AN ECONOMIC ANALYSIS OF DUAL TRADING

by

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Abstract

Dual trading is said to occur when an entity sometimes trades as a broker for customers, and at other times trades for its own account. Dual trading is quite pervasive throughout the United States securities and futures markets as well as in financial and commodity markets throughout the world. The pervasiveness of dual trading is due to the fact that many of the skills and facilities required to be a good broker are also necessary to be a good trader. Dual trading increases the supply of both brokers and floor traders because a dual trader can earn income from two activities to cover the costs of training, an Exchange seat, and time spent on the floor. He has less idle time and facilities when he can switch from the activity in low demand to the activity in high demand.

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1. Executive Summary

Dual trading is said to occur when an entity sometimes trades as a broker for customers, and at other times trades for its own account. Dual trading is quite pervasive throughout the United States securities and futures markets as well as in financial and commodity markets throughout the world. The pervasiveness of dual trading is due to the fact that many of the skills and facilities required to be a good broker are also necessary to be a good trader. Dual trading increases the supply of both brokers and floor traders because a dual trader can earn income from two activities to cover the costs of training, an Exchange seat, and time spent on the floor. He has less idle time and facilities when he can switch from the activity in low demand to the activity in high demand.

Dual trading has both a direct and an indirect effect on the quality of customer services. The direct effect is an increase in the quality and quantity of brokers. The fact that dual trading increases the supply of brokers means the customer has more brokers to choose from and at a lower price. Furthermore, using a broker who is a good trader means higher quality executions for customers.

The indirect effect derives from the increase in the liquidity of the market caused by the increase in the number of market makers. Parties who trade for their own account by buying at a low price and selling at a high price serve a market making function. Thus the ability for an entity to use its facilities

for proprietary trading results in an increased presence of market makers on the floor at times when their services are most needed. More traders standing ready to trade make for a more liquid market with smoother price changes.

In order to aid in a comparative analysis of dual trading I distinguish two types of dual trading. The first type, called simultaneous dual trading occurs when a firm trades as a principal for its own account, and an agent for its customer in the same transaction. This type of dual trading is prevalent in securities markets, currency and interest rate swap markets, and the fixed income market. Simultaneous dual trading does not take place in futures markets. The second type of dual trading called consecutive dual trading occurs when a firm trades for customers as an agent and at other times trades for its own account as a principal, but the firm does not do both in the same transaction. Consecutive dual trading occurs in futures markets, as well as in all of the markets in which there is simultaneous dual trading.

Dual trading plays a particularly important role in futures markets as contrasted with securities markets. The fact that all trading in futures takes place on the exchange floor and that spread trading is an important part of hedging strategies make the skills of a trader more necessary for a good futures broker. The immediacy required by the futures market makes liquidity more important, and therefore makes a larger supply of market makers more critical.

There are three types of brokerage services the customer

needs. The first service ("search") involves searching for the parties who are interested in being on the other side of the trade (i.e., the contra-party). The second service ("timing") involves obtaining and processing information to determine how long to wait for the arrival of the most advantageous contra-party while being exposed to the risk of an adverse price move. The third service ("bargaining") involves actively bargaining among available contra-parties to obtain the best price.

A securities broker can use his skills and sales force to prearrange trades "upstairs". Upstairs search is often an effective substitute for the downstairs working of an order where "timing" and "bargaining" skills are needed. A futures broker cannot prearrange trades upstairs. The brokerage firm cannot substitute "search" skills for trading skills. The order must be worked on the Exchange floor. The floor broker must have the ability to trade in such a way on the floor of the Exchange that he brings the other side of the trade to the floor at a good price for his customer. Therefore floor trading skills are relatively more important in the futures market than in the securities market.

Further, much futures trading involves "spreads" where a customer wants to buy and sell two (or more) contracts simultaneously for a guaranteed net price. The customer's broker can execute the spread by trading with a "local" on the floor, or the broker can execute the individual "legs" of the spread consecutively. The latter will be in the best interest of his

customer if the broker is a skilled trader, since, by trading each leg himself, the broker avoids paying the local a premium for the risk in trading the spread. Such spread trading is inherently risky to a broker, since after he executes one leg of the spread his customer can hold him to a price for the other leg of the spread, which the broker may find impossible to achieve if the price moves after he does the first leg. This aspect of futures trades as well as the relatively higher underlying price volatility in many futures contracts increase the trading skills burden on a futures floor broker relative to that of a securities floor broker.

Futures trading customers often have a high demand for immediacy because they are trading to hedge an underlying spot market position. The fact that immediacy of trade execution is extremely important to futures customers implies that they will have a greater demand for market makers than will be the case in markets where the cost of delayed execution is smaller. A commodity hedger bears great risk if he does not do his futures trade immediately. This risk may force him to trade using a "market" order, for example to sell immediately to the highest bidder currently available. If there are few market makers then he will receive a relatively low price, i.e., his trade will have a high market impact cost. Thus futures markets have a great demand for traders who in effect serve a market making function. The institution of dual trading permits this demand to be met at low cost.

Dual trading increases the supply of the types of customer services which are relatively most demanded by futures customers. Dual trading is prevalent in the securities market, both on the floor and off the trading floor. Institutional securities trades are often prearranged off of the floor, and this lessens the burden of securities floor brokers. It would be quite peculiar to eliminate dual trading for futures and maintain it for securities where the dual trading by floor brokers is less important. The elimination of dual trading from futures markets will harm customers by reducing the quality of brokers who do customer business. The best traders will trade for their own account, leaving customers with brokers who are less skilled traders. By preventing traders from acting as brokers, the elimination of dual trading will reduce the number of floor traders, and thus reduce market liquidity. Foreign markets will gain an advantage over US markets causing large customers to leave US markets which will lose liquidity. Therefore small customers, unable to trade overseas, will be most adversely affected by the loss of liquidity in US markets. Spot markets, such as grains and the US treasury bond market will be adversely affected by the loss of liquidity in futures markets, and spot prices will become more volatile. Finally, customers will lose the freedom of choice they now have to pick either a broker who also trades for his own account, or a broker who trades exclusively for customers.

2. Introduction

Dual trading is said to occur when an entity sometimes trades as a broker for customers, and at other times trades for its own account. This paper explores the economic function of dual trading, and proposes methods for calculating its impact on market liquidity and the quality of customer brokerage services. A later paper will implement those methods on actual trading data.

The structure of this paper is as follows:

Section 3 provides some general background on the organization of markets and trading. It will be seen that dual trading is pervasive in the United States securities and futures markets, though futures markets can be distinguished from securities markets by the fact that dual trading is permitted off the trading floor in securities while it is prohibited for futures. The Appendix provides a summary of the extent to which dual trading exists on markets throughout the world.

Section 4 provides an economic analysis of the determinants of the effectiveness of markets. It examines the demand for, and the supply of various brokerage services. It also explains the determinants of market liquidity.

Section 5 shows how dual trading impacts on the ability of brokers to deliver the above services, and how dual trading impacts on market liquidity.

Section 6 applies the above analysis to determine the likely consequences of eliminating dual trading in futures markets.

Special attention is given to evaluating proposals to selectively eliminate dual trading in particular commodities or contract months.

Section 7 discuses various methods which can be used to compute the monetary benefits to customers from the existence of dual trading.

3. Customer Order Flow and Market Structure

Dual trading can best be understood by tracing the manner in which a customer order is executed. It is convenient to begin with a customer who wants to buy an "item". This item might be a futures contract, a listed security, a government bond, etc.

Discussion of Table 1

Table 1 presents the first part of the path which the order can traverse. Part A of the Table analyzes the order flow if the customer gives his order to a dealer, while Part B considers the case where the order goes to a broker. In Part A, the customer deals with a principal, while in Part B, the broker acts as the customer's agent.

Part A1 is the simplest case, where the customer trades directly with the dealer. This type of trade is characteristic of the fixed income market, for example US treasury bonds, municipal bonds, corporate bonds, etc. It is also the method by which the spot and forward market in foreign exchange, and interest rate swaps operate. In such markets, the customer trades directly with a dealer. As will be elaborated in the next section, the customer must engage in active search to find the dealer who is offering him the best price. He is not employing an agent to do the work for him.

