Dynamic Markets – Dynamic Relationships: The Example of Grain Marketing in Germany

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1 Introduction

Grain markets in Germany, as in the rest of the world, are becoming more and more volatile. At the same time, the consolidation process on the level of the first hand, buying the grain from farmers, is moving forward in a strong pace, leaving farmers with less local alternatives to sell their grain. This paper addresses the question of what these developments mean for farmers' grain marketing decisions and for their relationships with local marketing partners.

The focus of the paper is on marketing of wheat and rapeseed, which are today the most important cash crops according to their share in total acreage, with 3.3 (27,7%) and 1.5 Mio ha (12,8%), respectively (destatis 2010). For 2007, the number of specialized arable farms producing cereals combined with oilseeds and/or root crops was 76,000, and further 57,400 farms had combined arable and livestock production (BMELV 2007). It can be assumed, that almost half of all farms in Germany depend to a strong degree on arable farming, and thus on the results of crop marketing, underlining the importance of the issue.

While Alexander and Patrick (2010) used a standardized questionnaire to investigate the reactions of large-scale farmers participating in Top Farmer Crop Workshops at Purdue University, here, a qualitative research approach is chosen to gain insights into large-scale farmers' reasoning about the developments and how these influence their decision making processes.

The following sections first give an overview about the German grain marketing chain and its recent developments. Then, the current state of what is known about grain marketing behavior and business relationships between farmers and grain buyers is established and more detailed research questions are presented. The results of the focus group discussion are presented and discussed, before overall conclusions are drawn and future research directions are delineated.

2 Grain marketing in Germany

The structure of the marketing chain and the general possibilities of grain marketing are delineated in the following, including also possibilities of information gathering.

2.1 First handlers of cereals and oilseeds: market structure

Private and cooperative enterprises are the most important first handlers buying the grain from farmers and selling it to fodder or bread mills, or export markets. In this study, only the first stage of the marketing channel, i. e, cooperatives and private companies buying the grain from farmers, will be taken into account in the analysis. The sector has undergone fundamental changes in the last decades, which are still going on. Traditionally, local enterprises also provide inputs such as feedstuff, fertilizer, pesticides, and even credit to the

farmers. For 2006, the German Raiffeisen Association (DRV) estimated a number of 800 private traders of agricultural in- and outputs competing with 606 local "supply and marketing" coops. Main cooperatives at the regional level traditionally fulfilled wholesaling activities for the local (primary) level, but in the past decade partially took over the business of a number of those primary coops, dealing directly with especially larger farms. This development is accompanied by a consolidation process also at the site level: more and more sites for storage and selling inputs have been closed in order to increase efficiency. Similar developments have been described by Fulton et al. (1998) for the U.S. Today, five of the seven companies still carrying the name main cooperative have given up the cooperative status (Bronsema and Theuvsen, 2010), although they are still member of the DRV with one exception.

2.2 General possibilities of grain and rapeseed marketing and information gathering

Grain and rapeseed can be sold following many different strategies in terms of moment of pricing and delivery, number of transactions, and instruments used: the grain can be sold already before harvest, using forward, premium, or futures contracts[1], it can be sold at the cash market at the time of harvest, or after harvest.

Forward contracts generally specify not only the quantity to be traded but also quality measures such as minimum protein and maximum moisture content. The "Unified Contracts Terms for the German Cereals Trade" ("Einheitsbedingungen"), defined by the Working Group of German cereals and commodity exchanges ("Arbeitsgemeinschaft der deutschen Getreide- und Produktenbörsen) provide a set of standards for juristic details and regulations on contract fulfillment in terms of, e.g., time, quantity, payment and transport. Different arrangements can be defined as to price formation, such as price corridors.

Futures markets are the basis for pricing of standard commodities, i.e., wheat and rapeseed; in Europe, the reference market is the Matif in Paris. To define the price at the farm gate, a premium is calculated which comprises transportation costs, but also quality deviations from the standard wheat contract (milling wheat) at the Matif. The premium thus varies with different parameters, such as supply and demand, but also fuel prices when it comes to transport. Through so called premium contracts, farmers can a priori define a fixed amount premium.[2] The farmer then observes the markets and decides at which price to sell. The risk of increased premiums due to a changed market situation can thereby be excluded, however the farmers also renounce on possible decreases in the margin. In the last decades, hedging as a risk management tool to cope with price volatility has been widely promoted; participation of farmers however is still rather low in the US (Simmons 2002, Alexander and Patrick 2010) and Europe alike. Elevators however use the instrument and also increasingly provide respective services to farmers, although they state that high efforts are required to handle this.

