Liquidity without Volume. II. Using Block Orders to Measure Market Resiliency

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INTRODUCTION

In "Liquidity without Volume: The Case of FINEX, Dublin," Clyman, Allen, and Jaycobs (1997) explore the apparent contradiction of a low-volume, liquid, futures market. In that article (hereafter referred to as Part I), the authors argue that it should not be surprising to discover that some low-volume futures markets are indeed liquid, especially when derivative to highly liquid underlying markets. To explore this hypothesis, Part I examines trading in one particular market—the U.S. Dollar Index (USDX)—when it trades during European hours on the floor of FINEX Europe (located at the International Financial Center in Dublin, Ireland).[1]

This article continues the investigation by examining two newer, even lower-volume futures markets that were designed from the start to tap the liquidity of the interbank-currency markets. These contracts, which also trade during European trading hours at the International Financial Center in Dublin, are the deutsche mark/Japanese yen (MY, Mark/Yen) and deutsche mark/French franc (MF, Mark/Paris) contracts.

[1]The FINEX is the financial instruments division of the New York Cotton Exchange.

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The decision to look for liquidity in FINEX's low-volume futures markets was not made arbitrarily. Rather, FINEX markets were selected because, as was discussed at some length in Part I, FINEX's liquidity-building strategy has focused not on promoting trading by locals, the traditional source of liquidity in futures markets, but rather on promoting risk-arbitrage with the interbank market.[2] Indeed, the FINEX designed these new cross-currency futures contracts with this goal in mind by writing them in cash-foreign-exchange-market terms[3] (foreign currency per dollar or marks per foreign currency unit) and in unit sizes twice those traded at the Chicago Mercantile Exchange (CME).

Most important, however, FINEX extended its Large Lot System (FILLS) to include trading in these contracts. FINEX introduced FILLS in August 1993 to help foster risk-arbitrage between its markets and the interbank markets by allowing market participants to request quotes (bid and ask) for specified large-order sizes,[4] thus helping identify the best available market for an order of that specific size.

(More recently, on 18 June 1996, the CME—the dominant market for currency futures trading—adopted an All or None (AON) rule of similar design and effect, and it implemented a pilot program to test the rule in its deutsche mark futures contract. On 5 August 1996, it extended the pilot program to encompass all of its currency futures contracts.)

Thus, the FILLS rule and the AON rule attempt to make it as easy as possible to trade in volumes comparable to those traded on the interbank market in a single transaction and at one price. If the theory hypothesized in Part I is correct—that it is indeed possible for a low-volume derivative market to tap the liquidity of deeper underlying markets—then it seems plausible that FINEX's cross-currency contracts, which are designed to be compatible with their cash counterparts and are facilitated by the large-lot trading rule, should be liquid, even though they are new and post very low volumes.[5]

[2]See Clyman et al. (1997) for a more complete discussion of the historical antecedents for this approach to building liquidity in a futures market, especially the International Monetary Market's (IMM's) use of class B memberships when it first established its currency contracts to link floor traders with banks for the express purpose of facilitating arbitrage with the interbank market.

[3]Due to the historical back office requirement of futures brokers to settle futures contracts daily in U.S. dollars, most U.S. currency futures contracts trade in U.S. dollar terms, which are inverse to their foreign-exchange cash counterparts. The globalization of futures markets and the advent of advanced computing technology has made it both feasible and practical to list contracts in foreign-exchange market terms.

[4]Large-lot orders were initially permitted in the USDX for trades of 100 contracts (approximately US $10 million) or more. Eventually the minimum-trade requirement was reduced to 50 contracts.

[5]For an excellent review of the empirical literature concerning the relationships among trading volume, price volatility, and liquidity, see Wang and Yau (1996). For relevant theoretical background see Figlewski (1987) and Stoll (1989).

The FILLS market mechanism also provides researchers with a heretofore unavailable mechanism for exploring this question because it opens up a window through which the liquidity of a market may be observed. The operational requirements of the FILLS mechanism provides a detailed transaction record of market participant activity and interest in dealing in large quantities. When a broker formally operates under the terms of the FILLS rule, he or she approaches the trading pit and requests a "market" (bid and offer) for a specified number of contracts not less than the large-order minimum of 50 lots. An exchange floor reporter notes the time of the request and the size requested. After 15 seconds has elapsed, respondents may show bids and offers for the desired quantity, and the reporters capture any bids and offers that are forthcoming.[6] The requesting broker then has 45 seconds within which to try and consummate a trade with one, several, all, or none of the responding brokers.[7] This process may be repeated as often as the originating broker likes, and several FILLS orders may exist in the trading pit at one time. Similarly, the requesting broker is under no obligation to trade and may terminate the FILLS procedure at any time.

