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FINANCIAL TRANSACTION TAXES: A COMPARATIVE STUDY

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ABSTRACT

Financial transaction taxes are instruments used by governments to raise revenue and reduce large fluctuations in the stock market. There is debate as to the efficacy of financial transactions taxes yet governments around the world are utilizing them more and more. This comparative study of seven countries (Columbia, Finland, India, Japan, Sweden, Taiwan, and United Kingdom) is aimed at viewing the implementation and repeal of various FTTs. The study compares revenue gained from the tax, trading volume, and market volatility before and after the legislation was enacted. There are mixed results as to the overall effectiveness of curbing volatility in the market yet there is substantial revenue to be gained from implementation. While there is not “one size fits all” rate or scope for a country, there is evidence to suggest that trading volume will continue to rise as will revenues from the tax.

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Chapter 1

The Concept of a Financial Transaction Tax

A financial transaction tax (or securities transaction tax) is a tax on a specific type monetary transaction; in most cases stocks, currencies, and debt products. This is not to say this is a tax on financial institution themselves, but rather the specific transactions that occur within the framework of the tax. Financial transactions taxes (FTT's) have been implemented in the financial sector in order to generate revenue for the country which levies the tax as well as try to curb speculative investments. While there is some debate as to whether or not FTT's help or hurt the economy, this paper will use specific data in order to compare countries that have implemented or repealed such taxes since 1980 and understand the taxes' effect on trading volume, market volatility, and revenue generated from the tax.

It should be noted that a financial transaction tax is not the same as a capital gains tax. A capital gains tax is taxed on the income generated from the sale of securities while a securities transaction tax is taxed on the actual sale or purchase of a security, regardless the amount of income generated from the sale. Capital gains taxes have also been shown to reduce trading volume as it is used to discourage short term trading.

In this paper we will be examining the before and after affects of each financial transaction tax in Columbia, Finland, India, Japan, Sweden, Taiwan, and the United Kingdom in order to understand how the nuances in each tax affect the three key areas mentioned above. By comparing countries with taxes of different size and scope, we can try to better understand the optimal level and scope for which a financial transaction tax can generate sufficient revenue,

reduce market volatility, yet continue to see steady investment volume.

Chapter 2

The Pros and Cons of Implementation

The implementation of a financial transaction tax has been a popular yet hotly contested instrument used by governments in an attempt to mitigate asset price volatility and harness revenue from the expanding financial sector. In order to understand the comparison between the countries used in this study, it is important to understand the arguments made by both sides as to how financial transaction taxes theoretically affect economies.

According to Stephan Schulmeister, there are six “pro-FTT-proposition” (PP) which can be summarized as follows:

- PP1: There is excessive trading activity in modern asset markets due to the predominance of short term speculation.
- PP2: The most pressing problem is not so much the volatility of asset prices over the short run but over the long run. This is so because short-term speculation produces long swings in asset prices and, hence, persistent deviations from their fundamental equilibria.
- PP3: The overshooting of exchange rates, but also of stock prices, interest rates, and commodities prices fosters the “predominance of speculation over

enterprise” (Keynes, 1936) and thereby dampens economic growth and employment.

- PP4: A uniform tax per transaction increases the costs of speculative trades the more, the shorter their time horizon is. Hence, a transaction tax would have a stabilizing effect on asset prices and would thereby improve the overall macroeconomic performance.
- PP5: A FTT would compensate the distortion effect caused by the exemption of financial services from the value-added-tax.
- PP6: A transaction tax would provide governments and/or supranational organizations with considerable revenues which could/should be used for fiscal consolidation and/or the achievement of policy goals, particularly on the supranational level.

While Schulmeister is able to portray an economic environment of increased employment, higher government revenues, and reduced market volatility, there are those on the other side who believe a financial transaction tax of any sort will have negative consequences. Schulmeister is able to summarize these “counter-FTT-propositions” (CP) below.

- CP1: The high transaction volumes in modern financial markets reflect the liquidity necessary for the price discovery process and, hence, for facilitating and smoothing the movements of asset prices towards their fundamental equilibria.
- CP2: A great deal of short-term transactions is related to hedging and, hence, to the distribution of risk.
- CP3: Speculation is an indispensable component of both the price discovery process as well as the distribution of risks. As part of the former, speculation is

essentially stabilizing, i.e., it moves asset prices smoothly and quickly to their equilibria.

- CP4: Any increase in transaction costs, e.g. due to an FTT, will cause liquidity to decline which in turn will increase the short-term volatility of asset prices.
- CP5: An endogenous overshooting caused by excessive speculation does not exist. Any deviation of asset prices from their fundamental equilibrium is due to endogenous shocks.
- CP6: Transaction taxes are hard to implement, in particular taxes on international transactions. In addition, actors will find ways to circumvent the tax.

The arguments made for and against financial transactions taxes are derived from two fundamentally different views on the activities of market participants, market efficiency, and price dynamics. In this context, any evaluation of the different arguments has to be based in empirical evidence that either fits the pro-FTT view of the economic environment, or the counter-FTT (traditional) view of economics (Schulmeister).

The evidence provided by Schulmeister suggests that a small FTT (between 0.1% and 0.01%) would mitigate price volatility not only over the short run but also over the long run. At the same time, the tax would generate considerable revenues (1.6% of GDP) for Europe at a rate of 0.05% (assuming transaction volume declines by 65%).

These assumptions will guide the comparison between the seven countries in the study as we investigate the changes in transaction volume, market volatility, and revenue generated.

Chapter 3

Literature Review

In this section we will examine various reports, journal articles, and studies in order to understand the previous work done on financial transaction taxes with respect to volatility, revenues, and trading volume. The first report we will look was done in April of 2010 by Mark P. Keightley and Maxim Shvedov titled: *A Securities Transaction Tax: Financial Markets and Revenue Effects*.

In regard to market volatility, Keightley and Shvedov examine various studies about the subject and find an overwhelming majority of these studies suggest that implementing a financial transaction tax would actually increase stock price volatility. However, they go on to argue that while these studies all seem to come to a similar conclusion, most of the studies rely on data over twenty years old. Thus a financial transaction tax imposed today may not be directly applicable to the results found from previous work. They cite regulatory changes and advances in technology as having fundamentally changed the way financial markets operate over time. One such technological change is the increase of high-frequency trading. This is estimated to represent between 40% and 70% of all U.S. equity trading volume.

As far as revenue is concerned, according to Keightley and Shvedov imposing a FTT could result in significant revenues if the proper rate is implemented. They expressed concerns about too high of a rate reducing trading volume and causing revenue from the FTT to be lower than possible with a lower rate. Not only could too high of a rate reduce the taxable base, but revenues could be further reduced by its interaction with existing taxes as well as any FTT becoming a tax-deductible cost. The report then examines historical projections as to the revenue

generated from a securities transactions tax and found that a 0.25% tax could generate between \$82.7 and \$132.3 billion per year depending on the assumed taxable base reduction.

