Developing methods for strategic evaluation in agricultural research and production

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Abstract. We analyze instruments to evaluate investment strategies as new options for co-operatives within the wheat production chain. Using a value-based management the extension of our concept, a "cooperative balanced scorecard" is discussed as we propose the further differentiation of the scorecard's financial perspective. This is a market development-driven approach as cooperatives may be regarded as commodity-price-intermediators for their members. Proposing this approach we use a simple model of conjoint-hedging in intermediating firms within agribusiness.

Keywords: Agribusiness, Wheat Production, Cooperatives, Intermediation, Value-based Management, Commodity Markets.

1. Introduction

Any type of organization has to define its strategy – irrespective of the questions *what* it does and *how* it wants to achieve it. The organization's business fields ("*what*") have to be defined to handle their goals efficiently ("*how*"). Defining a strategy an organization has to determine its horizontal boundaries identifying the quantities and varieties of products and services it produces (Besanko, 2007, pp. 74) as well as its degree of vertical integration (ibid., pp. 136). The definition of a strategy is indispensible for its execution: A case study of management failures shows that more than 70% up to 90% emerge rather from a bad execution than from a bad definition of strategy (Kaplan / Norton, 1996, p. 77; 2001, p. 1; Welge / Al-Laham, 1997; Mintzberg, 1994, pp. 161). Although the vision is the "sine-qua-non" condition a good execution seems to be at least as important. This relationship is grounded for firms in the field of agribusiness just as in any other business field. Bridging the gap between definition and execution of strategies the balanced scorecard concept developed by Kaplan and Norton in the 1990ies (Kaplan / Norton, 1992, 1996b) has proven useful at last (Mooraj et. al., 1999; Beuthien et. al., 2008, p. 186).

Most of today's organization must recognize an increased significance of intangible assets contributing to their success as we can see as well in the case study of Souza (2007) for Brazilian agribusiness. Trading and processing enterprises within the wheat production chain – in this case a cooperative with an own wheat processing mill – are significantly responsible for the research on and the consultancy of the correct application of wheat seed. Including research and (employee-) education strategies we present our concept of a cooperative balanced scorecard (see chapter 2). It is designed as a management tool for controlling the (financial) consequences of the firm leader's decisions considering the achievement of previously defined strategy. The concept was accomplished concerning the cooperative's peculiarities leading to the question: which further strategic perspectives must be considered attentively and need to be integrated prospectively (see chapter 3)?

Comparing other organization of the same business field and regarding the integration of agribusiness trade into global markets we identify the emergence of new producer-payment tools on the part of German agribusiness: these payments are attached to international (future) markets in ways which we may criticize. Assuming a stronger market orientation in Germany we propose another use of these tools. We conclude with their integration into our cooperative balanced scorecard to assign them a role concerning the organization's strategy.

2. Value-based management for cooperatives

The emergence of the balanced scorecard concept in the beginning 1990ies is owed to the fact that strategy evaluation was oftentimes realized by measuring key figures derived from a firm's financial system (Nørreklit, 2000). This one-sided approach tends to ignore other needs than the shareholder's. Moreover, strategies oftentimes occur more differentiated e.g. in an intended and a realized way (Mintzberg / Waters, 1985) making their accomplishment still more difficult to control. Additionally the expressiveness of financial key figures opens up with a certain delay i.e. sometimes not until the annual statement of account.

Kaplan and Norton claim to identify a serious deficiency in traditional management systems: their inability to link a company's long-term strategy with its short-term actions (Kaplan / Norton, 1996a, p. 56) especially because the management is overwhelmed with data (Mooraj et. al. 1999, p. 482; Steiner, 1997). Handling these limits Kaplan and Norton's work is based on studies of US-companies to present a concise summary of key success factors of a business, and to facilitate the alignment of business operations with the overall strategy (Kaplan / Norton, 2001).

A strategy can be considered as a shared understanding (which the organization's elements should have) about how the ultimate goal of the organization is to be reached (Reed, 2003, p. 91). Defining its strategy an organization's vision has to be captured as it describes the organization's ultimate goals. The Balanced Scorecard paradigm is that the financial results are obtained by successful implementation of strategic initiatives in the key business perspectives – as opposed to being their driving force (Mooraj et. al. 1999, p. 482). Kaplan and Norton (1996c, p. 76) propose four perspectives as key drivers of revenue growth:

- Financial perspective
- Perspective of internal business process
- Learning and growth perspective
- Customer perspective

From each of these perspectives the management has to deduce targets inline with the organization's strategy; target key figures must be derived to control the achievement (Kaplan / Norton, 1996c, p. 76). Linking the perspectives with one another and with "revenue growth" Kaplan and Norton (1996c, p. 84) suggest a causal-loop-learning model (Argyris, 1991). This results in cause-and-effect-relationships (Kaplan / Norton, 1996a, pp. 65-66) linking firm- or organization-individual elements of the four perspectives to financial objectives and driving the ROCE (return on capital employed, ibid, p. 67, p. 65). For that reason using the balanced scorecard concept may be considered as a value-based management.

