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The Information Dissemination Process of Futures Exchange Innovations: A Note

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In financial literature, much attention has been paid to theories that explain the success or failure of futures contracts. Previous literature explains the success or failure of futures contracts by the underlying characteristics of the futures contract (Black, 1986; Tashjian, 1995). From a marketing point of view, these investigations implicitly focus on the product element of the marketing mix. In this article, I argue that the promotion and distribution element of the marketing mix can be another valuable element in explaining success or failure of futures contracts by looking at the information dissemination process regarding new futures contracts. J BUSN RES 1998. 43.141–145. © *1998 Elsevier Science Inc.*

Futures markets make it possible for those who want to manage price risk—hedgers—to transfer that risk to those who are willing to accept it—speculators. Futures contracts can be seen as a hedging and speculation service provided by the futures exchange to hedgers and speculators. Futures exchanges also provide price information that the world looks to as a benchmark in determining the value of a particular commodity or financial instrument on a given day and time. These important benefits—risk transfer and price discovery—reach every sector of the world where changing market conditions create economic risk, including such diverse areas as agricultural products, foreign exchange, imports and exports, financing, and investments. Futures exchanges provide a location for buyers and sellers to meet and, through an auction process, discover a price for specific futures contracts. Exchanges are also responsible for disseminating these prices and guaranteeing fulfillment of traded contracts.

This activity is centralized on the trading floor of each futures exchange. Whereas all market participants have direct access to the floor through their brokers, only exchange members have the privilege of actually trading on the floor. Some traders known as floor brokers fill outside orders for different firms such as commission houses, commercial interests, financial institutions, and portfolio managers. Others trade hedging or speculative accounts for the company they work for. Another group, known as locals, trades for their own account and speculate on future price movements. Futures exchanges are free markets where the many factors that influence supply and demand converge on the trading floor and through auction are translated to a price (Telser and Higinbotham, 1977; Cornell, 1981; Catania, 1989). The futures industry is one of the fastest growing industries. In the last decade, there has been an almost exponential growth of futures activity and in its wake also of options. In 1995, 1.8 billion contracts, both futures and options, were traded throughout the world. The futures industry is composed of competing firms (exchanges). Not only do futures exchanges compete with other futures exchanges, but also with cash forward markets. Moreover, competition with over the counter (OTC) markets has rapidly developed over the past decade. To ensure survival, futures exchanges show a rapid product innovation (Carlton, 1984; Miller, 1990). The risk of not being successful is considerable for futures contracts (Carlton, 1984; Tashjian and McConnel, 1989; Tashjian, 1995). In 1995, 40 new futures contracts were launched throughout the world, only a few of which have proved to be successful in the first year (Davey and Maguire, 1996).

In previous research, the success of futures contracts has been explained by some well-known observable variables such as size of cash market and cash price volatility (Silber, 1981; Black, 1986; Ross, 1989; Nothaft, Lekkas, and Wang, 1995; Brorsen and Fofana, 1995). The three well-known approaches in successful futures contract innovation are the commodity characteristics approach, the contract characteristics approach, and the efficient cross-hedge approach. The first approach defines feasible commodities for futures trading based on an extensive list of required commodity attributes; the second focuses on factors endogenous to the futures industry, and the third approach combines the above-mentioned approaches and emphasizes that presence or absence of an efficient cross-hedge for the commodity underlying a new futures

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market is an important variable in the explanation of success. Another strain of literature explaining the success or failure of futures is literature on contract design. This literature suggests that successful contracts will emerge where futures contracts satisfy a hedging need, where the futures price closely tracks the assets held by hedgers, and in markets where long and short participants are driven by different motives (Black, 1986; Duffie and Jackson, 1989; Tashjian, 1995).

Although the benefits associated with risk reductions are important factors in motivating the decisions to engage in futures trading, potential users are also heavily influence by their subjective assessment of the performance and reliability of a futures market as has been outlined by Ennew et al. (1992). The subjective assessment of the performance is heavily influenced by the information potential users have been exposed to about the hedging service and speculation service of the futures contract. This is because of the relative complexity of the financial service provided by the futures contract.

In this article, I argue that the financial literature neglects the specific structure of futures exchanges that provide financial services. A futures exchange can be seen as an institution that maximizes the common interest of its members. The rivalry theory (Kamien and Schwartz, 1976) has been identified as being a key determinant in futures markets innovation. The rival theory finds that the rate of innovation activity, i.e., introduction of new futures contracts, increases with the intensity of rivalry (competition) in the futures industry. Most exchanges are not-for-profit membership associations. Membership in each exchange is limited to a specific number of individuals, although some exchanges permit the holding of multiple memberships by members. The members of futures exchanges are often brokerage houses who facilitate the auction process. The broker helps to bring individual buyers and sellers together. In the case of new futures contracts, the broker plays an important role in providing information to potential customer. This information could lead to participation of the potential customers in the market of the new futures contract and hence enhance the success of the new futures contract. In this article, I elaborate on the information dissemination role of the brokers.

