1	Farm yard (w/asphalt, fence)	-	-	80.000	30	0
1	Fuel pump, tanks	-	-	20.000	20	0
1	Seed cleaning + treatment	-	-	40.000	20	0
1	Vehicle scale	-	-	25.000	20	0
1	Administration building	-	-	35.000	30	0

Source: Own research.

Table A.3: Machinery and buildings of the 2,000 ha typical agriholding farm

Units	Type	Make	Size	Purchase price	Depreciation period	Salvage value
2	Tractor	West	285 hp	185.400	5	43.600
4	Tractor	CIS	90 hp	20.200	5	4.800
2	Mounted spreader	West	3 t	16.300	5	3.800
1	Heavy cultivator	West	4 m	38.300	5	9.000
1	Medium cultivator	West	6 m	50.400	5	11.900
1	Light cultivator	West	9 m	37.300	5	8.800
1	Grain drill	West	6 m	110.000	5	25.900
1	Corn header	West	8 row	52.800	5	12.400
1	Roller	CIS	9 m	6.600	5	1.600
1	Grain header w/rape equipment	West	9.2 m	41.000	5	9.600
1	Planter 75 cm	West	8 row	38.100	5	9.000
1	Flail shredder	West	2.8 m	5.600	5	1.300
1	Trailed sprayer	West	24 m	53.600	5	12.600
1	Combine	West	480 hp	346.200	5	81.500
2	Truck with trailer	CIS	25 t	71.500	5	16.800
1	Telescopic handler	West	100 hp	80.300	5	18.900
2	4x4 car	CIS	-	9.000	5	2.100
1	Grain dryer	-	-	90.000	20	0
1	Grain storage	-	3,500 t	52.500	30	0
1	Machine shed with workshop	-	-	50.000	30	0
1	Workshop equipment	-	-	35.000	10	0
1	Farm yard (w/asphalt, fence)	-	-	60.000	30	0
1	Fuel pump, tanks	-	-	20.000	20	0
1	Seed cleaning + treatment	-	-	30.000	20	0
1	Vehicle scale	-	-	25.000	20	0
1	Administration building	-	-	25.000	30	0

Source: Own research.

Table A.4: Machinery and buildings of the 10,000 ha typical agriholding farm

Units	Type	Make	Size	Purchase price	Depreciation period	Salvage value
3	Tractor	West	560 hp	317.300	5	74.700
2	Tractor	West	285 hp	185.400	5	43.600
4	Tractor	CIS	130 hp	42.300	5	10.000
5	Tractor	CIS	90 hp	20.200	5	4.800
4	Trailed spreader	West	8,000 l	49.200	5	11.600
1	Heavy cultivator	West	8 m	68.400	5	16.100
2	Medium cultivator	West	12 m	102.000	5	24.000
1	Light cultivator	West	18 m	67.300	5	15.800
2	Grain drill	West	18 m	218.000	5	51.300
1	Corn header	West	16 row	112.500	5	26.500
3	Roller	CIS	12.5 m	12.100	5	2.800
1	Sunflower header	West	12 m	46.800	5	11.000
3	Grain header	West	10.7 m	38.900	5	9.200
1	Grain header w/rape equipment	West	10.7 m	46.800	5	11.000
2	Planter 75 cm	West	16 row	101.300	5	23.800
1	Flail shredder	West	8 m	33.200	5	7.800
4	Combine	West	550 hp	370.300	5	87.100
10	Truck with trailer	CIS	25 t	71.500	5	16.800
1	Self-propelled sprayer	West	36 m	318.100	5	74.800
3	Telescopic handler	West	100 hp	80.300	5	18.900
2	Tank truck	CIS	25 m^3	71.500	5	16.800
10	4x4 car	CIS	-	9.000	5	2.100
1	Grain dryer	-	-	400.000	20	0
1	Grain storage	-	17,500 t	262.500	30	0
1	Machine shed with workshop	-	-	70.000	30	0
1	Workshop equipment	-	-	45.000	10	0
1	Farm yard (w/asphalt, fence)	-	-	80.000	30	0
1	Fuel pump, tanks	-	-	20.000	20	0
1	Seed cleaning + treatment	-	-	40.000	20	0
1	Vehicle scale	-	-	25.000	20	0
1	Administration building	-	-	35.000	30	0

Source: Own research.

