Evaluation of a Proposal to Reinstate the New York Stock Transfer Tax

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This report considers a proposal to reinstate the New York stock transfer tax (STT) that was phased out between 1979 and 1981. The proposal under consideration would reinstate the tax at half the rate that prevailed at the time of its repeal. The revenues from such a tax, at around $3.5 billion under current stock market conditions, would be shared equally by the governments of New York City and New York State.

I N A LETTER DATED MARCH 12, 2003, Ronald Tocci and John Lavelle of the New York State Assembly requested that we evaluate a proposal to reinstate a tax on the transfer of ownership—that is, the purchase and sale—of stocks that occur in the state's security markets. The revenues from this tax would be shared equally between the City and State of New York.

This paper was written in April 2003 at the request of Assemblymen Tocci and Lavelle, with specific reference to the New York

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State and City's fiscal crisis at that time. Some of the specifics of the crisis have changed since the time of writing, but the basic features of the crisis, and the role that the stock transfer tax (STT) might play in resolving it, remain intact.

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The reason the proposal to reinstate the STT has emerged in public discussions is clear: Both New York City and New York State face severe fiscal crises at present. The current state budget includes cuts amounting to $5.6 billion, approximately 6 percent of total state expenditures. The city is projected to experience budgetary shortfalls averaging $3.5 billion from 2004 to 2007, which amounts to 8 percent of the city's 2003 budget.

The reinstatement of a stock transfer tax could make a significant contribution toward ameliorating these fiscal crises. But, at the same time, imposition of this tax could produce serious negative unintended consequences. Such consequences could include eliminating jobs in the securities industry and elsewhere; the migration of the New York Stock Exchange, either out of New York or onto electronic trading platforms, as a means of enabling traders to circumvent the tax; and distortions in the efficient functioning of the financial markets. We evaluate each of these considerations in what follows.

The State of New York initially instituted the stock transfer tax in 1905. The tax was shifted to New York City in 1966. It was phased out between 1979 and 1981. However, it is still nominally "paid" to the state on paper and immediately rebated back to the payer. In other words, though traders in New York's stock markets have not faced any tax obligation since 1981, the apparatus to operate the tax remains in place. Therefore, at least at the level of administrative start-up costs, the city and state would not face serious difficulties in reinstating the tax.

At the time of its repeal in 1981, the tax operated on a sliding-scale basis relative to the selling price of a traded share. For shares

whose sale price was under $5.00, the tax rate was 1.25 cents per share sold. The rate then rose gradually to 5 cents per share for stocks selling at $20 or above. The STT also included a maximum tax obligation for a given trade of $350.

The current proposal for reinstating the tax suggests that the new rates should be one-half those at the time of repeal. In other words, under the new proposal, the tax would begin at 0.63 cent per share sold. The rate would then rise to a maximum of 25 cents per share sold for stocks selling at $20 or above. The maximum tax obligation would then be $175 per trade. We have focused our analysis on the effects of a tax set at this rate, that is, one-half the rate as of 1981. The effects of the tax, both positive and negative, would obviously vary if the tax rate itself were to change.

It is important to make clear here that the total tax obligation applies to both parties to the stock trade. The tax rates we have cited are therefore derived from what is known as the "two-sided" rate, since it applies to both parties. But this also means that each party to the transaction would tend to assume only one-half of the total obligation. In other words, what are called the "one-sided" tax rates are one-half of the "two-sided" rates. Thus, with the current STT proposal, the lowest one-sided rate is 0.32 cent per share traded, and the highest one-sided rate is 1.25 cents per share. The maximum tax obligation calculated on a "one-sided" basis would therefore be $87.50.

To illustrate how the stock would operate in practice, let us consider a transaction for a single share of stock valued at $25, which happens to be the average price of equity shares in the New York Stock Exchange in January 2003. In this case, the one-sided tax rate would be at the maximum level of 1.25 cents. The tax rate on this average transaction would be 0.05 percent (that is, 1.25 cents is 0.05 percent of $25). Now consider a case in which 100,000 shares of this same stock were traded. This $2.5 million

transaction would be taxed at the maximum rate of $175, or $87.50 on a "one-sided" basis. This amounts to a one-sided tax rate of 0.004 percent ($87.50 is 0.004 percent of $2.5 million). As we see, the tax rate continues to fall as the size of transactions increases, given that the maximum tax paid is $175.

Experiences with Stock Transfer and Other Securities Transaction Taxes

Stock transfer tax taxes are one variant of a broader category of securities transaction taxes. Transaction taxes can be and have been applied to other securities trades besides stocks, including bonds and futures. The type of securities transaction tax proposal that has received the most attention in recent years is one that would apply to foreign currency markets. This is the so-called Tobin Tax, named for the late Yale University economist and Nobel laureate James Tobin, who first proposed this type of securities transaction tax.

Security transaction taxes of various kinds have been a common policy tool throughout the world. Table 1 shows a range of taxes that have operated in thirty-eight countries in the recent past and that are roughly of the same magnitude we are considering. As the table shows, most of the major financial markets in the world have operated with some version of a securities transaction tax. These include Japan, the United Kingdom, Germany, Italy, and France. The table also shows that smaller developed economies such as Australia, Austria, Belgium, Denmark, Greece, and Ireland, and many developing economies, such as Chile, China, India, and Malaysia, have also operated with securities transfer taxes. These taxes have thus been viewed and utilized as a policy tool in a wide range of countries. But in recent years, they have been reduced or eliminated in most of the countries listed. We have tried to provide a summary picture of the cur-

Table 1

Security Transaction Taxes Around The World

Country	Stocks	Corporate bonds	Government bonds	Futures	Detail
Argentina	0.6%	0.6%	0.6%	0.6%	Tax of 0.6% on all financial transactions approved by legislature in March 2000.
Australia	0.3%	0.15%	—	—	Reduced twice in 1990s; currently 0.15% each on buyer and seller.
Austria	0.15%	0.15%	—	—	Present
Belgium	0.17%	0.07%	0.07%	—	Present
Brazil	0.3% {0.38%}	0.3% {0.38%}	0.3% {0.38%}	—	Tax on foreign-exchange transactions reduced from 2% to 0.5% 1999. Tax on stocks increased and on bonds reduced in June 1999.
Chile	18% VAT on trade costs	18% VAT on trade costs	—	—	Present
China	0.5% or 0.8%	{0.1%}	—	—	Tax on bonds eliminated 2001. Higher rate on stock transactions applies to Shanghai exchange.
Colombia	1.5%	1.5%	1.5%	—	Introduced in June 2000.
Denmark	{0.5%}	{0.5%}	—	—	Reduced in 1995, 1998. Abolished effective October 1999.
Ecuador	{0.1%}	1.0%	—	—	Tax on stocks introduced in 1999, abolished in 2001. Tax on bonds introduced in 1999.
Finland	1.6%	—	—	—	Introduced in January 1997; applies only to trades off HEX (main electronic exchange).

