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The Effect of Trade Liberalization on Capital Markets- Case of Canada and U.S FTA, Sector Level Study.

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Abstract:

Transitional economies tend to see trade liberalization and capital reforms hand in hand. The main goal or aim for lawmakers is to maximize welfare effects when bringing trade and capital reforms within an economy. A nation gets greater access to international financial markets, which in turn attracts inflow of investments within economy. This newfound inflow of investments can also be attributed as a major contributor to a nations growth, leading to an upward push in the capital markets. The presented empirical study investigates if there exists a relationship in between Trade Liberalization and Capital Markets, at sector level over a period of ten years (1989-1999). This paper investigates this relationship by using the case of Canada- USA free trade agreement (1988) and Toronto Stock Exchange Index (S&P/TSX). This being a relatively new topic in the field of research, only few past studies have been conducted. And they mostly rely on 'Event Study' methodology for their analysis. This empirical paper applies a different approach (i.e. Fixed Effects and Random Trend Model.) in analyzing the relationship between trade liberalization and capital markets. In this empirical study, we find in the case of Canada-USA FTA, TSX on average saw a fall of 0.22 percent, when tariffs rose by one percent. Enough the effect is negligible, but it is statistically significant as well. Though the model is not capable of explaining in the detail the cause of this effect, I believe in future study employment and firm size should also be included in the modeling.

Table of Contents

1. Introduction -1

2. Methodology - 3

3. Data - 5

4. Results - 7
- *4.1 Weighted Average Ad Valorem Tariff* - 8
- *4.2 Simple Average Ad Valorem Tariff* - 14

5. Discussion - 18

6. Conclusion - 19

References - 21

Appendix I
- *Graph 1 and 2* - 23
- *Graph 3: (a) and (b)* - 24
- *Graph 4: (a), (b) and (c)* - 25
- *Graph 5: (a) and (b)* - 26

Appendix II
- *Table 1* - 27
- *Table 2* - 28

Appendix III
- *Stata Coding* - 29

1. Introduction:

Economic Reform! What does it really mean and what are the dynamic effects associated with it? Is an intriguing question, especially when analyzing the Trade Liberalization part during an Economic Reform. In the past, there have been some qualitative and empirical studies conducted, which addressed the problem of speed and order of Trade Liberalization; whether it promotes efficiency with in an economy. In general, these quantitative papers have focused on should the tariffs be removed gradually or just cold turkey from an economy; and should the liberalization of capital markets take place pre or post trade liberalization (tariff reduction).

I personally want to fathom, the relationship in between trade liberalization parameters and its effect on capital markets. As often in developed or OECD countries, policy makers couple trade and fiscal reforms together. Since the main objective is to maximize welfare effects of trade and capital liberalization, as this directly depends on the degree of nations, accessibility to financial markets. Since, a closed economy will not have access to international financial markets, to raise funds for investments within economy. Time and again, from the examples of India and China, we can see the level of growth within economy and the inflow of capital investments rising exponentially post trade liberalization. One can rationally ponder; this new growth and inflow of capital investment should have some positive impact on the financial markets. Leaving us to the question- what is the relationship in between these two, if it does exist. In broad terms, the purpose of this empirical paper is to investigate: How does Trade liberalization effect capital markets? In particular the response of the stock market.

In order to access the existence of an empirical relationship, this study focuses on the case of Canada - United States of America (U.S) bilateral free trade agreement (FTA, 1988). According to the Statistics Canada, during the ensuing six years, the number of plants operating in Canada dropped by 21% though the manufacturing output rose by 34%. On the contrary even though the manufacturing output was on the rise for ensuing six years, Canadian economy was going through a

bumpy ride. It saw negative growth for ensuing three years and subsequently positive growth for three years and then returning back in red. Overall, the economy did see a positive trend in the GDP growth. This could be argued as Canadian economy, specially the manufacturing or labor intensive industries were going through rationalization. The economy saw aggregate productivity gains through intra-industry re-allocation due to trade liberalization, a key point from Melitz (2003) paper.

This re-allocation and productivity gains in the economy can also be comprehended as efficiency gains. Also observed in my previous study on "The employment effect of a regional integration: Case of Canada and USA (2012)"; where I found the Canadian economy saw steep fall in employment rates at industry level, but that was absorbed by efficiency gains in intra-industries. Meaning inefficient players either exited the market or where absorbed by bigger players, resulting a fall in employment but majority of it absorbed by the growth in efficient industries. Over the years Canadian employment saw a marginal negative trend in employment rates due the trade liberalization, based on my previous master thesis.[1]

After looking at these two considerable points, one can ponder, how these efficiency gains would be reflected on the capital markets? Since one can infer with increased access to forging markets benefited exporters, while on the other hand non-exporters suffered decline in profits due to the market competition (product and factor market). We can see (*graph 2*) a clear positive trend in the aggregate Canadian Stock Market (S&P/TSX) ensuing ten years of the FTA agreement. Breinlich (2014), points out the lack of qualitative research done in this regard. Breinlich's (2014) paper investigates the firm level responses in Canadian economy due to the trade liberalization (FTA, 1988). He found *0.3* percent gain in the abnormal returns for the larger firms over the years. Strikingly similar research done by R. Parinduri and S. Thangavelu (2012) on the free trade agreements and the value of firms, using Singapore capital market (Singapore-U.S FTA, 2003). Where they found a positive response in the Singapore capital market, due to the FTA with

[1] *The employment effect of a regional integration: The case of the Canadian and the US integration since the 80's, keeping EU-15 as benchmark. (August, 2012).*

United States (USSFTA). Their empirical research concluded that out of six observed industries only two benefited directly form the USSFTA, and those were the Basic Materials and Healthcare. Firms in these industries saw their value rise by 1 to 11 percentage points.

Both, the above mentioned empirical studies apply 'Event Study' for their empirical analysis. Event study analysis measures the valuation effect of a prominent event-taking place in financial markets. They use Abnormal Returns and Cumulative Abnormal Returns for their capital market dependent variables. I on the other hand, will be applying a different approach. Where I will be looking at sector level stock market indices (S&P/TSX) and the impact of trade liberalization on these sector level indices.

The rest of the disposition of this empirical paper is broken down into: Methodology, Data, Results, Discussion and then Conclusion.

2. METHODOLOGY:

When it comes to empirical analysis of capital markets performances, researches have mostly preferred the use of 'Event Study Analysis'. Here, you identify few key monumental events that can have an impact on the capital markets; for example the signing of a trade treaty, general elections and etc. Breinlich (2014) and Parinduri (2011), both used 'Event Study Analysis', where the monumental events where the signings of free trade treaties. Though Parinduri (2011) used abnormal returns (AR) and cumulative abnormal returns (CAR) to measure the impact associated with FTA. Though Breinlich (2014), first applies stock price reactions to test of heterogeneous firm models and later Breinlich applies these predictions to analyze the within sector differences in AR.

What makes this study different from the mentioned research; is rather than applying Event Study Analysis, I will be using Stock Market Indices at sector level and analyzing the effects associated ensuing ten years the FTA (1989). Hence, for the construction of panel data, I will be using the average annual tariff changes, average annual foreign exchange of the top three trading partners and the foreign exchange trade weights; all at sector level.

When a nation follows through economic liberalization policies, the economic effects within the nation can be profound for both the investors and the nation. One of the main aims of an economic liberalization policy is the free flow of capital between nations, provision for efficient allocations of national resources and the competitive advantages. First step for lawmakers to shift from a protectionist policy (i.e. Tariffs, trade laws and etc.) to an economic liberalization; usually is done by lowering of the tariffs. Once the tariffs in a nation are lowered then the inflow of capital into the nation's capital markets rises. With this increased capital liquidity, the access to this capital becomes comparatively easier and cheaper for the potential investors (and private entities.). This will directly have an impact on the number of profitable projects these publically listed companies would commence, translating into a higher growth. In turn leading to spill over effect, having an impact on the firm's value. At an aggregate level to be able to have a better understanding of the impact on publically traded firms, one can use the stock index as well.

Since nations have their own currencies, the local currency would strengthen in comparison to the trading partners currencies due this surge in the demand of local currency. Since the impacts of liberalization will be felt first and foremost with the leading trade partners, effecting the trade balances and most importantly the exchange rate of converting home currency into the foreign currency.

