Deal Breaker: How Tariff Barriers Affect Cross-Border Mergers And Acquisitions

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April 6, 2018

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Abstract

This study examines the effects of tariff barriers on cross-border Mergers and Acquisition (M&A) investment and shows how tariffs impact M&A deal value. Since the 1990s, we saw a decline in tariff rates for most nations coinciding with a sharp rise in cross-border M&A. The rise in cross-border M&A has significant implications on various issues from antitrust to foreign direct investment. To analyze the effect of tariff barriers, I use a panel dataset primarily obtained from Bloomberg and UNCTAD. I employ a gravity model to allow for distance and macroeconomic effects along with a poisson distribution based on the counting nature of the dataset. Based on the data given, there is a statistically significant positive correlation between M&A activity and tariff rates for both acquirer and target countries, indicating that a firms motive for cross-border M&A is mainly a market-entry strategy.

Contents

Introduction

Mergers and Acquisitions have been increasingly prevalent since the 1990s from the multi-billion-dollar merger of Time Warner and AOL to Rosnefts acquisition of Essar Oil. As seen with Figure 3, global M&A transactions reached over $2.16 trillion for 2015, a seven-year high since the global financial crisis (Bloomberg, 2018). There are various reasons that firms choose to acquire their international counterparts, but this rise is largely due to the global factors that have changed the world for the last 30 years. With the retreat of state-oriented policies and markets, foreign direct investment increased as firms sought an advantage over their competitors with either lower costs or new sources of revenue overseas (World Bank, 2018). Yet outside of business journals and investment banks annual M&A reports, there is little recent academic discussion as to how trade policy, with a focus on tariffs, would affect cross-border M&A.

Looking at cross-border M&A is important particularly if policymakers are researching foreign direct investment (FDI). Historically, FDI has been positively correlated with increases in economic growth though there is significant debate among certain people about the full benefits and drawbacks behind foreign direct investment (Fruman, 2016 & Mukherjee, 2012). While this paper is not going to touch on the welfare gains or losses behind FDI, this paper seeks to determine to what extent tariffs from both the target and acquiring countries affect cross-border M&A deal flow. This research will follow some of the economic research done in FDI, with special importance to Giovanni (2005) who determined how M&A is affected by macroeconomic factors such as the target nations financial market size determined by market capitalization to GDP. This paper seeks to expand the economic literature by determining to what effect does a countrys trade policy impede or promote foreign direct investment with the main focus on cross-border M&A.

This study uses the gravity model framework to discover the trade determinants in cross-border M&A flows. This empirical framework has been commonly used in the trade literature and in international finance literature such as Giovanni (2005). Cross-border

M&A data are typically found within finance databases which I built using Bloombergs M&A dataset that covers the period 2000-2015 with reasonable accuracy. According to the data set used in this study, the value of deals announced increased up to 2007 where the financial crisis decreased cross-border deal flows and the market has not since surpassed its 2007 peak. One can see in the dataset that the growth in announced M&A deals has not been limited just to developed country-pairs. They have also proliferated between nations in the OECD but as seen in the table below, M&A deal flow has increased outside of the OECD where approximately 75% of deals involving at least one country in the developing world [1].

I estimate the importance of several macroeconomic, financial and institutional variables in explaining these cross-border M&A investments. The main hypothesis I test in this paper is whether tariff reduction in the country is negatively correlated with cross-border M&As for both target and acquiring countries. To this end, I look primarily at both nations involved in the M&A transaction and how their tariff rate impedes (or encourages) M&A investment. It is not immediately apparent that this effect should be economically significant for M&A activity, once other variables that may affect FDI are considered. Therefore, I control for the importance of economic size, WTO admission, distance, trade agreements, and financial development.

My hypothesis is that tariffs will have a statistically significant and negative correlation, for both target and acquiring countries, on tariff barriers with M&A investment. The reasoning is based on my preliminary analysis of the data which showed a significant negative correlation between tariffs and M&A investment. Yet when the regression was run, it appears that the hypothesis is challenged for both target and acquiring countries where the correlation was positive and significant. This is likely because corporations use M&A as a method to enter a market without paying for the tariff on their exports. This presents a significant deviation from the literature as no economist suggests that M&A ac-

[1]The OECD variable does include Brazil, China, India, Russia and South Africa given their unique place in the investment world.

tivity will increase from the acquiring country if tariffs from said country increase.

Section 2 discusses some of the key issues that will be considered and describes some of the underlying economic literature. Section 3 describes the data and presents the econometric methodology. Section 4 contains the empirical results and descriptive statistics. Finally, Section 5 summarizes and concludes the study.

Literature Review

Terminology

A merger and acquisition (M&A) is a situation in which at least two corporations join at least part or all their operations. The main purpose of M&A is to create value for their shareholders of the parent companies from the deal, ideally for all investors in both companies, making the company worth more than before the M&A (Coyle, 2000). The higher value would result from higher cost-efficiency, improved competitiveness and a higher market share achieved through synergies and management expertise.

A cross-border merger and acquisition involves a firm in a home country, defined to as the acquiring country in this paper, acquires or merges with a firm in a foreign country (the target country). This activity is also counted by the United Nations Conference on Trade and Development as brownfield foreign direct investment since a firm is investing in an existing firm instead of developing new operations within a foreign country (UNCTAD, 2000). There are various types of brownfield investment, ranging from a joint-venture creation to a partial buy-out of another firm. However, for the sake of this paper, only full acquisitions and mergers will be considered. Since 1990, M&A has grown considerably as firms acquire outside competitors as part of their global strategy in turn increasing brownfield foreign direct investment (Bloomberg, 2017).

Literature Review

There is little research that seems to look at the empirical link between tariffs and cross-border M&A yet the academic literature does a strong job in researching foreign direct investment and its determinants. Corporations merge or acquire for various reasons whether it is within a country or across borders. Before 2000, few studies previously looked at why firms merge with their international counterparts since it was hypothesized that mergers happen if there would be abnormal economic benefits (Neary, 2002). Other studies, in this line of thinking, also hypothesize that firms merge or acquire their counterparts across the border to jump tariffs which Hijzen (2008) explains in his study. For some time, it was thought that cross-border M&A would not be profitable once trade became liberalized as firms could simply increase production and steal revenue away from the merging parties (Salant et al, 1983). As trade become liberalized, mergers would not generate any abnormal returns after a period instead increasing competition between the firms remaining (Salant et al, 1983). This idea is confirmed by Neary (2002) which looks at how firms compete in international trade and shows that competition does increase when an economy moves to free trade from autarky though it doesnt consider firms merging across borders.

Despite Nearys explanation as to how international trade affects competition, the paper does not look at the rise in cross border M&A starting in the 1990s. Economic thought in this issue somewhat changed with Horn and Persson (2001), who provided a theoretical model in which foreign firms purchase domestic firms as part of a corporate strategy. This idea had not been considered before in international trade. With this study, they acknowledge that only select firms, namely firms with a large market share, would pursue this strategy given its immense costs. The strategy would call into question whether there would be significant competition across borders. The reason that Horn and Persson found that international mergers became more attractive compared to national M&A is the decline in investment barriers allowing domestic firms to target their international counter-

parts. This was later explained by Bjorvatn (2004) who showed in a theoretical study that M&A across border can occur as economies integrate diminishing the transaction costs within a merger. The cost reduction can cause further consolidation and potentially higher profit thus extending Nearys original work.

Unfortunately, the studies mentioned above still do not explain why a firm would merge altogether over other strategies though there is significant literature done by business professors. One signature book about competitive strategy, whose lessons are used to justify mergers, is Michael Porters Competitive Strategy (1990) that considers market power through his famous five forces model though it does not explicitly mention M&A. Yet an earlier study found that M&A is used primarily for companies to directly enter foreign markets as well to protect their own domestic markets. These cross-border M&A deals are part of a corporate strategy that would either expand profits through market entry or to protect their market from a foreign competitor (Hitt et al, 1988).

The papers mentioned above refer to various investment barriers that can affect M&A activity yet their studies do not focus on specific barriers, such as tariffs, that can inhibit M&A. There are various barriers to trade from a tariff on goods to indirect barriers such as regulations and taxes. One study done by Karolyi and Taboada (2015) looked at cross-border and national M&A with banks between 1995-2012 and found that regulations can affect deal flow and the markets reaction. Their findings found that banks deliver a positive abnormal return to shareholders if they are acquiring a firm from a less regulated country. What is also seen as a barrier to trade, or to deal in this case, are business regulations. If regulations were made friendlier to mergers, the country in question can expect an increase in deal activity as was seen in Latin America during the late 1990s (Pablo, 2009).

Another important factor, and the main topic of this paper, is how M&A transactions are correlated to trade barriers. Trade barriers have many forms from a country establishing tariffs to import quotas. In a UNCTAD 2000 World Investment Report, they

stated that, Trade liberalization and regional integration efforts have added an impetus to cross-border M&As by setting the scene for more intense competition (UNCTAD, 2000). This is confirmed by Gorg, Hijzen, and Manchin (2008) where they looked at 23 OECD countries from 1990-2001 and analyzed their cross-border activity as well as their trade costs. In their study, they divide cross-border M&A between horizontal and vertical integration finding that trade costs negatively impact cross-border merger activity. Yet what is interesting is not this linkage but their discovery that horizontal mergers are impacted less by trade costs than vertical mergers (Gorg et al, 2008). This observation points to tariff jumping[2] as a reason for firms buying their foreign counterparts.