(continues)

Table 1 (*continued*)

Country	Stocks	Corporate bonds	Government bonds	Futures	Detail
France	0.15%	See note	—	—	Present
Germany	{0.5%}	0.4%	0.2%	—	Removed in 1991.
Greece	0.6%	0.6%	—	—	Imposed 1998; doubled in 1999.
Guatemala	3%	3%	See note	—	Present
Hong Kong	0.3% + $5 stamp fee	{0.1%}	{0.1%}	—	Tax on stock transactions reduced from 0.6% in 1993; tax on bonds eliminated in February 1999.
India	0.5%	0.5%	—	—	Present
Indonesia	0.14% + 10% VAT on commissions	0.03%	0.03%	—	Introduced in 1995.
Ireland	1%	—	—	—	Present
Italy	{1.12%}	—	—	—	Stamp duties eliminated in 1998.
Japan	{0.1%}, {0.3%}	{0.16%}	—	—	Removed in April 1999.
Malaysia	0.5%	0.5%	0.015% {0.03%}	0.0005%	Present
Morocco	0.14% + 7% VAT on trade costs	7% VAT on trade costs	7% VAT on trade costs	—	Present
Netherlands	{0.12%}	{0.12%}	—	—	1970–1990
Pakistan	0.15%	0.15%	—	—	Present
Panama	—	—	—	—	Stamp duties eliminated in January 2000.
Peru	18% VAT on trade costs	18% VAT on trade costs	—	—	Present

Philippines	{0.5%} + 10% VAT on trade costs	—	—	VAT present
Portugal	{0.08%}	{0.04%}	{0.008%}	Removed in 1996.
Russia	0.8% on secondary offerings + 20% VAT on trade cost			Present
Singapore	0.05% + 3% VAT on trade costs	—	—	Reduced in 1994, eliminated in 1998; VAT present.
South Korea	0.3% {0.45%}	0.3% {0.45%}	—	Reduced in 1996
Sweden	{1%}	—	—	Removed in 1991
Switzerland	0.15%	0.15%	—	Present; 0.3% on foreign securities, 1% on new issues.
Taiwan	0.3% {0.6%}	0.1%	0.05%	Reduced in 1993.
United Kingdom	0.5%	—	—	Present
Venezuela	0.5% {1%}	—	—	Reduced in May 2000.
Zimbabwe	0.45% VAT on trade costs	—	—	Present

rent status of this trend in the far-right column of Table 1. Though we have not fully surveyed the debates in each country around the issue, we feel safe in saying that a primary motivation for reducing or eliminating the tax has been the perception that the taxes were contrary to the priority of allowing financial markets to operate in an untrammeled fashion. Thus, for example, as recently as 1989, the securities transaction taxes in Japan generated more than 4 percent of the country's total government revenue (Japanese Securities Research 1992, 244). But the government has been reducing the tax in stages through the 1990s as part of its effort to weaken the economy's long-standing financial regulatory structure.[1]

The United States stands out among the advanced economies for never having instituted a significant securities transaction tax. Nevertheless, in addition to the tax that operated in New York from 1909 to 1981, smaller versions of such taxes have operated in the United States at various times. There was a federal stock transfer tax in place from 1914 to 1966. From 1960 to 1966, stocks were taxed at the rate of 0.1 percent at issuance and 0.04 percent on transfer. Bonds were taxed at the rate of 0.11 percent at issuance and 0.05 percent at transfer. While these taxes have been eliminated, the federal government still imposes a small tax on both the registration of new equity issues and their transfer, with the primary purpose of using the funds raised to finance the operations of the Securities and Exchange Commission (SEC). In 2000, the taxes were 1/36th of 1 percent (0.028 percent) of the value of a share registered, and the transfer fee was 1/300th of 1 percent (0.0033 percent) of the value of a transferred share. Together, these taxes generated $2.2 billion in revenue, nearly six times more than the 2000 budget allocation of $370 million for the SEC.

Given this wide range of experiences, including in New York State and New York City themselves, it is clear that implement-

ing the tax again would not present unusual administrative hurdles. In addition, enforcement of the tax also should not present major difficulties. We assume that the tax would be administered as a "stamp tax." This means that the transfer of stock ownership would not be legally effective until the tax was paid and the documents recording receipt of the tax were stamped (though, of course, the actual "stamping" could be done electronically). Assuming market participants place a high value on establishing legal status for their stock purchases and sales, the stamp requirement creates a strong disincentive against efforts to circumvent the tax. Further strong disincentives can also be achieved through additional simple measures—in particular, establishing large fines for tax avoidance, along with comparable rewards (e.g., a high percentage of the value of fines incurred) for employees who report on the nonpayment of stock transfer taxes within their firms.

Benefits of the Stock Transfer Tax

The basic benefit of the stock transfer tax is straightforward. It is the public revenue it would generate, which would, in turn, allow both the state and city to avoid sharp cuts in their ability to provide health, education, public safety, and other vital services. In 2002, revenues from the stock transfer tax (which were automatically rebated to taxpayers) totaled $6.7 billion, according to the New York Department of Taxation and Finance. If the tax were reintroduced at half the previous rate—that is, 50 percent of the revenues were rebated—this would generate an additional $3.4 billion in public income, $1.7 billion each for the city and state, to address their ongoing fiscal crises and the projected shortfalls in years to come.

At the state level, the additional revenue would have a major impact on the planned budget cuts of $5.6 billion in the current

administration's budget. The state's share of the revenues from the full stock transfer tax could be used to directly reduce the cuts by 30 percent and to counter the damage such fiscal auster-ity would inflict in terms of worsening the state's recession.

Let us briefly consider these general figures in more concrete terms. The current revenues from the reintroduction of the stock transfer tax at half its former rate would be more than sufficient to reverse over 60 percent of the planned cuts in school budgets ($1.2 billion), Medicaid ($1 billion), and higher education ($600 million) combined (NYS Division of the Budget 2003). Accord-ing to low-end estimates, the impact of avoiding the education cuts would, by itself, save 4,000 teaching positions, prevent an increase in class size, and rescue from elimination the successful prekindergarten program in which 60,000 children are currently enrolled (Goodnough 2003).

