

**Securities Transaction Tax Reduction and Stock-Futures Arbitrage In India**  
**Why India Should Further Reduce Its Securities Transaction Tax**

Can reduction or elimination of India's Securities Transaction Tax favorably increase government revenues from stock and futures trading?



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**Securities Transaction Tax Reduction and Stock-Futures Arbitrage In India****ABSTRACT (<http://ssrn.com/abstract=1989539>)**

UK Sinha, Chairman of the Securities Exchange Board of India (SEBI) announced in November 2011 that SEBI had engaged the Ministry of Finance in a discussion hopefully leading to a reduction of India's Securities Transaction Tax (STT), a discussion that would hopefully produce benefits to India's capital markets (CNBC, 2011). The matter of reducing or eliminating the STT is presently under study by the Ministry of Finance and will come before the Indian Parliament in February 2012. Removal of this tax has been a long-term objective of brokers, stock exchanges and investors who compare the exceptionally high total transaction cost of fees and taxes in India with lower total costs in other countries.

In this study both intraday and inter-day data on a representative selection of single stocks and their associated futures contracts is used to explore the effects of reduction or elimination of the STT when single stocks are arbitrated against their related futures contracts. For this purpose data was chosen spanning selected days in June through December 2011 for eight liquid single stocks. Since the profit from a potential arbitrage can be calculated in advance of entering a trade, the number of profitable single stock arbitrage trades available on a specific day can be calculated after accounting for STT cost ranging from zero to 100% of its current statutory level. The result of this careful analysis suggests a decrease in the STT of at least 75% is necessary to achieve meaningfully increased levels of arbitrage normally found in most successful global futures markets. Such a decrease in the STT is also likely to result in the maximum transaction revenue collected by the government.

**Key Words:** Securities Transaction Tax, STT, India futures, single stock futures, arbitrage, zero arbitrage band, India, forward arbitrage

## INTRODUCTION

While there are studies supporting the introduction or retention of a Securities Transaction Tax or STT (Singh, Tax Financial Speculation: The Case for a Securities Transaction Tax in India, 2001) there are no known studies reflecting the effect of STT reduction on transactions in India. The purpose of this paper is to examine the effect of STT reduction on one class of important transactions in the India market, namely that in which single stocks are arbitrated against their single stock futures. This particular class of vital transactions is critical to establishing and maintaining an economic fair value for equity futures listed on the Bombay (BSE) and National Stock Exchange (NSE) of India. The frequency with which profitable arbitrage opportunities arise is also very sensitive to transaction costs so the effect of an STT reduction is particularly attractive as a subject for study by India's taxing authorities, brokers and regulators.

It is well known that stock arbitrage, when frequently pursued in adequate size, keeps futures contracts in global markets near to their economic fair values. A lack of fair value in futures markets reduces liquidity in both futures and stock markets and also erodes the willingness of institutional investors to hedge their economic risks using futures contracts. Regulators and policy makers generally recognize that without liquid, efficient hedging instruments it is difficult to retain domestic institutional investors or to attract foreign ones. Thus governing politicians and regulators have an important stake in establishing market conditions conducive to the growth of arbitrage in India's capital markets.

## SINGLE STOCK ARBITRAGE IN INDIA

Arbitrage is an activity prevalent in all global capital markets and in all major asset classes. Within a single asset class the form taken by this activity varies from country to country depending upon the availability of financial instruments, their liquidity and, most importantly, transaction costs. In the China market, for example, absence of trading platforms with which to efficiently and directly purchase baskets of single stocks and the presence of only one index futures contract have limited arbitrage to Exchange Traded Funds (ETFs) vs. index futures (Slivka, Zhang, & Zhang, "Index Arbitrage In China", 2012).

Since the liberalization of India's markets in 1991 there have been at least six different active forms of equity arbitrage from time to time (Slivka, Wu, & Shah, "Arbitrage of Single Stocks Versus Futures In India", 2012) including:

### Index Futures and Stock Basket Arbitrage

1. Stock Baskets vs. Index Futures
2. ETFs (Exchange Traded Funds) vs. Stock Baskets
3. ETFs vs. Index Futures

### Single Stock Arbitrage

4. ADR/GDRs vs. Single Stocks
5. Single Stock Futures vs. Single Stock Futures
6. Single Stocks vs. Single Stock Futures

At present limited liquidity in Indian ETFs, underdeveloped trading platforms for stock basket transactions, high transaction costs and adverse regulations on ADRs have all combined to confine current equity arbitrage to two types: single stock futures vs. single stocks and single stock futures vs. other stock futures. The high trading costs in India compared with other global stock markets has further limited single stock arbitrage to non-delivery (intraday) vs. inter-day transactions (Table 1). The predominant element of non-brokerage transaction costs in these two types of arbitrage is the STT (Table 2) which, if reduced or eliminated, has been argued will significantly encourage the growth of arbitrage in frequency, size and breadth.