The FILLS rule is intended to encourage large traders' participation by reducing the uncertainty that a given trading size can actually be absorbed in the market and by increasing transaction-cost transparency. Without such a rule, brokers attempting to fill large orders frequently obtain only "partial fills," which are undesirable.[8] Even more significantly, public futures markets in the United States have long had a prohibition against market participants bidding below the best prevailing bid or offering above the best prevailing offer. This prohibition is consistent with the price discovery mandate of these markets and is intended to insure

[6]When FINEX approached the Commodity Futures Trading Commission (CFTC) for approval of the FILLS rule, the CFTC was concerned that the rule might inadvertently facilitate prearranged trading. The 15-second waiting period was incorporated into the rule so that all interested responding brokers would have time to contact their customers and provide competing quotes. Interestingly, the 15-second delay could be misconstrued as enabling appointment trading, when, in fact, it was implemented expressly to make prearranged trading more difficult.

[7]The 45-second trading restriction reflects the intended use of the rule as a dealing mechanism and not as an alternative market. The AON rule at the CME has no specific time limit on trade completion, and the CME has indicated that AON orders should have lifetimes similar to market orders or "fill or kill" orders.

[8]The term "partial fill" refers to the situation where a broker is unable to fill the entire order requested by his or her customer. Numerous fund managers with whom the authors have spoken indicated that partial fills are troublesome, especially when they are trading multiple individual accounts that require identical positions. Partial fills are troublesome also for arbitrageurs, who often require complete fills to achieve desired hedge ratios. These problems exist with all futures markets, which may be part of the reason that substantial business has moved from the exchanges to the interbank market. For a discussion of how dramatically futures currency contract volume (and market share) has fallen, see Nusbaum (1996).

that every participant receives the best available price at any point in time. Large traders, however, argue that this requirement forces them to expose their intention to buy or sell while enabling them to transact only a small portion of their order at a time. They claim this compromises their ability to fill the remaining portion of an order without additional price movement. Futures traders call this "slippage" or "skid," and often measure the extent to which this has an adverse affect on the ultimate (average) price of the transaction. Rules such as FILLS and AON are designed to allow large participants to trade "through" existing orders (i.e., market participants can buy or sell the requested number of contracts without regard to the bid or offer prevailing in the market for smaller quantities) thereby eliminating skid. Furthermore, although the large-block trading mechanism does not eliminate the cost associated with trading larger quantities, it does make the cost of transacting the entire order observable prior to trading.[9]

The authors make no claim that a large-block rule is either a necessary or sufficient condition for achieving liquidity in low-volume markets. Indeed, it is beyond the scope of this study to address whether the FILLS mechanism itself is effective in facilitating liquidity or promoting arbitrage. Nevertheless, the mechanism does provide (i) a window for measuring liquidity and (ii) insight, at least anecdotally, into how exchanges have interpreted market participant perceptions of liquidity and tried to respond. To this latter point, the FILLS mechanism attempts to provide traders with a mechanism for determining ex ante whether a given market is sufficiently liquid to warrant using it to execute large trades. Clearly, foreign-currency traders have alternatives to the futures market, so large-order market participation, despite low volume, suggests a perception by at least some traders that the market is sufficiently liquid, not only at the instant the trade is made, but in anticipation of exiting a position initiated in this way. Thus, without offering any evidence that the mechanism itself makes liquidity without volume possible, its implementation does suggest, along with the growing volume of large-block trades, that large-lot rules facilitate the transfer of liquidity from the underlying markets to the futures markets.[10]

[9]The bid–offer spread may not be sufficient for testing market liquidity in all cases, because, as traders note, interbank quotes may be artificially tight. When a dealing-desk trader knows, for instance, that a market participant requesting a quote intends to buy, and will not sell (will not "hit the bid"), both the bid and the offer quoted might be a little high (with the bid raised more than the offer, thereby tightening the quote). Unlike the interbank market, however, the FINEX currency market, like all futures markets, is a competitive public market; therefore, all bids and offers are observable by all participants, thereby reducing (if not eliminating) the risk that such bids and offers are "faded" against a single price taker.

[10]By way of example, the highest AON volume in September 1996 occurred in the Japanese yen

It is necessary to note that the FILLS rule is rarely formally invoked at the FINEX. Traders avoid the rule because they consider the required procedures and time restrictions somewhat onerous.[11] At the CME, it would not be possible to execute large-lot orders without invoking a large-lot rule because the large-lot trades are executed outside the trading range of normal standing orders, which would be a violation of the one pit, one price rule. At the FINEX, however, where there are often no standing orders, this is not a problem. Nevertheless, at the request of these authors, FINEX uses the pit-reporting mechanism established for FILLS to collect the spread information that would otherwise be collected were the rule invoked.