Moreover, avoiding the cost-saving strategies with respect to Medicaid reimbursements would sustain access to home-based care for elderly patients (which is currently slated to be elimi-nated), prevent the erosion of quality standards in nursing homes (which are facing a $400 million cut in reimbursements) and hos-pitals throughout the state, and help maintain the contribution of the medical services industry to the New York economy. Revers-ing the higher education cuts would eliminate the damage to New York's network of community colleges, allow for lower tuition costs at State University of New York campuses (which are expected to increase by $1,200 a year), and maintain access to needed financial aid programs (e.g., the state's Tuition Assistance Program, or TAP).

Finally, the added revenues would protect jobs during the cur-rent economic slump. By March 2004, state employment is sched-ule to decline by 10,000 from its November 2001 level of 196,000 (NYS Division of the Budget 2003). Injecting an additional $1.75 billion in revenue into the state budget will allow the state to avoid having to eliminate most of these jobs.

New York City will benefit directly from the state's additional revenue, since the city receives 19 percent of its total budgetary allocation directly from the state. Beyond this, the city will obviously benefit further from the $1.75 billion that it would be allocated directly through the STT. Thus, the $1.75 billion in direct revenue for the city would cover over 5 percent of current city-funded expenditures totaling approximately $32 billion out of the overall city budget of $45 billion, which includes revenues from state and federal sources. This additional revenue would cover roughly half of the average annual shortfalls projected by the Independent Budget Office's analysis of the Mayor's Preliminary Budget for 2004–7.[2]

Without the additional revenue from the STT, cuts to city agencies as proposed by the current Program to Eliminate the Gap (PEG) would substantially reduce the capacity of the city to deliver its basic services. The proposed cuts would weaken all basic services, including police and public safety, sanitation, social welfare services, public libraries, parks, and youth programs. The added revenues would also help prevent tuition increases at City University of New York and sustain public employment in the city. Moreover, the STT would expand the resources available to make long-run investments in the city's infrastructure, such as the redevelopment of Lower Manhattan.

Summing all these considerations with respect to their impact on jobs, the situation can be fairly assessed as stark for both the city and the state. The *New York Daily News* (April 12, 2003) reported that the Bloomberg administration was prepared to lay off as many as 15,400 city workers unless it received $1 billion in extra funds from the state. These job losses could clearly be avoided through the revenues generated by a revived STT.

The positive effects of the STT would also not be limited to the direct impacts on the state and city governments' ability to provide basic services to its residents. If severe budget cuts to the

state and city government can be avoided, this would also produce significant ripple effects throughout the regional economy. Consider just the roughly 15,000 jobs Mayor Bloomberg says may need to be cut from the New York City payroll. The income and spending power of an employee and his/her family is attached to each of these jobs. When the city is able to retain 15,000 jobs, this in turn provides a stimulus to the regional economy, just as, correspondingly, cutting these 15,000 jobs would serve as a severe drag on the prospects for economic recovery. The job cuts and other budget-cutting measures, in other words, cannot help but significantly worsen an already severe unemployment situation in the city, with the unemployment rate at 9.1 percent as of January 2003. Avoiding these cuts will, correspondingly, provide a substantially stronger foundation for the regional economy to emerge from its current slump.

Costs of the Stock Transfer Tax

The main concern with the STT is whether it would generate significant negative unintended consequences. Of course, in terms of the operations of the financial markets, the immediate effect of the STT would be to raise the costs of effectuating the trade of a stock—that is, to raise "transaction" costs of trading equity shares. The specific question, therefore, is how high these costs are likely to be, and whether, at the given level of transaction cost increases, significant negative consequences would result.

Size of Transaction Cost Increases

Relatively little solid data exist on the amount of total transaction costs traders incur when they buy and sell shares. However, based on a number of studies conducted over the past decade, we are able at least to draw some broad conclusions.[3]

The most basic finding is that transaction costs have varied

considerably over the past twenty years in U.S. equity markets. Specifically, they have varied along four dimensions:

1. *Variation by market*. Costs have been substantially lower in the stock exchanges relative to those in NASDAQ and other over-the-counter markets.
2. *Variation by size of firm being traded*. The costs of trading shares of firms with large market capitalizations are well below those with small capitalizations.
3. *Variation by size of trade.* The costs of smaller-sized trades are lower than those of larger-sized trades.
4. *Variation over time*. Transaction costs have fallen substantially since the early 1980s.

We can observe these variations in transaction costs through the figures presented in Table 2, which have been compiled from three separate academic studies. Before proceeding with the table, it will be helpful to introduce a technical term used in financial markets that will facilitate the discussion from here on out. In financial markets, one refers to 0.1 percent as 10 "basis points." Similarly, 0.01 percent is 1 basis point. Referring to these fractional values in terms of basis points will allow us to avoid referring regularly to very small numbers with lots of zeros to the right of decimal points.

Table 2 expresses transaction costs in terms of basis points. The top panel of the table presents evidence on changes in transaction costs between 1980 and 1990 published by Hans Stoll of Vanderbilt University in 1993. Stoll found that for trades that took place through the exchanges, the one-sided transaction costs fell between 1980 and 1990 from 68.9 to 28.5 basis points relative to the value of shares traded. With the over-the-counter markets, transaction costs began in 1980 at 152.8 basis points, that is, a level nearly double that of the exchanges, then fell by 1990 to 76.1 basis points (Stoll 1993).

Table 2

Representative Estimates of Stock Market Transaction Costs (Basis Points)

Average One-Sided Costs in U.S. Markets

Exchanges		OTC	
1980	1990	1980	1990
68.9	28.5	152.8	76.1

Source: Hans Stoll, "Equity Trading Costs in the Large," *Journal of Portfolio Management* (summer 1993): 41–50.

One-Sided Costs on Buyer-Initiated Institutional Trades in U.S. Markets

	Exchanges	NASDAQ
Range from smallest to largest market caps	178–31	285–24
Range from smallest to largest trade size	31–90	76–180

Source: Donald B. Keim and Ananth Madhaven, "The Cost of Institutional Equity Trades," *Financial Analysts Journal* (July/August 1998): 50–69.

