ELSEVIER

Journal of Business Research 57 (2004) 601–609

JOURNAL OF BUSINESS RESEARCH

A marketing–finance approach towards industrial channel contract relationships: a model and application

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Received 16 August 2001; accepted 3 June 2002

Abstract

Channel contract relations are dynamic. In this paper, it is argued that one of the drivers for this dynamism is a firm's strive for shareholder value. Using channel contract relationships as market-based assets, firms are managing a portfolio of spot and forward contract relationships. By exclusively focusing on the cash flow consequences of contract relationships, in the context of an industrial marketing channel, we introduce a decision-oriented, normative, multichannel dyadic model that shows how channel contract relationships interact, thereby explaining the various contract relationships that exist and the dynamics within these relationships. The model transforms top management's financial objectives into marketing management decisions and guides the decision process of channel members in optimizing the cash flow consequences of channel contract relationships. The properties of the model are illustrated for the meat departments of European retailers.

Keywords: Cash flows; Channel contract relationships; Marketing–finance interface

"Good financial analysis complements rather than contradicts good marketing analysis." (Barwise et al., 1989, p. 85)

1. Introduction

The increasing globalization of marketing channels has resulted in more volatility in companies' cash flows (e.g., Fellman, 1998; McCallum, 1999). Rappaport (1986) and Srivastava et al. (1998, 1999) have shown that cash flow volatility has a direct relationship to the creation of shareholder value. Managers of large companies increasingly use the creation of shareholder value as a yardstick of performance (Day and Fahey, 1999; Srivastava et al., 1998, 1999). Shareholder value can be thought of as a forecast cash flow, discounted by the risk-adjusted cost of capital (Benninga and Sarig, 1997; Leland, 1998). Rappaport (1986) and Srivastava et al. (1998, 1999) show that reducing the risk associated with cash flows is one of the drivers of creating shareholder value. A decrease in cash flow volatility will decrease the firm's cost of capital and hence enhance shareholder value. That is, more stable cash flows generate higher net present values and hence more shareholder value (Christie and Nanda, 1994).

One way to deal with the volatility of cash flows is through channel relationship management. Srivastava et al. (1998) argued that the volatility of cash flows is reduced when the firm's relationship with its customers and channel partners is arranged in a manner that promotes stability in operations. Hence, channel relationship management may

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0148-2963/$ – see front matter
doi:10.1016/S0148-2963(02)00394-6

be seen as an important marketing action, linking marketing to its cash flow consequences (Anderson, 1982; Bernstein, 1996). This is especially true for internationally operating firms that have various channel relationships with different companies abroad.

The relationships that a firm establishes often differ per channel party. That is, a firm has a whole portfolio of channel relationships across goods and services, across purchases and sales, and across regions or countries. This portfolio of channel contract relationships yields the firm's total net cash flow, where 'total net cash flow' is defined as all cash flows generated by sales contract relationships minus all cash flows generated by purchase contract relationships. The total net cash flow and its volatility make up the firm's contribution to shareholder value. This means that firms must monitor all cash flow streams, particularly the relation between them, in order to come up with "optimal" channel relationship strategies. In this paper, "optimal" refers to the optimal risk–return trade-off that channel members make assuming that this is their only objective. Other objectives, such as creating long-term channel relationship are not captured in our definition of optimal.

We introduce a multichannel dyadic contract model that simultaneously accounts for all cash flow consequences that channel contract relationships generate. The model focuses exclusively on the cash flow consequences of channel contracts. Other important elements of channel relationships, such as trust, commitment, and power are not dealt with (e.g., Gundlach and Cadotte, 1994; Kumar et al., 1995).

Channel relationship decisions are described in terms of the type of contract used by the channel members. The model's purpose is to show how channel contract relationships interact, thereby explaining the various existing contract relationships and the dynamics in them. The term "interact" refers, in this paper, to the situation that contract relationships with suppliers influence the channel member's contract relationships with buyers and vice versa, and the term "dynamics" refers to changes in the type of contract relationships. The model provides normative guidance to channel members that make decisions regarding their contractual relationships with customers and suppliers. The model is decision-oriented and guides channel members in designing their contractual relationships with other channel members when their only objective is to maximize their risk–return trade-off, i.e., enhancing shareholder value.

We start with a brief background on managing volatile cash flows in marketing channels. Thereafter, we introduce the multichannel dyadic contract model that yields the channel member's optimal combination of channel contract relationships. We illustrate the model, using data from the meat-marketing channels of retailers in six European countries: France, Germany, Italy, the Netherlands, Spain, and the United Kingdom.