2.1. Use of balanced scorecards

Putting a balanced scorecard into practise four major steps for any organization are crucial : (1) clarifying and translating the vision and strategy, (2) communicating and linking, (3) planning and target setting, and (4) strategic feedback and learning (Lipe / Salterio, 2000, p. 285; Kaplan / Norton, 1993).

Although quite successful the balanced scorecard concept has encountered criticism by-and-by. Still in 2000 Zimmermann and Jöhnk survey 24 firms of which nineteen consider the balanced scorecard to be an inherent part of their organizations (Zimmermann / Jöhnk, 2000). Speckbacher et. al. (2003, p. 369) analyze the implementation of balanced scorecards in 194 German-speaking organizations in 2003; they state that 9% of the organizations have the concept fully implemented organization-wide, 17% partly, 13% were still introducing, 17% had evaluated the concept and 44% didn't get used to it yet. For 2003 this seems to be a limited distribution range for the German case (Ahn, 2005, p. 122).

Judging the applicability Dinesh and Palmer compare Peter Drucker's (1954) concept of "management by objectives" (MBO) with the balanced scorecards finding relevant similarities (Dinesh / Palmer, 1998, p. 365). As MBO is about 40 years older but similar ("based on the on the same philosophies as MBO", ibid, p. 367) they assume similar rising problems e.g. organisations that adopt MBO as a performance management system later claim that MBO proved to be more of a hindrance rather than a help (ibid, citing van Tassel, 1995). Newing (1994) suggests that one of the main balanced scorecard's weaknesses is the complexity and time involved in its development.

Kaplan and Norton's opposite view is that measurement systems add more value than the measures themselves, because they develop a clearer picture of the organisation, and the process of developing measures provides focus and strategic alignment even as the measures themselves change (Dinesh / Palmer, 1998, p. 368, referring to Kaplan / Norton, 1996b). As well de Geuser et. al. (2009) claim for the cases of 76 business units and their use of a balanced scorecard (1) a better translation of the strategy into operational terms, (2) the fact that strategising becomes a continuous process, and (3) the greater alignment of various processes, services, competencies and units of an organisation.

In fact Kaplan and Norton themselves (1996a, p. 77) remark that "the balanced scorecard is not really a "strategy formulation" tool". All in all the organizations' assessments of the balanced scorecard use turns out to be positive regarding the occurred effects (Zimmermann / Jöhnk, 2000, p. 603). We will assume that a balanced scorecard may not differentiate false or unrealistic aims from positive ones what may lead to a systematic undesirable development promoted by the use of a balanced scorecard. Therefore a balanced scorecard is primarily not designed for the formulation or development of a (new) strategy as it is thought to be a "management *method*"; it is suitable especially for interlinking strategic and operative management – a task that the balanced scorecard may solve convincingly (Kieser, 2000, pp. 123,124).

We will use the balanced scorecard's advantages when we consider its adaption to cooperatives in the agribusiness as these aspects – what we will show for a Brazilian case – are needed. Furthermore this differentiation of the concept's capabilities will help us with our suggestions of integrating further market-driven strategic aspects which we will identify considering horizontal boundaries of agribusiness.

2.2. The cooperative balanced scorecard

Using a balanced scorecard achieving a value-based management for agribusiness means to take the same obstacles as in any other case of adapting the value-based management to any other sector. Formulating a strategy and putting it into practice is related to the specific business duties of an organization. In the case of cooperatives as legal form there is a further chokepoint of adaption as there is a dual nature of cooperatives: on the one hand cooperatives in agribusiness trade possess an own business related to economic performance in so far as the business itself or at least its member-owners try to avoid bearing losses (in the German law a non-profit-maxim is unneeded unlike in Brazilian cooperative law). Insofar thy have a financial incentive influencing their interests towards their cooperative. On the other hand this business entity is devoted to promote its members' business: in the case of joint purchase members realize economies of scale bundling their demand for better (lower) purchase prices or – the case of joint sale – building up bargaining power for a better sales position. It is coherent that member-owners of a cooperative are connected to the financial and customer perspective. As a result the cooperative has to differentiate the customer perspective in the fields of non-members and member-customers as drivers of their performance.
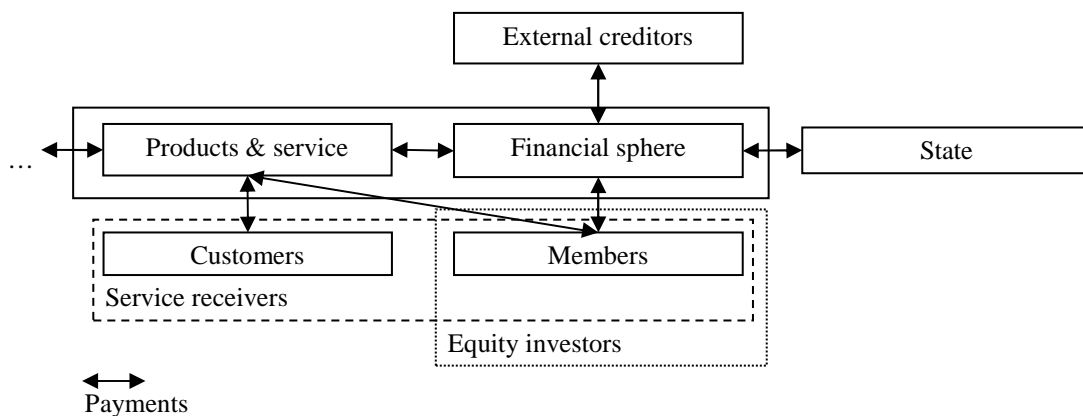

Figure 1. Payments linking the cooperative's products & service, financial sphere
(adaption of Beuthien et. al. 2008, p. 178).