Due to above mentioned reasons, I believe using stock market index, tariff changes and currency exchange rate (of the trading partners.) for the below analysis is logical and justifiable.

$$y_{i,t} = \beta\, \Gamma_{i,t}^{w,s} + \sum_{j=1}^{3} \mu_1\, \mathrm{F}_{j,t} + \eta\, \Phi_{i,j,t}^{r} + \alpha_i + \mathcal{E}_{i,t} \qquad (\mathbf{1})$$

Where,[2]

- $y_{i,t}$ –*Annual average stock index (S&P/TSX) for each sector.*
- $\Gamma_{i,t}^{w,s}$ –*Tariff changes in Canadian Imports, with respect to USA (weighted and simple average changes.).*
- $\mathrm{F}_{i,t,j}$ –*Average annual foreign exchange.*
- $\Phi_{i,j,t}^{r}$ –*Foreign exchange trade weights (r =import or export weights), (j=1,2,3. I.e. USA, UK and Japan.)*
- α_i *-(i=1....n) is the unknown intercept for each sector (n sector-specific intercepts).*

[2] Detailed discussion of the variables follows in the *DATA* section of this paper.

$\varepsilon_{i,t}$ *–Error Term.*

The above stated equation is the general form of the linear panel regression equation for the rest of the paper. I will be applying and analyzing different forms of *equation 1*: natural log linear panel fixed effect estimation (FE), first difference of natural log linear ordinary least square regression (OLS), first difference of natural log panel FE.

3. *DATA:*

For the purposes of this study, the time range for the data is from 1989 until 2000; this gives to analyze the ensuing ten years of Canada-US FTA. Since there is no downloadable data set for this study, hence I will be creating one. This study contains eight sectors within the Canadian economy, that are comparable with financial and trade data (due to the comparable data availability constraints.).

"*Chemicals, Food Products, Fuels, Machinery and Electrical, Metals, Minerals, Transportation and Wood."*

Two sets of effectively applied Ad Valorem tariff [3] data for these sectors was obtained from the World Integrated Trade Solution website (WITS); Weighted Average and Simple Average tariff. S&P/TSX indices of the corresponding sectors was obtained form the Thompson Reuter's Data Stream database. Yearly average foreign exchange from Canadian Dollar (CAD) to US Dollar (USD), British Pound Sterling (GBP), Japanese Yen (YEN) and vice-versa, was also obtained from the Data Stream database.

The Canadian government did not opt for removal of tariffs in 'cold turkey', but they opted for a gradual trade liberalization policy. [4] From the graphical representation's we can observe that the first wave of tariff reduction started in 1989, followed by in 1993 and lastly in 1995. Where by 1997, the most of the sectorial tariffs were almost close to zero if not zero. One thing stands out from the

[3] An ad-valorem tariff is tax that is levied based on the imported or exported item's value (e.g., 5% of the imported or exported car's value).
[4] This can be seen in the graphical representation of both Weighted and Simple average tariffs in *Appendix I, Graph 2.*

graphs is that; Food Products sector does not follow the common downward trend as seen in other chosen sectors, it actually follows its own random path. The basic reason for this is, the protectionist policy towards the agricultural and animal farming industry from the foreign players. This could be also argued that, Canadian government was willing to scarify the rationalization and efficiency gains within this very inefficient sector. Hence, we can call Food Products sector as an outlier.

Interestingly enough, one of the major impacts of trade liberalization is the strengthening of home currency compared to those of trading partners. Though we see actually a marginal fall in the Canadian dollar (CAD) exchange rates, when buying the trading partners currency for the ensuing 10 years from 1989. Due to this, one could rationally expect marginal rise in exchange rates when using the foreign currency to buy the Canadian Dollars, but during the period of study we see a significant strengthening of trading partners currency (specially US Dollar, USD and British Pound Sterling, GBP.) [5]. We can also see that the Japanese YEN is the most volatile currency when comparing with the other two trading partners.

As stated in the section above, through 'spill-over effect' when a nation actively pursues trade liberalization policy, one can see that Canadian Stock indices did enjoy a positive growth for the ensuing 10 years. Though Transportation sector witnessed a wild run in both directions, this could very well be due to the fact that transportation sector had to go through major structural changes as compared to the other chosen sector.[6]

The foreign exchange trade weights at sector level are calculated for all three major trading partners (US, UK and Japan.), as export and import weights. Where exchange rates from foreign currency to home currency (CAD) are multiplied to the ratio of: export/import value to trading partner over the total export/import value to the world; are used for computing of export weights and vice-versa for import weights. The export and import trade values were also downloaded from the WITS website, though all of the respective trade values were in USD. For simplicity before computing and weights, these trade values were converted to CAD; going forward using converted trade values. Below is the mathematical representation of the weights:

[5] Graphical representation of these variables is in *Appendix I, Graph 4.*
[6] Graphical representation of Stock Indices is in *Appendix I, Graph 5.*

$$\Phi_{i,j,t}^{export} = \sum_{j=1}^{3} \left[\left(\Lambda_{i,j,t}^{export} \Big/ \mathrm{T}_{i,j,t}^{export} \right) * \Pi_{j,t}^{p} \right]$$

$$\Phi_{i,j,t}^{import} = \sum_{j=1}^{3} \left[\left(\Lambda_{i,j,t}^{import} \Big/ \mathrm{T}_{i,t}^{import} \right) * \Pi_{j,t}^{s} \right]$$

Where;

$\Pi_{j,t}^{p}$ *–Annual average foreign exchange, (I.e. USD/GBP/YEN to CAD) and (j=1,2,3. I.e. USA, United Kingdom and Japan.)*

$\Pi_{j,t}^{s}$ *–Annual average foreign exchange, (I.e. CAD to USD/GBP/YEN)*

$\Lambda_{i,j,t}^{export/import}$ *–Export/Import value to and from trading partners, at sector level.*

$T_{i,t}^{export/import}$ *-Total export value to world at sector level.*

4. Results:

In this paper all of the different estimation models used for weighted average tariffs (WAVG); are also replicated for the Simple average tariff (SAVG) variable as well. Since, this paper main motive to find a relationship between the capital markets and trade liberalization. We are using different forms of tariff calculations, to be able to infer if they have similar or different impact on the dependent variable. In this section I will be discussion results based on the tariff types (i.e. Weighted Average and Simple Average.) and All of the empirical results are represented in *Table 1 and 2 (Appendix II.)*,

According the macro economic theory stated by Fukuda and Kon (Sept, 2010), foreign currency exchange rate would have an impact on the home countries exports and imports. As a stronger home currency compared to the trading partners would make its products expensive in the export market; resulting in the fall of exported products. Though home country might start to import more from the trading partners, since their products are cheaper to buy than previously. Due to this exact reason, I will use exchange rate of converting CAD into USD, GBP and YEN when modeling with imports weight and vice-versa when modeling with export weights. These fluctuations in the currency exchange rates, tend to have a direct impact on the bottom line of a firm (i.e. their profits.). Since, the profitability of a firm and the

trade flows have a direct impact on the firms valuations on the capital markets (i.e. Stock Markets.).

4.1 Weighted Average Ad Valorem Tariff:[7]

4.1.a Natural Log, Fixed Effect (FE) Estimate:

According to economic theory, FE estimate explores the relationship between predictor (independent) and outcome (dependent) variables with an entity. In our case, the entity is sectors within the economy. Each of these sectors have an individual characteristics that could have an impact on the dependent variable. One of the key assumptions when applying FE estimate is, individual sectors are different from each other, therefore sector's error terms and the constant are not correlated. Since we are only interested in analyzing the impact of independent variable on dependent variable, being in line with this fact, we will apply FE estimation to our models.