2. Managing cash flow volatility in channel relationships

Channel relationship management requires marketing managers to determine the different aspects of channel contract relationships. Channel contract relationships are complex, as they capture different dimensions. In the channel literature, the dimensions of trust, commitment, and power, among others, are extensively investigated (e.g., Geyskens et al., 1999). In this paper, we exclusively focus on the cash flow dimension of channel contracts, as this dimension relates marketing activities directly to the financial performance of the channel member. Marketing managers must determine the degree of cash flow volatility in each part of the channel and assess the ability and willingness of other channel members to cope with cash flow volatility. Channel contracts can be used to redistribute cash flow volatility (Lusch and Brown, 1996). In order to examine how channel behavior translates into the financial performance of channel members, we have to focus on the cash flow consequences of channel contracts. Following Jackson (1980), we distinguish two broad classes of contracts based on their cash flow consequences: spot contracts and forward contracts. Spot contracts define the price at the moment of the transaction (time $t+1$), based on the spot market, not at the channel member's decision moment (time t). Cash flows resulting from such contracts are uncertain at the moment the contract is initiated. Spot market buys (sales) are common at, for example, fruit and vegetable auctions for retailers. Forward contracts, on the other hand, fix the price at the moment the contract is initiated (time t), and, hence, the cash flow generated at the time of actual delivery (at time $t+1$) is certain and, as a result, may contribute to shareholder value. Thus, a forward contract is able to reduce the volatility of cash flows between channel members (e.g., Crocker and Masten, 1991). In the remainder of this paper, we use the term "channel contract relationships" when talking about the cash flow consequences of channel contract relationship. Hence, our definition of channel contract relationship refers only to one dimension of the contract: the cash flow consequence, neglecting other important dimensions such as trust and interdependence.

Previous studies on market transactions have highlighted the dyadic relationship between two parties (e.g., Bonoma et al., 1978; Achrol et al., 1983; Anderson and Weitz, 1989; Curry et al., 1991; Iacobucci and Hopkins, 1992). The dyadic perspective provides insight into a particular exchange relationship between two channel members, as it explicitly takes both channel members' behavior into account. We extend this approach, such that extradyadic influences can be analyzed, that is, how one change in a firm's channel relationship triggers another in another channel relationship. In this paper, we show that a contract with an upstream (downstream) channel member influences the channel member's contract behavior with other upstream (downstream) channel members. Furthermore, we show that a contract with an upstream channel member influences the channel member's contract behavior with downstream channel members and vice versa. This interaction between channel decisions among different channel parties is driven by the fact that channel members wish to optimize the trade-off between the total net cash flow (which equals the result of all channel relationships) and its volatility. Therefore, we study the channel member's contract relationships with upstream channel members (e.g., customers), as well as his/her contract relationships with downstream channel members (e.g., suppliers).

In Section 3, we propose a multichannel dyadic contract model that includes all cash flow consequences resulting from the various channel contract relationships. The model is theoretically rooted in economics and marketing (e.g., Pratt, 1964; Arrow, 1971; Tsiang, 1972, 1974; Hirshleifer, 1988; Rindfleisch and Heide, 1997).

3. A multichannel dyadic model

Following the work on the expected utility model, we assume that the objective of a channel member is to maximize the expected utility of the net cash flows (cf. Baron, 1979; Schoemaker, 1982; Nielsen, 1987; Meyer, 1987; Meyer and Rasche, 1992; Bateman et al., 1988; Epstein and Zin, 1989). The expected utility equals the expected total net cash flow adjusted for the volatility (e.g., creation of shareholder value) and can be given by:

$$U = E(\mathrm{CF}) - \lambda \mathrm{Var}(\mathrm{CF}) \tag{1}$$

where U denotes the utility of the uncertain total net cash flow CF, and E(CF) and Var(CF) are its expected value and its variance, respectively. The variance of the total net cash flow reflects the volatility in the total net cash flow, that is, the volatility that remains after all cash flows of the various channel contract relationships on the products purchased and sold have neutralized one another. The parameter λ denotes risk attitude, which is positive (negative) for risk-averse (-seeking) channel members.

All channel contracts, spot or forward, are eventually (at time $t+1$) executed in the spot market. Thus, ultimately, any channel contract relationship will lead to delivery or acceptance in the actual spot market. Hence, the total net cash flow *CF* equals the cash flows from the delivery and acceptance of the products in the spot market at time $t+1$ plus the cash flow resulting from forward contract relationships. The total of products accepted and delivered is denoted by β, which is the $n \times 1$ vector of all products delivered or accepted in the spot market (by means of spot contracts or forward contracts) at time $t+1$. For sales, the corresponding element of β is positive, for purchases, it is negative. The relationship between sales and purchases may be considered determined by a fixed-proportions production function, that is, β is known. The cash flow resulting from forward contract relationships equals $f_0 - f$, where f_0 is the $n \times 1$ vector of forward prices at time t (purchases as well as sales) and f the $n \times 1$ vector of forward prices at time $t+1$. Taking the transaction costs into account, the net cash flow can be written as:

$$\begin{aligned} \mathrm{CF} &= \alpha'(f_0 - f) + \beta' s - |\alpha|'\mathrm{TC} \\ &= (-\alpha' \beta') \begin{pmatrix} f \\ s \end{pmatrix} + \alpha' f_0 - |\alpha|'\mathrm{TC} \end{aligned} \tag{2}$$

where α is the $n \times 1$ vector of the number of forward contracts relationships. A positive value for an element indicates a forward contract sales relationship, a negative value of α stands for a forward contract purchasing relationship. The variable s is the $n \times 1$ vector of cash flows generated at time $t+1$ when engaged in spot contracting relationships, and TC is the $n \times 1$ vector of the transaction costs for forward contracts.

