

# MSET Insight: Impact of Citigroup Reverse Split

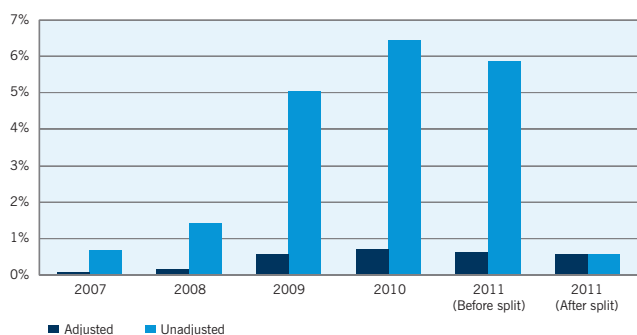
June 2011

Citigroup Inc completed its 1-for-10 reverse stock split on May 6, 2011 automatically combining every ten shares of outstanding Citigroup common stock into one share of common stock without any change in the par value per share. The impact reduced the number of outstanding shares of Citigroup common stock from ~29 billion to ~2.9 billion. Despite the reduction in Citi shares traded, overall market volumes have not meaningfully decreased. In addition, as a result of the reverse split there has been a shift in the composition of market participants trading Citigroup, as well as a change in a number of its key technical factors. This MSET Insight report examines the trading behavior of Citigroup stock since the split.

## IMPACT ON EQUITY VOLUMES

As expected on an unadjusted basis, market share dropped from an average of approximately 6% YTD to under 1%. However, on a 10:1 split adjusted basis, shares traded in Citigroup, as a proportion of the overall market actually remained relatively flat.

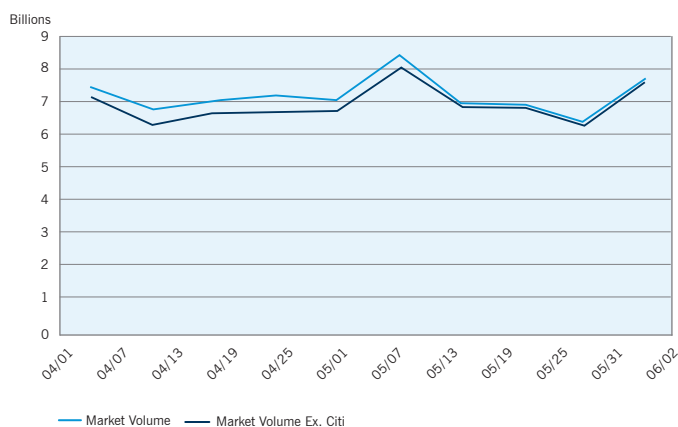
### Citigroup Market Share



Source: Morgan Stanley Electronic Trading, BATS, FactSet

Despite the significant reduction in Citigroup volume traded on an unadjusted basis, overall market volumes have remained in line with volume levels in prior weeks.

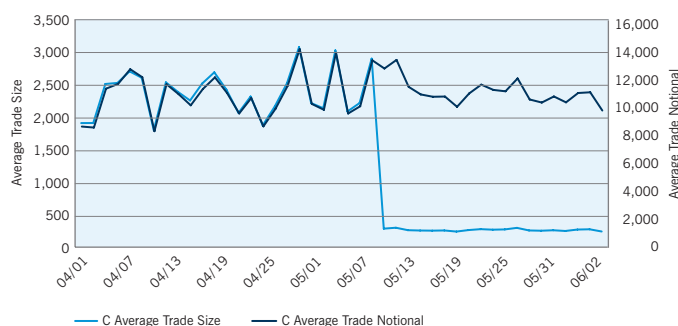
### Average Weekly Market Volume



Source: Morgan Stanley Electronic Trading

In addition, Citi notional traded remained relatively stable while average trade sizes dropped from approximately 2,400 shares to approximately 270 shares.