Average One-Sided Trading Costs in North American Markets 1996.3–1998.3

Year and quarter	Average trading costs in basis points
1996.3	68.2
1996.4	54.0
1997.1	63.0
1997.2	49.3
1997.3	43.8
1997.4	51.1
1998.1	45.9
1998.2	35.0
1998.3	32.3

Source: Ian Domowitz, Jack Glen, and Ananth Madhaven, "Liquidity, Volatility and Equity Trading Costs Across Countries and Over Time," *International Finance* 4, no. 2 (2000): 221–55.

To gain some perspective on these figures, it will be helpful to compare them with the costs represented by the proposed New York STT: the 0.05 percent costs—or 5 basis points—for trading

an average $25 share. As of 1980, the maximum STT would be roughly equal to 7 percent of total transaction costs for trades occurring on the exchanges and 3 percent for over-the-counter (OTC) trades. As of 1990, the tax on trading a $25 stock would represent 18 percent of transaction costs on the exchanges and 7 percent of costs for OTC trades.

Consider now the second panel in Table 2. Here we provide evidence from a 1998 study by Donald Keim of the Wharton Business School and Ananth Madhaven of ITG Inc. (and formerly of the University of Southern California). Again, we see large differences in the one-sided transaction costs. We also see how these costs vary along three dimensions—between markets; according to the market capitalization of firms; and according to the size of trades. Considering the highest and lowest transaction costs figures reported here, the 5-basis-point average New York STT would represent a 1.7 percent increase in transaction costs for a NASDAQ trade of the smallest firms (i.e., 5/285) and a 21 percent increase in transaction costs for NASDAQ trades of the largest firms (i.e., 5/24).

In the bottom panel of Table 2, we present data reported in a 2000 study by Ian Domowitz of Pennsylvania State University, Jack Glen of the International Finance Corporation, and, again, Ananth Madhaven. These data show transaction costs combined for both Canadian and U.S. stock markets, presented on a quarter-by-quarter basis from 1996.3 to 1998.3. Here we see that average costs fell by more than half over this two-year period, from an average of 68.2 basis points in 1996.3 to 32.4 basis points in 1998.3. Elsewhere in this same study, Ian Domowitz et al. report an average figure for transaction costs for the United States alone over this full 1996.3–1998.3 period. This average figure is 38.1 basis points.

Comparing again the effects of the proposed New York STT relative to these figures, we see that the 5 basis points average tax rate amounts to about 13 percent (= 5/38.1) of the average

total transaction costs in the United States over this period. The 5 basis points tax would also range from being between 7.3 percent (= 5/68.2) of total transaction costs in North American markets as of 1996.3, but rising to 15 percent (= 5/32.4) of these costs in 1998.3.

The central question in evaluating these figures is straightforward: whether the increase in costs generated by the STT would represent a major burden on traders operating in the New York stock markets.

The first point to emphasize here is that there is no single answer to the question, given that the relative burden of the tax will vary substantially according to the size of the trade, the size of the firm being traded, and whether the trade takes place on an exchange or over the counter. The burden of the tax will be heavier on exchange-based trades, on trades of smaller firms, and on larger-sized trades, since, in all of these cases, the levels of existing transaction costs are lower.

But to move from this range of cases to a general perspective, let us focus on the situation for the average-sized trade. Referring again to the 1996.3–1998.3 data in the bottom panel of Table 2—the most recent figures we have—we have seen that for trading an average $25 share, the proposed STT tax of 5 basis points would entail an increase in total transaction costs from 32.3 to 37.3 basis points. This would be a 15 percent increase in total transaction costs as of 1998.3, which is a significant rise in percentage terms. At the same time, this increase in transaction costs from 32.3 to 37.3 basis points would still mean that total transaction costs as of 1998.3 would remain 45 percent below the average level of total transaction costs as of 1996.3 of 68.2 basis points. Moreover, continuing to draw from the data in the bottom panel of Table 2, this post-STT level of 37.3 basis points for total transaction costs would remain nearly 20 percent below the level of 45.9 basis points that traders paid as recently as the first quarter of 1998.

There is no way one can conclude with certainly what the effects of an average 5 basis point increase in transaction costs would be, given that we also cannot know what the state of stock market itself would be at the point when the tax would be implemented. Still, it is clear from the evidence presented here that a tax imposed at the level being proposed would raise total transaction costs only to a point well within the range that traders have been paying even in the late 1990s. As such, we would not expect that an STT at the level proposed is likely to produce substantial changes in the patterns of trading relative to what would have otherwise occurred.

Beyond this, we can gain further perspective on the effects of the tax by considering its impact not just on stock trading alone, but within a broader set of economic considerations, such as the effects on overall employment in the financial markets and the region more generally. Exploring this broader set of questions will enable us to bring additional evidence to bear on the questions at hand—what are likely to be the costs of the STT.

Effect of Tax on New York Employment

The imposition of the STT on stock trading in New York is likely to reduce trading volume to some extent, given that the tax will, of course, raise the transaction costs of trading. But, as we have discussed in the previous section, we would expect this decline in trading to be relatively modest.

However, assuming there will be some decline in trading volume, this raises another question: Would this decline in trading produce significant job losses for people who are involved in trading securities? If there were significant job losses in the securities industry, this effect could, in turn, reverberate throughout the broader economy. That is, if a large number of well-paid financial traders and others in the industry lose their jobs, they

would have less money to spend, which would in turn produce further job losses among people in the region whose jobs depend on the spending of the newly unemployed securities industry employees.

The New York City Independent Budget Office (IBO) has estimated that the 1.25-cent one-sided STT could produce up to 10,000 job losses in the securities industry itself (NYC Independent Budget Office 2003a). The IBO then projects that this loss of 10,000 securities industry jobs could lead to as many as 80,000 overall job losses in New York City's private sector. As of January 2003, total employment in New York City was 3.35 million. A loss of 80,000 jobs would therefore mean a 2.4 percent increase in the city's unemployment rate. Especially given that unemployment in New York City stood at 9.1 percent as of January 2003, the loss of 80,000 private-sector jobs would obviously represent a severe blow to the economy, raising the unemployment rate under current conditions to 11.5 percent. It is therefore a matter of considerable importance to evaluate this estimate by the IBO.

The logic behind the IBO estimate follows from what we've sketched above. It proceeds in three stages:

1. The rise in transaction costs leads to a decline in trading volume.
2. The decline in trading volume means approximately 10,000 layoffs for New York City securities industry employees.
3. When 10,000 securities industries employees become unemployed, the loss of spending power by these people produces a total of 80,000 job losses for the city's private sector.

