

Trade and Conflict: An Inverse Relationship?

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Abstract

This study tries to empirically show that trade openness does, in fact, decrease the most readily available measure of militarism: military spending as a proportion of gross domestic product. By using data from twelve countries over a period twenty years, a linear regression model will be able to show the best estimated effects of several variables, including a measure of trade openness on military spending of gross domestic product.

Key Words: trade, conflict, military spending

Introduction

Europe has been through many bloody wars in its history. One could say that Europe's history is continuous warfare with crescendos every other generation. The last half of the twentieth century has shown an extreme departure from the divisiveness that Europe had seen for millennia. The European Steel and Coal Community, the European Economic Community and other agreements were created to increase trade and cooperation amongst European member states in the hope to decrease military conflict that historically plagued the continent. But is this what occurred?

Scholars from differing concentrations have argued back and forth whether trade does promote peace. Some argue that it does while others insist that it increases tensions between nations. While it may be easy to join the fray of the debate with another anecdotal piece or philosophical discussion, an empirical analysis of the question might shed some light on the subject. By analyzing the core twelve members of the European Union, the founding members plus the expansion until the mid-1980s from 1998 to 2008, using statistical models, a relationship between trade openness and war might be empirically shown to have an inverse effect on each other.

Literature Review

When the discussion of the relationship between trade and military conflict arises, the three main arguments always seem to be: free trade promotes peaceful cooperation; trade may

spark tensions between trading blocs and partners and that trade has no effect because military conflict is based on more important variables. In this section all three sides will be discussed briefly and will be finished with a short history of how Europe had evolved from warring states to an economic community.

“History teaches that wars begin when governments believe the price of aggression is cheap.”¹ Ronald Reagan perfectly summarized the bulk of the “trade brings peace” scholars. The classically liberal economists and scholars theories are quite consistent and have a lot of anecdotal and empirical evidence to support them. Han Dorussen (1999) begins his paper by stating that it is obvious that trade reduces military conflict, he is convinced beyond doubt that this is the case, and by explaining that trade in any sector reduces the chances for conflict because it allows comparative advantage to form between the two nations. He further adds that the goods traded do not matter if they are strategic or non-strategic.² Dawood Mamoon and S. Mansoob Murshed’s (2009) findings in their analysis of India and Pakistan’s rocky relationship have found similar results. . In their empirical study, they found that:

Conflict between India and Pakistan, which spans most of the last 60 years since their independence from British rule, has significantly hampered bilateral trade between the two nations. However, we also find that the converse is also true; more trade between India and Pakistan (especially Indian exports to Pakistan) decreases conflict... A regional trade agreement... has much potential for the improvement of relations between India and Pakist on a long-term basis.³

¹ Notable Quotes, “Quotes on War,” Notable Quotes, http://www.notable-quotes.com/w/war_quotes.html.

² Dorussen, Han. “Trade Interests and Conflicts: What You Trade Matters.” *The Journal of Conflict Resolution* 50, No. 1 (2006): 100-105.

³ Mamoon, Dawood and Murshed, S. Mansoob. “The conflict mitigating effects of trade in the India-Pakistan case.” *Springerlink.com* (October 2009) 164-165.

Further, the formation of trade-blocs and rival free-trade zones do not seem to have an effect on conflict either as discussed by John O’Loughlin and Luc Anselin (1996). They found that while trade may intensify in the trading blocs, which may upset former trade partners, the amount traded to non-bloc members may also increase as the economies grow due to export-led growth.⁴ In further support of these author’s findings, Pavel Yakolev (2007) finds that military spending actually has a negative effect on economic growth. Interestingly, this negative growth is decreased slightly if the nation decides to exports a portion of their weaponry to another nation.⁵

Other scholars believe the findings of the above authors are false. The dissenters, mostly from the neo-realist and Marxist schools of thought, disagree with the idea that trade brings peace. They believe that trade does not bring peace and may, in fact, cause conflict. For example, Keshk, Reuveny and Pollins’s (2010) paper empirically finds the opposite that trade increases conflict.