Lastly, one factor that is significant and has been researched considerably is the economic gravity between countries. Economic gravity has been analyzed as a factor showing why developed nations largely trade with other developed nations even when taking trade costs into consideration (Bergstrand, 1985). Yet this research was not fully implemented until recently where several studies looked at how the gravity model would impact cross-border M&A activity whether it is in the Pacific (Hur et al, 2011), or focusing on how institutions affect M&A volume (Hyun & Kim, 2009). However, economic gravity does not explain the disparity in M&A investment by itself but may indicate how a nation is developed in its ease of doing business. My main study by Giovanni (2005) looks at how a nations capital market development affects M&A investment and he discovered that the higher the nations development, the more likely they will receive significant M&A investment. This explains why a developing nation such as Angola, with a low financial development score, would receive less M&A investment than a nation with a higher score.

[2]Tariff Jumping is defined as a corporation merging with a foreign competitor primarily to avoid tariffs.

Methodology & Data

Data

Several data sources are used in constructing the panel. The cross-border M&A data is from an M&A database compiled by Bloomberg. The following categories are available for most deals in the world (see Appendix B for a list of countries in the sample) between January 1, 2000 and December 31, 2015: (i) announcement date, (ii) target and acquiring firms names, (iii) target and acquiring firms country of origin, (iv) target and acquiring firms industrial sector, (v) value of deal in US dollars, (vi) form of payment(s) used in deal, e.g., cash, stocks, etc., and (viii) target and acquiring firms currency. The database begins in 1985 and allegedly covers all deals since that period though the database manifests more accurate results from 2000 onwards, influencing the studys timeframe. The database counts each M&A transaction that involves at least a controlling ownership stake bought or sold with the firm in question. Bloombergs sources include news reports, stock market filings, law firms, and investment bank announcements.

There are two deficiencies with this specific dataset. The first significant deficiency of this data set is that, since firms do not have to announce the value of a deal, not all deals have values attached to them. Specifically, after cleaning the data, only 20% of deals have a target SITC code attached to them. This SITC code is important for merging the deals with their respective sectoral tariff rates for the gravity model. I could not detect any patterns of which industry sectors, countries or years have more missing values than others. Therefore, the number of deals with no values appears to be random given these criteria.

Another issue with the data is that it contains duplicated data within the target and acquiring country category. This duplicated data is to show firms that were involved in purchasing or targeting (i.e. A Swiss company and an American company purchasing an Indian multinational). While the data was largely scrubbed for unnecessary duplicated

data, some of the entries could not be cleaned further due to lack of further information. Fortunately, only around 2.32% of deals have this issue and as this issue appears to be randomly generated, these deals will have no value that will be generated being labeled as missing.

For the tariff data, I use data from the UNCTADs Import tariff rates, specifically the TRAINS database that contains comprehensive tariff data for over 200 countries and territories. The data goes back to 1984 though it must be noted that there is data missing particularly within developing countries and colonial entities. Given that some of these territories are merely distant dependencies of certain countries, and various countries are not listed in the M&A database, I reduced the comprehensive data to around 182 countries. It is important to note that the separated territories offer some additional insight namely pointing to a reason why firms merge. An example of this is a company headquartered in the Cayman Islands, a popular tax haven, is acquired by a U.K. company. While this is not a cross-border M&A deal as it technically is a deal within a country, this ambiguity is not rectified as it can point to an important cause in M&A as theorized by Karolyi and Taboada (2015).

One important caveat that must be addressed about the two main databases is that while each offers an industry sector category, the category follows different formats for each. Bloomberg uses the Standard Industrial Classification (SIC) while UNCTAD uses the Standard Industrial Trade Classification (SITC). There is no directory compiled from any association that allows a conversion from SITC to SIC. Using the definitions of each SIC and SITC sector, I developed a database that converts SITC industrial codes to SIC codes allowing me to merge my data. As seen in the Appendix 3, each SIC has an SITC value attached to it and as seen in the figure, there are some SIC industries that have the same SITC code. The method on sorting the SITC was to find industries whose definitions closely match with each trade industry sector . Using this database, I developed my compiled M&A tariff database with approximately 20,000 tariff entries for target countries and 40,000 tariff entries for acquiring countries.

Finally, a good portion of M&A deals are with firms in the service sector. As these industries would not be directly facing these tariffs, a proxy was used with the OECDs services trade restrictiveness Index. Started in 2014, this index categorizes OECD members restrictiveness on select service industries. While it covers most of service M&A deals, the recent start of this index hurts the ability to understand the change of restrictiveness from 2000 up to 2014. The 2014 data is therefore used as a proxy for this period to measure this restrictiveness.

Along with tariffs from the database, I will be using controls that measure a countrys friendliness to foreign investment and international trade. This is seen by the Frasier Institute index, which measures non-tariff barriers to trade, the countrys financial development, and whether the country pair has a free trade agreement in place between the two. I also use the two main variables for a gravity model: distance and economic size which is measured by GDP. I do expand on the distance variable through developing a common border variable to determine if a neighboring country obtain more M&A investment from the acquirer country than a non-neighboring country. Finally, I choose to use the WTO and OECD variables to determine the effect of a multinational trade organization and being a developed country has respectively on cross-border M&A. These control variables are generally what are used from other studies (see Giovanni 2005) though a few other variables are added given the papers focus on a countrys friendliness to foreign trade.

I will also use additional databases to obtain the data for the variables listed above from the International Monetary Fund, the Frasier Institute, Centre d'Etudes Prospectives et d'Informations Internationales (CEPII), and the Chin-Ito Index. These databases provide the control variables for the gravity model from GDP to financial development. For the GDPs database, I use the IMFs database, obtained through their 2017 World Economic Outlook. The database uses current US prices determining how economic growth affects M&A deal flow though I chained GDP using 2015 US prices. It is also beneficial as a significant portion of international trade is valued using US dollars and the deals value is also denominated in US dollars.

The distance variable, which is critical to build a gravity model, was found within CEPII. CEPII has an estimate of distance in kilometers for each country pair using the distance between the two countrys business centers. They also have access to the primary language spoken which is another key variable for the database. An additional database that was used to identify non-tariff barriers to trade was the Frasier Institutes Economic Freedom Index. Started as an annual index in 2000, this index measures the various aspects of a countrys competitiveness. This index was preferable than the World Banks Doing Business Index given its ability to break down the barriers to trade on direct and indirect barriers.

Finally, I obtain my financial development information through the Chin-Ito Index which depicts a nations degree of capital account openness. This dataset was not used by other economists given its recent development but this was chosen to represent a countrys openness to foreign direct investment. Developed by Chinn & Ito (2005), they use data by the IMF to build a chi-squared distribution score that it goes back to 1970 for most countries. The data grades nations on their financial openness from most open (2.37), such as the US, to least open (-1.9) such as Cuba, allowing me to take into account a nations openness to foreign investment separated from a nations openness to foreign goods.

Gravity Model

The gravity model is a simple empirical model very common in trade literature. Briefly stated, its key idea is that trade between two countries is inversely dependent on the distance between the countries and directly dependent on their economic size (or their GDP). All econometric work will be built around this model using the database labeled above.

Considering the empirical evidence and dataset, I expect to see a negative correlation in M&A deal flow with tariff barriers given that cross-border M&A has increased. To test my hypothesis, I intend on running a gravity model using the standard gravity variables (i.e distance and GDP) along with other macroeconomic and financial variables. The

tariff data will be at the same period as the M&A deal flow measured. The gravity model is as follows:

$$LnM\&A_{ijtk} = \beta_0 + \beta_1 Tariff_{itk} + \beta_2 Tariff_{jtk} + \beta_3 GDP_{it} + \beta_4 GDP_{jt} + \beta_5 Dist_{ij} + \beta_6 Lang_{ij} + \beta_7 Border_{ij} + \beta_8 Chinn_{jt} + \beta_9 Chinn_{it} + \beta_{10} WTO_{itj} + \beta_{11} FTA_{ijt} + \beta_{12} OECD_{ij} + \beta_1 3 Frasier_{it} + \beta_1 4 Frasier_{jt} + \phi_{tk} + \epsilon_{ijtk}$$

with i= Acquiring country, j= target country, t= year and k= industry as the subscripts. The reasoning for dividing the target and acquiring countries is to look at how tariffs would impact buyers and sellers separately. The dependent variable is defined as the number of M&A deal flows from country i to country j at year t and industry k.

The independent variables are defined as follows:

- TARIFF: Tariff rate of the target and acquiring country at year t and industry k
- GDP: real GDP (deflated by 2015 dollars)
- DIST: distance by kilometers
- LANGUAGE: Binary variable if country pair share a language
- BORDER: Binary variable if country pair share a border
- CHINN: Chinn-Ito index measuring the financial development index
- WTO: Year of entry into the WTO (If country entered the WTO before or during the study period, it is denominated at a 1 when they entered and a 0 when the country is not with the WTO)
- CURRENCY: Binary Variable if country pair shares a common currency
- FTA: Binary Variable is country pair are members of a free-trade agreement
- OECD: Binary Variable if country I or J are part of the OECD (includes China, Russia, India, South Africa, and Brazil)

- FRASIER: the non-tariff trade barrier index compiled by Frasier

Fixed effects are represented by the δ and ϕ which represent industrial and time fixed effects respectively.

Based on the literature review and the work done by Giovanni (2005), Karolyi and Taboada (2015), and the expected signs for the coefficients in Eq. (1) as:

Expected Variables			
Tariff	-	WTO	+
GDP	+	OECD	+
Language	+	Distance	-
Border	+	FTA	+
Chinn	+	Frasier	+

Eq. (1) is estimated by pooling the data and using target/acquiring country group and industrial fixed effects. The within R2s are also reported (where grouping is done by country-pairs) to see the importance of the time-series characteristics of the data to the fit of the regressions. It should also be noted that the data has few entries within certain industrial sectors preventing them from being statistically significant. The years and industries are mostly statistically insignificant and do not vary the end results greatly so they will not be presented in this paper.