Thus, whenever a large trade request is made—even when the FILLS rule is not actually invoked—exchange reporters collect the lot size requested and the bids and offers of the respondents.[12] As a result, a unique data base has been created of large-order inquiries and the resulting bids and offers (market spreads) to execute the block transaction.[13]

For a researcher interested in examining market resiliency, these data are remarkable as they provide an ex post means to assess the ex ante liquidity of a market, without regard to the normal volume in the market. After all, if standard analyses of bid–ask spreads reveal the costs of transacting standard-sized orders in the market, these data reveal the costs of transacting large-sized orders in the market; what's more, they indicate the transaction cost by order size. Using these data, one can regress the size of spread on the size of the order to determine whether and to what extent the costs of transacting the market increase with order size.

Using this unique data base, it is possible to examine both components of liquidity suggested by Massimb and Phelps (1994): (i) a market's ability to provide immediate execution of standard-sized incoming market orders (often called immediacy) and (ii) a market's ability to execute large

contract. During that month, 11,113 Japanese yen contracts traded under the AON rule in 35 separate transactions. In November 1996, the highest volume AON contract was the Canadian dollar, which traded 17,178 contracts in 62 separate transactions.

[11]The de facto procedure used at the FINEX is consistent with the CME's new AON rule which effectively eliminates the rigorous procedural time stamp requirements of the FILLS rule. Now that the CFTC has accepted the less onerous CME version, the FINEX Advisory Board, at its June 1997 meeting, voted to submit rule changes to the CFTC that would simplify the procedures.

[12]Because the FILLS rule is rarely formally requested, the authors have chosen to use phrases like large-block or large-lot trade to distinguish the data. This distinction is more for semantic clarity than any actual difference in the procedures used to execute orders.

[13]This methodology, unfortunately, unlike that used in Part I, is not currently reproducible in other futures markets because no other exchange currently records this level of transaction detail for large-order activity. For example, the CME is not currently recording respondent bids and offers on trades utilizing their AON rule. Nevertheless, over time, the methodology is likely to be replicable in other markets, as the value of collecting and maintaining these data becomes clearer and as other exchanges adopt similar rules.

orders without large changes in price (often called market depth or price resiliency).[14] As always, one can explore the question of immediacy by looking at the spreads generally existent in the market, i.e., the spread associated with standard-sized trades. Now, with this data base, one can also explore the question of resiliency by looking at spreads—this time, the spreads associated with large-lot trades. This is by far the purest measure of price resiliency, or market depth, for which one could hope, as it measures for nonstandard-sized (large) orders—by the size of the order—the exact cost of transacting the market.

Thus, spread analyses can be used to explore questions of both immediacy and resiliency. For the former, a variety of simple spread analyses are conducted. The simplest of these analyses confirms in this market (which is true in many low-volume markets) that the distribution of spreads just prior to a trade is substantially and significantly narrower than the distribution of spreads normally quoted.[15] Similarly, the distribution of spreads just prior to a trade is also significantly narrower than the distribution of spreads in existence at the close of each trading day. Thus, while a more traditional examination of end-of-day spreads, or of all spreads, might lead one to question the liquidity (immediacy) of the market, it is necessary in these cross-currency markets, as in many low-volume markets, to examine the spreads that exist when there is true interest in trading.

What is most interesting, however, is that while these analyses of spreads just prior to trades do not provide particularly compelling arguments for the liquidity of these markets, the analyses of the market spreads in existence following requests for large-lot quotes tell a much more compelling story.

To explore the question of resiliency, or market depth, one regresses size of spread on order size. As one would expect, there are statistically significant positive relationships between the size of the order and the size of the spread in both the Mark/Paris and Mark/Yen contracts. However, while the relationships are statistically significant, (i) they do not

[14]As discussed at some length in Part I, neither part of this definition requires market volume. However, it is hard to argue that a low-volume futures market is successful. After all, exchange revenues are often dependent upon transaction fees, which rise and fall with volume. Greater volume also offers members more opportunities to trade, which is how many of them earn their livings. Finally, without sustained volume, it is hard for an exchange to fulfill one of its primary missions: continual price discovery.

[15]The authors thank a reviewer for pointing out that this narrowing of spreads prior to trading might be considered a trading opportunity. After all, if locals know that spreads are likely to widen again, it would make sense to trade when spreads are narrow in anticipation of that later widening. However, for this strategy to work, it would have to be possible to trade shortly thereafter against a wider spread. However, since spreads in these markets tend to narrow as soon as there is any evidence of true interest in trading, that may not be possible.

appear to be economically significant and (ii) the spread sizes for large orders appear consistent with those in the interbank market.