As we have said, we consider it doubtful that imposing a tax at the level being considered would, on its own, lead to a significant decline in trading volume. However, even if it did produce a significant decline in trading volume, it is not clear that this result, on its own, would lead to a loss of 10,000 jobs in the securities

industry. As of January 2003, 178,000 people were employed in the New York City securities industry. The loss of 10,000 jobs would therefore mean a fall in employment in the industry by a substantial 6 percent.

The IBO based its estimate of 10,000 job losses in the securities industry on a formal statistical model by Professors John Heaton of the University of Chicago Graduate School of Business and Andrew Lo of the MIT Sloan School of Management. However, there are two serious problems with the way the IBO has applied the Heaton and Lo model to the present situation. In our view, these problems have led the IBO to produce a large overstatement of the potential for job losses resulting from the STT.

First, as Heaton and Lo make clear, their statistical estimate is based on the use of data for the years 1929–87 only. In other words, their model does not take into account any of the major changes in the operations of the securities industry that began in the early 1990s and then accelerated dramatically with the spread of computer technology, the Internet, and the unprecedented rise in stock prices. The IBO makes no attempt to incorporate more recent figures that would have enabled their model to better reflect contemporary market conditions. However, we have re-estimated the Heaton and Lo model using data from January 1990 through January 2003 (the details of our updating of the Heaton and Lo model are presented in the appendix). In doing so, we found that the impact of a given decline in trading volume on employment is, with the current data, roughly one-quarter as large as the Heaton and Lo estimate that relied on 1929–87 data.

Second, and more important still, in reporting the results of their model, Heaton and Lo themselves make clear that the reliability of their results is questionable, given a technical problem with their 1929–87 data set (explained in the appendix). When we make the appropriate adjustments in statistical procedures
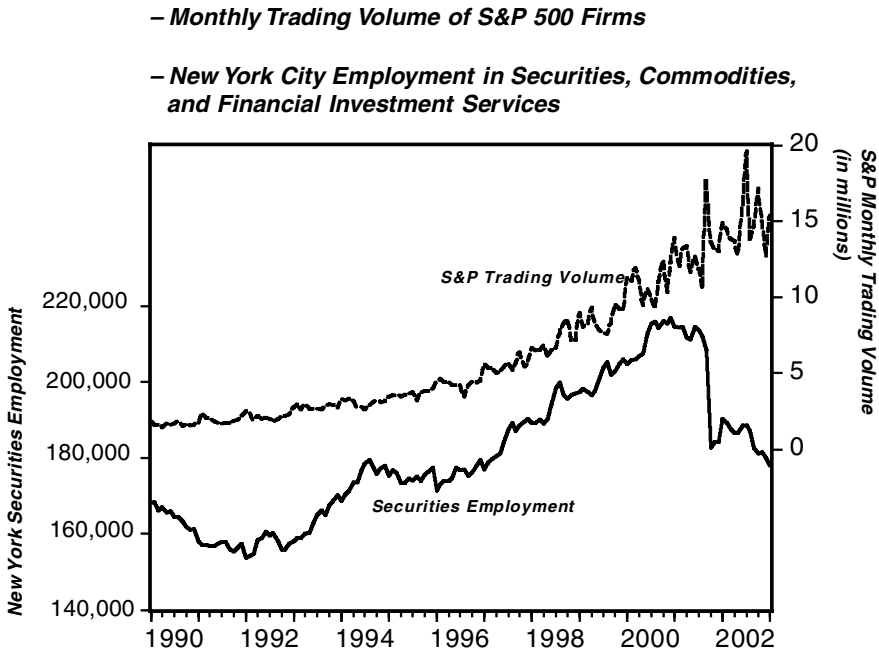
– Monthly Trading Volume of S&P 500 Firms

– New York City Employment in Securities, Commodities, and Financial Investment Services

Figure 1. Employment and Stock Market Trading Volume

Sources: Economagic Web site (www.economagic.com); New York State Department of Labor.

to control for this technical problem, the result we now obtain is that there is *no reliable statistical relationship at all* between trading volume and employment between January 1990 and January 2003.

Figure 1 presents the relevant updated statistics on trading volume and employment, from January 1990 to January 2003. Simply observing the data patterns in this figure should help make clear why we find no reliable statistical relationship in the relative movements between trading volume and employment. First, looking at the lower line tracking employment between 1990 and 1992, we see that employment falls, from 168,000 to 153,000, while trading volume is rising slowly but fairly steadily through these initial two years. Then, from 1992 through August 1994, employment now rises sharply, to 174,400, while, again, trading volume continues to rise slowly. Employ-

ment then flattens out for roughly the next two years before rising again, peaking in October 2000 at 215,900, before beginning a sharp descent that continued until January 2003. Meanwhile, trading volume continues to rise even after 2000—that is, while employment is falling. Short-term sawtooth-like fluctuations in trading volume do occur beginning in 2000. But these short-term changes are also not matched by corresponding fluctuations in employment.

Overall then, the patterns we see in this figure are consistent with the results we obtain through formal statistical analysis. That is, contrary to the assumptions underlying the IBO estimates of employment losses—which are based on a faulty statistical model relying on data from 1929 to 1987—in fact, there is no reliable statistical relationship between trading volume and employment in the New York securities industry between January 1990 and January 2003. Employment and trading volume neither rise nor fall together in any reliable pattern.

The data from Figure 1 also provide some broader perspective for evaluating the employment-loss estimates of the IBO. As we have seen, employment in the New York City securities industry peaked in October 2000 at 215,900 before falling to 178,000 as of January 2003. That is an employment loss of 37,900 jobs. These jobs were lost in the wake of what can be fairly termed a series of calamitous shocks to the New York City economy. These shocks included the collapse of the stock market bubble, the subsequent corporate accounting scandals and major corporate bankruptcies, the broader economic recession, and, of course, the September 11 terrorist attacks. However, the IBO estimate effectively contends that a 1.25-cent-per-share one-sided STT would have more than one-quarter the total impact on security industries jobs in New York City as *the combination of all these other factors*—the market collapse, the scandals and bankruptcies, the recession, and September 11.

It is also useful to consider this same point with respect to the broader estimate (NYC Independent Budget Office 2003a) that 80,000 private-sector jobs overall could be lost through reinstatement of a 1.25-cent-per-share one-sided STT. Overall private-sector employment in New York City peaked in December 2000 at 3,254,600 jobs. As of January 2003, private-sector employment in the city stood at 2,932,300. In other words, 322,300 private-sector jobs were lost between December 2000 and January 2003. Because these figures are for all types of employment in the city, the job losses that occurred also reflect the effects of September 11 on the city's tourist and entertainment industries. Now compare this actual experience with the IBO estimate that the 1.25-cent-per-share one-sided STT would produce up to 80,000 private-sector job losses. Again, the IBO estimate effectively concludes that the STT *by itself* would be fully one-quarter as powerful in its impact on jobs as the stock market crash, the accounting scandals, the recession, and September 11 combined.