To set up an operational futures exchange, implementation should follow a structured procedure. Sandor (1973, 1991) divides the process of research and development by a futures exchange into two stages.

The first stage consists of a formal examination of certain established criteria to determine whether or not the commodity can be adapted to futures trading. In this stage, the three well-known approaches in successful futures contract innovation, as discussed above, are used.

The second stage consists of marketing the new futures contract to potential customers. An important element of marketing new futures contracts is information dissemination of the new services provided by the new futures contract. Futures contracts are often perceived as a complex financial service, thereby inhibiting participation in futures trading. Information about the services futures contracts provide is thus a prerequirement for successful futures trading.

Good information dissemination regarding the service the futures exchange provides, will enhance the diffusion of futures contract innovations and hence will enhance the success of new futures contacts. Information dissemination of a new futures contract is strongly related to both the promotion and distribution element of the marketing mix. Promotion includes the provision of information regarding the new product or service, whereas distribution determines the accessibility of the product or service for the customer. Providing information will reduce the psychological distance of a complex service such as the hedging and speculative service provided by the futures exchange.

This information dissemination process seems particularly important to futures exchanges whose participants are relatively small, for instance, small commodity cash market traders who use the futures exchange to reduce their risk on their cash market position (Stoll and Whaley, 1993). These small participants are not members of the futures exchange and are not able to generate information within their organization regarding such a complex financial service.

To represent the effect of information dissemination on the diffusion process of new futures contracts, I propose, in accordance with Jones and Ritz (1991), a model in which there are two independent groups that make decisions on information dissemination regarding the services the new futures contract provide and information processing, respectively.[1] The groups interact with each other. One group comprises the final customers of the futures contract: Hedgers and speculators. The second group contains brokers who allow customers from outside the exchange access to the trading floor. An important aspect of the brokers in this article is that they act as intermediaries between the futures exchange and the customers. That is, the flow of services that the futures contract provides goes from the futures exchange to the brokers and further to the customers. It is often the broker who provides the information of the service of the futures contract to the customer. So, the information dissemination process of a new futures contract consists of two parallel processes. An information flow diagram for such a system is shown in Figure 1. Included is the interaction between the two processes, namely that the size of the potential customer market is dictated by the willingness of the brokers to provide high quality information regarding the services that the futures exchange provides.

[1] Note that the information dissemination process is only one of the many variables explaining the success or failure of futures exchange innovations. I argue that the model presented in this article can contribute to a better understanding of the diffusion of futures contract innovations and hence to the success or failure of futures contracts.

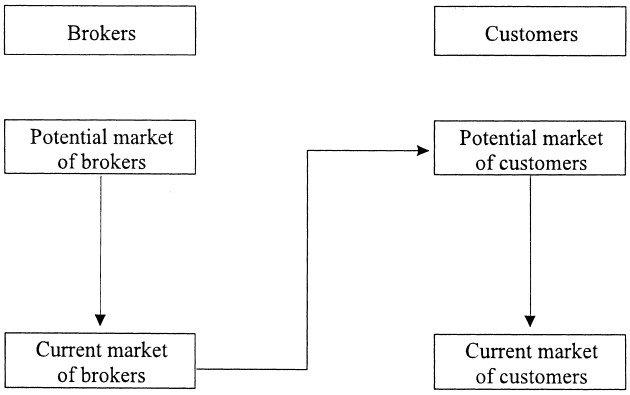

Figure 1. The interaction between the information dissemination process of brokers and customers of new futures contracts.

Information Dissemination Model

The model can be developed from Figure 1. Following Fourt and Woodlock (1960), Bass (1969), and Jones and Ritz (1991), the information dissemination process regarding the new futures contract of the brokers can be expressed as a differential equation: (Equation 1)

$$\frac{dB}{dt} = \lambda(CI)[\overline{B}(CI) - B(t)] \quad (1)$$

where $B(t)$ is the cumulative number of brokers who have disseminated the information of the product at time t, λ is the individual transfer rate, and $\overline{B}$ is the maximum number of brokers who would disseminate information of the futures contract. Both the individual transfer rate and the maximum number of brokers are dependent on, i.e., can be influenced by, the controllable instruments (CI) of the futures exchange (see Table 1).

Equation 1 represents the speed of the brokers who disseminate information about the new futures contract. The individual transfer rate λ is the speed adjustment rate; it represents the fraction of brokers who have not yet started to disseminate information regarding the new futures contract in this period, but will disseminate the information in the next period. The futures exchange can use incentive measures, such as bonuses, to speed up the transfer rate.

For the customers, I assume a similar model: (Equation 2)

$$\frac{dC}{dt} = \alpha(CI)[\overline{C}(CI,t) - C(t)] \quad (2)$$

where $C(t)$ is the cumulative number of customers who have been exposed to the information and did process this information regarding the new futures contract at time t, α is the individual transfer rate, and $\overline{C}(CI,t)$ is the maximum number of customers who would be exposed to the information. Both the individual transfer rate and the maximum number of customers are dependent on, i.e., can be influenced by, the controllable instruments of the futures exchange (see Table 1).