In the Mark/Paris contract, the lower volume of the two contracts, the minimum 50 lot large-block order (that traded) has a 3.47 tick spread, on average, and that spread widens by 1.64 ticks per 100 contracts, or equivalently, by 1 tick for every additional 61 contracts. Since each Mark/Paris contract represents the French franc equivalent of 500,000 deutsche marks, this represents a bid–offer spread of 3.47 ticks for a DM 25,000,000 transaction and increases by 1 tick for each DM 30,500,000 beyond that level. By way of comparison with the cash-foreign-exchange market, spreads ranging in size from 2.00 to 4.00 ticks could be expected for a nonbank market participant on a DM 25,000,000 trade (the typical trade of DM 20,000,000 generally trades against a spread at the lower end of this range), and spreads of 5.00 to 7.00 ticks could be expected for trades between DM 50,000,000 and DM 100,000,000.[16]

In the Mark/Yen contract, the minimum 50 lot large-block order that traded has a spread 1.61 ticks wide, on average, and it widens by 0.36 ticks for every additional 100 contracts, or equivalently, by 1 tick for every additional 274 contracts. Since each Mark/Yen contract represents the Japanese yen equivalent of DM 125,000, this represents a bid–offer spread of 1.61 ticks for a DM 6,250,000 transaction and increases by 1 tick for each DM 34,500,000 beyond that level. Again, by way of comparison with the cash-foreign-exchange market, dealers report that a spread of about 2.00 ticks could be expected for a nonbank market participant on a DM 10,000,000 trade (the typical size traded), and the spread would increase to about 3 ticks for a DM 50,000,000 trade.

These data suggest that the FINEX market for these contracts has similar ex ante liquidity to the cash-interbank-foreign-exchange market for large-lot trades despite extremely low volume.[17]

[16]Although the authors have no specific data set for interbank trades, conversations with multiple foreign-exchange brokers confirm the approximate dealing sizes and spreads in the cash-foreign-exchange markets for these currencies. It merits noting again that these traders routinely warn that spreads in the interbank market can be artificially narrow because of quote fading. After all, it is part of every trader's job to attempt to figure out before quoting which side of the market the quote-requesting market participant is on. Whenever one is able to do so, it is possible to advantageously narrow and fade the quote offered to that market participant.

[17]While these large-lot analyses indicate substantial liquidity for large-lot trades, they say nothing about the liquidity below the large-lot minimum. Thus, it may be that the FINEX markets are best thought of as two-tiered markets that are more liquid for large and small orders than for intermediately sized orders—of between say 15 or 20 lots and the large-lot minimum of 50 lots. Indeed, the fact that the Exchange so easily dropped the large-lot minimum from 100 lots to 50 lots indicates that in doing so it did not interfere with any locals' business (or prospective business) in the intermediate range.

BACKGROUND AND OVERVIEW OF THE DATA

The remainder of this paper is brief and organized as follows. This section provides some background information and presents an overview of the data. The following section presents statistical analyses beginning first with analyses of spreads to address the question of immediacy, followed by regressions of spreads on block-order size to address the question of resiliency. The final section contains concluding remarks.

The New York Cotton Exchange's FINEX division opened the International Financial Services Center in Dublin on 17 June 1994.[18] At that time, the only currency futures contract that traded actively on the FINEX was the USDX contract. Coincident with opening of the FINEX trading facility at the International Financial Services Center, FINEX also introduced several U.S. dollar-based contracts (identical in construction to the IMM dollar-based contracts) and several cross-currency contracts. To support risk-arbitrage with the interbank market, the initial dollar-based currency contracts were eventually replaced with new contracts generally twice the size of the original contracts and inverted so that they could be quoted in European terms.

Since then, additional contracts have been added, and trading opportunities now exist in the USDX, dollar-based currencies, and a variety of crosses. For example, against the U.S. dollar one can trade the deutsche mark, British pound, Japanese yen, Swiss franc, South African rand, Australian dollar, New Zealand dollar, Indonesian rupiah, Malaysian ringgit, Thai baht, and Canadian dollar. Against the deutsche mark one can trade the British pound, Japanese yen, Swedish krona, French franc, Italian lira, Swiss franc, and Spanish peseta. In addition, one can trade the British pound against the Swiss franc and against the Japanese yen, and it is possible to trade options on most of these contracts.