Next we will examine a journal article published in *The Economic Journal* titled: *Securities Transaction Tax and Market Volatility*. This article, written by Frank M. Song and Junxi Zhang looks at volatility from both sides of the debate. They examine the view that a FTT will discourage short-term trading and reduce volatility as well the view that a financial transaction tax will increase volatility due to the reduction in market liquidity. It should be noted that the economies used in the study were select Asian countries that have implemented financial transaction taxes.

The results from the work done by Song and Zhang suggest that the effect of a FTT on market volatility is contingent on market conditions. They also suggest that countries with lower volatility and noise traders (investors who make transactions without using fundamental data) that an increase in a securities transaction tax will help reduce security volatility. However, they find the exact opposite is true in markets with higher volatility and larger noise trader participation, and that using a FTT will increase volatility.

A third article we will examine is titled: *Securities Transaction Taxes for U.S. Financial Markets*, which was originally published in the *Eastern Economic Journal* in fall of 2003. The authors, Robert Pollin, Dean Baker, and Marc Schaberg attempted to examine the viability of a securities transaction tax in the United States as well as design a specific STT that could be applied to the contemporary U.S. financial markets.

When looking at how FTT's impact market volatility, the authors looked at five different studies which were published between 1989 and 2000. This gives us a broader view as to how volatility is affected throughout time considering financial markets have changed. Two of the earlier studies done in this review (1989, 1991) suggest that higher transaction taxes may reduce volatility but the effect was insignificant. However, a review of a study done in 1997 by Jones

and Seguin suggests that reduced transaction taxes actually lowered volatility and that a FTT would increase volatility rather than accomplish what it was meant to do. Overall there were no clear conclusions as to the relationship between transaction costs and volatility. The authors rationalize the ambiguity of the results with the point that three separate factors influence volatility: the underlying performance of the nonfinancial economy, the possibilities for herd behavior to become dominant on financial markets, and the prospects for quelling a herd that has already begun.

The authors then go on to cite Davidson (1998) who argues that a FTT will decrease trading volume and this may well increase volatility. The reasoning is based upon the Keynesian idea that markets are fundamentally uncertain, thus thicker markets will be more stable. If we reduce the size of the market, the likelihood increases that pessimists and optimists in the market will not be able to balance each other out.

The revenue estimates from this paper are based on levels of market activity for the full year 1997 for stock, bond and swap markets, and 3/99 data for futures and options markets.

TABLE 7
Revenue Estimates for U.S. STET
(Estimates based on 1997 data except as noted)

	Tax Rate	Revenue estimates with no volume or price reduction (billions \$)	25 percent volume reduction (billions \$)	50 percent volume reduction (billions \$)
Equities	0.5 percent of asset value	54.9	41.2	27.5
Government Bonds	0.01 percent of asset value	41.6	31.2	20.8
Corporate Bonds	per number of years to maturity	22.1	16.6	11.1
Futures	0.002 percent of notional value of underlying asset	2.6	2.0	1.3
Options	0.5 percent of option premium	6.5	4.9	3.3
Swaps	0.02 percent of asset value, per number of years to maturity	4.4	3.3	2.2
Totals		132.1	99.2	66.1

Futures and Options based on data from *Wall Street Journal*, 3/17/99. Sources: *Securities Industry Association Factbook 1998*; *Securities Industry Association Investor Activity Report 1993*; *Federal Reserve Bulletin*, Table 1.42; *Futures and Options Factbook 1999*; *International Swap Dealers Association Market Survey 1997 Market Activities Data*.

Figure 1: FTT Revenue Estimates

As these estimates show, the revenue generated matches roughly what Keightley and Shvedov predicted in their article. With both of these studies we can form a clear picture of what a FTT would look like if implemented in the United States.

The last study we will look at is another journal article originally published in *Empirical Economics* titled: *Transaction Tax and Stock Market Behavior: Evidence from an Emerging Market*. The article written by Badi H. Baltagi, Dong Li, and Qi Li looks at the impact of a stamp tax rate increase on market behavior using data from two stock exchanges in China.

The study examines a tax rate increase from 0.3% to 0.5% and finds that trading volume decreases by $\frac{1}{3}$ after. This decrease in volume is identical to the transaction cost increase. As a result, the total tax revenue increases roughly $\frac{1}{9}$, which was much smaller than what was expected. Not only does this study find that revenues were less than expected, but that market volatility actually increases after the tax rate increase. The authors note that caution should be taken with these studies as this economy is considered an emerging market and is almost completely segmented from the rest of the world. They note that investors in this market do not have good substitutes for the stocks when a transaction tax is imposed on trading.

By looking at these articles, reports, and studies we now have a better understand of how financial transaction taxes have an impact on volatility, volume, and revenue. While there are mixed results it is important to note that not every economy is the same and that these studies were done over different time periods.

Chapter 4

Overview of Country Financial Tax Legislation

The seven countries chosen for this study have either implemented or repealed a financial transaction tax sometime since 1980. The purpose is to study exactly how the tax affected each country before the change and then after in order to gain a better understanding of how different countries' economies react to the change in policy. First it is important to understand the nuances of each country's financial transaction tax based on the size and scope of the legislation.

Columbia

Columbia implemented a financial transaction tax in 1998 with a rate of 0.2% with rates increasing to 0.3% in December of 2000 and another increase of 0.1% in three years. This tax is charged on all bank notes, promissory notes, internet banking, performance bonds, and essentially all financial transactions within the country (Patel). Initial research has suggested tax revenue as a percent of GDP (productivity) deteriorates over time. This indicates that the tax base has been receding over time which could signal the development of tax avoidance within the country (Coelho). This initial assertion was backed up by claims from Giraldo (2008) in which she suggests that cash holdings were transferred to unreported accounts overseas.

Finland

Finland imposes a tax on the transfer of certain Finnish securities if the transferee and/or transferor are a Finnish resident or a Finnish branch of certain financial institutions (European Union). Transactions that concern profit participating loans, equities, bonds, debt securities, derivatives, and options to subscribe for shares are subject to this tax. Finland has the highest tax rate of any in the study with a rate of 1.6% due upon transfer of the legal title. According to the Finnish government the tax was first introduced in 1996 after a failed attempt of a 0.5% transaction fee was repealed in 1992 (Finland).

India

Introduced on October 1, 2004, India levies taxes of 0.125% on securities transactions made through a national stock exchange and is not applicable to off market transactions. There are also rates of 0.025% on “non-delivery-based” transactions, and 0.017% on futures and options transactions. The following table summarizes the rates from 2004 to 2011.