Table 1

With Whom Does the Customer Initiate His Trade

A. Customer Uses a Dealer.

A1. The customer can trade directly with a dealer who sells to him from the dealer's inventory.

A2. The customer can trade directly with a dealer who obtains the item elsewhere.

A2a. The dealer could obtain the item from another dealer who has it in its inventory.

A2b. The dealer could obtain the item from another customer.

A2c. The dealer could obtain the item indirectly from another customer by obtaining it from a dealer who obtains it from another customer.

B. The customer can use a broker to find a buyer.

B1. The broker can find a seller on an Exchange.

B2. The broker can find a seller from its own customers.

C. The Customer uses Broker/Dealer Services.

The Broker/Dealer executes its customer's order by selling from its own account and by finding customers who want to sell.

Part A2 considers the case where the customer desires an item which the dealer does not have in his inventory. In such a case the dealer will attempt to obtain the item from another dealer, or from another customer. That is, the dealer is acting like a broker by engaging in efforts to obtain the item for his customer. Therefore even in pure dealer markets, brokerage services are provided. More importantly, it is impossible to distinguish trades made on behalf of a customer from trades made on the "brokers" own account. The broker/dealer almost always trades ahead of his customers in a pure dealer market. The broker/dealer must do so in order to obtain the item for his customer.

Part B of Table 1 considers the case where the customer uses a broker to obtain the item for him. The clearest example of this situation occurs with regard to futures contracts. A customer desiring to trade a futures contract, is prohibited by CFTC regulations from trading directly with a dealer off of the floor of an Exchange. The customer must engage the services of a broker to act as his agent. This is labelled B1 on Table 1.

A more complex situation is summarized by B2, where the broker can find a seller from among its own customers. An important example of this phenomenon occurs in the institutional trading of common stock. A customer who desires to purchase a large block of common stock may ask an NYSE member firm to attempt to find sellers. The member firm will utilize various information sources to locate existing holders of the stock who

might be sellers. The member firm will then bring both the buy and sell orders of its customers to the NYSE floor where the orders will be crossed.

Part C of Table 1 considers the case where the customer uses the firm to be simultaneously a broker and a dealer. This was already implicit in the "pure" dealer relationship described in Part A2, but it can be very explicit in the case of securities. Consider the example mentioned above where the NYSE member firm is putting together the purchase of a large block of stock for a customer. If the broker/dealer cannot find enough customers who want to sell, it might sell out of its own inventory, and thus takes part of the other side of its own customer's trade. It would then bring the whole trade to the NYSE floor for open outcry.

The above remarks indicate that securities are traded by firms that engage in a type of dual trading which I will refer to as simultaneous dual trading. That is, the firms are being both brokers and dealers at the same time for the same customer. It may be useful to contrast this with what I will call consecutive dual trading in which the firm sometimes trades as principal and sometimes trades as agent, but does not do both in a single transaction. Simultaneous dual trading occurs in the securities markets (including options) but does not occur in the futures markets.

A customer in the securities or futures industry will use a firm which does one or the other of the above types of dual

trading. The economics of why this is the case will be analyzed in the next two Sections. Here it suffices to note that just about every firm which accepts customer orders also trades for its own account; there are very few firms that trade only for their own account, or that trade only for customers. This is literally true in the dealer markets like the fixed income markets and the over the counter stock market (where the distinction between principal and agent trades does not exit), but it is also true for common stock and futures contracts.

Discussion of Table 2

Table 2 traces the next step followed by the customer's order under the assumption that it is not executed directly by the broker/dealer accepting the order. In particular, the order is traced through its execution on an Exchange. It is convenient to refer to the broker who first receives the customer order as the "upstairs broker". It is conceptually useful (and usually descriptively accurate) to visualize the upstairs broker transmitting the order "downstairs" to the trading floor of an Exchange, or transmitting it to a computerized "Exchange" (such as the NASDAQ "over the counter", or Instanet "markets"). The recipient of the order on the Exchange floor can be a pure "agent" on the Exchange floor who never trades as a principal (category A on Table 2), or it can be a floor broker who does both customer business and also trades for his own account as a principal (category B on Table 2).

Table 2

Tracing the Customer's Order On An Exchange

A. Customer's order handled by an AGENT on the Exchange floor.

A.1 Employee of the Exchange executes the customer's order.

A.2 Floor broker who specializes in trading for customers executes the customer's order.

B. Customer's order handled by a PRINCIPAL/AGENT on the Exchange floor.

B1. A broker/dealer handles the order.

B1a. The broker/dealer handles it as an agent.

B1b. The broker/dealer handles it as an agent and principal.

B2. A broker/trader handles the order as an agent.

B3. A broker/market maker handles the order.

B3a. He handles it as an agent.

B3b. He handles it as a principal.

The purest form of an "agent" who executes the customer's order on the Exchange floor is an employee of the Exchange who executes customer orders (category A1 in Table 2). This occurs on many foreign Exchanges (such as the Tokyo Stock Exchange), as well as on the Chicago Board Options Exchange (CBOE) where an Exchange employee maintains a limit order book for customer orders, and handles the execution of these orders when the market price reaches the level at which the customer indicated that he is interested in trading. Note that by "executing the customer order", I do not mean that he takes the other side of the trade. Rather, the agent follows the prescribed rules of the Exchange in an attempt to get the best price for the customer. This may involve announcing to the trading crowd that he has an order to fill, and then trading with the member of the trading crowd who offers the best price. The member of the trading crowd with whom the agent trades may himself be representing customers as an agent or he could be trading for himself as a principal.

Part A2 of Table 2 indicates a less extreme situation where a member of the Exchange decides to specialize in trading for customers on the floor, and essentially does no trading as a principal for its own account. Almost all Exchanges have individual members who have built a reputation as good brokers trading for customers, but who do little or no trading on their own account.

In contrast to the above situations where the customer order is handled by "agents", an enormous amount of floor brokerage is

effected by firms that are broker/dealers, broker traders, or broker/market makers. These categories appear in Section B of Table 2. An example of category B1 is a broker/dealer such as Merrill Lynch who handles a customer's stock trade on the NYSE Exchange floor. The Merrill broker can act as a pure agent (category B1a on Table 2) who buys the stock on the Exchange from another broker in an open outcry auction. In a more complex case, Merrill may be both a principal and an agent; selling to the customer partially from its own account and partially for other Merrill customers. For large institutional trades, the Merrill floor broker may be representing Merrill Lynch, and both buying and selling customers on the NYSE floor at the same time in the same trade. Merrill negotiates the trade secretly upstairs, and exposes the orders "downstairs" on the trading floor by offering out one side of the trade to whomever is present at the specialist post.

Categories B1a, and B1b indicate that the broker dealer may handle the order as an agent (not taking a part of the trade on its own account), or in contrast as in the above example, the firm may be acting simultaneously as a principal and an agent in executing the customer's order. In the situation where the broker/dealer acts as both a principal and an agent, it is engaging in what I call simultaneous dual trading. In the case where it executes this customer's order as an agent, it may be engaging in consecutive dual trading, since at some other time it may be trading in the stock as a principal.

In order to further emphasize the distinction between these types of dual trading, Table 2 contains the additional category, B2 of "broker/trader". A broker/trader is a floor trader who sometimes trades on his own account as principal, and at other times trades as a broker for customers. He is not a "dealer" in that he does not take the other side of customer trades. He is a consecutive dual trader but not a simultaneous dual trader. As noted earlier, consecutive dual trading is permitted on futures markets, but simultaneous dual trading is not permitted. In contrast, both types of dual trading occur on the floor of securities Exchanges.

The final category of Table 2, labelled B3, concerns the situation where a designated market maker handles the customer order. For example, on the NYSE, the upstairs broker may give the "specialist" (who is a broker's broker, and a market maker on the NYSE floor) a customer order. The specialist may handle this order as an agent and find the other side of the trade among other floor brokers (category B3a in Table 2). On the other hand, the specialist may act as a principal, and take the other side of the trade on its own account. Thus the specialist can engage in simultaneous dual trading.

Summary

A customer's order for securities or futures will usually be handled by firms engaged in dual trading. This is the case at the "upstairs" level where the customer order arrives at a

securities broker/dealer or Futures Commission Merchant (FCM), each of whom trades for its own account as well as for customers. However, it is also the case at the "downstairs" level on the trading floor where the customer's order is handled by a specialist, broker/dealer, or broker/trader, each of whom engages in some form of dual trading.

