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Discussion

Discussion of “The competitive effects of US decimalization: Evidence from the US-listed Canadian stocks” by Oppenheimer and Sabherwal

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1. Background

Models of market microstructure tell us that a spread is necessary to compensate market makers for order processing costs, inventory risk, and adverse selection. Since entry into market making is relatively easy on the Nasdaq dealer market, and the New York Stock Exchange (NYSE) specialist faces competition from public liquidity suppliers as well as from regional exchanges, competition should at least theoretically lead to spreads that are just large enough to cover these costs. This is, of course, provided that spreads are free to adjust to reflect the economic costs of providing liquidity. However, to economize on negotiation costs between buyers and sellers, equity markets have traditionally stipulated a minimum tick size. A minimum tick size reduces the ability of the spread to adjust downwards, potentially resulting in excess trading costs and excess profits to market makers. ²

While the tick size in US equity markets had remained one-eighth since the founding of the NYSE in 1792, ³ the costs for providing liquidity had come down considerably by the end of the 1990s, both due to technological innovation, improved access to information, and improved liquidity. It was clear that a tick size of one-eighth of a dollar was too large. In 1996, the US Congress issued a mandate

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² See Harris (1994, 1997) for a discussion of the role of a discrete tick size.

³ In fact, the pricing of stocks in eighths traces even further back to the old Spanish “pieces of eight,” coins divided into eight parts.

for decimal pricing through legislation that arose out of Congressional hearings on the matter. In response, US equity markets slashed the tick size in two, from one-eighth of a dollar to one-sixteenth of a dollar, or a “teeny,” in the summer of 1997. However, by 1998, policy makers and regulators and many academics argued that costs had come down to the point where even the new smaller tick size was binding. As a result, they argued that trading costs facing particularly retail investors were too high. In addition, policy makers felt that US equity markets needed to move to decimal pricing to remain competitive internationally.

By 1998, the US Securities and Exchange Commission was charged with ordering the US stock exchanges to implement the switch to decimals. The monumental task of shifting to decimals was somewhat delayed because of the already staggering costs facing the industry for safeguarding the integrity of all computer systems as the world moved into the new millennium. Decimalization was implemented for all NYSE stocks in January of 2001 and was fully implemented for Nasdaq by April 2001.

By this time, many markets around the world were already trading in decimals. The Canadian exchanges implemented decimal pricing on April 15, 1996 (see Ahn et al., 1996). This change reduced the minimum tick size on the primary Canadian exchange, the Toronto Stock Exchange (TSE), from 12.5 to 5 cents for stocks trading above \$5. For stocks trading between \$3 and \$5, the minimum tick size was reduced from 5 to 1 cent. The minimum tick size for stock trading under \$3 was unchanged.

2. Research question

Several studies have examined the impact of tick size reductions within a particular market (see below). Generally, the results from these studies show that quoted and effective spreads declined significantly following a tick size reduction. However, displayed (i.e. quoted) depth also have declined significantly following a tick size reduction. Nevertheless, since retail investors typically trade small orders, the general consensus is that retail investors have benefited from recent tick size reductions. The picture is more complicated for institutional investors who are more likely to suffer from the reduction in displayed depth, and the evidence is here more mixed.⁴

Much less is known about the competitive effects of decimalization: what the effects of one market changing its tick size are on other markets trading the same stocks. This is the topic of the paper by Oppenheimer and Sabherwal. Specifically, they ask: “What happened following US decimalization to Canadian market share, spreads, depth, and trading volume for Canadian stocks cross-listed in the US?” I think this is a great research question!

⁴ Jones and Lipson (2001) find a significant increase in institutional trading costs following the 1997 move from one-eighth to one-sixteenth, but Chakravarty et al. (2002) and Werner (2002) find significant reductions in institutional trading costs following the 2001 move to decimals.

3. Previous results

In a related paper, Ahn et al. (1997) examine the competitive effect of the 1996 TSE tick size reduction on US trading of Canadian stocks.⁵ They find significant reductions in quoted spreads on the TSE following TSE decimalization. The magnitude of the reduction is larger for stocks cross-listed on the NYSE (27%) than for those cross-listed on Nasdaq (16%), and non-cross-listed stocks (17%). However, surprisingly, they find no competitive effect on NYSE spreads, and only a small reduction in Nasdaq spreads. In fact, NYSE spreads were significantly higher than TSE spreads for the same stocks before and even more so after the TSE tick size reduction. By contrast, Nasdaq and TSE spreads were of roughly equal magnitude both before and after the TSE experiment.

Interestingly, Ahn et al. (1997) find no significant order flow migration back to Canada from either the NYSE or Nasdaq, despite the significant lowering of relative trading costs in Canada particularly for stocks cross-listed on the NYSE. This suggests that order flow is not particularly sensitive to cross-border competition which is consistent with previous work that finds trading of cross-listed securities to be at least to some extent segmented (e.g., Werner and Kleidon, 1996).

Despite these earlier findings of very limited competitive spillovers, the recent US decimalization was clearly at least potentially a threat to Canadian equity markets. Hence, Oppenheimer and Sabherwal investigate whether US decimalization was more effective in capturing order flow for Canadian cross-listed stocks than the 1996 Canadian decimalization.