Assuming that the member-interest is the relevant for the cooperative because it constitutes the "owner"-interest, an increase in the value of this cooperative can be achieved by means of the "product & service" or the "financial" relationships to its members. Following the cooperative's promotion principles facilitating members with products and services should be the preferred perspective in the case of agribusiness

cooperatives as opposed to financial promotion. This circumstance has not been realized consequently in the German cooperative system, running contrary to the legal assignment (Beuthien et. al., 2008, p. 179; Beuthien, 2006).

Assigning these facts to strategy formulation the existing structural aspects driving competition within an industry have to be recognized by the cooperative along the way. These are (Porter, 1998, p. 4): (1) threats of new market entrants, (2) the bargaining power of buyers, (3) threats of substitute products or services, and (4) the bargaining power of the suppliers (as indicated in Figure 1 leaving the left side open for further supply chain links; in the case of a cooperative the members are the suppliers for wheat). Therefore the cooperative's management task is to analyze how the market competition forces influence the two-fold member relationship compiling these forces regarding an operative management.

Regarding an adequate case one has to analyze the legal frame agribusiness firms are operating in. Agribusiness and agribusiness trade in Brazil is significantly affected by the role of cooperatives. As a restriction Brazilian law confines cooperative executive leadership to members (Legislação Cooperativista, 1993). Cooperatives are excluded from additional "human capital" by legal admission – e.g. as it is embodied by external "professionals" as managing executives. As growing and globalizing business entities the need for an increase of management competence of members seems evident.

To estimate the consequences of the resulting path dependant structures we analyze a large agricultural cooperative in Brazil involved in wheat production and processing (Souza, 2007). Defining the relevant scorecard perspectives from interviews the field of research was regarded as important likewise by the management, specialists and members. The research on new wheat seeds remains to a certain extent in the hands of Brazilian cooperatives and of federal institutions in comparison to other countries (in the United States it is dominated by few major producers; in Germany the supply side is fragmented by smaller enterprises). As a result we propose the following adapted balanced scorecard for this cooperative including the perspective's details (based on quantitative key figures).
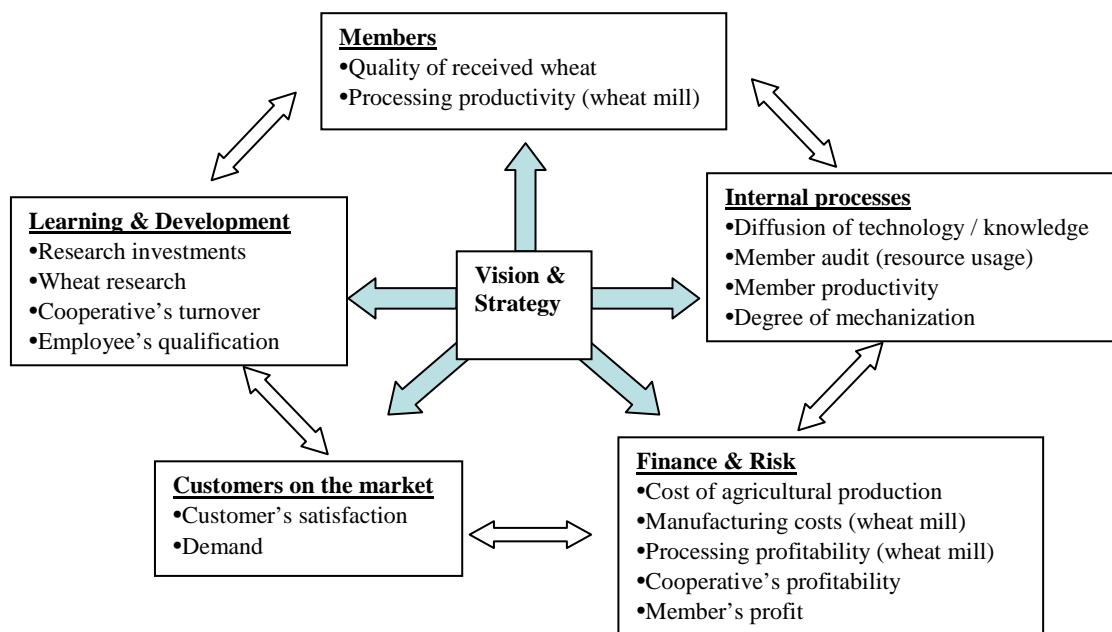

Figure 2. Adapted balanced scorecard for a Brazilian agricultural cooperative engaged in wheat production and processing (the business includes a wheat processing mill; own illustration).