Count Data

As I am estimating how tariffs can affect M&A deal flow, I adapted my dataset from a panel format to a count format for a proper regression. My original dataset was a panel format with each entry describing an M&A deal that took place. What I did was convert it to a count format where the entries are cumulated and placed into a country pair based on the year and industry. The dataset has the following format with the deal column representing how many deals took place with a country pair by year and industry:

Acquiring	Target	Year	Industry	Deal
U.S.	U.K.	2000	27	4

Having it divided by time and industrial category allows me to run a regression while having fixed effects. It should be noted that during the process of doing so, the table created an estimated 16 million pairs[3] in which an M&A can theoretically occur. Given that this study is seeking to understand how tariffs affected past mergers, as well as my inability to effectively regress with 16 million observations on STATA, I eliminated all pairs that had no deal value leaving me with around 30,000 pairs that have at least one M&A deal. The loss of these zero deal observations could be of interest for a follow-up study though the processing power must be able to compute these observations.

Poisson Distribution

The Poisson Distribution is a discrete probability distribution that measures the probability of certain events happening in a fixed time. The Poisson method allows me to measure the probability of a country pair at any given year within a specific year to have a certain level of deal flow. It is mainly used to regress count data more effectively than a standard OLS method. Given that the data was formatted to count data, using the Poisson would deliver more accurate results than the OLS. Note that I still use and will present on the OLS regression mainly for comparison with the Poisson distribution. The distribution is also cumulative where the probability of a limited number of events will all add to one. This distribution allows me to see how a percentage change in tariffs would increase or decrease deal flow within a given country. I still use all my variables for this distribution and I do log all non-dummy variables save for the deal method. While I do log the dependent variable in the OLS, I do not log the dependent variable given that the Poisson Distribution is a cumulative distribution.

While the Poisson distribution appears to show the best interpretation of the re-

[3]The 16 million pairs was calculated by squaring the countries to give every possible country pair multiplied by year and industry.

sults, I will be using a negative binomial distribution as a method to verify my results. Using a negative binomial function should verify my results further as it is a similar method to Poisson only that it uses a different method to measure probability. In brief, the negative binomial method involves estimating a number of successes using a sequence of independent Bernoulli trials. This can be used to measure the probability of a country pair executing a number of deals at a given time and industry. This regression will serve as a check on my initial model though more emphasis will be placed on the Poisson Distribution.

Results

Descriptive Statistics

Before the data was regressed, the data was analyzed using a set of descriptive statistics to determine if the theory described before would hold with the dataset. After summarizing the data, the data was correlated between the total M&A deal flows with the tariff barriers from both target and acquiring countries. Here, the data indicates a negative correlation for the target and acquiring countries, which is in line with previous research and my hypothesis. Currently, the literature does not distinguish how M&A flows are affected differently by tariffs from either the home or target country.

Figure 3	deal	Acquirer	-	-	deal	Target
Acquirer	-0.0168	1.0000	-	Target	-0.0349	1.0000

Another correlation was run on the control variables with the M&A for the target. In Figure 4, there is a clear positive correlation in the relation between the target and the ChinnIto Index, Frasier non-tariff barriers, and GDP, which is consistent with the economic literature. There is only a negative correlation between M&A deal flow with distance, which is also consistent with the theory surrounding international trade and distance. The correlation results are expected given the economic literature posted with foreign direct investment and financial development (Giovanni, 2005).

Figure 4	deal	GDP	-	-	deal	Chinn-Ito	-	-	deal	Frasier
GDP	.0786	1.0000	-	Chinn-Ito	0.0506	1.0000	-	Frasier	.0486	1.0000

The third set of descriptive statistics involves plotting the data. This is seen with the scatter plot on Figure 5 where the line shows the predicted deal flow with a set average target tariff rate for all products listed. Another scattering was done to see the

distribution of the deal flow by number of deals per country, industry and year. As seen in Figure 6, we see that around 85% of countries have only one deal between them when accounting for industry and year. This large tail in the left end is to be expected as most of countries are not expected to develop more than ten deals within a given year. There are a few exceptions with the maximum observed was 65 deals occurring with one country pair though this occurred in 2000, before the dot com bubble burst.

Figure 1: Scatter of Deal Flow with Target Tariff

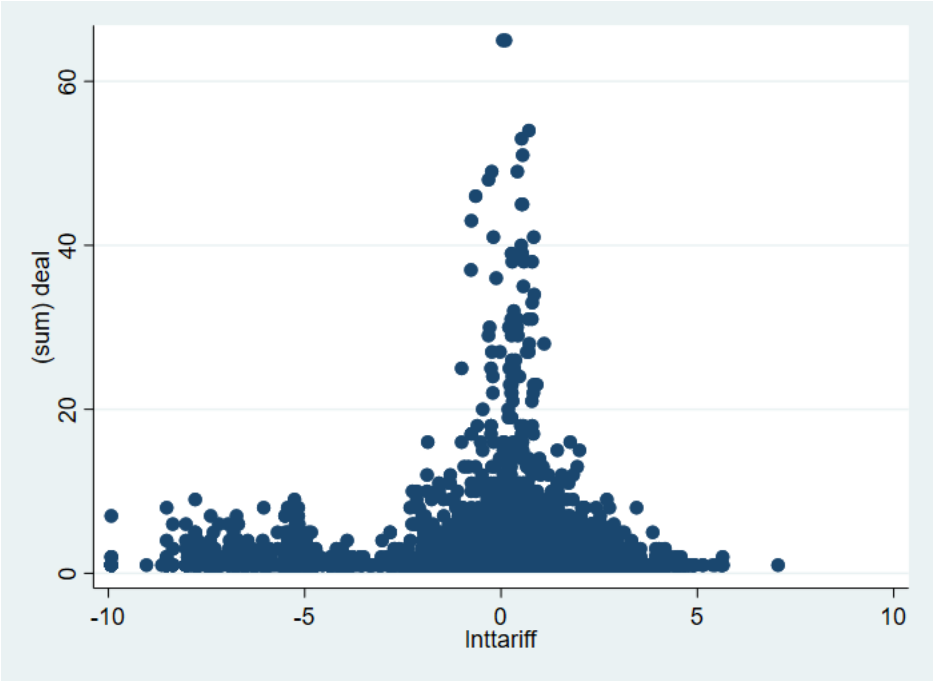
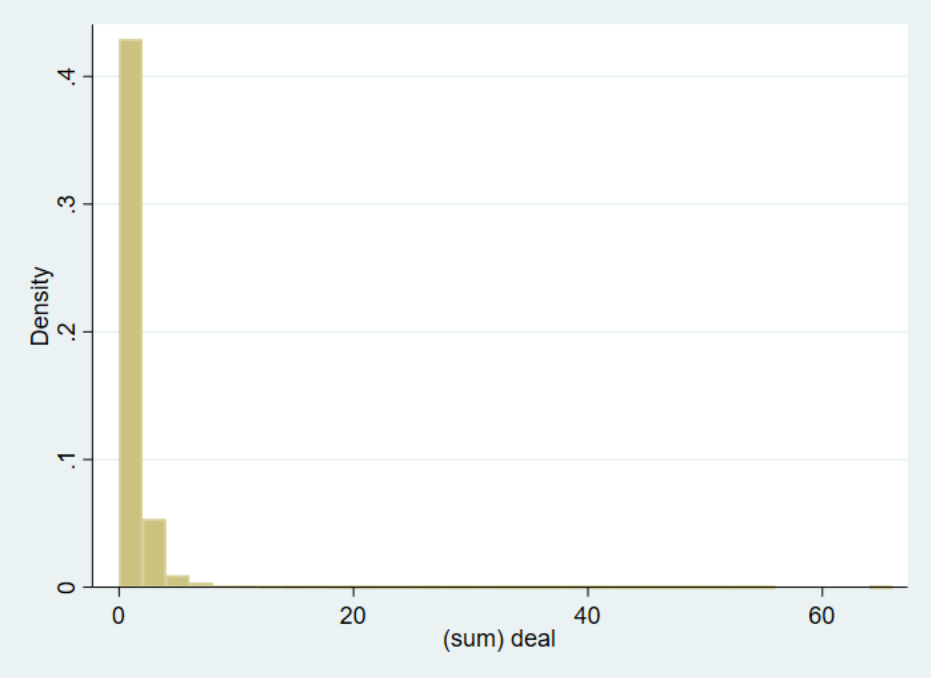


Figure 2: Deal Flow Histogram



Results

The gravity model is estimated first by using the OLS regression as a base assumption. Table 1 exhibits the OLS regression by pooling the data across all countries using four different regressions. These four omit certain variables to verify robustness and determine its effect on the other coefficients left in. Including these variables in the regression does reduce some data observations though there are still enough observations that allows for a normal distribution of the results. Some attention will be given as to the change in R2 when I omit certain variables though the fit within the data is still low when considering all variables.

Table 1 presents the regression results with interest of the variables in descending order. Turning to the first regression run, one sees that the coefficient for both the target and acquirer tariffs are statistically significant and positively correlated with deal flow. According to the first regression, a 1% increase in a tariff from a target country is

associated to a 11% increase in deal flow. What this means is that a country pair will see 11% higher deal flow with a 1% higher tariff rate from the target country. For the acquiring country, we do see a 4% increase and it is statistically significant even when accounting for the target tariff. The first regression challenges the studys hypothesis as it is seen that the target and acquiring countries can increase M&A trade flow with higher tariffs. It should be noted that it was run with all of the control variables and fixed effects.