The vectors f and s are uncertain and are modeled by stochastic vectors with expected values of F and S, respectively. Their joint distribution is assumed to have a covariance and a correlation matrix, written as:

$$\Sigma = \begin{pmatrix} \Sigma_{ff} & \Sigma_{fs} \\ \Sigma_{sf} & \Sigma_{ss} \end{pmatrix} \text{ and } R = \Lambda^{-1} \Sigma \Lambda^{-1} = \begin{pmatrix} R_{ff} & R_{fs} \\ R_{sf} & R_{ss} \end{pmatrix}$$

respectively, where:

$$\Lambda = \begin{pmatrix} \Lambda_f & 0 \\ 0 & \Lambda_s \end{pmatrix}$$

$$\Lambda_f = \mathrm{diag}\{\sigma_1, \ldots, \sigma_{n_s+n_p}\}$$

$$\Lambda_s = \mathrm{diag}\{\mathrm{sd}_1, \ldots, \mathrm{sd}_{n_s+n_p}\}$$

where n_s is the number of contract relationships that reflect sales, n_p is the number of contract relationships that reflect purchases, Σ_{ff} is the matrix of covariances between the forward prices at $t+1$ (e.g., cash flow resulting from forward contract relationships), Σ_{ss} is the matrix of covariances between the spot prices (e.g., cash flows from delivery and acceptance of the products in the spot market at time $t+1$), R_{ff} is the matrix of correlations between the forward prices at $t+1$, R_{ss} is the matrix of correlations between the spot prices at $t+1$, Σ_{sf} is the matrix of covariances between spot price and forward price at $t+1$, R_{sf} is the matrix of correlations between spot and forward prices at $t+1$, σ_i is the standard deviation of the forward price of product i at $t+1$, and sd_i is the standard deviation of the spot price of product i.

In line with previous findings in the financial literature, we assume the joint probability distribution of the cash flows generated by forward contracts and those generated by spot contracts to be multivariate Gaussian (Britten-Jones, 1999; Pennings and Leuthold, 2001). The distribution is assumed to be completely known at the decision moment, along with the current forward prices f_0, and the vector of transaction costs TC. This situation occurs frequently in industrial marketing channels, such as pork and soybeans, where the traded goods are relatively homogeneous and where spot markets are available for these goods.

The variance of the channel member's total net cash flow is determined by various cash flow relationships between the products that have been sold (using spot and forward contracts) and between the products that have been bought (using spot and forward contracts). This shows that we must take a multidyadic perspective in order to derive the channel member's optimal channel-contracting behavior. The total net cash flow volatility can be expressed as (The variances and covariances are conditional on the information set at time t. In this paper, the time horizon of the cash flows of purchases and sales is fixed (e.g., from time t to time $t+1$).):

$$\mathrm{Var}(\mathrm{CF}) = (\alpha'\beta')\Sigma\begin{pmatrix}\alpha\\ \beta\end{pmatrix} \quad (3)$$

$$= \alpha'(\Sigma_{ff}\alpha + 2\Sigma_{fs}\beta) + \beta'\Sigma_{ss}\beta$$

The expected utility function (e.g., Eq. (1)) can now be represented as:

$$U(\alpha) = \alpha'(f_0 - F) + \beta'S - |\alpha|'\mathrm{TC} - \lambda\alpha'\Sigma_{ff}\alpha - 2\lambda\beta'\Sigma_{sf}\alpha - \lambda\beta'\Sigma_{ss}\beta \quad (4)$$

The optimal amount of forward contact relationships α^o should now fulfill the first-order optimality criterion:

$$\nabla_\alpha U(\alpha^o) = 0 \Longleftrightarrow (f_0 - F) - \mathrm{TC} - 2\lambda\Sigma_{ff}\alpha^o - 2\lambda\Sigma_{fs}\beta$$

$$= 0 \Longleftrightarrow \Sigma_{ff}\alpha^o = \frac{1}{2\lambda}(f_0 - F - \mathrm{TC}) - \Sigma_{fs}\beta \quad (5)$$

If Σ_{ff} is assumed to be nonsingular, the optimal amount of forward contract relationships can be derived from Eq. (5) in a closed form:

$$\alpha^o = \frac{1}{2\lambda}\Sigma_{ff}^{-1}(f_0 - F - \mathrm{TC}) - \Sigma_{ff}^{-1}\Sigma_{fs}\beta \quad (6)$$

Eq. (6) demonstrates the flexibility and generality of the model: It considers all purchasing decisions and all sales decisions simultaneously for both spot and forward contract relationships. The model's multichannel dyadic approach to contracting behavior captures the complexity of interorganizational relations.