Purchase of single stock shares and the simultaneous sale of futures contracts on that same stock establishes a forward arbitrage position. Reverse arbitrage position, while prevalent in other global markets, is far less available in India and China due to an underdeveloped stock lending business essential for this type of transaction (Slivka, Wu, & Shah, "Arbitrage of Single Stocks Versus Futures In India", 2012). Profits from established forward arbitrage positions result when the price difference between a long stock and short futures contract is diminished following initial execution. This narrowing of the price spread can occur if the stock rises in price relative to the futures contract, the futures price falls relative to the stock price or the two prices each move to narrow the price spread. Regardless of how this occurs, the systematic pursuit of forward arbitrage in sufficient size causes stock and futures to realign to their fair market values. Thus, arbitrageurs engaged in such transactions perform a valuable function in equity markets by increasing liquidity in arbitrated stocks and by creating sufficient selling pressure on overpriced futures so that they revert to their economic fair value.

While exploiting deviations from futures fair value is the short term objective of an arbitrageur, having reliable short term fair values is the goal of both domestic and foreign investors seeking to invest and hedge for a much longer term. Knowing that active daily arbitrage keeps futures near to their fair value gives investors comfort in using futures contracts for hedging purposes during volatile periods in the equity market. Investors concerned with controlling portfolio price risk can cheaply and efficiently hedge this risk with selective futures contracts, only if the contracts can be relied upon to be fairly valued and cost effective. Having the ability to control or mitigate portfolio price risk in turn minimizes the need to liquidate stocks in times of market distress, a move that is very costly to investors and frequently leads to increased market volatility. Since a stated objective of Indian regulators is to encourage domestic and foreign longer term investment, the presence of a deep and continuously functioning arbitrage market is important.

The value added by the presence of efficient arbitrage within an equity market, then, is generally agreed to include the following (Singh, Tax Financial Speculation: The Case for a Securities Transaction Tax in India, 2001).

1. Increased liquidity in both arbitrated equity instruments (stock and futures)
2. Reduction and elimination of pricing abnormalities
3. Creation of investing and hedging markets attractive to both domestic and foreign investors

## **FORWARD ARBITRAGE COSTS**

Arbitrageurs engaged in forward arbitrage, where stock is purchased for delivery and futures sold to hedge, must calculate their projected returns after netting out all costs. Those costs include the following three major categories.

### Bid / Ask Spreads

The setup and subsequent unwinding of an arbitrage trade may cause the arbitrageur to pay the difference between bid and offer prices for both stock and futures contract. The magnitude of the futures bid-offer spread is quite small being typically 0.03% in the stocks for this study. With skillful execution and the use of algorithms the cost of this spread may be zero or negligible. In this study the bid/ask spreads are set aside in favor of an examination of non-brokerage costs, such as the STT.

### Brokerage Costs

For arbitrage trading in India a stock brokerage on traded value of 0.10% for delivery transactions and 0.015% for futures represent highly favorable terms for investors and hedgers and so were used in our calculations. Brokers and dealers trading for their own account experience lower commissions than those assumed here.

### Government, Regulatory and Exchange Fees

Indian brokers are required by the government to collect a securities transaction tax (STT), exchange transaction charge, stamp duty and regulatory fee, all of which are normally included in the total customer charges appearing on transaction statements. A typical set of these fees appears in Table 1.