Due the different units and scale in our variables, we estimate natural log of *equation 1*, after computing for the appropriate weights. This will result in variables with comparable scale and units. Going forward with our analysis, we will be working with these natural logged dependent and independent variables, then we apply panel OLS regression:

$$\mathrm{Ln}\left(y_{i,t}^{1}\right) = \beta^{1}\ln(\Gamma_{i,t}^{w}) + \sum_{j=1}^{3}\beta_{j}^{2}\ln(\mathrm{F}_{i,j,t}^{1}) + \sum_{j=1}^{3}\beta_{j}^{3}\,ln(\Phi_{i,j,t}^{export}) + \alpha_{i}^{1} + \mathcal{E}_{i,t}^{1} \qquad (\mathbf{2})$$

$$\mathrm{Ln}\,(y_{i,t}^{2}) = \mu^{1}\ln\,(\Gamma_{i,t}^{w}) + \sum_{j=1}^{3}\mu_{j}^{2}\ln(\mathrm{F}_{i,j,t}^{2}) + \sum_{j=1}^{3}\mu_{j}^{3}\,ln(\Phi_{i,j,t}^{import}) + \alpha_{i}^{2} + \mathcal{E}_{i,t}^{2} \qquad (\mathbf{3})$$

Where,

$y_{i,t}^{1,2}$ –*Annual average stock index (S&P/TSX) at sector level.*
$\Gamma_{i,t}^{w}$ –*Tariff changes in Canadian Imports, with respect to US*
$\mathrm{F}_{i,j,t}^{1,2}$ –*Average annual foreign currency exchange (FX) (converting USD/GBP/YEN to CAD.*

[7] Results for the Weighted Ad Valorem Tariffs in represented in Appendix II, *Table 1*

$\Phi_{i,j,t}^{export,import}$ *–Foreign exchange export/import trade weights (j=1,2,3. I.e. USA, UK and Japan.)*

$\alpha_i^{1,2}$ *-(i=1....n) is the unknown intercept for each sector (n sector-specific intercepts).*

$\mathcal{E}_{i,t}^{1,2}$ *–Respective Error Term.*

It is quite interesting to see the FE estimation results. One can clearly say that trade competition in exporting and importing industry had almost no impact on the Canadian stock indices. Since none of the independent variables are significant.[8] Even though the import weight model seems a bit more convincing due to the fact that our regression constant is significant.

Though we can infer tariff changes in both of the models had a very negligible negative impact on the stock indices. Due the fact the co-efficient of respective models bearing negative sign. Implying stock indices at the chosen sectorial level saw a very negligible negative growth ensuing ten years of trade liberalization; while the Canadian sectors as a whole was going through rationalizing, gaining efficiency and productivity (*-0.035* and *-0.078* percent respectively.)

It is intriguing to see when comparing the foreign exchange export and import weights of chosen trading partners (USA, UK, Japan.). During to the trade liberalization with respect to USA, exporting sectors had a negative impact on the indices and importing sectors had a positive impact by, *-0.537* and *0.127* percent respectively. But when analyzing the foreign exchange weights for UK, we find opposite results. Here we see a positive relationship in between the export model and the stock indices and a negative relationship for the import model, *0.005* and *-0.061* percent respectively. Even though the co-efficient values are negligible, but it is worth noting the bearing co-efficient signs. In contrast to USA and UK, stock indices saw a negative relationship for the Japanese foreign exchange weights (export/import), *-0.337* and *-0.038* percent respectively.

This could be due to the fact that, majority of Canadian exporters was neither efficient nor competitive, but the importing sector was opposite when compared to their American counterparts. Though Canadian exporters were better off and importers worse off when compared to their British counterparts. Even though during the period of this study, Japan was third largest trading partner of Canada.

[8] Going forward Significance level is at 5 percent, unless otherwise stated.

It is quite intriguing to see that both exporters and importers were neither competitive nor efficient when compared to the Japanese counterpart.

Hence we can conclude, though the it is interesting to see the co-efficient signs, but none of the weight's models (export/import) can explain if there exists a relationship in between trade competition and capital markets.

4.1.b First Difference, Linear Regression (OLS) and FE estimate:

Since, it is known that the estimation of time series modeling does tend to have random walk problem. In this empirical study, we have random walk with a drift term. Since in our model we expect to have an average downward trend in tariffs changes with respect to USA. We also witness a downward trend in currency exchange rates, when foreign currency is used to buy home country currency (i.e. when USD/GBP/YEN is converted to CAD.). Logically, we see an upward trend in the currency exchange when home currency is used to buy foreign currency. This upward (or downward) trend is also expected to be present in the future currency exchange values, due to which we add a constant drift term. Due to these strong trends that would exist within the sectors as well, the independent and dependent variables are not satisfactorily stationary. Hence we take the first difference of our variables, so that more or less our data has a stationary noise.

To address this exact issue, we use the above transformed natural log variables and take their first difference. These new variables will be used for the further analysis.

$$\Delta\left(\check{y}_{i,t}^{1}\right) = \left[\, Ln\left(y_{i,t}^{1}\right) - Ln\left(y_{i,(t-1)}^{1}\right)\right] \qquad (4)$$

$$\Delta\left(\check{y}_{i,t}^{2}\right) = \left[\, Ln\left(y_{i,t}^{2}\right) - Ln\left(y_{i,(t-1)}^{2}\right)\right] \qquad (5)$$

Linear Regression (OLS):

Now we use the first difference of our dependent variable and apply linear regression against the first difference of our independent variable. Here our estimations (β) will show the direct unit change impact of independent variables will have on the dependent variable (i.e. the stock market indices.)

$$\Delta\left(\check{y}_{i,t}^{1}\right) = \alpha_{i,t}^{1} + \beta^{1}\,\Delta\left(\check{\Gamma}_{i,t}^{w}\right) + \sum_{j=1}^{3}\beta_{j}^{2}\,\Delta(\check{\mathrm{F}}_{i,j,t}^{1}) + \sum_{j=1}^{3}\beta_{j}^{3}\,\Delta(\Phi_{i,j,t}^{export}) + \mathcal{E}_{i,t}^{1} \qquad (\mathbf{6})$$

$$\Delta\left(\check{y}_{i,t}^{2}\right) = \alpha_{i,t}^{2} + \beta^{1}\,\Delta\left(\check{\Gamma}_{i,t}^{w}\right) + \sum_{j=1}^{3}\beta_{j}^{2}\,\Delta(\check{\mathrm{F}}_{i,j,t}^{1}) + \sum_{j=1}^{3}\beta_{j}^{3}\,\Delta(\Phi_{i,j,t}^{export}) + \mathcal{E}_{i,t}^{2} \qquad (\mathbf{7})$$

Where,

$\alpha_{i,t}^{1,2}$ *–Are respective constants for two models that contain (export and import weights.)*

$\mathcal{E}_{i,t}^{1,2}$ *–Are respective OLS error terms.*

The rest of the variables are same as before.

In linear regression estimation, one can presume when comparing change in weighted tariff had a negative impact on the stock indices. In both the export and import modeling by *0.097* and *0.112* percent respectively. Even though one can argue that these values are if not, but almost negligible though significant.

When analyzing the rest of the independent variables, the currency exchange rate from foreign to home currency are insignificant in export and import model. Though it is worth noting the co-efficient signs, with the strengthened of USD against CAD; stock indices saw a fall of *3.85* percent (export model) and as CAD strengthened against USD, the stock markets fell by *0.577* percent (import model). It is interesting though that two-way foreign exchange rates for GBP and YEN had positive impact on the stock markets. In export model, GBP to CAD and YEN to CAD both coefficients are insignificant, but with the strengthening of foreign currency saw Canadian stock markets rise by *0.97* and *0.096* percent respectively. When comparing the results in import model, the magnitudes of these co-efficient are quite high. As home currency grew stronger than compared to GBP and YEN, Canadian stock index saw a significant rise (i.e. *3.88* and *2.08* percent respectively.)

Now the last set of independent variables (i.e. the foreign exchange rate weights USA, UK and Japan.) in export and import model, except the UK weight rest all of the coefficients are insignificant (at 10% significance level.). That is, Canadian stock saw a fall of *0.21* percent (in import model.). Though Japanese currency weight in export model was the only weight variable with a negligible positive impact on the indices, even though the model cannot explain this relationship. The rest of the

independent variables and the constant of the model as well are insignificant.

Though when analyzing the model with foreign exchange import weights it is quite interesting to see, most of our coefficients of independent variables and constant are significant and the R^2 value of this model is higher *(0.4027)* when compared to the foreign exchange export weights model *(0.3788)*. Stock market indices rose by *3.88* and *2.08* percent when Canadian dollar was strengthening against GBP and YEN, ensuing 10 years (1989). When comparing the foreign exchange import weights of USA, UK and Japan; only UK weight had a significant impact on the stock indices (at 10 percent significance level.), where the indices fell by *0.2138* percent, rest had a negative impact that cannot be explained by this model.

From the estimation results, we can conclude, foreign exchange export weight model cannot explain any existence of a relationship in between changes in tariffs and stock market indices. Though in import weight model, we did see a negative relationship in between tariff changes and stock indices. Foreign exchange tariff import weights for the trading partners also had a negative impact on the stock indices. We can interpret the foreign exchange weight variable, as we see a positive impact when CAD is strengthening, then it must be the ratio of import value from a trading partner over import value from world bringing a negative effect, at sector level. This scenario can only exist when imports from the world are rising at a faster rate than from the specific trading partner.