Appendix 4

Profit and loss accounts of the typical farms

Figure A.3: Profit and loss account of the 2,000 ha typical independent farm (1)

Profit and loss calculation of the Cash Crop enterprise

2,000 ha typical independent farm

agri benchmark

For a better understandig of farming systems worldwide

text	Unit	Total	w. wheat	sunflower	soybeans	corn	w. rapeseed			
acreage	ha	1.999	500	333	333	500	333			
yield	t/ha	---	6,00	2,80	2,50	8,80	2,80			
market price	USD/t	---	116	341	316	128	363			
market revenue main product	USD/ha	---	696	955	790	1.126	1.016			
market revenue by-product	USD/ha	---	0	0	0	0	0			
other revenues	USD/ha	---	0	0	0	0	0			
gross revenue	**USD/ha**	**1.830.680**	**696**	**955**	**790**	**1.126**	**1.016**			
seed density	kg/ha	---	230,0	0,5	130,0	1,1	0,5	Seeding units in the case of corn, sunflower and rapeseed		
seed price	USD/kg,U	---	0,2	106,0	0,4	47,0	155,0			
seed total	**USD/ha**	**106.638**	**40**	**53**	**51**	**54**	**76**			
		USD/kg								
N	kg/ha	0,77	140	40	0	130	145			
P	kg/ha	0,98	48	40	38	70	50			
K	kg/ha	0,66	50	84	60	62	39			
fertilizer total	**USD/ha**	**328.157**	**188**	**125**	**77**	**210**	**186**			
herbizide	USD/ha	---	0	0	0	0	0			
fungizide	USD/ha	---	0	0	0	0	0			
insectizide	USD/ha	---	0	0	0	0	0	Pesticides were only analyzed at aggregated level		
other pesticide	USD/ha	---	85	46	70	71	137			
plant protection total	**USD/ha**	**162.249**	**85**	**46**	**70**	**71**	**137**			
contract work (crop related)	**USD/ha**	**0**	**0**	**0**	**0**	**0**	**0**			
crop insurance	**USD/ha**	**0**	**0**	**0**	**0**	**0**	**0**			
other direct costs (excl. drying)	**USD/ha**	**0**	**0**	**0**	**0**	**0**	**0**			
total direct cost	**USD/ha**	**597.044**	**313**	**224**	**198**	**334**	**399**			

Figure A.3: Profit and loss account of the 2,000 ha typical independent farm (2)

text	Unit	Total	w.wheat	sunflower	soybeans	corn	w. rapessed			
diesel price	USD/l	0,8								
diesel consumption field	l/ha	99.269	41,1	48,4	38,7	61,8	56,5			
diesel cost field	USD/ha	---	33	39	31	49	45			
total diesel cost field	**USD**	**79.415**								
diesel consumption overhead	l	10.731								
diesel cost overhead	**USD**	**8.585**								
petrol cost overhead	USD	6.400								
oil/lubricants	USD	0	Included in repair costs							
fuel and supplies total	**USD**	**94.400**								
repairs machinery	USD	37.400								
repairs buildings	USD	5.500								
repairs total	**USD**	**42.900**								
dry energy total	**USD**	**11.880**								
total number of workers	---	26	Including family labor							
work volume per year	h	52.000	Including family labor							
labor cost (hired)	USD	182.330								
labor cost (family)	USD	0								
labor total	**USD**	**182.330**	Including family labor							
contract work (crop related)	USD	0								
contract work (overhead)	**USD**	**0**								
contract work total	USD	0								
sub-total	**USD**	**928.554**	Including total direct cost							