It should not be surprising that firms which develop facilities for trading on their own account will also be able to provide high quality executions for customers. In the next Section, I explain why it is the case that good executions of customer orders often involve substantial trading skills.

4. The Determinants of Market Liquidity and Brokerage Services

4A. Brokerage Services

Consider a customer who desires to trade. He may desire "dealer" and/or "brokerage" services. We will see below that it can sometimes be difficult to distinguish dealer from brokerage services. There are three types of "brokerage" services the customer needs. The first service ("search") involves searching for the parties who are interested in being on the other side of the trade (i.e., the contra-party). The second service ("timing") involves obtaining and processing information to determine how long to wait for the arrival of the most advantageous contra-party while being exposed to the risk of an adverse price move. The third service ("bargaining") involves actively bargaining among available contra-parties to obtain the best price.

The above three activities (or services) are performed in obvious ways in some markets, but in a subtle manner in other markets. For example, the sale of a house often requires the use of a broker who advertises the house and searches for buyers. The owner of the house must decide whether to accept the first offer he receives or delay the sale until other potential buyers (hopefully willing to pay more than the current buyer) are found. Finally, the seller must bargain among the buyers to try to obtain the highest price.

Brokerage Services For Institutional Securities Customers

The institutional securities market provides another example

of brokerage services. A portfolio manager may desire to hedge his portfolio of stocks buy purchasing put options. He might want 10,000 SPX index options. These options trade on the CBOE, and the typical trading volume in the particular option of interest might be 1,000 options per day, and the quotation on the option may show 100 options offered at $3.00 per option. The portfolio manager will call the index products department of a broker/dealer. The broker will call its trader on the Exchange floor to ascertain at what price 10,000 options can be purchased on the floor. Typically, the price will be higher than the $3.00 shown on the quotation screen at which only 100 options were offered for sale. At this point, the broker will use its knowledge of its other customers' trading desires to search for a better price than is being offered on the floor. It may find customers willing to sell 9,000 options at $3.00. It may then "accommodate" the customer by selling 900 options from its own account. The broker will then bring the order down to the floor of the CBOE and bid for 10,000 options for a price of $3.00. Assuming that the crowd on the trading floor is still only offering 100 options, the broker will sell 900 from its own account, and 9,000 from its other customers, effectively crossing the order on the Exchange floor. Note that the broker engaged in a dealer function in order to better provide brokerage services to its customer.

It should be emphasized that the "search" function is intimately related to the "timing" function. The customer is

subject to the risk that the market will move against him while he tries to get a better price than is currently offered on the Exchange for the large number of options which he is attempting to buy. He also bears this risk, if he and the broker engage in bargaining to attempt to get a higher price. It is crucial that his broker have a "feel" for the potential price movements, and also knowledge about the prices at which his own customers are willing to sell. If the broker acts as a dealer by selling some options from his own account to accommodate the customer, then he must also have the same kinds of knowledge and ability. To summarize, the institutional brokerage function will be performed most effectively by a firm with the skills and knowledge of a trader. For trades which cannot simply be sent to the Exchange for immediate execution (i.e., as a "market" order), the broker is not merely a clerk. He must engage in all of the activities, and have all of the skills of a trader.

The search function is even more important for the market in individual common stock. A buyer of a large block of common stock must often find sellers off of the Exchange floor. Here again the information brokers have about sellers will be crucial. First, the brokers can review public documents which provide the names of large institutional holders of the stock. The broker can then solicit selling interest from them. Second, the brokerage firm can call upon the knowledge of its sales force which stays in day-to-day contact with investors, and thus comes to know something about who is willing to sell and at what price.

In the securities market a broker can directly contact potential trading partners who are not present on the Exchange floor and he is thereby able to gain information for his customer about the costs and benefits of delay. The fact that it is possible and necessary to gain off-floor information distinguishes the activities and necessary skills of securities brokers, from futures brokers. Though any floor broker can communicate with his upstairs office, futures markets are distinguished from securities markets by the fact that price discovery occurs exclusively on the trading floor for futures, while price discovery occurs upstairs as well as downstairs in the securities market. Unlike securities brokers, futures brokers cannot secretly prearrange trades upstairs, and thus the futures floor broker must trade in such a way as to bring the other side down to the trading floor, as is analyzed below.

Brokerage Services for Futures Customers.

Consider a grain storage firm which desires to hedge its position. The broker who receives this order will transmit it to the futures Exchange. He is prohibited by regulations from working the order "upstairs". The broker who executes the trade on the trading floor must carry the full burden of "search", "timing", and "bargaining". For example, if the order is to sell 3 million bushels at a time when only 100,000 bushels are being bid for $3.00, then the floor broker must trade in such a way that he induces buyers who may be "upstairs" to send orders to

the floor. This is an implicit form of "search". The broker could simply announce that he has 3 million to sell, and hope that the other floor brokers will call potential customers "upstairs" to induce buying. However, unlike securities, commodity futures brokers may have less information about their customers underlying interest in particular positions. This information is often proprietary and strongly related to the underlying business operation of the commodities customer. Thus, the only effect of announcing that he has 3 million bushels to sell will be to cause a large fall in price which will give the customer a poor (if any) execution.

The situation is further complicated by the fact that the customer may be bearing extreme risk while the broker delays the execution of the trade in an attempt to get a better price. The fact that futures customers are often hedging underlying commodity or securities positions means that they can face greater risk from delayed executions than a securities customer. In the above example, the grain storage firm's overall profitability will suffer greatly if grain prices fall before it can hedge its inventory.

The floor broker can sell some futures, perhaps driving the price down a little. The fall in price communicates "through prices" that the market needs buyers. The prices at which trades occur on the Exchange are communicated to the world. A customer (off of the Exchange floor) who was not interested in buying at the previous price may become interested in buying after seeing

trades at lower prices. The floor broker is thus using his trading to indirectly communicate with potential customers who are off of the trading floor. This is an alternative mechanism to that which occurs in the trading of securities where much communication occurs upstairs on the telephone between brokers and their customers.

The futures broker attempting to sell 3 million bushels will sometimes find it necessary to disguise the true intention and size of his order. No buyer wants to buy from the broker just before the broker sells 2 million bushels. A broker who keeps selling in an attempt to generate buying interest can actually cause buying interest to disappear. For this reason a broker may find it advantageous to occasional intersperse his customer sell orders with buy orders for his personal account. This helps disguise his intentions. The effective execution of the customer order involves a subtle interplay between communicating a desire to sell in an attempt to attract buyers, while disguising the full size of the order.

The floor broker on the futures market can only bargain with those present on the floor. At each stage of the execution of his customer's order he can accept the bids currently being made, or he can make a counter-offer. He bargains through open outcry with the trading crowd on the Exchange floor. This is in contrast with the securities market, where a floor broker can seek better bids "upstairs".

The above remarks indicate that the floor broker on the

futures market must have all of skills of a good trader in order to give his customer a high quality execution. A person who trades for his own account on the Exchange floor makes money by being able to judge where the market is going to move in the short run. A floor broker's greatest fear is that the market will move away from him (for example, that the existing bids will disappear and be replaced by lower bids) while he delays execution of his customer's order in an attempt to get him a better price. The ability to judge short run market movements is thus at the essence of being a good floor broker and being a good trader.

Summary

The distinct characteristics of a futures market imply that a futures broker must behave like, and have all the skills of a trader. This is much more the case than in securities markets where a broker can effect a good execution for his customer by the use of a its upstairs sales force which brings both sides of the trade together. The key skills if the floor trader are "timing" and "bargaining" - these are used in place of upstairs "search" to obtain a contra party for his customer at the best price.

4B. The Determinants of Market Liquidity

The quality of brokerage services is only one of the determinants of the quality of order execution. A customer can have an excellent broker, but if the market in which the broker

executes the trade is illiquid, then it will be very difficult to get a good execution. Therefore an understanding of the quality of customer order execution requires an understanding of the determinants of market liquidity.

Clearly, markets serve the function of enabling parties to engage in trade. However this is not the only function of markets. Markets serve a price discovery function: providing and aggregating information across both active and inactive market participants.