Our empirical findings show clearly that international policy pushes commerce in a much broader range of circumstances than the reverse. In fact, we could find no combination of model choices, indicators, or data assumptions that failed to yield the result that dyadic conflict reduces dyadic trade. Liberal claims regarding the effect of dyadic trade on dyadic conflict simply were not robust in our findings.⁶

Martin, Mayer and Thoenig (2007) also share this conclusion. They argue that while more trade between two countries may make them more inclined to be peaceful towards each other, but may

⁴ O’Laughlin, John and Anselin, Luc. “Geo-Economic Competition and Trade Bloc Formation: United States, German and Japanese Exports, 168-1992.” *Economic Geography* 72, No. 2 (1996): 155-159.

⁵ Yakolev, Pavel, “Arms Trade, Military Spending, and Economic Growth.” *Defense and Peace Economics* 18 (2007) 334-337.

⁶ Keshk, Omar M., Reuveny, Rafael, and Pollins, Brian M. “Trade and Conflict: Proximity, Country Size and Measures.” *Conflict Management and Peace Science* 27, No. 3 (2010): 23.

increase the probability of conflict with a third because of the decreased resources available to that third country. They further suggest a study that takes into account both regional trade agreements and whether or not international goods are compliments of other international goods.⁷ These two groups of scholars definitely put into question the liberal assumption that trade creates peace. They seem to argue that trade is a symptom of peace and not a cause.

Another group of scholars argue that both groups are incorrect. These author's all have different ideas about the relationship between trade and the military. Dieter and Higgott (2007) argue that trade, especially American trade, is being used as a new way to influence developing countries and provide security. They argue that the United States is pursuing trade agreements in Asian states for security reasons, not trade. Therefore, this increase in trade can be seen as a tool for making peace but they argue that it is being used for regional influence.⁸ Bearce and Fisher discuss that economic geography has a larger impact on military spending and trade. That these "third factors" is what really drives nations towards war and also affects the amount they trade.⁹ Long (2003) discusses on of the "third factors" Bearce mentions. Long found that military pacts had a positive effect on trade.¹⁰

⁷ Martin, Phillipe and Mayer, Thierry, and Thoenig, Mathias. "Make Trade Not War?" *Review of Economic Studies* 75, (2008): 894-895.

⁸ Dieter, Heribert and Higgott, Richard. "Linking Trade and Security in Asia: Has Washington's Policy Worked?" *Aussenwirtschaft* 62, No. 2 (2007) 167-170.

⁹ Bearce, David H. and Fisher, Eric. "Economic Geography, Trade and War." *The Journal of Conflict Resolution* 46, (2002): 388-391.

¹⁰ Long, Andrew G. "Defense Pacts and International Trade." *Journal of Peace Research* 4, No. 5 (2003): 549-551.

McDonald (2004) goes one step further than the others by saying that liberal trade does not ensure peace. He points at how the increased globalization of the world in the late nineteenth and early twentieth centuries failed to prevent the First World War. McDonald argues that liberal trade will not produce peace if it does not liberalize the nations' involved. McDonald claims that this is the effect that is being observed, the increase in free trade across the world is accompanied by greater liberal domestic policies.¹¹

It is clear that there is much discussion and disagreement in the academic world on whether or not trade has a positive, negative or nil effect on militarism.

Brief History

After World War II, Europe found itself economically devastated by another terrible war. After the French were unable to convince the world powers that it should be able permanently control South Eastern Germany, which is rich in coal and industry, they began feverishly to create a way to prevent the Germans to have a large share of Europe's industry and resources required for war. The European Steel and Coal Community was founded in 1953 and included Belgium, Germany, France, Italy, Luxembourg and the Netherlands. The free trade zone of these specific resources and goods was such a success that the member states decided to extend their free trade experiment and founded the European Economic Community in 1958. Between 1958 and 1986 Denmark, Ireland, the United Kingdom, Portugal and Spain join the newly

¹¹ McDonald, Patrick J. "Peace through Trade or Free Trade?" *The Journal of Conflict Resolution* 48, No. 4 (2004): 568-569.

consolidated, and much more free trade agreement, European Community.¹² The founding members of the organization that would become the European Union believed in the liberal relationship between peace and trade: they knew that the cure to their generations of conflict was free trade, especially strategic resources.