From our examination of the evidence, we conclude that the IBO's claims on prospective employment losses from the proposed STT are not supported by empirical evidence. Still, as we hasten to emphasize, we are not suggesting that the STT would produce no job losses. Our point is simply that the evidence we have reviewed suggests that if there would be losses, they would likely be modest, certainly in comparison with the combined effects of the series of major shocks that the New York City economy has experienced since the latter months of 2000.

Finally, the IBO makes no effort to estimate the other side of the employment effects of the STT—that is, the employment *gains* that would result through being able to avoid cutting $3.5 billion from the city and state's operating budgets. As we have discussed above, these employment gains—for example, allowing the city to retain 15,000 public-sector jobs funded out of the municipal budget—are quite substantial.

Relocation as a Means of Avoiding the STT

Would the reinstatement of the STT create serious incentives for security firms and their clients to circumvent the tax through either (1) the securities firms' relinquishing their listing on the New York Stock Exchange in favor of alternative trading platforms, or (2) the New York Stock Exchange's physically relocating from New York City to northern New Jersey? These possibilities have been widely discussed, most prominently in letters of April 15 of this year signed by the CEOs of fourteen major securities and addressed to New York Governor George Pataki, Assembly Speaker Sheldon Silver, and Senate Majority Leader Joseph Bruno respectively. The letters assert that proponents of the STT "lack an understanding of the detrimental impact the STT will have on the industry and the State's and City's economies."

Accompanying the letters was a statement issued by the Securities Industry Association, which discussed in somewhat more detail the basis for the CEOs' claim. This statement explains,

> Securities firms must adhere to "best execution" rules mandated by regulatory authorities. Faced with the STT, these firms are likely to gravitate towards Electronic Crossing Networks (ECNs), Automatic Trading Systems (ATSs) and other alternative trading platforms, which are not within the tax jurisdiction of the State.

Do such threats carry substance? We need to distinguish, and consider separately, the two possibilities—that firms might delist from the New York Stock Exchange or that they might physically remove themselves from New York.

Delisting from the New York Stock Exchange

In our view, reinstatement of the STT at half its 1981 rate is highly unlikely to induce the results that the Securities Industry Association claims. The reason is straightforward: Even with the reinstatement of the STT, overall transaction costs for firms trading on the New York exchanges would almost definitely still be well

below those of alternative trading platforms.

Based on the evidence we have reviewed in Table 2, it is clear that overall transaction costs are significantly lower in the NYSE relative to over-the-counter markets, including the NASDAQ. For example, the evidence from Professor Stoll presented in the top panel of the table shows that in 1990, average transaction costs in over-the-counter markets were 2.7 times higher than those in exchanges. Similarly, from the Keim and Madhaven data in the middle panel of the table, we see that trading costs varied between 2 and 2.5 times more on NASDAQ relative to the exchanges when trades are grouped according to size. These basic findings from the academic literature were broadly affirmed in a 2001 study issued by the U.S. Securities and Exchange Commission (Office of Economic Analysis 2001).

The most important reason that overall transaction costs are lower on the NYSE is that, in most situations, the NYSE is simply more liquid. This means that it is a larger and more organized market, which in turn means that more possibilities exist on the NYSE to find the best possible trading partners. This is true even as differences in explicit execution costs—primarily the fees one pays to brokers in the two markets—are relatively narrow.

The clear advantages in overall trading costs for the NYSE relative to the NASDAQ become even more pronounced in comparison with the "Electronic Crossing Networks (ECNs), Automatic Trading Systems (ATSs) and other alternative trading platforms" to which the Securities Industry Association memo refers. The Keim and Madhaven study provides a useful survey of the literature on this question. They recognize that the ECNs provide benefits in terms of increasing the technical efficiency of executing trades. However, the ECNs also introduce several serious problems for traders, such as raising significantly the possibility of failing to execute a trade because dealers are not available to fa-

cilitate the trade. Moreover, in the absence of dealers, it becomes more difficult to discover the appropriate price at which trades will take place. It is precisely in recognition of these problems that trading on the NYSE has maintained its dominance over the ECN alternatives. This dominance has only strengthened with the bursting of the 1990s market bubble. As a recent report in the *Wall Street Journal* points out, there have been

> countless predictions that the stock exchange, with its reliance on a physical floor to bring traders together, would one day be made obsolete by faster, cheaper electronic markets. Those predictions reached a peak with the 1990s bull market. . . . But ECNs had difficulty reaching the critical mass of trading volume they needed. Unless they had lots of volume, big traders wouldn't be confident of getting the best possible price on them. At the same time, without those big traders, reaching that volume was difficult. Meanwhile, the meltdown in technology stocks and the three-year bear market have severely scaled back the NASDAQ's volume, prestige and ambitions. Now many ECNs are struggling to survive. The NYSE has also suffered from the bear market, but not nearly as much. And even its critics acknowledge there is no place else they can trade such large volumes of blue-chip stocks as efficiently. (Ip and Craig 2003)

The advantages of the NYSE relative to other organized exchanges in the United States are similar. None of the exchanges located outside of New York operate at levels of trading volume, and thus of liquidity, even close to that offered by the NYSE. For example, the largest markets outside of New York are the Chicago and Cincinnati Stock Exchanges, which, despite the latter's name, are both based in Chicago's financial district. Trading volume on the Chicago Stock Exchange was 5.1 percent of the NYSE in 2001. As for the Cincinnati exchange, virtually all the firms trading there are cross-listed on NASDAQ. They would therefore lose the liquidity advantages of operating on NASDAQ if they chose to list themselves solely on the Cincinnati exchange. The other exchanges include the Archipelago Exchange, with 2.1 percent of the dollar volume of the NYSE in 2002, the Boston ex-

change, at 2.1 percent of NYSE in 2001, and the Pacific exchange, at 0.4 percent of the NYSE in 2001.