Of the currency and cross-currency contracts, the two with the greatest volume during the study period, which ran from January 1 through June 30, 1996, were the Mark/Yen and Mark/Paris. During this period, volume in the Mark/Yen averaged about 200 contracts per day (for a half-year total volume of about 25,000 contracts) and volume in the Mark/Paris averaged about 90 contracts per day (for a half-year total of about 11,300 contracts). Most of this volume was executed in large blocks. Indeed, large block-order trades represented about 65% of the Mark/Yen

[18]Since the opening of the International Financial Center in Dublin, the trading day on the FINEX is broken into three components. The trading day begins at 7:00 PM EST (8:00 PM during DST) and continues until 10:00 PM (EST) to support Asian business. Trading resumes five hours later in Dublin at 3:00 AM (EST) and continues until 8:00 AM to support European business with a physical presence in the European time zone. The market then temporarily suspends and reopens in New York five minutes later, at 8:05 AM, where trading continues until 3:00 PM (EST). Contracts traded during any of these sessions cross-clear.

volume and 70% of the Mark/Paris volume. Figure 1A,B presents both total volume and large-block volume for the Mark/Paris and Mark/Yen contracts, respectively. As is evident from Figure 1, there is a wide variation in volume from day to day, and the high-volume days are primarily due to large-block trades.[19]

For example, the highest-volume Mark/Paris day occurred on May 10 when 1911 contracts traded (for 955.5 million deutsche marks). Of these, 1899 contracts were executed in response to three block-order requests for 581, 857, and 461 contracts, respectively. Although, large blocks only traded on 16% of the days during the study period in the Mark/Paris contract, they represented over 70% of the business in this contract. Furthermore, on those days in which large blocks did trade, the average number of contracts executed per day in response to such requests was about 400 contracts, which represented about 88% of the business on those days. Similarly, large blocks traded on 31% of the days in the Mark/Yen contract and represented 65% of the total business during the study period. Focusing only on those days in which large lots traded, the average number of contracts executed per day in response to large-lot requests was 415, and these trades represented 86% of the business on those days that large lots traded. This information may be inferred from Figure 1A, B.

More specifically, there were 44 Mark/Paris block orders for which information was captured by the reporters in the ring. Of these, 30 resulted in trades. The average lot size that traded was 267 lots, which was not significantly different from the average lot size of those that did not trade (235 lots; $t = 0.4296$). The average spread for those that traded was 7.03 ticks, which, while smaller than the average spread of 8.50 ticks for those that did not trade, also was not significantly different ($t = 0.7013$). By comparison, there were 117 Mark/Yen block orders for which spread information was captured by the reporters in the ring. Of these, 78 resulted in trades; 39 did not. The average lot size that traded was 207 lots, which, while larger than the average of 189 lots for those that did

[19]These data slightly underestimate the true impact of the large-block orders on the business of the Exchange because reporters occasionally failed to capture the spread information associated with block orders, and the spread information was required for inclusion in the large-block-trade data set. Indeed, when one checks those days where there appears to be a large discrepancy between total volume and large-lot volume, one often finds a large-block trade that is not in the data set because the reporters failed to capture the spread information. Nonetheless, as is evident from Figure 1A, B, there were very few days when the total volume greatly exceeded the large-lot volume, and so failures to capture the spread data had to be rare. Even with this understatement of large-block volume, the correlation between large-block volume and total volume in Dublin was 0.99 and 0.95 in the Mark/Paris and Mark/Yen contracts, respectively.