Data, Variables and Model

Forming a model to try and explain the relationships between several nations is an extremely daunting task. First of all, how can militarism be accurately measured? The number of wars that country is involved in confuses this measure because it doesn't take into account whether they were being defensive or aggressive and the actual amount they participated in the conflict. The size of the military also does not do a good job of measuring militarism because larger nations probably will have larger militaries; also, nations with higher Gross Domestic Product (GDP) will also tend to spend more of their nominal income on their military. It seems that the best measurement of militarism in a nation is their military expenditures as a portion of GDP. This measure is extremely useful because it negates the differences between economies. In addition, it should also measure the relative rate of participation in the conflicts that they join because if a country is heavily involved in a conflict it follows that their military spending of GDP will increase.

¹² Bulmer, Simon. "History and Institutions of the European Union." in *The Economics of the European Union: Policy and Analysis*. (Oxford University Press: New York, 1996) 5-10.

The next problem faced is how to measure trade openness. While there are many measures of how to do this, the best is often the simplest. Trade openness will be measured as the summation of exports and imports divided by GDP. In other words, the amount traded in relation to GDP is an excellent measure of trade openness. As noted above, trade is not the only thing that affects the amount of militarism. Nation size, population, military alliances, terrorism, active wars, domestic conflicts, political structures, military tradition, neighboring states, etc. all will have some influence on a nation's relative militarism.

Military tradition and the value of having a hostile neighboring state, both difficult to measure, will not be studied due to wanting model simplicity. In this short time period that is being studied, only twenty years, nation size seems to not be a good measurement because it probably will not change by a significant amount. Terrorism will also be eliminated from this model. While terrorism seems like a good match for this study, especially the effects that it has had on world military philosophies, it is difficult to decide exactly what a major terrorist act is. Obviously the Spanish and British bombings in 2004 and 2005, respectively, are major terror events, it is questionable whether or not minor instances can be considered. Is the measure of terrorism just how many people were harmed? Is it property damage? Is a riot, which both destroys human and physical capital, considered a terrorist act? Terrorism is too complicated a variable to counted in this study, even though it would probably add some more depth. War also is a complicated matter. While it should be straight forward, did the country declare war or was it attacked, modern military conflicts sometimes do not have anyone declaring war on anyone. Also, if NATO or the UN are involved in any conflict, does that mean the member state is

automatically involved? For the purpose of this study, a country will be considered at war if a member of their armed forces is officially involved in a conflict or if NATO is involved.

Total population will be kept in this study, unlike the other two. A larger population probably would require a larger military force to protect it than a less populated nation. Also, a larger population might represent a more heterogeneous sample of ideas and feelings toward the military. Along with population, the countries total territory it controls will also be included because it follows that a larger country requires a larger military force to protect its borders.

After cutting problematic variables, the only ones that are left that will probably have a significant impact on military spending as a proportion of GDP (will be referred to as GME from now on) are the classic measurement of trade openness, population, military alliances, active wars, land area and population. Information for military spending will come from the Stockholm International Peace Institution (www.sipri.org), trade, land area will come from the Food and Agricultural Organization of the United Nations (<http://faostat.fao.org/site/377/default.aspx#ancor>), GDP and population data will be coming from the United Nations' Department of Economic and Social Affairs (<http://unstats.un.org/unsd/default.htm>).¹³

With all the data collected, it became necessary to organize it for analysis. The panel creation had to be extremely careful because the wrong panel creation would lead to either

¹³ A graph of each non-dummy variable compared with GME is attached in Appendix: Graphs. Population and Land area were taken to their logs to make the numbers more manageable. So $\ln(\text{POPULATION}) = \ln \text{POP}$ and $\ln(\text{LAND}) = \ln \text{LAND}$.

insignificant results or wrongly estimated effects. For example, averaging all of the observations for in each respective country for each variable would allow for a simple cross-section panel but would result in absorbing the effects of the error term in each and every variable thus creating an unreliable measure of trade openness on GME. Therefore, a cross-section time series panel seemed to be the most appropriate in this study because it will allow for the true effects of each variable to be seen. To find these true effects, a linear regression model will be used with GME as the dependent variable and all others explanatory.