FE Estimate:

The first difference FE specification is also called the random trend model. Here we are not only controlling for time-invariant sector specific effects, but also trying to control for within sector specific trends.

$$\Delta\left(\check{y}_{i,t}^{1}\right) = \beta^{1}\,\Delta\left(\check{\Gamma}_{i,t}^{w}\right) + \sum_{j=1}^{3} \beta_{j}^{2}\,\Delta(\check{\mathrm{F}}_{i,j,t}^{1}) + \sum_{j=1}^{3} \beta_{j}^{3}\,\Delta(\Phi_{i,j,t}^{export}) + \alpha_{i}^{1} + \mathcal{E}_{i,t}^{1} \qquad (\mathbf{8})$$

$$\Delta\left(\check{y}_{i,t}^{2}\right) = \mu^{1}\,\Delta\left(\check{\Gamma}_{i,t}^{w}\right) + \sum_{j=1}^{3} \mu_{j}^{2}\,\Delta(\check{\mathrm{F}}_{i,j,t}^{2}) + \sum_{j=1}^{3} \mu_{j}^{3}\,\Delta(\Phi_{i,j,t}^{import}) + \alpha_{i}^{2} + \mathcal{E}_{i,t}^{2} \qquad (\mathbf{9})$$

In the FE regression estimate, both of our models (i.e. Foreign exchange export and import weights) follows the same pattern as estimation tests mentioned above, a negative relationship between tariff changes and stock indices. Stock indices on average at sector level fell by *0.10* and *0.11* percent respectively and both of the coefficients are significant.

This can be interpreted as the importance of these years (1989, 1993 and 1995), due the last round of average tariff cuts, sectors where still adjusting to the new shock and going through further rationalization within sectors. This could be very well related to the negative impact of tariff changes on stock indices. Though over time, the sectors have reacted to the tariff changes (which now are at zero.) and have reached a stable state, this result in a more competitive sector leaving a positive impact on the indices.

Export and import weight model, all the foreign exchange weights for the trading partners even though are insignificant. One can see negative impact in both of then USA foreign exchange weight on the stock indices (i.e. *0.13* and *0.11* percent respectively.). Then we see a positive and negative impact of UK and Japan weights on the stock indices, for both of our models. Even though the model cannot explain a significant relationship in between them and stock indices, one can think maybe these sectors where inefficient when compared to the counter-parts in USA. This on average saw a fall in the stock indices at sector level, but during these changes, Canadian sectors could have become more efficient players when compared to their counterparts in UK and Japan for the export weight model. One of the major reasons for this I believe is in the weakening of the Canadian dollar ensuing 10 years rather than strengthening against the trading partners. [9]

One can rationally analyze why rise in import could have a negative impact, but it seems bit dubious to have a negative impact on stock indices in export model. This could very well be attributed to the traditional trade theory, where it states with the rise in trade competition, it will result in inefficient players leaving the market or bought out by the efficient players. This could very well be seen as rationalization of efficient players in the sectors. Due to the protectionism policies of

[9] Graphical representation is in the Appendix I, *Graph 4.*

government of Canada up to the Canada- USA FTA, one can interpret on average Canadian sectors had higher number of inefficient players. The rationalization of sectors saw most of these publicly listed companies exit the market or got bought out by efficient players. Resulting in an average fall of stock indices at sector level, ensuing 10 years. As macro economic theory states, with strengthening of home currency, imports become comparatively cheaper giving rise to imports from trading partners.

4.2 Simple Average Ad Valorem Tariff:[10]

4.2.a Natural Log, Fixed Effect (FE) Estimate:

In this section, we replicate all of the models mentioned above, but this time replacing them with Simple Average Tariff variable instead of using Weighted Average tariff.

Our test model equations become:

$$\mathrm{Ln}\left(y_{i,t}^{1}\right) = \beta^{1}\ln(\Gamma_{i,t}^{s}) + \sum_{j=1}^{3}\beta_{j}^{2}\ln(\mathrm{F}_{i,j,t}^{1}) + \sum_{j=1}^{3}\beta_{j}^{3}\,ln(\Phi_{i,j,t}^{export}) + \alpha_{i}^{1} + \mathcal{E}_{i,t}^{1} \qquad (\mathbf{12})$$

$$\mathrm{Ln}\,(y_{i,t}^{2}) = \mu^{1}\ln\,(\Gamma_{i,t}^{s}) + \sum_{j=1}^{3}\mu_{j}^{2}\ln(\mathrm{F}_{i,j,t}^{2}) + \sum_{\square=1}^{3}\mu_{j}^{3}\,ln(\Phi_{i,j,t}^{import}) + \alpha_{i}^{2} + \mathcal{E}_{i,t}^{2} \qquad (\mathbf{13})$$

Where,

$y_{i,t}^{1,2}$ *–Annual average stock index (S&P/TSX) at sector level.*

$\Gamma_{i,t}^{s}$ *–Tariff changes in Canadian Imports, with respect to US (Simple Average.).*

$\mathrm{F}_{i,j,t}^{1,2}$ *–Average annual foreign currency exchange (FX) (converting USD/GBP/YEN to CAD.*

$\Phi_{i,j,t}^{export,import}$ *–Foreign exchange export/import trade weights (j=1,2,3. I.e. USA UK and Japan.)*

$\alpha_{i}^{1,2}$ *-(i=1....n) is the unknown intercept for each sector (n sector-specific intercepts.)*

$\mathcal{E}_{i,t}^{1,2}$ *–Respective Error Term.*

It is quite interesting to see the replicating FE estimation results. One can clearly say even with the new set of data on change in tariff variable, still trade

[10] Results for the Simple average Ad Valorem Tariffs is represented in Appendix II, *Table 2*

competition in exporting and importing industry had no impact on the Canadian stock indices, from the estimation result and also, none of the independent variables are significant.[11] Though we still see changes in tariffs had a negative impact on the stock indices that is the indices fell by *0.065* and *0.074* percent respectively.

When comparing the foreign exchange export and import weights of USA, we see the coefficients have a negative and positive impact on the indices by *0.489* and *0.085* percent respectively. On contrary to the USA foreign exchange weights, UK had a negligible positive and negative impact, by *0.01* and *0.056* percent respectively. And Japanese weights had a negative relationship with stock indices (i.e. *0.34* and *0.03* percent respectively.).

Hence we can conclude, none of the foreign exchange weight's models can explain if there exists a relationship in between trade competition and capital markets as well. The interesting point is that our results with SAVG tariff are very similar to the WAVG tariff. When compared with each other, both of them exhibit same relationship with stock indices and their coefficient values are also approximately equal to each other.

4.2.b First Difference, Linear Regression (OLS) and FE estimate:

Since we are replicating our models from above, the theory and the concept remains the same here as well. Now we apply the same steps as before, but to the *equations 12 and 13*.

Linear Regression (OLS):

Now we use the first difference of our dependent variable and apply linear regression against the first difference of our independent variable. Here our estimations (β) will show the direct unit change impact of independent variables will have on the dependent variable (i.e. the stock market indices.)

$$\Delta\left(\check{y}_{i,t}^{1}\right) = \alpha_{i,t}^{1} + \beta^{1}\,\Delta\left(\check{I}_{i,t}^{s}\right) + \sum_{j=1}^{3}\beta_{j}^{2}\,\Delta(\check{\mathrm{F}}_{i,j,t}^{1}) + \sum_{j=1}^{3}\beta_{j}^{3}\,\Delta(\Phi_{i,j,t}^{export}) + \mathcal{E}_{i,t}^{1} \qquad (\mathbf{14})$$

[11] Going forward Significance level is at 5 percent, unless otherwise stated.

$$\Delta(\check{y}_{i,t}^{2}) = \alpha_{i,t}^{2} + \beta^{1}\,\Delta(\check{r}_{i,\square}^{s}) + \sum_{j=1}^{3} \beta_{j}^{2}\,\Delta(\check{\mathrm{F}}_{i,j,t}^{1}) + \sum_{j=1}^{3} \beta_{j}^{3}\,\Delta(\Phi_{i,j,t}^{export}) + \mathcal{E}_{i,t}^{2} \qquad (\mathbf{15})$$

Where,

$\alpha_{i,t}^{1,2}$ *–Are respective constants for two models that contain (export and import weights.)*

$\mathcal{E}_{i,t}^{1,2}$ *–Are respective OLS error terms.*

The rest of the variables are same as before.

In linear regression estimation of export and import model, one can presume changes in SAVG tariff had a negative impact on the stock indices by *0.136* and *0.148* percent respectively. These coefficients are also significant.