Product	Transaction	STT rate	Charged on
Equity-Delivery	Purchase	0.125%	Turnover
	Sell	0.125%	Turnover
Equity-Intraday	Purchase	-	-
	Sell	0.025%	Turnover
Future	Purchase	-	-
	Sell	0.017%	Turnover
Option	Purchase	0.125%	Settlement price, on exercise
	Sell	0.017%	Premium

Figure 2: Indian Securities Transactions Tax Rates

While the tax rates were altered by the Indian government in 2012, we will only be examining the data prior to this change.

Japan

Repealed in 1999, Japan had implemented a financial transaction tax of on a variety of debt and equity instruments since 1953. The rates varied from an initial levy of 0.015% for stock transactions to a high of 0.055% in 1981. The Japanese government reduced the rate to 0.03% in 1989 and then to 0.021% in 1996 until the complete elimination of the tax just before the new millennium (Ono). These reforms were a part of the “Japanese Big Bang,” which was a set of measures intended to overhaul the Japanese financial system.

Sweden

Sweden introduced a 0.5% tax on the purchase or sale of all equity securities in January of 1984. This means that a total of 1% was paid when an investor bought and sold an equity security in the Swedish market. The main flaw in the Swedish system was that it only taxed securities traded using domestic brokerage firms; meaning one would only need to use a foreign brokerage firm to avoid the tax (EU). The tax rate was then increase 1% in 1986 and in 1989 a tax on fixed-income securities was introduced at a rate of 0.002%. The revenues from the fixed-income securities tax were disappointing; an average of 50 million Swedish kronor per year, while the expectation was 1.5 billion kronor per year (Campbell). In January of 1991 the rates of the remaining taxes were halved and then completely abandoned by the end of the year. Poor revenue, declining share prices, and offshore trading were all factors in the abolishment of the tax (EU).

Taiwan

Taiwan is one of the few countries not in Europe or North America to enact a financial transaction tax on securities. A tax of 0.3% was imposed in 1998 upon the gross sales price of securities transferred for share certificates issued by corporations. There was also a 0.1% tax levied on corporate bonds or securities offered to the public which had government approval (EU). Also beginning in 1998, Taiwan levied a tax on stock index futures which amounts to no less than 0.01% and no more than 0.06%. According to a report commissioned by the European Union, revenues for the securities transaction tax and futures transaction tax was around 2.4 billion Euros in 2009, the majority (96.5%) coming from the taxation of stocks and bonds. This corresponds to roughly 0.8% of GDP (EU).

United Kingdom

The Stamp Duty Reserve Tax was introduced in the United Kingdom in 1986. This legislation taxes the underlying value of the transferred good at 0.5% for UK based companies. This rate applies whether or not the transaction took place overseas or in the UK, and whether either party is a resident of the UK or not (EU). Revenue generated from this tax peaked in 2000-2001 during the economic boom at 7.38 billion pounds (0.46% GDP) and dropped to roughly 3.7 billion in 2004 due to worsening economic conditions. The research suggests that revenues from the stamp duties are pro-cyclical with economic activity (EU). On a year to year basis, the stamp duties average about 0.7% of total tax revenue generated in the UK.

Chapter 5

Analyzing the Data

Now that we understand how each tax functions we can better understand and analyze the data about volatility, revenue, and volume. The data will look at the five years prior to implementation of the tax as well as the five years after the tax was introduced. We will be using gross revenue compared to revenue generated from the FTT as a measure of how well the tax did comparatively to the other countries in the study. We will also look at total transaction volume per country and how it changes with the introduction of the tax. Lastly we will examine historical volatility in each market on a year to year basis by calculating the standard deviation of the market using daily index prices over the given years. Data obtained for this study was acquired through OECD libraries, governmental finance departments, World databank, and historical stock index records.

After calculating each country's revenue from the financial transaction tax as well as the total revenue generated during the indicated years we produced this chart to show the year to year change in revenue. India and Taiwan are left out of this portion of the study due to lack of available information on specific revenue generated from each countries financial transaction tax.

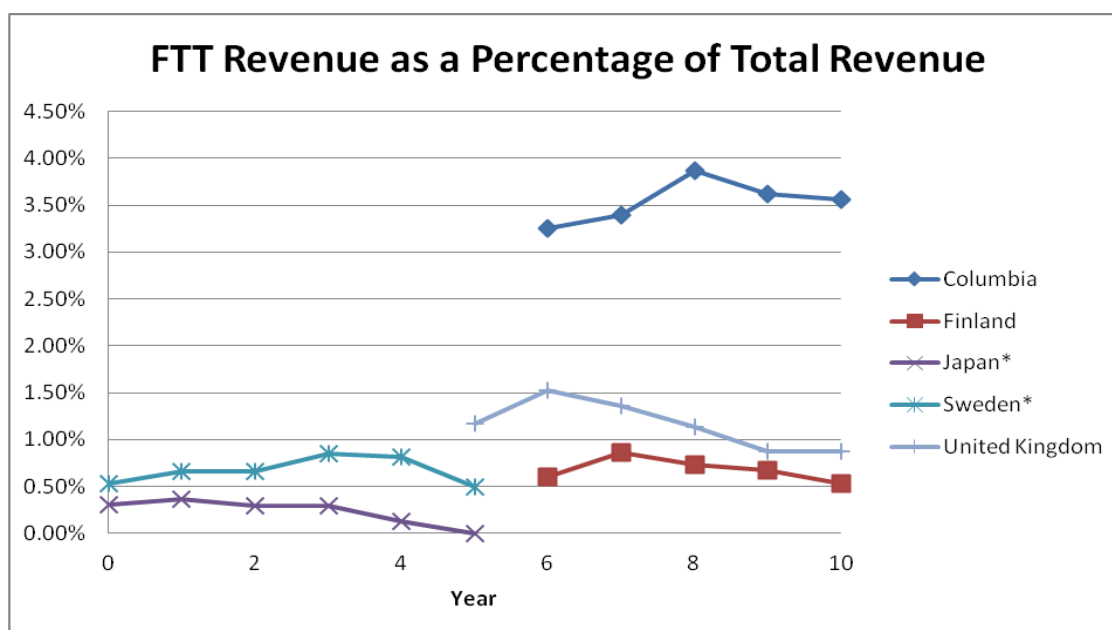


Figure 3: FTT Revenue as a Percentage of Total Revenue

Year five indicates the year each tax was either introduced or repealed. The asterisks next to Japan and Sweden indicate it being a country which repealed the FTT in year five. When comparing the countries we notice that Columbia has a significantly higher portion of its total revenue generated through the FTT. This is because the legislation passed by the Columbian government taxes *all* financial transactions, including ATM withdrawals, bank transfers, and other. Although Finland has the highest tax rate out of all countries in the study, it actually generates less than the United Kingdom as a share of total revenue. We also notice that Japan's legislation to decrease the rate in 1996 had a significant effect on revenue. While it is not clear from the data what constitutes a good return as a share of total revenue, we can estimate that a higher tax rate doesn't necessarily mean increased revenue as it could reduce the overall tax base.