Elaborating this visualized form of operative strategy it is obvious that the impact's and the reciprocity's intensity between variables remain non-educible. Kaplan and Norton's (1996c, p. 84) proposed an own solution, a causal-loop-model that has been criticized (Akkermans / van Oorschot, 2002; Linard et. al., 2000; Todd / Palmer, 2000) because "strategic maps" (as Kaplan and Norton name the results) show little flexibility explaining the consequences of external impacts or adverse strategic decisions. We propose the combination of system dynamics and strategic maps elaborating a cooperative balanced scorecard (Freier et. al., 2009) what is in line with latest insights (Schoeneborn, 2003; Capelo / Dias, 2005; Bianchi / Montemaggiore, 2008). As a result a cooperative's "stock-and-flow map" (derived from system dynamics in-

stead of Kaplan and Norton's causal-loops) connects the perspective's variables quantitatively enabling the scorecard concept to be simulated. Concerning the need to realize a strategy the simulation opens up the possibility to evaluate the consequences simultaneously giving the cooperative's management a decision support tool for strategic controlling.

3. Intermediation in Agribusiness

We can conclude so far that putting a strategy into practice and controlling it, seems to be essential for organizations in the field of agribusiness wherein the balanced scorecard – although afflicted with certain restrictions – can be adapted and used. Presupposing the firm's vision the balanced scorecard is in fact not a "strategy formulation" tool (Dinesh / Palmer, 1998, p. 368, referring to Kaplan / Norton, 1996b).

Regarding concepts to define strategies economic theory provides four independent approaches of firm theory (Spulber, 1992, p. 568), which are (1) the neoclassical theory of the firm, (2) the industrial organization theory of the firm (industrial economics (Tirole, 1990)), (3) contractual theories of the firm (i.e. regarding transaction costs (Grossmann / Hart, 1986)), and (4) organizational incentive theories of the firm (regarding agency problems).Each of the approaches creates its own normative "state-of-the-firm". In pursuance of our previous statements it is evident that economic and management perspectives on management strategy can and should be integrated (coherent with Spulber, 2003, p. 253). The question is – distinguishing between strategy definition and implementation – which elements should be considered for a firm's strategy definition and how?

Spulber's (2003, p. 257) approach is to combine "economic" and "management" approaches formulating an "intermediation theory of the firm". Both parts are considered in a specific form of analysis. The economic approaches are captured in an external analysis (ibid., p. 260) of prospective customers, suppliers, competitors, and partners (e.g. by integrating Porter's competitive strategy as one element of the mentioned economic approaches). The internal analysis captures organizational abilities such as structures, resources, competencies, and performance (ibid., p. 261). The elements of the internal analysis are close to the perspective's elements of a balanced scorecard; the questions Spulber poses e.g. for performance "how can the company's performance be maintained or improved" can be achieved by analyzing the system dynamic elaboration of Kaplan and Norton's strategic map (Freier et. al. 2009). As already pointed out the elaboration of a balanced scorecard doesn't prevent organizations from enhancing wrong strategies; the examined cooperative has proven the ability to stand competition and generated satisfying results. Therefore we want to take its structure for granted as a path dependent one now. The cooperative balanced scorecard can be used for the purposes of Spulber's internal analysis. What remains unsolved yet is the appreciation of how this organization can stand the elements of Spulber's external analysis. We will go into the matter of new market driven developments as we let the organization pose the question: what competitors will we face as companies develop substitute products, new production processes, new types of transactions and new combinations of products, services and transactions?

Spulber (2003, p. 265) concludes that his intermediation theory of the firm shows that managers maintain the company's competitive advantage by creating innovative transactions. The company's ability to do so depends on the presence of market frictions that allow the company to improve on direct interaction between buyers and sellers. Therefore we will analyse new and innovative transactions in the field of agribusiness in the next step.

3.1. Risk in Agribusiness

In this section we want to take into consideration what drives recent agribusiness development identifying innovative transactions in this field. One recent impetus came from the bio-fuels directives i.e. a mandatory percentage of fuels used in combustion-engines must be non-fossil. Bio-fuels have led to a land-use-competition as the production of oilseeds in the EU increased approx. 15% during the period of 2005-2009 (USDA, 2009, p. 30). In Germany energy production accounts for around 50% of the use of veg oil (Carus, 2009). The question if EU bio-fuel policies affect agricultural markets has to be answered in the affirmative (Banse et. al. 2008, p. 135). As a consequence prices for agricultural products have risen – a positive aspect regarding Spulber's external analysis for agribusiness trade; regarding the wheat production chain as in the case of the presented cooperative the competition for land-use could be regarded in its strategy to-be. Eventually bio-fuel and the prices of the related biomass-products are probably interconnected in the other direction as well: the price for crude oil dropped dramatically at least 46% of the pro-

duction capacity of biodiesel in Germany remain unused in 2009 (EBB, 2009). Price drivers resulting from land-use competition are revealed in markets in which agribusiness firms are directly involved in. Another effect resulting from biomass-use for energy is the linkage of agricultural commodity markets to the conventions of the existing energy markets.