Table 1: Common Costs for Forward Arbitrage In India

<b><u>Charges On Each Leg Of Delivery Transactions as a % of Traded Value</u></b>	<b>%</b>
<b><u>Stock Charges</u></b>	
<b>Brokerage on Turnover (Traded Value)</b>	<b>0.10%</b>
<b>Service Tax on Brokerage</b>	<b>10.30%</b>
<b>Securities Transaction Tax (STT) For Delivery Trades</b>	<b>0.125%</b>
<b>Exchange Transaction Charges for NSE and BSE Trades</b>	<b>0.0035%</b>
<b>Stamp Duty</b>	<b>0.010%</b>
<b>SEBI Charges</b>	<b>0.0001%</b>
<b>Total for Stock</b>	<b>0.2489%</b>
<b><u>Futures Charges</u></b>	
<b>Brokerage on Turnover (Traded Value)</b>	<b>0.015%</b>
<b>Service Tax on Brokerage</b>	<b>10.30%</b>
<b>Securities Transaction Tax (STT)*</b>	<b>0.0085%</b>
<b>Exchange Transaction Charges for NSE and BSE Trades</b>	<b>0.002%</b>
<b>Stamp Duty</b>	<b>0.002%</b>
<b>SEBI Charges</b>	<b>0.0001%</b>
<b>Total for Futures</b>	<b>0.0291%</b>

\*Total of 0.0170% is charged on sales only; half-turn shown here

The dominance of the STT as a percentage of non-brokerage charges for forward arbitrage round-trip delivery transactions is shown in Table 2. It is clear from this analysis that reduction for elimination of the STT is the most important source of easing the overall cost of conducting this form of arbitrage. The degree to which this results in increased arbitrage opportunities is the primary purpose of this study.

Table 2: Non-Brokerage Costs for Forward Arbitrage

<b><u>Non-Brokerage Costs for Forward Arbitrage*</u></b>	<b>% of Traded Value</b>	<b>% of Total</b>
<b>Securities Transaction Tax (STT) For Delivery Trades</b>	<b>0.2670%</b>	<b>88.29%</b>
<b>Exchange Transaction Charges for NSE and BSE Trades</b>	<b>0.0110%</b>	<b>3.64%</b>
<b>Stamp Duty</b>	<b>0.0240%</b>	<b>7.94%</b>
<b>SEBI Charges</b>	<b>0.0004%</b>	<b>0.13%</b>
<b>Totals for Non-Brokerage Costs</b>	<b>0.3024%</b>	<b>100.0%</b>

\* For round trip delivery transactions combining stock and futures

At the time of its introduction in 2004 the perceived benefits from applying an STT included (Singh, India Introduces Securities Transaction Tax, 2004):

1. Reducing the amount of speculative trading relative to investing activity in the India market
2. Reducing market volatility
3. Establishing an efficient way to raise tax revenues from domestic and foreign investors

There is no known study that verifies if the STT has reduced speculative trading relative to investing activity in India. However, there are some studies indicating that the reduction of market volatility is highly questionable when an STT is introduced (Roll, 1989). Regarding the third perceived benefit it does seem clear that the collection of the STT by India brokers has represented a very efficient way to raise tax revenues at minimal expense to the government.

Today the potential benefits of decreasing or eliminating the STT are thought to include (Jagota & Sahu, 2011):

1. Broadening market participation by investors and hedgers and partially reversing the flight of capital from the Indian market experienced in 2010-2011
2. Increasing trading volume by lowering transaction costs
3. Improving market liquidity and efficiency

The argument that market participation can be broadened has some foundation. Because capital will seek a satisfactory return in global markets, any significant rise in returns resulting from a reduction or elimination of transaction costs should affect capital flows. With the STT applied every time securities change hands this tax should in theory and in practice reduce returns by the present value of all future tax payments. By playing the dominant role in arbitrage transactions (Table 2) the STT, if eliminated, is likely to have a significant direct effect on participation by arbitrageurs who in turn are likely to raise transaction volumes among stocks and futures available for forward arbitrage. Long-term hedgers and investors who subsequently experience futures priced closer to fair value and increased liquidity will have an improved incentive to utilize these instruments in their portfolios. This incentive is likely to be appealing to foreign as well as domestic investors but any realized increase in market participation by foreign or domestic longer-term investors will have to await a confirming future study following STT reduction or elimination.

Because the highest transaction volumes in Indian derivatives markets occur for short-term contracts, typically with maturities under 6 months, the positive effect on volume of an STT reduction is likely to be large in such instruments. If a trading volume increase is realized, then it should be most easily measured in the futures and options markets. Finally, historical examples in derivative transactions do indicate that volume and liquidity flow to international markets having the lowest transaction costs. Across a broad array of empirical studies a direct relationship between the level of transaction costs and trading volume has been confirmed (Matheson, 2011) (Ericsson & Lindgren, 1992). With India's high transaction costs relative to many other countries, the improvement in trading volume, liquidity and efficiency resulting from a reduction of STT must be considered likely.