As we look at trading volume changes year to year it is important to note that there are many other macroeconomic factors at play here and financial transaction taxes do not operate in a bubble. It is also important to understand that each FTT was implemented or repealed in a

different year; thus complicating the picture even more as trading volumes have grown significantly in recent years.

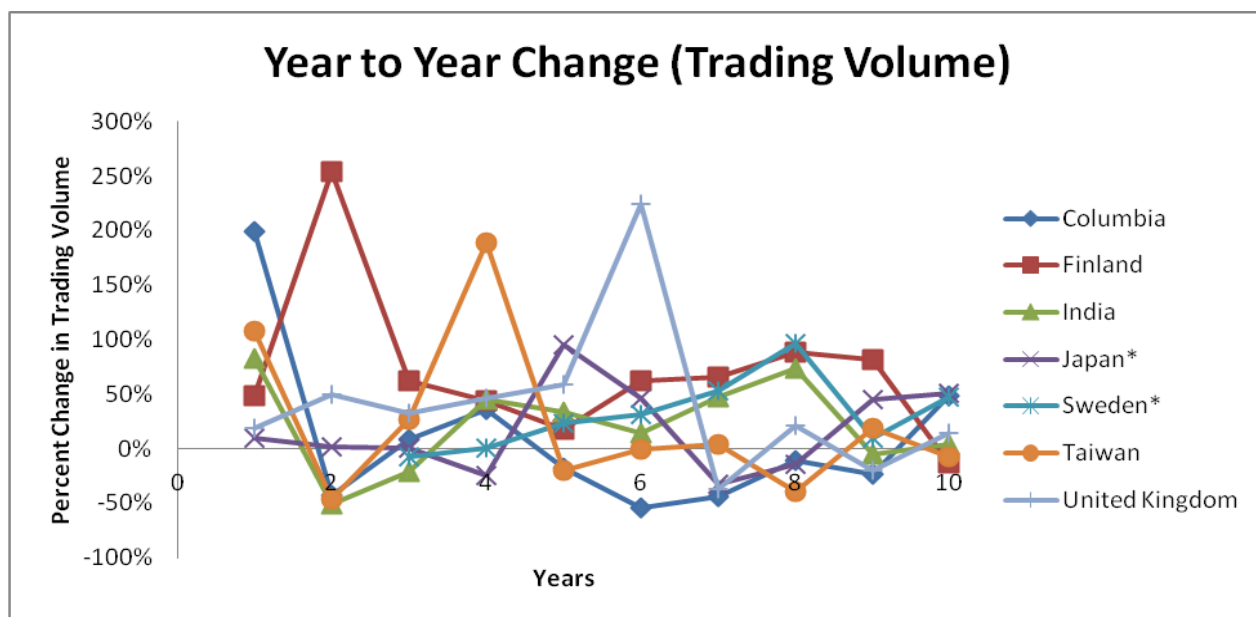


Figure 4: Year to Year Change in Trading Volume

This chart, while difficult to understand, offers us a look at how trading volumes changed (in dollar terms) year to year over the course of the study. We see that Columbia experienced four straight years of declining trading volume, which could be an indicator that the FTT reduced trading volume in the market. When examining Japan we see that trading volume spiked immediately after the tax was repealed and only declined in year 7 (2001). This could be explained by the economic crisis of the early 2000's as investors were remaining cautious. Overall we tend to see trading volume rise even in the long run, both for countries which repealed taxes and those that implemented them. As noted before, trading volumes tend to rise every year so this comes as no real surprise. The one FTT that seems to have a significant impact on trading volumes is that of Taiwan. The year the FTT was introduced, trading volume declined 20.47% from the previous year.

If we look at average trading volumes before and after the tax was implemented we find that these are the results:

Table 1: Trading Volume Changes

<i>Country</i>	<i>Tax Rate</i>	<i>Average Trading Volume Before Change</i>	<i>Average Trading Volume After Change</i>	<i>Differential in Trading Volume</i>
Columbia	0.2%	\$1,477,600,012.80	\$609,910,000.00	-58.72%
Finland	1.6%	\$8,830,800,076.80	\$103,055,504,697.00	1067.00%
India	0.125%	\$303,971,542,500.00	\$782,942,694,311.73	157.57%
Japan*	0.03%	\$1,161,052,001,459.20	\$2,274,333,766,839.63	95.89%
Sweden*	0.5%	\$17,914,333,184.00	\$68,191,999,392.00	280.66%
Taiwan	0.3%	¥17,633,815,167,200.00	¥24,999,864,780,500.00	41.77%
United Kingdom	0.5%	£57,533,060,000.00	£346,488,350,000.00	502.24%

From this table we can see that every country with the exception of Columbia saw an increase in trading volume after the change in the transaction tax. We know that this was expected in the case of Sweden and Japan as these countries repealed their taxes. It is interesting to note the large increase in trading volume for those that implemented such taxes. While trading volumes rise over the long run we still see that the taxable base for these countries increased on average over the five year span after implementation.

If we look at how the size of the tax rate affects trading volume it is hard to see a relationship between the two. While we have a small sample size and these rate changes occurred during different periods of time we can compare similar economies. We can see that India, only having a 0.125% rate saw volume increase by roughly 157% and Taiwan, having a larger rate of 0.3%, only saw trading volume increase by 41.77%. This is consistent with previous findings that show larger tax rates reduce trading volume. However, there are outliers such as the United

Kingdom and Finland in which even higher tax rates (0.5% and 1.6% respectively) led to significantly increased trading volume.

We can also examine how Finland, Sweden, and the United Kingdom's trading volume compares to other countries in the Euro area. I have used eleven different countries in this study which include Belgium, France, Finland, Germany, Ireland, the Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom.