Figure A.3: Profit and loss account of the 2,000 ha typical independent farm (3)

text	Unit	Total		
owned arable land	ha	0		
rented arable land	ha	2.000		
land cost arable land	**USD**	**130.000**	Including opportunity cost for own land	
total other expenditures	**USD**	**47.000**		
identification		number	purchase value	depreciation p.a.
tractors		7	749.500	99.917
towed machinery		15	633.000	84.400
selfpropelled machinery		7	1.031.500	137.533
buildings		9	440.000	20.250
annual depreciation	**USD**	**342.100**		
total original cost	**USD**	**2.854.000**		
share of debts in fixed assets	%	10		
interest rate	%	15,0		
interest cost on total orig. cost	**USD**	**145.155**	Including opportunity cost for own capital	
share of debts in current assets	%	50		
interest rate	%	22,0		
inter. cost var. inputs (< 1 year)	**USD**	**69.642**	Including opportunity cost for own capital	
total interest cost	**USD**	**214.797**	Including opportunity cost for own capital	
total cost	**USD**	**1.662.451**		
decoupled payment	USD/ha	0		
total decoupled payment	**USD**	**0**		
entrepreneur's profit	**USD**	**168.228**		

Source: Own calculations.

Figure A.4: Profit and loss account of the 10,000 ha typical independent farm (1)

Profit and loss calculation of the Cash Crop enterprise

10,000 ha typical independent farm

agri benchmark

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text	Unit	Total	w. wheat	sunflower	soybeans	corn	w. rapeseed			
acreage	ha	9.998	2.500	1.666	1.666	2.500	1.666			
yield	t/ha	---	6,00	2,80	2,50	8,80	2,80			
market price	USD/t	---	121	346	321	133	368			
market revenue main product	USD/ha	---	726	969	803	1.170	1.030			
market revenue by-product	USD/ha	---	0	0	0	0	0			
other revenues	USD/ha	---	0	0	0	0	0			
gross revenue	**USD/ha**	**9.408.632**	**726**	**969**	**803**	**1.170**	**1.030**			
seed density	kg/ha	---	230,0	0,5	130,0	1,1	0,5	Seeding units in the case of corn, sunflower and rapessed		
seed price	USD/kg,U	---	0,2	104,0	0,4	46,0	152,0			
seed total	**USD/ha**	**530.365**	**41**	**52**	**52**	**52**	**74**			
		USD/kg								
N	kg/ha	0,77	140	40	0	130	145			
P	kg/ha	0,98	48	40	38	70	50			
K	kg/ha	0,66	50	84	60	62	39			
fertilizer total	**USD/ha**	**1.641.174**	**188**	**125**	**77**	**210**	**186**			
herbizide	USD/ha	---	0	0	0	0	0			
fungizide	USD/ha	---	0	0	0	0	0			
insectizide	USD/ha	---	0	0	0	0	0	Pesticides were only analyzed at aggregated level		
other pesticide	USD/ha	---	82	45	68	69	133			
plant protection total	**USD/ha**	**787.336**	**82**	**45**	**68**	**69**	**133**			
contract work (crop related)	**USD/ha**	**0**	**0**	**0**	**0**	**0**	**0**			
crop insurance	**USD/ha**	**0**	**0**	**0**	**0**	**0**	**0**			
other direct costs (excl. drying)	**USD/ha**	**0**	**0**	**0**	**0**	**0**	**0**			
total direct cost	**USD/ha**	**2.958.875**	**311**	**222**	**197**	**331**	**394**			