Table 1: OLS Regression

	(1)	(2)	(3)	(4)
	Tariffs Included	Target Ommitted	Acquirer Omitted	Tariffs Omitted
lnttariff	0.0489***		0.0379***	
	(0.0103)		(0.00970)	
lnatariff	0.157***	0.138***		
	(0.0106)	(0.00990)		
lndistance	-0.106***	-0.0944***	-0.103***	-0.0902***
	(0.0123)	(0.0114)	(0.0121)	(0.0103)
lntfrasier	0.452***	0.208*	0.465***	0.141
	(0.132)	(0.0990)	(0.134)	(0.0948)
lntchinn	-0.0134	-0.00518	-0.0100	-0.00285
	(0.00802)	(0.00705)	(0.00762)	(0.00627)
lntgdp	0.170***	0.157***	0.170***	0.158***
	(0.0107)	(0.00903)	(0.0104)	(0.00840)
lnagdp	0.169***	0.152***	0.148***	0.128***
	(0.0125)	(0.0117)	(0.0124)	(0.0102)
WTO	0.0543	-0.0866	-0.153	-0.123
	(0.135)	(0.148)	(0.147)	(0.103)
comlang_off	0.348***	0.340***	0.339***	0.328***
	(0.0412)	(0.0383)	(0.0407)	(0.0347)

FTA	-0.169***	-0.200***	-0.178***	-0.183***
	(0.0259)	(0.0255)	(0.0259)	(0.0231)
OECD	-0.00813	0.0155	-0.0293	0.00157
	(0.0219)	(0.0182)	(0.0227)	(0.0173)
Border	-0.244***	-0.255***	-0.276***	-0.254***
	(0.0610)	(0.0562)	(0.0607)	(0.0515)
lnafrasier		-0.00766	-0.250	-0.194
		(0.151)	(0.154)	(0.137)
lnachinn		0.0262	0.0307*	0.0286*
		(0.0142)	(0.0140)	(0.0124)
Constant	-1.371***	-0.571	-0.198	0.429
	(0.360)	(0.471)	(0.511)	(0.425)
Observations	19333	20778	19396	22588
Pseudo R^2				

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Commenting on the R2 within the four regressions, I decided to run a regression without the tariff barriers for the fourth regression to determine its impact in explaining the control variables. I also run two additional regressions where I omitted the target tariff (with regression 2) and the acquirer tariff (with regression 3) to see how the coefficients and R2 change. As seen in regressions 2 and 3, we see that the tariffs respectively made up around 80% of the total R2 in the first equation. For example, the overall R2 in specification (1) is 0.0503 with all variables and is reduced to 0.01 when both tariff variables are omitted. With this loss, one can assume that tariff barriers do not make a significant factor in explaining M&A trade flows.

Turning to the Poisson regression, the results appear to be even more significant with a

positive coefficient for the target and acquiring countries. The coefficients shown below is interpreted as a percentage increase in deal flow exactly how the coefficients were interpreted for the OLS regression listed above. The same can go for the control variables though the dummy variables should be interpreted as a one-off change in M&A deal flow. One interesting facet is the coefficients for Chinn-Ito, and Frasier where the coefficients for the target country are positive and significant, but the coefficients are not as large or significant for the acquiring country. This points to the macro risks an acquiring firm would consider when acquiring a firm outside of their home country. Lastly, another interesting facet of the results found is that the OECD coefficient is negative but not statistically significant, an observation that does merit further discussion.

Table 2: Poission Regression

	(1)	(2)	(3)	(4)
	Tariffs Included	Target Ommitted	Acquirer Omitted	Tariffs Omitted
(sum) deal				
lnttariff	0.0358***	0.0265***		
	(0.00735)	(0.00663)		
lnatariff	0.124***		0.109***	
	(0.00822)		(0.00779)	
lndistance	-0.0744***	-0.0692***	-0.0643***	-0.0628***
	(0.00859)	(0.00861)	(0.00804)	(0.00748)
lntfrasier	0.427***	0.456***	0.251**	0.216**
	(0.108)	(0.111)	(0.0848)	(0.0825)
lntchinn	-0.00800	-0.00658	-0.00233	-0.00248
	(0.00642)	(0.00630)	(0.00571)	(0.00526)
lntgdp	0.132***	0.127***	0.122***	0.120***
	(0.00724)	(0.00688)	(0.00615)	(0.00562)
lnagdp	0.136***	0.117***	0.121***	0.103***

	(0.00918)	(0.00897)	(0.00857)	(0.00751)
WTO	0.0921	-0.102	-0.0479	-0.0947
	(0.0931)	(0.114)	(0.113)	(0.0835)
comlang_off	0.228***	0.220***	0.225***	0.219***
	(0.0251)	(0.0256)	(0.0240)	(0.0225)
FTA	-0.111***	-0.117***	-0.134***	-0.124***
	(0.0180)	(0.0185)	(0.0179)	(0.0167)
OECD	-0.0133	-0.0262	0.00959	0.000122
	(0.0172)	(0.0180)	(0.0142)	(0.0137)
Border	-0.175***	-0.200***	-0.182***	-0.192***
	(0.0408)	(0.0424)	(0.0391)	(0.0372)
lnafrasier		-0.153	-0.0239	-0.112
		(0.112)	(0.112)	(0.101)
lnachinn		0.0326**	0.0353**	0.0302**
		(0.0109)	(0.0113)	(0.00984)
Constant	-2.215***	-1.383***	-1.551***	-0.881**
	(0.292)	(0.384)	(0.357)	(0.322)
Observations	19333	19396	20778	22588
Pseudo R^2	0.061	0.048	0.057	0.046

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Lastly with the negative binomial distribution, the baseline results do not change drastically remaining positive for both countries and statistically significant. The results must be interpreted as a percentage change in deal flow given the change in any coefficient. As for the coefficients behind the control variables, there is little change of significance or sign. Any deviation with the negative binomial results are within the standard error of the Poisson distribution, confirming my results. In summation, the

negative binomial regression confirms the results from the Poisson distribution with ease though it should be noted that the R2 for the former is smaller than the latter.

Table 3: Negative Binomial Regression

	(1)	(2)	(3)	(4)
	Tariffs Included	Target Ommitted	Acquirer Omitted	Tariffs Omitted
(sum) deal				
lnttariff	0.0332***	0.0241***		
	(0.00673)	(0.00600)		
lnatariff	0.119***		0.0974***	
	(0.00663)		(0.00599)	
lndistance	-0.0623***	-0.0643***	-0.0590***	-0.0585***
	(0.00753)	(0.00749)	(0.00694)	(0.00656)
lntfrasier	0.409***	0.382***	0.199**	0.163*
	(0.0961)	(0.0991)	(0.0742)	(0.0743)
lnafrasier	-0.0368	-0.146	-0.0203	-0.105
	(0.110)	(0.103)	(0.103)	(0.0945)
lnachinn	0.0378***	0.0313**	0.0315**	0.0291**
	(0.0112)	(0.00991)	(0.0103)	(0.00906)
lntchinn	-0.00599	-0.00534	-0.00114	-0.000968
	(0.00607)	(0.00585)	(0.00529)	(0.00492)
lntgdp	0.126***	0.121***	0.114***	0.115***
	(0.00604)	(0.00594)	(0.00515)	(0.00493)
lnagdp	0.123***	0.109***	0.112***	0.0965***
	(0.00776)	(0.00748)	(0.00693)	(0.00638)
WTO	-0.0346	-0.0968	-0.0489	-0.0853
	(0.124)	(0.107)	(0.105)	(0.0781)
comlang_off	0.225***	0.211***	0.212***	0.210***

	(0.0227)	(0.0229)	(0.0211)	(0.0203)
FTA	-0.123***	-0.111***	-0.128***	-0.119***
	(0.0171)	(0.0170)	(0.0163)	(0.0155)
OECD	-0.0121	-0.0236	0.0116	0.000825
	(0.0165)	(0.0166)	(0.0132)	(0.0130)
Border	-0.162***	-0.181***	-0.166***	-0.175***
	(0.0358)	(0.0367)	(0.0341)	(0.0327)
Constant	-1.960***	-1.182***	-1.348***	-0.746*
	(0.373)	(0.355)	(0.328)	(0.303)
/				
lnalpha	-1.738***	-1.691***	-1.839***	-1.832***
	(0.0862)	(0.0878)	(0.0916)	(0.0926)
Observations	18535	19396	20778	22588
Pseudo R^2	0.048	0.038	0.044	0.037

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

One important observation I found within each model is that the R2 for each regression is lower than expected. The R2 for the OLS, Poisson, and Negative binomial regressions are .0506, .0605, and .0479 respectively. While the R2 is not considered to be important for analysis, it is worth pointing out that these regressions contained variables known to impact deal flow such as GDP. It should be noted that this low R2 can be caused by the data having a significant variance over time. This low R2 can point to an omitted variable bias which can not only cause a low fit in the regression but also question the integrity of the results.

As this regression results were not expected, some variables were removed with the Poisson distribution to determine which addition of variables have caused such an unexpected

shift. After omitting the Frasier and ChinnIto coefficient for acquiring countries, the regression still showed a positive correlation that is statistically significant. The other controls that were left in are statistically significant on a 99% confidence level. Another action that was attempted was to eliminate the dummy variables along with the variables listed above. Despite the elimination of the variables, the coefficient remains positive though it is significantly lower. The final regression did include time and industrial fixed effects though when I eliminated those effects but kept all of the coefficients, the target tariff coefficient was negative and significant while the acquirer coefficient was positive and significant.