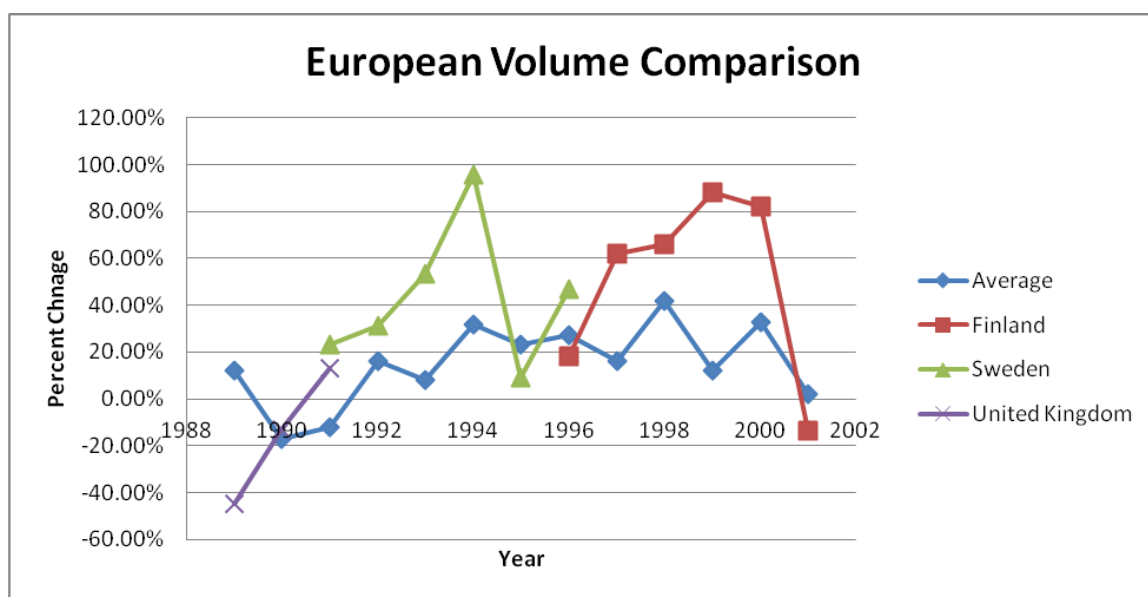


Figure 5: European Volume Comparison

This chart only examines the data after the change in tax rate as compared to the average trading volume of 11 European countries. As we can see, trading volume in the United Kingdom seemed to be slightly lower in comparison to the Euro area two years after the FTT was enacted but volume rose at the tail end of the study to pass the Euro average. When examining Sweden we are looking at trading volumes after the FTT was repealed and see that trading volume is comparatively higher than the Euro average which suggests that investors trade more when there are less transactions costs. However, near the end of the five year study we see trading volume decline to roughly the same level of the Euro average. This could suggest that trading volume returns to the regional market average in the long run. Finland looks very similar to Sweden yet

this is after implementation of a 1.6% tax. This volume increase in the short run could also be a factor of other market forces such as the economic boom of the early 2000's and its subsequent crash in 2001. This information may suggest that other economic forces have a stronger influence on trading volume than financial transaction taxes.

The last and possibly most important factor of this study is to examine volatility in each of the countries used in the study. If volatility declines after a FTT is implemented, this would be a sign that financial transaction taxes can reduce significant market fluctuations.

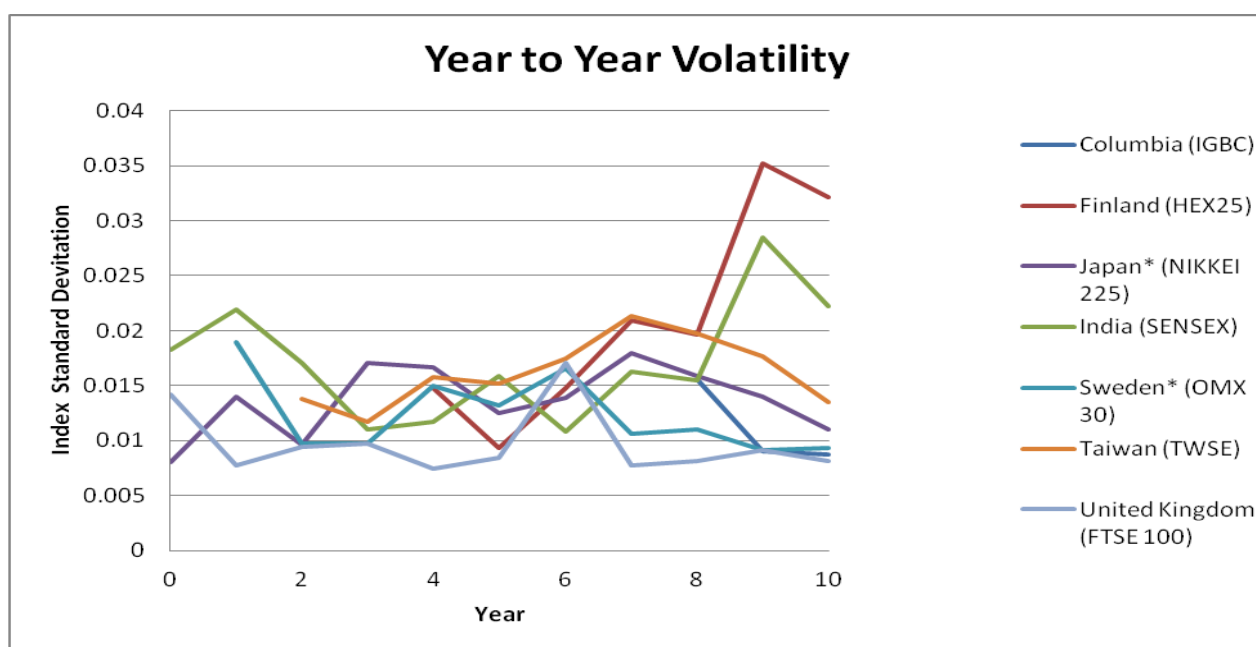


Figure 6: Year to Year Volatility

In this figure we can examine what happens to volatility after the tax is either implemented or repealed in year 5. Finland is the country that seems to stick out the most as the volatility of the HEX25 continues to rise even after implementation of the 1.6% transactions tax. This is the opposite of what a financial transaction tax is intended to do. However, when we examine the Taiwanese stock market we notice that after a slight increase in volatility, there is a continued trend of smaller and smaller standard deviations, meaning the financial transaction tax

worked in theory. We can also see that market volatility in India declined the year after the tax was implemented but then increased over the long run. This could suggest that volatility declines may only be temporary. We also notice that Japan and Sweden, both countries that repealed FTT's saw their volatility decline over the long run. These results show that financial transaction taxes might actually increase volatility as noted in previous research. From this chart there isn't too much evidence to suggest that a financial transaction tax will curb volatility as there are too many other economic factors at work.

All data used in these charts can be found in Appendix A.

Chapter 6

Conclusion

This study was intended to compare seven different countries with financial transactions taxes and their effect on government revenue, trading volume, and market volatility. While each tax is different in nature, this study is aimed at helping understand whether or not a financial transaction tax is helpful in raising revenue and curbing extensive day trading which could lead to increase market volatility.