Commodity prices and its risks are commonly attached (among others) to systematic risk as climate, geography, and policy (Markowitz, 1952). Non-systematic risk includes management errors such as decisions concerning wrong product policy. This last type of risk may be completely "hedged" via portfolio selection – on certain restrictive conditions – on the side of investors as risk takers (Sharpe, 1964; Lintner, 1965; Mossin, 1966).

Among other effects price hedging and other innovative financial instruments have made commodity markets accessible for financial investors and risk-takers in significant proportions. Speculative investment in commodity markets is accentuating price movements due to supply shortfalls of some crops, is leading to higher market volatility, and is pushing up the prices of commodities and food products (Anderson / Outlaw et al., 2008, pp. 3, pp. 31). We will assume the following relationships looking at a typical value chain of production, processing and sale of agricultural commodities:
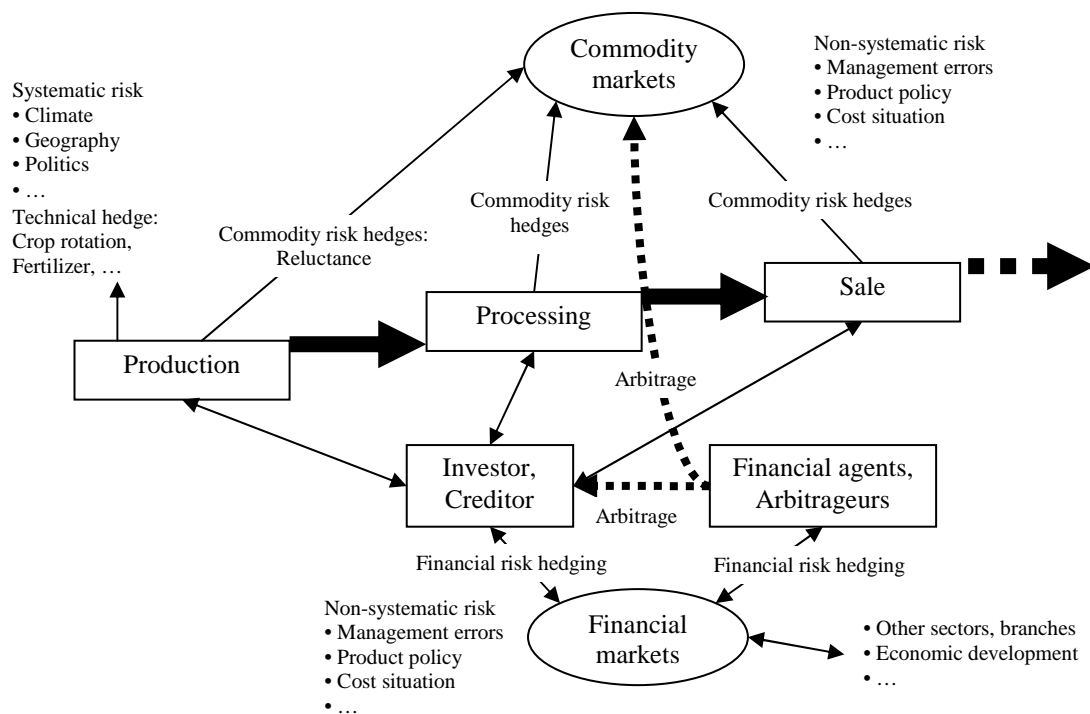

Figure 3. Differentiation of risk and risk takers (own illustration).

Apparently farmers in the US are unwilling to give up small amounts of their sales prices per acre for a significant reduction in per acre net revenue variance (for the case of insurance, see Just et. al., 1999, p. 847). To give an impression we use the following figure (Figure 4) to point out the speculator's positions in commodity markets. Obviously the value of the trade volume has increased approximately within ten years about threefold. It must be considered that the Standard & Poors GSCI Spot Price Index is composed of energy (69.56%), industrial metals (7.67%), precious metals (3.21%), agricultural products (14.66%), and livestock (4.90%) putting the role of wheat speculation into perspective. "Commercial positions" in the sense of CBOT rules refer to traders hedging their own (wheat) asset prices whereas traditional speculators are involved in commodity trade (arbitrageurs), and index speculators must be perceived as institutional speculators involved in any kind of future trade.
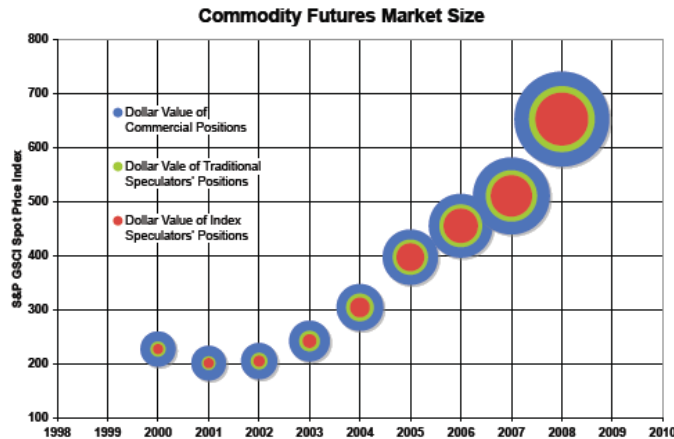
Figure 4. Speculator's influence on commodity future markets (Rabobank, 2009).