Eq. (6) shows that the optimal amount of forward contract relationships depends on several factors: the channel member's risk attitude, the expected cash flow from forward contract relationships, the cash flow relation among forward contracts, the expected cash flow from spot contract relationships, and the cash flow relation among forward and spot contracts (see Pennings, 2002 for factors that determine manager's behavior in initiating a contract in a concrete choice situation). The first term of Eq. (6) presents a well-known finding of financial models: an increase of risk aversion leads to an increase in forward contracting, ceteris paribus (e.g., Ederington, 1979; Holthausen, 1979; Koski and Pontiff, 1999; Pennings and Smidts, 2000). The last term of Eq. (6) shows clear marketing implications: Channel contract relationships are dynamic, and the whole portfolio of channel relationships is intertwined through the cash flow streams involved.

For example, if customers are unwilling to make forward contracts, and cash flows resulting from sales and purchase are exactly positively related, then the (risk-averse) channel member will not use forward contracts with his/her suppliers. After all, the volatility present in the purchasing cash flows is being neutralized by the volatility in the sales cash flows, leading to a so-called 'natural hedge'. (A natural hedge expresses a condition in which an exposure to a risk factor is offset or partly offset by an opposite exposure to that risk factor.) On the other hand, if customers require the channel member to make forward contracts, then (again assuming that the purchase and sales cash flows are exactly positively related) the risk-averse channel member will also make forward contracts with his/her suppliers in order to reduce his/her total net cash flow volatility.

The example shows how a multidyadic approach can, in part, explain dynamic channel contract relationships. These dynamics are, among others, driven by the interaction between the upstream contract relationships, between the downstream relationships, and between upstream and downstream contract relationships, as embedded in the various cash flow relationships between purchases and sales through both spot and forward contracts, and by the channel member's trade-off between the total net cash flow and volatility, as embedded in the channel member's risk attitude. Furthermore, Eq. (6) shows that there might be a benefit of diversification within a firm, making, for example, vertical integration less attractive for channel members as a means of decreasing cash flow volatility. Hence, the last term of Eq. (6) shows the importance of taking a multichannel dyadic approach and the influence of contract relationships with customers on contract relationships with suppliers and vice versa.

Our model confirms the notion that "the volatility of cash flows is reduced when the firm's relationship with customers and channel partners is arranged in a manner that promotes stability in operations. This is, in part, the motivation for packaged good manufacturers as they attempt to forge relationships with retailers that create operations that result in fewer and smaller peaks and valleys in sales" (Srivastava et al., 1998, p. 12). That is, channel contract relationships are market-based assets, as they may lower the volatility and vulnerability of cash flows. Hence, they are of great interest to both marketers and financial managers.

The need among channel members to manage cash flow volatility with forward contracts has led several channel members to act as forward contract service providers. These channel members have come to serve as cash flow volatility clearing centers within their respective channels. This development is most noticeable in commodity channels, particularly in the raw food marketing channels, such as pork, soybeans, etc. Often, these forward contract providers are large firms within the channel, with a big pool of contract relationships. For these firms, it may be interesting to take over other the channel members' cash flow volatility by offering forward contracts, as this may decrease the volatility of their own profits. Eq. (3) shows that adding sales forward contracts to purchasing forward contracts leads to a decrease in total net cash flow volatility, if the cash flows resulting from purchasing forward contracts are positively related with the cash flows resulting from selling forward contracts. The cash flow volatility generated by sales and purchases thus neutralize one another, thereby enhancing shareholder value and overall utility.

Not just firms within the channel offer forward contract services: Third parties such as banks and exchanges offer these facilities as well. Among the most notable forward contract service providers are derivatives exchanges (e.g., Chicago Board of Trade and London International Financial Futures Exchange), which provide standardized forward contracts (so-called futures contracts), such that channel members may reduce exposure to cash flow volatility.

In Section 4, we illustrate the properties of our model. We show how a contract with a downward channel member influences the channel member's contract behavior towards other downstream channel members.

4. Empirical illustration: the meat-marketing channel of retailers

To show effectively the properties of the model, a volatile channel context was needed with multiple channel members at multiple channel levels, as well as a high frequency of interaction between channel members, resulting in a chain of contracts. Furthermore, we needed a marketing channel that met the main assumption of our modeling framework: The cash flow consequence had to be the most important dimension of the channel contract relationships. This is particularly true for commodity marketing channels, where the commodity features are relatively homogeneous and pricing is a very important marketing decision (Keith et al., 1990). The marketing channel of fresh meats was found to meet these requirements. Retailers buy meat products for their meat department from wholesalers (meat brokers) and meat processing plants. In Europe, the meat department of a retailer accounts for about 7% of the total net cash flow stream (source: GfK, 2000), showing the importance of this department. The meat-marketing channels are characterized by a high frequency of interactions between processing plants and meat brokers on the one hand and retailers on the other hand, which result in spot and forward contract relationships. In this paper, we exclusively focus on the spot and forward contract purchasing relationships of retailers. This research design allows us to investigate how the contract relationships between retailers and their suppliers interact. Unfortunately, this research design does not allow us to demonstrate empirically this interaction between both upstream and downstream channel members (i.e., the interaction between the suppliers and the consumers of retailers). We show how the different channel relationships of retailers regarding the different meat products interact and how they change when one channel contract relationship changes. Furthermore, we come up with the optimal combination of forward and spot contract channel relationships for retailers in different European Union countries.