## EFFECTS OF STT REDUCTION ON ARBITRAGE TRANSACTIONS

While in the past two decades the trend of governments has been to reduce rather than increase transaction taxes, the IMF nevertheless recommended in 2010 that G-20 countries consider the use of a global financial transactions tax raising funds to pay for global costs of the recent financial crisis (Matheson, 2011). This global tax, sometimes referred to as a "Tobin tax" is highly controversial and seemingly a long way from being adopted by all G-20 nations. India is unlikely to agree to implement such a tax given its current focus on finding ways to increase transactions against the background of total equity trading costs that are unusually high. Presently India is among 17 of the G-20 countries that already apply some form of transaction tax to secondary equity trading (Matheson, 2011) but notably is only one of three that apply an STT to futures and options transactions.

To test the effect of STT reduction on the Indian equity futures market eight stocks with favorable liquidity in their futures contracts were chosen from among the 226 stocks with futures listed on the NSE. Four stocks were components of the CNX IT Index and four were constituents of the CNX Bank Nifty Index. The choices of stocks and futures for this study appear in Table 3. Each of the 8 stocks was then taken through a series of steps to determine both the number of profitable forward delivery arbitrage opportunities available as a function of the STT level and the width of the zero arbitrage band within which no forward arbitrage is profitable. Not all stocks and futures had usable data for each date. Representative among these stocks were ICICI Bank and Infosys Ltd. each of which had a leading position in their index weighting.

**Table 3: Arbitrage Candidates**

<u>Stock / Future</u>	<u>Stock Ticker</u>
<b>Axis Bank</b>	<b>AXIS</b>
<b>HCL Technologies, Ltd.</b>	<b>HCL</b>
<b>HDFC Bank</b>	<b>HDFC</b>
<b>ICICI Bank</b>	<b>ICICI</b>
<b>Infosys, Ltd.</b>	<b>INFY</b>
<b>Punjab National Bank</b>	<b>PNB</b>
<b>Tata Consultancy Services, Ltd.</b>	<b>TCS</b>
<b>Wipro, Ltd.</b>	<b>WPRO</b>

Source: National Stock Exchange of India

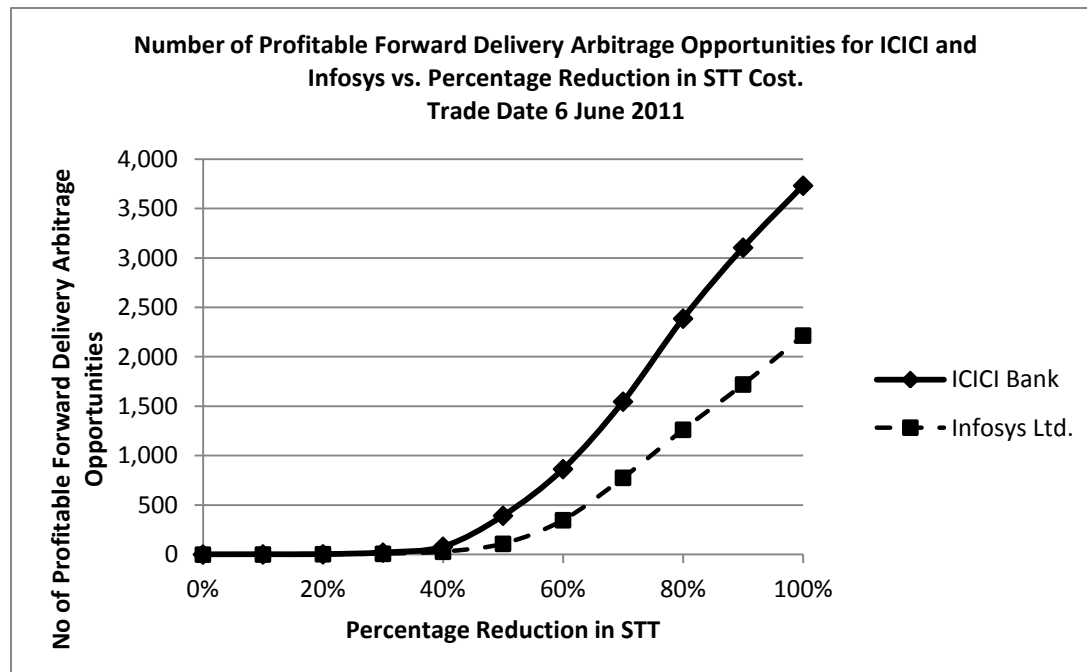
#### Number of Profitable Forward Delivery Arbitrage Opportunities

The following steps were taken for each stock in Table 3 to identify the number of profitable forward delivery opportunities available during a typical trading day.