With the data used, we found that revenues generated from financial transaction taxes can be substantial although we saw that volatility actually seemed to increase in some economies after implementation of the tax. This is the opposite effect of the intended purpose of implementing a securities transaction tax. We also noticed that trading volume seemed to rise after implementation of a FTT which could be a result of other macroeconomic factors.

There is more research to be done on the subject as to the extent FTTs reduce volatility controlling for other market factors. In the long run financial transaction taxes seem to have little negative effects on the market as trading volumes continue to rise and there is some evidence of reduced volatility. Not only that, but financial transaction taxes seem to be a reliable source of revenue in almost every case.

Appendix A

Data used in Analysis

Revenue from FTT (Domestic Currency)

Year 0	Year 10		0	1	2	3	4
1993	2003	Columbia	..	..	..	..	..
1991	2001	Finland	..	..	..	..	..
1999	2009	India	..	..	..	..	..
1994	2004	Japan*	390.5	479.1	391.5	403.6	172.6
1986	1996	Sweden*	2632	3746	4013	5832	6105
1993	2003	Taiwan	..	..	..	..	..
1981	1991	United Kingdom	..	..	..	..	..

5	6	7	8	9	10	
..	880677.567	1036584.093	1421334.225	1443229.436	1621461.719	Chilean Peso
..	296.818	462.87	411.034	421.378	330.557	Euro, Millions
..	
0	..	..	..	..	..	Yen, Billions
3869	..	..	..	..	..	Kronor, Millions
..	
1700	2355	2344	2127	1755	1789	Pound, Millions

Total Revenue (Domestic Currency)

Year 0	Year 10		0	1	2	3	4
1993	2003	Columbia	7255086.73	10638187.01	13907889.8	17627495.62	22596738.47
1991	2001	Finland	38654.058	37306.133	37281.327	41306.919	43853.369
1999	2009	India	180755	184430	200482	222377	252382
1994	2004	Japan*	127844.8	133276.7	136392.6	139500.8	134914.3
1986	1996	Sweden*	497042	566688	610556	683570	755953
1993	2003	Taiwan	..	..	..	..	..
1981	1991	United Kingdom	92880	108233	113345	122092	133701

5	6	7	8	9	10	
25049954.86	27078295.28	30512910.47	36774526.79	39824494.46	45600817.85	Peso
46641.202	49782.453	53950.076	56159.191	62418.392	62334.319	Euro, Millions
303872	363983.34	471057	588909	598383	..	Rupees, Crore
131416.1	136124.9	134663.1	128265.9	127002.5	131132.2	Yen, Billions
777029	735319	724853	777887	859254	915243	Kronor, Millions
145729	154902	173088	186990	202414	205352	Pound, Millions

FTT Revenue as a Percentage of Total Revenue

Year 0	Year 10		0	1	2	3	4
1993	2003	Columbia					
1991	2001	Finland					
1999	2009	India					
1994	2004	Japan*	0.31%	0.36%	0.29%	0.29%	0.13%
1986	1996	Sweden*	0.53%	0.66%	0.66%	0.85%	0.81%
1993	2003	Taiwan					
1981	1991	United Kingdom					

5	6	7	8	9	10
	3.25%	3.40%	3.86%	3.62%	3.56%
	0.60%	0.86%	0.73%	0.68%	0.53%
0.00%					
0.50%					
1.17%	1.52%	1.35%	1.14%	0.87%	0.87%

Stocks traded (\$US)

Year 0	Year 10		0	1	2	3	4
1993	2003	Columbia	732000000	2191000064	1254000000	1360000000	1851000000
1991	2001	Finland	1550000000	2292000000	8112000000	13194000384	19006000000
1999	2009	India	2.78828E+11	5.09812E+11	2.49298E+11	1.97118E+11	2.84802E+11
1994	2004	Japan*	1.12144E+12	1.23155E+12	1.252E+12	1.25175E+12	9.48522E+11
1986	1996	Sweden*	..	..	18752000000	17419999232	17571000320
1993	2003	Taiwan**	9.05672E+12	1.88121E+13	1.01515E+13	1.29076E+13	3.72411E+13
1981	1991	United Kingdom**	29633200000	35025200000	52339500000	69404400000	1.01263E+11

5	6	7	8	9	10
1525000000	703700000	397300000	355010000	273060000	405390000
22422000000	36368000000	60321000000	1.1353E+11	2.06643E+11	1.79049E+11
3.79085E+11	4.339E+11	6.38484E+11	1.10755E+12	1.04975E+12	1.08889E+12
1.84923E+12	2.69386E+12	1.82623E+12	1.57328E+12	2.27299E+12	3.43042E+12
21661999104	28394999808	43592998912	85406998528	93197000000	1.36898E+11
2.9619E+13	2.92915E+13	3.05266E+13	1.83549E+13	2.1874E+13	2.03332E+13
1.6087E+11	5.20908E+11	3.25589E+11	3.95477E+11	3.15625E+11	3.60461E+11

**Denotes volume traded in domestic currency

Year to Year Change (Volume Traded)

Year 0	Year 10		0	1	2	3	4
1993	2003	Columbia		199.32%	-42.77%	8.45%	36.10%
1991	2001	Finland		47.87%	253.93%	62.65%	44.05%
1999	2009	India		82.84%	-51.10%	-20.93%	44.48%
1994	2004	Japan*		9.82%	1.66%	-0.02%	-24.22%
1986	1996	Sweden*				-7.10%	0.87%
1993	2003	Taiwan		107.71%	-46.04%	27.15%	188.52%
1981	1991	United Kingdom		18.20%	49.43%	32.60%	45.90%

5	6	7	8	9	10	Overall Change Since Year 5
-17.61%	-53.86%	-43.54%	-10.64%	-23.08%	48.46%	-16.713%
17.97%	62.20%	65.86%	88.21%	82.02%	-13.35%	50.484%
33.10%	14.46%	47.15%	73.47%	-5.22%	3.73%	27.782%
94.96%	45.67%	-32.21%	-13.85%	44.47%	50.92%	31.662%
23.28%	31.08%	53.52%	95.92%	9.12%	46.89%	43.303%
-20.47%	-1.11%	4.22%	-39.87%	19.17%	-7.04%	-7.517%
58.86%	223.81%	-37.50%	21.47%	-20.19%	14.21%	43.442%

Standard Deviation (Volatility)

Year 0	Year 10		0	1	2	3	4
1993	2003	Columbia (IGBC)	..	..	..	..	..
1991	2001	Finland (HEX25)	..	..	..	..	0.014825919
1999	2009	India (SENSEX)	0.01824946	0.021972188	0.017061886	0.011035367	0.011674354
1994	2004	Japan* (NIKKEI 225)	0.00805298	0.013992332	0.009595203	0.017037637	0.016670135
1986	1996	Sweden* (OMX 30)	..	0.018978903	0.009724257	0.009685397	0.015020306
1993	2003	Taiwan (TWSE)	..	..	0.013794673	0.011733206	0.015753587
1981	1991	United Kingdom (FTSE 100)	0.014164859	0.007726432	0.009430087	0.009771304	0.007420296