Equation (2) represents the speed of the information exposure process to potential customers. Important to note is that being exposed to information is not the same as processing the information (mentally). In this article exposure to information includes processing the information and subsequently using this information in deciding whether or not to engage in futures trading. The individual transfer rate α is the speed adjustment rate; it represents the part of the customers that have not yet been exposed to information regarding the new futures contract in this period, but will be exposed in the next period. This transfer rate is dependent on the relevance of the service offered by the new futures contract. If the service is relevant for the potential customer, we might expect that the potential customer processes the information. The relevance of the service might depend on the hedging effectiveness, liquidity, and transaction costs of the futures exchange (Pennings and Meulenberg, 1997; Pennings et al., 1998).

The maximum numbers of customers who would be exposed to the information is determined by the number of brokers who have disseminated the information regarding the new futures contract. Assume that each such broker reveals the information to an additional ϕ customer, as expressed in Equation 3,

$$\overline{C}(t) = \phi(CI)B(t) \quad (3)$$

where ϕ is the rate of transfer between brokers and customers

Table 1. Controllable Instruments of the Futures Exchange

Controllable Instruments	Activities of the Futures Exchange
B	Seat policy of the exchange, only allowing the most motivated brokers on the floor, this will increase the number of brokers who are willing to disseminate high quality information to potential customers, hence increase $\overline{B}$.
C	Increase of network of brokers.
α	Increase of promotion and increase of the quality of the service provided, for example, increase of hedging effectiveness and decrease of transaction costs, will increase the customers' individual transfer rate.
λ	Incentive measures for brokers, rewarding good performance, will increase brokers' individual transfer rate.
ϕ	Training of brokers regarding the benefits of the new futures contract will increase ϕ.

that can be influenced by the controllable instruments of the exchange. Equation 3 shows the relation between brokers who disseminate the information and the customers.

Using Equations 1–3, the solution of the differential equation for the information dissemination process yields, (Equation 4)

$$C(t) = \phi(CI)\bar{B}(CI)(1 - e^{-\alpha(CI)t}) + \frac{\phi(CI)\alpha(CI)(\bar{B}(CI) - B_0)}{\alpha(CI) - \lambda(CI)}(e^{-\alpha(CI)t} - e^{-\lambda(CI)t}) \quad (4)$$

where B_0 is the initial number of brokers that disseminated the information.

This model is able to provide insight into the information dissemination process and hence in the adoption process of the futures contract innovation and can therefore contribute to the explanation of the success or failure of new futures contracts. The model is an S-shaped curve. The futures exchange management will be interested to use their controllable instruments in such a way that the S-curve reaches the maximum within a short period. The model consists of two parts. The first part

$$\phi(CI)\bar{B}(CI)(1 - e^{-\alpha(CI)t})$$

shows the information dissemination process if brokers had no influence on the process. If this were the only component of Equation 4, the resulting evolution of information exposure to the potential customer would be an exponential curve, always increasing at a decreasing rate. However, in the case of futures contracts the brokers play an important role, which is captured by the second part:

$$\frac{\phi(CI)\alpha(CI)(\bar{B}(CI) - B_0)}{\alpha(CI) - \lambda(CI)}(e^{-\alpha(CI)t} - e^{-\lambda(CI)t})$$

This part shows the influence of brokers on the information dissemination process and causes the function to be S-shaped. Thus, the second part of Equation 4 can be considered a transient term, which initially diminishes what otherwise would be an exponential pattern of potential customers being exposed to information regarding the new futures contract (Jones and Ritz, 1991).

Now the futures exchange management has five instruments, represented by the parameters of the model (as shown in Table 1), in order to maximize the model, i.e., to reach the maximum information dissemination within a short period. This means that the S-shaped curve has to be reshaped toward an exponential curve, which causes the maximum to be reached in the shortest possible time, i.e., the second part of Equation 4 will lose influence in favor of the first part.

From Table 1, we can conclude that the information dissemination process of new futures and thus the diffusion of futures contract innovations is not only dependent on the variables thoroughly investigated in financial literature, but also on the marketing mix elements promotion and distribution, embodied in this article by the information dissemination process. This has been recognized by the Warenterminbörse Hannover (WTB) in Germany. In 1998, this exchange will launch new futures contracts for wheat and hogs. Because of the fact that these contracts will be the first agricultural futures contracts in Germany, i.e., the potential customer is confronted with a relatively long (psychological) distance to the futures exchange, the futures exchange management puts a lot of effort into disseminating information about their new futures, using the activities as described in Table 1 to reach a large share of both motivated brokers and customers.

Further research that will empirically identify the parameters of the model and incorporate the model into the existing ones from the financial literature should prove an interesting avenue to explore in the future.

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