Figure A.4: Profit and loss account of the 10,000 ha typical independent farm (2)

text	Unit	Total		
owned arable land	ha	0		
rented arable land	ha	10.000		
land cost arable land	**USD**	**620.000**	Including opportunity cost for own land	
total other expenditures	**USD**	**285.000**		
identification		number	purchase value	depreciation p.a.
tractors		16	2.489.600	327.483
towed machinery		28	2.171.500	285.717
selfpropelled machinery		32	4.109.400	542.433
buildings		9	1.190.000	52.417
annual depreciation	**USD**	**1.208.050**		
total original cost	**USD**	**9.960.500**		
share of debts in fixed assets	%	35		
interest rate	%	12,0		
interest cost on total orig. cost	**USD**	**554.468**	Including opportunity cost for own capital	
share of debts in current assets	%	50		
interest rate	%	12,0		
inter. cost var. inputs (< 1 year)	**USD**	**225.090**	Including opportunity cost for own capital	
total interest cost	**USD**	**779.558**	Including opportunity cost for own capital	
total cost	**USD**	**7.394.403**		
decoupled payment	USD/ha	0		
total decoupled payment	**USD**	**0**		
entrepreneur's profit	**USD**	**2.014.229**		

Figure A.4: Profit and loss account of the 10,000 ha typical independent farm (3)

text	Unit	Total	w. wheat	sunflower	soybeans	corn	w. rapeseed			
diesel price	USD/l	0,8								
diesel consumption field	l/ha	488.822	40,3	48,0	38,3	61,0	55,1			
diesel cost field	USD/ha	---	32	38	31	49	44			
total diesel cost field	**USD**	**391.058**								
diesel consumption overhead	l	51.178								
diesel cost overhead	**USD**	**40.942**								
petrol cost overhead	USD	32.000								
oil/lubricants	USD	0	Included in repair costs							
fuel and supplies total	**USD**	**464.000**								
repairs machinery	USD	187.000								
repairs buildings	USD	18.430								
repairs total	**USD**	**205.430**								
dry energy total	**USD**	**59.400**								
total number of workers	---	85	Including family labor							
work volume per year	h	170.000	Including family labor							
labor cost (hired)	USD	814.090								
labor cost (family)	USD	0								
labor total	**USD**	**814.090**	Including family labor							
contract work (crop related)	USD	0								
contract work (overhead)	**USD**	**0**								
contract work total	USD	0								
sub-total	**USD**	**4.501.795**	Including total direct cost							

Figure A.5: Profit and loss account of the 2,000 ha typical agriholding farm (1)

Profit and loss calculation of the Cash Crop enterprise

2,000 ha typical agriholding farm

agri benchmark

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text	Unit	Total	w.wheat	w. rapeseed	sunflower	soybeans	corn	
acreage	ha	1.999	500	333	333	333	500	
yield	t/ha	---	4,20	2,20	2,20	1,70	7,00	
market price	USD/t	---	126	373	351	326	138	
market revenue main product	USD/ha	---	529	821	772	554	966	
market revenue by-product	USD/ha	---	0	0	0	0	0	
other revenues	USD/ha	---	0	0	0	0	0	
gross revenue	**USD/ha**	**1.462.551**	**529**	**821**	**772**	**554**	**966**	
seed density	kg/ha	---	230,0	0,5	0,5	130,0	1,1	Seeding units in the case of corn,
seed price	USD/kg,U	---	0,2	144,0	99,0	0,4	44,0	sunflower and rapessed
seed total	**USD/ha**	**102.918**	**41**	**71**	**50**	**52**	**50**	
		USD/kg						
N	kg/ha	0,75	120	135	24	0	130	
P	kg/ha	0,95	34	40	30	20	49	
K	kg/ha	0,64	35	31	64	31	43	
fertilizer total	**USD/ha**	**253.170**	**145**	**159**	**87**	**39**	**172**	
herbizide	USD/ha	---	0	0	0	0	0	
fungizide	USD/ha	---	0	0	0	0	0	
insectizide	USD/ha	---	0	0	0	0	0	Pesticides were only analyzed
other pesticide	USD/ha	---	52	78	56	54	40	at aggregated level
plant protection total	**USD/ha**	**108.604**	**52**	**78**	**56**	**54**	**40**	
contract work (crop related)	**USD/ha**	**0**	**0**	**0**	**0**	**0**	**0**	
crop insurance	**USD/ha**	**0**	**0**	**0**	**0**	**0**	**0**	
other direct costs (excl. drying)	**USD/ha**	**0**	**0**	**0**	**0**	**0**	**0**	
total direct cost	**USD/ha**	**464.692**	**238**	**308**	**193**	**145**	**262**	