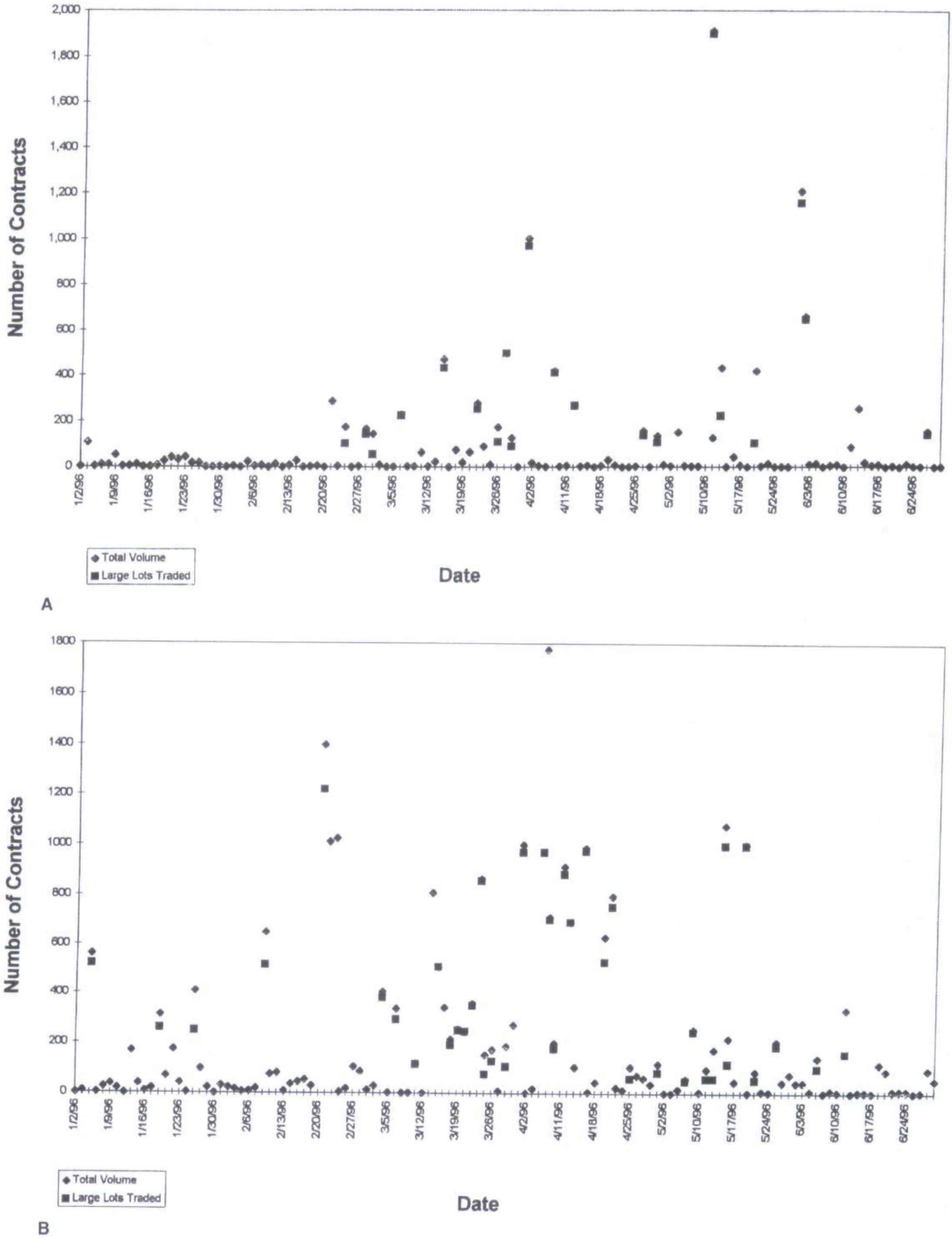

FIGURE 1
Total and large-block volume in Dublin. **A:** Mark/Paris. **B:** Mark/Yen.

not trade, was not significantly different ($t = 0.5198$). The average spread, however, was significantly smaller for the group that traded (2.18 ticks) compared to the group that did not trade (2.82 ticks; $t = 2.3742$). Since the decision to execute a large-lot trade follows learning the spread, it should not be surprising to find that the quoted spread was narrower for those trades that executed than it was for those that did not. It does, however, also suggest that traders find the market more liquid at some times than at others.

STATISTICAL ANALYSES

This section is divided into two parts. The first focuses on the question of immediacy by examining spreads of different subpopulations. For instance, bid–ask spreads quoted in the market just prior to a trade are compared to the general population of all other quoted spreads in Dublin, and separately to the population of spreads quoted at the close of trading in Dublin. As was also discovered in Part I, there are significant differences between these groups. And although the differences are not as great as they were with the USDX contract examined in Part I, they are still different enough for examinations of the more readily available populations of spreads to be misleading indicators of the liquidity of these markets.

The second section, by far the more important of the two, presents the analyses of market resiliency, and demonstrates the statistically significant, positive relation between the size of the block order and the size of the spread quoted. This finding is consistent with the usual expectation that the larger the order, the greater the risk, and hence, the wider the spread. What is potentially surprising about this finding is the relatively small amount by which the spread widens as the order size increases. As already reported, for the Mark/Paris, the spread only widened on average by 1.64 ticks per 100 contracts traded (DM 50,000,000); similarly, for the Mark/Yen, the spread widened on average by 0.36 ticks per 100 contracts traded (DM 12,500,000).

Tests of Immediacy

This section begins by examining spreads to estimate the normal transaction costs of the market. As was found in Part I, spreads just prior to a trade are significantly narrower than spreads at other times; they are also narrower than spreads at the close of the Dublin trading day. The three specific subpopulations of spreads examined are spreads just prior to a trade, spreads at the close of trading, and all other spreads. (In doing these analyses the sets were defined to be mutually exclusive.)

Figure 2A,B presents graphs of these three populations of spreads for the Mark/Paris and Mark/Yen contracts, respectively. (In these analyses, spreads were measured in ticks. When measured in basis points, the results were essentially the same.) Not only is the mean of the distribution of spreads just prior to a trade significantly narrower than the means of the spreads of the other two groups, but the distributions themselves are significantly different with chi-square statistics in the thousands.