It is interesting to note that the rest of the independent variables are insignificant in export model. Though when analyzing the model with foreign exchange import weights it is quite interesting to see, most of our coefficients of independent variables are significant in this case and the R^2 value of this model is higher *(0.4055)* when compared to the foreign exchange export weights model *(0.3860)*.

When the currency of trading partners was strengthening as compared to the home currency (i.e. CAD.), we see that with stronger USD brought down the stock indices by *4.46* percent, with a stronger GBP indices rose by *1.38* percent. Lastly, a stronger YEN had a negligible impact that is a fall in indices by *0.066* percent. Though these coefficients are insignificant. Now when comparing these currency rates other way around, that is when the home currency is appreciating when compared to the trading partners. We find a stronger CAD in comparison to USD, GBP and YEN; the indices on average dropped by *0.71*, though they rose by *4.01* and *2.15* percent respectively. In the import model, all of the currency rates were significant, except when converting CAD to USD.

Moving forward and comparing the foreign exchange export and import weights of USA, UK and Japan. In both of the models, USA and Japanese weights were insignificant. Though the indices fell by *0.12* and *0.14* percent for USA weights; and indices had a positive and negative impact for the Japanese weights. That is the index rose by a negligible 0.081 and fell by *0.061* percent respectively. Only the import foreign exchange weight of UK had a significant impact on the stock indices (at 10 percent significance level.), they fell by *0.212* percent; rest had a negative

impact that cannot be explained by this model.

From the estimation results, we can conclude, our results with the new Simple average tariffs, foreign exchange export/import weight model cannot explain any existence of a relationship in between changes in tariffs and stock market indices. Though in import's model, we did see a negative relationship in between tariff changes and stock indices. Interestingly enough though, the results in this section are very similar to the ones found with WAVG tariff's. The only difference is that the magnitude of the significant coefficients is higher than the ones found in WAVG tariffs.

FE Estimate:

Now we apply the FE estimate to our first differenced variables.

$$\Delta(\check{y}_{i,t}^{1}) = \beta^{1}\,\Delta(\check{I}_{i,t}^{s}) + \sum_{j=1}^{3}\beta_{j}^{2}\,\Delta(\check{\mathrm{F}}_{i,j,t}^{1}) + \sum_{j=1}^{3}\beta_{j}^{3}\,\Delta(\Phi_{i,j,t}^{export}) + \alpha_{i}^{1} + \mathcal{E}_{i,t}^{1} \qquad (\mathbf{16})$$

$$\Delta(\check{y}_{i,t}^{2}) = \mu^{1}\,\Delta(\check{I}_{i,t}^{s}) + \sum_{j=1}^{3}\mu_{j}^{2}\,\Delta(\check{\mathrm{F}}_{i,j,t}^{2}) + \sum_{j=1}^{3}\mu_{j}^{3}\,\Delta(\Phi_{i,j,t}^{import}) + \square_{i}^{2} + \mathcal{E}_{i,t}^{2} \qquad (\mathbf{17})$$

In the FE regression estimate, both of our models (i.e. foreign exchange export and import weights) show a negative relationship between SAVG tariff changes and stock indices. Stock indices on average at sector level fall by *0.14* and *0.15* respectively and significant.

In export and import models, the foreign exchange weights even though are insignificant for both USA and UK but, USA weight had a negative impact on the indices that is; indices fell by a negligible *0.083* and *0.182* percent respectively. Where as UK foreign exchange export weight had a negligible though positive relationship with indices and the indices fell by *0.217* percent for the import weight. Even though the model cannot explain a relationship in between them and stock indices, but the foreign exchange export weight of Japan had a positive impact and Canadian indices rose by *0.12* percent and its coefficient is significant at 10 percent level.

Yet again, if we compare the magnitude of coefficients to the ones from WAVG model, we will find that SAVG tariffs again have higher coefficient value than the WAVG modeling estimates.

5. Discussion:

Empirical analysis done by Parinduri and Thangavelu (2012) on the effect capital markets in Singapore due to FTA with USA, found an over all positive impact on the firms value. Though they were was unable to explain the relationship in certain sectors, due to the fact that some industry gains might have cancelled out by the losses of others.

Breinlich (2014) found in his empirical study, Canadian exporters had increased competition in USA post FTA making harder to sell in USA. This in turn brought down the profits for these exporting firms. His empirical analysis also highlighted, due to the trade liberalization larger firms had a positive impact on their market values.

After considerable qualitative and quantitative comparison of this paper with the two studies mentioned above, we can confer that the foreign exchange export and import weights did not had any significant impact on the stock indices, at sector level. Though contrary to the theory mentioned in previous sections (i.e. trade liberalization increases the capital inflow, resulting in higher stock values of publicly listed firms.) of this paper; Canadian Stock market indices fell by an average of *0.112* percent if we consider the weighted average model and it fell by an average of *0.142* in the case of simple average.[12]

Another key point regarding the methodology applied in this paper is the use of linear panel trade model in comparison to the widely used 'event study analysis'. I personally have not been able to find an empirical study related to this research theme, where linear panel trade models have been applied. The results obtained form this empirical study are to an extent are robust and similar to the 'event study analysis', implying linear panel trade models could also be used as an alternative method for the analyzing the effects of trade competition on the capital markets.

[12] Average effect of tariffs on Stock Indices, for FE estimation=
(export model tariff coefficient + import model tariff coefficient)/2

6. Conclusion:

From the common knowledge of economic theory and financial markets, one could tend to agree to efficiency gains would result in some kind of positive monetary gains. Through increased trade we see increase in innovation and knowledge spillovers, this in turn improves the productivity in an economy and also stimulates domestic economic growth. This will have a direct positive impact on the value of firms due to the increase in total productivity of a country (Grossman and Helpman, 1992.). Similar results have also been found by Bernard, Redding and Schott (2006); where they examined firms behavior during trade liberalization and found productivity gains in both within and across firms through trade liberalization. My goal in this paper was to investigate if there exist a relationship in between International trade competition and the capital markets.

From means that were available to me and from the results discussed above, we can say that Simple average Tariffs had the most robust results.[13] Ensuing 10-year period from 1989, with trade liberalization, Canadian S&P/TSX index on average rose by *0.142* percent at the give sector level (as stated in linear OLS model). Similarly we saw S&P/TSX rose by an average of *0.22* percent (in Fixed Estimate Model).

After looking at the historical S&P/TSX index data[14], one could very well ask if the stock market on average had an upward trend for the period of this study, then why do empirics suggest a negligible upward trend in the stock market indices for the chosen sectors. One of the reasons could be attributed to the fact that, even though these sectors were gaining efficiency and absorbing the inefficient players, leaving existent efficient players with higher market share. This will result in rise of the value of large firms; if majority of the firms in these sectors were medium or small sized then we would not see significant impact on the stock indices. It tends to be the case specially in Canadian economy, majority of the exporting or importing business are of small or medium size and these tend to not be publically traded

[13] when comparing the R^2- *within* value for Weighted Average and Simple Average modeling.
[14] Graphical representation of the Historical Stock Index data is presented in *Appendix I, graph 2*

firms. For future research it will be interesting to incorporate some other factors affecting these large sized firms, due to which we see a small negative effect on the stock market.

To conclude, I think it will be interesting to broaden this study and try to evaluate the positive relationship between international trade competition and capital markets in the case of Canadian- USA FTA in depth, by looking at the firm size, employment level within the sectors and maybe even expand the sector (specially add service and financial sectors.) As I firmly believe this negligible positve impact on the S&P/TSX is part of the broader trade liberalization and structural changes within the sectors.