Figure A.5: Profit and loss account of the 2,000 ha typical agriholding farm (2)

text	Unit	Total	w.wheat	w. rapeseed	sunflower	soybeans	corn			
diesel price	USD/l	0,8								
diesel consumption field	l/ha	111.631	52,1	59,1	45,4	51,9	67,0			
diesel cost field	USD/ha	---	42	47	36	42	54			
total diesel cost field	**USD**	**89.305**								
diesel consumption overhead	l	10.369								
diesel cost overhead	**USD**	**8.295**								
petrol cost overhead	USD	6.400								
oil/lubricants	USD	0	Included in repair costs							
fuel and supplies total	**USD**	**104.000**								
repairs machinery	USD	37.400								
repairs buildings	USD	4.520								
repairs total	**USD**	**41.920**								
dry energy total	**USD**	**8.235**								
total number of workers	---	38	Including family labor							
work volume per year	h	76.000	Including family labor							
labor cost (hired)	USD	158.550								
labor cost (family)	USD	0								
labor total	**USD**	**158.550**	Including family labor							
contract work (crop related)	USD	0								
contract work (overhead)	**USD**	**0**								
contract work total	USD	0								
sub-total	**USD**	**777.397**	Including total direct cost							

Figure A.5: Profit and loss account of the 2,000 ha typical agriholding farm (3)

text	Unit	Total		
owned arable land	ha	0		
rented arable land	ha	2.000		
land cost arable land	**USD**	**130.000**	Including opportunity cost for own land	
total other expenditures	**USD**	**100.000**		
identification		number	purchase value	depreciation p.a.
tractors		6	451.600	69.040
towed machinery		12	466.300	71.320
selfpropelled machinery		6	587.500	89.860
buildings		9	387.500	18.000
annual depreciation	**USD**	**248.220**		
total original cost	**USD**	**1.892.900**		
share of debts in fixed assets	%	20		
interest rate	%	12,0		
interest cost on total orig. cost	**USD**	**98.877**	Including opportunity cost for own capital	
share of debts in current assets	%	10		
interest rate	%	12,0		
inter. cost var. inputs (< 1 year)	**USD**	**32.651**	Including opportunity cost for own capital	
total interest cost	**USD**	**131.527**	Including opportunity cost for own capital	
total cost	**USD**	**1.387.144**		
decoupled payment	USD/ha	0		
total decoupled payment	**USD**	**0**		
entrepreneur's profit	**USD**	**75.407**		

Source: Own calculations

Figure A.6: Profit and loss account of the 10,000 ha typical agriholding farm (1)