From two recent studies of the US decimalization (Bacidore et al., 2001; Harris et al., 2001), we know that quoted spreads declined by an average of 30% on the NYSE and by 50% on Nasdaq. At the same time, displayed liquidity declined by an average of 70% on the NYSE and by 67% on Nasdaq. However, importantly, neither study found significant changes in volume for US stocks despite the spread reduction.⁶ Thus, there were significant reductions in quoted spreads on US exchanges. If the reduction was of similar magnitude for Canadian stocks that are listed in the US, we would expect that trading costs on the TSE for these stocks would have to come down to prevent order flow from migrating to the US. Of course, the reduction in displayed liquidity on the US markets would potentially mitigate the order flow migration and so would any market segmentation in trading. However, markets would have to be incredibly segmented for such a significant reduction in US trading costs not to adversely affect liquidity on the TSE absent a competitive response. Based on previous empirical results, I would predict little or no effect of decimalization on overall trading volume for Canadian stocks. What would happen to the market share of trading Canadian stocks depends both on the competitive response and on the degree of market segmentation.

⁵ See also Bacidore (1997).

⁶ See also Bessembinder (2001), Chakravarty et al. (2001), and Chung et al. (2001).

4. A win–win situation

Oppenheimer and Sabherwal find that the quoted spreads declined significantly for Canadian stocks on all exchanges. However, the decline was larger in the US (NYSE sample: 34%, Nasdaq sample: 23%) than in Canada (NYSE sample: 18%, Nasdaq sample: 17%). Depth declined substantially on the NYSE for Canadian cross-listed stocks (60%), and also on the TSE (24%). Unfortunately, the data source used by the authors (TAQ) for Nasdaq is not informative on depth so no evidence is presented on the effect of decimalization on depth for the Canadian stocks that cross-list on Nasdaq.

Unlike previous studies, Oppenheimer and Sabherwal find a significant increase in both US and Canadian trading volume following US decimalization. The US dollar volume for Canadian cross-listed stocks increased by 18% on the NYSE and by 40% on Nasdaq following decimalization. Interestingly also TSE dollar volume increased by 5% for Canadian stocks cross-listed on the NYSE and by 26% for Canadian stocks cross-listed on Nasdaq.

Finally, Oppenheimer and Sabherwal find no significant shifts in market share of trading Canadian cross-listed stocks following US decimalization.

5. Comments

Overall, I very much like this paper and only have a couple of comments. The first relates to the mechanics of how cross-border competition works. The way the paper is written suggests that spreads are synonymous with market maker profits. This is the channel through which the authors envision cross-border competition to work. However, this would only be true if every trade was intermediated which is clearly not true for either Canadian or US equity markets of today. The NYSE specialist participates in 15% of dollar volume⁷ and my guesstimate is that Nasdaq market makers participate in less than 50% of dollar volume. Therefore, I think that it is important to clarify that spreads decline because both public liquidity suppliers and market makers compete for a pool of liquidity demanding orders.

My second comment is that Oppenheimer and Sabherwal choose a 30 day window to examine the effects of US decimalization. Since it is likely that it takes some time for market participants to adjust their trading strategies to a new market structure, I would suggest examining a longer window. Granted, lengthening the window means an increased risk of attributing effects to decimalization that in reality arise from confounding factors. However, I do think that it would be worthwhile to go beyond the 30 days currently examined by the authors.

At the same time, it is important to control for other factors that might cause changes in trading volume. This is particularly important since the authors find a significant increase in trading volume for Canadian stocks, while previous research

⁷ NYSE Fact Book (2002), the New York Stock Exchange.

finds no significant change in volume. Why do you think that Canadian stocks are so different? The time-period is after all the same as that examined by previous authors. A more elaborate discussion comparing the results for Canadian stocks to those for US stocks would be very useful.

Most of the findings in the paper are straightforward, but there are some puzzling results in the paper. The first one I already mentioned: trading volume increases both in the US and in Canada after decimalization. Yet, no significant increase in trading volume has been found by other researchers examining US stocks pre- and post-decimalization. What makes Canadian stocks so different from US stocks? I think that the authors need to come up with a story for why there is such a stark difference across the samples. Second, what do you make of the finding that Nasdaq trade size increased while NYSE trade size declined? Is this because large orders are broken up on the NYSE, or was there a change in the proportions of institutional versus retail order flow? Why would the tendency to break up orders differ across Nasdaq and the NYSE? It would be nice to have more interpretations of these findings in the paper.

A smaller point is that it was not clear from the study whether or not commissions are comparable across markets. Thus, it is difficult to know what the effects on total trading costs across the markets were of decimalization. It would help to have at least some ball-park numbers on commissions in Canada versus the US for trading US stocks.

Finally, I find the questions the authors raise at the end of the paper about institutional trading (the block size category) intriguing. I suggest that the authors pursue this further, either in this paper or in future work. Incidentally, do you know where institutions trade post-decimals? It would seem that they are more likely to be affected by the depth-decline, and based on that it is natural to predict that they migrated towards the TSE.

6. Conclusions

Oppenheimer and Sabherwal examine a highly relevant research question for policy makers, exchange officials, and academics alike. They carefully and competently examine the empirical evidence from the TSE and US markets following US decimalization.

The results point to a win-win situation where investors in both markets benefit from lower trading costs and enhanced liquidity. Of course, the flip side of this is that the rewards for providing liquidity have declined in North American equity markets. It remains to be seen what the long run ramifications are of this on trading costs and liquidity.

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