For the Mark/Paris contract, the mean spread just prior to a trade is 6.06 ticks, whereas the mean closing spread is 9.42 (t = 14.2377) and the mean of all other spreads is 9.04 (t = 14.7767). Similarly, for the Mark/Yen contract, the mean spread just prior to a trade is 2.96 ticks, while the mean closing spread is 4.50 ticks (t = 14.1614) and the mean of all other spreads is 4.42 (t = 18.9666).

In the Mark/Yen contract it also merits noting that mode of the distribution shifts from 5 ticks wide for closing spreads and all other spreads to 1 tick wide for the distribution of spreads just prior to a trade. In the Mark/Paris contract, while the modes are 10 ticks wide for all three distributions, only the distribution of spreads just prior to a trade has substantially smaller, secondary modes (at 1 and 5 ticks wide).

Tests of Resiliency

This section reports on market depth by examining how the market spread widens as order size increases, and it does so both in absolute terms as ticks and in relative terms as basis points (defined relative to the midpoint of the spread). The analyses conducted are all particularly straightforward—simple linear regressions of spread width on order size. In all cases, the coefficient of order size is statistically significant with t-statistics ranging from 2.3 to 6.5. This is true for both the Mark/Paris and Mark/Yen contracts; it is also true regardless of whether one measures spreads in ticks or basis points, and whether one examines all large-lot orders, only those that resulted in trades, or only those that did not. Nevertheless, even though the coefficient of order size is always significant, as has been discussed previously in the paper, the amount by which the spread grows with order size does not appear to be economically significant or out of line with the cash market.

The results of these regression models are presented in Table IA,B for the Mark/Paris and Mark/Yen contracts, respectively. Interestingly, the regressions explained a substantially greater proportion of the uncertainty