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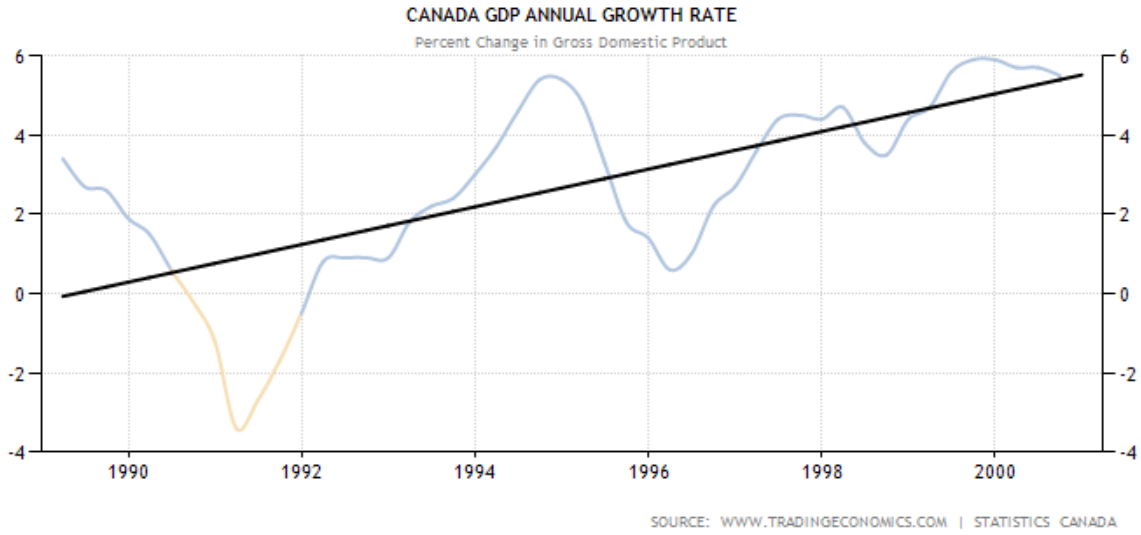
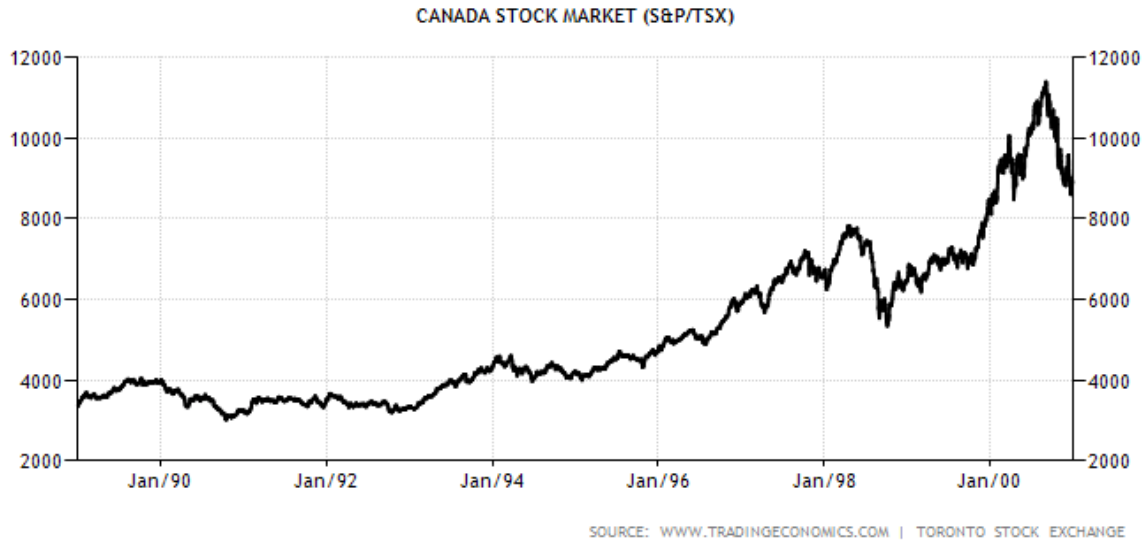
Appendix I

GRAPHS:

1: Canadian Annual GDP growth rate (1989-2000)

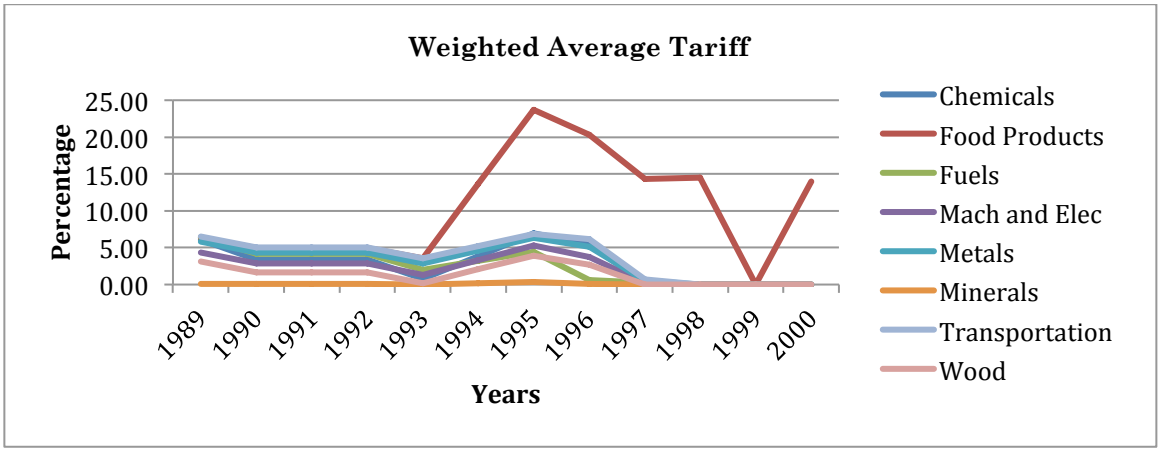


2: Canadian Stock Market Index (S&P/TSX, 1989-2000)

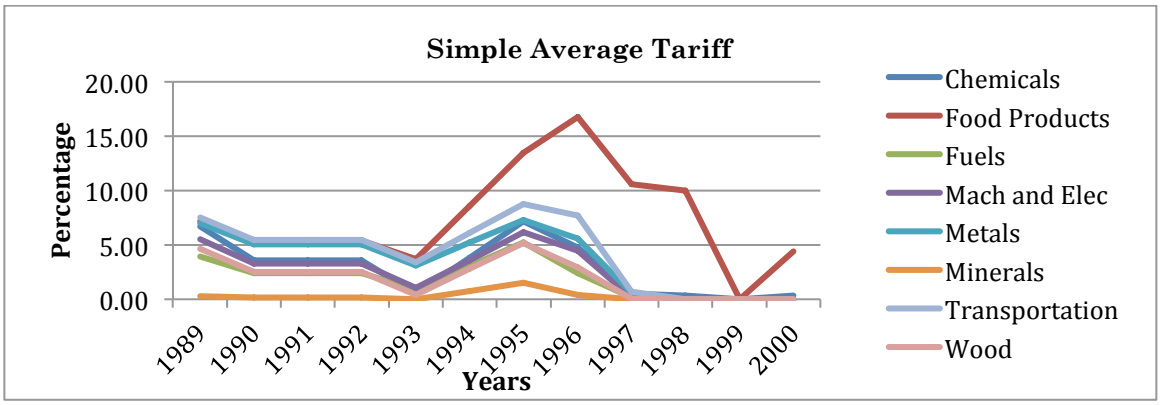


3: Post 1989 Tariff Changes in Canada, with respect to USA.

a.)

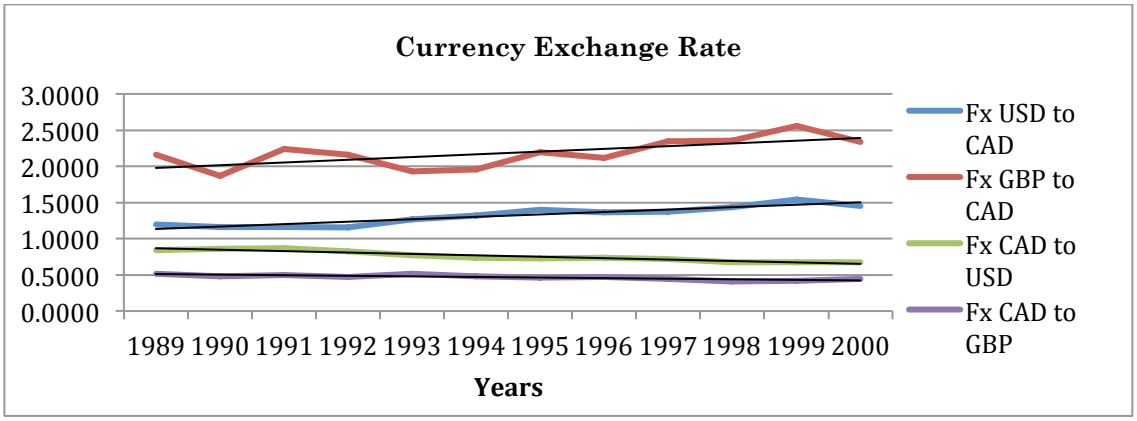


b.)