In recent years, commodity futures markets gained large capital inflows which have driven up trading volumes and commodity prices. In 2007 the futures industry could increase its managed funds by 8.7% totaling USD 184.8 billion. More recently, investors have also turned to commodities as an alternative source of returns in the wake of the sub-prime crisis (Rabobank, 2008).

As a result commodity markets are increasingly bound to financial markets resulting in an increased volatility of commodity prices. This may lead to unexpected consequences e.g. to the reduction of the producer's ability to manage price risks using future markets (Andersen et. al., 2008, p. 32). A strong price fluctuation leads to a wider spread between spot and future prices inducing margin calls. This increases the price risk of any firm involved in the wheat production chain as considered in Figure 3. In the next sections we will have a look at the future market's mode of operation in the case of wheat and the evolving innovative transactions in this field.

3.2. Intermediation in Agribusiness

In Figure 3 we estimated a three-step general value chain equalizing farmers with the production chain link, agribusiness trade with "processing" and "sale" in the case of the mentioned cooperative. One important aspect to point out is the reluctance of the actors on the production stage to hedge their price risk on commodity future markets. Obviously small future traders may increase their business risk in case of high volatility of future prices if – in the case of unexpected losses of forward market investments – they may receive a "margin call" due to their credibility. Firms operating in the field agribusiness trade – regardless if they are investor-oriented or cooperatives – may operate as price takers. In theory producers, processors and sellers can hedge price risks simultaneously linking their organizations with commodity future markets. If there is non-systematic risk induced by financial market actors or other organizations within the field of agribusiness (see Figure 3) and causing price fluctuation their individual linkage to the commodity future market hedges this risk "completely". This may provoke the question why the actors do not cooperate as they face the same problem? There is the option to regard the other chain links as "quasi-vertically integrated" in the above mentioned sense (Besanko 2007, p. 136). In the case of investor-oriented firms this may be voluntary as the producers have the choice where they sell – but cooperatives have to fulfill their promotion task regarding members not as "pure" customers or suppliers. For that reason the "member's profit" was regarded as element of the "financial perspective" of the cooperative balanced scorecard (see Figure 3) expanding the vertical boundaries of the cooperative. If there is cooperation among the actors and speculation raises volatility the question emerges how do actors cooperate, and which pricing mechanisms do they use, respectively?

4. Implementing intermediation in a cooperative balanced scorecard

To estimate the financial instruments used within the wheat production chain and towards future markets the comprehension of these tool's effects is necessary. We will use a simple model of contracting and hedging as basis to analyze the various approaches of the actors. Let us assume a situation with producer's harvesting wheat once a year (during the timeframe between June and September); speculation occurs on how prices will be fixed in June when the spot market is open and the physical trade of wheat starts; additionally there are investors using commodity futures on wheat prices to hedge their own risk

from other business fields (e.g. real estate prices). What are possible pricing mechanisms between producers and traders (respectively processors) of agribusiness goods? As an example we analyze the producer-payment-price-models in the German cooperative system focusing on the larger central cooperatives of which – in the course of an intensified competition and mergers process –six remain, playing in part the role of primary cooperatives.

Table 1. Producer payment-pricing (RWKT, 2009)

Name	Condition	Cost	Pricing
Market-model, daily fixing	delivery of at least 100t wheat by producer, fixed quality	min. 15.5€/t monthly; selling day: 3€/t freighttage	daily Matif-listing;
Drop-shipping	delivery of at least 100t wheat by producer, fixed quality	5€/t courtage, 3€/t freightage	daily Matif-listing
Storage	delivery of at least 25t	min. 15.5€/t monthly	dependent on commercialization possibilities
Prepayment	Prepayment; additional payment dependent on commercialization possibilities	dependent on commercialization possibilities	dependent on commercialization possibilities

To get a Matif (Marché A Terme d'Instruments Financiers, Paris) listing-price another pricing-model of a different central cooperative presumes three months storage, if the producer wishes to sell his stored wheat at current fixed prices the central cooperative will purchase an according contract in Paris.

4.1. Differentiating financial services

Before going into detail we will consider a simple model. In the case of cooperation between producer and trader (processor / seller in Figure 3) a special incentive structure may occur. We will presume that the producer must bear costs of (C_P) 120€/t producing wheat, the seller will be able to get a sells bonus of 10%. Furthermore producer and trader will agree on a trade contract with the fixed price (FP) of 150€/t at July 1st. At the fixed day the spot price (SP) is 160€/t; the margin for the producer will be M_P = FP-C_P=150-120= 30 as he has agreed on 150€/t. The trader will have M_T=(SP*1.1)-FP=176-150=26. Each of them will now consider what he would have earned without a contract agreement:

Table 2. Resulting matrix with SP > FP

	trader's revenue with contracting	trader's revenue without contracting
producer's revenue with contracting	30 26	30 16
producer's revenue without contracting	40 26	40 16