5	6	7	8	9	10
..	..	..	0.015540696	0.009057472	0.008756947
0.009331925	0.014824116	0.020902408	0.019691322	0.035173489	0.032159426
0.015924939	0.010794705	0.016241045	0.015445102	0.028438673	0.022264697
0.012537778	0.013909483	0.017953696	0.015842518	0.014019237	0.010980239
0.013168896	0.01661611	0.010574839	0.011051478	0.009158859	0.009329771
0.015206448	0.017439495	0.021310006	0.019779324	0.017666623	0.013518063
0.008449508	0.017049703	0.007779198	0.008178557	0.009168155	0.008181597

European Trading Volume Data

Country Name	1988 [YR1988]	1989 [YR1989]	1990 [YR1990]	1991 [YR1991]	1992 [YR1992]
Belgium	\$8,368,999,936	\$7,708,000,256	\$6,424,999,936	\$6,208,999,936	\$8,030,000,128
France	\$65,505,001,472	\$107,286,003,712	\$116,892,999,680	\$113,573,003,264	\$121,841,999,872
Finland	\$7,075,999,744	\$7,362,999,808	\$3,932,999,936	\$1,550,000,000	\$2,292,000,000
Germany	\$350,273,994,752	\$628,630,028,288	\$501,804,990,464	\$379,382,988,800	\$446,019,010,560
Ireland	..	..	..	..	..
Netherlands	\$34,554,998,784	\$89,847,996,416	\$40,199,000,064	\$38,970,998,784	\$45,511,000,064
Norway	\$4,848,999,936	\$12,488,999,936	\$13,996,000,256	\$11,642,000,384	\$10,151,000,064
Spain	\$25,607,999,488	\$38,388,998,144	\$40,967,000,064	\$40,590,999,552	\$39,986,999,296
Sweden	\$18,752,000,000	\$17,419,999,232	\$17,571,000,320	\$21,661,999,104	\$28,394,999,808
Switzerland	..	..	..	\$68,835,999,744	\$75,406,999,552
United Kingdom	\$579,170,992,128	\$320,268,009,472	\$278,740,008,960	\$315,279,015,936	\$382,995,988,480

1993 [YR1993]	1994 [YR1994]	1995 [YR1995]	1996 [YR1996]	1997 [YR1997]
\$11,198,999,552	\$12,819,999,744	\$15,249,000,000	\$26,120,000,000	\$29,713,000,000
\$174,282,997,760	\$307,686,014,976	\$364,550,000,000	\$277,100,000,000	\$402,550,000,000
\$8,112,000,000	\$13,194,000,384	\$19,006,000,000	\$22,422,000,000	\$36,368,000,000
\$302,984,986,624	\$460,616,990,720	\$573,549,000,000	\$768,745,000,000	\$535,745,272,525
..	\$4,380,000,256	\$12,987,258,141	\$12,269,696,221	\$16,254,727,475
\$67,185,000,448	\$170,596,007,936	\$248,606,000,000	\$339,500,000,000	\$284,869,000,000
\$8,750,999,552	\$8,817,000,448	\$24,420,000,000	\$35,882,000,000	\$46,421,000,000
\$47,155,998,720	\$61,452,001,280	\$59,791,000,000	\$250,951,000,000	\$453,016,000,000
\$43,592,998,912	\$85,406,998,528	\$93,197,000,000	\$136,898,000,000	\$176,172,000,000
\$167,879,999,488	\$226,723,004,416	\$310,928,000,000	\$392,783,000,000	\$494,912,000,000
\$423,526,006,784	\$464,084,992,000	\$510,131,000,000	\$578,471,000,000	\$829,131,000,000

1998 [YR1998]	1999 [YR1999]	2000 [YR2000]	2001 [YR2001]
\$55,360,000,000	\$59,128,906,000	\$38,013,170,013	\$41,110,000,000
\$591,252,000,000	\$787,573,000,000	\$1,083,267,636,766	\$1,077,341,000,000
\$60,321,000,000	\$113,530,000,000	\$206,643,028,182	\$179,049,000,000
\$761,888,000,000	\$814,740,000,000	\$1,069,120,464,174	\$1,419,579,000,000
\$42,440,000,000	\$50,592,000,000	\$14,432,114,570	\$22,534,000,000
\$420,199,000,000	\$478,436,000,000	\$677,211,000,000	\$1,033,468,000,000
\$42,638,000,000	\$54,135,000,000	\$60,124,000,000	\$52,333,000,000
\$699,034,000,000	\$744,315,000,000	\$985,856,000,000	\$838,600,000,000
\$203,690,000,000	\$238,237,000,000	\$390,035,000,000	\$301,586,000,000
\$637,344,000,000	\$538,955,000,000	\$609,137,000,000	\$300,871,000,000
\$1,167,382,000,000	\$1,377,859,000,000	\$1,835,278,000,000	\$1,861,131,378,256

WORKS CITED

- Baltagi, Badi H., Dong Li, and Qi Li. "Transaction Tax and Stock Market Behavior: Evidence from an Emerging Market." *Empirical Economics* 31.2 (2006): n. pag. Web. 2 Apr. 2014.
<<http://link.springer.com/article/10.1007/s00181-005-0022-9/fulltext.html>>.
- Campbell, John Y., and Kenneth A. Froot. *National Bureau of Economic Research*. Working paper no. 4587. N.p., Dec. 1993. Web. 26 Feb. 2014.
- Chicago Political Economy Group. *CPEG Fact Sheet: Taxing Wall Street to Revive Main Street*. N.p.: Chicago Political Economy Group, 2010. *Chicago Political Economy Group*. 20 June 2010. Web. 18 Dec. 2013.
- Coelho, Isaias. *Taxing Bank Transactions - The Experience in Latin America and Elsewhere*. Tech. N.p., n.d. Web. 26 Feb. 2014.
- "Department of Revenue." *Government of India, Minister of Finance*. Government of India, n.d. Web. 28 Mar. 2014.
- Finland. Ministry of Finance. *Ministry of Finance*. N.p., n.d. Web. 26 Mar. 2014.
- Fukukawa, Shinji. "Development of the Japanese Big Bang and Its Impact." *Development of the Japanese Big Bang and Its Impact*. Dentsu Institute for Human [Studies](#), 11 Nov. 1997. Web. 27 Mar. 2014.
- "GDP Growth Annual %." *The World Bank*. The World Bank, n.d. Web. 24 Mar. 2014.
- "Historical [Stock Market Prices](#)." *TRADING ECONOMICS / 300.000 INDICATORS FROM 196 COUNTRIES*. N.p., n.d. Web. 26 Mar. 2014.
- Keightley, Mark P., and Maxim Shvedov. "A Securities Transaction Tax: Financial Markets and Revenue Effects." Congressional Research Service, 19 Apr. 2010. Web. 26 Feb. 2014.