Weekly wholesale spot and forward price data were gathered on beef, chicken, and pork in France, Germany, Italy, the Netherlands, Spain, and the United Kingdom. Furthermore, we gathered data on the average composition of the meat department of an average retailer in these six counties. Data were obtained from the European Commission, GfK, and the meat product boards in these countries. The wholesale prices of the three meat components are very volatile. The coefficient of variation (e.g., the standard deviation expressed as a fraction of the mean) may be used to indicate the cash flow volatility in the meat-marketing channels (Snedecor and Cochran, 1994). Table 1 shows the coefficients of variation of the different meat products and the coefficients of variation of the meat departments for the six countries.

Table 1 shows that the coefficients of variation are relatively high compared to, for example, US soybeans (coefficient of variation of 0.14, e.g., Pennings and Wansink, 1999), which is considered as a very volatile market. Furthermore, Table 1 shows the advantage of taking the multidyadic channel approach instead of a monodyadic channel approach (i.e., not accounting for the relationship between the cash flows of different contract relationships): The coefficients of variation for the meat departments are

Table 1
Coefficients of variation for single meat products and meat departments in Europe[a]

	Beef	Chicken	Pork	Meat department
France	0.178	0.208	0.186	0.107
Germany	0.201	0.068	0.213	0.148
Italy	0.141	0.158	0.165	0.099
The Netherlands	0.149	0.069	0.228	0.127
Spain	0.085	0.142	0.190	0.112
United Kingdom	0.093	0.156	0.194	0.134

[a] The coefficients of variation of the different meat products are based on weekly wholesale prices in the six European counties over the period 1990–1999. The coefficients of variation of the meat departments are based on data on the average composition of the meat department of an average retailer in these counties and the weekly wholesale prices in the six European countries.

smaller than all the coefficients of variation of the single meat products taken together. This is because the cash flows of the purchase contract relationships for the different meat products are interrelated.

4.1. Research design and results

Since we wish to evaluate the optimal amount of forward contract across countries, we have reported the optimal forward contract ratio, which is the amount of forward contracts expressed as a fraction of total contract relationships (spot and forward). (The forward contract ratio is that fraction of the total retail demand for a meat product that is purchased through forward contracts.) We have calculated the optimal forward contract ratios for an extremely risk-averse retailer (in Eq. (6), this means that $\lambda \rightarrow \infty$) in a particular country using Eq. (6). Furthermore, using Eq. (3), we have calculated the reduction in cash flow volatility for the different portfolios of channel contract relationships.

In order to show the benefits of the multidyadic approach, we first calculated the optimal contract ratios neglecting the relationships among the three meat products. The flexibility of the model allows us to calculate the optimal contract amounts for this situation by simply setting the covariances between purchasing cash flows to zero in Eq. (6). Table 2 shows the optimal forward contract ratios for a retailer that uses only one type of forward contract (beef, chicken, or pork) to reduce cash flow volatility in the meat departments.

Table 2 shows that using a forward contract relationship for a single meat product can contribute significantly to the reduction of cash flow volatility in the meat department. In this respect, pork forward contracts outperform the other two meat forward contracts in all six countries. This is due to the fact that pork is the largest product in the meat department in all six countries, except for the United Kingdom. The value share of pork within retailers' meat departments is the highest as well. Furthermore, as was shown in Table 1, pork exhibits the largest coefficient of variation in all six countries, except in France.

Table 2 shows that it is not necessary for a retailer to forward contract all of his or her meat products, as most optimal forward contract ratios are smaller than 1. Thus, a portfolio of both spot and forward contract relationships constitutes the optimum. This is caused by the fact that part of the cash flow volatility of the single meat products is offset in the meat department (as shown in the last component of Eq. (6)).

Cash flow volatility can be reduced even further if the retailer uses a combination of forward contracts, instead of one forward contract relationship for a single meat product (cf. Table 3). A dramatic reduction in cash flow volatility can be observed when moving from row 1 in Table 2 (retailers that use beef contracts exclusively) to row 1 in Table 3 (retailers that use beef and chicken forward contracts simultaneously).

Table 2
Retailers' optimal forward contract ratios: the monodyadic case (not accounting for the relationships between purchase cash flows)

Forward contract ratios				
Forward contract relationship	Beef (B)	Chicken (C)	Pork (P)	Reduction in cash flow volatility (%)
France				
B	0.218	–	–	17.2
C	–	0.318	–	29.3
P	–	–	0.392	47.1
Germany				
B	0.109	–	–	2.20
C	–	1.000	–	49.5
P	–	–	0.679	94.4
Italy				
B	0.231	–	–	10.6
C	–	0.360	–	27.1
P	–	–	0.490	73.8
The Netherlands				
B	0.110	–	–	1.70
C	–	1.207	–	44.0
P		–	0.548	92.9
Spain				
B	0.394	–	–	9.10
C	–	0.506	–	21.9
P	–	–	0.643	95.8
United Kingdom				
B	0.434	–	–	9.30
C	–	0.614	–	70.1
P	–	–	0.512	71.1