These points can be clarified by temporarily making the following artificial distinctions. Divide the potential market participants into three groups: brokers, market makers and final customers. Pure brokers are agents, who by definition, never take a position in the instrument being traded, and I have discussed them extensively in the previous section. Market makers, by definition, take a position only for short term trading profits, i.e., the average return from a position held for the long run will not reward them for the risk of capital committed over the long run relative to other uses they have for their capital. Final customers, by definition, are willing to accept the average returns for the risk of their positions over the long run, and are <u>trading</u> perhaps with great current immediacy to achieve that <u>position</u>. This division of actors is obviously artificial, but it will help to explain some important

concepts.[1]

Final Customers

The final customer could be a bond dealer who sells bond futures to hedge a portfolio of bonds in its inventory. The customer faces the risk that bond prices will fall before he is able to sell the bonds in his inventory. He insures against this risk by selling bond futures. He bears the risk of a price fall while his broker attempts to fill his order on the Exchange floor. This customer may be willing to accept no return on average from being short the bond future. He is willing to take a zero or even negative expected return position because of the insurance provided by the position. In particular, if bond prices rise, then his losses on the bond futures are offset by gains on the bond inventory.

In the securities market, the final customer might be a money manager who wants to add a particular industry group to its portfolio of common stock. This type of customer demands less immediacy of order execution than does the futures customer who is trading to hedge a position. The money manager does not hold a large group of assets that are necessarily going to enjoy a price move in the opposite direction from the price move in the stocks that are being purchased. Though there may be some diversification effect leading to a risk reduction from a

[1] See Sanford Grossman and Merton Miller, "Liquidity and Market Structure," The Journal of Finance, July 1988, Vol. 43, No. 3, p.617-37.

securities trade, it tends to be much smaller than the risk reduction effected by a commodity futures hedge.

Market Makers

The market maker could be a dealer buying at a price from which it expects high abnormal returns. The market maker buys the instrument in situations when the price is temporarily low, while the final customer buys the instrument because (a) the long run average return is high relative to its risk, or (b) the reduction in risk of his overall portfolio compensates for the low expected return of buying the instrument. More precisely, the market maker takes positions because of the variability in the expected return (buying when expected returns are high and selling when expected returns are low), while the final customer takes positions based upon the long run average expected return. Many trading institutions who are usually final customers in the above definition, will function as market makers when there are clear variations in expected returns. For example an S&P 500 Index Fund may substitute futures for stock when futures are trading at a discount relative to stock. The fund is taking a position in the spread because the spread has a temporarily high (risk adjusted) expected return.

To better understand the role of market makers, consider the following example. For reasons unrelated to information about future payoffs, a group of equity holders desires to sell a substantial block of equity. Assume that a negligible price fall

would be required to induce the rest of the economy to increase its equity holding by the amount that is to be sold. That is, if final buyers could be matched with final sellers, then there would be no price impact of the trade. However, the potential final buyers are dispersed throughout the economy (if not the world), and are not in constant communication with the market. A market maker will buy the offered stock into his inventory to bridge the time interval between the arrival of the sellers and buyers. He bears risk while the stock is in his inventory, and hence must, on average enjoy a reward.

A market maker (or final customer, behaving like a market maker) buys when expected returns are high (relative to the normal risk adjusted return for the asset), and sells when expected returns are low. A large unanticipated flow of sell orders which occurs in the absence of information about future payoffs, will lower price and raise expected returns (in the absence of market maker intervention). It is the fall in price, in the absence of news, which signals to the market makers (and eventually the final buyers) that their intervention is necessary. The price move is a crucial signal for allocating resources. The buying activity of market makers trying to take advantage of the high expected returns will diminish the size of the price fall, and thus stabilize the market.

Market makers engage in exactly the same activities in the futures market. The only important distinction for our purposes is that the activity only occurs on the Exchange trading floor in

the case of futures, while it can also occur off of the Exchange floor in the case of securities. Therefore the market makers on the floor of a futures Exchange are the only source of liquidity for a futures customer, while there are also off-floor sources of liquidity for securities customers.

Markets as Information Conveyors

The ideal market would be one in which everyone in the economy could costlessly, effortlessly, and continuously participate. In such an ideal market there would be no brokers (and they surely would disagree with this definition of ideal), because there would be no search for contra-parties. There would also be no market makers, since no one is needed to bridge the gap in time between the arrival of buyers and sellers at the market; all potential buyers and sellers are always costlessly and effortlessly present. Unfortunately, discussions of ideal markets can be sterile, as I feel are discussions about ideal worlds without wars, earthquakes, bad weather, or government regulators.

A major factor which causes markets to deviate from the ideal is the fact that continuous participation and information retrieval and evaluation is neither effortless nor costless. If one party wants to sell, this information is not costlessly disseminated to, and processed by all potential buyers. More importantly no single person is being made aware of the collective demand and supply schedules of the rest of the market.

The fact that we are not all part of this fantastic telepathic network creates the need for information to be provided by markets and broker/dealers, as well as the need for market makers.

Market makers take a position in the instrument, and bridge the gap in time between the arrival of the final sellers and buyers. In the absence of a large supply of market makers, a customer order will have a large "market impact" cost of execution. This cost is the fall in price caused by a sellers demand for immediate order execution, and the rise in price caused by a buyers demand for immediate order execution.

The market impact of a trade clearly depends on how the trade is executed. There are two reasons for this. First, orders which demand immediate execution convey information to other participants. Market participants know that one reason that a trader demands immediate execution is that he has information, they thus offer to trade at adverse prices with the trader who demands immediacy. Of course, immediacy may be demanded for other reasons, such as a liquidity or hedging need. The weight put on the information motivation for the trade will determine the size of the market impact of the trade. The market impact of a trade depends on the method by which it is executed for a second reason, namely if a final customer is not present to take the other side of the trade, then someone must earn a return from taking the other side of the order into his inventory. This return is to cover the risks and other costs of maintaining an

inventory, and the market maker earns this return by taking the other side of the trade at an adverse price to the customer. This adverse price move is the market impact of the trade.

The greater are the number of market makers, the smaller will be the market impact of a given customer order. The impact is smaller not only because of the increased competition, but also because each market maker can take a smaller fraction of the customer's order into his inventory when there are more market makers. The smaller is the position that a market maker is asked to take, the more willing he is to trade at a price which does not disadvantage the customer (for example., a market maker will be willing to buy at a higher price, the less he is asked to buy, since he has a smaller inventory and thus less risk).

The number of market makers available to take the other side of a customers trade will be determined by the costs and benefits of market maker activities. The costs of market making involve

(a) the cost of capital to carry (or margin) positions;

(b) the costs of training;

(c) the cost of the time spent on the trading floor.

Anything which reduces the cost of market making will raise market liquidity, and lower the market impact cost to customers of effecting their trades.

Summary

The quality of execution available to a customer will depend on the quality of the brokerage services provided to him as well

as the underlying liquidity of the market in which he trades. The floor brokerage services needed by a futures customer involve the broker in the use of trading techniques which only a skilled trader will have mastered. The (1) inability to prearrange trades "upstairs" for futures customers and (2) the great demand for immediacy inherent in a hedge transaction, imply that floor trading skills are relatively more important to the typical futures customer than to the typical securities customer. Further, the above two characteristics of futures trading also imply that the liquidity of the Exchange floor will be relatively more important for futures than for securities customers. Anything which can reduce the cost of market making will thus tend to be relatively very important for achieving quality futures trade executions for customers.

5. Dual Trading, Market Liquidity, and the Quality of Brokerage

The economics of brokerage services and market liquidity outlined in Section 4 provide the basis for understanding the pervasiveness of dual trading discussed in Section 3.

The previous discussion showed that the skills of timing and bargaining are important both for the broker in getting the best execution for his customer and for a market maker trading for his own account. It should be added that a broker who trades for customers bears risk. This risk occurs because he agrees to execute limit orders, spread orders, and stop loss orders for customers. If he fails to execute these orders as agreed then he will have to make up the losses to his customer.[2] The institution of dual trading permits an individual to use his time, skills and risk bearing capacity for two activities, namely market making and customer brokerage. In order to engage in trading, a person must bear the costs of training, an Exchange seat, and the time spent on the trading floor. A system in which the trader can earn a return from these costs by spreading his talent and energies over two activities will clearly encourage more people to be engaged in the activities. Thus the institution of dual trading increases both the supply of market makers and of brokers.