### Citigroup Notional Traded and Trade Size—2011



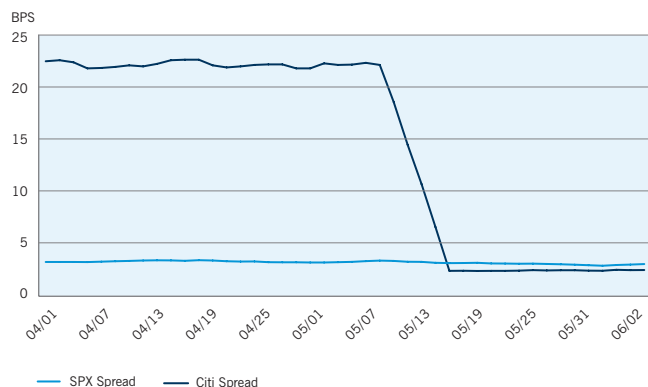
Source: Morgan Stanley Electronic Trading

## POTENTIAL SHIFT IN THE COMPOSITION OF CITIGROUP TRADERS AND INVESTORS

Three major indicators that suggest Citigroup may now be less attractive to high frequency traders are: a lower spread ratio, decreased quoting activity, and lower relative trading levels.

Citigroup may have been among the stocks most heavily traded by HFT, with a spread to price ratio exceeding that of the S&P 500 by a factor of eight. However, since the reverse split, the spread to price ratio has narrowed significantly.

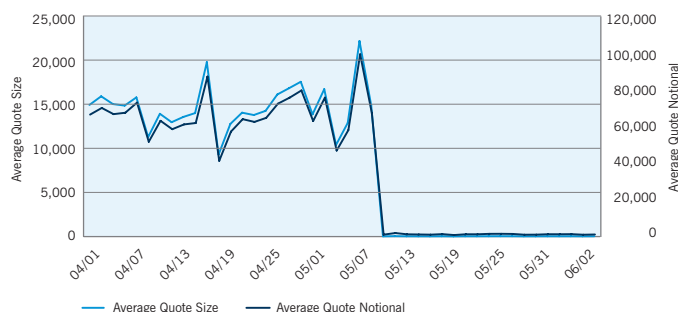
### Citigroup Spread vs. S&P 500 Spread—2011



Source: Morgan Stanley Electronic Trading

Quoting activity has also declined significantly, with the average quote size for Citigroup decreasing by roughly 400X and the average quote notional decreasing by approximately 40X since the reverse split.

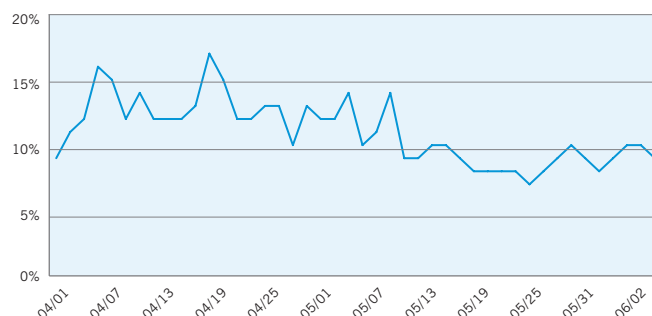
### Citigroup Quote Size Before and After the Reverse Stock Split—2011



Source: Morgan Stanley Electronic Trading

HFT has been estimated to comprise 50–70% of trading volume,<sup>1</sup> and Citigroup had actually been among the top five names traded for the past two years. Since the stock split however, Citigroup has fallen out of the top five most traded names by shares traded and market concentration of these names has decreased from approximately 12% to 9%.

### Market Share of Top Five Traded Names (U.S.)—2011

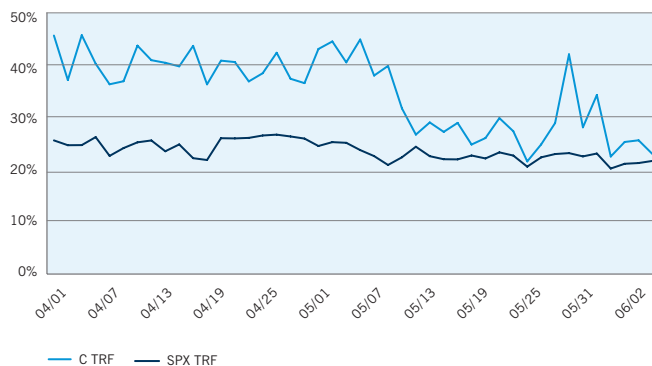


Source: Morgan Stanley Electronic Trading

### TRADING THE NEW CITIGROUP

Since the reverse split, Citigroup trading patterns e.g., TRF volume, intraday volume distribution and mid-point quote duration, now more closely resemble those of other large cap financial stocks. For example, the Citigroup proportion of TRF volume decreased from a median of 40% to about 27%, closer to the S&P 500 median of about 22%.