Tables 2 and 3 also show how a change from a spot contract relationship to a forward contract relationship may affect the channel contract relationships for the other meat products, for example, in terms of their forward contract ratios. The dynamics can be determined using the model as summarized in Eq. (6). For example, a UK beef forward contract relationship, complemented by a chicken forward contract relationship, leads to a decrease in the forward contract ratio of beef. Advancing from row 1 in Table 2 to row 1 in Table 3, the forward contract ratio of beef decreases from 0.434 to 0.337. By adding chicken forward contracts to the other forward contract relationships, the cash flow relationships change, and, hence, the optimal forward contract relationships (Eq. (6)), change as well. The forward contract ratio can also increase: Adding chicken forward contracts to beef forward contracts leads to an increase in the forward contract ratio for beef in the Netherlands. These different results for the United Kingdom and the Netherlands can be attributed to the different cash flow relationships between the two meat products. In the United Kingdom, there is no significant relation between the two cash flows resulting from forward beef and forward chicken contracts, whereas in the Netherlands, there is a significant negative relationship between the two cash flow streams.

Table 3
Retailers' optimal forward contract ratios: the multidyadic case (accounting for the relationships between purchase cash flows)

Forward contract ratios				
Forward contract relationships	Beef (B)	Chicken (C)	Pork (P)	Reduction in cash flow volatility (%)
France				
B and C	0.228	0.327	–	48.2
B and P	0.307	–	0.462	79.8
C and P	–	0.265	0.355	67.1
B, C, and P	0.309	0.266	0.425	100.0
Germany				
B and C	0.181	1.000	–	55.4
B and P	0.171	–	0.693	99.7
C and P	–	0.101	0.656	94.5
B, C, and P	0.175	1.173	0.654	100.0
Italy				
B and C	0.293	0.402	–	43.7
B and P	0.283	–	0.509	89.6
C and P	–	0.194	0.440	80.9
B, C, and P	0.313	0.236	0.450	100.0
The Netherlands				
B and C	0.268	1.351	–	53.4
B and P	0.211	–	0.565	98.9
C and P	–	0.103	0.527	93.0
B, C, and P	0.232	0.253	0.515	100.0
Spain				
B and C	0.236	0.449	–	24.9
B and P	0.091	–	0.659	96.2
C and P	–	0.202	0.605	99.0
B, C, and P	0.146	0.226	0.628	100.0
United Kingdom				
B and C	0.337	0.600	–	75.7
B and P	0.255	–	0.495	74.2
C and P	–	0.420	0.354	97.1
B, C, and P	0.243	0.418	0.339	100.0

The different composition of the meat department plays a role as well: In the United Kingdom, the value share of chicken is much larger than in the Netherlands: 41% versus 25%.

The differences among the six countries between forward contract ratios for different combinations of forward contract relationships are relatively large. They are driven by the different market structures for each meat product (e.g., different cash flow streams, and the relations among them) on the one hand, and different value shares in the meat department of retailers on the other hand. These differences have clear implications for an internationally operating retailer. The results show that it is not necessarily optimal for a retailer to have the same contract channel relationship structures in different regions. In order to optimize shareholder value, the retailer must take into account the different drivers of cash flow volatility, which may well result in a portfolio of contract relationships that differs across regions, market structures, and consumption patterns. Managing such complex portfolios of channel contract relationships is a challenging task. The proposed framework adds structure to this task and helps channel members optimize their contract relationships and manage them as market-based assets, as Srivastava et al. (1998) have suggested.

Furthermore, the model shows how channel contract relationships with different channel members interact, thereby explaining the dynamics in channel contract relationships. For example, if a Spanish retailer uses beef forward contracts exclusively (Table 2, row 1), (s)he should purchase 39% of the beef through forward contracts. However, as soon as this same retailer includes pork forward contracts (Table 3, row 2), the contract relationship regarding beef must change dramatically to remain optimal: (S)he should now contract forward only 9% of the total beef purchases. These changes, when made by a retailer, can cause tension, frustration, and disagreement in the existing channel relationship (e.g., Anderson and Narus, 1990; Dant and Schul, 1992; Frazier and Rody, 1991; Frazier et al., 1989). Although, in theory, the other channel partner is free to establish a channel relationship with another party, switching costs might prevent him/her from doing so (e.g., Betancourt and Gautschi, 1998).

Our results show that a channel member must carefully coordinate all the channel relationships with upstream and downstream channel members simultaneously. Channel conflicts caused by disagreement on the channel contract relationship (spot vs. forward contracting) can be disastrous to the financial objective of channel members (e.g., enhancing shareholder value). Our findings imply that a conflict with one channel partner, and, hence, a changing channel contract relationship with that partner, has great impact on contract relationships with other channel members as well. Our model shows that in such an event, the other channel contract relationships will have to be adjusted, which might trigger conflicts with other channel members. Hence, the topic of channel conflict management seems to be important for channel marketing researchers. Not only does it impact concepts such as trust and channel interdependence, it also has a direct effect on the channel member's financial performance. In the financial literature, it has been suggested that channel conflicts resulting from incongruent contract preferences may be resolved by financial facilitating services that complement the cash flow consequences of channel contracts (Pennings and Leuthold, 2000).