Therefore dual trading has both a direct and an indirect

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[2] For example, if the broker accepted a limit order to buy at a price of $3 or below, and a trade occurs at $2.90 afterwards, and then all trades occur at prices above $3.00, then the broker will be held accountable by his customer for a price between $2.90 and $3.00.

effect on the quality of customer services. The direct effect is that it increases the pool of brokers available to customers who are skilled at providing the services of search, timing, and bargaining. The indirect effect is that it increases the supply of market makers, so that even if the customer's order is not executed by a dual trader, his broker will be able to provide the above services at lower cost because of the increased liquidity provided by the increased number of market makers.

The Importance of Dual Trading in Futures Markets

Dual trading has a particularly important function in futures markets in the United States for three reasons. First, various regulations make the Exchange floor of the futures market the only focal point of trade. Second, the nature of many types of futures trades would make it very difficult to search for contra-parties "upstairs", even if such activities were permitted. Finally, the high degree of immediacy demanded by many futures customers both increases the advantages of using a skilled floor trader as a broker, and also the advantages of having a liquid market on the Exchange floor. These points are elaborated upon below.

The Exchange Floor is a Focal Point In Futures Markets

It is a violation of CFTC regulations for trades to be arranged off of the trading floor. Hence the only source of liquidity to customers is the liquidity provided on the Exchange

floor. This should be distinguished from the situation which prevails in securities markets. A securities customer who, for example, wants to sell a large block of stock can use the services of "upstairs" brokers to search for buyers off of the Exchange floor. Eventually, the broker will find buyers and possibly commit its own capital as a buyer, and bring the trade down to the floor of the stock Exchange to be crossed. The "upstairs" securities broker is able to search for buyers without revealing to the world how much its customer is interested in selling. Further, he can provide information to his customer regarding what price can be obtained for the block. In a futures market this type of information can only be obtained by careful trading. <u>There is a greater burden put on futures floor brokers than is put on securities floor brokers</u>. Performing the tasks of timing and bargaining are more difficult on futures markets than on securities markets because the absence of upstairs search places all the burden on floor brokers. In particular, the futures broker must extract information through his trading that would have been extracted by the securities broker through telephone calls.

Another important consequence of the fact that the futures pit is the focal point of trade is that potential buyers and sellers do not have to search among upstairs brokers for the best price; they need only look to the trading floor. Though a futures floor broker must work hard to communicate his clients need to the world through trading, this has the effect of

enhancing the value to the world of the observed prices at which trades occur on the futures floor, i.e., price discovery takes place on the trading floor. This is in contrast to the securities market where much institutional price discovery takes place in secret upstairs. If a trade is negotiated upstairs, then this is done in secret, and the rest of the world is not informed until the trade is brought down to the Exchange floor to be crossed.

The fact that futures markets put a heavy burden on floor brokers means that there is a greater need for skilled floor traders in such markets. The skills needed by a floor broker are very similar to the skills needed by someone trading for his own account. The ability to sometimes work as a broker and other times work as a trader increases the rewards that a skilled trader can earn, and hence increases the number of such traders present on the Exchange floor.

It should be emphasized that the CFTC regulations prohibiting "upstairs" trading are not the only reason that a futures Exchange tends to be more of a focal point of trade than is the case for a stock Exchange. The fact that a futures customer's hedging needs are intimately related to secret aspects of its business will make it relatively more difficult for brokers to know where to find contra-parties to a futures trade, than it is to find contra-parties to a securities trade. A grain exporter who has just signed an agreement to deliver wheat to a foreign country, and may thus have a great desire to have a long

futures position, will not tend to publicize this fact. This is in contrast to a money manager who desires to add an industry group to its portfolio over the next few weeks. The latter is likely to be revealed to securities brokers. Thus it is more likely that securities brokers know where to look for the "buy" side of the trade in the above securities example, than that they could discover that the grain exporter is a potential buyer in the commodity example. The contrast is even more extreme when a broker needs to find the sell side. In the case of common stock, the broker can find all large institutional holders of the stock (from form 13F filling made with the SEC) and solicit a sale from them. No corresponding holders of short commodity positions need exist. The very fact that there are "shares outstanding" of equities is in contrast to futures where "short" and "long" positions must be created by customers. The existence of the shares outstanding creates shareholders (i.e., potential sellers) who can be directly contacted by brokers, in contrast to futures where all potential creators of "short" positions would have to be contacted in an attempt to find a seller.

Futures Customers Require Brokers Who are Traders

Many futures orders are for "spread" trades. A spread trade involves selling one contract and buying another contract. For example a customer currently holding a short Treasury bond contract for June expiration may want to buy the June contract and simultaneously sell the September contract, i.e., he wants to

buy the June/September spread. This type of trade is very common because, unlike common stock, futures contracts expire. A customer who wants to maintain his hedged position must "roll" his position into the next contract month (by trading out of his position in the contract which is about to expire, and simultaneously trading into the same position in a contract with a later expiration). Note that the customer will give the order to the broker as a single spread trade, rather than as two separate trades because the customer does not want to bear the risk of a price move while only one "leg" of the trade is being executed.

The customer's broker has two choices in executing a spread trade. He can trade with a market maker who sells him the spread at a specified price, or he can "leg" the trade himself by, for example, selling the September contract first, and then waiting for a propitious time to buy the June contract. For example, suppose the customer gave him the order to buy the spread for 3/32 which means to pay 3/32 more for the June contract than he receives from selling the September contract. There may be a market maker on the floor who is willing to sell the spread for 3/32. However, the customer's broker sees that the June contract is being offered at 96-07, and the September contract is bid for 96-04 and offered at 96-06.[3] So he decides to buy the June for 96-07 immediately, and offer the September at 96-05, with the hope of saving his customer 1/32. If he is right in his judgment

[3] Note that 96-06 means 96 and 6/32.

of the market then he will be able to sell the September at 96-05, but if he is wrong then he may have to sell at 96-04 or below. If the market moves against him before he can sell the September at 96-04, then he will have to pay his customer for the difference between 96-04 and the price he executes the trade.

Spread trading is inherently risky.[4] A good broker is a trader skilled at taking the types of risk described above. This very specialized trading skill is used by a dual trader to trade for his own account with the brokers for other customers who do not want the risks, or to trade for his own customers. A particular spread trader may go through periods where he has no customer business, but is able to support himself by trading for his own account. When his customers need him he is able to stop trading for his own account and provide them with spread brokerage services. The institution of dual trading thus puts more spread traders on the Exchange floor than would otherwise be present because it gives each trader more business in which he can earn a return from his skills, for the time he spends on the floor, and for the cost of his Exchange membership. It also permits the broker to use his risk bearing capacity to both cover the risk of trading on his own account as a market maker, and also the risk of being unable to fill customer limit and stop-loss orders.

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[4] A broker can avoid this risk by trading the spread directly with a local, however then the customer is indirectly paying someone else to bear the risk, and in effect using two people to execute the trade rather than one person.

Dual Trading and Liquidity on Futures Markets.

The above remarks indicate that customers will receive more skilled brokerage because of dual trading. However, there is an indirect benefit to customers from dual trading which they receive even if they use a broker who never dual trades. This benefit is the fact that dual trading will increase the number of market makers and especially spread market makers. The number of market makers is increased from dual trading for exactly the same reason that it increases the number of skilled brokers. The ability to engage in customer brokerage enhances the value of an Exchange membership to a market maker. The market maker knows that after he has committed as much of his own capital that he can to trading on his own account, then there is still another way to earn income from his presence on the trading floor, namely customer brokerage. This "second income" can be a substantial inducement to be a market maker, which significantly lowers the effective cost.

The fact that immediacy of trade execution is extremely important to futures customers implies that they will have a greater demand for market makers than will be the case in markets where the cost of delayed execution is smaller. A commodity hedger bears great risk if he does not do his futures trade immediately. This risk may force him to trade using a "market" order, for example to sell immediately to the highest bidder currently available. If there are few market makers then he will

receive a relatively low price, i.e., his trade will have a high market impact cost. Thus futures markets have a great demand for market makers who accommodate immediacy of order execution. The institution of dual trading permits this demand to be met at low cost.