### Citigroup TRF Percentage Before and After Stock Split—2011



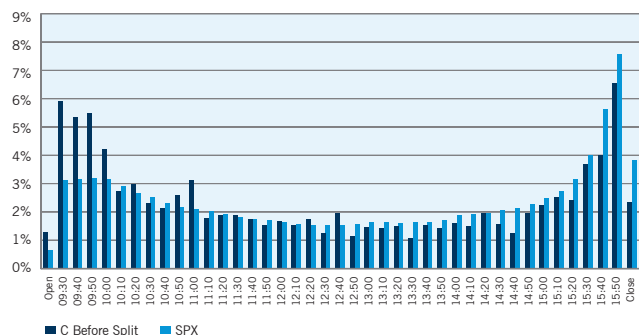
Source: Morgan Stanley Electronic Trading

1. TABB Group, U.S. Equity High Frequency Trading: Strategies, Sizing and Market Structure, September 2009.

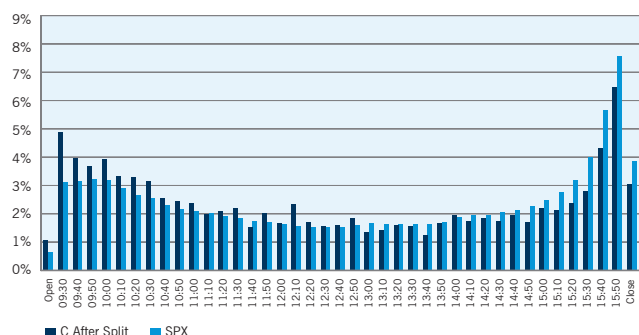
The charts below depict the intraday volume distribution for Citigroup before and after the reverse split. Before the split, relative to the S&P 500, a greater proportion of Citigroup volume traded between 9:30 and 10am, but after the split Citigroup's trading pattern reversed to correspond more closely with the S&P distribution.

#### Average Intraday Volume Distribution—Citigroup vs. S&P 500

##### Before Split



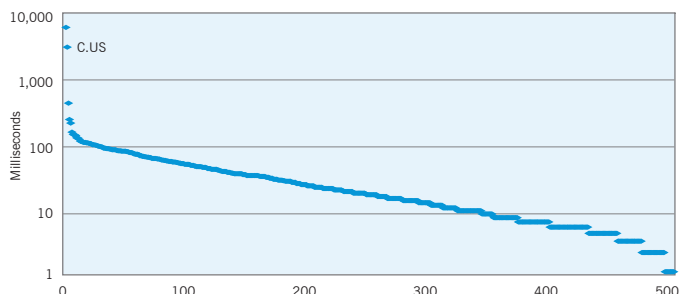
##### After Split



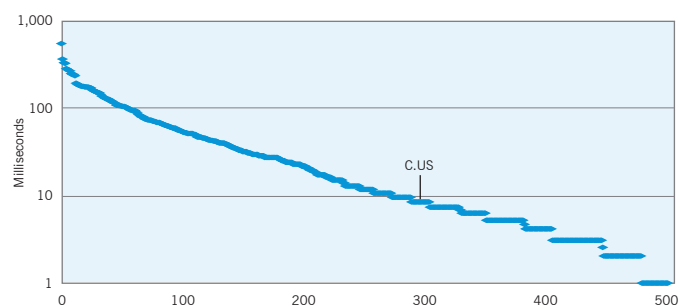
Source: Morgan Stanley Electronic Trading

The second set of charts below illustrate the mid-point quote duration before and after the reverse split, which measures the length of time it takes the mid-point quote price to move. The median duration has dropped from 3000+ milliseconds to roughly seven milliseconds, in line with other S&P 500 stocks.

#### Median Mid-point Quote Duration Before Split— 2011



#### Median Mid-point Quote Duration After Split— 2011



Source: Morgan Stanley Electronic Trading

In summary, Citigroup's trading behavior and patterns now closely resemble those of other large cap financial stocks. The per-share cost to take Citigroup stock on an exchange is now much more reasonable than it was before, which has resulted in the reduction of the TRF percentage of Citigroup's trading volume. This represents an excellent case study for researchers to use when evaluating lower priced stocks—the same asset instantly transformed from a \$4 stock to a \$40 stock behaves very differently in our current market structure.

MSET continues to monitor the trading behavior of Citigroup as well as that of the rest of the market and incorporates this data into all of its trading tools to ensure that our clients have the best possible electronic trading experience. For further information, please contact your MSET representative.

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