A development which is likely to swap over from the US is the extension of marketing windows, i.e., the period in which one years' harvest is marketed. Stark et al. (2011) report periods of up to three years, which is when the first part of the harvest is sold one year before it is sown, and the last part is sold when the next harvest is finalized. The possibility of selling after harvest is relevant especially for farmers with storage capacities, but farmers can also "rent" storage capacities from neighbors or grain traders (Loy 2008).

[1] Patrick and Musser (1996, p. 40) call this "preharvest pricing activities".
[2] In 2006, e.g., premiums for wheat in quality category B ranged from +5 to -15 € per metric ton of wheat at the wholesale level (franko Mannheim, see BWagrar 2007).

Having now delineated the institutional framework of grain marketing, the following section will now present the current state of knowledge about farmers marketing behavior and use of information.

3 Theoretical background

Reasoning about farmers' marketing behavior is of course not new. Methods applied to address this topic are the analysis of market data, experimental studies, and qualitative and quantitative interviews or surveys among farmers. The following section provides some information about studies carried out so far and the main findings.

Main interests of researchers so far have been the use of marketing instruments, i.e., contracts and hedging (Patrick et al. 1998, Wang et al. 2004, Simmons 2002) and the impact of farm and farmer characteristics (Cunningham et al. 2008), extension services (Cabrini et al. 2007; Irwin et al. 2006; Pennings et al. 2004; Schroeder et al. 1998), and risk attitudes (Musser et al. 1996; Patrick et al. 1998) on marketing decisions. Another research stream has conceptually addressed the question of optimal grain marketing decisions (Berg 1987; Blakeslee and Lone 1995; Loy 2008). Some researchers further analyzed farmers grain marketing behavior with respect to phenomena subsumed under the term „behavioral finance" (Brorsen and Anderson 2001, Cunningham et al. 2007, Eales et al. 1990, Cruz Junior 2009, Fryza and Mattos 2010).

3.1 Analyses of market data

Previous research on agricultural commodity marketing using market data comprising *prices and transactions* is rare. An exception is Canada, where all wheat has to be marketed via the Canadian Wheat Board (Fryza and Mattos 2010). Their work is however only in the beginning. Cunningham et al. (2007) were able to access real transaction data which were provided by three grain elevators from Oklahoma. The panel data set contains weekly individual transaction data for nine crop years. Interestingly, no significant differences in prices received with either marketing style were found, and there is also no evidence for the performance persistence hypothesis, meaning that farmers do not consistently have the best strategy during the whole period. For Germany, Loy and Mueller (2004) tried to gain insights into the marketing behavior of farmers in Schleswig-Holstein and had difficulties to find farmers who had kept record of the exact marketing dates and the prices received, leaving them with only 44 observations (Loy 2008).

Another application of market data analysis is the ex-post analysis of *price data* with the aim of determining an optimal marketing (frequency) strategy (Berg 1987, Blakeslee and Lone 1994, Stark et al. 2011) or to assess marketing advice (e.g., Cabrini et al. 2007, Colino et al. 2006, Irwin et al. 2005, Good et al. 2001). Irwin et al. (2006) used price data to analyze the performance of 27 Marketing Advisory Services over 10 crop years. The data they use show a huge variety in proposed marketing frequency, with a minimum number of 5 and a maximum of 59 advised transactions.

Although marketing strategies generally are propagated to farmers as a means to achieve better prices or a more stable income, Loy (2008) admits that the contribution of science to improve marketing decisions is very limited. In line with this, Irwin et al. (2006), in their analysis of the performance of marketing advisory services found that in most of the cases and years, spreading sales throughout the marketing period in a random manner would have led to better results than following the advice.

3.2 Experiments on farmers' marketing behavior

A recent overview of ***experiments*** that have been carried out so far is given by Fryza and Mattos (2010). In the centre of interest of these studies are specific behavioral phenomena causing biases from rational behavior, such as overconfidence, behaviors subsumed under mental accounting ((myopic) loss aversion or the house money effect), or framing effects, such as anchoring. These have to a great extent been introduced already by Kahneman and Tversky (1979, 1992) in their Prospect Theory and today are often discussed under the keyword "behavioral finance" (Brorsen and Anderson 2001, Fryza and Mattos 2010).