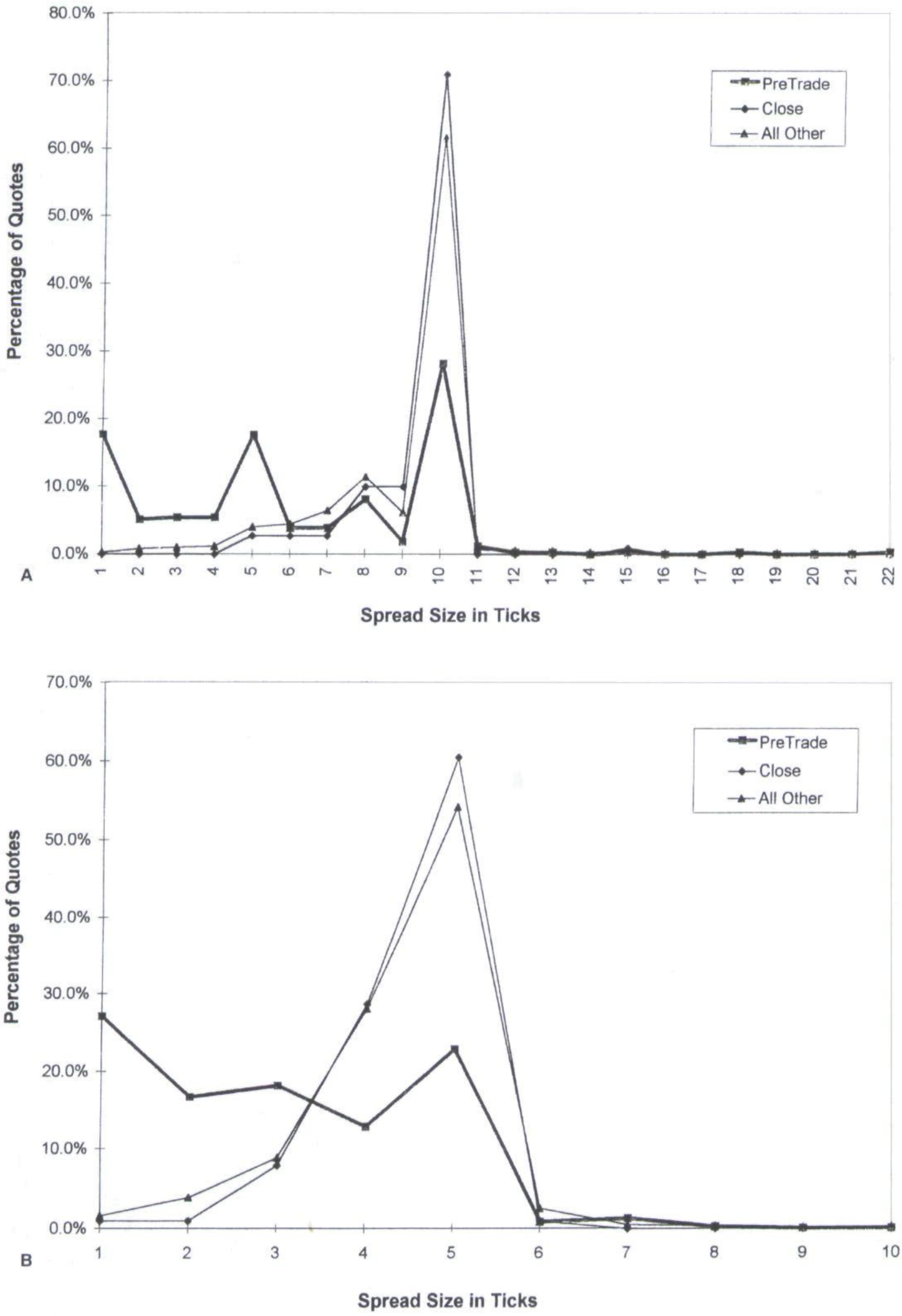

FIGURE 2
Comparison of spreads by group. A: Mark/Paris. B: Mark/Yen.

TABLE I

Tests of Market Resiliency

	Measured in Ticks			*Measured in Basis Points*		
	All Large Blocks	*Large Blocks That Traded*	*Large Blocks That Did Not Trade*	*All Large Blocks*	*Large Blocks That Traded*	*Large Blocks That Did Not Trade*
A. Mark/Paris						
Intercept	2.6121	2.6497	2.4036	0.7614	0.7757	0.6937
	(2.62)	(2.11)	(1.69)	(2.60)	(2.10)	(1.65)
Order size	0.0190	0.0164	0.0259	0.0056	0.0048	0.0077
	(6.49)	(4.56)	(5.82)	(6.50)	(4.56)	(5.84)
R^2	0.5004	0.4260	0.7384	0.5013	0.4264	0.7397
Spread of 50 lot trade	3.56	3.47	3.70	1.04	1.02	1.08
Spread increases per 100 contracts	1.90	1.64	2.59	0.56	0.48	0.77
Lots required for a 1 tick or 1 basis point increase in the spread	52.53	60.85	38.61	178.07	206.67	130.53
B. Mark/Yen						
Intercept	1.7008	1.4246	2.2362	2.3993	2.0043	3.1715
	(9.35)	(6.51)	(7.18)	(9.35)	(6.51)	(7.19)
Order size	0.0034	0.0036	0.0031	0.0048	0.0051	0.0042
	(5.19)	(4.81)	(2.41)	(5.16)	(4.81)	(2.33)
R^2	0.1898	0.2335	0.1356	0.1878	0.2337	0.1283
Spread of 50 lot trade	1.87	1.61	2.39	2.64	2.26	3.38
Spread increases per 100 contracts	0.34	0.36	0.31	0.48	0.51	0.42
Lots required for a 1 tick or 1 basis point increase in the spread	290.43	274.13	324.15	207.32	194.64	236.38

in the Mark/Paris than in the Mark/Yen contract (R^2s of 0.42–0.74 in the Mark/Paris vs. R^2s of 0.13–0.23 in the Mark/Yen).

Several other models were also tested—including one with a dummy variable for whether a trade occurred, one with a term representing the square of the order size, and one with a cross-term for the order size and whether a trade occurred. None of them performed better than the simple regressions reported in Table I.

CONCLUSIONS

This paper continues the exploration of low-volume, liquid futures markets begun in "Liquidity without Volume: The Case of FINEX, Dublin." In this paper, two low-volume futures contracts were examined. Unlike most contracts, these particular contracts were designed from the very start to tap the liquidity of the interbank market. They are quoted in cash-foreign-exchange-market terms, and, because of the FILLS, they are tradable in lot sizes comparable to interbank trades at a single price in a single transaction.

If the theory hypothesized in Part I is correct—that it is indeed possible for a low-volume derivative market to tap the liquidity of deeper underlying markets—then one would expect these contracts to be liquid, even though they post very low volumes.

This paper also makes a methodological contribution by pioneering a new methodology for examining liquidity. It does so by exploiting the data collection mechanisms associated with the FILLS rule which provide a detailed transaction record of market participant interest and activity in dealing large quantities. Thus, the Exchange has created a unique data base of large-order inquiries and the resulting bids and offers (spreads) to execute the entire block. For a researcher interested in examining market resiliency, these data are remarkable as they provide an ex post means to assess the ex ante liquidity of the market, without regard to normal market volume. Indeed, with these data it is possible to regress spread size on order size to determine whether and to what extent the transaction costs of the market increase with order size.

When this methodology is used to explore the resiliency of these two cross-currency contracts, statistically significant positive relationships between the size of the order and the size of the market are found. However, while the relationships are statistically significant, (i) they do not appear to be economically significant, and, even more importantly, (ii) the sizes of the spreads for large orders appear consistent with those quoted in the interbank market.

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