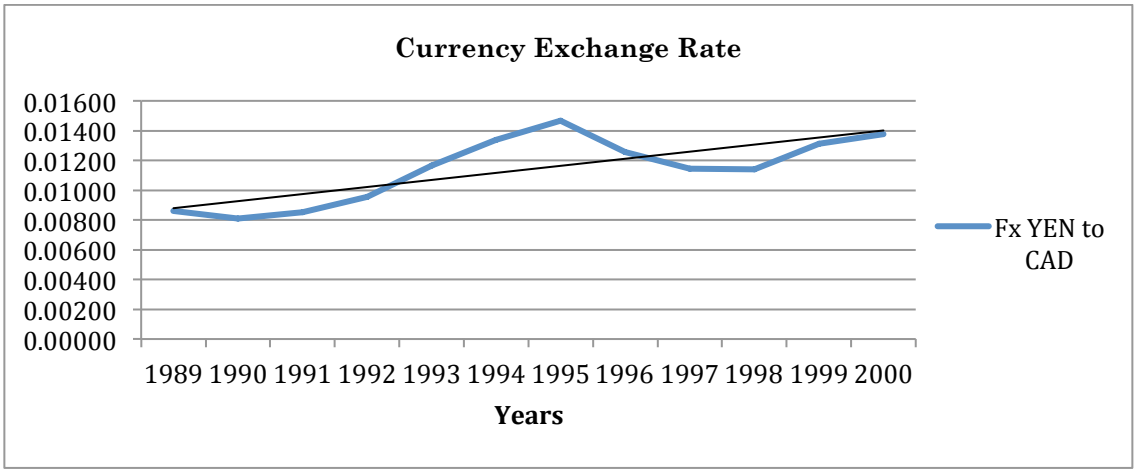


Graph 4: Foreign Currency Exchange rates with trend line's:

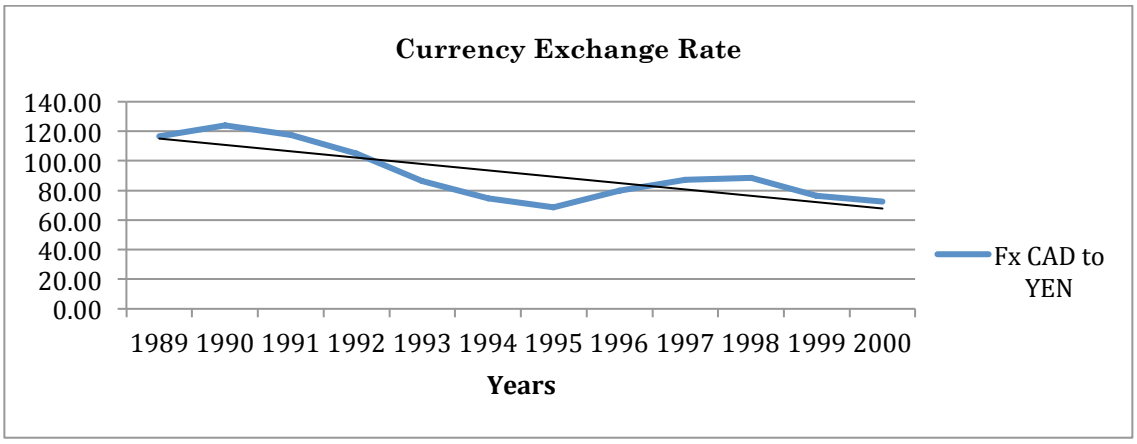
a.)



b.)

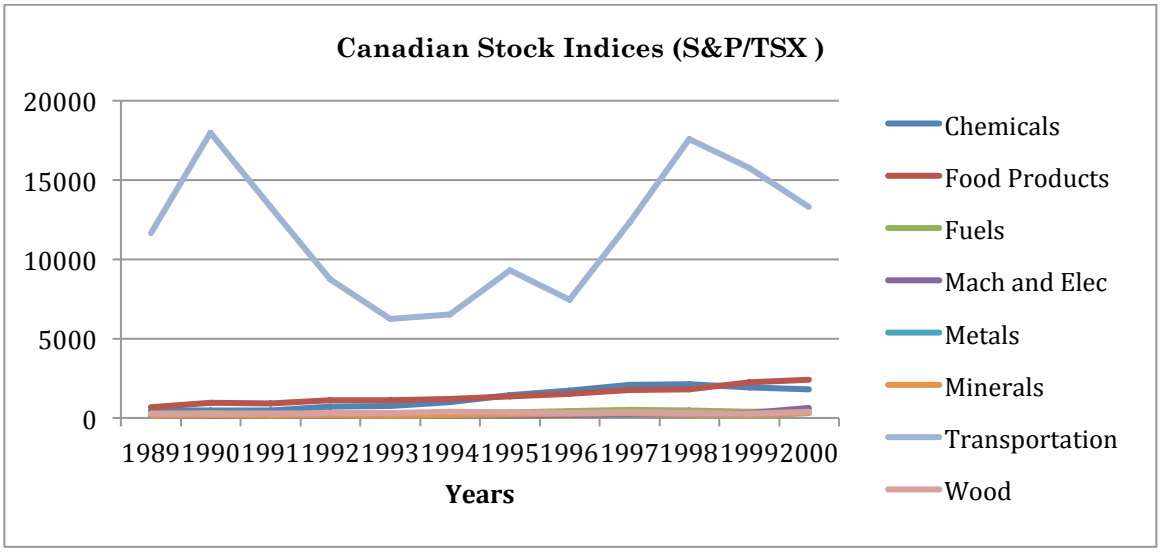


c.)

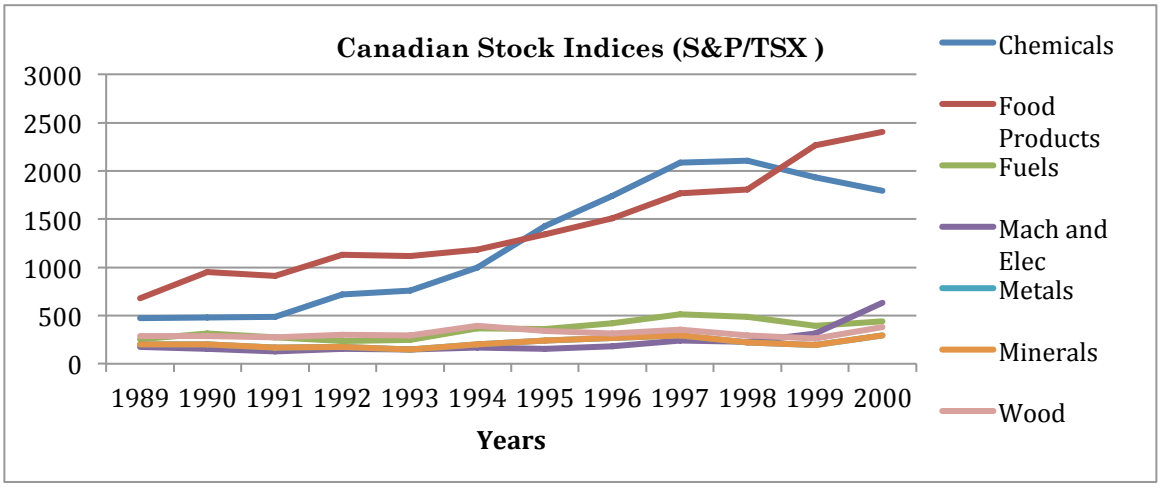


5: Canadian Stock Indices at Sector Level, (Toronto Stock Index)

a.) All 8 sectors.



b.) Without Transportation sector.



Appendix II

Tables:

1: Weighted Average Tariff Models.