The notion of *overconfidence* describes a disproportional confidence in the own ability of predicting prices and influencing their own performance, also known as "illusion of control" (Langer 1975). *Myopic loss aversion* means that a loss is perceived to be much worse than a gain of the same amount. Brorsen and Anderson (2001) relate this to farmers' marketing behavior in putting that farmers tend to evaluate outcomes separately and do not see the consequences for the whole farm. The *house money effect* relates to the same phenomenon of having different accounts in mind ("mental accounting"), but puts the inverse, i.e., that after a loss, people become take less risks, while after a gain, they are ready to take higher risks (Thaler and Johnson 1990). *Framing* and *anchoring* finally describe the importance of prior experiences and information for belief formation, which is especially important for the evaluation of new information that is contrasted with what the individual already has in mind.

For the practical relevance and existence of most of the phenomena, mixed evidence has been found (Wilkinson 2008, Kahneman and Tversky 2000), leaving room for more research.

3.3 Surveys on grain marketing behavior and information use

Surveys on ***grain marketing behavior*** have mainly been carried out in the United States. To the author's best knowledge, no such studies do exist for Germany. Davis and Patrick (2000), e.g., analyze the stated marketing behavior of 1239 soy bean producers from three States who responded their mail survey. They investigate farmers risk attitudes and its' correspondence with the use of risk management tools, identifying a positive relationship (Davis and Patrick 2000, p. 13).

As to adaptation strategies to increased volatility, Alexander and Patrick (2010) carried out a survey among participants of Top Farmer Crop Workshops at Purdue University in the years 2008 (N= 44) and 2009 (N = 50). In terms of business relationships, the authors found that around a quarter of the farmers switched the buyer as a response to decreased price offerings of their elevators, while 52% stayed with the same elevator but partially changed the marketing plan. 31% also employed hedging strategies. Stark et al. (2011) report a huge expansion of the marketing window and a trend towards high marketing frequencies.

Further, due to the major importance information plays in the context of decision making (Ford and Babb 1989, p. 465), surveys have also been used throughout the last three decades to address the question of ***farmers' information use*** when marketing their produce (O'Reilly 1982, Ford and Babb 1989, Patrick and Ullerich 1996, Pennings et al. 2004).

Studies on information use of ***German farmers*** as support for grain marketing decisions do to the author's knowledge not yet exist. A rather recent study investigated the importance of different information sources for farmers in general (agrarzeitung 2009). On a five-point scale, farmers could rate 15 different sources, from magazines over farmers and traders to fairs and books. As a results, the weekly regional farmers' magazines ("Wochenblätter")

were estimated as very important or important by 85% of farmers, followed by "other farmers" (84%), traders and their advisory staff (70%), specific professional journals (61%) and supra-regional professional journals (60%). Looking only at the "very important" ranks, the internet is ranked 4th (18%), while traders and supra-regional with 17% of answers each share rank 5. Unfortunately, no distinction of farm sizes or farmer characteristics is publicly available for all sources. What is important to note is that the results reported here for Germany are very similar to those reported by Ford and Babb (1989) for the US 20 years ago.

All in all, the existent literature leaves room for further research, namely in the field of behavioral determinants of marketing decisions. It must however be stated, that a data base such as the one analyzed by Fryza and Mattos (2010) is unique and not obtainable for Germany. Instead, qualitative interviews or surveys have to be conducted among farmers, which suffer from several drawbacks such as representativeness, reliability of the information provided by respondents, or selection bias. For this study, first a qualitative approach was chosen since so little is known about German farmers marketing behavior.

4 Material and methods

In June 2010, a focus group study[3] was carried out with seven farmers from Schleswig-Holstein and Mecklenburg-Western Pomerania. The group was selected by a grain marketing company, and it is assumed that the participants are somewhat indicative of the future type of large-scale farmers, at the same time still reflecting a broad variety of entrepreneurial backgrounds, and also age and experiences.[4] All except one participant had additional honorary positions and thus can be considered to be well-informed multiplicators within the farming community in their regions. There was however no established network among the participants themselves: only two of them knew each other, and only from far.

To start, all participants were asked to think about the developments of grain traders in their surrounding in recent years and which changes had occurred in their possibilities to buy inputs and market their produce. The thoughts should be written down on moderation cards and were collected by the moderator and read out loud and discussed one by one. The participant having written the respective point was first asked to briefly explain what was meant and then the other participants could react on this. The moderator only intervened into the discussion when a participant seemed to be excluded from the discussion, or when no new opinions and experiences on a specific point were added any more. Further structuring questions related to future developments farmers expected in terms of market structure, marketing options and price developments, and how that would affect their marketing behavior.