There is also great variability in the customer demand for both brokerage and market making services. The variability in price volatility which is common in futures markets creates both a great need for reserve brokerage capacity (as seen, for example, in the summer of 1988 where grain price volatility and trading volume rose after some slow years) and produces lulls during which it is hard for non-dual trading brokers to survive.

6. Preliminary Evaluation of Proposals to Restrict Dual Trading

A. Consequences of Eliminating Dual Trading

The fact that a broker trades for his own account and also trades for customers is a potential source of a conflict of interest. One major conflict of interest is that the broker may "front run" his customer order by trading on his own account before executing the customer's order. For example, a broker holding a large sell order for a customer might sell out of his own account first and thereby benefit from the price fall caused by the execution of the customer order. This potential abuse exists in both the securities markets and futures markets. It is a violation of NYSE rules for a member to trade ahead of its customer, and it is also a violation of CFTC regulations for a futures broker to trade ahead of its customer.

Though the elimination of dual trading may reduce the above conflict of interest, it will actually increase another type of conflict of interest. Front running is not the only source of conflict of interest between a broker and a customer. The broker gets paid for getting the trade executed. The customer wants an execution at a good price. The faster the broker can get the order executed, the sooner he can begin executing the next customer's order and earn another commission. The fact that a customer wants the broker to expend both time and effort to do the trade conflicts with the fact that the broker gets a commission on a particular trade independently of how hard he works the order. (Of course, the customer will not give repeat

business to a broker who he knows provides him with poor executions.) This conflict of interest is mitigated for a skilled broker/trader because it is easier for him to give his customer a good execution. It is also mitigated when there are many brokers (each, not overburdened with orders to be executed), and when a large supply of market makers are available giving good bids for large size orders.

Thus, the first consequence of eliminating dual trading will be to exacerbate the conflict of interest between a broker and his customer. We will show below that the elimination of dual trading will decrease the number of brokers, decrease the number of market makers, and decrease market liquidity. In times of heavy demand by customers for broker services, there will therefore be fewer brokers to handle the customer orders, and each order will be more difficult to execute because of the decrease in market liquidity. Since heavy demand by customers for brokers often occurs at the same time that market volatility rises, the elimination of dual trading will cause there to be: (a) fewer brokers to satisfy the increased demand for brokers, and (b) fewer locals trading as market makers to counteract the increased volatility. Broker/traders who are very skilled at trading will trade for their own account, while broker/traders who are somewhat less skilled will trade only for customers. In periods of heavy customer trading, these less skilled brokers will necessarily be under great pressure to quickly trade each order so that they can move on to the next order, thus maximizing

their total commission.

The analysis presented in Section 6 showed that there are four main benefits associated with dual trading:

(1) Customers receive brokerage services from skilled traders.

(2) The number of brokers is increased.

(3) The number of market makers is increased.

(4) The liquidity of the market is increased.

In addition to exacerbating the conflict of interest between brokers and customers, the elimination of dual trading will clearly lower all of the above benefits.

The Best Traders Will Not Do Customer Trades

The best traders are those individuals who have a comparative advantage at judging short run market moves. If these individuals must choose between executing customer trades or their own trades exclusively, then they will choose to trade for themselves. The most that a broker can make from a customer trade is the commission. If he is a good trader for customers, then he will get more commission business, but he cannot share in the profit from individual trades. The most skilled traders will not give up the unlimited profit from buying low and selling high which they obtain from their own trading, in order to get commissions from customers. These trading profits are often high on the same days when there is high price volatility and thus high demand by customers for skilled brokers.

We noted in Section 5 that the facts that futures trading is focused on the Exchange floor and that futures customers often

desire spread trades and trades characterized by great need for immediacy all combine to make a futures customer need relatively more skilled floor brokerage services than a securities customer. The elimination of dual trading from futures markets, while the maintenance of dual trading on securities markets would be eliminating the skilled floor brokers from the customers who have relatively the greatest need for their services.

The Number of Market Makers and of Brokers Will Decrease

The fact that an individual can engage in two activities to earn a return for the cost of an Exchange seat, the expenses of training, and the time spent on the Exchange floor will inevitably increase the supply of individuals who are broker/traders. Eliminating dual trading will lower the value of being on the floor for both activities. This is because an individual who now concentrates on being a broker can trade on his own account when his own brokerage business is light, and an individual who specializes in trading on his own account can switch to customer business when customers demand heavy brokerage services or when he has committed all of his capital to trading on his own account.

Dual trading creates a reserve group of potential brokers who can freely switch to customer business when the volume of customer orders rises. It also creates a reserve group of market makers who can add liquidity when customer orders threaten to have a large market impact.

Market Liquidity Will Be Reduced

The elimination of dual trading will reduce the risk capital made available by floor traders who act as market makers. This will increase bid ask spreads. It will decrease the liquidity provided in the periods when it is needed most, namely when there is an unanticipated inflow of customer orders. The inability of brokers to switch from customer business to trading for their own account will prevent them from taking the other side of the large inflow of orders. Therefore price movements will be exacerbated. Market prices will show greater volatility.

Spot Markets Will Be Adversely Affected

The decreased liquidity and increased volatility of futures prices will adversely effect the underlying spot markets. Futures markets serve a hedging and price discovery function which will be impaired by the elimination of dual trading. This will make holding the spot commodity or financial instrument more risky. This will impact on a whole range of underlying activities from grain storage to the financing of the US treasury debt.

One example of the type of impact can be seen in the grain market. Grain elevators buy grain and store it. They bear the risk that the price will fall between the time they buy the grain and the time they sell the grain. The elevator owner can hedge this risk by selling the grain forward on the futures market. He thereby shifts the risk to the rest of the world, rather than bearing it all by himself. The fact that the grain elevator does not have to bear the risk of price fluctuations means that it is

able to pay farmers more for the grain. If the elevator owner had to bear the risk of price fluctuation, then he would pay the farmer less, so as to cover the risk he bears in storing the grain. If the liquidity of futures markets falls, or if transactions costs rise, then the effective cost of obtaining insurance from futures markets will rise. This increased cost will be passed along to farmers in the form of a lower price they receive for their grain. Final users of grain will not receive a lower price, but may even have to pay a higher price, since the grain elevator's effective cost of storing the grain has risen due to the increase in its cost of obtaining insurance in the futures market.

Another example of the deleterious effects of reducing futures market liquidity can be seen in the US treasury security market. Bond dealers who put in bids at US treasury auctions can hedge the inventory of bonds they acquire by using the US treasury bond futures market. The ability to hedge their inventory increases the amount that they are able to buy at auctions, and the price that they are willing to pay. If the cost of trading on the futures market rises, then this will increase the cost to the US treasury of issuing treasury securities.

The enormous importance of futures markets in our economy means that even small increases in the cost of using the markets or the liquidity provided by the markets can have very large impacts on the economy. If farmers receive $.05 less per bushel,

or if consumers must pay $.05 more per bushel, or if the US treasury receives 1/32 less per $100 of bonds it issues, then the consequences per 100 million bushels and per 1 trillion dollars of debt are enormous.

Foreign Markets Will Replace US Markets

The fact that dual trading is permitted in many foreign markets will give those markets an advantage over the US markets. The preeminence of many US futures markets arises from the great liquidity added by "locals", who are traders risking their own capital to add liquidity to markets. These locals will lose an important source of their potential income if they are excluded from customer brokerage, and hence be discouraged from entering the trading business.

The movement of brokerage business overseas will further decrease the liquidity of US markets because there will be fewer customers for a given customer on the US market to trade with. Customers forced to trade in the US will therefore be trading in less liquid markets, after mobile customers take their business elsewhere.

Customers Will Lose Their Freedom Of Choice

Currently, with dual trading permitted, a customer concerned about conflicts of interest can choose to use a floor broker who does not engage in dual trading. On the other hand, a customer who is not concerned about the conflict of interest and wants an active skilled trader can choose a floor broker who does engage in dual trading. This freedom of choice will be lost to

customers if dual trading is banned.