5. Conclusions and further research

This study shows that the financial objectives targeted by top management can be transformed into marketing decisions by focusing on the cash flow consequences of contracts (spot vs. forward contract relationships). All channel contract relationships should be taken into account simultaneously when optimizing top management's financial objectives. That is, any singular channel contract decision must take into account the cash flow consequences for those contracts already existent with up- and downstream channel members. Ideally, all contract decisions should be made simultaneously, as this would enable management to benefit from the various cash flow relationships among forward and spot contracts, across sales and purchases. From a descriptive perspective, the model shows that changes in channel contract relationships are driven by channel members' goals to optimize the trade-off between the total net cash flow (which is the result of all channel relationships) and its volatility, in order to enhance shareholder value. Following the proposed framework, dynamics in channel contract relationships are driven, among others, by the interaction between upstream and downstream contract relationships. That is, the contract relationship with a downstream channel member depends, among others, on the contract relationships with upstream channel members, which is caused by the channel member's strive for shareholder value, rather than management of single purchases or sales. The way in which channel contract dynamics become manifest depends on the various cash flow relationships between purchases and sales for both spot and forward contracts, and on the channel member's risk attitude.

The aforementioned conclusions are drawn within the context of our model. The model's assumes that a channel member solely aims to maximize his/her risk–return trade-off, as it is directly related to the creation of shareholder value, a criterion used more and more by marketing managers and top management. However, we must not forget that channel contract relationships include other less tangible and measurable concepts like power, commitment, interdependence, and trust. Although these concepts do not affect a channel member's financial performance directly, they do have indirect influence, because they are the basic drivers of channel relationships.

The assumption of our model is best illustrated by commodity channels in which relatively homogeneous goods are traded and spot prices are available. In this industrial marketing channel, price is the most important term of a contract. Hence, the applicability of the proposed model should be found in this channel domain.

For this reason, the model has been specified in the context of an industrial (commodity) marketing channel in which prices are determined by competitive forces, and, hence, exogenous to the channel member. While this is true for many industrial marketing channels (especially raw food marketing channels), it is not for others. In some channels, the prices are endogenously set by a firm in response to demand. For our model, this means that not just volatility but also the cash flow level will have to be taken into account explicitly. Extending the model in this direction would be most interesting, as it brings marketing and finance closer together.

This paper should also be seen as an attempt to integrate marketing theory and finance by introducing a model that transforms financial objectives into marketing management decisions. The important role of financial services offered by financial institutions (banks and exchanges) in marketing channel relationships and marketing decisions would be an interesting avenue to explore, because such efforts would enhance the integration of finance and marketing.

Acknowledgements

This research was supported by grants from Euronext, Chicago Mercantile Exchange, De Algemene Stichting Termijnhandel (AST), and the Niels Stensen Foundation. The author expresses special thanks to Philip Garcia, Erica van Herpen, James Hess, Frenkel ter Hofstede, Koert van Ittersum, Ivo van der Lans, Raymond Leuthold, Matthew Meulenberg, Brian Wansink, two anonymous *JBR* reviewers and Professor Hans Mühlbacher (associate editor, *JBR*) for helpful comments on the research project and preliminary versions of this manuscript.

References

Achrol RS, Reve T, Stern LW. The environment of marketing channel dyads: a framework for comparative analysis. J Mark 1983;47:55–67 (Fall).

Anderson PF. Marketing, strategic planning and the theory of the firm. J Mark 1982;46:15–26 (Spring).

Anderson JC, Narus JA. A model of distributor firm and manufacturer firm working partnership. J Mark 1990;54:42–58 (January).

Anderson E, Weitz B. Determinants of continuity in conventional industrial channel dyads. Mark Sci 1989;8(4):310–23.

Arrow KJ. Essays in the theory of risk bearing. Chicago: Markham Publishing; 1971.

Baron DP. Investment policy, optimality, and the mean–variance model: review article. J Finance 1979;34:207–32 (March).

Barwise P, Marsh PR, Wensley R. Must finance and strategy clash. Harv Bus Rev 1989;67:85–90 (September/October).

Bateman BW, Moore GE, Keynes JM. A missing chapter in the history of the expected utility model. Am Econ Rev 1988;78:1098–106 (December).

Benninga S, Sarig OH. Corporate finance: a valuation approach. New York: McGraw-Hill; 1997 (series in Finance).

Bernstein PL. Against the Gods: the remarkable story of risk. New York: Wiley; 1996.

Betancourt RR, Gautschi DA. Distribution services and economic power in a channel. J Retailing 1998;74:37–60 (Spring).

Bonoma Th, Bagozzi RP, Zaltman G. The dyadic paradigm in marketing thought. In: Bonoma Th, Zaltman G, editors. Organizational buying behavior. Chicago: American Marketing Association; 1978. p. 49–66.

Britten-Jones M. The sampling error in estimates of mean–variance efficient portfolio weights. J Finance 1999;54:655–71 (April).

Christie WG, Nanda V. Free cash flow, shareholder value, and the undistributed profits tax of 1936 and 1937. J Finance 1994;49:1727–54 (December).

Crocker KJ, Masten SE. Pretia ex machina? Prices and process in long-term contracts. J Law Econ 1991;34:69–99 (April).