Discussion and Conclusion

Discussion

The results given by each of the regressions find that tariffs from both the target and acquiring countries are positive and statistically significant. Given that M&A has increased significantly since the global financial crisis, I am interpreting my results that M&A activity will increase faster with higher tariffs than lower tariffs. This is an opinion that does not hold if considering the economic literature that preceded this study. In the absence of studies found was there any indication that acquiring countries tariffs are positively correlated with cross-border M&A. Because of a lack of precedence, I believe that the results presented must be interpreted with caution.

With regards to the target country, it is possible that a target country would increase their deal flow if the tariff rate is high enough to encourage tariff jumping. This hypothesis has been proposed before with Hijzen (2008) showing that firms could acquire foreign corporations as a strategy to bypass foreign tariffs. Assuming this hypothesis is correct, it generates more questions that the paper partially answers. The first question asks what characteristics within a country must be present to encourage the acquiring firm to enter a foreign country by tariff jumping. The second question asks why an increase in tariffs from

the target country would deliver a smaller increase in M&A than an increase in tariffs from the acquiring country. Answering the first question, the study indicates that the economy within a target country must be large enough for a foreign firm to justify investment within a country, rather than exporting its goods. Economic development, shown in this study by the GDP coefficient, is aligned with previous studies by showing larger M&A deal flow as economic growth increases. This situation was seen in China where the number of deals increased annually in tandem with an increase in GDP. As a target nations domestic market increases, firms are incentivized to jump tariffs which can be done through cross-border M&A. If the coefficient for the target country is correct, this will confirm Heary (2008) and Hijzens original work on the matter (2008).

There are also other factors that can incentivize firms to invest in foreign markets. Looking at the Frasier and Chinn-Ito index, both coefficients were positively correlated with M&A from the target country though not with the acquirer country. With this information, along with referring to the work by Giovanni (2005), it appears that a target countrys financial development and friendliness to foreign investment can encourage firms to enter foreign markets.

Lastly, another interesting subject worth discussing is how the deal flow is broken down further. When the data is broken down, most of acquisitions from developing countries are not industrial or service oriented but are rather focused on metal and mining, agriculture, and petroleum. Developing nations generally have higher tariffs than in developed nations and their financial development is typically under-developed. There is no study that explicitly mentions which industries would develop operations in politically and/or economically volatile regions though based on non-academic evidence, it appears that firms focused on mining and oil extraction can take the risk. A cross-border merger or acquisition could be an entry-point for foreign companies to enter lucrative markets or obtain exclusive access to resources which can compensate investors for the risks and costs that would be behind the deal.

While the first question could be answered with the research done, the second question cannot be answered within this study as it is unprecedented by economic literature. Even in considering a previous study concerning M&A among the OECD members, which largely encompass the acquiring countries, tariffs were still negatively correlated with deal flow. It is very likely that the acquirer tariff coefficient is accounting for an omitted variable that ensures its positive correlation. As mentioned in the results above, the control variables were focused on a nations attractiveness to foreign direct investment. What was omitted from the study were any values on government transparency, tax rates, and even whether they use the international accounting standards. While taxes were omitted given the complexity behind locating the effective tax rate a corporation could face within a specific country, it is possible that the omission of these variables affect the acquirer tariff coefficient. If a future study were to follow the research question and the methodology, I would recommend maintaining the variables listed above but to include the effective tax rate, government transparency, and other variables on the ease of doing business within a country.

Error

Because of the unexpected results found in the results, it is probable that the approach and the data have considerable errors. To begin with the dataset, it includes around 105,000 M&A deals since 2000 yet a good portion of the data is censored limiting the sample size already. Only 20% of the entries have an SIC code for the target country attached to the transaction and as mentioned in Section 3.1, it appears that this issue is randomly distributed around the data. Even though there is enough of a sample size for the regression to have a normal distribution, the regression was still omitting around 40% of all the data combinations. Even with ensuring that the results were left intact by ensuring the missing entries are properly labeled, it is not possible to add additional observations without guessing at the proper industry. This is not likely an issue that is solely faced using Bloomberg data. M&A data is dependent on corporations announcing

the deal value, target, and other key facts. While public corporations typically discuss their acquisitions as required by securities law, many M&A deals happen with private corporations where there is no legal obligation to share details that is considered confidential. This lack of self-reporting compromises the ability for the study to be comprehensive and able to develop an accurate table of results.

Another issue that I discovered while compiling the descriptive statistics specifically the M&A transactions was the time frame for my research. As shown in the Appendix, one can see that M&A deal flows steadily increase from 2000-2007 until dropping off significantly since 2008. While the market has largely recovered, they have not returned to its 2007 high implying that the higher valuations and deal flow achieved before 2008 was largely attributable to the asset bubble seen before the financial crisis. Because of this, the chart indicates an issue that was initially overlooked: the value of a corporation could be overvalued or undervalued given the present macroeconomic conditions. It is possible that because this study does not consider macroeconomic conditions such as a recession, my results may not be properly accounting for this important development. It is worth noting that this study is different from the other studies given that the time frame is from 2000-2015 where the predecessors considered data from the 1990s. There is no doubt that the recession influences results but the magnitude on these results is a question that is left unanswered for the time being.

Conclusion

This paper attempts to determine some of the factors underlying gross cross-border M&A flows for the period 2000 – 2015. A gravity model is estimated and a Poisson distribution is used to regress the results. Empirical results highlighting the data used showed how tariffs from acquirer and/or target countries have positive correlations to M&A deal flows. The baseline estimation implies that a 1% increase of tariff from a target country is associated with a 4% increase in cross-border M&A activity fixing for the year and

industry. This number is statistically and economically significant, indicating that tariffs are not a primary concern for firms. The impact of the acquirer tariffs is positive and statistically significant in the baseline specification. Whether the results reflect the reality.

Given the unique results given in the study, it is very likely that the results do not portray the real effect that tariffs have on cross-border deal flow. Given that tariff barriers have diminished since the 1990s along with sustained growth in brownfield foreign direct investment, the results contradict what empirical evidence has shown for the last 28 years. Some of the errors that deliver these unique results could be an omission of country pairs that have no deal flow, a recession that diminished cross-border deal flows as well as omission of certain variables. If a replication study were to take place using the same research question, the study should consider these omitted variables as well as to possibly consider M&A data from the 1990s.

Despite the papers drawbacks, more consideration must be given with regards on foreign direct investment and how it is affected by trade policy. FDI is seen as overall beneficial for a developing country though further studies can not only correct this papers work on brownfield FDI but also expand it to consider greenfield FDI. Further studies could also look at the welfare benefit on greenfield FDI vs brownfield FDI, a topic that is relevant for policy makers yet has not been as discussed in economic literature. Lastly, there can be studies considering recent events, such as President Trumps announcement of new steel and aluminum tariffs, and how it will impact FDI within the steel and aluminum industry for both countries. In conclusion, working further to address how trade policy can affect FDI is an important subject for economists and policy makers alike.

Appendix

SIC Code	Industry	SITC Code
100	Agricultural Production-Crops	10

200	Agricultural Prod-Livestock & Animal Specialties	1
700	Agricultural Services	7
800	Forestry	6
900	Fishing, Hunting and Trapping	2
1000	MetalMining	81
1040	Gold and Silver Ores	84
1090	Miscellaneous Metal Ores	26
1220	Bituminous Coal & Lignite Mining	27
1221	Bituminous Coal & Lignite Surface Mining	27
1311	Crude Petroleum & Natural Gas	27
1381	Drilling Oil & Gas Wells	27
1382	Oil & Gas Field Exploration Services	27
1389	Oil & Gas Field Services, NEC	27
1400	Mining & Quarrying of Nonmetallic Minerals (No Fuels)	26
1520	General Bldg Contractors - Residential Bldgs	OECD Construction
1531	Operative Builders	OECD Construction
1540	General Bldg Contractors - Nonresidential Bldgs	OECD Construction
1600	Heavy Construction Other Than Bldg Const - Contractors	OECD Construction
1623	Water, Sewer, Pipeline, Comm & Power Line Construction	OECD Construction
1629	Heavy Construction, Not Elsewhere Classified[6]	OECD Construction
1700	Construction - Special Trade Contractors	OECD Construction
1731	Electrical Work	85
2000	Food and Kindred Products	10
2011	Meat PackingPlants	16
2013	Sausages& Other Prepared Meat Products	16
2015	Poultry Slaughtering and Processing	16
2020	Dairy Products	4
2024	Ice Cream& Frozen Desserts	5

2030	Canned, Frozen & Preserved Fruit, Veg & Food Specialties	20

SIC Code	Industry	SITC Code
2033	Canned, Fruits, Veg, Preserves, Jams & Jellies	20
2040	Grain Mill Products	10
2050	BakeryProducts	19
2052	Cookies&Crackers	19
2060	Sugar& Confectionery Products	17
2070	Fats & Oils	15
2080	Beverages	22
2082	Malt Beverages	22
2086	Bottled & Canned Soft Drinks & Carbonated Waters	22
2090	Miscellaneous Food Preparations & Kindred Products	21
2092	Prepared Fresh or Frozen Fish & Seafood	3
2100	Tobacco Products	24
2111	Cigarettes	24
2200	Textile Mill Products	61
2211	Broadwoven Fabric Mills, Cotton	61
2221	Broadwoven Fabric Mills, Man Made Fiber & Silk	61
2250	Knitting Mills	61
2253	Knit Outerwear Mills	61
2273	Carpets&Rugs	57
2300	Apparel & Other Finished Prods of Fabrics & Similar Matl	62
2320	Men's & Boys' Furnishings, Work Clothing, & Allied Garments	62
2330	Women's, Misses', and Juniors Outerwear	62
2340	Women's, Misses', Children's & Infant's Undergarments	62
2390	Miscellaneous Fabricated Textile Products	63
2400	Lumber & Wood Products (No Furniture)	44
2421	Sawmills & Planing Mills, General	6