B. Review of Proposals to Partially Eliminate Dual Trading

1. Eliminate Dual Trading in Liquid Contracts

There are two problems with this proposal. First, the contracts may be liquid exactly because of the ability of broker/traders to switch to market making activities when there is a large customer order which would otherwise have a large adverse price impact. It is very difficult to maintain a liquid futures market. Most contracts which have been introduced by Exchanges fail to become liquid and disappear. No customer will initiate a position when he fears that the market will not be liquid when he wants to take off the position. If customers lose confidence in the liquidity of a market, then that market will fail. A delicate balance is required for a market to survive, and anything which reduces the liquidity by even a small amount can initiate a vicious circle whereby customer confidence is lost, volume falls, so confidence further falls, and liquidity totally disappears.

A second problem with eliminating dual trading only from liquid contracts is the prevalence of spread trading between illiquid and liquid contracts. A typical spread trade will involve, for example, buying the near liquid expiration month, and selling a later less liquid month. It might even involve selling a less liquid commodity and buying a more liquid commodity. For example, a bond hedger may want to sell federal

funds futures (a less liquid contract), and buy treasury bond futures (a more liquid contract), to hedge against a change in the term structure of interest rates.

In order for the spread market to be liquid a trader must be able to do both customer and principal business in both the liquid and illiquid contracts.

A third problem with eliminating dual trading in the liquid contracts is that the volume and liquidity of a particular contract can be quite variable. During periods of unusual weather, a grain futures contract that has had very little volume can show a huge increase in volume. If dual trading is banned from the contract when its volume of trade rises, then when there is a sudden rise in volume, there will be a shortage of brokers and traders to serve customer needs.

2. Eliminate Dual Trading at the Open and the Close of Trading

These are periods of the day with highest volume of trade. It is very easy for order imbalances (for example, a preponderance of customer sells over buys) to appear within a few seconds in this period as brokers attempt to execute "market on open" or "market on close" orders. The market making capital of a broker/trader can become crucial to maintaining price stability in the space of a few seconds. The benefits from switching from brokerage to principal trading can thus appear within a few seconds. This creates benefits from dual trading even at the open and the close of trade.

3. Limit the Size of Customer Orders Executable by a Dual Trader

This would lower the quality of brokerage services to large customers who often need it the most. It would increase price volatility, as large orders have higher market impacts due to execution by less skilled traders. The large traders are the most mobile, and will thus move their orders to foreign markets if they can be executed more effectively there. This will lower the liquidity available to the customers who remain. The customers who remain are likely to be small customers. Hence this limitation on dual trading will harm small customers more than it harms large customers.

4. Limit Dual Trading to the Back Months

I have already noted the problems with eliminating dual trading from liquid contracts. Eliminating dual trading from the front months will make spread trading very difficult, for reasons noted above. However it will also have another subtle, but deleterious effect. It will make it impossible for traders in the back month to hedge their risk in the back month contracts by taking an offsetting position in the front months. For example, a broker/trader who buys a back month contract like the December 1990 bond future (thereby providing liquidity to a customer who wants to sell it) would normally sell the front month to hedge his position. However, if he losses the ability to trade the front month, then he will cease to trade the back month because of the risk involved. Therefore eliminating dual trading from the front months will also cause dual trading to disappear from the back months.

7. Measuring the Benefits of Dual Trading

The previous Sections provide a theoretical overview of the economic role of dual trading and the nature of the benefits customers derive from dual trading. Much of the discussion in the previous Sections can be quantified. In particular, it is possible to measure the contribution made in various futures markets by dual traders. It should be noted that the measurement of the benefits is quite a complex process, and to the best of my knowledge no study exists which has measured the potential losses to the economy of eliminating dual trading.

An empirical analysis of dual trading must begin with an analysis of the extent to which dual trading exists in particular markets, particular contracts, and particular periods. No comprehensive analysis exists of the extent to which an individual member trades for his own account and also trades for customers. The trading records of individual members exist and can be used to reconstruct a record of overall dual trading. This data can be analyzed from two points of view. The first view is "positive", i.e., an attempt to determine what underlying factors have led to the observed historical patterns of dual trading. It would then be determined whether the observed patterns are consistent with the theory of dual trading outlined in the previous Sections. The second view is "normative". This approach will compute the extent to which dual traders have directly and indirectly benefited customers, and the extent to which these benefits would disappear if dual trading is

prohibited.

The Determinants of Dual Trading

The theoretical framework developed in this report implies that the following factors will cause dual trading to be important.

1. The extent to which customers desire immediacy of execution. If there are large customer orders which must be "worked" (in the sense that trading it immediately "at market" will give the customer a poor price), but for which the customer bears great risk while the order is unfilled, then there will be a great demand for brokers who are skilled traders.

2. The extent to which customers desire complex spread trades. This is another example where the customer demands brokers with strong timing and bargaining skills.

3. The extent to which there is insufficient customer business or insufficient principal trading business for an individual to earn a living from engaging in only one of these activities.

4. The extent to which there are large swings in the demand for either brokerage or principal trades. Dual trading will be important when there are surprise increases or decreases in customer business which lead to wide and unpredictable variations in the appropriate use of a broker/traders time and effort.

The above factors can be quantified and used in a time series and cross sectional analysis of dual trading, to see if they indeed

explain the degree to which dual trading occurs on various futures contracts in various periods.

The Benefits of Dual Trading

The factors emphasized in the previous Sections indicate that dual trading has a direct effect on customers via providing better floor brokerage services, and an indirect effect of increasing market liquidity.

Measuring the direct benefits of dual trading involves the following analysis.

1. Computing the extent to which direct brokerage costs are reduced, for a given level of broker quality, because a dual trader has multiple uses of his time, skills and Exchange seat, and thus can offer to trade at a lower cost.[5]
2. Measuring the extent to which customers receive better executions on complex spreads, and large orders through the use of dual traders.

Measuring the indirect benefits of dual trading on market liquidity involves the following analysis.

1. Computing the extent to which the effective bid ask spread is reduced due to the existence of dual trading.
2. Computing the extent to which the effective bid ask spread is reduced for spread trades.

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[5]"Measuring the Operational Cost of Dual Trading: An Analytical Framework", Kenneth L. Stanley, The Journal of Futures Markets, Vol. 1, No. 3, 329-336, 1981.

3. Computing the extent to which the market can absorb large orders to buy, or large orders to sell with a small market impact (i.e., market depth).

The measurement of effective bid ask spreads, and the measurement of market depth will be accomplished by various methods. All methods will rely upon the idea that trades which have a large market impact and/or are executed against wide bid ask spreads will cause price and expected returns to move in opposite directions. Recall that, for example, a seller will have a large market impact if the price can be expected to rise from the price at which his trade is executed. Various methods will be used to compute the extent to which price and expected returns are negatively correlated, including Roll's measure derived from the autocovariance of period by period returns), and the Grossman-Miller autocorrelation measure, as well as Kalman filtering approaches.[6]

It is important to control for other effects which may impact on actual market liquidity, these effects include variation across contracts in volume traded, average trade size, spot price volatility, time to expiration, the importance of

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[6] These approaches are summarized in : "Economic Costs and Benefits of the Proposed One-Minute Time Bracketing Regulations," Sanford J. Grossman and Merton Miller, Journal of Futures Markets, vol. 6, no. 1, 1986, 141-166. "Liquidity and Market Structure," Sanford J. Grossman and Merton Miller, The Journal of Finance, July 1988, Vol. 43, No. 3, 617-637. "Determinants of Liquidity Costs in Commodity Futures Markets," Review of Futures Markets, Spring 1988. "Inferring the Components of the Bid-Ask Spread: Theory and Empirical Tests," Hans Stoll, Journal of Finance, vol. 44, no. 1, March 1989.

intra-market and inter-market spread trading. Further, it is important to distinguish cause from effect. In particular, the magnitude of the above factors may be either a response to the increase in liquidity caused by the supply of dual traders or instead be factors which contributed to the demand for dual traders.

Appendix

Dual Trading In Foreign Markets

In looking at financial markets throughout the world, one finds that dual trading is very prevalent. This is not surprising, given the important benefits that dual trading provides both to brokers and to clients. My preliminary review of world markets indicate that 15 out of 19 countries permit some form of dual trading. Dual trading can take the form of trader/brokers on the Exchange floor as in US futures markets, or the form of banks which act as both principals and agents for customers, or the form of designated specialists, or the form of broker/dealers who can trade on or off the Exchange floor with clients.