- One trading day each in June through December 2011 was chosen, each having 20 - 24 calendar days to expiration of the futures contract expiring in that same month.
- For each date intraday stock and futures prices along with their execution times for ICICI Bank and Infosys were captured.
- Times for stock and futures trades were matched to the same transaction second.
- The return on a forward arbitrage position was calculated assuming the arbitrage was held to expiration of the future and all costs in Table 1 were included.
- If the calculated return was positive it was record it as a potential profitable arbitrage opportunity.
- While recording the number of profitable opportunities for forward arbitrage the STT was then systematically reduced, keeping all other costs constant. As the STT declined the number of profitable arbitrage opportunities rose reaching a maximum when the STT was completely eliminated at the zero STT level. Representative examples of this rise for ICICI Bank and Infosys Ltd. appear in Table 4 with plots in Figure 1.



**Figure 1: Profitable Forward Delivery Arbitrage Opportunities For ICICI Bank and Infosys Ltd. vs. Percentage Reduction in STT Cost**



Source: Authors' Calculations

**Table 4: Profitable Forward Delivery Arbitrage Opportunities For ICICI Bank and Infosys Ltd. vs. Percentage Reduction in STT Cost**

% Reduction in STT Cost	Number of Profitable Forward Arbitrage Opportunities*	
	ICICI Bank	Infosys Ltd.
0%	1	0
10%	2	1
20%	3	4
30%	20	8
40%	80	29
50%	393	109
60%	865	348
70%	1547	777
80%	2387	1263
90%	3105	1721
100%	3732	2216