2430	Millwood, Veneer, Plywood, & Structural Wood Members	44
2451	Mobile Homes	44
2452	Prefabricated Wood Bldgs & Components	44
2510	Household Furniture	94
2511	Wood Household Furniture, (No Upholstered)	94

SIC Code	Industry	SITC Code
2520	Office Furniture	94
2522	Office Furniture (No Wood)	94
2531	Public Bldg & Related Furniture	94
2540	Partitions, Shelvg, Lockers, & office & Store Fixtures	94
2590	Miscellaneous Furniture & Fixtures	94
2600	Papers & Allied Products	48
2611	Pulp Mills	47
2621	Paper Mills	48
2631	Paperboard Mills	48
2650	Paperboard Containers & Boxes	48
2670	Converted Paper & Paperboard Prods (No Containers/Boxes)	48
2673	Plastics, Foil & Coated Paper Bags	39
2711	Newspapers: Publishing or Publishing & Printing	49
2721	Periodicals: Publishing or Publishing & Printing	49
2731	Books: Publishing or Publishing & Printing	49
2732	Book Printing	49
2741	Miscellaneous Publishing	49
2750	Commercial Printing	49
2761	Manifold Business Forms	48
2771	Greeting Cards	48
2780	Blankbooks, Looseleaf Binders Bookbinding	48
2790	Service Industries For The Printing Trade	48

2800	Chemicals & Allied Products	38
2810	Industrial Inorganic Chemicals	38
2820	Plastic Material, Synth Resin/Rubber, Cellulos (No Glass)	39
2821	Plastic Materials, Synth Resins & Nonvulcan Elastomers	39
2833	Medicinal Chemicals & Botanical Products	30
2834	Pharmaceutical Preparations	30
2835	In Vitro & In Vivo Diagnostic Substances	30
2836	Biological Products, (No Diagnostic Substances)	38
2840	Soap, Detergents, Cleaning Preparations, Perfumes, Cosmetics	34
2842	Specialty Cleaning, Polishing and Sanitation Preparations	34

SIC Code	Industry	SITC Code
2844	Perfumes, Cosmetics & Other Toilet Preparations	34
2851	Paints, Varnishes, Lacquers, Enamels & Allied Prods	38
2860	Industrial Organic Chemicals	29
2870	Agricultural Chemicals	30
2890	Miscellaneous Chemical Products	38
2891	Adhesives & Sealants	26
2911	Petroleum Refining	27
2950	Asphalt Paving & Roofing Materials	27
2990	Miscellaneous Products of Petroleum & Coal	27
3011	Tires & Inner Tubes	40
3021	Rubber & Plastics Footwear	39
3050	Gaskets, Packg & Sealg Devices & Rubber & Plastics Hose	40
3060	Fabricated Rubber Products, NEC	40
3080	Miscellaneous Plastics Products	39
3081	Unsupported Plastics Film & Sheet	39
3086	Plastics Foam Products	39
3089	Plastics Products, NEC	39

3100	Leather & Leather Products	42
3140	Footwear, (No Rubber)	42
3211	Flat Glass	70
3220	Glass & Glassware, Pressed or Blown	70
3221	Glass Containers	70
3231	Glass Products, Made of Purchased Glass	70
3241	Cement, Hydraulic	67
3250	Structural Clay Products	68
3260	Pottery & Related Products	68
3270	Concrete, Gypsum & Plaster Products	68
3272	Concrete Products, Except Block & Brick	69
3281	Cut Stone & Stone Products	68
3290	Abrasive, Asbestos & Misc Nonmetallic Mineral Prods	68
3310	Steel Works, Blast Furnaces & Rolling & Finishing Mills	72
3312	Steel Works, Blast Furnaces & Rolling Mills (Coke Ovens)	72

SIC Code	Industry	SITC Code
3317	Steel Pipe & Tubes	73
3320	Iron & Steel Foundries	72
3330	Primary Smelting & Refining of Nonferrous Metals	75
3334	Primary Production of Aluminum	76
3341	Secondary Smelting & Refining of Nonferrous Metals	77
3350	Rolling Drawing & Extruding of Nonferrous Metals	78
3357	Drawing & Insulating of Nonferrous Wire	79
3360	Nonferrous Foundries (Castings)	80
3390	Miscellaneous Primary Metal Products	81
3411	Metal Cans	73
3412	Metal Shipping Barrels, Drums, Kegs & Pails	73
3420	Cutlery, Handtools & General Hardware	82

3430	Heating Equip, Except Elec & Warm Air; & Plumbing Fixtures	82
3433	Heating Equipment, Except Electric & Warm Air Furnaces	82
3440	Fabricated Structural Metal Products	73
3442	Metal Doors, Sash, Frames, Moldings & Trim	73
3443	Fabricated Plate Work (Boiler Shops)	73
3444	Sheet Metal Work	73
3448	Prefabricated Metal Buildings & Components	73
3451	Screw Machine Products	73
3452	Bolts, Nuts, Screws, Rivets & Washers	73
3460	Metal Forgings & Stampings	73
3470	Coating, Engraving & Allied Services	73
3480	Ordnance & Accessories, (No Vehicles/Guided Missiles)	73
3490	Miscellaneous Fabricated Metal Products	74
3510	Engines & Turbines	75
3523	Farm Machinery & Equipment	82
3524	Lawn & Garden Tractors & Home Lawn & Gardens Equip	82
3530	Construction, Mining & Materials Handling Machinery & Equip	82
3531	Construction Machinery & Equip	82
3532	Mining Machinery & Equip (No Oil & Gas Field Mach & Equip)	82
3533	Oil & Gas Field Machinery & Equipment	82

SIC Code	Industry	SITC Code
3537	Industrial Trucks, Tractors, Trailers & Stackers	87
3540	Metalworking Machinery & Equipment	82
3541	Machine Tools, Metal Cutting Types	82
3550	Special Industry Machinery (No Metalworking Machinery)	82
3555	Printing Trades Machinery & Equipment	82
3559	Special Industry Machinery, NEC	82
3560	General Industrial Machinery & Equipment	82

3561	Pumps & Pumping Equipment	82
3562	Ball & Roller Bearings	82
3564	Industrial & Commercial Fans & Blowers & Air Purifying Equip	82
3567	Industrial Process Furnaces & Ovens	82
3569	General Industrial Machinery & Equipment, NEC	82
3570	Computer & office Equipment	85
3571	Electronic Computers	85
3572	Computer Storage Devices	85
3575	Computer Terminals	85
3576	Computer Communications Equipment	85
3577	Computer Peripheral Equipment, NEC	85
3578	Calculating & Accounting Machines (No Electronic Computers)	81
3579	Office Machines, NEC	81
3580	Refrigeration & Service Industry Machinery	81
3585	Air-Cond & Warm Air Heatg Equip & Comm & Indl Refrig Equip	81
3590	Misc Industrial & Commercial Machinery & Equipment	81
3600	Electronic & Other Electrical Equipment (No Computer Equip)	81
3612	Power, Distribution & Specialty Transformers	85
3613	Switchgear & Switchboard Apparatus	85
3620	Electrical Industrial Apparatus	85
3621	Motors & Generators	85
3630	Household Appliances	94
3634	Electric Housewares & Fans	85
3640	Electric Lighting & Wiring Equipment	85

SIC Code	Industry	SITC Code
3651	Household Audio & Video Equipment	OECD Telephone
3652	Phonograph Records & Prerecorded Audio Tapes & Disks	OECD Telephone
3661	Telephone & Telegraph Apparatus	OECD Telephone

3663	Radio & TV Broadcasting & Communications Equipment	OECD Telephone
3669	Communications Equipment, NEC	OECD Telephone
3670	Electronic Components & Accessories	85
3672	Printed Circuit Boards	85
3674	Semiconductors & Related Devices	85
3677	Electronic Coils, Transformers & Other Inductors	85
3678	Electronic Connectors	85
3679	Electronic Components, NEC	85
3690	Miscellaneous Electrical Machinery, Equipment & Supplies	85
3695	Magnetic & Optical Recording Media	90
3711	Motor Vehicles & Passenger Car Bodies	87
3713	Truck & Bus Bodies	87
3714	Motor Vehicle Parts & Accessories	87
3715	Truck Trailers	87
3716	Motor Homes	87
3720	Aircraft & Parts	88
3721	Aircraft	88
3724	Aircraft Engines & Engine Parts	88
3728	Aircraft Parts & Auxiliary Equipment, NEC	88
3730	Ship & Boat Building & Repairing	89
3743	Railroad Equipment	86
3751	Motorcycles, Bicycles & Parts	87
3760	Guided Missiles & Space Vehicles & Parts	88
3790	Miscellaneous Transportation Equipment	88
3812	Search, Detection, Navigation, Guidance, Aeronautical Sys	88
3821	Laboratory Apparatus & Furniture	90
3822	Auto Controls For Regulating Residential & Comml Environments	90
3823	Industrial Instruments For Measurement, Display, and Control	90