Variables

- Military Spending as a Portion of GDP = GME
- Trade openness measured by the summation of exports and imports divided by GDP = TOPEN
- Member of the North Atlantic Treaty Organization = NATO
- Active military conflict = WAR
- Total population of the country = POPULAT
- Total Land Area of COUNTRY in 1000 Hectares = LAND
- Intercept of the linear relationship = A

Model

$$BGME = A + BTOPEN + BNATO + BWAR + BPOPULAT$$

Variable	Min	Max	Mean	STD
GME	0.005	0.051	0.019	0.0096
LAND	259	54919	19740.5	18352.82
POPULAT	373300	82541000	29461231.4	26989618.5
TOPEN	0.329	3.006	0.2103	0.408
NATO	0	1	0.917	0.277
WAR	0	1	0.210	0.408

Data Analyses

To begin with, descriptive statistics were run in the SAS 9.2 statistical software. It is found that the average core 12 EU nation from 1988-2008 has a GME of 0.02, TOPEN of 1.039, NATO membership of about 90%, were involved in some sort of military conflict 20% of the time and a POPULAT of 29,461,231 individuals. A number of different regressions were run to try and find the real effects these variables have on GME.

$$\begin{aligned}
 1) \text{ BGME} &= 0.03042 - 0.00997\text{TOPEN} \\
 &\quad (32.73)^* \quad (-12.92)^* \\
 2) \text{ BGME} &= 0.00895 + 0.01239\text{NATO} - 0.00114\text{WAR} \\
 &\quad (4.53)^* \quad (5.93)^* \quad (-0.80)^* \\
 3) \text{ BGME} &= 0.03593 - 0.013\text{TOPEN} - 0.9 \times 10^{-10}\text{POPULAT} \\
 &\quad (23.89)^* \quad (-13.44)^* \quad (-4.55)^* \\
 4) \text{ BGME} &= 0.031 - 0.012\text{TOPEN} + 0.007\text{NATO} - 0.001\text{WAR} - 1 \times 10^{-10}\text{POPULAT} - 1.09 \times 10^{-8}\text{LAND} \\
 &\quad (13.30)^* \quad (-13.14)^* \quad (3.90)^* \quad (-1.69)^* \quad (-2.10)^* \quad (-2.58)^* \\
 &\quad \text{D.W. (0.207) R}^2 = 0.4990 \\
 5) \text{ BGME} &= 0.02429 - 0.009\text{TOPEN} + 0.006\text{NATO} \\
 &\quad \quad \quad (-11.36)^* \quad (3.18) \\
 &\quad \text{D.W. (0.207) R}^2 = 0.4226
 \end{aligned}$$

*t-Values

Each of these models gives us new information to make the model better. In the first model we see the TOPEN is a significant measure. Expanding that model to include POPULAT reveals that POPULAT is significant but it is effectively zero. In model 2, NATO is found to have a positive significant effect while WAR has a negative, but non-significant, effect on GME, so it is considered to have no effect on military spending. In model 4, all of the variables are put in and we find that TOPEN and POPULAT have negative, significant effects on GME while NATO has a positive, significant effect. Interestingly, WAR has no effect on GME in our model.

The final model shows that between 1988 and 2008 in the first twelve countries of the EU that if the level of trade openness increased by one than military expenditure as a proportion of GDP decreased by 0.12 percent. Also being a participant in NATO had the opposite effect on

military spending, it increased GME by 0.007 percent. Population and size of the country have no effect on military spending because their parameters are effectively zero.. In this panel, war did not have a clear effect on military spending. This might be because the conflicts that Europeans were involved in required light use of their militaries relative to the larger participants in the war, namely the United States.

This model also appears to suffer from positive autocorrelation because of its relatively low Durbin-Watson statistic, 0.207. Some of the variables also appear to be heavily correlated.¹⁴ The R2 statistics also do not break 0.50. It is obvious that this model is missing significant variables.