All in all, the discussion took 2.5 hours. The talk was recorded and transcribed verbally afterwards, in order to be able to capture everything that was said. The analysis of answers is purely descriptive. In the following, the most interesting results, contributing to a deeper understanding of individual reasoning of farmers marketing grain, are reported.

[3] An old, however still valid description of this method is provided by Krueger (1988).

[4] Participants are between 27 and 56 years old. There are 2 family-run farms and 5 cooperations; 3 farms are situated in M-WP, 4 in SH; 3 farms are pure arable farms, 1 includes milk production, and 3 produce pigs along with their arable farming. All participants have an agricultural education, only 2 did not visit university. 5 out of 7 follow important additional activities, however only one very strongly relies on off-farm income from various partnerships.

5 Results and discussion

The section is structured as follows: first, the perceptions of recent developments and the impact on relationships with local trading companies are described. Then, some hints are given on attempts to bypass intermediaries, and current marketing behavior is explained. A brief overview of farmers' perceptions as to volatility and information is provided at the end.

5.1 Concentration of buyers and relationships with local trading companies

The consolidation process was perceived as something necessary and even positive at least for larger farms by the participants. The better bargaining position and direct delivery of inputs were among the most important positive developments farmers mentioned. All farmers agreed to the notion "*In the past, we only delivered the grain – today, we market it*" put by one farmer during the discussion. There is a certain proud in this statement, showing a new self-definition of farmers, which is also reflected in their relationships with buyers: while traditionally, the local or regional buyers represented the "evoked set" of farmers when considering possible buyers, today supra-regional thinking characterizes the decision, and deals are often concluded on the telephone. As one farmer put it: "*Regardless of which lorry comes and takes up the stuff – if the margin is ok and the money's right, that's ok for me*." This indicates that strong bonds are eroding and competition increases among grain buyers and traders. However, at least some farmers also paid attention to buyers' solvency, leading them to rather work together with selected and well-known buyers.

In line with this, all participants agreed that the concentration process and the increased competition among trading companies is rather positive for their own position, since with their farm size, they would always be able to choose between a number of buyers, and the competition would keep elevators' margins low. One farmer reported that based on a number of negative experiences, he now had learned to "stay cool" in negotiations with buyers and was able to achieve a lot of safeguards against production risks in the contracts he signed. However, it was made quite clear that smaller farms had a worse position and had to bear much higher costs of services but that at their scale, this would still be less costly than, e.g., building an own storage capacity for fodder components or own silos.

Besides the local availability and concentration of buyers, the bargaining positions also depend on the respective market situation. All participants agreed that in some years, when harvests are good, the buyers "invent" new quality measures which lead to price reductions. Here, farmers seemed to have no good means to stop this, irrespective of their size.

5.2 Attempts of disintermediation and switchback to specialization

The discussion about how to react on increased concentration on the retailer / wholesale level was vivid. While some farmers described their ongoing discussions among colleagues about bypassing the intermediaries, others already made some experiences in this regard:

One participant reported that he and some others had tried some years ago to bypass the local grain traders and directly market their grain at the harbor with own lorries. However, the experiences were rather negative, since the risk of the produce being refused at the harbor was found to be high and the bargaining position much weaker. Thus, the experiment was abandoned and the classical two-tier chain was reestablished. The same was reported for attempts to purchase pesticides directly from producers. The conclusion of participants was that margins in the grain trading sector were so thin that only specialized traders could bare the risk and deliver the service at reasonable cost.

5.3 Current marketing practices: evidence for overconfidence and house-money effect

One statement on the development of marketing practices, which perfectly sums up what all participants experienced, was *"more, and longer"*: both the amount of in- and outputs bought and sold, and the duration of the contract, i.e., the time span between signing the contract (pricing) and actual delivery of the produce has increased strongly in the last years. The milk producing farmer complemented this in reporting that soybeans were sometimes contracted 1.5 to 2 years before they were actually fed to the cows. Participants further determined that the general ability to store the grain and thus extending the marketing window to manage price risks without jeopardizing liquidity[5] was more important than achieving the highest prices. A consensus showed among all participants, that the capability of storing at least two harvests is among the major success factors in grain marketing.