It is obvious that in the case with a spot price higher than the fixed price the producer has no incentive for further contraction in contrast to the trader. Let us further assume that producer and seller keep FP = 150€/t in mind (they learn) during the next harvest period when they agree on trading again, this time under terms of spot prices which is SP= 140€/t at July 1st:

Table 3. Resulting matrix with SP < FP

	trader's revenue with contracting		trader's revenue without contracting	
producer's revenue with contracting	30	4	30	14
producer's revenue without contracting	20	4	20	14

Dependent on the combination of contracting y/n and SP</>FP, different incentives will occur influencing the willingness to cooperate in the next harvest period; we can conclude that both contractors falter between their options and obviously the larger the volatility of SP will be over time the greater the loss one party must bear from this type of cooperation. There is no equilibrium solution in this estimated situation for the question contracting or not – from a principal-agent-point of view in each result one side has the inherent incentive to violate the contract.

Another kind of cooperation appears regarding the producer-payment-models with more price transparency if spot market prices are embedded. Most of the pricing mechanisms in Table 1 have in common that they require an "over-the-counter" business with physical trade of wheat between producer and trader, what reduces risk on the part of the trader who has now the option for further price speculation. This fosters a situation with few cooperation incentives between the actors as considered in chapter 3.2: they have the possibility to hedge their risk on their own.

The pricing mechanism in which the trader purchases sale-contracts as soon as the producer whishes (who must deliver wheat beforehand) may be regarded as a "pseudo-hedging": The producer may receive different prices at the cost of storing (what is the trader's business of course) but he is unable to hedge price risk before harvesting wheat and transferring it physically to the trader.

4.2. A simple model of a Conjoint-price-hedging

Hedging as a risk-reducing instrument comprises presuppositions as any other instrument for this task, especially the functioning of future markets is crucial (Pennings / Meulenberg, 1997, p. 295). We do not want to join the discussion on the efficiency of risk-reducing tools (Odening / Musshoff, 2001; Garcia / Leuthold, 2004) but look on the applicability for strategy formulation and differentiation of our balanced scorecard. Farmers trading on future markets must stand the effects of volatility as they may be forced to even up their future positions due to margin calls (Anderson / Outlaw et al., 2008, p. 32). Even larger trading firms or processors are not immune against it. Defining vertical boundaries a processing and trading firm in the field of agribusiness may hedge price risk *together* with the producer by exchanging contracts (Hull, 2006, pp. 649, pp.721).

We will assume again that producer and trader agree on cooperation, this time exchanging options. To convince the producer the trader offers him a bonus (B) of 2€/t in addition to the effective spot price he will receive. Again the producer will have to spend $C_P = 120$€/t for his production but in February the market price raises because of intense speculation leading him to sell his yield in advance opening a future position (short call open) SC_{Feb}^+ receiving 180€/t and informing his subsequent trader. The trader is now in charge as he will guarantee for the producers ability to fulfil his contract avoiding a "margin call". The trader observes the market attentively now facing that he has to guarantee for either risks and therefore buys in May contracts for the same quantity of wheat (long call open) LC_{May}^- paying 145€/t. Both parties now possess a future spread of 35€/t. In June the harvests commences leading to "correct" spot market prices. Producer and trader come to the agreement to exchange their positions, they have to (1) change future positions and (2) exchange physical property as the trader buys from the producer and sells the producer's wheat at the spot market for SP=160€/t at July 1st. For the purpose of evening their future positions producer and seller close their positions. The producer will buy a LC_{July}^- paying 160€/t spot price and closing his short call whereas the trader will use SC_{July}^+ for the same price closing his long call; as result producer and trader receive the following margins:

$$M_P = SP_T + B + SC_P^+ + LC_P^- - C_P = 160 + 2 + 180 - 160 - 120 = 62 \tag{1}$$

$$M_T = SP - SP_T + SC_T^+ - B - LC_T^- = 160 - 160 - 2 + 160 - 145 = 13 \tag{2}$$

What has been accomplished with this conjoint hedge is that the producer's margin is now solely dependent on his ability to generate low costs (C_P), his ability to negotiate a high price for his short call SC_{Feb}^+ and on the Bonus (B) he receives from the trader because the spot price he receives from the trader SP_T in July is LC_P^-. Consequently the margin for the producer remains M_P=62 even if the spot market price in July falls below the necessary production costs of 120€/t (SP<C_P)!

This is different for the trader in our example; he uses the spot market price for the producer *and* his sale. His margin depends on his capability to negotiate his contract price (long call) below the later spot market price for wheat and the amount of bonuses he gives producers. The break-even for his transactions is a July spot market price of 147€/t covering his contract and bonus expenses in our case. Let us remind that without this hedging type the producer would have received M_P=40€ instead of 62€ at SP=160€/t, at the trader's break-even-point only SP-C_P= 27€.