Conclusions and Remarks

The idea that increasing the level of trade will decrease militarism amongst nations is somewhat supported by this study. This study looked at twelve different European countries who were the first in the European Union, at the time it was still known as the European Economic Community. The results are clear: trade openness does decrease military spending. However, it is not an extremely large decrease. For every one point increase in trade openness, military spending decreases by a mere 0.12 percent. This is not as significant as an affect that was hoped for. Being a member of the North Atlantic Treaty Organization had an even smaller effect, being a member increased military spending by only 0.007 percent. These results are not was expected but are promising for future studies.

¹⁴ The attached Pearson Correlation Coefficients table from SAS shows that the variable TOPEN is correlated with GME, LAND and POPULAT at significant levels.

As noted earlier, this model suffers from both multicollinearity and positive autocorrelation. Even though these problems are almost expected from a time series panel and they might not affect the best linear unbiased estimates, the model would be helped by an expansion of either additional explanatory variables or observations. Future studies need to be able to create good variables that can estimate a value for military tradition, terrorism and hostility of neighboring nations. In addition, a longer time period would also lead to better results.

This study shows that trade openness is a significant explanatory variable for military spending. Therefore, an expansion of the variable list may better decrease the size of the error term. The best solution to this problem is increasing the amount of countries used in this study and the length of time studied. If this small sample and year set delivered the expected results, a larger sample and time series might provide even more convincing results.

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- ⁴ Notable Quotes, "Quotes on War," Notable Quotes, http://www.notable-quotes.com/w/war_quotes.html.
- ⁵ Morrow, James D. "How Could Trade Affect Conflict?" *Journal of Peace Research* 36 No. 4 (July 1999) 481-489.
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¹⁷ Kim, Hyung Min and Rousseau, David L. "The Classical Liberals Were Half Right (or Half Wrong): New Tests of the 'Liberal Peace,' 1960-1988." *Journal of Peace Research* 42 No. 5 (September 2005) 523-543.

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¹⁹ Oneal, John R. and Russett, Bruce M. "The Classical Liberals Were Right: Democracy, Interdependence, and Conflict, 1950-1985." *International Studies Quarterly* 41 No. 2 (June 1997) 267-275)

²⁰ Oneal 276-277. ²¹ Oneal 278-290.

²² Stockholm International Peace Research Institute, *SIPRI Yearbook 1979, 1989* (Oxford: Oxford University Press; 1979). SIPRI's website was also used for data from 1988 onwards. <http://sipri.org>

²³ Center for International Comparisons of Production, Income and Prices, "The Penn World Table," http://pwt.econ.upenn.edu/php_site/pwt_index.php (accessed November 14, 2011).

²⁴ Food and Agricultural Organization of the United Nations, "FAOSTAT," <http://faostat.fao.org/site/377/default.aspx#ancor> (accessed November 14, 2011).

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²⁸ Values with an asterisk have a p-value of at least 0.05 and two asterisks indicate a p-value of at least 0.001. Highlighted cells indicate significant correlation between variables.

²⁹ The random effects and fixed effects models appear similar at first glance but the way they define their error terms is dramatically different. In the fixed effects model, the error term v can be divided into both a time effects error term, t , and an observational group error term, n . These two terms can be used as dummy variables and will control for unobservable variables that differ between time periods but are constant through units and variables that are constant over time but vary over units. On the other hand, the random effect model's error term is divided into a deterministic error and a random error. The deterministic error acts as an intercept for the linear model and the random term enters the model's error term resulting in the error term to be autocorrelated with the explanatory variables.

³⁰ If we use dummy variables to control for unique observation and time effects and then test this regress for heteroskedasticity, we receive a chi² statistic of 75065.89. This model suffers from sever

heteroskedasticity, but this is not unexpected because of the nations and the time frame of this study. Ideally the study would have either more countries and a greater time period or be a more constrained group of nations and the same time period. However, the data would be extremely difficult to acquire to extend the time period anymore and constraining the amount of nations in the study reduces the explaining power of the study.

³¹ Heritage Foundation Economic Freedom Index, "Economic Freedom Index: Explore the Data," <http://www.heritage.org/index/Explore.aspx?view=by-region-country-year> (Accessed November 17, 2011).