The following describes the structure of financial exchanges throughout the world, with regard to brokerage services and dual trading.[7] Unless specifically noted, the Exchanges described are stock exchanges.

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[7]This information was obtained from the following sources. International Society of Securities Administrators Handbook, 1986. European Stock Exchange Handbook, 1973, Noyes Data Corporation, Park Ridge, New Jersey. Major Stock Markets of Europe, Paul Stonham, 1982, St. Martin's Press, New York. The Principal Stock Exchanges of the World, David E. Spray, 1964, International Economic Publishers, Inc., Washington, D.C..

Australia

On the Sydney futures Exchange a local can trade for his own account as well as for other members of the Exchange. He is not permitted to trade ahead of his customer.

On the Australian stock exchange, stockbrokers may trade on their own account, as well as acting for clients. A broker dealer must disclose than he is acting as such. An odd lot specialist is a member broker who exercises a franchise to handle all odd lots. He is able to buy odd lots at a set rate of discount and sell at a set rate of premium, in order to be recompensed for his services.

Options are traded on the Australian options market in much the same manner as ordinary securities. A Registered Trader is required by the exchange to provide a continuous and orderly market by making a market in at least one contract when called upon to do so. He also maintains an appropriate price relationship among the options series in each stock he deals with. A floor trader is a representative of a member firm and executes client orders on behalf of his firm.

Austria

Those holding stock exchange cards include banks and other credit institutions, who may deal directly with each other in purchasing

or selling securities. Official brokers may not engage in any stock exchange dealings on their own behalf. The securities quoted on the official list are divided up so that each official broker handles only certain securities. Brokers may also trade off the exchange. Free brokers, who are not officially appointed by the exchange, act as intermediaries between credit institutions, or between clients and credit institutions. They may also trade on their own behalf. Free brokers also deal in securities which may be traded on the exchange floor but which are not officially quoted. All securities may be traded off the exchange.

Belgium

Trading is done exclusively by brokers ("Agents de Change"). These brokers are forbidden to act as a principal. The brokers can receive orders directly from clients or indirectly from corresponding brokers or banks. Corresponding brokers receive orders from clients which they must bring to the brokers for execution. Banks must also go through the brokers to get trades executed, except for orders of over Bfr. 10 million.
Corresponding brokers and banks may act as both agent or principal.

Brazil

Brokerage firms cannot trade for their own account or act as

principals. By contrast, investment banks and distribution companies may trade for their own account.

Canada

Member firm brokers trade for their customers and retain a commission as payment. Securities firms who wish to trade listed securities without formally joining the exchange may do so as an authorized non-member. A Registered Trader acts as a dealer in specific stocks assigned to him by the exchange. His function is to act as a market maker in those stocks - to contribute to market liquidity and enhance price continuity. The Registered Trader can execute trades as an agent for a member firm and may also trade his own account, within limitations.

Finland

Most members are banks. Members may trade for their own account as well as for clients. Banks are major investors as well as brokers.

Germany

Clients must place their orders through a bank which is represented on the stock exchange. Banks may trade securities for their own account, take the other side of a customer

position, or arrange for another bank to take the other side. They may also place trades through a broker. Official brokers are assigned certain securities by the exchange. Their function is to arrange transactions and set official quotations. The official broker sets a single price for each security which permits him to execute the largest number of orders received for that security. If additional orders are needed to balance existing orders, he calls the quotations to receive them. He may then enter into the trading himself so far as it is necessary to fill existing orders. Otherwise, official brokers are not supposed to deal in their assigned securities for their own account. "Free brokers" execute transactions between banks and may also trade for their own account.

France

Member firms of MATIF, the French financial futures Exchange, are able to execute both proprietary and customer orders.

Securities clients may place orders through a bank or a remisier, an investment advisor. The banks and remisiers in turn transmit the orders to a broker who executes them on the floor or off the exchange. A broker may not trade for his own account or acquire any interest in or any management responsibility for any commercial or industrial enterprise other than his brokerage firm. Banks may also deal directly, off the exchange, including

trading on their own account and taking the other side of a customer order.

Hong Kong

All orders must be executed by stock exchange brokers or their employees. Brokers may also trade on their own accounts, as long as these transactions are segregated from those for their clients. Brokers may employ authorized clerks or sales representatives to execute orders on the floor. These employees may not trade for their own accounts.

The Hong Kong Futures Exchange permits dual trading.

India

Any member can act as both a principal or an agent, as long as he provides notification that he is trading for his own account.

Italy

Banks may receive client orders and match them, but all trades executed on the exchange must be done by brokers. The brokers may not trade on their own account nor own any interest or accept any managerial responsibility in any commercial or industrial firm other than their own brokerage firm.

Japan

Regular members of the exchange are companies who both receive orders from clients and trade on their own account. Most regular members also underwrite securities. Special members perform the function of connecting markets by handling orders at the Tokyo or Osaka exchanges which could not be filled on the regional exchanges. Except in situations of unusually high volume, stock exchange members must send orders to the saitoris for execution. These are companies who are responsible for matching orders and fixing the price for those stocks assigned to them by the Exchange. Saitoris cannot trade for their own accounts in the stocks to which they are assigned.

Luxembourg

Stock exchange members are banks or stockbrokerage firms. Stockbrokerage firms may execute trades on their own account as well as for clients. Banks and brokers may trade directly between themselves, without intermediaries. Banks may take the other side of a customer trade.

Mexico

Members are either individual brokers or member firms. Individual brokers may trade for their own account or for a

member firm. Brokerage firms may execute orders for clients or trade for their own account.

Netherlands

Banks and brokers receive orders from clients. All orders are transmitted to a hoekman, or specialist. The specialists execute trades in a particular set of securities. They receive a commission form the banks and brokers for performing this function. They may also trade for their own account.

The European Options Exchange is an association set up under Dutch law. Members include banks, brokers, and private traders from North America, Canada, Western Europe and the Far East. Public order members receive orders from the public and pass them to a floor broker for execution. Market makers are traders who are responsible for making a market in those options assigned to them. They act exclusively for their own account.

Singapore

There are three kinds of stock exchange dealer. A stockbroker is a shareholder in a member firm. He may act both for clients and for his own account. A dealer is an employee of a member firm. A remisier is a commissioned agent of a member firm. He may only transact business on behalf of the firm he is employed by.

Trades can also be carried out off the floor and outside of normal hours.

The Singapore International Monetary Exchange is a futures market which permits dual trading by floor broker/traders.

South Africa

Stockbrokers primarily trade for clients, but may also trade on their own account. A "dealer in stocks and shares" primarily trades for his own account, but may also hold himself out to the public. Trading also takes place off the exchange, typically directly between institutional investors, such as banks or insurance companies.

Spain

Orders may be placed through banks or directly with a stockbroker. All orders must be executed by a stockbroker. Stockbrokers may not trade for their own account.

Switzerland

Banks are the only members of the stock exchange. Member banks may trade either on or off the floor. Off the floor trading permits banks to match customer orders against each other. Banks may trade for clients and also trade directly with each other as

principals. Formally, most orders are executed by the banks acting as principals.

United Kingdom

The London International Financial Futures Exchange permits dual trading. In particular, Public Order Members are permitted to trade for their own accounts, as well as for customers.

The new securities "market" is based on a system of broker-dealers functioning in a dual capacity, trading as agents for clients as well as principals on their own account. Broker-dealers may also take the other side of a customer order. Certain broker-dealers act as market makers in specific securities. They may deal directly with investing clients. Inter-dealer brokers provide a mechanism through which market makers can trade anonymously with each other. Inter-dealer brokers are not allowed to take positions in stocks. Some market makers are located off the floor in their own trading rooms and trades may be executed by telephone.

United States

The New York Stock Exchange (NYSE) permits the designated specialist to trade as a broker's broker and also to trade for its own account. NYSE broker/dealers can trade for their own account on the NYSE floor as well as for their customers, but

they cannot trade ahead of their customers. Other Stock Exchanges have similar rules.

The Chicago Board Options Exchange requires floor traders to choose whether on a given day they will execute customer business exclusively or trade for their own account exclusively. Broker/dealers who are members have employees on the floor who may trade for their firm's account or for customers.

All major futures Exchanges permit dual trading.