Assuming that the highest price was not achievable against the background of increased volatility, some discussants showed a certain relaxation as to absolute output price levels, focusing more on break even and price relations with inputs when deciding when and how much to price or sell. Selling wheat and buying fertilizer or selling rapeseed and purchasing soybeans as fodder protein at the same time is an important strategy for all participants. The goal thus is more in avoiding losses than in receiving the highest price. This finding both supports and contradicts at the same time the statement put by Brorsen and Anderson (2001) who wrote that successful farms could be distinguished by production costs and yields rather than by output prices received. Further, the idea of Brorsen and Anderson (2001) that farmers do not look at the consequences of decisions for the whole farm (mental accounting) cannot be affirmed for this group. Against the background of an increased volatility also of input prices, which can be observed all over the world (Alexander and Patrick 2010), combined purchasing and selling decisions become more and more crucial for farm success.

Farmers also reported very openly about their trials and errors in improving their marketing strategies. An important contribution was made by one farmer who told about his experiences with storage: one year they had stored a part of the wheat for more than one year, with very high gains. With these experiences in the back, he stated, "we could not get enough" and stored a lot more than the year before. This is an interesting report, which extends the discussion on risk aversion in the context of gains and losses which has been described above. The behavior reported here might hint at the house money effect: the farmers responded with taking more risk after having realized gains and then, after struggling with this decision and having lost a lot of money, they returned to moderate strategies, diversifying their risks again. As one farmer put it "*the greedy loses in the end*". Further, this point might also explain why Cunningham et al. (2007) found no evidence of performance persistence in their nine year panel data set: farmers who have had success with a certain strategy, try it again until they lose, and then change their strategy if losses were high. Together with the problem of overconfidence, some hints to the phenomena subsumed under behavioral finance can thus be identified in the farmers' reports.

[5] This also hints at a problem that has so far been neglected in analyses of marketing strategies: for some farmers, liquidity simply is the reason of selling crops at a specific point in time: there is a need to buy inputs and to finance the next sowing period. Thus, some farmers are forced to sell a part of the harvest before they even have it harvested, just to continue operating.

5. 4Increased price volatility and information quality

The problems of price volatility and the impossibility of always selling in the top of the market have been mentioned before. A major challenge to successful marketing was defined by the participants as the high amount of "bad information" in the market, which led to huge irritations sometimes. All participants acknowledge the increased price volatility and an immense difficulty to distinguish "good" from "bad information". As decision makers, they are confronted with a high number of market news and recommendations each day, but not all provided clear statements about causalities and the relevance for prices.

As to reliable sources of market information and recommendations, the farmers' points of view were quite heterogeneous: while one mainly relied on private extension services and his own expertise, others have strong bonds with certain (local!) buyers and their staff, stating that they preferred a personal relationship to their informants. In this context, also the reputation effect and the direct and personal responsibility of the advisor were mentioned as important sources of information and informant credibility.

This is quite interesting, since buyers often state that for larger farms, personal relationships are not important anymore and that everything is decided on the phone or via internet, since money is the only language needed. For this behavior, only one farmer in the group can be defined as a kind of a prototype. For him, "*every on-site visitor means an undesirable disturbance of the work flow on the farm*.

6 Conclusions and future research

In the light of increased price volatility, which is perceived by farmers as one of the most important risks they are facing (Morales et al. 2008), marketing decisions are becoming more and more difficult. While research so far has focused on the US, this study used a qualitative approach to better understand what factors underlie farmers' decision making and strategic behavior in grain marketing in Germany.

Altogether, results show homogeneous attitudes in a number of aspects as well as heterogeneous strategies to cope with the situation. Storage capacities and liquidity buffers are to all farmers' point of view the preconditions of successful grain marketing. Many and partially contradicting information complicate the formation of clear expectations about future price developments. Most of the farmers looked more after price relations with input prices than after absolute grain prices when deciding to sell. In these interviews, no hints on phenomena such as mental accounting or heuristics could be detected. The open and honest discussion however brought about some insights into farmers reasoning, including the existence of overconfidence and house money effects.

Participating farmers are of course not representative for the whole farming community, since sample size is small and all of the farmers manage farms of above-average size. Their positive view on the concentration processes is certainly different from the one of smaller farmers, and their capability to react on the developments also differs a lot. A quantitative survey has thus been conceptualized and is currently carried out to gain a more representative overview about German farmers' grain marketing behavior. More specifically, the following questions shall be addressed: Which marketing strategies do farmers use, and how can these choices be explained by farm and household structure, education, social relationships and information gathering? What determines choice of marketing partners in a dynamic environment, and is there still place for long-term relationships?

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