4.3. Differentiating the financial scorecard perspective

Further tools are conceivable, e.g. that the trader uses additional options to limit his losses below the break-even price as is already indicated within the producer-payment-pricing mechanisms. In the case that the spot market price exceeds 180€/t (what was the producer's future price) there are further participations considerable, the producer could receive a share of the trader's margin (which is 33 at SP=180€/t). This leads to the question: who is responsible for the financial services? The trader could be in charge to organize SC_{Feb}^+ for the producer. It must be clearly said that in this example the producer limits his margin to 62€/t what may be perceived as constraint of flexibility just as in the case of the contract above. Otherwise the producer obtains additional flexibility fixing his future contract influencing his own margin putting this argument into perspective. The bonus paid by the trader may compensate this additionally.

One decisive objective is that both actors use a risk diminishing tool that imports new systematic risk as seen above but what is now shared conjointly. At the cooperative level in the production chain the incidental surplus will be shared by its members regarding their turnover with the cooperative.

Consequently we would to distinguish the financial services within the cooperative's perspectives as there is risk in the producers' and traders' transactions on commodity markets, and within their conjoint transactions. We therefore propose to integrate "cooperative's risk-management", "member's risk-management" and "conjoint risk-management" into the perspectives of the cooperative balanced scorecard. As key figures we suggest the number of instruments and the traded volume of these instruments. Furthermore the organization's strategic map should be reviewed regarding further possible aspects that could be hedged conjointly.
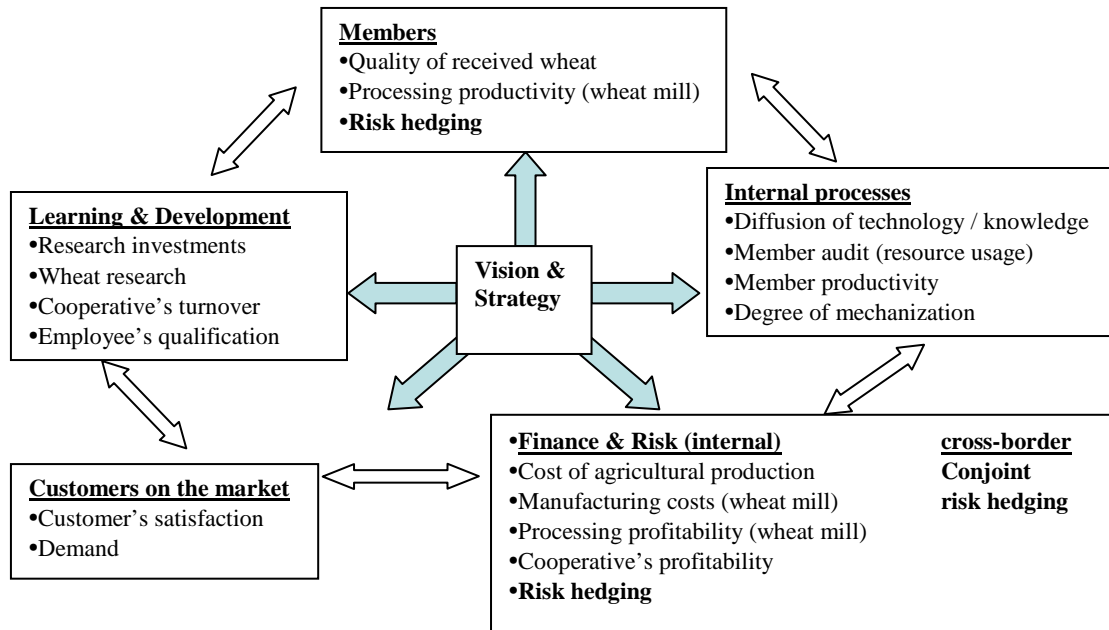
Figure 5. Adapted balanced scorecard.

5. Conclusions

Differentiating strategies for organizations in the field of agribusiness we started with the question how strategies must be defined and implemented in firms of agribusiness. Strategy implementation leads us to the discussion about the applicability of the balanced scorecard as a management tool which must strictly not be apprehended as a "strategy formulation tool". Although conditioned with certain restrictions we consider it as expedient tool that has to be adapted.

In regard to strategy formulation we go into the matter of Spulber's intermediation theory in order to bridge the formulation and implementation gap. Spulber's theory opens up a wide research field of which we can pick up only parts as we use it to search further and prospective elements to enhance our cooperative balanced scorecard questioning which further elements have to be regarded by firms of agribusiness. We succeed in identifying conjoint risk hedging as new element that can be implemented in the cooperative scorecard.

Recapitulating these facts it is obvious that at this point the new balanced scorecard must be put into practice. This means convincing members, managers, stakeholders and established structures introducing new elements into an organization. Especially the identified reluctance of farmers to use future contracts or insurances will be a barrier that will probably enhance regarding conjoint risk hedging or the use of the adapted balanced scorecard likewise.

For the Brazilian case we propose the computer aided simulation of the scorecard's elements as a decision support tool for the management especially because of the cooperative's peculiarities. For the field of agribusiness in general we recommend the communication of the possibilities of conjoint risk hedging. The German central cooperative's producer-pricing mechanisms can be criticized whereas we interpret cooperative risk taking in the presented way as mandatory and in line with the promotion principles.

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