Curry DJ, Menasco MB, van Ark J. Multiattribute dyadic choice: model and tests. J Mark Res 1991;28:259–67 (August).

Dant RP, Schul PL. Conflict resolution processes in contractual channels of distributions. J Mark 1992;56:38–54 (January).

Day G, Fahey L. Valuing market strategies. J Mark 1999;52:45–57 (July).

Ederington LH. The hedging performance of the new forward markets. J Finance 1979;34:157–70 (March).

Epstein LG, Zin SE. Substitution, risk aversion, and the temporal behavior of consumption and asset returns: a theoretical framework. Econometrica 1989;57:937–69 (July).

Fellman MW. Globalization. Mark News 1998;32:1–12 (December).

Frazier GL, Rody RC. The use of influence strategies in interfirm relationships in industrial product channels. J Mark 1991;55:52–69 (January).

Frazier GL, Gill JD, Kale SH. Dealer dependence levels and reciprocal actions in a channel of distribution in a developing country. J Mark 1989;53:50–69 (January).

Geyskens I, Steenkamp J-BEM, Kumar N. A meta-analysis of satisfaction in marketing channel relationships. J Mark 1999;36:223–38 (May).

Gundlach GT, Cadotte ER. Exchange interdependence and interfirm interaction: research in a simulated channel setting. J Mark Res 1994;31: 516–32 (November).

Hirshleifer D. Risk, futures pricing and the organization of production in commodity markets. J Polit Econ 1988;96:1206–20 (December).

Holthausen DM. Hedging and the competitive firm under price uncertainty. Am Econ Rev 1979;69:989–95 (December).

Iacobucci D, Hopkins N. Modeling dyadic interactions and networks in marketing. J Mark Res 1992;29:5–17 (February).

Jackson BB. Manage risk in industrial pricing. Harv Bus Rev 1980;58: 121–33 (July/August).

Keith JE, Jackson DW, Crosby LA. Effects of alternative types of influences strategies under different channel dependence structures. J Mark 1990;54:30–41 (July).

Koski JL, Pontiff J. How are derivatives used? Evidence from the mutual fund industry. J Finance 1999;54:791–816 (April).

Kumar N, Scheer LK, Steenkamp J-BEM. The effects of perceived interdependence on dealer attitudes. J. Mark. Res. 1995;32:348–56 (August).

Leland HE. Agency costs, risk management, and capital structure. J Finance 1998;53:1212–43 (August).

Lusch RF, Brown JR. Interdependency, contracting, and relational behavior in marketing channels. J Mark 1996;60:19–38 (October).

McCallum JS. Managing rising financial market volatility. Ivey Bus J 1999;63:72–5 (May/June).

Meyer J. Two-moment decision models and expected utility maximization. Am Econ Rev 1987;77:421–30 (June).

Meyer J, Rasche RH. Sufficient conditions for expected utility to imply mean–standard deviation rankings: empirical evidence concerning the location and scale condition. Econ J 1992;102:91–106 (January).

Nielsen LT. Portfolio selection in the mean–variance model: a note. J Finance 1987;42:1371–6 (December).

Pennings JME. Pulling the trigger or not: factors affecting behavior of initiating a position in derivatives markets. J Econ Psychol 2002;23: 263–78 (April).

Pennings JME, Leuthold RM. The motivation for hedging revisited. J Futures Mark 2000;20(9):865–85.

Pennings JME, Leuthold RM. Introducing new futures contracts: reinforcement versus cannibalism. J Int Money Finance 2001;20:659–75 (October).

Pennings JME, Smidts A. Assessing the construct validity of risk attitude. Manage Sci 2000;46:1337–48 (October).

Pennings JME, Wansink B. Contract behavior: the role of risk attitude, risk perceptions, and channel power. Working paper, University of Illinois at Urbana-Champaign, ACE 1999, pp. 1–45.

Pratt JW. Risk aversion in the small and in the large. Econometrica 1964;32:122–36 (January–April).

Rappaport A. Creating shareholder value: the new standard for business performance. New York: Free Press, 1986.

Rindfleisch A, Heide JB. Transaction cost analysis: past, present, and future applications. J Mark 1997;61:30–54 (October).

Schoemaker PJH. The expected utility model: its variants, purposes, evidence and limitations. J Econ Lit 1982;20:529–63 (June).

Snedecor GW, Cochran WG. Statistical methods. Ames: Iowa Univ Press; 1994.

Srivastava RK, Shervani T, Fahey AL. Market-based assets and shareholder value: a framework for analysis. J Mark 1998;62:2–18 (January).

Srivastava RK, Shervani T, Fahey AL. Marketing, business processes, and shareholder value: an organizationally embedded view of marketing activities and the discipline of marketing. [special issue] J Mark 1999;63:168–79 (October).

Tsiang SC. The rationale of the mean–standard deviation analysis, skewness preference and demand for money. Am Econ Rev 1972;62:354–71 (June).

Tsiang SC. The rationale of the mean–standard deviation analysis: reply and errata for original article. Am Econ Rev 1974;64:442–50 (June).