- Matheson, Thornton. *International Monetary Fund*. Working paper. International Monetary Fund, Mar. 2011. Web.
- "OECD." *OECD*. N.p., n.d. Web. 26 Mar. 2014.
- Ono, Hiroyuki. "A Turnover Tax, Transaction Costs and Stock Trading Volume: The Case of Japan." *The University of Kitakyushu*. Toyo University, June 2005. Web. 26 Mar. 2014.
- "Overview of [Taxes](#) on Financial Transactions within the EU - Finland." *Financial Transaction Tax*. KPMG, n.d. Web. 26 Mar. 2014.
- Patel, Tejas H. "Financial Transaction Tax (FTT) - For Greater Stability?" *Tata Consultancy Services*. Tata Consultancy Services, n.d. Web. 26 Mar. 2014.
- Pollin, Robert, Dean Baker, and Marc Schaberg. "Securities Transaction [Taxes](#) for U.S. Financial Markets." *Eastern Economic Journal* 29.4 (2003): 527-58. Web. 2 Apr. 2014.
<<http://www.jstor.org/stable/40326385>>.
- Proposal for a Council Directive on a Common System of Financial Transaction Tax and Amending Directive 2008/7/EC*. Working paper no. 28.9.2011. Vol. 9. Brussels: European Commission, 2011. Print.
- Rogoff, Kenneth. "The Wrong [Tax for](#) Europe." *Reuters*. Reuters, 3 Oct. 2011. Web. 26 Feb. 2014.
- Schmitterer, Eric M. "Evidence in Opposition to Securities Transaction Taxes: The Case of Japan." *George W. Bush Presidential Center*. George W. Bush Institute, n.d. Web. 27 Mar. 2014.
- Schulmeister, Stephan. *A General Financial Transaction Tax: A Short Cut of the Pros, the Cons and a Proposal*. Social Science Research Network, 2009. Web.
- Schulmeister, Stephan, Margit Schratzenstaller, and Oliver Picek. *A General Financial Transaction Tax: Motives, Revenues, Feasibility and Effects*. Publication. N.p.: Austrian Institute of Economic Research, 2008. Print.
- Singh, Kavaljit. *Equitable Equity: India Introduces Securities Transaction Tax*. Tech. N.p.: n.p., n.d. Print.

- Song, Frank M., and Junxi Zhang. "SECURITIES TRANSACTION TAX AND MARKET VOLATILITY." *The Economic Journal* 115.506 (2005): n. pag. Web. 2 Apr. 2014. <<http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0297.2005.01034.x/pdf>>.
- "Stamp [Taxes](#) Manual." *HM Revenue and Customs*. N.p., 2001. Web. 26 Feb. 2014.
- "Summary Data of Stock Market (by Year) Annual Statistics." *Taiwan Stock Exchange Corp.* Taiwan Stock Exchange Corp., n.d. Web. 27 Mar. 2014.
- "Summary of STT Rates." [Day Trading](#) Shares. N.p., n.d. Web. 26 Mar. 2014.
- "What Are the Stamp Duty Rates." [IRAS](#):. N.p., n.d. Web. 02 Mar. 2014.
- "World DataBank." *The World Bank DataBank*. The World Bank, n.d. Web. 27 Mar. 2014.

ACADEMIC VITA

Matthew Hopkins
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EDUCATION

The Pennsylvania State University
Schreyer Honors College, Smeal College of Business
Bachelor of Science in Finance
Minor: Economics (Concentration in Human Resource and Public Economics)
Participated in a supply chain research project in which I provided Unilever with inventory tracking software analysis to implement in their North and South American warehouses to cut costs.

May 2014
University Park, PA

RELEVANT EXPERIENCE

Expedia Inc.

Bellevue, WA

Associate Analyst

5/13 – 2/14

- Researched and documented current occupancy tax rates using Boolean logic for the top 1000 travel locations across the globe to be loaded into the Expedia system as a part of the Global Tax Solution.
- Created data metrics for management to better understand the financial implications of uploading new tax rates into Expedia's internal system.
- Communicated with hotel associations, government agencies, and market managers in Expedia to confirm new tax rates and understand tax structures for different locations.

Unlimit3D

State College, PA

Business Team Leader

7/12 – 11/12

- Created a working business plan and business model for a start-up 3D printing company which is looking for \$20 million to \$50 million in seed money.
- Worked with upper management to create and develop a strategic marketing and sales plan to target value customers as well as corporations in order to maximize profits in the growing 3D printing industry.
- Reviewed and advised upper management on certain key aspects to the business plan including structure of the document, key components to include, competitor analysis, and market research.

PitchBook Data Inc. – Internship

Seattle, WA

Research Associate

6/11 – 8/11, 5/12 – 8/12

- Organized and managed private equity funds returns data to be uploaded to company website.
- Worked on a month long project that was aimed at exceeding our direct competition in funds, funds with returns, and limited partner information.
- Updated and organized client information to create a better, more intuitive experience for the company website in order to gain an edge on the competition.

OTHER EXPERIENCE

New Leaf Initiative, Global Leadership Fraternity

State College, PA

Business Team Member

1/12 – 5/12

- Created a 150 page long term business plan for New Leaf Initiative to create a global leaders and sustainability fraternity nationally and internationally.
- Developed a 5-year income statement, balance sheet, cash flows statement, marketing plan, and exit strategy for New Leaf Initiative to be financially able to make its plan work.
- Dedicated over 15 hours per week researching the legal operating structure of a non-profit organization, meeting with real estate agents in the State College area to find a suitable home for the fraternity, working with the Executive Board of New Leaf on different marketing plans, exit strategies, finding seed money from universities and corporate sponsors, and developing the business plan into a single document.

INVOLVEMENT

Sigma Phi Epsilon Fraternity

State College, PA

Vice President of Finance, Brotherhood Development Coordinator, Risk Manager, Standards Board

9/10 – Present

- Accountable for budgeting, managing, and collecting over \$80,000 for a chapter of over ninety brothers. This includes presenting budgets to alumni and working with the executive board of the chapter to properly allocate funds.
- Created a Brotherhood Development Program that details the various tasks and goals each brother must achieve in order to remain in good standing with the fraternity. The Penn State Interfraternity Council uses my program to display to other households with subpar programs as a model of what a great program should entail.