Over time, it is conceivable that large numbers of firms would migrate out of the New York exchanges and into the other trading platforms. The large cost advantages of trading in New York could then erode. However, because the benefits of trading in New York are so large at present, any firm that chooses to migrate now would face the near certainty of significantly higher trading costs in the immediate time frame—even after paying the STT—without any guarantee that their trading costs would fall in the future. The Securities Industry Association memo emphasizes that "securities firms must adhere to 'best execution' rules mandated by regulatory authorities." The term "best execution" is typically interpreted to mean trading at the most favorable price available in the market. What emerges from the available evidence is that, to maintain adherence to "best execution" standards, firms that trade on the NYSE at present would need to continue doing so even if the STT were reinstated at one-half its 1981 rate.

Relocating the NYSE to New Jersey

In theory, all the advantages of trading on the NYSE could be retained, while the STT could also be circumvented, if the entire exchange simply relocated to northern New Jersey. But this also seems like an implausible scenario in light of the modest increase in overall transaction costs that would result from the proposed STT.

The NYSE has made frequent threats to relocate over the past 100 years. Michael Wallace, in *A New Deal for New York* (2002), points out that the Exchange threatened to move to New Jersey in the first decade of the twentieth century, after New York initially adopted the STT. The most recent threat to relocate took place between 1998 and 2001, when a bidding war erupted be-

tween New York and New Jersey, with each offering incentive packages to the NYSE (Bagli 1998; Pacelle and Ip 1998). These packages focused on infrastructure development and direct incentives to the exchange, including the construction of a new building with an expanded trading floor (NYC Independent Budget Office 2001). What seems clear is that progress toward the successful redevelopment of lower Manhattan, including the infrastructure projects being planned around the former World Trade Center site, will exert far more influence over any plans to move the NYSE than the relatively modest transaction cost increases resulting from the low-level STT. Moreover, the tax revenues generated by the STT can themselves contribute toward the goal of maintaining the NYSE in New York, since these revenues will be a source of funding for the redevelopment of downtown Manhattan.

There is another perspective from which we can evaluate the prospects of the NYSE's relocating so those trading on it can avoid paying the STT. This is the fact that the costs that securities firms pay at present for maintaining their operations in Manhattan are *already* significantly higher than what they would be in New Jersey. As one important component of total costs, the average rent for offices in northern New Jersey is approximately $24 per square foot per year compared to $35 per square foot per year in lower Manhattan (CB Richard-Ellis 2002, 2003). That is, securities firms are paying at present a 30 percent premium on rent for maintaining their offices in Manhattan. Thus, if lower costs were the driving factor informing the NYSE's choice of location, it would clearly have left for New Jersey years ago.

Possible Market Distortions from STT

A common criticism of security transaction taxes such as that being considered for New York is that they create distortions in

financial markets. The specific proposal being considered would indeed create a distortion because it would apply only to stock trades, exempting trading in bonds and derivative instruments such as futures and options. This would therefore make trading in stocks relatively less attractive than trading in other instruments that did not face a tax.

No doubt it is not the intent of the proposal to render stocks less desirable than other financial instruments. One solution to this problem is straightforward: to tax trades of other financial instruments as well, setting rates for trading bonds and derivatives at levels that are appropriate relative to the rate on stocks.[4] As one can see from Table 1, security transaction taxes in bond markets have been applied in other countries nearly as frequently as they have with stocks. However, let us assume for now that only the reinstatement of the tax on stocks will be under consideration. How serious would be the market distortions created by this situation?

There have been cases where security transaction taxes were limited in their scope, which in turn led to serious problems in the functioning of markets. The best-known case of this situation was the tax introduced in Sweden in 1984 that was subsequently lifted in 1990. But in this case, the tax was targeted in a fashion that virtually invited attempts at circumvention. The tax applied only to trades executed through Swedish brokerage firms. It did not apply to foreign trades of domestic taxpayers, even if they were of Swedish financial instruments. It also did not apply to domestic trades conducted through foreign brokerage houses. It was initially limited to equity and equity-derivative trades, and only later was it extended to bond markets and bond derivatives. Given the narrowness of this tax, it is not surprising that it created strong incentives for market traders to migrate to untaxed market segments, both within Sweden and elsewhere.

The New York STT tax being considered will certainly not create such severe distortions as those experienced in Sweden. The most basic reason is that, as we have seen, the tax rate being considered would be modest relative to prevailing levels of transaction costs for trading stocks. If the tax rates were a significantly higher proportion of prevailing transaction costs, the possibilities for generating significant market distortions would rise correspondingly. In addition, the corporate shares that are traded in the New York stock markets are more extensive than any other securities market in the world. Traders would be hard-pressed to find close substitutes for these ownership and trading opportunities were they to migrate out of the market in an effort to avoid the STT.

Thus, while it would be preferable that the tax be imposed to equivalent degrees in all of New York's financial markets, it should not be a serious immediate problem under current conditions to impose the tax on the stock market only.

Conclusions

Each of the negative consequences from the STT that we have considered exists as a possibility. But they are not likely to impose significant costs on the city and state economies. Consequently, we conclude that the revenues generated by the STT—and the ability to use these revenues to ameliorate the current fiscal crises for both the city and state—outweigh the costs of reinstating the tax.

Specifically, we find that, in terms of employment effects, the IBO's assessment that reinstating the STT could lead to as many as 10,000 job losses in the New York securities industry and 80,000 overall in the city's private sector is not supported by the weight of evidence. Among other points, the IBO's estimates mean that the impact of the STT at a maximum one-sided rate of 1.25 cents

per share traded could have fully one-quarter the negative effect on employment in New York City as the *combined effects* of the stock market collapse, the corporate accounting scandals, the recession, and the September 11 terrorist attacks. We did not find any evidence to support a negative employment effect at anything close to this formidable magnitude.

We also do not anticipate that the NYSE would seriously consider relocating, either to alternative trading platforms or out of Manhattan, as a means of circumventing the proposed STT. The cost advantages for firms to trade on the NYSE are large, and have only increased in the aftermath of the collapse of the 1990s bubble. With respect to a physical relocation, securities firms and the NYSE itself are paying an average of 30 percent more for office space in lower Manhattan that would be available to them in northern New Jersey. Again, the 1.25-cent one-sided tax per share traded is not likely to create a strong incentive to relocate when a 30 percent differential in office rental costs has not itself provided a sufficiently strong allure to move into New Jersey.

Finally, imposing the tax on stock trades but not on bonds or derivative trades will create market distortions. It would be preferable that all segments of the financial market be taxed at comparable rates. Still, because the differences in transaction costs remain modest, the market distortions created by the tax will also be modest. This is true especially given that the ownership of stocks—as opposed to bonds or derivatives—continue to offer distinct attributes that will not be seriously diminished by the 1.25-cent one-way tax per share traded.