Profit and loss calculation of the Cash Crop enterprise

10,000 ha typical agriholding farm

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text	Unit	Total	w. wheat	w. rapeseed	sunflower	soybeans	corn			
acreage	ha	9.998	2.500	1.666	1.666	1.666	2.500			
yield	t/ha	---	4,20	2,20	2,20	1,70	7,00			
market price	USD/t	---	126	373	351	326	138			
market revenue main product	USD/ha	---	529	821	772	554	966			
market revenue by-product	USD/ha	---	0	0	0	0	0			
other revenues	USD/ha	---	0	0	0	0	0			
gross revenue	**USD/ha**	**7.314.902**	**529**	**821**	**772**	**554**	**966**			
seed density	kg/ha	---	230,0	0,5	0,5	130,0	1,1	Seeding units in the case of corn,		
seed price	USD/kg,U	---	0,2	144,0	99,0	0,4	44,0	sunflower and rapessed		
seed total	**USD/ha**	**514.760**	**41**	**71**	**50**	**52**	**50**			
		USD/kg								
N	kg/ha	0,75	120	135	24	0	130			
P	kg/ha	0,95	34	40	30	20	49			
K	kg/ha	0,64	35	31	64	31	43			
fertilizer total	**USD/ha**	**1.266.135**	**145**	**159**	**87**	**39**	**172**			
herbizide	USD/ha	---	0	0	0	0	0			
fungizide	USD/ha	---	0	0	0	0	0			
insectizide	USD/ha	---	0	0	0	0	0	Pesticides were only analyzed		
other pesticide	USD/ha	---	52	78	56	54	40	at aggregated level		
plant protection total	**USD/ha**	**543.208**	**52**	**78**	**56**	**54**	**40**			
contract work (crop related)	**USD/ha**	**0**	**0**	**0**	**0**	**0**	**0**			
crop insurance	**USD/ha**	**0**	**0**	**0**	**0**	**0**	**0**			
other direct costs (excl. drying)	**USD/ha**	**0**	**0**	**0**	**0**	**0**	**0**			
total direct cost	**USD/ha**	**2.324.103**	**238**	**308**	**193**	**145**	**262**			

Figure A.6: Profit and loss account of the 10,000 ha typical agriholding farm (2)

text	Unit	Total	w. wheat	w. rapeseed	sunflower	soybeans	corn			
diesel price	USD/l	0,8								
diesel consumption field	l/ha	552.147	51,3	58,3	45,0	51,5	66,4			
diesel cost field	USD/ha	---	41	47	36	41	53			
total diesel cost field	**USD**	**441.717**								
diesel consumption overhead	l	47.853								
diesel cost overhead	**USD**	**38.283**								
petrol cost overhead	USD	32.000								
oil/lubricants	USD	0	Included in repair costs							
fuel and supplies total	**USD**	**512.000**								
repairs machinery	USD	187.000								
repairs buildings	USD	13.520								
repairs total	**USD**	**200.520**								
dry energy total	**USD**	**41.175**								
total number of workers	---	138	Including family labor							
work volume per year	h	276.000	Including family labor							
labor cost (hired)	USD	429.550								
labor cost (family)	USD	0								
labor total	**USD**	**429.550**	Including family labor							
contract work (crop related)	USD	0								
contract work (overhead)	**USD**	**0**								
contract work total	USD	0								
sub-total	**USD**	**3.507.348**	Including total direct cost							

Figure A.6: Profit and loss account of the 10,000 ha typical agriholding farm (3)

text	Unit	Total		
owned arable land	ha	0		
rented arable land	ha	10.000		
land cost arable land	**USD**	**620.000**	Including opportunity cost for own land	
total other expenditures	**USD**	**400.000**		
identification		number	purchase value	depreciation p.a.
tractors		14	1.592.900	243.520
towed machinery		22	1.567.400	239.720
selfpropelled machinery		30	2.988.200	457.140
buildings		9	977.500	43.667
annual depreciation	**USD**	**984.047**		
total original cost	**USD**	**7.126.000**		
share of debts in fixed assets	%	20		
interest rate	%	12,0		
interest cost on total orig. cost	**USD**	**377.194**	Including opportunity cost for own capital	
share of debts in current assets	%	10		
interest rate	%	12,0		
inter. cost var. inputs (< 1 year)	**USD**	**147.309**	Including opportunity cost for own capital	
total interest cost	**USD**	**524.503**	Including opportunity cost for own capital	
total cost	**USD**	**6.035.898**		
decoupled payment	USD/ha	0		
total decoupled payment	**USD**	**0**		
entrepreneur's profit	**USD**	**1.279.004**		

Source: Own calculations

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THÜNEN

Thünen Report 15

Herausgeber/Redaktionsanschrift

Johann Heinrich von Thünen-Institut
Bundesallee 50
38116 Braunschweig
Germany

www.ti.bund.de

ISBN 978-3-86576-119-4