3824	Totalizing Fluid Meters & Counting Devices	90

SIC Code	Industry	SITC Code
3825	Instruments For Meas & Testing of Electricity & Elec Signals	90
3826	Laboratory Analytical Instruments	90
3827	Optical Instruments & Lenses	90
3829	Measuring & Controlling Devices, NEC	90
3841	Surgical & Medical Instruments & Apparatus	90
3842	Orthopedic, Prosthetic & Surgical Appliances & Supplies	90
3843	Dental Equipment & Supplies	90
3844	X-Ray Apparatus & Tubes & Related Irradiation Apparatus	90
3845	Electromedical & Electrotherapeutic Apparatus	90
3851	Ophthalmic Goods	90
3861	Photographic Equipment & Supplies	90
3873	Watches, Clocks, Clockwork Operated Devices/Parts	91
3910	Jewelry, Silverware & Plated Ware	71
3911	Jewelry, Precious Metal	71
3931	Musical Instruments	92
3942	Dolls & Stuffed Toys	95
3944	Games, Toys & Children's Vehicles (No Dolls & Bicycles)	95
3949	Sporting & Athletic Goods, NEC	95
3950	Pens, Pencils & Other Artists' Materials	47
3960	Costume Jewelry & Novelties	47
3990	Miscellaneous Manufacturing Industries	47
4011	Railroads, Line-Haul Operating	86
4013	Railroad Switching & Terminal Establishments	86
4100	Local & Suburban Transit & Interurban Hwy Passenger Trans	86
4210	Trucking & Courier Services (No Air)	OECD Logistics
4213	Trucking (No Local)	OECD Logistics

4220	Public Warehousing & Storage	OECD Logistics
4231	Terminal Maintenance Facilities For Motor Freight Transport	OECD Logistics
4400	Water Transportation	89
4412	Deep Sea Foreign Transportation of Freight	89
4512	Air Transportation, Scheduled	88
4513	Air Courier Services	88

SIC Code	Industry	SITC Code
4522	Air Transportation, Nonscheduled	88
4581	Airports, Flying Fields & Airport Terminal Services	88
4610	Pipe Lines (No Natural Gas)	OECD Logistics
4700	Transportation Services	OECD Logistics
4731	Arrangement of Transportation of Freight & Cargo	OECD Logistics
4812	Radiotelephone Communications	OECD Logistics
4813	Telephone Communications (No Radiotelephone)	OECD Telephone
4822	Telegraph & Other Message Communications	OECD Telephone
4832	Radio Broadcasting Stations	OECD Telephone
4833	Television Broadcasting Stations	OECD Telephone
4841	Cable & Other Pay Television Services	OECD Telephone
4899	Communications Services, NEC	OECD Telephone
4900	Electric, Gas & Sanitary Services	27
4911	Electric Services	27
4922	Natural Gas Transmission	27
4923	Natural Gas Transmission & Distribution	27
4924	Natural Gas Distribution	27
4931	Electric & Other Services Combined	oecd telecom
4932	Gas & Other Services Combined	27
4941	Water Supply	23
4950	Sanitary Services	23

4953	Refuse Systems	23
4955	Hazardous Waste Management	84
4961	Steam & Air-Conditioning Supply	85
4991	Co-generation Services & Small Power Producers	85
5000	Wholesale-Durable Goods	82
5010	Wholesale-Motor Vehicles & Motor Vehicle Parts & Supplies	87
5013	Wholesale-Motor Vehicle Supplies & New Parts	87
5020	Wholesale-Furniture & Home Furnishings	94
5030	Wholesale-Lumber & Other Construction Materials	44
5031	Wholesale-Lumber, Plywood,millwork& Wood Panels	44
5040	Wholesale-Professional & Commercial Equipment & Supplies	82

SIC Code	Industry	SITC Code
5045	Wholesale-Computers & Peripheral Equipment & Software	85
5047	Wholesale-Medical, Dental & Hospital Equipment & Supplies	90
5050	Wholesale-Metals & Minerals (No Petroleum)	26
5051	Wholesale-Metals Service Centers & Offices	26
5063	Wholesale-Electrical Apparatus & Equipment, Wiring Supplies	85
5064	Wholesale-Electrical Appliances, TV & Radio Sets	85
5065	Wholesale-Electronic Parts & Equipment, NEC	85
5070	Wholesale-Hardware & Plumbing & Heating Equipment & Supplies	82
5072	Wholesale-Hardware	82
5080	Wholesale-Machinery, Equipment & Supplies	85
5082	Wholesale-Construction & Mining (No Petro) Machinery & Equip	85
5084	Wholesale-Industrial Machinery & Equipment	85
5090	Wholesale-Misc Durable Goods	82
5094	Wholesale-Jewelry, Watches, Precious Stones & Metals	91
5099	Wholesale-Durable Goods, NEC	49
5110	Wholesale-Paper & Paper Products	49

5122	Wholesale-Drugs, Proprietaries & Druggists' Sundries	30
5130	Wholesale-Apparel, Piece Goods & Notions	61
5140	Wholesale-Groceries & Related Products	7
5141	Wholesale-Groceries,General Line (merchandise)	8
5150	Wholesale-Farm Product Raw Materials	7
5160	Wholesale-Chemicals & Allied Products	38
5171	Wholesale-Petroleum Bulk Stations & Terminals	27
5172	Wholesale-Petroleum & Petroleum Products (No Bulk Stations)	27
5180	Wholesale-Beer, Wine & Distilled Alcoholic Beverages	22
5190	Wholesale-Miscellaneous Non-durable Goods	49
5200	Retail-Building Materials, Hardware, Garden Supply	43
5211	Retail-Lumber & Other Building Materials Dealers	44
5271	Retail-Mobile Home Dealers	oecd rchitecture
5311	Retail-Department Stores	61
5331	Retail-Variety Stores	61
5399	Retail-MiscGeneral Merchandise Stores	61

SIC Code	Industry	SITC Code
5400	Retail-Food Stores	2
5411	Retail-Grocery Stores	2
5412	Retail-Convenience Stores	2
5500	Retail-Auto Dealers & Gasoline Stations	87
5531	Retail-Auto & Home Supply Stores	87
5551	Boat Dealers	89
5600	Retail-Apparel & Accessory Stores	62
5621	Retail-Women's Clothing Stores	62
5651	Retail-Family Clothing Stores	62
5661	Retail-Shoe Stores	62
5700	Retail-Home Furniture, Furnishings & Equipment Stores	94

5712	Retail-Furniture Stores	94
5731	Retail-Radio, TV & Consumer Electronics Stores	85
5734	Retail-Computer & Computer Software Stores	85
5735	Retail-Record & Prerecorded Tape Stores	85
5810	Retail-Eating & Drinking Places	OECD Distribution
5812	Retail-Eating Places	OECD Distribution
5900	Retail-Miscellaneous Retail	OECD Distribution
5912	Retail-Drug Stores and Proprietary Stores	OECD Distribution
5940	Retail-Miscellaneous Shopping Goods Stores	OECD Distribution
5944	Retail-Jewelry Stores	91
5945	Retail-Hobby, Toy & Game Shops	95
5960	Retail-Nonstore Retailers	OECD Distribution
5961	Retail-Catalog & Mail-Order Houses	OECD Distribution
5990	Retail-Retail Stores, NEC	OECD Distribution
6012	Pay Day Lenders	OECD Banking
6021	National Commercial Banks	OECD Banking
6022	State Commercial Banks	OECD Banking
6029	Commercial Banks, NEC	OECD Banking
6035	Savings Institution, Federally Chartered	OECD Banking
6036	Savings Institutions, Not Federally Chartered	OECD Banking
6099	Functions Related To Depository Banking, NEC	OECD Banking

SIC Code	Industry	SITC Code
6111	Federal & Federally Sponsored Credit Agencies	OECD Banking
6141	Personal Credit Institutions	OECD Banking
6153	Short-Term Business Credit Institutions	OECD Banking
6159	Miscellaneous Business Credit Institution	OECD Banking
6162	Mortgage Bankers & Loan Correspondents	OECD Banking
6163	Loan Brokers	OECD Banking

6172	Finance Lessors	OECD Banking
6189	Asset-Backed Securities	OECD Banking
6199	Finance Services	OECD Banking
6200	Security & Commodity Brokers, Dealers, Exchanges & Services	OECD Banking
6211	Security Brokers, Dealers & Flotation Companies	OECD Banking
6221	Commodity Contracts Brokers & Dealers	OECD Banking
6282	Investment Advice	OECD Insurance
6311	Life Insurance	OECD Insurance
6321	Accident & Health Insurance	OECD Insurance
6324	Hospital & Medical Service Plans	OECD Insurance
6331	Fire, Marine & Casualty Insurance	OECD Insurance
6351	Surety Insurance	OECD Insurance
6361	Title Insurance	OECD Insurance
6399	Insurance Carriers, NEC	OECD Insurance
6411	Insurance Agents, Brokers & Service	OECD Insurance
6500	Real Estate	OECD Architecture
6510	Real Estate Operators (No Developers) & Lessors	OECD Architecture
6512	Operators of Nonresidential Buildings	OECD Architecture
6513	Operators of Apartment Buildings	OECD Architecture
6519	Lessors of Real Property, NEC	OECD Architecture
6531	Real Estate Agents & Managers (For Others)	OECD Architecture
6532	Real Estate Dealers (For Their Own Account)	OECD Architecture
6552	Land Subdividers & Developers (No Cemeteries)	OECD Architecture
6770	Blank Checks	OECD Banking
6792	OilRoyaltyTraders	27
6794	Patent Owners & Lessors	OECD Banking