	FX Export Weight Model			**FX Import Weight Model**		
Estimation Method.	Log, Fixed Effect	1st Diff. Linear OLS	**1st Diff. Fixed Effect**	Log, Fixed Effect	1st Diff. Linear OLS	**1st Diff. Fixed Effect**
Estimate Equation	*(2)*	*(6)*	***(8)***	*(3)*	*(7)*	***(9)***
Variables	**Coefficient's Value *(p-values)***					
Tariffs	-.0353013 *(0.589)*	-.0979497 *(0.000)*	**-0.1067725 *(0.004)***	-.0786742 *(0.305)*	-.1127058 *(0.000)*	**-0.1180165 *(0.008)***
FX USD-CAD	0 (omitted)	-3.851572 *(0.300)*	**0 (omitted)**	0 (omitted)	-.5770844 *(0.676)*	**0 (omitted)**
FX GBP-CAD	0 (omitted)	.9706834 *(0.717)*	**0 (omitted)**	0 (omitted)	3.884296 *(0.007)*	**0 (omitted)**
FX YEN-CAD	0 (omitted)	.096674 *(0.945)*	**0 (omitted)**	0 (omitted)	2.08479 *(0.015)*	**0 (omitted)**
FX Weight USA	-.5378855 *(0.316)*	-.1149262 *(0.672)*	**-0.066706 *(0.780)***	.1278968 *(0.785)*	-.0942541 *(0.550)*	**-0.1318459 *(0.649)***
FX Weight UK	.0055465 *(0.910)*	-.0003052 *(0.988)*	**0.0012672 *(0.961)***	-.0611801 *(0.802)*	-.2138743 *(0.056)*	**-0.2185187 *(0.224)***
FX Weight Japan	-.3372151 *(0.338)*	.0818666 *(0.503)*	**0.1193714 *(0.114)***	-.0387865 *(0.622)*	-.0643787 *(0.130)*	**-0.0557568 *(0.175)***
R^2		0.3788			0.4027	
R^2-within	0.5643		**0.4059**	0.5315		**0.4251**
sigma_u	1.2372972		**0.05228801**	1.4171378		**0.04908041**
sigma_e	0.26039787		**0.18514187**	0.27003247		**0.18211509**
rho	0.95758644		**0.07386982**	0.96496366		**0.0677133**

2: Simple Average Tariff Models:

	FX Export Weight Model			**FX Import Weight Model**		
Estimation Method.	Log, Fixed Effect	1st Diff. Linear OLS	**1st Diff. Fixed Effect**	Log, Fixed Effect	1st Diff. Linear OLS	**1st Diff. Fixed Effect**
Estimate Equation	*(12)*	*(14)*	***(16)***	*(13)*	*(15)*	***(17)***
Variables	**Coefficient's Value *(p-values)***					
Tariffs	-0.0651752 *(0.489)*	-0.1364127 *(0.000)*	**-.01477232 *(0.009)***	-0.0742339 *(0.443)*	-0.1481538 *(0.000)*	**-0.1545097 *(0.012)***
FX USD-CAD	0 (omitted)	-4.467354 *(0.236)*	**0 (omitted)**	0 (omitted)	-.7194749 *(0.604)*	**0 (omitted)**
FX GBP-CAD	0 (omitted)	1.389884 *(0.612)*	**0 (omitted)**	0 (omitted)	4.015322 *(0.004)*	**0 (omitted)**
FX YEN-CAD	0 (omitted)	-.0666487 *(0.963)*	**0 (omitted)**	0 (omitted)	2.154279 *(0.012)*	**0 (omitted)**
FX Weight USA	-0.4897992 *(0.381)*	-0.1219791 *(0.652)*	**-0.0837285 *(0.729)***	0.0854152 *(0.860)*	-0.1485119 *(0.346)*	**-0.1824275 *(0.516)***
FX Weight UK	0.010624 *(0.834)*	0.0081258 *(0.692)*	**0.0099342 *(0.701)***	-0.0563941 (0.821)	-0.212439 *(0.057)*	**-0.2171251 *(0.213)***
FX Weight Japan	-.03492904 *(0.321)*	0.0813461 *(0.494)*	**0.1234893 *(0.077)***	-0.0311145 *(0.691)*	-0.0619177 *(0.119)*	**-0.054995 *(0.106)***
R^2		0.3860			0.4055	
R^2-within	0.5662		**0.4139**	0.5277		**0.4275**
sigma_u	1.2332786		**0.05264242**	1.4121762		**0.04875932**
sigma_e	0.25984896		**0.1838851**	0.2711225		**0.018173505**
rho	0.9574934		**0.0757476**	0.964450		**0.06715054**

Appendix III

Stata12, Estimation Model Regression Coding:

```
xtset induscode years

g y=canadiandatastreamsectorindices
g dy=D.y
g lny=ln(y)
g dlny=D.lny

g lntar_w=ln(tar_w+1)
g dlntar_w=D.lntar_w

g lntar_s=ln(tar_s+1)
g dlntar_s=D.lntar_s

g lnusd_cad=ln(cad)
g dlnusd_cad=D.lnusd_cad

g lngbp_cad=ln(var8)
g dlngbp_cad=D.lngbp_cad

g lnyen_cad=ln(var9)
g dlnyen_cad=D.lnyen_cad

g lncad_usd=ln(var10)
g dlncad_usd=D.lncad_usd

g lncad_gbp=ln(var11)
g dlncad_gbp=D.lncad_gbp

g lncad_yen=ln(var12)
g dlncad_yen=D.lncad_yen

g lnexpw_usd=ln(expw_usd)
g dlnexpw_usd=D.lnexpw_usd

g lnexpw_gbp= ln(expw_gbp)
g dlnexpw_gbp=D.lnexpw_gbp

g lnexpw_yen= ln(expw_yen)
g dlnexpw_yen=D.lnexpw_yen

g lnimpw_usd= ln(impw_usd)
g dlnimpw_usd= D.lnimpw_usd


g lnimpw_gbp= ln(impw_gbp)
g dlnimpw_gbp= D.lnimpw_gbp


g lnimpw_yen= ln(impw_yen)
g dlnimpw_yen= D.lnimpw_yen


**************************** Weight Avg. TARIFFS ******************************
***** Natural Log, Fixed Effect.
```

```
                    ** Export Weight
xtreg lny lntar_w lnusd_cad lngbp_cad lnyen_cad lnexpw_usd lnexpw_gbp
lnexpw_yen  i.years, fe vce(r)
estimates store exp_lnw_avg_fe

                    ** Import Weight
xtreg lny lntar_w lncad_usd lncad_gbp lncad_yen lnimpw_usd lnimpw_gbp
lnimpw_yen i.years, fe vce(r)
estimates store imp_lnw_avg_fe



******* 1st Difference Linear Regression.

                    ** Export Weight
reg dlny dlntar_w dlnusd_cad dlngbp_cad dlnyen_cad dlnexpw_usd dlnexpw_gbp
dlnexpw_yen i.years, vce(r)
estimates store exp_dlnw_avg_reg

                    ** Import Weight
reg dlny dlntar_w dlncad_usd dlncad_gbp dlncad_yen dlnimpw_usd dlnimpw_gbp
dlnimpw_yen i.years, vce(r)
estimates store imp_dlnw_avg_reg


*******1st difference FE.

                    ** Export Weight
xtreg dlny dlntar_w dlnusd_cad dlngbp_cad dlnyen_cad dlnexpw_usd dlnexpw_gbp
dlnexpw_yen  i.years, fe vce(r)
estimates store exp_dlnw_avg_fe

                    ** Import Weight
xtreg dlny dlntar_w dlncad_usd dlncad_gbp dlncad_yen dlnimpw_usd dlnimpw_gbp
dlnimpw_yen i.years, fe vce(r)
estimates store imp_dlnw_avg_fe




**************************** Simple Avg. TARIFFS ****************************
***** Natural Log, Fixed Effect.

                    ** Export Weight
xtreg lny lntar_s lnusd_cad lngbp_cad lnyen_cad lnexpw_usd lnexpw_gbp
lnexpw_yen  i.years, fe vce(r)
estimates store exp_lns_avg_fe

                    ** Import Weight
xtreg lny lntar_s lncad_usd lncad_gbp lncad_yen lnimpw_usd lnimpw_gbp
lnimpw_yen i.years, fe vce(r)
estimates store imp_lns_avg_fe



******* 1st Difference Linear Regression.

                    ** Export Weight
reg dlny dlntar_s dlnusd_cad dlngbp_cad dlnyen_cad dlnexpw_usd dlnexpw_gbp
dlnexpw_yen i.years, vce(r)
```

```
estimates store exp_dlnw_avg_reg

                    ** Import Weight
reg dlny dlntar_s dlncad_usd dlncad_gbp dlncad_yen dlnimpw_usd dlnimpw_gbp
dlnimpw_yen i.years, vce(r)
estimates store imp_dlns_avg_reg



*******1st difference FE.

                    ** Export Weight
xtreg dlny dlntar_s dlnusd_cad dlngbp_cad dlnyen_cad dlnexpw_usd dlnexpw_gbp
dlnexpw_yen  i.years, fe vce(r)
estimates store exp_dlns_avg_fe

                    ** Import Weight
xtreg dlny dlntar_s dlncad_usd dlncad_gbp dlncad_yen dlnimpw_usd dlnimpw_gbp
dlnimpw_yen i.years, fe vce(r)
estimates store imp_dlns_avg_fe
```