\* 6 June 2011

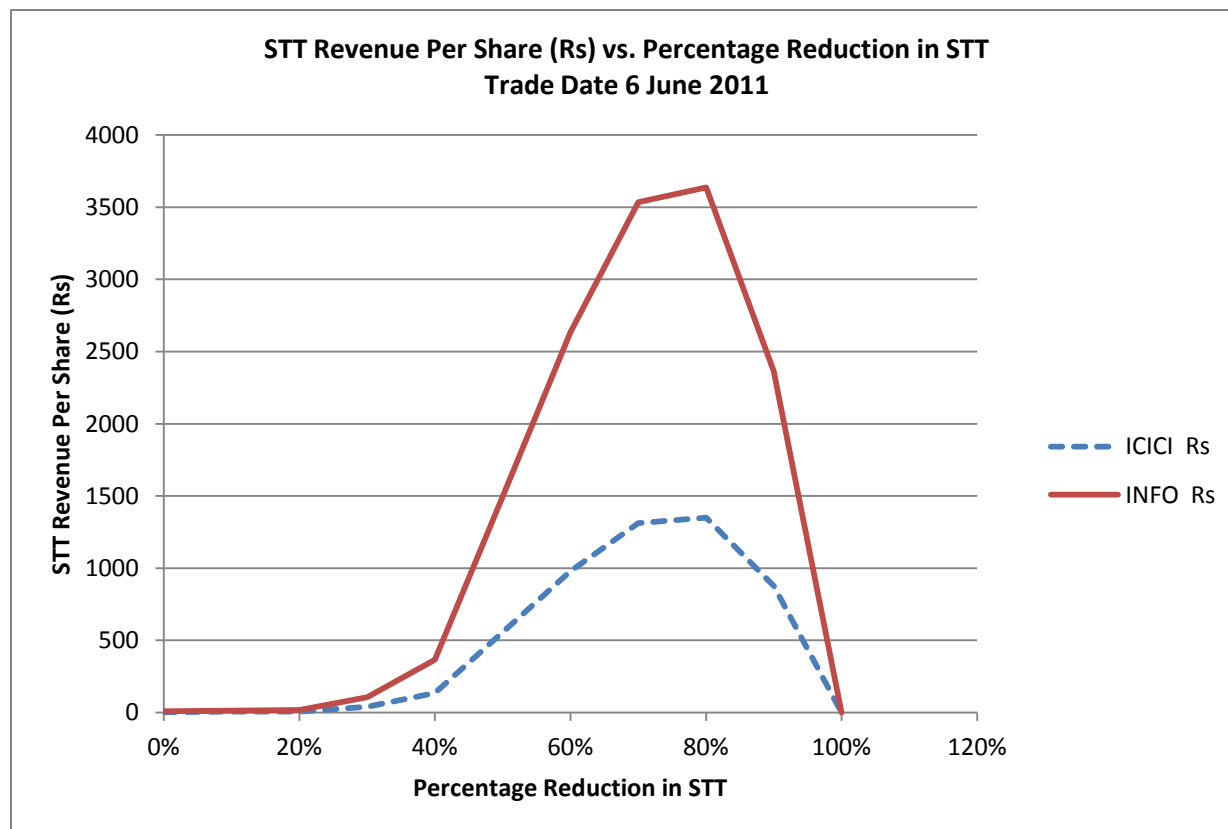
Union Budget 2012 and the STT

The Union Budget 2012 contains a set of provisions seeking to facilitate capital market transactions. The process of bringing initial public offerings of shares to the market is simplified and made less costly, qualified foreign investors will be allowed participation in the corporate bond market and the Rajiv Gandhi Equity Savings Scheme will allow retail investors below an annual income of Rs 10 lakh a 50 percent income tax deduction for new equity investments of up to Rs 50,000. None of these provisions are expected to affect meaningfully the class of transactions considered in this case study.

While the Parliamentary Standing Committee on Finance recommended the 2012 Budget abolish the STT on equity trades the government remained concerned about the continuing need to raise revenues and narrow the fiscal deficit, currently targeted at 4.6% of GDP. Accordingly the STT for delivery transactions was only reduced from 0.125% to 0.100% effective from July 1 and remains unchanged for intraday transactions on stock, futures and options.

For day traders and professional arbitrageurs who dominate intraday trading and provide essential market liquidity, profit margins will therefore remain thin. Unfortunately against this background the number of day traders also appears to have declined by an estimated 25% - 30% since 2008 (Gurav & Sahgal, 2012). For intraday transactions this implies it is unrealistic to expect any increase in government revenues arising from this particular Budget provision for STT treatment.

For delivery transactions, our study suggests the 20% reduction in STT to 0.100% is also unlikely to produce any meaningful increase in government revenues. As an illustration of why this is the case, consider the number of arbitrage opportunities for ICICI Bank and Infosys Ltd. displayed in Figure 1 and Table 4. At STT levels between 0.125% and 0.100% the number of profitable arbitrage opportunities was tiny. The potential STT revenue collected per share of stock arbitrated would therefore remain accordingly low. It is also the case that if the STT were abolished, the collected revenue per share would be zero. However an STT reduction somewhere between zero and 100% would result in a an increase in collected revenue. The profile for this collected revenue per share at differing levels of STT reduction is easy to calculate and appears in Figure XX. This profile suggests a decrease in STT of near to 75% - 80% yields the optimal revenue collected by the government.