SIC Code	Industry	SITC Code
6795	MineralRoyaltyTraders	OECD Banking

6798	Real Estate Investment Trusts	OECD Banking
6799	Investors, NEC	OECD Banking
7000	Hotels, Rooming Houses, Camps & Other Lodging Places	OECD Tourism
7011	Hotels & Motels	OECD Tourism
7200	Services-Personal Services	OECD Tourism
7310	Services-Advertising	oecd telecom
7311	Services-Advertising Agencies	oecd telecom
7320	Services-Consumer Credit Reporting, Collection Agencies	OECD Banking
7330	Services-Mailing, Reproduction, Commercial Art & Photography	OECD Courier
7331	Services-Direct Mail Advertising Services	OECD Courier
7334	Services-Photocopying and Duplicating Services	OECD Courier
7340	Services-To Dwellings & Other Buildings	OECD Courier
7350	Services-Miscellaneous Equipment Rental & Leasing	OECD Courier
7359	Services-Equipment Rental & Leasing, NEC	OECD Courier
7361	Services-Employment Agencies	OECD Courier
7363	Services-Help Supply Services	OECD Courier
7370	Services-Computer Programming, Data Processing, Etc.	85
7371	Services-Computer Programming Services	85
7372	Services-Prepackaged Software	85
7373	Services-Computer Integrated Systems Design	85
7374	Services-Computer Processing & Data Preparation	85
7377	Services-Computer Rental & Leasing	85
7380	Services-Miscellaneous Business Services	OECD Legal
7381	Services-Detective, Guard & Armored Car Services	OECD Legal
7384	Services-Photofinishing Laboratories	OECD Telephone
7385	Services-Telephone Interconnect Systems	OECD Telephone
7389	Services-Business Services, NEC	OECD Legal
7500	Services-Automotive Repair, Services & Parking	87

7510	Services-Auto Rental & Leasing (No Drivers)	87
7600	Services-Miscellaneous Repair Services	87
7812	Services-Motion Picture & Video Tape Production	85

SIC Code	Industry	SITC Code
7819	Services-Allied To Motion Picture Production	85
7822	Services-Motion Picture & Video Tape Distribution	85
7829	Services-Allied To Motion Picture Distribution	85
7830	Services-Motion Picture Theaters	85
7841	Services-Video Tape Rental	85
7900	Services-Amusement & Recreation Services	OECD Motion
7948	Services-Racing, Including Track Operation	OECD Motion
7990	Services-Miscellaneous Amusement & Recreation	OECD Motion
7994	Services-Video Game Arcades	85
7995	Services-Gambling Transactions	OECD Motion
7996	Services-Amusement Parks	OECD Motion
7997	Services-Membership Sports & Recreation Clubs	OECD Motion
8000	Services-Health Services	90
8011	Services-Offices & Clinics of Doctors of Medicine	90
8050	Services-Nursing & Personal Care Facilities	90
8051	Services-Skilled Nursing Care Facilities	90
8060	Services-Hospitals	90
8062	Services-General Medical & Surgical Hospitals, NEC	90
8071	Services-Medical Laboratories	90
8082	Services-Home Health Care Services	90
8090	Services-Misc Health & Allied Services, NEC	90
8093	Services-Specialty Outpatient Facilities, NEC	90
8111	Services-Legal Services	OECD Legal
8200	Services-Educational Services	OECD Legal

8300	Services-Social Services	OECD Legal
8351	Services-Child Day Care Services	OECD Legal
8600	Services-Membership organizations	OECD Legal
8700	Services-Engineering, Accounting, Research, Management	OECD Architecture
8711	Services-Engineering Services	OECD Architecture
8731	Services-Commercial Physical & Biological Research	OECD Architecture
8734	Services-Testing Laboratories	OECD Legal
8741	Services-Management Services	OECD Legal

SIC Code	Industry	SITC Code
8742	Services-Management Consulting Services	OECD Legal
8744	Services-Facilities Support Management Services	OECD Legal
8748	Business Consulting Services, Not Elsewhere Classified	OECD Legal
8900	Services-Services, NEC	OECD Legal
9721	International Affairs	OECD Legal
9995	Non-Operating Establishments	OECD Legal

Country List

Albania	Ghana	Pakistan
Algeria	Gibraltar	Panama
Andorra	Greece	Papua New Guinea
Angola	Guadeloupe	Paraguay
Antigua & Barbuda	Guatemala	Peru
Argentina	Guinea	Philippines
Armenia	Guyana	Poland
Aruba	Haiti	Portugal
Australia	Honduras	Qatar

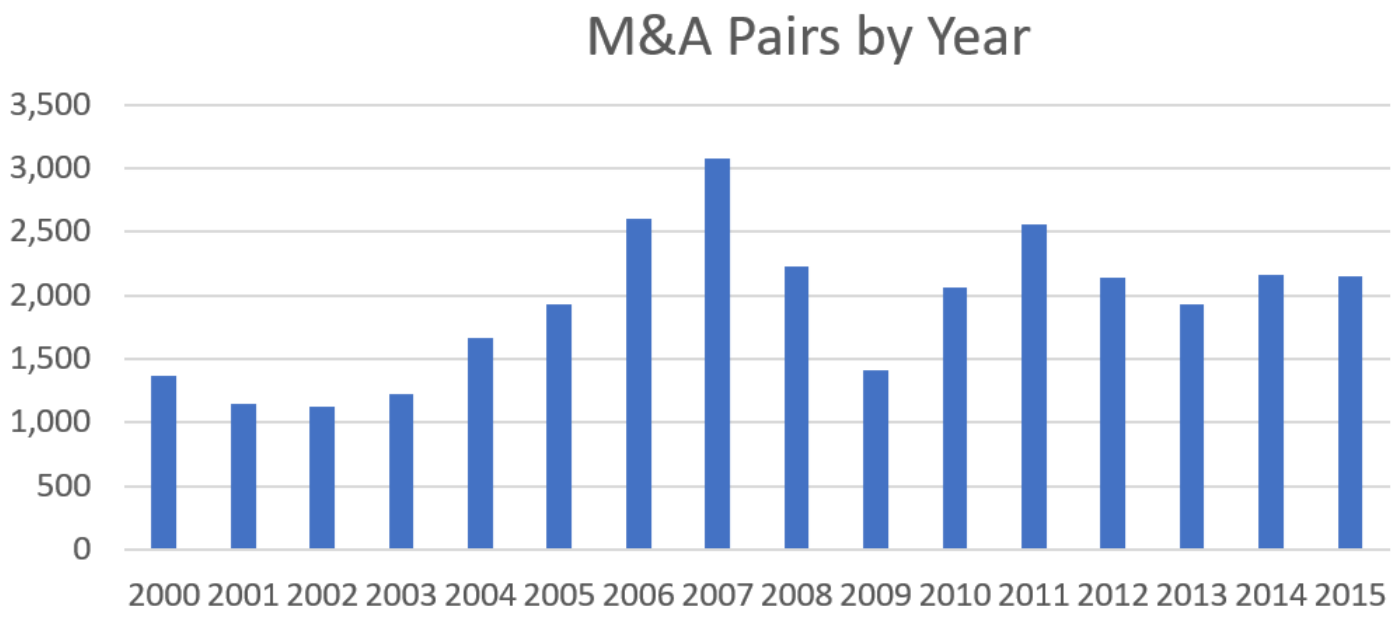
Austria	Hong Kong	Romania
Azerbaijan	Hungary	Russia
Bahamas, The	Iceland	Rwanda
Bahrain	India	SOLOMON ISLAND
Bangladesh	Indonesia	Samoa
Barbados	Iran	San Marino
Belarus	Iraq	Saudi Arabia
Belgium	Ireland	Senegal
Belize	Isle of Man	Serbia
Costa Rica	Israel	Seychelles
Bermuda	Italy	Sierra Leone
Bolivia	Ivory Coast	Singapore
Bosnia And Herzegovina	Jamaica	Slovakia
Botswana	Japan	Slovenia
Bouvet Island	Jersey	South Africa
Brazil	Jordan	South Korea
British Virgin Islands	Kazakhstan	Spain
Bulgaria	Kenya	Sri Lanka
Bulgaria, Morocco	Kuwait	Sudan
Burkina Faso	Kyrgyzstan	Suriname
Cambodia	Laos	Swaziland
Cameroon	Latvia	Sweden
Canada	Lebanon	Switzerland

Country List

Cayman Islands	Liberia	Syria
Chad	Libya	TUVALU

Chile	Lithuania	Taiwan
China	Luxembourg	Tanzania
Colombia	Macau	Thailand
Congo	Macedonia	Trinidad & Tobago
Croatia	Madagascar	Tunisia
Cuba	Malawi	Turkey
Curacao	Malaysia	U.A.E.
Cyprus	Maldives	U.K.
Czech Republic	Mali	U.S.
DJIBOUTI	Malta	Uganda
Democratic Republic of the Congo	Marshall Islands	Ukraine
Denmark	Mauritania	Uruguay
Dominica	Mauritius	Uzbekistan
Dominican Republic	Mexico	Venezuela
Ecuador	Moldova	Vietnam
Egypt	Monaco	Yemen
El Salvador	Mongolia	Zambia
Equitorial Guinea	Montenegro	Zimbabwe
Eritrea	Morocco	
Estonia	Mozambique	
Ethiopia	Myanmar	Germany
FRENCH GUIANA	Namibia	Oman
Fiji	Nauru	
Finland	Nepal	
France	Netherlands	
GREENLAND	New Zealand	
GRENADA	Nicaragua	
GUYANA	Niger	

Gabon	Nigeria
Georgia	Norway



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