On its own, the $3.5 billion in revenues that would be generated by the STT under current conditions will not be sufficient to close the budget gap for either the city or the state. But it will go far toward preventing the most severe consequences that could result from the fiscal crisis, such as the predicted loss of upward of 15,000 jobs in the city alone.

Enabling the city and state to avoid imposing such severe budget cuts will also establish a firmer foundation on which the private sector of the region can begin growing out of the current prolonged economic slump. In fact, the private sector will not be able to sustain its upward momentum out of the slump without the stabilizing effects of a viable public sector. Moreover, the benefits of any renewed economic growth will not be broadly shared if public spending on education, health, social welfare, and safety are allowed to continue deteriorating under the current conditions of fiscal austerity.

Notes

1. Of course, a sharp debate proceeds in Japan as to the extent to which this thrust toward financial deregulation—of which elimination of security transaction taxes was one piece—has been responsible for the economy's persistent financial fragility over the 1990s, and its subsequent inability to recover from these financial-sector difficulties.

2. The Independent Budget Office forecasts shortfalls of $2.2 billion in 2004, $3.9 billion in 2005, $4.0 billion in 2006, and $3.7 billion in 2007 (NYC Independent Budget Office 2003b).

3. The basic transaction cost one incurs—what researchers call the "explicit" cost—is the commission a trader pays to his/her broker to effectuate the trade. But some researchers have also tried to incorporate "implicit" costs into their calculations, such as the potential impact that large trades might have on market prices. Keim and Madhaven (1998), for example, break down "implicit" costs into three components: (1) bid-ask spreads, (2) the price impacts of large trades on markets, and (3) the opportunity costs associated with missed trading opportunities.

4. The paper by Pollin, Baker, and Schaberg (2003) examines at some length some issues and specific proposals through which a transaction tax could be imposed at equivalent rates for all segments of U.S. financial markets.

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Appendix

A straightforward statistical procedure can be used to measure the impact of changes in the volume of securities traded on employment in the New York securities industry by regressing employment on an index of volume, such as the S&P 500 index. This procedure is the technique used by Heaton and Lo (1997) in exploring this relationship. Heaton and Lo, using data from 1929 to

1987, find that "a regression of natural logarithm of employment on a constant and the natural logarithm of volume yields a coefficient of 0.40 with a standard error of 0.015 and an R^2 of 0.998" (p. 97). Since the variables are expressed as natural logarithms, the estimate of 0.40 can be interpreted in terms of percentage changes. That is, this estimate would suggest that a 10 percent increase in volume would result in a 4 percent increase in employment. The low standard error suggests, at first glance, that this estimate is both statistically significant and statistically meaningful.

We can replicate the Heaton and Lo analysis as it would apply to the New York securities industry using more recent data, from January 1990 to January 2003. Monthly data for employment and volume were taken from the New York Department of Labor and the Standard & Poor's index of trading volume, respectively. A simple regression of the natural logarithm of both variables yields the following results:

$$\log(\text{employment}) = 3.42 + 0.11 * \log(\text{volume})$$

$$(0.91)\ (0.056)$$

$$R^2 = 0.73\ \text{Durbin-Watson} = 0.14$$

The estimated coefficient, 0.11, is statistically significant, but markedly smaller than Heaton and Lo estimate. Nevertheless, there are problems with this estimation procedure. The low value of the Durbin-Watson statistic suggests that the model suffers from first-order serial correlation. That is, the unobserved errors in one month are correlated with the unobserved errors in the preceding months. Under such conditions, the estimates are misleading.

Adding lagged values of the employment variable to the right-hand side of the model can correct for the problem of serial correlation. For example, employment in June would be determined by both (1) changes in volume and (2) employment in May. This modified model yields the following results:

$$\log(\text{employment}) = 0.06 - 0.0004 * \log(\text{volume}) +$$
$$0.99 * \log(\text{employment}_{t-1})$$

$$(0.08)\ (0.003)\qquad (0.023)$$

$$R^2 = 0.97\ \text{Durbin-Watson} = 1.80$$

The Durbin-Watson statistic no longer indicates strong first-order serial correlation. However, the effect of a change in volume on employment is not significantly different from zero. Moreover, current employment is almost entirely explained by previous employment. This relationship results in a high R^2—a measurement of the fraction of the variance in employment explained by the model. Heaton and Lo also report an extremely high R^2, and, as a result, they suggest that their results should be interpreted "with some caution" (p. 97).

There is a more fundamental problem with these estimates, one that is not addressed by Heaton and Lo. Both variables in the regressions are nonstationary, meaning that their means change over time (e.g., the average volume traded at the beginning of the 1990s is much smaller than the average volume traded at the beginning of the 2000s). When nonstationary variables are included in a regression, a statistical relationship can be found to exist, even if the results are purely spurious. Such spurious results emerge because both variables tend to drift together over time, regardless of the existence of a meaningful relationship between them.

The problem of nonstationarity can be addressed by performing the same analysis on the changes in the variables as opposed to their actual levels. In this case, we are asking whether changes in volume lead to changes in employment and, if so, by how much? The results of this modified approach are:

$$\log(\text{employment}) = 0.0003 + 0.005 * \log(\text{volume})$$

$$(0.001)\ \ (0.010)$$

$$R^2 < 0.001\ \text{Durbin-Watson} = 1.74$$

These estimates, which account for the nonstationarity of the variables, show no relationship between changes in employment and changes in volume. Furthermore, the volume variable explains virtually none of the total variation in the employment variable, as indicated by the very low R^2 value. This casts a great deal of doubt on the Heaton and Lo estimates.

Finally, Heaton and Lo do suggest that "the long-run effects of changes in volume on employment in the financial sector are likely to be captured approximately" by their results (p. 97). This could very well be the case, even if the variables are nonstationary. When a long-run equilibrium relationship exists between nonstationary variables, they are said to be cointegrated. Fortunately, we can test for just such a cointegrating relationship. Performing Johansen tests for cointegration for various lag structures and assumptions as to whether the variables have linear trends reveals no evidence of cointegration between the natural logarithm of employment and the S&P volume index (results available on request).

In summary, an analysis of monthly data from January 1990 to January 2003 reveals no evidence of a strong relationship between traded volume and New York securities employment in either the short or long run. The application of the Heaton and Lo (1997) model to more current data reveals an estimated coefficient one-fourth as large as the one they report. However, even this lower coefficient estimate is spurious, according to a variety of standard time-series diagnostic tests.