**Figure 2: STT Revenue Per Share (Rs) vs. Percentage Reduction in STT**

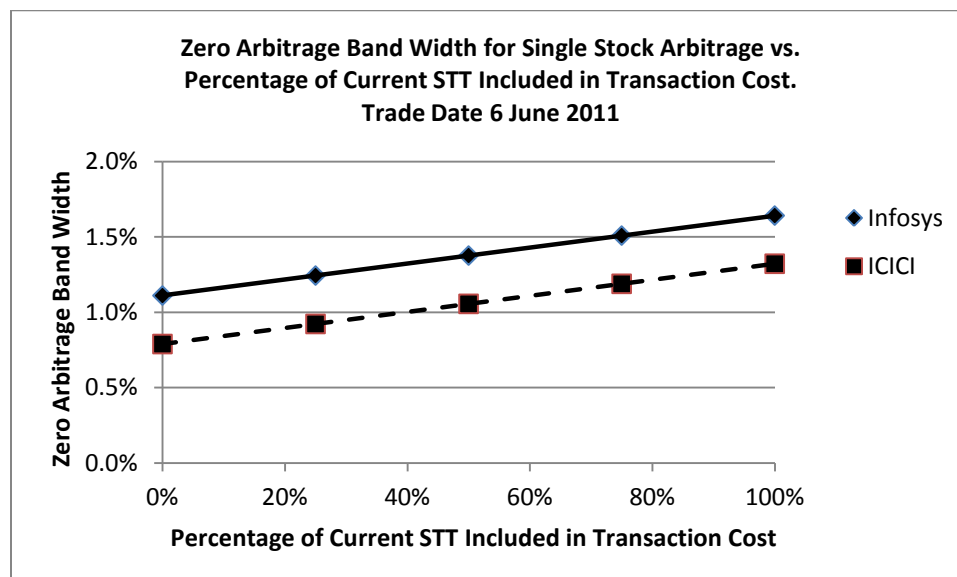
Source: Authors' Calculations

### Zero Arbitrage Band

Reduction of the STT also has a direct effect on the width of the zero arbitrage band, the pricing band surrounding the fair value of a futures contract and within which arbitrage is not profitable and does not take place (Slivka, Wu, & Shah, "Arbitrage of Single Stocks Versus Futures In India", 2012).

The width of this band is determined by the sum of direct and indirect costs that must be covered by an arbitrageur before a profit can be made. The higher the costs, the wider the band and so the less efficient the pricing of futures and the less frequent arbitrage will occur. For mature futures markets with a high degree of liquidity the width of the zero arbitrage band is typically about 1%. In a developing market such as China, the width of this band has been found higher but in India, even with highly favorable commission assumptions and very good liquidity, the band width should be lower but is yet considerably higher (Slivka, Wu, & Shah, "Arbitrage of Single Stocks Versus Futures In India", 2012) reflecting the role of high taxes and fees. The effect on the narrowing of the zero arbitrage band as the STT was reduced was calculated using a commission level suitable to professional arbitrageurs (Table 1). The results for Infosys and ICICI appear in Figure 3 and are typical among the futures studied. It can be estimated from this graph that for ICICI a 60% reduction in the STT is required to bring the zero arbitrage band width to approximately 1%, a desirable width for the present India futures markets. For Infosys the STT reduction has to be complete.

**Figure 3: Zero Arbitrage Band Width for Single Stock Arbitrage vs. Percentage of Current STT Included in Transaction Cost.**



Source: Authors' Calculations

## CONCLUSIONS

The analysis presented here leads to the following conclusions.

1. Reduction of the STT by only 40%, considered by the Indian Ministry of Finance in October, 2011 (Tiwari & Shah, 2011) is unlikely to narrow the zero arbitrage band for many stock to the critical level of 1%, a level globally consistent with healthy degree of future arbitrage.
2. Reduction of the STT by 40% is also unlikely to have a meaningful effect on the number of single stock forward arbitrage opportunities (Table 4).
3. Reduction of the STT by 50% from the current STT level creates on average only about 10% - 13% of the maximum number of observed profitable forward delivery opportunities . A decrease of STT by more than 50% from the current STT level causes a rapid and increasingly significant rise in maximum number of observed profitable forward delivery opportunities (Table 4).
4. A reduction of the STT greater than 60% from its current level is required to narrow the zero arbitrage band width to a level consistent with global futures markets having high liquidity (Figure 3).
5. A reduction of STT between 75% and 80% (Table 4) from the current level is required to raise the number of arbitrage opportunities to about 50% of the maximum level that occurs at zero STT (STT elimination). The maximum STT revenue enhancement also occurs at this level (Figure 2).
6. Complete elimination of the STT is highly likely to significantly increase transaction volumes in those NSE-listed shares that also have single stock futures (Table 4).
7. A meaningful increase in arbitrage activity will cause futures to trade closer to their economic fair value providing comfort to investors and hedgers that futures can be efficiently used in investment strategies.

Of the three typical potential benefits generally thought to arise from decreasing or eliminating India's STT (Jagota & Sahu, 2011) this study suggests that trading volume in NSE-listed shares having single stock futures is likely to increase significantly in both stock shares and their associated futures. A related liquidity benefit is that the improvement in the market pricing of futures contracts resulting from more frequent arbitrage opportunities will likely enhance the Indian regulatory objective of making India's equity market more attractive for both domestic and foreign institutional investors. A separate important benefit is that STT revenue collected by the government is likely to increase. These and other benefits, however, will require a significant reduction in the STT of at least 75% - 80%.

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